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# *COMPLIANCE EMISSIONS TEST*
# *WEST PLANT SRU INCINERATOR*
# *TCEQ PERMIT NO. 8778A AND PSD-TX-408M3*
# *TCEQ ACCOUNT NO. I.D.: NE-0192-F*
# *EPN 554-ME5*
# *CORPUS CHRISTI, TEXAS*

*Citgo Refining and Chemicals Company, Inc.*
*Corpus Christi, Texas*

*October, 2008*

*Stork SwL Project No. 08091128*

*This study was conducted by the*
*Air Emissions Services Division of*
*Stork Southwestern Laboratories, Inc.*
*Houston, Texas*

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**Stork Southwestern Laboratories**

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December 3, 2008

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Re: Compliance Emissions Test
West Plant SRU Incinerator
TCEQ Permit No. 8778A and PSD-TX-408M3
TCEQ Account No. ID: NE-0192-F
EPN 554-ME5
Corpus Christi, Texas
Stork SwL Project No. 08091128

Gentlemen:

In accordance with our agreement, Stork Southwestern Laboratories, Inc. (Stork SwL) hereby submits our test report covering the compliance test program on the West Plant SRU Incinerator located your Corpus Christi, Texas facility. Compliance testing was performed on October 7-8, 2008.

This report is for the exclusive use of Citgo Refining and Chemicals Company, L.P. and except for submission to regulatory agencies, the use of our name relative to the report must receive our prior written approval. Copies of this report should be submitted to the appropriate regulatory agencies (TCEQ and EPA, if applicable). As per Special Condition 28E, copies must be sent to:

- TCEQ Corpus Christi regional office
- EPA New Source Review Section, Dallas
- TCEQ Compliance Support Division, Austin

It has been a pleasure working with you and your personnel once again. Please let us know if you have any questions concerning this report, or if we may be of further service.

Sincerely,

**STORK SOUTHWESTERN LABORATORIES, INC.**

Johndunn B. Johnston/pjm

Johndunn B. Johnston
Senior Project Manager
Air Emissions Services Division

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# EXECUTIVE SUMMARY

A test program was performed on the Sulfur Recovery Unit (SRU) Incinerator located at the West Plant of the Citgo Refining and Chemicals Company, Inc. (Citgo) Corpus Christi, Texas facility. The test program consisted of compliance emissions testing by Stork Southwestern Laboratories, Inc. (Stork SwL). The test program was performed to evaluate the incinerator at a lower firebox temperature, thus requiring an updated test program to satisfy the EPA and TCEQ. The unit is regulated under TCEQ Permit No. 8778A/PSD-TX-408M3 and EPA NSPS Subpart J.

The test program results are summarized as follows:

| 40 CFR 60 Subpart J | | | |
|---|---|---|---|
| **Pollutant** | **Average Concentration** | **Allowable Limit** | **Percent of Allowable Limit** |
| $SO_2$, ppmvd @ 0% $O_2$ | 97.36 ppmvd @ 0% $O_2$ | 250 ppmvd @ 0% $O_2$ | 38.9 |

| TCEQ Permit | | | |
|---|---|---|---|
| **Pollutant** | **Average Emissions** | **Allowable Limit** | **Percent of Allowable Limit** |
| $SO_2$ | 65.75 ppmvd | 250 ppmvd[1] | 26.3 |
| $SO_2$ | 7.29 lb/hr | 22.4 lb/hr | 32.5 |
| NOx | 1.63 lb/hr | 3.50 lb/hr | 46.5 |
| CO | 2.37 lb/hr | 3.90 lb/hr | 60.9 |
| $H_2S$ | <1.28 ppmvd @ 3% $O_2$ | 10 ppmvd @ 3% $O_2$[2] | <12.8 |
| $H_2S$ | <0.06 lb/hr | 0.50 lb/hr | <12.0 |

Note: All runs for $H_2S$ were nondetectable, therefore the average is shown as a "less than" (<) value.
[1] Special Condition 19.
[2] Special Condition 32.

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# INTRODUCTION

A compliance emissions test program was conducted on the West Plant sulfur recovery unit (SRU) tail gas incinerator (Emission Point No. [EPN] 554-ME5) located at the Corpus Christi, Texas facility of Citgo Refining and Chemicals Company, Inc. (Citgo). Compliance emissions testing, consisting of determining oxygen ($O_2$), sulfur dioxide ($SO_2$), nitrogen oxides (NOx), carbon monoxide (CO), hydrogen sulfide ($H_2S$) and flow, was performed by Stork Southwestern Laboratories, Inc. (Stork SwL) Air Emissions Services (AES) Division. Personnel present at times during the test program were Mr. Chris Adams and staff of Citgo, and Messrs. Gus Gonzalez, John Johnston and Manuel Garcia of Stork SwL. The West Plant SRU is equipped with two (2) Claus trains, a single SCOT tail gas treating unit, a single incinerator and a single exhaust stack. The test program was performed to evaluate the incinerator at a lower firebox temperature, thus requiring an updated test program to satisfy the EPA and TCEQ.

Sampling was conducted to determine the concentration and, where applicable, emission rates of $SO_2$, NOx, CO and $H_2S$ from the West Plant SRU in order to satisfy the EPA 40 CFR 60 Subpart J and Texas Commission on Environmental Quality (TCEQ) Permit No. 8778A/PSD-TX-408M3.

The SRU has multiple applicable $SO_2$ emission limits:

- 40 CFR 60, Subpart J: 250 ppmvd @ 0% $O_2$
- TCEQ Permit 8778A: 22.4 lb/hr (MAERT) plus 250 ppmv (Special Condition No. 19)

Therefore, the test program was performed to satisfy both the EPA NSPS Subpart J and TCEQ Permit criteria, and was performed as follows:

- $SO_2$: Twelve (12) one (1) hour samples using EPA Method 6C.
- $O_2$: Twelve (12) one (1) hour samples using EPA Method 3A, obtained simultaneous with the $SO_2$ sample runs (to correct the $SO_2$ ppmvd data to a 0% $O_2$ basis).
- NOx and CO: Three (3) one (1) hour samples using EPA Method 7E and 10, respectively.

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- $H_2S$: Three (3) three (3) hour samples using EPA Method 15.
- Flow: Three (3) velocity traverse/moisture samples using EPA Methods 1-4 (modified to allow a single point moisture sample).

The sampling sequence was conducted as follows:

- October 7, 2008 – Four (4) EPA NSPS Subpart J samples.
- October 8, 2008 – Eight (8) EPA NSPS Subpart J samples and three (3) TCEQ Permit compliance runs.

## RESULTS

Results of the test program, calculated in accordance with EPA and TCEQ procedures are included in the Tables section of this report, and are summarized as follows:

| 40 CFR 60 Subpart J | | | |
|---|---|---|---|
| **Pollutant** | **Average Concentration** | **Allowable Limit** | **Percent of Allowable Limit** |
| $SO_2$, ppmvd @ 0% $O_2$ | 97.36 ppmvd @ 0% $O_2$ | 250 ppmvd @ 0% $O_2$ | 38.9 |

| TCEQ Permit | | | |
|---|---|---|---|
| **Pollutant** | **Average Emissions** | **Allowable Limit** | **Percent of Allowable Limit** |
| $SO_2$ | 65.75 ppmvd | 250 ppmvd[1] | 26.3 |
| $SO_2$ | 7.29 lb/hr | 22.4 lb/hr | 32.5 |
| NOx | 1.63 lb/hr | 3.50 lb/hr | 46.5 |
| CO | 2.37 lb/hr | 3.90 lb/hr | 60.9 |
| $H_2S$ | <1.28 ppmvd @ 3% $O_2$ | 10 ppmvd @ 3% $O_2$[2] | <12.8 |
| $H_2S$ | <0.06 lb/hr | 0.50 lb/hr | <12.0 |

Note: All runs for $H_2S$ were nondetectable, therefore the average is shown as a "less than" (<) value.
[1] Special Condition 19.
[2] Special Condition 32.

The average incinerator temperature was 1300°F during this test program.

As shown above, the West Plant SRU met both the EPA NSPS and TCEQ Permit limits at the lower firebox temperature.

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# PROCEDURES

Sampling equipment and procedures were in conformity, except where noted, with Reference Methods 1, 2, 3, 3A, 4, 6C, 7E, 10 and 15 of the Code of Federal Regulations, Title 40, Part 60 (40 CFR 60) "Standards of Performance for New Stationary Sources", Appendix A - Reference Methods and TCEQ sampling and analytical methodologies.

A Compliance Sampling Plan (CSP dated September 8, 2008) was submitted to the TCEQ prior to the test program (email dated September 10, 2008) and can be found in the Appendix of this report. The test program was conducted in accordance with the CSP.

***Sample and Velocity Traverses - EPA Method 1***

The exhaust stack was 82 inches in diameter at the sampling location (as measured in the field by Stork SwL personnel). Two (2) three (3) inch flanged sampling ports complete with valves, 90° apart were provided on the stack. Upstream distance from flow disturbance (diameter change) to sample ports (Distance A) was 110 inches (~1.3 stack diameters), downstream distance from flow disturbance (diameter change/inlet) to sample ports (Distance B) was 658 inches (~8.0 stack diameters). Therefore, a sixteen (16) point traverse for velocity sampling (eight [8] points from each port) was performed on the stack (see Figure No. 1). A check for cyclonic flow within the exhaust stack demonstrated that the flow was parallel to the stack wall (therefore noncyclonic). One (1) velocity traverse run was obtained for each of the three (3) TCEQ compliance tests (run nos. 5, 8 and 10).

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***Determination of Stack Gas Velocity and Volumetric Flow Rate - EPA Method 2***

Stack gas velocity was measured with an "S" type pitot tube constructed in accordance with "proper pitot tube sampling nozzle configuration", as specified in the Environmental Protection Agency, "Standards of Performance for New Stationary Sources - Revision to Reference Method 1-8 (FR Thursday August 18, 1977, Part II)." Due to the high exhaust temperatures, a pitot tube constructed of inconel was used. Pitot tube correction coefficients were determined either by calibration in a wind tunnel or by following the construction guidelines contained in the method. Temperature measurements were determined by means of a calibrated digital thermometer with a Type "K" thermocouple. Actual flue gas flow rate data were obtained with sample runs 5, 8 and 10.

***Gas Analysis and Molecular Weight Determination - EPA Methods 3 and 3A***

Stack gas samples were taken throughout the emission test period and analyzed by use of a continuous instrumental analyzer technique for $O_2$ and by Fyrite Gas Analyzers for $CO_2$.

The following $O_2$ analyzer was utilized in the sample program:

$O_2$ - Servomex Model 1420B Paramagnetic ($O_2$)

The $O_2$ sample system consisted of an inconel probe (due to elevated stack temperature), heated Teflon transport line, vacuum sample pump, a chilled sample conditioning system, sample inlet manifold and metering apparatus, the aforementioned analyzer and a data acquisition system (DAS). The $CO_2$ analysis consisted of a Bacharach Fyrite Combustible Gas Analyzer kit.

An $O_2$ sample run was obtained from the stack during each of the twelve (12) $SO_2$ pollutant sample runs (and therefore also with each of the three (3) NOx and CO sample runs). Total sample time on each

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pollutant run was one (1) hour. The $CO_2$ samples were obtained at the stack during each of the three (3) $SO_2$/NOx/CO TCEQ compliance tests using the Fyrite analyzer. Each $CO_2$ test consisted of three (3) samples taken during the moisture sample run obtained with $SO_2$ run nos. 5, 8 and 10.

Prior to sampling, the $O_2$ analyzer was calibrated with gases prepared in accordance with EPA Protocol ($O_2$/$CO_2$ in nitrogen gases were used). Throughout the sample program, the zero and span gases were injected to confirm accurate instrument calibration, and to calculate instrument calibration drift and bias.

To ensure accurate data, Stork SwL performed bias checks of the sample system prior to sampling. This procedure included sending the calibration gas up to the inlet of the sampling system and reintroducing the gas back through the entire system.

Oxygen data were used to correct $SO_2$ ppmvd data to a 0% $O_2$ basis. $CO_2$ and $O_2$ data were also used (with $N_2$ determined by difference) to compute flue gas molecular weight which was then used in stack velocity calculations.

***Determination of Moisture Content in Stack Gases - EPA Method 4***

Moisture content of the stack gas was determined by volumetric and gravimetric analysis of the impinger catch from each moisture sample run. A sixty (60) minute sample was obtained with each TCEQ compliance sample run. The sample was obtained at the approximate stack midpoint at a constant rate. Data were used in flue gas exhaust rate calculations which were then used to convert pollutant emission concentrations to a lb/hr basis (TCEQ compliance test only).

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***Determination of Oxygen, Sulfur Dioxide, Nitrogen Oxide and Carbon Monoxide - EPA Methods 3A, 6C, 7E and 10***

Stork SwL obtained a total of twelve (12) $SO_2/O_2$ sample runs and three (3) NOx and CO sample runs. All of the runs were of sixty (60) minutes duration. The sampling incorporated the updated Continuous Instrumental Test Methods (as contained in the May 15, 2006 Federal Register with an effective date of August 14, 2006). A summary of the test method is provided below:

**Analyzer**: The instruments included a Ametek/Western Research Model 721-CE for $SO_2$, Servomex Model 1420B for $O_2$, ThermoEnvironmental (TECO) Model 42C-HL for NOx and TECO Model 48H for CO.

**Analytical Principle**: Ultraviolet Photometric for $SO_2$, Paramagnetic for $O_2$, Chemiluminescence for NOx and Nondispersive Infrared (NDIR) for CO.

**Measurement System Performance**: The criteria specified in Methods 3A/6C/7E/10 was used as follows:

- Determined sampling system bias which is critical to accurately determine emissions.
- Calibration gases were injected at the back of the probe, thereby requiring the gas to pass through the entire sampling system, including sample transport lines, sample conditioning system and metering apparatus. This ensured accurate calibration by more precisely simulating the actual test methodology.

**Apparatus/Components**: The criteria for Reference Methods 3A/6C/7E/10 were used. The sample system consisted of an inconel probe (due to elevated stack temperature), a particulate removal filter, heat traced Teflon transport line, heated stainless steel and Teflon diaphragm pump, chilled conditioning system, metering apparatus, the respective analyzers and a data acquisition system (DAS).

**Calibration Gases**: The gases specified in Methods 3A/6C/7E/10 were used as follows:

- Zero grade nitrogen for $SO_2$, $O_2$, NOx and CO zero gas.
- EPA Protocol mid (40-60% of calibration span) and high level (100% of calibration span) gases for $SO_2$, NOx, CO and $O_2$. The high level gas sets the calibration span of each instrument.

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**Measurement System Performance Test**:

- Used EPA Protocol gases for the test program as stated above.
- Performed calibration error (linearity), response time and sample system bias measurements by Methods 3A, 6C, 7E and 10, which met the criteria.
- Performed the $NO_2$ to NO converter efficiency check. This was done with a Tedlar bag mixture of NO calibration gas and oxygen. Results were 0.81% which meets the 2% criteria.
- Determined which calibration check (mid or high level) best approximated the actual emissions and used it for the upscale calibration gas.

**Initial Performance Test**: Methods 3A/6C/7E/10 techniques were used as follows:

- A three (3) point traverse was used to determine stratification. The sample points were located at 16.7, 50.0 and 83.3% of stack diameter. Stratification was not present (based on the $O_2$ data), therefore point no. 2 was used for testing as it represented the value closest to the average. The initial sample point was purged for at least twice the maximum response time prior to recording actual data.
- The range of the instruments during the test program were 100 ppmv CO, 100 ppmv NOx, 100 ppmv $SO_2$ and 25% $O_2$. The calibration span (equivalent to high level calibration gases) were 91.4 ppmv $SO_2$, 95.1 ppmv NOx, 95.1 ppmv CO and 21.0% $O_2$.
- Determined sample bias.
- Introduced the calibration gases through the entire sampling system, as discussed above.

**Emissions Calculations**: Stork SwL used the techniques set forth in Methods 1-4, 3A/6C/7E/10 and 15 as follows:

- The Method 6C/7E/3A/10 requirement to correct the $SO_2$, NOx, CO and $O_2$ data for calibration drift and error was applied to each run. Equation 7E-5, as set forth in 40 CFR 60, Appendix A, Method 7E, Section 12 (effective date of August 14, 2006), was used.
- Stork SwL performed flue gas flow measurements using EPA Methods 1-4 for three (3) of test runs. This data was used to convert pollutant concentration data to an emission rate basis on the unit to determine TCEQ Permit compliance.

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- The Method 3A/6C/7E/10 requirement to correct the $O_2$, $SO_2$, NOx and CO data for calibration drift and error was applied to each run.

- Stork SwL used a calculation technique to convert the $SO_2$ concentration data to a 0% $O_2$ (EPA NSPS Subpart J) and $H_2S$ to 3% $O_2$ emission basis (TCEQ permit) and the flow data measured by Method 1-4 to calculate the lb/hr emissions rates (TCEQ permit). The equations used are as follows.

$$SO_2\ ppmvd\ @\ 0\%\ O_2 = SO_2\ ppmvd\ x\left(\frac{20.9}{20.9 - \%O_2}\right)$$

$$H_2S\ ppmvd\ @\ 3\%\ O_2 = H_2S\ ppmvd\ x\left(\frac{17.9}{20.9 - \%\ O_2}\right)$$

Where:

ppmvd = pollutant concentration, from Stork SwL test.
$\%O_2$ = stack oxygen, dry basis, from Stork SwL test.

$$pollutant\ Cd\ (lb/dscf) = \frac{ppmvd\ x\ molecular\ weight\ x\ 6.242\ x\ 10^{-8}}{24.04}$$

$$Pollutant\ lb/hr = pollutant\ lb/dscf\ x\ Qsd\ in\ dscf/hr$$

Where:

Molecular Weight = 28 for CO, 46 for NOx (as $NO_2$), 64 for $SO_2$ and 34 for $H_2S$
Cd = pollutant concentration in lb/dscf
Qsd = stack flow rate, dscf/hr as measured by Stork SwL

- In accordance with EPA regulations, the Subpart J samples were calculated as $SO_2$, ppmvd corrected to 0% $O_2$.

## ***Determination of Hydrogen Sulfide Emissions – EPA Method 15***

Stork SwL performed sampling of the SRU gas stream to determine hydrogen sulfide ($H_2S$), content in order to demonstrate compliance with the TCEQ permit (ppmvd @ 3% $O_2$ and lb/hr limits).

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The sampling system consisted of an quartz lined probe connected to a stainless steel cooling coil (due to the high stack temperatures), to a Teflon line, a heated Teflon filter, a chilled citrate buffer impinger train to remove moisture and $SO_2$, unheated Teflon transport line to the on-site gas chromatograph equipped with a flame photometric detector (GC/FPD). The gas was extracted from the approximate stack midpoint and transported by vacuum pump with Teflon coated heads to the on-site GC equipped with a capillary column, a VICI 10 port gas sampling valve with a 100µL loop and a flame photometric detector. Chromatography conditions are listed on each chromatogram which are contained in the Field and Laboratory Data section of this report. As this test was to satisfy a TCEQ permit requirement, three (3) three (3) hour samples were obtained, with each run consisting of twenty-nine (29 – Run No. 3) to thirty (30 – Run No. 1 and No. 2) injections (which meets the 3 to 6 hour run and minimum 16 injections stated in Section 8.2.3 of Method 15).

## SAMPLE RECOVERY

***Carbon Dioxide, Oxygen and Nitrogen – EPA Methods 3 and 3A***

The stack $CO_2$ analysis was performed on samples taken with each run by use of a standard Fyrite analyzer, $O_2$ was determined using a continuous paramagnetic oxygen ($O_2$) analyzer. Prior to sampling, the $O_2$ analyzer was set and calibrated in accordance with manufacturer and EPA instructions using EPA Protocol calibration gases.

The $CO_2$ Fyrite contains a potassium hydroxide solution that absorbs $CO_2$ as it is bubbled through the Fyrite. The $CO_2$ content is measured by the displacement of the solution level. The $CO_2$ data, coupled with the $O_2$ analyzer data and nitrogen determined by difference, were used in flue gas molecular weight determinations which was subsequently used in the flue gas exhaust rate computations.

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To measure $O_2$ by analyzer, the gas sample is passed through a strong, non-linear magnetic field, which deflects an electromagnetic "dumb-bell" mounted on a torque suspension. This deflection is detected by an optical system and twin photo-cells connected to an amplifier. The "dumb-bell" is wrapped with a coil of wire through which a current is passed to return the "dumb-bell" to its original position. The measured current is proportional to the concentration. Instrument calibration error (linearity), response time and system bias checks were performed at the field site prior to use. An upscale gas and zero ($N_2$) gas were injected after each sample run to determine calibration drift and system bias. Copies of field and calculation data are included with this report. The $O_2$ data was used to correct the $SO_2$ data to a 0% basis (for EPA NSPS criteria – see Table No. 3). The $O_2$ data from the TCEQ compliance test are shown in Table No. 4 and 5.

***Sulfur Dioxide - EPA Method 6C***

Analysis of the stack gas sulfur dioxide content was performed continuously at the field site utilizing a microprocessor-based photometric $SO_2$ analyzer (Ametek/Western Research Model 721 CE). The unit was calibrated in accordance with manufacture instructions utilizing certified EPA Protocol span gases. Prior to introducing each sample, the analyzer was purged with "zero" nitrogen.

The $SO_2$ analyzer measures two discrete wavelengths. One wavelength is absorbed by $SO_2$ and the other is not absorbed by $SO_2$. The sample flows through the measuring cell while the reference cell contains only non-absorbing gases. As the chopper wheel rotates, a flash of radiation passes through the measuring filter to the beam splitter. After a brief period, a flash of radiation passes through the reference filter to the beam splitter. These flashes of measuring and reference radiation continue at a nominal frequency of 52 times per second per filter. The beam splitter directs half the radiation through the

measuring cell and half through the reference cell to the two detectors which develop electrical signals proportional to the amount of radiation that impinged on the detectors. The detector signals are demultiplexed into two measuring signals and two reference signals. The reference signals are used to automatically control the gain of each detector to independently compensate each path for optical contamination. The detector signal developed from the measuring wavelength radiation that passes through the reference cell is used to control the current to the ultraviolet source. The two detector signals developed from the reference wavelength radiation that pass through the measuring and reference cell are used to produce an analyzer output signal that is proportional to the $SO_2$ concentration in the measuring cell. Instrument calibration error, response time and system bias checks were performed at the field site prior to use. An upscale gas and zero ($N_2$) gas were injected after each run to determine calibration drift and system bias.

Copies of field and laboratory data are included with this report. The average concentration of each run was calculated using a time weighted average technique. The EPA NSPS $SO_2$ data was corrected to 0% $O_2$. The TCEQ permit required emissions rate data was calculated using the velocity traverse data. $SO_2$ EPA 40 CFR 60 Subpart J data is shown on Table No. 3. $SO_2$ TCEQ compliance test data is shown in Table No. 4.

***Nitrogen Oxides – EPA Method 7E***

Analysis of the stack gas for nitrogen oxide content was performed continuously on-site utilizing a chemiluminescent NO/NOx analyzer (Thermo Environmental Model 42C-HL). Prior to sampling, the unit was set and calibrated in accordance with manufacturer and EPA instructions.

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The NOx instrument is capable of measuring NO and NOx (NO plus $NO_2$). To measure NO, the gas sample is blended with ozone ($O_3$) in a reaction chamber. Chemiluminescence from the $NO/O_3$ reaction is monitored through an optical filter by a high-sensitivity photomultiplier positioned at one end of the chamber. The filter/photomultiplier combination responds to light in a narrow-wavelength band unique to the $NO/O_3$ reaction. The output from the photomultiplier is linearly proportional to the NO concentration. To measure NOx (NO plus $NO_2$) concentrations, the sample gas flow is diverted through an $NO_2$ to NO converter. The chemiluminescent response in the reaction chamber to the converter effluent is linearly proportional to the NOx concentration entering the converter. The unit was operated on the NOx mode throughout the emissions test. Instrument calibration error (linearity), response time and system bias checks were performed at the field site prior to use. An upscale gas and zero ($N_2$) gas were injected after each run to determine calibration drift and system bias. In addition a NOx converter efficiency was performed.

Copies of field and calculation data are included with this report. The average concentration of each run was calculated using a time weighted average technique. The average emission rate for each run was then calculated using the stack flow rate data obtained from the corresponding flow sample runs. The NOx mass emissions data is quantitated as $NO_2$, in accordance with EPA/TCEQ definitions. The NOx emissions data are summarized in Table No. 5.

***Carbon Monoxide – EPA Method 10***

Analysis of the stack carbon monoxide levels were performed continuously on-site utilizing a nondispersive infrared (NDIR) gas filter correlation (GFC) analyzer (Thermo Environmental Model 48H).

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The unit was calibrated in accordance with manufacturer instructions utilizing EPA Protocol span gases (CO in $N_2$). Prior to introducing each sample, the analyzer was purged with nitrogen.

Instrument calibration error (linearity), response time and system bias checks were performed at the field site prior to use. An upscale gas and zero ($N_2$) gas were injected after each run to determine calibration drift and system bias.

Copies of field and calculation data are included with this report. The average concentration of each run was calculated using a time weighted average technique. The average emission rate for each run was then calculated using stack flow rate data obtained from the of the corresponding flow determinations. The CO emissions data are summarized in Table No. 5.

***Hydrogen Sulfide – EPA Method 15***

Stork SwL personnel performed on-site GC analysis of the SRU gas stream to determine the hydrogen sulfide ($H_2S$) content. The $H_2S$ was quantified using the power fit function of Chrom Perfect by Justice Laboratories software. This was necessary because the relationship between concentration and response on the FPD is not linear. Three (3) injections of three (3) different concentration gases were used to calibrate the FPD. The calibration gases were generated by passing nitrogen over permeation devices that emit a specific analyte at a fixed rate given a fixed temperature. The temperature was maintained at 30°C ± 0.1°C for Chamber 1. The concentration was changed by altering the amount of diluent nitrogen used. As required, a line loss study was conducted using a 5.9 ppmv calibration gas cylinder at the completion of testing. The sample is routed through the sample system. The recovery was 86%, which meets the ± 20% line loss criteria. The line loss correction is applied to the data for each run.

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Hydrocarbon sulfide results are contained in Table No. 6.

***Stork SwL Data Acquisition System***

Stork SwL utilized a custom developed DAS incorporating an analog to binary converter box to download the analyzer output signals to the data acquisition system (DAS) to record parameters. The DAS programming is based on Visual Basic, version 6.0. The data acquisition system downloads the analyzer output to a PRN file in an ASCII format, with data delineated by commas. The DAS was setup to sample information from the analyzers every second and to save one (1) minute averages of these samples (sixty [60] one [1] second samples are averaged for a one [1] minute average). Stork SwL data are presented in a column format with the first column containing the date and the time. Each column is labeled as to which pollutant it is and each file has an initial creation date and time.

## CUSTODY OF SAMPLES

After completion of tests, each sample was placed in the custody of the technician for analysis. It was his assigned responsibility to ensure that each sample was recorded and correctly analyzed. Analysis of samples was performed at the field site Stork SwL's Air Emissions Services personnel. It was the duty of the Air Emissions Program Manager and Project Manager to answer any procedural queries from the Laboratory Technician. Final responsibility rested with the Air Emissions Program Manager.

## QUALITY ASSURANCE

Stork SwL maintains a strict quality assurance program. A summary of this program follows:

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- Equipment Calibrations
  - Sampling Console - annual
  - Wet Test Meter - annual
  - Pitot Tubes - either annual wind tunnel calibration or adherence to EPA construction guidelines.
  - Analyzers - calibration with EPA Protocol gases plus calibration error (linearity), bias, converter efficiencies
  - Post test sampling console gamma calibration
  - Post test barometer and thermometer calibration
  - $H_2S$ Line Loss: 86% recovery (therefore 14% line loss)

- Analytical QA
  - Use of reagent grade chemicals
  - Use of ASTM Type III deionized water
  - Use of appropriately completed chain of custody forms
  - Adherence to appropriate sample shipping and storage procedures

- Calculation QA
  - hand check of computer programs
  - check print procedure for data entry

- Report QA
  - peer review

## DISCUSSION

All sampling was coordinated with Citgo personnel to ensure that the West Plant SRU was operating at stable and desired conditions. The goal of the test program was to evaluate the incinerator for compliance while operating at a lower firebox temperature.

The test sequence proceeded as follows:

| Day | Date, 2008 | Test Program |
|---|---|---|
| Friday | October 3 | Stork SwL mobilized two (2) mobile emission test trailers to Corpus Christi, Texas and requested electrical power. Electrical power could not be hooked up until Monday. |
| Monday | October 6 | Stork SwL mobilized to the site and received electrical power. Stork SwL personnel also set up testing equipment on the incinerator. |

**Citgo Refining and Chemicals Company, L.P.** **Stork SwL Project No. 08091128**

| | | |
|---|---|---|
| Tuesday | October 7 | Stork SwL mobilized to the site and prepared the analyzers and stack equipment for testing. Four (4) one (1) hour $SO_2/O_2$ sample runs (Run Nos. 1 through 4) were performed from 1440 through 2002. The $H_2S$ GC initial calibration checks were conducted. No NOx/CO/$H_2S$/flow/moisture sample runs were performed. |
| Wednesday | October 8 | Stork SwL mobilized to the site and prepared the analyzers and stack equipment for testing. Testing was performed from 0745 to 1831. The additional eight (8) $SO_2/O_2$ sample runs, the three (3) one (1) hour NOx/CO runs complete with flow and moisture samples and all three (3), three (3) hour $H_2S$ sample runs were conducted. |
| Thursday | October 9 | Stork SwL removed stack testing equipment, while Citgo electricians disconnected power. Stork SwL personnel and equipment returned to Houston, Texas. |

The test program was designed to simultaneously satisfy two (2) criteria:

- Compliance with the TCEQ Permit test requirements: three (3) one (1) hour $SO_2$, NOx, CO, $O_2$, flow/moisture sample runs. Three (3) three (3) hour $H_2S$ sample runs.
- Compliance with the EPA NSPS Subpart J requirements: four (4) sets of three (3) one (1) hour $SO_2/O_2$ runs for a total of twelve (12) one (1) hour runs.

There were multiple emission limits that needed to be met during this test program. The TCEQ permit contains a mass emission rate (lb/hr) limit for each of the pollutants. In addition, the permit Special Conditions contain a concentration limit for $SO_2$ (250 ppmv as stated in Special Condition 19) and $H_2S$ (10 ppmvd @ 3% $O_2$ as stated in Special Condition 32). In addition, the EPA NSPS Subpart J limit for $SO_2$ is 250 ppmvd @ 0% $O_2$.

## SUMMARY

Stork SwL performed a TCEQ Permit and EPA NSPS Subpart J compliance emissions test on the West Plant SRU incinerator. The unit met all the TCEQ permit and EPA NSPS emission limits at the average firebox temperature of 1300°F.

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**TABLE NO. 1**

**SOURCE IDENTIFICATION**
**Stork SwL Project No. 08091128**

| | | | | | |
|---|---|---|---|---|---|
| **Plant Name:** | Citgo Refining and Chemicals, Co., LP | | | **Phone:** | 361/844-4376 |
| **Address:** | 1802 Nueces Bay Boulevard | | | | |
| **City:** | Corpus Christi | **State:** | Texas | **Zip:** | 78469 |
| **Plant Representative:** | Mr. Chris Adam | | | | |
| **Process or Function:** | Sulfur Recovery Unit | | | | |
| **Source Identification:** | West Plant SRU Incinerator | | | | |
| **Stack or Duct Description:** | Round, vertical stack | | | | |
| **Stack Height:** | ~65 feet to ports | | | | |
| **Stack Diameter:** | 82 inches (with 16 inch port extensions) | | | | |
| **Stack Temperature:** | ~ 1320 °F | | | | |
| **Percent Moisture:** | ~ 10 % | | | | |
| **Sampling Facilities:** | Two (2) ports, 90 ° apart. The ports were 3 inch complete with valves, no monorail brackets. | | | | |
| **Process (Batch or Continuous):** | Continuous | | | | |
| **Operational Status (Sampling Period):** | Average Incinerator Temperature : 1,300 °F | | | | |
| **Sampling Parameters:** | $O_2$, $SO_2$, NOx, CO, $H_2S$ and Moisture and Flow | | | | |
| **Date Tested:** | October 7-8, 2008 | | | | |

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## TABLE NO. 2

## SUMMARY OF SAMPLING RESULTS - Flow Data

Citgo Refining and Chemicals Company, Inc.
Corpus Christi, Texas

West Plant SRU Incinerator
Stork SwL Project No. 08091128

| Run No. | Date | Time Period | Net Time (Mins) | Vm (Std) dscf | Ts Stack Temp. °F | Vs Stack Velocity ft/sec | Percent Moisture | ACFM Stack Gas Flow | Qsd Dry Stack Gas Flow dscf/hr |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 8-Oct-08 | 0745-0845 | 60 | 33.176 | 1,354 | 19.31 | 9.3 | 42,494.9 | 675,742 |
| 8 | 8-Oct-08 | 1152-1252 | 60 | 32.830 | 1,303 | 16.19 | 9.7 | 35,635.5 | 580,527 |
| 10 | 8-Oct-08 | 1440-1540 | 60 | 32.952 | 1,304 | 20.68 | 10.2 | 45,504.7 | 736,679 |

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## TABLE NO. 3

## SUMMARY OF SAMPLING RESULTS - EPA Subpart J : $SO_2/O_2$

Citgo Refining and Chemicals Company, Inc.
Corpus Christi, Texas

West Plant SRU Incinerator
Stork SwL Project No. 08091128

| Set No. | Run No. | Date | Time Period | Net Time (Mins) | $SO_2$ ppmvd | $SO_2$ ppmvd @ 0% $O_2$ (dry) | $O_2$ % (dry) |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 7-Oct-08 | 1440-1540 | 60 | 66.60 | 91.16 | 5.63 |
| | 2 | 7-Oct-08 | 1617-1717 | 60 | 74.68 | 106.60 | 6.26 |
| | 3 | 7-Oct-08 | 1739-1839 | 60 | 68.10 | 96.61 | 6.17 |
| | 4 | 7-Oct-08 | 1902-2002 | 60 | 65.75 | 94.25 | 6.32 |
| | | | | Average: | 68.78 | 97.16 | 6.10 |
| 2 | 5 | 8-Oct-08 | 0745-0845 | 60 | 58.57 | 86.44 | 6.74 |
| | 6 | 8-Oct-08 | 0912-1012 | 60 | 63.12 | 92.77 | 6.68 |
| | 7 | 8-Oct-08 | 1031-1131 | 60 | 63.78 | 95.49 | 6.94 |
| | 8 | 8-Oct-08 | 1152-1252 | 60 | 65.21 | 93.71 | 6.36 |
| | | | | Average | 62.67 | 92.10 | 6.68 |
| 3 | 9 | 8-Oct-08 | 1321-1421 | 60 | 67.22 | 95.18 | 6.14 |
| | 10 | 8-Oct-08 | 1440-1540 | 60 | 73.47 | 108.21 | 6.71 |
| | 11 | 8-Oct-08 | 1610-1710 | 60 | 71.91 | 104.44 | 6.51 |
| | 12 | 8-Oct-08 | 1731-1831 | 60 | 70.68 | 103.48 | 6.63 |
| | | | | Average: | 70.82 | 102.83 | 6.50 |
| | | | | 3 Set Average: | 67.42 | 97.36 | 6.42 |

## TABLE NO. 4

## SUMMARY OF SAMPLING RESULTS - TCEQ Permit : $SO_2$ and $O_2$

Citgo Refining and Chemicals Company, Inc.
Corpus Christi, Texas

West Plant SRU Incinerator
Stork SwL Project No. 08091128

| Run No. | Date | Time Period | Sulfur Dioxide ppmv (dry) | Sulfur Dioxide ppmv (dry) @ 0% $O_2$ | Sulfur Dioxide Rate lb/hr | Oxygen % (dry) |
|---|---|---|---|---|---|---|
| 5 | 8-Oct-08 | 0745-0845 | 58.57 | 86.44 | 6.58 | 6.74 |
| 8 | 8-Oct-08 | 1152-1252 | 65.21 | 93.71 | 6.29 | 6.36 |
| 10 | 8-Oct-08 | 1440-1540 | 73.47 | 108.21 | 8.99 | 6.71 |
| | | **Average:** | **65.75** | **96.12** | **7.29** | **6.60** |

## TABLE NO. 5

## SUMMARY OF SAMPLING RESULTS - TCEQ Permit: CO, NOx and $O_2$ Data

Citgo Refining and Chemicals Company, Inc.
Corpus Christi, Texas

West Plant SRU Incinerator
Stork SwL Project No. 08091128

| Run No. | Date | Time Period | CO | | NOx | | % $O_2$ |
|---|---|---|---|---|---|---|---|
| | | | ppmvd | lb/hr | ppmvd | lb/hr | |
| 5 | 8-Oct-08 | 0745-0845 | 61.58 | 3.03 | 20.47 | 1.65 | 6.74 |
| 8 | 8-Oct-08 | 1152-1252 | 41.71 | 1.76 | 20.80 | 1.44 | 6.36 |
| 10 | 8-Oct-08 | 1440-1540 | 43.65 | 2.34 | 20.35 | 1.79 | 6.71 |
| | | **Average** | **48.98** | **2.37** | **20.54** | **1.63** | **6.60** |

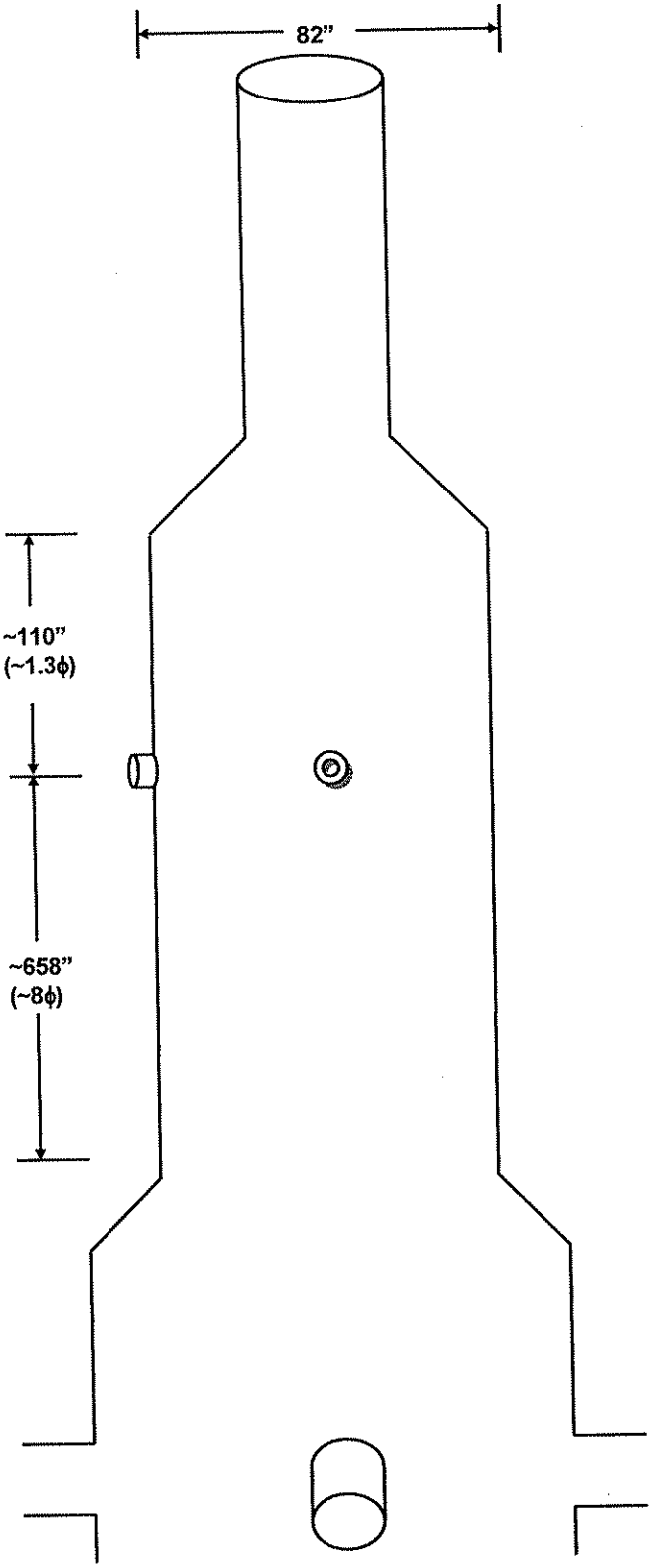
## TABLE NO. 6

## SUMMARY OF SAMPLING RESULTS - TCEQ Permit $H_2S$ Data

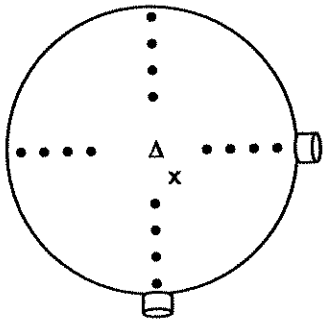
Citgo Refining and Chemicals Company, Inc.
Corpus Christi, Texas

West Plant SRU Incinerator
Stork SwL Project No. 08091128

| Run No. | Date | Time Period | $H_2S$ ppmvd | $H_2S$ ppmvd @ 3% $O_2$ | $H_2S$ lb/hr |
|---|---|---|---|---|---|
| 1 | 8-Oct-08 | 0745-1045 | < 1.02 | < 1.29 | < 0.06 |
| 2 | 8-Oct-08 | 1046-1346 | < 1.02 | < 1.26 | < 0.05 |
| 3 | 8-Oct-08 | 1347-1647 | < 1.02 | < 1.29 | < 0.07 |
| | | **Average:** | **< 1.02** | **< 1.28** | **< 0.06** |




Cross-sectional View



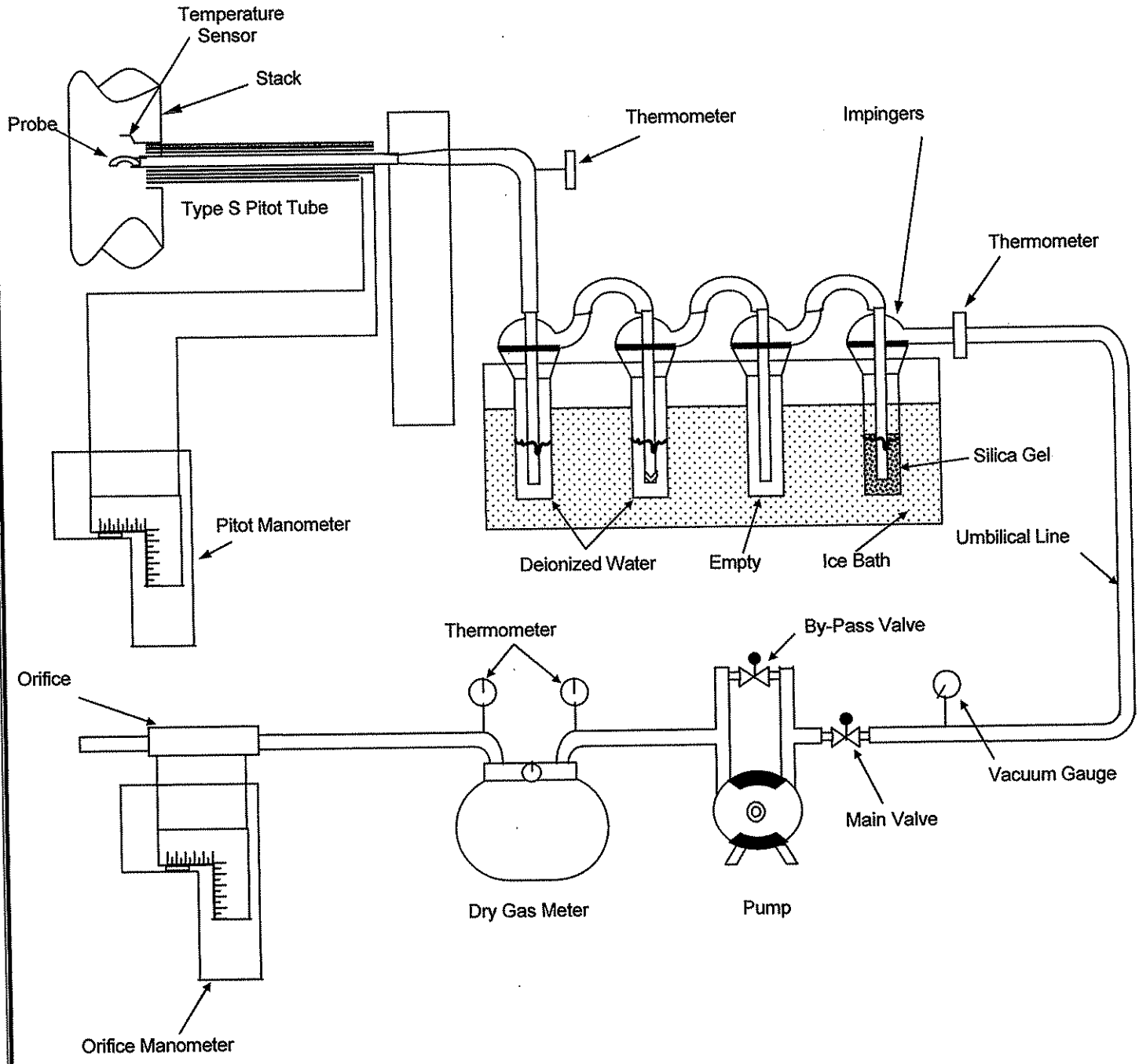
x Moisture sample point
Δ $SO_2/O_2$/NOx/CO sample points (16.7%, 50% and 83.3% of stack diameter)
• Velocity Traverse points

| Traverse Point | Percent of Diameter | Distance From Wall, inches |
|---|---|---|
| 1 | 3.2 | 2.62 |
| 2 | 10.5 | 8.61 |
| 3 | 19.4 | 15.91 |
| 4 | 32.3 | 26.49 |
| 5 | 67.7 | 55.51 |
| 6 | 80.6 | 66.09 |
| 7 | 89.5 | 73.39 |
| 8 | 96.8 | 79.38 |

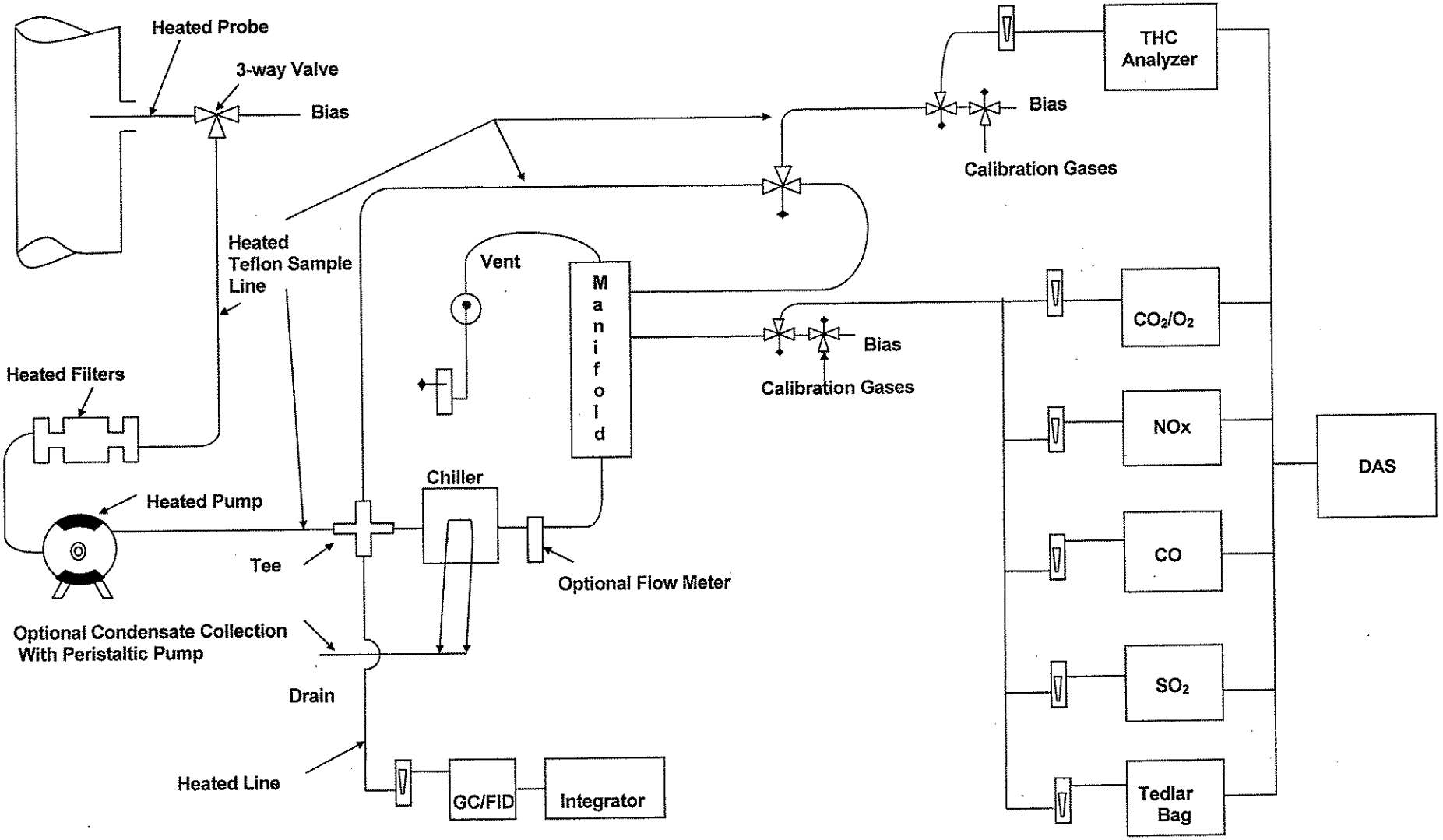
Note: Port extensions are 16 inches (measured)

Citgo Refining and Chemicals, LP
Corpus Christi, Texas

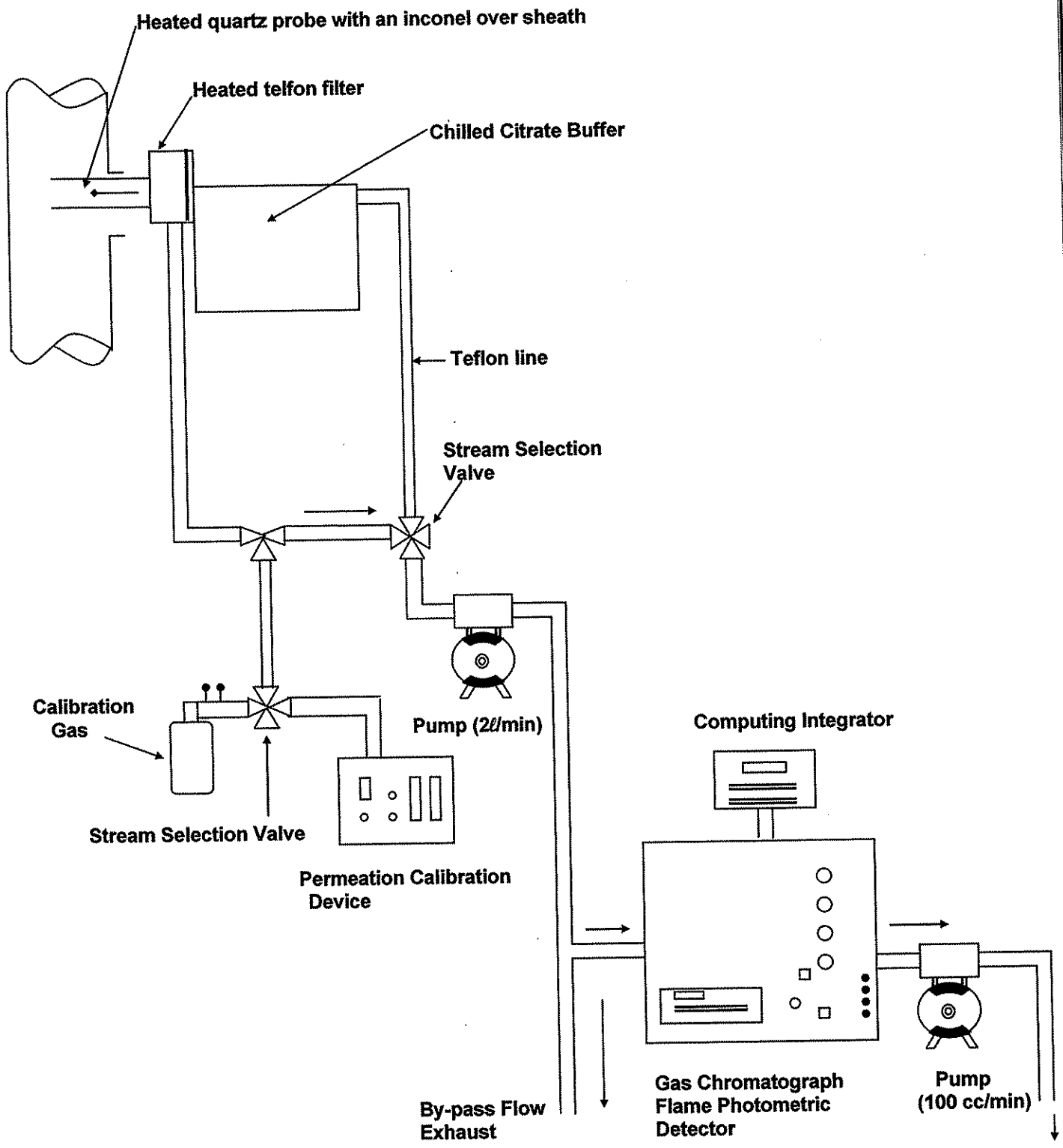
West Plant SRU
Exhaust Stack Schematic




**EPA METHODS 1-4 SOURCE SAMPLING TRAIN**




EPA Method 3A, 6C, 7E, 10, 18, 20 and 25A
Instrumental Analyzer Technique




EPA Method 15 Sampling Train

## Stork Southwestern Laboratories, Inc.

Houston, Texas

| Diameter of Stack = | 82.00 | inches |
|---|---|---|

### E. P. A. Method 1-4 Analytical Data

| Run No. | Sample Time min | Net Volume $ft^3$ | Average $\sqrt{\Delta P}$ in $H_2O$ | Average $\Delta H$ in $H_2O$ | Avg Stack Temp. °F | Avg Meter Temp. °F | Meter P $P_m$ in Hg | Stack P $P_s$ in Hg | DGMCF | Pitot Correction $C_p$ | Stack Area $A_s$ $ft^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 60 | 33.429 | 0.1829 | 1.00 | 1,354 | 73 | 30.15 | 30.03 | 0.9942 | 0.840 | 36.6737 |
| 8 | 60 | 33.887 | 0.1553 | 1.00 | 1,303 | 86 | 30.15 | 30.03 | 0.9942 | 0.840 | 36.6737 |
| 10 | 60 | 34.075 | 0.1981 | 1.00 | 1,304 | 87 | 30.15 | 30.03 | 0.9942 | 0.840 | 36.6737 |

| Run No. | Date | Time |
|---|---|---|
| 5 | 10/8/2008 | 0745-0845 |
| 8 | 10/8/2008 | 1152-1252 |
| 10 | 10/8/2008 | 1440-1540 |

E. P. A. Isokinetic Methods Flow Calculations

1 $Vs\ (ft/sec) = 85.49 \times Cp \times \sqrt{\Delta P} \times \sqrt{(Ts / MWSG \times P_s)}$

2 $ACFM\ (ft^3/min) = V_s \times 60 \times A_s$

3 $Q_{sd} = 60 \times [\ 1 - (\ \%H_2O / 100\ )\ ] \times ACFM \times [\ 528 / (\ T_s + 460\ )\ ] \times (\ P_s / 29.92\ )$

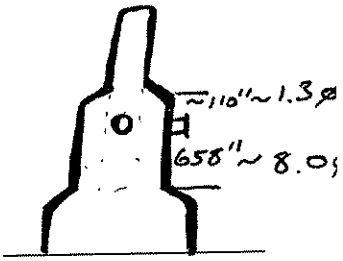
4 $I\ (\%) = 0.0945 \times (\ T_s + 460\ ) \times V_m\ (std) / [\ P_s \times V_s \times A_n \times Sample\ Time \times (\ 1 - (\ \%H2O / 100\ ))\ ]$

| Run No. | Total $H_2O$ Collected ml | Flue Gas Data | | | Flow Calculations | | | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | % $CO_2$ | % $O_2$ | % $N_2$ | $V_m$ (std) dscf | % $H_2O$ | MWSG g/g mole | Vs ft/sec | ACFM $ft^3$/min | Qsd dscf/hr |
| 5 | 72.1 | 4.3 | 6.74 | 89.0 | 33.176 | 9.28 | 27.941 | 19.31 | 42,494.90 | 675,742.2 |
| 8 | 74.7 | 4.0 | 6.36 | 89.6 | 32.830 | 9.67 | 27.840 | 16.19 | 35,635.47 | 580,526.6 |
| 10 | 79.4 | 4.0 | 6.71 | 89.3 | 32.952 | 10.19 | 27.797 | 20.68 | 45,504.71 | 736,679.2 |

## STORK SOUTHWESTERN LABORATORIES, INC.
AIR EMISSIONS SERVICES DIVISION

FACILITY: Citgo
CITY, STATE: Corpus Christi TX
SOURCE NAME: West Plant SRU
DATE: 10-8-08
BAROMETRIC PRESSURE: 30.08
STACK I.D.: 82"
I.D by: Field Measurement ✓
PORT EXTENSIONS: (1) 16" (2) 16"
CYCLONIC FLOW CHECK: non-cyclonic

TECHNICIAN: GG JBJ
RUN(S): 5, 8, 10
inches Hg.
STATIC PRESSURE: -.65 inches H2O
Engineering Drawing ___ Client Information ___
(3) —
(4) —
Port Description: 2-3" flanged ports Monorail Brackets: Yes / (No)



STACK SCHEMATIC

| TRAVERSE POINT NO. | % OF STACK DIAMETER | DIST. FROM REFERENCE (inches) | CYCLONIC FLOW ANGLE ° | RUN NO. 5 TIME: 0745-0755 ΔP | RUN NO. 5 TIME: 0745-0755 $T_s$ | RUN NO. 8 TIME: 1152-1202 ΔP | RUN NO. 8 TIME: 1152-1202 $T_s$ | RUN NO. 10 TIME: 1440-1450 ΔP | RUN NO. 10 TIME: 1440-1450 $T_s$ |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.2 | 2.62 | | .04 | 1353 | .00 | 1305 | .04 | 1304 |
| 2 | 10.5 | 8.61 | | .04 | 1352 | .02 | 1302 | .04 | 1305 |
| 3 | 19.4 | 15.91 | | .04 | 1351 | .02 | 1303 | .04 | 1302 |
| 4 | 32.3 | 26.49 | | .03 | 1350 | .03 | 1304 | .04 | 1302 |
| 5 | 67.7 | 55.51 | | .03 | 1358 | .03 | 1305 | .04 | 1304 |
| 6 | 80.6 | 66.09 | | .03 | 1360 | .02 | 1302 | .04 | 1303 |
| 7 | 89.5 | 73.39 | | .03 | 1355 | .02 | 1301 | .04 | 1305 |
| 8 | 96.8 | 79.38 | | .02 | 1350 | .02 | 1299 | .04 | 1304 |
| | | | | | | | | | |
| 1 | | | | .04 | 1351 | .00 | 1299 | .03 | 1304 |
| 2 | | | | .04 | 1350 | .02 | 1305 | .03 | 1306 |
| 3 | | | | .04 | 1352 | .03 | 1308 | .04 | 1303 |
| 4 | | | | .04 | 1356 | .03 | 1305 | .04 | 1305 |
| 5 | | | | .03 | 1352 | .03 | 1300 | .04 | 1304 |
| 6 | | | | .03 | 1358 | .03 | 1302 | .04 | 1305 |
| 7 | | | | .03 | 1357 | .03 | 1299 | .05 | 1302 |
| 8 | | | | .03 | 1362 | .02 | 1300 | .04 | 1304 |
| AVERAGES: SQ.RT. ΔP, $T_s$ | | | | 0.1829 ✓ | 1354 ✓ | 0.1553 ✓ | 1303 ✓ | 0.1981 ✓ | 1304 ✓ |

TEMPERATURE ID: M-7
PROBE ID: 1-10 B
PITOT CORRECTION FACTOR: 0.840
UMBILICAL ID: JBJ

| Run No. | PITOT LEAK CHECK Pretest | Post-test | FYRITE ANALYSIS $CO_2$ | $O_2$ |
|---|---|---|---|---|
| 5 | ✓@ 6" | ✓@ 5" | 4.3 | Analyzer |
| 8 | ✓@ 7" | ✓@ 6" | 4.0 | ↓ |
| 10 | ✓@ 6" | ✓@ 5" | 4.0 | |

## Stork Southwestern Laboratories, Inc.

Facility Citgo
City, State Corpus Christi, Tx
Source West Plant SRU
Date 10-8-08 Oper. GG Sample No. 5
Meter No. M-7 DGMCF 0.9942 Umb. ID 0.25-H2O
ΔH @ Box 1.8172 Filter No. N/A Heater ID N/A
Stack Press. -.65 Data H2O Imp. ID IC-3
Stack ID (Port) 82" (16") Platform Ht. ≈90' Ass. Moist. ?
Silica Gel No. SG 1221 Baro. ID T-2 Bar. Pres. 30.08
Probe No. N/A PTCF N/A Probe Liner Tefx
Nozzle No. N/A Nozzle Area N/A
Store 6 N/A Store 7 N/A
Leak Rate : Initial <.01@15" Hg Final <.01@5" Hg
Pitot Leak Check: Initial N/A Final N/A
Gas Analysis ( Fyrite / Orsat / Analyzer ) : $CO_2$ 4.0 $O_2$ Analyzer
$CO_2$ 4.5 $O_2$ Analyzer $CO_2$ 4.5 $O_2$ Analyzer
Avg. Gas Analysis : $CO_2$ 4.3 O Analyzer

| Moisture Data : | Imp. 1 | Imp. 2 | Imp. 3 | Imp. 4 | Imp. 5 |
|---|---|---|---|---|---|
| Impinger Solution : | DI | DI | Empty | SG | |
| Final Vol or Wt (ml or g) | 160 | 106 | Ø | 266.7 | |
| Initial Vol or Wt (ml or g) | 100 | 100 | Ø | 260.6 | |
| Net Increase (ml or g) | 60 | 6 | Ø | 6.1 | |

| Rinse Data : | Imp. 1 | Imp. 2 | Imp. 3 | Imp. 4 | Imp. 5 |
|---|---|---|---|---|---|
| Rinse Solution : | | | | | |
| Rinse Volume (ml) | | | | | |
| Final Sample Volume, Including Rinse (ml) | | | | | |

Total Water Collected (TWW) [Imp. + SG*] = 72.1 ml
* Converted to ml by dividing by the density of $H_2O$ (g/ml)

Meter Pressure (Pm) = 30.08 + 1.0 = 30.15

Stack Pressure (Ps) = 30.08 + $\frac{-.65}{13.6}$ = 30.03

% Moisture = $\frac{(0.04707 \times TWW) \times 100}{Vm(std) + (0.04707 \times TWW)}$ =

## Source Sampling Field Data

| Pts | Time Minutes (24 hrs.) | Dry Gas Meter Reading $ft^3$ | Inches $H_2O$ ΔP | Inches $H_2O$ ΔH | Line Vac. " Hg | Temperature °F Stack $T_s$ | Probe | Heater Box | Last Imp. | Meter Inlet | Meter Outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 07:45 | 538.382 | N/A | 1.0 | 1 | N/A | N/A | N/A | 68 | 71 | 69 |
| 2 | 07:50 | 541.14 | | | 1 | | | | 64 | 70 | 69 |
| 3 | 07:55 | 543.91 | | | 1 | | | | 65 | 71 | 69 |
| 4 | 08:00 | 546.67 | | | 1 | | | | 65 | 73 | 69 |
| 5 | 08:05 | 549.73 | | | 1 | | | | 66 | 74 | 70 |
| 6 | 08:10 | 552.25 | | | 1 | | | | 66 | 74 | 71 |
| 7 | 08:15 | 555.44 | | | 1 | | | | 67 | 76 | 72 |
| 8 | 08:20 | 557.83 | | | 1 | | | | 68 | 77 | 72 |
| 9 | 08:25 | 560.62 | | | 1 | | | | 68 | 78 | 73 |
| 10 | 08:30 | 563.41 | | | 1 | | | | 64 | 77 | 73 |
| 11 | 08:35 | 566.21 | | | 1 | | | | 66 | 77 | 74 |
| 12 | 08:40 | 569.01 | | | 1 | | | | 67 | 77 | 74 |
| Stop | 08:45 | 571.811 | | | — | | | | — | — | — |
| | 60 mins Sample Time | 33.429 ✓ Net Volume | N/A Avg. √ΔP | 1.0 Avg. ΔH | | N/A Avg. Stack | | | | | 73 ✓ Avg. Meter (AMT) |

Vm(std) = _____ (Net Volume) x _____ (DGMCF) x 528 std Temp (R) AMT (R) x _____ Pm = _____ dscf
29.92 std press.

## Stork Southwestern Laboratories, Inc.

Facility Citgo
City, State Corpus Christi, TX
Source West Plant SRU
Date 10-8-08 Oper. RG Sample No. 8
Meter No. M-7 DGMCF 0.9942 Umb. ID V25:H20
ΔH @ Box 1.8172 Filter No. N/A Heater ID N/A
Stack Press. -.65 Data H20 Imp. ID 1C3
Stack ID (Port) 82" (16") Platform Ht. ~90' Ass. Moist. —
Silica Gel No. SG 33 Baro. ID T-2 Bar. Pres. 30.08
Probe No. N/A PTCF N/A Probe Liner Flex
Nozzle No. N/A Nozzle Area N/A
Store 6 N/A Store 7 N/A
Leak Rate : Initial <.01 @ 15" Hg Final <.01 @ 5" Hg
Pitot Leak Check: Initial N/A Final N/A
Gas Analysis ( Fyrite / Orsat / Analyzer ) : $CO_2$ 4.0 $O_2$ Analyzer
$CO_2$ 4.0 $O_2$ Analyzer; CO2 4.0 O2 Analyzer
Avg. Gas Analysis : $CO_2$ 4.0 $O_2$ Analyzer

| Moisture Data : | Imp. 1 | Imp. 2 | Imp. 3 | Imp. 4 | Imp. 5 |
|---|---|---|---|---|---|
| Impinger Solution : | DI | DI | Empty | SG | |
| Final Vol or Wt (ml or g) | 162 | 106 | 0 | 266.4 | |
| Initial Vol or Wt (ml or g) | 100 | 100 | 0 | 259.7 | |
| Net Increase (ml or g) | 62 | 6 | 0 | 6.7 | |

| Rinse Data : | Imp. 1 | Imp. 2 | Imp. 3 | Imp. 4 | Imp. 5 |
|---|---|---|---|---|---|
| Rinse Solution : | | | | | |
| Rinse Volume (ml) | | | | | |
| Final Sample Volume, Including Rinse (ml) | | | | | |

Total Water Collected (TWW) [Imp. + SG*] = 74.7 ml
* Converted to ml by dividing by the density of $H_2O$ (g/ml)

Meter Pressure (Pm) = 30.08 + 1.0 = 30.15
Stack Pressure (Ps) = 30.08 $\pm \frac{13.6}{13.6}$ -.65 = 30.03

$$\% \text{ Moisture} = \frac{(0.04707 \times TWW) \times 100}{Vm(std) + (0.04707 \times TWW)} = 9.67$$

## Source Sampling Field Data

| Pts | Time Minutes (24 hrs.) | Dry Gas Meter Reading $ft^3$ | Inches $H_2O$ ΔP | Inches $H_2O$ ΔH | Line Vac. " Hg | Temperature °F Stack $T_s$ | Probe | Heater Box | Last Imp. | Meter Inlet | Meter Outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11:50 | 572.189 | N/A | 1.0 | 1 | N/A | N/A | N/A | 68 | 83 | 83 |
| 2 | 11:55 | 574.98 | | | 1 | | | | 67 | 84 | 84 |
| 3 | 12:00 | 577.77 | | | 1 | | | | 66 | 86 | 84 |
| 4 | 12:05 | 580.59 | | | 1 | | | | 66 | 86 | 84 |
| 5 | 12:10 | 583.39 | | | 1 | | | | 64 | 87 | 85 |
| 6 | 12:15 | 586.42 | | | 1 | | | | 65 | 87 | 85 |
| 7 | 12:20 | 589.04 | | | 1 | | | | 66 | 88 | 85 |
| 8 | 12:25 | 591.87 | | | 1 | | | | 67 | 88 | 85 |
| 9 | 12:30 | 594.68 | | | 1 | | | | 67 | 88 | 85 |
| 10 | 12:35 | 597.52 | | | 1 | | | | 67 | 88 | 85 |
| 11 | 12:40 | 600.38 | | | 1 | | | | 68 | 89 | 86 |
| 12 | 12:45 | 603.21 | ↓ | ↓ | 1 | ↓ | ↓ | ↓ | 68 | 89 | 86 |
| Stop | 1250 | 606.076 | — | — | — | — | — | — | — | — | — |
| | 60 MINS Sample Time | 33.887 Net Volume | N/A Avg. √ΔP | 1.0 Avg. ΔH | | N/A Avg. Stack | | | | | 86 Avg. Meter (AMT) |

$$Vm(std) = 33.887 \text{ (Net Volume)} \times 0.9942 \text{ (DGMCF)} \times \frac{528}{546} \text{ std Temp (R) / AMT (R)} \times \frac{30.15}{29.92} \text{ Pm / std press.} = 32.830 \text{ dscf}$$

## Stork Southwestern Laboratories, Inc.

## Source Sampling Field Data

Facility Citgo
City, State Corpus Christi Tx
Source West Plant SRU

Date 10-8-08 | Oper. GG | Sample No. 10
Meter No. M-7 | DGMCF 0.9942 | Umb. ID U-25-H20
ΔH @ Box 1.8172 | Filter No. N/A | Heater ID N/A
Stack Press. -.65 | Data H20 | Imp. ID IC3
Stack ID (Port) 80" (16") | Platform Ht. ≈90' | Ass. Moist. —
Silica Gel No. SG 2020 | Baro. ID T-2 | Bar. Pres. 30.08
Probe No. N/A | PTCF N/A | Probe Liner f/ex
Nozzle No. N/A | Nozzle Area N/A
Store 6 N/A | Store 7 N/A
Leak Rate : Initial ≤.01@15" Hg | Final ≤0.01@5" Hg
Pitot Leak Check: Initial N/A | Final N/A
Gas Analysis ( Fyrite / Orsat / Analyzer ) : $CO_2$ 4.0 $O_2$ —
$CO_2$ 4.0 $O_2$ — ; CO2 4.0 O2 —
Avg. Gas Analysis : $CO_2$ 4.0 $O_2$ Analyzer

| Pts | Time Minutes (24 hrs.) | Dry Gas Meter Reading $ft^3$ | Inches $H_2O$ ΔP | Inches $H_2O$ ΔH | Line Vac. " Hg | Temperature °F Stack $T_s$ | Temperature °F Probe | Temperature °F Heater Box | Temperature °F Last Imp. | Temperature °F Meter Inlet | Temperature °F Meter Outlet |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 14:40 | 606.179 | N/A | 1.0 | | N/A | N/A | N/A | 68 | 86 | 86 |
| 2 | 14:45 | 609.01 | | | | | | | 66 | 85 | 84 |
| 3 | 14:50 | 611.85 | | | | | | | 67 | 88 | 86 |
| 4 | 14:55 | 614.66 | | | | | | | 66 | 88 | 86 |
| 5 | 15:00 | 617.49 | | | | | | | 67 | 89 | 86 |
| 6 | 15:05 | 620.33 | | | | | | | 66 | 88 | 86 |
| 7 | 15:10 | 623.12 | | | | | | | 60 | 88 | 86 |
| 8 | 15:15 | 626.01 | | | | | | | 60 | 87 | 86 |
| 9 | 15:20 | 628.85 | | | | | | | 64 | 87 | 86 |
| 10 | 15:25 | 631.71 | | | | | | | 64 | 87 | 86 |
| 11 | 15:30 | 634.55 | | | | | | | 65 | 86 | 87 |
| 12 | 15:35 | 637.41 | | | | | | | 66 | 88 | 87 |
| Stop | 15:40 | 640.254 | — | — | — | — | — | — | — | — | — |
| | 60 Min Sample Time | 34.075 ✓ Net Volume | N/A Avg. √ΔP | 1.0 Avg. ΔH | | N/A Avg. Stack | | | | | 87 ✓ Avg. Meter (AMT) |

| Moisture Data : | Imp. 1 | Imp. 2 | Imp. 3 | Imp. 4 | Imp. 5 |
|---|---|---|---|---|---|
| Impinger Solution : | DI | DI | Empty | SG | |
| Final Vol or Wt (ml or g) | 168 | 104 | Ø | 268.0 | |
| Initial Vol or Wt (ml or g) | 100 | 100 | Ø | 260.6 | |
| Net Increase (ml or g) | 68 | 4 | Ø | 7.4 | |

| Rinse Data : | Imp. 1 | Imp. 2 | Imp. 3 | Imp. 4 | Imp. 5 |
|---|---|---|---|---|---|
| Rinse Solution : | | | | | |
| Rinse Volume (ml) | | | | | |
| Final Sample Volume, Including Rinse (ml) | | | | | |

Total Water Collected (TWW) [Imp. + SG*] = 79.4 ✓ ml
* Converted to ml by dividing by the density of $H_2O$ (g/ml)

Meter Pressure (Pm) = 30.08 + 1.0 = 30.15 ✓

Stack Pressure (Ps) = 30.08 + $\frac{13.6}{13.6}$ × -.65 = 30.03 ✓

% Moisture = $\frac{(0.04707 \times TWW) \times 100}{Vm(std) + (0.04707 \times TWW)}$ = ____

Vm(std) = ____ (Net Volume) × ____ (DGMCF) × 528 std Temp (R) / AMT (R) × ____ / 29.92 std press. Pm = ____ dscf

## Stork Southwestern Laboratories, Inc.

**Source:** **Citgo Refining, West Plant SRU** **Analyst:** MG

$SO_2$ and $O_2$ Calibration - Adjusted for Zero and Span drift and Bias

| Analyzer | Span of Analyzer ppm, % * | Span Gas Concentration ppm, % * | Span Gas Cylinder Number | Expiration Date | Remarks | Fuel F-Factor HHV dscf/mmBtu | Gross Caloric Value HHV Btu/ft$^3$ |
|---|---|---|---|---|---|---|---|
| $SO_2$ | 91.4 | 53.1 | ALM049185 | 2/26/2010 | | NA | NA |
| $O_2$ | 21.0 | 12.0 | ALM041061 | 9/30/2011 | | | |

| Run No. | Zero Gas | | | | Span Gas | | | |
|---|---|---|---|---|---|---|---|---|
| | Initial Reading | Final Reading | Difference ppm, % * | % Drift | Initial Reading | Final Reading | Difference ppm, % * | % Drift |
| 1 $SO_2$ | 0.14 | 1.44 | 1.30 | 1.4 | 52.54 | 52.29 | -0.25 | -0.3 |
| $O_2$ | 0.07 | -0.01 | -0.08 | -0.4 | 11.99 | 11.94 | -0.05 | -0.2 |
| 2 $SO_2$ | 1.44 | 1.43 | -0.01 | 0.0 | 52.29 | 52.32 | 0.03 | 0.0 |
| $O_2$ | -0.01 | 0.02 | 0.03 | 0.1 | 11.94 | 12.02 | 0.08 | 0.4 |
| 3 $SO_2$ | 1.43 | 1.38 | -0.05 | -0.1 | 52.32 | 52.48 | 0.16 | 0.2 |
| $O_2$ | 0.02 | 0.03 | 0.01 | 0.0 | 12.02 | 12.06 | 0.04 | 0.2 |
| 4 $SO_2$ | 1.38 | 1.51 | 0.13 | 0.1 | 52.48 | 52.55 | 0.07 | 0.1 |
| $O_2$ | 0.03 | 0.03 | 0.00 | 0.0 | 12.06 | 12.04 | -0.02 | -0.1 |
| 5 $SO_2$ | 0.35 | 1.42 | 1.07 | 1.2 | 52.34 | 52.85 | 0.51 | 0.6 |
| $O_2$ | 0.07 | -0.01 | -0.08 | -0.4 | 12.14 | 12.03 | -0.11 | -0.5 |
| 6 $SO_2$ | 1.42 | 1.83 | 0.41 | 0.4 | 52.85 | 53.39 | 0.54 | 0.6 |
| $O_2$ | -0.01 | -0.01 | 0.00 | 0.0 | 12.03 | 11.99 | -0.04 | -0.2 |
| 7 $SO_2$ | 1.83 | 1.68 | -0.15 | -0.2 | 53.39 | 53.15 | -0.24 | -0.3 |
| $O_2$ | -0.01 | 0.01 | 0.02 | 0.1 | 11.99 | 12.04 | 0.05 | 0.2 |
| 8 $SO_2$ | 1.68 | 1.66 | -0.02 | 0.0 | 53.15 | 53.31 | 0.16 | 0.2 |
| $O_2$ | 0.01 | 0.00 | -0.01 | 0.0 | 12.04 | 12.04 | 0.00 | 0.0 |
| 9 $SO_2$ | 1.66 | 1.81 | 0.15 | 0.2 | 53.31 | 53.45 | 0.14 | 0.2 |
| $O_2$ | 0.00 | 0.00 | 0.00 | 0.0 | 12.04 | 12.00 | -0.04 | -0.2 |
| 10 $SO_2$ | 1.81 | 1.92 | 0.11 | 0.1 | 53.45 | 53.45 | 0.00 | 0.0 |
| $O_2$ | 0.00 | 0.00 | 0.00 | 0.0 | 12.00 | 12.00 | 0.00 | 0.0 |
| 11 $SO_2$ | 1.92 | 1.90 | -0.02 | 0.0 | 53.45 | 53.66 | 0.21 | 0.2 |
| $O_2$ | 0.00 | 0.00 | 0.00 | 0.0 | 12.00 | 12.00 | 0.00 | 0.0 |
| 12 $SO_2$ | 1.90 | 1.84 | -0.06 | -0.1 | 53.66 | 53.31 | -0.35 | -0.4 |
| $O_2$ | 0.00 | 0.04 | 0.04 | 0.2 | 12.00 | 12.02 | 0.02 | 0.1 |

| Run No. | Uncorrected Stack Gas Concentration ppm, % * | Average of Zero Gas | Average of Span Gas | Corrected Stack Gas Concentration ppm, % * | C Concentration in lb/dscf | Corrected Concentration to 0% $O_2$ ppm, % * | Date | Time |
|---|---|---|---|---|---|---|---|---|
| 1 SO2 | 65.54 | 0.79 | 52.42 | 66.60 | 1.107E-05 | 91.16 | 10/7/2008 | 1440-1540 |
| O2 | 5.63 | 0.03 | 11.97 | 5.63 | | | | |
| 2 SO2 | 72.98 | 1.44 | 52.31 | 74.68 | 1.241E-05 | 106.60 | 10/7/2008 | 1617-1717 |
| O2 | 6.25 | 0.01 | 11.98 | 6.26 | | | | |
| 3 SO2 | 66.81 | 1.41 | 52.40 | 68.10 | 1.132E-05 | 96.61 | 10/7/2008 | 1739-1839 |
| O2 | 6.20 | 0.03 | 12.04 | 6.17 | | | | |
| 4 SO2 | 64.68 | 1.45 | 52.52 | 65.75 | 1.093E-05 | 94.25 | 10/7/2008 | 1902-2002 |
| O2 | 6.36 | 0.03 | 12.05 | 6.32 | | | | |
| 5 SO2 | 57.92 | 0.89 | 52.60 | 58.57 | 9.733E-06 | 86.44 | 10/8/2008 | 0745-0845 |
| O2 | 6.80 | 0.03 | 12.09 | 6.74 | | | | |
| 6 SO2 | 62.84 | 1.63 | 53.12 | 63.12 | 1.049E-05 | 92.77 | 10/8/2008 | 0912-1012 |
| O2 | 6.68 | -0.01 | 12.01 | 6.68 | | | | |
| 7 SO2 | 63.63 | 1.76 | 53.27 | 63.78 | 1.060E-05 | 95.49 | 10/8/2008 | 1031-1131 |
| O2 | 6.95 | 0.00 | 12.02 | 6.94 | | | | |
| 8 SO2 | 64.99 | 1.67 | 53.23 | 65.21 | 1.084E-05 | 93.71 | 10/8/2008 | 1152-1252 |
| O2 | 6.38 | 0.01 | 12.04 | 6.36 | | | | |
| 9 SO2 | 67.11 | 1.74 | 53.38 | 67.22 | 1.117E-05 | 95.18 | 10/8/2008 | 1321-1421 |
| O2 | 6.15 | 0.00 | 12.02 | 6.14 | | | | |
| 10 SO2 | 73.24 | 1.87 | 53.45 | 73.47 | 1.221E-05 | 108.21 | 10/8/2008 | 1440-1540 |
| O2 | 6.71 | 0.00 | 12.00 | 6.71 | | | | |
| 11 SO2 | 71.85 | 1.91 | 53.56 | 71.91 | 1.195E-05 | 104.44 | 10/8/2008 | 1610-1710 |
| O2 | 6.51 | 0.00 | 12.00 | 6.51 | | | | |
| 12 SO2 | 70.57 | 1.87 | 53.49 | 70.68 | 1.174E-05 | 103.48 | 10/8/2008 | 1731-1831 |
| O2 | 6.64 | 0.02 | 12.01 | 6.63 | | | | |

Note * $O_2$ is expressed in percent.

**NOTE: lb/mmBtu corrected 9/29/99 by RJD**

## Stork Southwestern Laboratories, Inc.
## Houston, Texas

**Source:** **Citgo Refining West Plant SRU** **Analyst:** MG

$NO_x$, CO, $O_2$ and $SO_2$ Calibration - Adjusted for Zero and Span Drift and Bias

| Analyzer | Calibration Span of Analyzer ppm, % * | Span Gas Concentration ppm, % * | Span Gas Cylinder Number | Expiration Date | Calibration Error Value Zero | Calibration Error Value Mid Level |
|---|---|---|---|---|---|---|
| CO | 95.10 | 45.80 | ALM044300 | 5/10/2010 | 0.14 | 45.64 |
| $NO_x$ | 95.10 | 51.50 | ALM058419 | 3/7/2009 | 0.09 | 51.28 |
| $O_2$ | 21.00 | 12.00 | ALM041061 | 9/30/2011 | 0.03 | 12.11 |
| $SO_2$ | 91.40 | 53.10 | ALM049185 | 4/10/2010 | -0.03 | 53.15 |

| Fuel F-Factor HHV dscf/mmBtu | Gross Caloric Value HHV $Btu/ft^3$ |
|---|---|
| NA | NA |

| | CO | NOx | O2 | SO2 |
|---|---|---|---|---|
| Initial Zero Bias - % of Span | -0.26 | 0.01 | 0.19 | 0.42 |
| Initial Span Bias - % of Span | 0.43 | 0.27 | 0.14 | -0.89 |

| Drift and Bias Limits | |
|---|---|
| Drift | +/- 3% of Span |
| Bias | +/- 5% of Span |

| Run No. | Zero Gas Initial Reading | Zero Gas Final Reading | Zero Gas Difference ppm, % * | Zero Gas % Drift | Zero Gas % Bias | Span Gas Initial Reading | Span Gas Final Reading | Span Gas Difference ppm, % * | Span Gas % Drift | Span Gas % Bias |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 CO | -0.11 | 0.07 | 0.18 | 0.19 | -0.07 | 46.05 | 45.20 | -0.85 | -0.89 | -0.46 |
| $NO_x$ | 0.10 | 0.29 | 0.19 | 0.20 | 0.21 | 51.54 | 51.40 | -0.14 | -0.15 | 0.13 |
| $O_2$ | 0.07 | -0.01 | -0.08 | -0.38 | -0.19 | 12.14 | 12.03 | -0.11 | -0.52 | -0.38 |
| $SO_2$ | 0.35 | 1.42 | 1.07 | 1.17 | 1.59 | 52.34 | 52.85 | 0.51 | 0.56 | -0.33 |
| 8 CO | 0.07 | 0.58 | 0.51 | 0.54 | 0.46 | 45.20 | 45.84 | 0.64 | 0.67 | 0.21 |
| $NO_x$ | 0.29 | 0.29 | 0.00 | 0.00 | 0.21 | 51.40 | 51.06 | -0.34 | -0.36 | -0.23 |
| $O_2$ | 0.01 | 0.00 | -0.01 | -0.05 | -0.14 | 12.04 | 12.04 | 0.00 | 0.00 | -0.33 |
| $SO_2$ | 1.68 | 1.66 | -0.02 | -0.02 | 1.85 | 53.15 | 53.31 | 0.16 | 0.18 | 0.18 |
| 10 CO | 0.58 | 0.63 | 0.05 | 0.05 | 0.52 | 45.84 | 45.84 | 0.00 | 0.00 | 0.21 |
| $NO_x$ | 0.29 | 0.39 | 0.10 | 0.11 | 0.32 | 51.06 | 50.82 | -0.24 | -0.25 | -0.48 |
| $O_2$ | 0.00 | 0.00 | 0.00 | 0.00 | -0.14 | 12.00 | 12.00 | 0.00 | 0.00 | -0.52 |
| $SO_2$ | 1.81 | 1.92 | 0.11 | 0.12 | 2.13 | 53.45 | 53.45 | 0.00 | 0.00 | 0.33 |

**EQUATIONS:** % Drift =[(Final Reading - Initial Reading )/Instrument Span] x 100
% Bias =[(Final Reading - Calibration Error Value) /Instrument Span] x 100
(NOTE: Initial Bias uses Initial Reading in place of Final Reading)

| Run No. | Uncorrected Stack Gas Concentration ppm, % * | Average of Zero Gas | Average of Span Gas | Corrected Stack Gas Concentration ppm, % * | C Concentration in lb/dscf | C Concentration ppmvd @ 0%O2 | Date Time |
|---|---|---|---|---|---|---|---|
| 5 CO | 61.35 | -0.02 | 45.63 | 61.58 | 4.477E-06 | | 10/8/2008 |
| $NO_x$ | 20.58 | 0.20 | 51.47 | 20.47 | 2.445E-06 | | 0745-0845 |
| $O_2$ | 6.80 | 0.03 | 12.09 | 6.74 | | | |
| $SO_2$ | 57.92 | 0.89 | 52.60 | 58.57 | 9.733E-06 | 86.44 | |
| 8 CO | 41.48 | 0.33 | 45.52 | 41.71 | 3.032E-06 | | 10/8/2008 |
| $NO_x$ | 20.86 | 0.29 | 51.23 | 20.80 | 2.484E-06 | | 1152-1252 |
| $O_2$ | 6.38 | 0.01 | 12.04 | 6.36 | | | |
| $SO_2$ | 64.99 | 1.67 | 53.23 | 65.21 | 1.084E-05 | 93.71 | |
| 10 CO | 43.72 | 0.61 | 45.84 | 43.65 | 3.174E-06 | | 10/8/2008 |
| $NO_x$ | 20.33 | 0.34 | 50.94 | 20.35 | 2.430E-06 | | 1440-1540 |
| $O_2$ | 6.71 | 0.00 | 12.00 | 6.71 | | | |
| $SO_2$ | 73.24 | 1.87 | 53.45 | 73.47 | 1.221E-05 | 108.21 | |
| Avg. CO | | | | 48.98 | 3.561E-06 | | |
| $NO_x$ | | | | 20.54 | 2.453E-06 | | |
| $O_2$ | | | | 6.60 | | | |
| $SO_2$ | | | | 65.75 | 1.093E-05 | 96.12 | |

| Run No. | | | | Methods 1-4 Calculation $Q_{sd}$ dscf/hr | Emission Rate lb/hr | Allowable Emission Rate lb/hr | Percent of Allowable Emission Rate |
|---|---|---|---|---|---|---|---|
| 5 CO | | | | 675,742.2 | 3.03 | 3.90 | 77.6 |
| $NO_x$ | | | | 675,742.2 | 1.65 | 3.50 | 47.2 |
| $SO_2$ | | | | 675,742.2 | 6.58 | 22.40 | 29.4 |
| 8 CO | | | | 580,526.6 | 1.76 ✓ | 3.90 | 45.1 |
| $NO_x$ | | | | 580,526.6 | 1.44 ✓ | 3.50 | 41.2 |
| $SO_2$ | | | | 580,526.6 | 6.29 ✓ | 22.40 | 28.1 |
| 10 CO | | | | 736,679.2 | 2.34 | 3.90 | 59.9 |
| $NO_x$ | | | | 736,679.2 | 1.79 | 3.50 | 51.1 |
| $SO_2$ | | | | 736,679.2 | 8.99 | 22.40 | 40.2 |
| Avg. CO | | | | 664,316.0 | 2.37 | 3.90 | 60.9 |
| $NO_x$ | | | | 664,316.0 | 1.63 | 3.50 | 46.5 |
| $SO_2$ | | | | 664,316.0 | 7.29 | 22.40 | 32.5 |

Note * $O_2$ is expressed in percent.

**EQUATIONS:** Method 1-4 lb/hr = C x Qsd

, Q

JBJ /MO

Citgo Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name:

| Date & Time M/D/Y H:M | O2 % | SO2 ppm |
|---|---|---|
| 10/7/2008 14:41 | 5.52 | 65.16 |
| 10/7/2008 14:42 | 5.63 | 65.04 |
| 10/7/2008 14:43 | 5.61 | 65.35 |
| 10/7/2008 14:44 | 5.6 | 65.23 |
| 10/7/2008 14:45 | 5.69 | 65.78 |
| 10/7/2008 14:46 | 5.6 | 65.92 |
| 10/7/2008 14:47 | 5.79 | 66.32 |
| 10/7/2008 14:48 | 5.65 | 66.48 |
| 10/7/2008 14:49 | 5.73 | 66.13 |
| 10/7/2008 14:50 | 5.69 | 66.1 |
| 10/7/2008 14:51 | 5.67 | 66.02 |
| 10/7/2008 14:52 | 5.62 | 65.48 |
| 10/7/2008 14:53 | 5.65 | 65.31 |
| 10/7/2008 14:54 | 5.6 | 65.2 |
| 10/7/2008 14:55 | 5.76 | 65.06 |
| 10/7/2008 14:56 | 5.65 | 64.96 |
| 10/7/2008 14:57 | 5.57 | 64.61 |
| 10/7/2008 14:58 | 5.69 | 57.36 |
| 10/7/2008 14:59 | 5.73 | 51.92 |
| 10/7/2008 15:00 | 5.66 | 51.68 |
| 10/7/2008 15:01 | 5.59 | 51.89 |
| 10/7/2008 15:02 | 5.67 | 51.97 |
| 10/7/2008 15:03 | 5.72 | 52.44 |
| 10/7/2008 15:04 | 5.61 | 52.59 |
| 10/7/2008 15:05 | 5.51 | 52.32 |
| 10/7/2008 15:06 | 5.63 | 52.46 |
| 10/7/2008 15:07 | 5.57 | 53.35 |
| 10/7/2008 15:08 | 5.65 | 53.71 |
| 10/7/2008 15:09 | 5.42 | 54.55 |
| 10/7/2008 15:10 | 5.57 | 55.54 |
| 10/7/2008 15:11 | 5.67 | 67.03 |
| 10/7/2008 15:12 | 5.48 | 70.61 |
| 10/7/2008 15:13 | 5.71 | 68.84 |
| 10/7/2008 15:14 | 5.42 | 69.71 |
| 10/7/2008 15:15 | 5.49 | 69.82 |
| 10/7/2008 15:16 | 5.55 | 70.13 |
| 10/7/2008 15:17 | 5.48 | 69.8 |
| 10/7/2008 15:18 | 5.74 | 69.5 |
| 10/7/2008 15:19 | 5.49 | 69.82 |
| 10/7/2008 15:20 | 5.58 | 69.77 |
| 10/7/2008 15:21 | 5.61 | 69.91 |
| 10/7/2008 15:22 | 5.58 | 70.48 |
| 10/7/2008 15:23 | 5.64 | 70.82 |
| 10/7/2008 15:24 | 5.48 | 71.53 |
| 10/7/2008 15:25 | 5.54 | 72.36 |
| 10/7/2008 15:26 | 5.79 | 71.61 |
| 10/7/2008 15:27 | 5.64 | 71.18 |
| 10/7/2008 15:28 | 5.69 | 71.66 |
| 10/7/2008 15:29 | 5.58 | 71.86 |
| 10/7/2008 15:30 | 5.67 | 72.06 |
| 10/7/2008 15:31 | 5.71 | 71.85 |
| 10/7/2008 15:32 | 5.74 | 71.68 |
| 10/7/2008 15:33 | 5.73 | 71.31 |
| 10/7/2008 15:34 | 5.69 | 71.2 |
| 10/7/2008 15:35 | 5.67 | 71.6 |
| 10/7/2008 15:36 | 5.81 | 71.92 |
| 10/7/2008 15:37 | 5.6 | 72.48 |
| 10/7/2008 15:38 | 5.81 | 71.72 |
| 10/7/2008 15:39 | 5.62 | 72.08 |
| 10/7/2008 15:40 | 5.66 | 72.29 |
| **Avg =** | **5.63** | **65.54** |

Citgo Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name:

| Date & Time | O2 | SO2 |
|---|---|---|
| M/D/Y H:M | % | ppm |
| 10/7/2008 16:18 | 6.22 | 72.8 |
| 10/7/2008 16:19 | 6.3 | 71.16 |
| 10/7/2008 16:20 | 6.25 | 71.98 |
| 10/7/2008 16:21 | 6.24 | 71.77 |
| 10/7/2008 16:22 | 6.28 | 72.08 |
| 10/7/2008 16:23 | 6.32 | 72.66 |
| 10/7/2008 16:24 | 6.02 | 73.46 |
| 10/7/2008 16:25 | 6.23 | 72.7 |
| 10/7/2008 16:26 | 6.02 | 73.47 |
| 10/7/2008 16:27 | 6.25 | 72.28 |
| 10/7/2008 16:28 | 6.14 | 72.06 |
| 10/7/2008 16:29 | 6.25 | 71.92 |
| 10/7/2008 16:30 | 6.13 | 72.28 |
| 10/7/2008 16:31 | 6.17 | 71.67 |
| 10/7/2008 16:32 | 6.33 | 71.17 |
| 10/7/2008 16:33 | 6.21 | 70.95 |
| 10/7/2008 16:34 | 6.28 | 71.53 |
| 10/7/2008 16:35 | 6.16 | 72.18 |
| 10/7/2008 16:36 | 6.19 | 72.37 |
| 10/7/2008 16:37 | 6.18 | 71.95 |
| 10/7/2008 16:38 | 6.23 | 72.07 |
| 10/7/2008 16:39 | 6.19 | 72.59 |
| 10/7/2008 16:40 | 6.21 | 73.03 |
| 10/7/2008 16:41 | 6.1 | 73.03 |
| 10/7/2008 16:42 | 6.17 | 72.89 |
| 10/7/2008 16:43 | 6.22 | 73.59 |
| 10/7/2008 16:44 | 6.09 | 73.44 |
| 10/7/2008 16:45 | 6.1 | 72.81 |
| 10/7/2008 16:46 | 6.28 | 72.69 |
| 10/7/2008 16:47 | 6.23 | 72.55 |
| 10/7/2008 16:48 | 6.14 | 73 |
| 10/7/2008 16:49 | 6.25 | 72.78 |
| 10/7/2008 16:50 | 6.2 | 73.15 |
| 10/7/2008 16:51 | 6.14 | 73.05 |
| 10/7/2008 16:52 | 6.22 | 72.99 |
| 10/7/2008 16:53 | 6.18 | 72.69 |
| 10/7/2008 16:54 | 6.39 | 72.96 |
| 10/7/2008 16:55 | 6.28 | 72.76 |
| 10/7/2008 16:56 | 6.3 | 73.65 |
| 10/7/2008 16:57 | 6.12 | 73.97 |
| 10/7/2008 16:58 | 6.21 | 74.19 |
| 10/7/2008 16:59 | 6.27 | 74.04 |
| 10/7/2008 17:00 | 6.19 | 73.98 |
| 10/7/2008 17:01 | 6.18 | 74.02 |
| 10/7/2008 17:02 | 6.16 | 74.35 |
| 10/7/2008 17:03 | 6.27 | 73.74 |
| 10/7/2008 17:04 | 6.27 | 73.96 |
| 10/7/2008 17:05 | 6.5 | 73.55 |
| 10/7/2008 17:06 | 6.54 | 73.35 |
| 10/7/2008 17:07 | 6.42 | 73.61 |
| 10/7/2008 17:08 | 6.41 | 73.78 |
| 10/7/2008 17:09 | 6.3 | 74.12 |
| 10/7/2008 17:10 | 6.29 | 73.96 |
| 10/7/2008 17:11 | 6.43 | 73.74 |
| 10/7/2008 17:12 | 6.36 | 73.51 |
| 10/7/2008 17:13 | 6.27 | 73.66 |
| 10/7/2008 17:14 | 6.34 | 73.86 |
| 10/7/2008 17:15 | 6.38 | 73.99 |
| 10/7/2008 17:16 | 6.31 | 73.57 |
| 10/7/2008 17:17 | 6.41 | 73.76 |
| **Avg =** | **6.25** | **72.98** |

Citgo Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name:

| Date & Time | O2 | SO2 |
|---|---|---|
| M/D/Y H:M | % | ppm |
| 10/7/2008 17:40 | 6.55 | 72.38 |
| 10/7/2008 17:41 | 6.36 | 71.62 |
| 10/7/2008 17:42 | 6.45 | 70.45 |
| 10/7/2008 17:43 | 6.34 | 70.16 |
| 10/7/2008 17:44 | 6.38 | 71.16 |
| 10/7/2008 17:45 | 6.35 | 71.18 |
| 10/7/2008 17:46 | 6.45 | 71.7 |
| 10/7/2008 17:47 | 6.48 | 71.02 |
| 10/7/2008 17:48 | 6.43 | 70.85 |
| 10/7/2008 17:49 | 6.33 | 70.79 |
| 10/7/2008 17:50 | 6.4 | 71.34 |
| 10/7/2008 17:51 | 6.39 | 71.83 |
| 10/7/2008 17:52 | 6.26 | 71.61 |
| 10/7/2008 17:53 | 6.35 | 71.04 |
| 10/7/2008 17:54 | 6.29 | 71.48 |
| 10/7/2008 17:55 | 6.32 | 71.29 |
| 10/7/2008 17:56 | 6.3 | 71.24 |
| 10/7/2008 17:57 | 6.27 | 71.08 |
| 10/7/2008 17:58 | 6.3 | 71.43 |
| 10/7/2008 17:59 | 6.23 | 71.52 |
| 10/7/2008 18:00 | 6.2 | 71.48 |
| 10/7/2008 18:01 | 6.22 | 71.3 |
| 10/7/2008 18:02 | 6.13 | 72.09 |
| 10/7/2008 18:03 | 6.2 | 71.62 |
| 10/7/2008 18:04 | 6.15 | 69.24 |
| 10/7/2008 18:05 | 5.95 | 69.14 |
| 10/7/2008 18:06 | 6.24 | 68.91 |
| 10/7/2008 18:07 | 6.1 | 68.77 |
| 10/7/2008 18:08 | 6.12 | 68.81 |
| 10/7/2008 18:09 | 6.14 | 69.02 |
| 10/7/2008 18:10 | 6.07 | 67.7 |
| 10/7/2008 18:11 | 6.13 | 65.52 |
| 10/7/2008 18:12 | 6.03 | 65.35 |
| 10/7/2008 18:13 | 6.1 | 65.45 |
| 10/7/2008 18:14 | 5.95 | 65.1 |
| 10/7/2008 18:15 | 6.21 | 63.86 |
| 10/7/2008 18:16 | 6.07 | 63.95 |
| 10/7/2008 18:17 | 5.99 | 63.16 |
| 10/7/2008 18:18 | 6.19 | 63.22 |
| 10/7/2008 18:19 | 6.01 | 62.67 |
| 10/7/2008 18:20 | 6.13 | 62.3 |
| 10/7/2008 18:21 | 6.2 | 62.36 |
| 10/7/2008 18:22 | 6.08 | 62.96 |
| 10/7/2008 18:23 | 6.08 | 63.12 |
| 10/7/2008 18:24 | 6.19 | 62.37 |
| 10/7/2008 18:25 | 6.06 | 62.18 |
| 10/7/2008 18:26 | 6.14 | 61.66 |
| 10/7/2008 18:27 | 6.23 | 61.74 |
| 10/7/2008 18:28 | 6.13 | 61.58 |
| 10/7/2008 18:29 | 6.02 | 61.64 |
| 10/7/2008 18:30 | 6.17 | 61.53 |
| 10/7/2008 18:31 | 6.07 | 61.44 |
| 10/7/2008 18:32 | 6.15 | 61.56 |
| 10/7/2008 18:33 | 6.11 | 61.99 |
| 10/7/2008 18:34 | 5.97 | 61.92 |
| 10/7/2008 18:35 | 6.14 | 61.97 |
| 10/7/2008 18:36 | 6.08 | 61.55 |
| 10/7/2008 18:37 | 6.11 | 60.89 |
| 10/7/2008 18:38 | 6.3 | 60.75 |
| 10/7/2008 18:39 | 6.16 | 61.4 |
| **Avg =** | **6.20** | **66.81** |

Citgo Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name:

| Date & Time M/D/Y H:M | O2 % | SO2 ppm |
|---|---|---|
| 10/7/2008 19:03 | 6.34 | 68.38 |
| 10/7/2008 19:04 | 6.25 | 67.92 |
| 10/7/2008 19:05 | 6.4 | 66.57 |
| 10/7/2008 19:06 | 6.31 | 66.76 |
| 10/7/2008 19:07 | 6.41 | 66.71 |
| 10/7/2008 19:08 | 6.33 | 67.29 |
| 10/7/2008 19:09 | 6.33 | 67.62 |
| 10/7/2008 19:10 | 6.39 | 67.46 |
| 10/7/2008 19:11 | 6.36 | 67.68 |
| 10/7/2008 19:12 | 6.44 | 66.98 |
| 10/7/2008 19:13 | 6.39 | 66.99 |
| 10/7/2008 19:14 | 6.3 | 66.33 |
| 10/7/2008 19:15 | 6.36 | 65.74 |
| 10/7/2008 19:16 | 6.46 | 65 |
| 10/7/2008 19:17 | 6.25 | 65.27 |
| 10/7/2008 19:18 | 6.38 | 64.68 |
| 10/7/2008 19:19 | 6.39 | 64.56 |
| 10/7/2008 19:20 | 6.28 | 64.6 |
| 10/7/2008 19:21 | 6.42 | 63.74 |
| 10/7/2008 19:22 | 6.3 | 63.65 |
| 10/7/2008 19:23 | 6.33 | 63.22 |
| 10/7/2008 19:24 | 6.42 | 63.65 |
| 10/7/2008 19:25 | 6.23 | 63.87 |
| 10/7/2008 19:26 | 6.42 | 63.89 |
| 10/7/2008 19:27 | 6.33 | 63.58 |
| 10/7/2008 19:28 | 6.53 | 62.92 |
| 10/7/2008 19:29 | 6.28 | 63.05 |
| 10/7/2008 19:30 | 6.48 | 62.88 |
| 10/7/2008 19:31 | 6.3 | 63.1 |
| 10/7/2008 19:32 | 6.48 | 62.86 |
| 10/7/2008 19:33 | 6.36 | 62.73 |
| 10/7/2008 19:34 | 6.41 | 62.41 |
| 10/7/2008 19:35 | 6.34 | 63.01 |
| 10/7/2008 19:36 | 6.37 | 62.88 |
| 10/7/2008 19:37 | 6.41 | 62.55 |
| 10/7/2008 19:38 | 6.4 | 62.6 |
| 10/7/2008 19:39 | 6.34 | 63.12 |
| 10/7/2008 19:40 | 6.4 | 62.82 |
| 10/7/2008 19:41 | 6.48 | 62.69 |
| 10/7/2008 19:42 | 6.32 | 63.09 |
| 10/7/2008 19:43 | 6.41 | 62.87 |
| 10/7/2008 19:44 | 6.48 | 63.47 |
| 10/7/2008 19:45 | 6.28 | 63.52 |
| 10/7/2008 19:46 | 6.48 | 63.47 |
| 10/7/2008 19:47 | 6.29 | 63.36 |
| 10/7/2008 19:48 | 6.35 | 63.32 |
| 10/7/2008 19:49 | 6.32 | 63.43 |
| 10/7/2008 19:50 | 6.4 | 64.01 |
| 10/7/2008 19:51 | 6.24 | 64.65 |
| 10/7/2008 19:52 | 6.43 | 64.7 |
| 10/7/2008 19:53 | 6.28 | 65.32 |
| 10/7/2008 19:54 | 6.42 | 65.9 |
| 10/7/2008 19:55 | 6.32 | 66.24 |
| 10/7/2008 19:56 | 6.31 | 65.97 |
| 10/7/2008 19:57 | 6.33 | 65.82 |
| 10/7/2008 19:58 | 6.34 | 65.04 |
| 10/7/2008 19:59 | 6.33 | 65.51 |
| 10/7/2008 20:00 | 6.41 | 66.26 |
| 10/7/2008 20:01 | 6.29 | 66.6 |
| 10/7/2008 20:02 | 6.28 | 66.47 |
| **Avg =** | **6.36** | **64.68** |

Citgo Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name: 10-08-08_06-43

| Date & Time | CO | NOx | O2 | SO2 |
|---|---|---|---|---|
| M/D/Y H:M | ppm | ppm | % | ppm |
| 10/8/2008 7:46 | 9.08 | 21.23 | 7.08 | 58.00 |
| 10/8/2008 7:47 | 12.05 | 20.83 | 7.04 | 58.49 |
| 10/8/2008 7:48 | 12.39 | 20.99 | 7.06 | 58.85 |
| 10/8/2008 7:49 | 14.25 | 20.97 | 7.06 | 59.28 |
| 10/8/2008 7:50 | 12.52 | 21.31 | 6.90 | 59.12 |
| 10/8/2008 7:51 | 10.60 | 21.81 | 6.92 | 59.49 |
| 10/8/2008 7:52 | 9.39 | 22.09 | 6.92 | 59.18 |
| 10/8/2008 7:53 | 10.04 | 22.13 | 6.93 | 59.09 |
| 10/8/2008 7:54 | 12.60 | 21.61 | 6.96 | 59.31 |
| 10/8/2008 7:55 | 23.49 | 21.36 | 7.16 | 59.38 |
| 10/8/2008 7:56 | 45.80 | 19.97 | 7.10 | 59.37 |
| 10/8/2008 7:57 | 43.94 | 20.05 | 7.11 | 59.52 |
| 10/8/2008 7:58 | 92.22 | 19.31 | 7.33 | 59.91 |
| 10/8/2008 7:59 | 104.91 | 19.49 | 7.13 | 60.51 |
| 10/8/2008 8:00 | 59.61 | 20.34 | 7.12 | 60.24 |
| 10/8/2008 8:01 | 112.46 | 19.40 | 7.22 | 60.56 |
| 10/8/2008 8:02 | 75.19 | 19.87 | 7.09 | 50.09 |
| 10/8/2008 8:03 | 88.17 | 19.80 | 7.20 | 47.90 |
| 10/8/2008 8:04 | 82.57 | 19.66 | 7.11 | 47.90 |
| 10/8/2008 8:05 | 74.56 | 19.89 | 7.12 | 47.97 |
| 10/8/2008 8:06 | 107.45 | 19.61 | 7.09 | 48.37 |
| 10/8/2008 8:07 | 75.98 | 20.34 | 7.05 | 47.96 |
| 10/8/2008 8:08 | 88.26 | 20.05 | 7.13 | 48.19 |
| 10/8/2008 8:09 | 72.06 | 20.20 | 6.91 | 47.96 |
| 10/8/2008 8:10 | 81.92 | 20.32 | 7.08 | 47.45 |
| 10/8/2008 8:11 | 99.57 | 19.74 | 7.00 | 47.87 |
| 10/8/2008 8:12 | 72.10 | 20.43 | 6.92 | 48.02 |
| 10/8/2008 8:13 | 68.34 | 20.61 | 6.94 | 48.12 |
| 10/8/2008 8:14 | 90.70 | 20.29 | 6.94 | 50.90 |
| 10/8/2008 8:15 | 59.23 | 20.97 | 6.79 | 61.19 |
| 10/8/2008 8:16 | 54.58 | 20.88 | 6.86 | 61.90 |
| 10/8/2008 8:17 | 73.96 | 20.59 | 6.92 | 61.38 |
| 10/8/2008 8:18 | 87.14 | 20.50 | 6.82 | 61.20 |
| 10/8/2008 8:19 | 51.11 | 21.39 | 6.77 | 61.14 |
| 10/8/2008 8:20 | 47.21 | 21.10 | 6.83 | 61.10 |
| 10/8/2008 8:21 | 102.15 | 20.56 | 6.86 | 61.27 |
| 10/8/2008 8:22 | 44.33 | 21.32 | 6.65 | 61.40 |
| 10/8/2008 8:23 | 63.99 | 20.59 | 6.86 | 61.25 |
| 10/8/2008 8:24 | 80.33 | 20.24 | 6.78 | 61.30 |
| 10/8/2008 8:25 | 49.57 | 20.67 | 6.70 | 60.94 |
| 10/8/2008 8:26 | 68.91 | 20.51 | 6.69 | 61.25 |
| 10/8/2008 8:27 | 62.88 | 20.55 | 6.64 | 60.84 |
| 10/8/2008 8:28 | 63.00 | 20.79 | 6.64 | 60.46 |
| 10/8/2008 8:29 | 65.89 | 20.73 | 6.61 | 60.63 |
| 10/8/2008 8:30 | 72.57 | 20.74 | 6.59 | 61.08 |
| 10/8/2008 8:31 | 57.68 | 20.75 | 6.56 | 61.32 |
| 10/8/2008 8:32 | 47.18 | 20.96 | 6.52 | 61.41 |
| 10/8/2008 8:33 | 89.19 | 20.28 | 6.55 | 61.45 |
| 10/8/2008 8:34 | 56.02 | 20.90 | 6.48 | 61.93 |
| 10/8/2008 8:35 | 82.63 | 20.37 | 6.50 | 61.59 |
| 10/8/2008 8:36 | 69.37 | 20.47 | 6.43 | 61.56 |
| 10/8/2008 8:37 | 68.89 | 20.43 | 6.40 | 61.41 |
| 10/8/2008 8:38 | 62.38 | 20.65 | 6.36 | 61.55 |
| 10/8/2008 8:39 | 52.52 | 20.73 | 6.31 | 61.77 |
| 10/8/2008 8:40 | 77.16 | 20.25 | 6.33 | 61.54 |
| 10/8/2008 8:41 | 57.68 | 20.44 | 6.22 | 61.43 |
| 10/8/2008 8:42 | 60.04 | 20.56 | 6.29 | 61.21 |
| 10/8/2008 8:43 | 69.25 | 20.52 | 6.28 | 60.04 |
| 10/8/2008 8:44 | 62.50 | 20.69 | 6.19 | 60.21 |
| 10/8/2008 8:45 | 59.51 | 20.72 | 6.22 | 59.59 |
| **Avg =** | **61.35** | **20.58** | **6.80** | **57.92** |

Citgo Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name:

| Date & Time | O2 | SO2 |
|---|---|---|
| M/D/Y H:M | % | ppm |
| 10/8/2008 9:13 | 6.42 | 50.75 |
| 10/8/2008 9:14 | 6.47 | 49.02 |
| 10/8/2008 9:15 | 6.41 | 48.18 |
| 10/8/2008 9:16 | 6.49 | 48.80 |
| 10/8/2008 9:17 | 6.36 | 49.09 |
| 10/8/2008 9:18 | 6.49 | 49.44 |
| 10/8/2008 9:19 | 6.58 | 49.62 |
| 10/8/2008 9:20 | 6.46 | 51.33 |
| 10/8/2008 9:21 | 6.48 | 61.87 |
| 10/8/2008 9:22 | 6.50 | 63.11 |
| 10/8/2008 9:23 | 6.63 | 62.56 |
| 10/8/2008 9:24 | 6.48 | 62.84 |
| 10/8/2008 9:25 | 6.54 | 62.87 |
| 10/8/2008 9:26 | 6.57 | 62.86 |
| 10/8/2008 9:27 | 6.43 | 63.30 |
| 10/8/2008 9:28 | 6.59 | 64.00 |
| 10/8/2008 9:29 | 6.42 | 64.10 |
| 10/8/2008 9:30 | 6.53 | 64.32 |
| 10/8/2008 9:31 | 6.54 | 64.29 |
| 10/8/2008 9:32 | 6.49 | 64.17 |
| 10/8/2008 9:33 | 6.62 | 64.44 |
| 10/8/2008 9:34 | 6.58 | 64.71 |
| 10/8/2008 9:35 | 6.57 | 64.19 |
| 10/8/2008 9:36 | 6.73 | 64.62 |
| 10/8/2008 9:37 | 6.49 | 64.56 |
| 10/8/2008 9:38 | 6.66 | 65.28 |
| 10/8/2008 9:39 | 6.62 | 64.96 |
| 10/8/2008 9:40 | 6.70 | 65.38 |
| 10/8/2008 9:41 | 6.80 | 65.23 |
| 10/8/2008 9:42 | 6.59 | 65.19 |
| 10/8/2008 9:43 | 6.62 | 65.69 |
| 10/8/2008 9:44 | 6.75 | 65.67 |
| 10/8/2008 9:45 | 6.68 | 65.44 |
| 10/8/2008 9:46 | 6.75 | 65.32 |
| 10/8/2008 9:47 | 6.74 | 65.58 |
| 10/8/2008 9:48 | 6.67 | 66.11 |
| 10/8/2008 9:49 | 6.77 | 66.02 |
| 10/8/2008 9:50 | 6.68 | 66.11 |
| 10/8/2008 9:51 | 6.81 | 65.52 |
| 10/8/2008 9:52 | 6.69 | 65.68 |
| 10/8/2008 9:53 | 6.75 | 65.95 |
| 10/8/2008 9:54 | 6.77 | 65.91 |
| 10/8/2008 9:55 | 6.72 | 66.10 |
| 10/8/2008 9:56 | 6.86 | 66.49 |
| 10/8/2008 9:57 | 6.73 | 66.30 |
| 10/8/2008 9:58 | 6.82 | 66.26 |
| 10/8/2008 9:59 | 6.87 | 66.32 |
| 10/8/2008 10:00 | 6.76 | 66.31 |
| 10/8/2008 10:01 | 6.76 | 66.12 |
| 10/8/2008 10:02 | 6.87 | 66.38 |
| 10/8/2008 10:03 | 6.93 | 66.22 |
| 10/8/2008 10:04 | 6.85 | 65.94 |
| 10/8/2008 10:05 | 6.84 | 66.03 |
| 10/8/2008 10:06 | 7.02 | 65.92 |
| 10/8/2008 10:07 | 6.88 | 65.98 |
| 10/8/2008 10:08 | 6.83 | 66.55 |
| 10/8/2008 10:09 | 7.08 | 65.97 |
| 10/8/2008 10:10 | 6.95 | 66.12 |
| 10/8/2008 10:11 | 6.96 | 64.07 |
| 10/8/2008 10:12 | 7.01 | 53.50 |
| **Avg =** | **6.68** | **62.84** |

Citgo Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name:

| Date & Time | O2 | SO2 |
|---|---|---|
| M/D/Y H:M | % | ppm |
| 10/8/2008 10:32 | 7.16 | 65.75 |
| 10/8/2008 10:33 | 7.11 | 64.98 |
| 10/8/2008 10:34 | 7.02 | 63.80 |
| 10/8/2008 10:35 | 7.12 | 64.10 |
| 10/8/2008 10:36 | 7.14 | 64.55 |
| 10/8/2008 10:37 | 7.07 | 64.53 |
| 10/8/2008 10:38 | 7.17 | 64.93 |
| 10/8/2008 10:39 | 7.10 | 65.23 |
| 10/8/2008 10:40 | 7.14 | 65.70 |
| 10/8/2008 10:41 | 7.14 | 65.72 |
| 10/8/2008 10:42 | 7.07 | 65.88 |
| 10/8/2008 10:43 | 7.12 | 65.74 |
| 10/8/2008 10:44 | 7.11 | 65.35 |
| 10/8/2008 10:45 | 7.13 | 65.56 |
| 10/8/2008 10:46 | 7.07 | 65.11 |
| 10/8/2008 10:47 | 7.14 | 65.81 |
| 10/8/2008 10:48 | 7.13 | 66.28 |
| 10/8/2008 10:49 | 7.06 | 66.30 |
| 10/8/2008 10:50 | 7.03 | 66.39 |
| 10/8/2008 10:51 | 7.16 | 65.87 |
| 10/8/2008 10:52 | 7.20 | 65.71 |
| 10/8/2008 10:53 | 7.10 | 65.57 |
| 10/8/2008 10:54 | 7.28 | 65.36 |
| 10/8/2008 10:55 | 7.10 | 65.75 |
| 10/8/2008 10:56 | 7.14 | 65.07 |
| 10/8/2008 10:57 | 7.21 | 65.32 |
| 10/8/2008 10:58 | 7.10 | 65.76 |
| 10/8/2008 10:59 | 7.03 | 65.67 |
| 10/8/2008 11:00 | 7.08 | 66.50 |
| 10/8/2008 11:01 | 7.05 | 66.58 |
| 10/8/2008 11:02 | 6.93 | 66.65 |
| 10/8/2008 11:03 | 6.93 | 66.79 |
| 10/8/2008 11:04 | 6.93 | 67.05 |
| 10/8/2008 11:05 | 6.83 | 67.43 |
| 10/8/2008 11:06 | 6.89 | 67.43 |
| 10/8/2008 11:07 | 6.75 | 67.78 |
| 10/8/2008 11:08 | 6.86 | 67.34 |
| 10/8/2008 11:09 | 6.76 | 67.31 |
| 10/8/2008 11:10 | 6.90 | 67.73 |
| 10/8/2008 11:11 | 6.78 | 67.51 |
| 10/8/2008 11:12 | 6.74 | 67.73 |
| 10/8/2008 11:13 | 6.78 | 60.38 |
| 10/8/2008 11:14 | 6.82 | 53.83 |
| 10/8/2008 11:15 | 6.87 | 53.51 |
| 10/8/2008 11:16 | 6.73 | 53.73 |
| 10/8/2008 11:17 | 6.73 | 53.81 |
| 10/8/2008 11:18 | 6.81 | 53.97 |
| 10/8/2008 11:19 | 6.77 | 53.77 |
| 10/8/2008 11:20 | 6.76 | 53.61 |
| 10/8/2008 11:21 | 6.75 | 54.36 |
| 10/8/2008 11:22 | 6.72 | 54.47 |
| 10/8/2008 11:23 | 6.78 | 53.91 |
| 10/8/2008 11:24 | 6.76 | 53.84 |
| 10/8/2008 11:25 | 6.67 | 54.32 |
| 10/8/2008 11:26 | 6.64 | 64.37 |
| 10/8/2008 11:27 | 6.78 | 69.38 |
| 10/8/2008 11:28 | 6.57 | 67.91 |
| 10/8/2008 11:29 | 6.74 | 67.66 |
| 10/8/2008 11:30 | 6.67 | 67.92 |
| 10/8/2008 11:31 | 6.79 | 67.57 |
| **Avg =** | **6.95** | **63.63** |

Citgo Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name: 10-08-08_06-43

| Date & Time | CO | NOx | O2 | SO2 |
|---|---|---|---|---|
| M/D/Y H:M | ppm | ppm | % | ppm |
| 10/8/2008 11:53 | 58.30 | 20.00 | 6.58 | 68.05 |
| 10/8/2008 11:54 | 41.07 | 20.57 | 6.47 | 67.43 |
| 10/8/2008 11:55 | 31.54 | 21.21 | 6.50 | 66.81 |
| 10/8/2008 11:56 | 36.42 | 20.80 | 6.55 | 66.43 |
| 10/8/2008 11:57 | 47.93 | 20.55 | 6.57 | 65.68 |
| 10/8/2008 11:58 | 34.53 | 21.11 | 6.49 | 65.73 |
| 10/8/2008 11:59 | 53.71 | 20.55 | 6.55 | 65.97 |
| 10/8/2008 12:00 | 28.47 | 21.09 | 6.45 | 66.46 |
| 10/8/2008 12:01 | 49.34 | 20.73 | 6.55 | 67.15 |
| 10/8/2008 12:02 | 43.69 | 20.84 | 6.35 | 67.35 |
| 10/8/2008 12:03 | 23.84 | 21.53 | 6.40 | 66.55 |
| 10/8/2008 12:04 | 40.83 | 20.66 | 6.51 | 66.49 |
| 10/8/2008 12:05 | 49.39 | 20.58 | 6.44 | 66.61 |
| 10/8/2008 12:06 | 33.00 | 21.53 | 6.40 | 66.58 |
| 10/8/2008 12:07 | 32.86 | 21.36 | 6.48 | 66.83 |
| 10/8/2008 12:08 | 57.56 | 20.63 | 6.41 | 67.70 |
| 10/8/2008 12:09 | 27.95 | 21.56 | 6.45 | 67.70 |
| 10/8/2008 12:10 | 60.14 | 20.44 | 6.56 | 68.10 |
| 10/8/2008 12:11 | 35.74 | 21.28 | 6.36 | 67.28 |
| 10/8/2008 12:12 | 31.29 | 21.38 | 6.44 | 66.73 |
| 10/8/2008 12:13 | 50.91 | 20.58 | 6.47 | 62.15 |
| 10/8/2008 12:14 | 26.84 | 21.31 | 6.31 | 54.00 |
| 10/8/2008 12:15 | 44.24 | 20.81 | 6.50 | 53.41 |
| 10/8/2008 12:16 | 37.27 | 20.79 | 6.38 | 53.58 |
| 10/8/2008 12:17 | 42.37 | 20.83 | 6.47 | 53.16 |
| 10/8/2008 12:18 | 41.94 | 20.63 | 6.41 | 52.88 |
| 10/8/2008 12:19 | 39.25 | 21.31 | 6.44 | 53.55 |
| 10/8/2008 12:20 | 52.10 | 20.71 | 6.38 | 53.53 |
| 10/8/2008 12:21 | 46.77 | 21.05 | 6.38 | 53.75 |
| 10/8/2008 12:22 | 38.96 | 21.15 | 6.33 | 53.79 |
| 10/8/2008 12:23 | 29.63 | 21.48 | 6.31 | 53.33 |
| 10/8/2008 12:24 | 36.01 | 20.89 | 6.42 | 53.68 |
| 10/8/2008 12:25 | 64.93 | 20.31 | 6.37 | 53.69 |
| 10/8/2008 12:26 | 29.50 | 21.38 | 6.33 | 61.82 |
| 10/8/2008 12:27 | 67.49 | 20.23 | 6.44 | 68.88 |
| 10/8/2008 12:28 | 37.30 | 20.99 | 6.28 | 68.45 |
| 10/8/2008 12:29 | 41.27 | 20.87 | 6.39 | 68.16 |
| 10/8/2008 12:30 | 42.86 | 20.72 | 6.25 | 68.07 |
| 10/8/2008 12:31 | 25.98 | 21.28 | 6.25 | 68.42 |
| 10/8/2008 12:32 | 60.70 | 20.19 | 6.40 | 68.77 |
| 10/8/2008 12:33 | 38.73 | 20.92 | 6.20 | 69.00 |
| 10/8/2008 12:34 | 27.08 | 21.36 | 6.24 | 69.47 |
| 10/8/2008 12:35 | 55.87 | 20.12 | 6.38 | 69.62 |
| 10/8/2008 12:36 | 40.17 | 20.73 | 6.24 | 69.38 |
| 10/8/2008 12:37 | 32.02 | 20.99 | 6.26 | 69.09 |
| 10/8/2008 12:38 | 28.24 | 21.09 | 6.23 | 69.56 |
| 10/8/2008 12:39 | 50.30 | 20.55 | 6.37 | 69.17 |
| 10/8/2008 12:40 | 37.01 | 21.25 | 6.33 | 69.23 |
| 10/8/2008 12:41 | 56.15 | 20.39 | 6.31 | 68.95 |
| 10/8/2008 12:42 | 30.91 | 21.16 | 6.34 | 69.20 |
| 10/8/2008 12:43 | 51.38 | 20.65 | 6.33 | 69.21 |
| 10/8/2008 12:44 | 29.91 | 20.99 | 6.22 | 69.62 |
| 10/8/2008 12:45 | 43.30 | 20.91 | 6.32 | 69.63 |
| 10/8/2008 12:46 | 31.85 | 20.94 | 6.26 | 69.46 |
| 10/8/2008 12:47 | 50.33 | 20.66 | 6.39 | 69.06 |
| 10/8/2008 12:48 | 31.51 | 20.89 | 6.22 | 69.08 |
| 10/8/2008 12:49 | 26.84 | 21.08 | 6.28 | 69.15 |
| 10/8/2008 12:50 | 70.55 | 20.11 | 6.38 | 69.56 |
| 10/8/2008 12:51 | 35.73 | 20.55 | 6.24 | 68.71 |
| 10/8/2008 12:52 | 46.71 | 20.59 | 6.42 | 68.78 |
| **Avg =** | **41.48** | **20.86** | **6.38** | **64.99** |

Citgo Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name:

| Date & Time | O2 | SO2 |
|---|---|---|
| M/D/Y H:M | % | ppm |
| 10/8/2008 13:22 | 6.13 | 66.81 |
| 10/8/2008 13:23 | 6.32 | 55.33 |
| 10/8/2008 13:24 | 6.23 | 54.36 |
| 10/8/2008 13:25 | 6.18 | 54.03 |
| 10/8/2008 13:26 | 6.30 | 53.95 |
| 10/8/2008 13:27 | 6.24 | 54.32 |
| 10/8/2008 13:28 | 6.22 | 53.80 |
| 10/8/2008 13:29 | 6.17 | 54.50 |
| 10/8/2008 13:30 | 6.19 | 54.56 |
| 10/8/2008 13:31 | 6.15 | 54.61 |
| 10/8/2008 13:32 | 6.11 | 55.30 |
| 10/8/2008 13:33 | 6.14 | 55.07 |
| 10/8/2008 13:34 | 6.26 | 54.90 |
| 10/8/2008 13:35 | 6.11 | 59.44 |
| 10/8/2008 13:36 | 6.23 | 69.94 |
| 10/8/2008 13:37 | 6.10 | 70.33 |
| 10/8/2008 13:38 | 6.07 | 69.32 |
| 10/8/2008 13:39 | 6.20 | 69.27 |
| 10/8/2008 13:40 | 6.07 | 69.19 |
| 10/8/2008 13:41 | 6.18 | 68.75 |
| 10/8/2008 13:42 | 6.02 | 68.92 |
| 10/8/2008 13:43 | 6.19 | 68.87 |
| 10/8/2008 13:44 | 6.14 | 68.99 |
| 10/8/2008 13:45 | 6.00 | 69.22 |
| 10/8/2008 13:46 | 6.01 | 69.69 |
| 10/8/2008 13:47 | 5.92 | 70.65 |
| 10/8/2008 13:48 | 6.12 | 69.79 |
| 10/8/2008 13:49 | 6.15 | 69.10 |
| 10/8/2008 13:50 | 6.18 | 69.44 |
| 10/8/2008 13:51 | 6.15 | 69.36 |
| 10/8/2008 13:52 | 6.10 | 69.34 |
| 10/8/2008 13:53 | 6.15 | 69.87 |
| 10/8/2008 13:54 | 6.13 | 70.28 |
| 10/8/2008 13:55 | 6.10 | 70.68 |
| 10/8/2008 13:56 | 6.11 | 69.88 |
| 10/8/2008 13:57 | 6.20 | 70.38 |
| 10/8/2008 13:58 | 6.03 | 70.14 |
| 10/8/2008 13:59 | 6.18 | 70.42 |
| 10/8/2008 14:00 | 6.11 | 70.05 |
| 10/8/2008 14:01 | 6.27 | 70.59 |
| 10/8/2008 14:02 | 6.10 | 70.87 |
| 10/8/2008 14:03 | 6.19 | 70.80 |
| 10/8/2008 14:04 | 6.26 | 71.01 |
| 10/8/2008 14:05 | 6.10 | 71.05 |
| 10/8/2008 14:06 | 6.12 | 71.29 |
| 10/8/2008 14:07 | 6.15 | 71.58 |
| 10/8/2008 14:08 | 6.18 | 71.60 |
| 10/8/2008 14:09 | 6.15 | 71.68 |
| 10/8/2008 14:10 | 6.09 | 71.90 |
| 10/8/2008 14:11 | 6.19 | 71.92 |
| 10/8/2008 14:12 | 6.17 | 71.40 |
| 10/8/2008 14:13 | 6.15 | 71.23 |
| 10/8/2008 14:14 | 6.23 | 71.72 |
| 10/8/2008 14:15 | 6.08 | 72.60 |
| 10/8/2008 14:16 | 6.10 | 72.63 |
| 10/8/2008 14:17 | 6.26 | 72.22 |
| 10/8/2008 14:18 | 6.13 | 72.39 |
| 10/8/2008 14:19 | 6.28 | 72.08 |
| 10/8/2008 14:20 | 6.18 | 71.74 |
| 10/8/2008 14:21 | 6.23 | 71.49 |
| **Avg =** | **6.15** | **67.11** |

Citgo Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name: 10-08-08_06-43

| Date & Time M/D/Y H:M | CO ppm | NOx ppm | O2 % | SO2 ppm |
|---|---|---|---|---|
| 10/8/2008 14:41 | 27.87 | 20.57 | 6.39 | 74.01 |
| 10/8/2008 14:42 | 49.57 | 20.20 | 6.53 | 72.73 |
| 10/8/2008 14:43 | 42.57 | 20.15 | 6.38 | 72.99 |
| 10/8/2008 14:44 | 35.74 | 20.68 | 6.51 | 72.80 |
| 10/8/2008 14:45 | 50.57 | 20.15 | 6.50 | 72.79 |
| 10/8/2008 14:46 | 34.00 | 20.63 | 6.53 | 72.45 |
| 10/8/2008 14:47 | 48.60 | 20.12 | 6.52 | 71.65 |
| 10/8/2008 14:48 | 26.78 | 20.86 | 6.47 | 72.34 |
| 10/8/2008 14:49 | 39.53 | 20.08 | 6.55 | 73.38 |
| 10/8/2008 14:50 | 60.00 | 19.80 | 6.57 | 73.24 |
| 10/8/2008 14:51 | 42.09 | 20.53 | 6.49 | 73.23 |
| 10/8/2008 14:52 | 38.00 | 20.42 | 6.51 | 73.04 |
| 10/8/2008 14:53 | 38.87 | 20.50 | 6.54 | 73.00 |
| 10/8/2008 14:54 | 37.68 | 20.40 | 6.50 | 72.72 |
| 10/8/2008 14:55 | 45.73 | 20.39 | 6.62 | 72.57 |
| 10/8/2008 14:56 | 48.90 | 20.11 | 6.58 | 71.91 |
| 10/8/2008 14:57 | 32.25 | 20.90 | 6.47 | 72.57 |
| 10/8/2008 14:58 | 39.33 | 20.34 | 6.61 | 72.74 |
| 10/8/2008 14:59 | 48.52 | 20.23 | 6.58 | 72.80 |
| 10/8/2008 15:00 | 29.57 | 21.03 | 6.54 | 72.57 |
| 10/8/2008 15:01 | 45.30 | 20.22 | 6.55 | 73.01 |
| 10/8/2008 15:02 | 37.84 | 20.32 | 6.58 | 73.48 |
| 10/8/2008 15:03 | 53.52 | 19.87 | 6.68 | 73.20 |
| 10/8/2008 15:04 | 42.15 | 20.23 | 6.60 | 73.68 |
| 10/8/2008 15:05 | 37.42 | 20.43 | 6.64 | 74.26 |
| 10/8/2008 15:06 | 78.65 | 19.68 | 6.75 | 73.88 |
| 10/8/2008 15:07 | 30.52 | 20.86 | 6.54 | 74.00 |
| 10/8/2008 15:08 | 31.61 | 20.69 | 6.67 | 72.72 |
| 10/8/2008 15:09 | 48.64 | 20.15 | 6.67 | 73.29 |
| 10/8/2008 15:10 | 31.77 | 20.93 | 6.72 | 73.15 |
| 10/8/2008 15:11 | 48.69 | 20.01 | 6.77 | 73.33 |
| 10/8/2008 15:12 | 40.65 | 20.53 | 6.71 | 73.18 |
| 10/8/2008 15:13 | 41.14 | 20.76 | 6.81 | 73.27 |
| 10/8/2008 15:14 | 66.55 | 19.76 | 6.82 | 73.20 |
| 10/8/2008 15:15 | 26.06 | 20.99 | 6.65 | 73.18 |
| 10/8/2008 15:16 | 51.07 | 20.11 | 6.85 | 73.54 |
| 10/8/2008 15:17 | 45.02 | 20.03 | 6.68 | 73.24 |
| 10/8/2008 15:18 | 37.52 | 20.81 | 6.87 | 73.47 |
| 10/8/2008 15:19 | 63.85 | 19.76 | 6.83 | 73.45 |
| 10/8/2008 15:20 | 29.59 | 20.91 | 6.76 | 73.08 |
| 10/8/2008 15:21 | 36.34 | 20.58 | 6.84 | 73.73 |
| 10/8/2008 15:22 | 58.09 | 19.78 | 6.91 | 73.82 |
| 10/8/2008 15:23 | 63.66 | 19.61 | 6.81 | 73.90 |
| 10/8/2008 15:24 | 30.74 | 20.69 | 6.86 | 73.64 |
| 10/8/2008 15:25 | 62.36 | 19.83 | 6.96 | 74.13 |
| 10/8/2008 15:26 | 47.87 | 20.01 | 6.79 | 74.03 |
| 10/8/2008 15:27 | 31.51 | 20.79 | 6.81 | 73.37 |
| 10/8/2008 15:28 | 39.78 | 20.40 | 6.87 | 73.77 |
| 10/8/2008 15:29 | 51.85 | 20.16 | 6.92 | 74.01 |
| 10/8/2008 15:30 | 35.17 | 20.84 | 6.91 | 73.46 |
| 10/8/2008 15:31 | 46.89 | 20.56 | 6.98 | 73.72 |
| 10/8/2008 15:32 | 37.78 | 20.59 | 6.75 | 73.46 |
| 10/8/2008 15:33 | 31.96 | 20.76 | 6.94 | 73.19 |
| 10/8/2008 15:34 | 74.07 | 19.58 | 6.94 | 73.45 |
| 10/8/2008 15:35 | 33.49 | 20.75 | 6.87 | 73.23 |
| 10/8/2008 15:36 | 54.18 | 20.02 | 7.02 | 73.15 |
| 10/8/2008 15:37 | 39.38 | 20.24 | 6.87 | 72.62 |
| 10/8/2008 15:38 | 21.63 | 20.81 | 6.80 | 73.24 |
| 10/8/2008 15:39 | 49.01 | 19.51 | 7.02 | 73.35 |
| 10/8/2008 15:40 | 73.58 | 19.10 | 6.99 | 73.80 |
| **Avg =** | **43.72** | **20.33** | **6.71** | **73.24** |

Citgo Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name:

| Date & Time | O2 | SO2 |
|---|---|---|
| M/D/Y H:M | % | ppm |
| 10/8/2008 16:11 | 7.02 | 71.59 |
| 10/8/2008 16:12 | 6.93 | 72.58 |
| 10/8/2008 16:13 | 6.85 | 71.51 |
| 10/8/2008 16:14 | 6.85 | 71.72 |
| 10/8/2008 16:15 | 6.81 | 71.65 |
| 10/8/2008 16:16 | 6.90 | 71.09 |
| 10/8/2008 16:17 | 6.82 | 70.48 |
| 10/8/2008 16:18 | 6.84 | 70.19 |
| 10/8/2008 16:19 | 6.94 | 70.58 |
| 10/8/2008 16:20 | 6.76 | 70.79 |
| 10/8/2008 16:21 | 6.74 | 70.82 |
| 10/8/2008 16:22 | 6.73 | 70.73 |
| 10/8/2008 16:23 | 6.75 | 70.74 |
| 10/8/2008 16:24 | 6.65 | 71.08 |
| 10/8/2008 16:25 | 6.80 | 70.79 |
| 10/8/2008 16:26 | 6.61 | 70.85 |
| 10/8/2008 16:27 | 6.53 | 71.07 |
| 10/8/2008 16:28 | 6.70 | 71.08 |
| 10/8/2008 16:29 | 6.61 | 70.84 |
| 10/8/2008 16:30 | 6.58 | 71.13 |
| 10/8/2008 16:31 | 6.49 | 71.52 |
| 10/8/2008 16:32 | 6.53 | 71.15 |
| 10/8/2008 16:33 | 6.60 | 71.38 |
| 10/8/2008 16:34 | 6.53 | 71.02 |
| 10/8/2008 16:35 | 6.58 | 71.49 |
| 10/8/2008 16:36 | 6.34 | 71.08 |
| 10/8/2008 16:37 | 6.55 | 71.37 |
| 10/8/2008 16:38 | 6.46 | 71.03 |
| 10/8/2008 16:39 | 6.39 | 71.83 |
| 10/8/2008 16:40 | 6.46 | 72.00 |
| 10/8/2008 16:41 | 6.36 | 71.89 |
| 10/8/2008 16:42 | 6.36 | 71.80 |
| 10/8/2008 16:43 | 6.48 | 71.49 |
| 10/8/2008 16:44 | 6.44 | 71.75 |
| 10/8/2008 16:45 | 6.26 | 72.18 |
| 10/8/2008 16:46 | 6.46 | 71.88 |
| 10/8/2008 16:47 | 6.30 | 71.94 |
| 10/8/2008 16:48 | 6.39 | 72.09 |
| 10/8/2008 16:49 | 6.37 | 72.22 |
| 10/8/2008 16:50 | 6.29 | 72.27 |
| 10/8/2008 16:51 | 6.47 | 71.91 |
| 10/8/2008 16:52 | 6.31 | 72.45 |
| 10/8/2008 16:53 | 6.39 | 72.24 |
| 10/8/2008 16:54 | 6.37 | 72.28 |
| 10/8/2008 16:55 | 6.34 | 72.26 |
| 10/8/2008 16:56 | 6.38 | 72.46 |
| 10/8/2008 16:57 | 6.27 | 71.96 |
| 10/8/2008 16:58 | 6.40 | 71.84 |
| 10/8/2008 16:59 | 6.35 | 72.31 |
| 10/8/2008 17:00 | 6.33 | 72.57 |
| 10/8/2008 17:01 | 6.27 | 73.58 |
| 10/8/2008 17:02 | 6.27 | 73.55 |
| 10/8/2008 17:03 | 6.29 | 73.78 |
| 10/8/2008 17:04 | 6.30 | 73.42 |
| 10/8/2008 17:05 | 6.39 | 73.48 |
| 10/8/2008 17:06 | 6.29 | 72.95 |
| 10/8/2008 17:07 | 6.28 | 73.53 |
| 10/8/2008 17:08 | 6.24 | 73.32 |
| 10/8/2008 17:09 | 6.49 | 73.17 |
| 10/8/2008 17:10 | 6.25 | 73.29 |
| **Avg =** | **6.51** | **71.85** |

Citgo Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name:

| Date & Time | O2 | SO2 |
|---|---|---|
| M/D/Y H:M | % | ppm |
| 10/8/2008 17:32 | 6.52 | 75.16 |
| 10/8/2008 17:33 | 6.42 | 74.02 |
| 10/8/2008 17:34 | 6.50 | 73.30 |
| 10/8/2008 17:35 | 6.52 | 72.67 |
| 10/8/2008 17:36 | 6.49 | 73.23 |
| 10/8/2008 17:37 | 6.56 | 73.03 |
| 10/8/2008 17:38 | 6.43 | 73.11 |
| 10/8/2008 17:39 | 6.54 | 73.71 |
| 10/8/2008 17:40 | 6.60 | 74.11 |
| 10/8/2008 17:41 | 6.38 | 73.72 |
| 10/8/2008 17:42 | 6.50 | 73.56 |
| 10/8/2008 17:43 | 6.54 | 74.11 |
| 10/8/2008 17:44 | 6.42 | 74.30 |
| 10/8/2008 17:45 | 6.61 | 74.62 |
| 10/8/2008 17:46 | 6.47 | 74.51 |
| 10/8/2008 17:47 | 6.56 | 74.03 |
| 10/8/2008 17:48 | 6.55 | 74.27 |
| 10/8/2008 17:49 | 6.46 | 74.21 |
| 10/8/2008 17:50 | 6.63 | 73.84 |
| 10/8/2008 17:51 | 6.60 | 72.83 |
| 10/8/2008 17:52 | 6.56 | 72.69 |
| 10/8/2008 17:53 | 6.65 | 72.59 |
| 10/8/2008 17:54 | 6.51 | 72.33 |
| 10/8/2008 17:55 | 6.55 | 72.75 |
| 10/8/2008 17:56 | 6.72 | 73.08 |
| 10/8/2008 17:57 | 6.62 | 72.89 |
| 10/8/2008 17:58 | 6.58 | 72.11 |
| 10/8/2008 17:59 | 6.59 | 72.24 |
| 10/8/2008 18:00 | 6.63 | 72.47 |
| 10/8/2008 18:01 | 6.65 | 72.26 |
| 10/8/2008 18:02 | 6.63 | 71.34 |
| 10/8/2008 18:03 | 6.60 | 71.31 |
| 10/8/2008 18:04 | 6.59 | 70.68 |
| 10/8/2008 18:05 | 6.70 | 69.42 |
| 10/8/2008 18:06 | 6.59 | 68.30 |
| 10/8/2008 18:07 | 6.71 | 68.45 |
| 10/8/2008 18:08 | 6.63 | 68.10 |
| 10/8/2008 18:09 | 6.66 | 67.93 |
| 10/8/2008 18:10 | 6.74 | 67.99 |
| 10/8/2008 18:11 | 6.63 | 67.27 |
| 10/8/2008 18:12 | 6.69 | 66.52 |
| 10/8/2008 18:13 | 6.69 | 66.86 |
| 10/8/2008 18:14 | 6.70 | 66.83 |
| 10/8/2008 18:15 | 6.73 | 66.35 |
| 10/8/2008 18:16 | 6.69 | 66.77 |
| 10/8/2008 18:17 | 6.71 | 66.21 |
| 10/8/2008 18:18 | 6.76 | 66.12 |
| 10/8/2008 18:19 | 6.76 | 66.49 |
| 10/8/2008 18:20 | 6.86 | 66.56 |
| 10/8/2008 18:21 | 6.70 | 66.67 |
| 10/8/2008 18:22 | 6.76 | 67.36 |
| 10/8/2008 18:23 | 6.87 | 67.59 |
| 10/8/2008 18:24 | 6.74 | 67.83 |
| 10/8/2008 18:25 | 6.88 | 69.92 |
| 10/8/2008 18:26 | 6.79 | 67.95 |
| 10/8/2008 18:27 | 6.72 | 67.23 |
| 10/8/2008 18:28 | 6.91 | 67.29 |
| 10/8/2008 18:29 | 6.83 | 67.36 |
| 10/8/2008 18:30 | 6.76 | 66.86 |
| 10/8/2008 18:31 | 6.91 | 67.07 |
| **Avg =** | **6.64** | **70.57** |

go Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name: 10-07-08_11-20

| Date and Time | CO | NOx | O2 | THC | CO2 | SO2 | Flow |
|---|---|---|---|---|---|---|---|
| MM/DD/YY HH:MM | ppm | ppm | % | ppm | % | ppm | lpm |
| 10/7/2008 11:21 | 0.16 | -0.01 | 20.44 | | | 0.14 | |
| 10/7/2008 11:22 | 0.44 | -0.01 | 15.18 | | | 0.88 | |
| 10/7/2008 11:23 | 0.75 | 0.25 | 0.11 | | | 2.00 | |
| 10/7/2008 11:24 | 0.53 | -0.01 | 0.11 | | | 0.19 | |
| 10/7/2008 11:25 | 0.48 | -0.01 | 0.12 | | | 0.15 | |
| 10/7/2008 11:26 | 0.54 | -0.01 | 0.12 | | | 0.14 | |
| 10/7/2008 11:27 | 0.57 | -0.01 | 0.14 | | | 0.14 | |
| 10/7/2008 11:28 | 0.56 | -0.01 | 0.15 | | | 0.14 | |
| 10/7/2008 11:29 | 0.55 | -0.01 | 0.16 | | | 0.14 | |
| 10/7/2008 11:30 | 0.57 | -0.01 | 0.17 | | | 0.14 | |
| 10/7/2008 11:31 | 0.51 | -0.01 | 0.17 | | | 0.14 | |
| 10/7/2008 11:32 | 0.51 | -0.01 | 0.18 | | | 0.14 | |
| 10/7/2008 11:33 | 0.50 | -0.01 | 0.18 | | | 0.14 | |
| 10/7/2008 11:34 | 0.57 | -0.01 | 0.19 | | | 0.14 | |
| 10/7/2008 11:35 | 0.51 | -0.01 | 0.20 | | | 0.42 | |
| 10/7/2008 11:36 | 0.57 | -0.01 | 0.05 | | | 0.19 | |
| 10/7/2008 11:37 | 0.59 | -0.01 | 0.02 | | | 0.06 | |
| 10/7/2008 11:38 | 0.53 | 0.01 | 0.02 | | | -0.04 | |
| 10/7/2008 11:39 | -0.03 | 0.09 | 0.03 | | | -0.08 | |
| 10/7/2008 11:40 | -0.02 | 0.09 | 0.01 | | | -0.07 | |
| 10/7/2008 11:41 | 0.14 | 0.09 | 0.01 | | | -0.07 | |
| 10/7/2008 11:42 | 0.10 | 0.09 | 0.02 | | | -0.04 | |
| 10/7/2008 11:43 | 0.14 | 0.09 | 0.03 | | | -0.01 | |
| 10/7/2008 11:44 | 0.14 | 0.09 | 0.03 | | | -0.03 | |
| 10/7/2008 11:45 | 0.14 | 0.09 | 0.03 | | | -0.02 | |
| 10/7/2008 11:46 | 0.17 | 0.09 | 0.03 | | | -0.03 | |
| 10/7/2008 11:47 | 0.17 | 0.09 | 0.04 | | | -0.04 | |
| 10/7/2008 11:48 | 0.14 | 0.09 | 0.04 | | | -0.04 | |
| 10/7/2008 11:49 | 53.08 | 1.02 | 15.37 | | | 49.99 | |
| 10/7/2008 11:50 | 97.02 | 70.61 | 21.03 | | | 72.68 | |
| 10/7/2008 11:51 | 98.26 | 98.78 | 20.99 | | | 53.32 | |
| 10/7/2008 11:52 | 98.59 | 99.22 | 21.09 | | | 53.28 | |
| 10/7/2008 11:53 | 94.19 | 99.56 | 21.14 | | | 53.19 | |
| 10/7/2008 11:54 | 93.97 | 99.63 | 21.11 | | | 53.09 | |
| 10/7/2008 11:55 | 94.00 | 96.28 | 21.02 | | | 52.74 | |
| 10/7/2008 11:56 | 94.87 | 88.37 | 19.93 | | | 52.71 | |
| 10/7/2008 11:57 | 95.13 | 74.49 | 20.13 | | | 51.70 | |
| 10/7/2008 11:58 | 95.10 | 94.53 | 20.98 | | | 53.37 | |
| 10/7/2008 11:59 | 95.16 | 94.06 | 21.04 | | | 53.75 | |
| 10/7/2008 12:00 | 95.20 | 94.35 | 20.99 | | | 53.47 | |
| 10/7/2008 12:01 | 71.25 | 94.90 | 16.89 | | | 53.12 | |
| 10/7/2008 12:02 | 45.64 | 94.45 | 12.16 | | | 53.15 | |
| 10/7/2008 12:03 | 45.66 | 95.13 | 12.12 | | | 77.76 | |
| 10/7/2008 12:04 | 45.63 | 94.93 | 12.11 | | | 91.14 | |
| 10/7/2008 12:05 | 45.64 | 94.85 | 12.11 | | | 92.53 | |
| 10/7/2008 12:06 | 45.63 | 95.27 | 12.11 | | | 92.71 | |
| 10/7/2008 12:07 | 45.67 | 95.07 | 12.11 | | | 92.47 | |
| 10/7/2008 12:08 | 45.60 | 95.03 | 12.11 | | | 92.14 | |
| 10/7/2008 12:09 | 45.73 | 95.01 | 12.11 | | | 91.97 | |
| 10/7/2008 12:10 | 45.67 | 94.78 | 12.11 | | | 91.97 | |
| 10/7/2008 12:11 | 45.70 | 94.67 | 12.11 | | | 92.06 | |
| 10/7/2008 12:12 | 45.77 | 94.64 | 12.61 | | | 91.93 | |

Calibration Error

| | | | | |
|---|---|---|---|---|
| 10/7/2008 12:14 | 45.60 | 94.62 | 13.14 | 90.79 |
| 10/7/2008 12:15 | 45.27 | 87.49 | 0.18 | 83.74 |
| 10/7/2008 12:16 | 6.14 | 47.97 | 0.19 | 1.34 |
| 10/7/2008 12:17 | 0.11 | 47.30 | 0.27 | 0.21 |
| 10/7/2008 12:18 | 0.11 | 50.36 | 0.03 | 0.17 |
| 10/7/2008 12:19 | 0.07 | 53.21 | 0.02 | 0.15 |
| 7/2008 12:20 | 0.07 | 52.54 | 0.05 | 0.13 |
| 10/7/2008 12:21 | 0.04 | 51.02 | 0.06 | 0.16 |
| 10/7/2008 12:22 | 0.04 | 51.40 | 0.06 | 0.14 |
| 10/7/2008 12:23 | 0.04 | 51.28 | 0.07 | 0.13 |
| 10/7/2008 12:24 | -0.03 | 51.13 | 0.07 | 0.13 |
| 10/7/2008 12:25 | -0.06 | 42.24 | 0.09 | 0.15 |
| 10/7/2008 12:26 | 0.04 | 1.10 | 2.98 | 0.15 |
| 10/7/2008 12:27 | -0.03 | 0.40 | 11.87 | 0.15 |
| 10/7/2008 12:28 | -0.03 | 0.29 | 11.91 | 0.14 |
| 10/7/2008 12:29 | -0.06 | 0.23 | 11.92 | 0.14 |
| 10/7/2008 12:30 | -0.03 | 0.19 | 11.98 | 0.13 |
| 10/7/2008 12:31 | -0.02 | 0.19 | 11.99 | 0.13 |
| 10/7/2008 12:32 | -0.10 | 0.19 | 11.99 | 0.14 |
| 10/7/2008 12:33 | -0.09 | 0.19 | 12.00 | 0.13 |
| 10/7/2008 12:34 | -0.13 | 0.19 | 12.00 | 0.14 |
| 10/7/2008 12:35 | 2.62 | 0.17 | 8.91 | 0.15 |
| 10/7/2008 12:36 | 41.85 | 0.19 | 0.22 | 0.13 |
| 10/7/2008 12:37 | 45.34 | 0.19 | 0.20 | 0.15 |
| 10/7/2008 12:38 | 45.34 | 0.19 | 0.19 | 0.14 |
| 10/7/2008 12:39 | 45.15 | 0.19 | 0.18 | 0.13 |
| 10/7/2008 12:40 | 22.97 | 17.51 | 0.16 | 0.13 |
| 10/7/2008 12:41 | 0.00 | 49.86 | -0.01 | 0.10 |
| 10/7/2008 12:42 | -0.06 | 50.47 | -0.01 | 0.08 |
| 10/7/2008 12:43 | 0.04 | 50.45 | -0.01 | 0.08 |
| 10/7/2008 12:44 | -0.10 | 51.09 | 0.04 | 0.08 |
| 10/7/2008 12:45 | -0.09 | 51.50 | 0.05 | 0.08 |
| 10/7/2008 12:46 | -0.09 | 51.43 | 0.05 | 0.08 |
| 10/7/2008 12:47 | -0.13 | 51.45 | 0.05 | 0.09 |
| 10/7/2008 12:48 | -0.20 | 50.34 | 3.72 | 0.13 |
| 10/7/2008 12:49 | -0.02 | 22.28 | 0.59 | 40.26 |
| 10/7/2008 12:50 | 0.04 | 0.37 | -0.01 | 49.78 |
| 10/7/2008 12:51 | 0.07 | 0.24 | 0.00 | 51.15 |
| 10/7/2008 12:52 | -0.03 | 0.19 | 0.00 | 51.61 |
| 10/7/2008 12:53 | 0.01 | 0.19 | 0.00 | 51.89 |
| 10/7/2008 12:54 | 0.00 | 0.19 | 0.00 | 52.07 |
| 10/7/2008 12:55 | -0.03 | 0.19 | 0.00 | 52.18 |
| 10/7/2008 12:56 | 0.00 | 0.19 | 0.00 | 52.30 |
| 10/7/2008 12:57 | -0.06 | 0.19 | 0.00 | 52.36 |
| 10/7/2008 12:58 | -0.06 | 0.19 | 0.00 | 52.42 |
| 10/7/2008 12:59 | -0.03 | 0.19 | 0.01 | 52.45 |
| 10/7/2008 13:00 | -0.09 | 0.19 | 0.00 | 52.48 |
| 10/7/2008 13:01 | -0.05 | 0.19 | 0.01 | 52.54 |
| 10/7/2008 13:02 | -0.03 | 0.19 | 0.01 | 52.55 |
| 10/7/2008 13:03 | -0.04 | 0.19 | 0.03 | 37.81 |
| 10/7/2008 13:04 | -0.33 | 0.11 | 0.07 | 2.32 |
| 10/7/2008 13:05 | -0.36 | 0.09 | 0.08 | 1.16 |
| 10/7/2008 13:06 | -0.33 | 0.09 | 0.08 | 0.79 |
| 10/7/2008 13:07 | -0.36 | 0.09 | 0.08 | 0.61 |
| 10/7/2008 13:08 | -0.37 | 0.09 | 0.08 | 0.49 |
| 10/7/2008 13:09 | -0.39 | 0.09 | 0.00 | 0.40 |
| 10/7/2008 13:10 | -0.36 | 0.09 | -0.02 | 0.34 |
| 0/7/2008 13:11 | -0.38 | 0.09 | -0.02 | 0.33 |
| 10/7/2008 13:12 | -0.33 | 0.09 | -0.02 | 0.29 |
| 10/7/2008 13:13 | -0.36 | 0.09 | -0.02 | 0.23 |
| 10/7/2008 13:14 | -0.37 | 0.09 | -0.01 | 0.25 |
| 10/7/2008 13:15 | -0.42 | 0.09 | -0.01 | 0.23 |
| 10/7/2008 13:16 | -0.40 | 0.09 | -0.01 | 0.19 |
| 10/7/2008 13:17 | -0.43 | 0.09 | -0.01 | 0.19 |

Line Bias

| | | | | |
|---|---|---|---|---|
| 10/7/2008 13:19 | -0.42 | 0.09 | -0.01 | 0.19 |
| 10/7/2008 13:20 | -0.39 | 0.09 | -0.01 | 0.18 |
| 10/7/2008 13:21 | -0.34 | 0.09 | -0.01 | 0.17 |
| 10/7/2008 13:22 | -0.38 | 0.09 | -0.01 | 0.17 |
| 10/7/2008 13:23 | -0.44 | 0.09 | -0.01 | 0.18 |
| 10/7/2008 13:24 | -0.38 | 0.09 | -0.01 | 0.19 |
| 10/7/2008 13:25 | -0.36 | 0.09 | -0.01 | 0.18 |
| 10/7/2008 13:26 | -0.36 | 0.09 | 0.00 | 0.19 |
| 10/7/2008 13:27 | -0.33 | 0.09 | -0.01 | 0.19 |
| 10/7/2008 13:28 | -0.40 | 0.09 | 0.00 | 0.20 |
| 10/7/2008 13:29 | -0.35 | 0.09 | 0.00 | 0.21 |
| 10/7/2008 13:30 | -0.35 | 0.09 | 0.00 | 0.20 |
| 10/7/2008 13:31 | -0.33 | 0.09 | 0.00 | 0.21 |
| 10/7/2008 13:32 | -0.30 | 0.09 | 0.00 | 0.20 |
| 10/7/2008 13:33 | -0.35 | 0.09 | 0.00 | 0.21 |
| 10/7/2008 13:34 | -0.36 | 0.09 | 0.00 | 0.18 |
| 10/7/2008 13:35 | -0.33 | 0.09 | 0.00 | 0.20 |
| 10/7/2008 13:36 | -0.36 | 0.09 | 0.00 | 0.21 |
| 10/7/2008 13:37 | -0.44 | 0.09 | 0.00 | 0.22 |
| 10/7/2008 13:38 | -0.45 | 0.09 | 0.00 | 0.22 |
| 10/7/2008 13:39 | -0.40 | 0.09 | 0.00 | 0.21 |
| 10/7/2008 13:40 | -0.42 | 0.09 | 0.00 | 0.21 |
| 10/7/2008 13:41 | 1.00 | 5.62 | 3.69 | 30.58 |
| 10/7/2008 13:42 | -0.27 | 22.53 | 5.70 | 68.35 |
| 10/7/2008 13:43 | -1.55 | 21.41 | 5.70 | 65.42 |
| 10/7/2008 13:44 | -1.38 | 21.24 | 5.55 | 68.99 |
| 10/7/2008 13:45 | | | 5.39 | 69.51 |
| 10/7/2008 13:46 | | | 5.28 | 70.45 |
| 10/7/2008 13:47 | | | 5.18 | 70.93 |
| 10/7/2008 13:48 | | | 5.29 | 69.20 |
| 10/7/2008 13:49 | | | 5.22 | 68.76 |
| 10/7/2008 13:50 | | | 5.23 | 68.03 |
| 10/7/2008 13:51 | | | 5.19 | 65.53 |
| 10/7/2008 13:52 | | | 5.14 | 65.97 |
| 10/7/2008 13:53 | | | 5.20 | 66.38 |
| 10/7/2008 13:54 | | | 5.18 | 66.32 |
| 10/7/2008 13:55 | | | 5.13 | 57.01 |
| 10/7/2008 13:56 | | | 5.14 | 53.61 |
| 10/7/2008 13:57 | | | 5.15 | 53.54 |
| 10/7/2008 13:58 | | | 5.20 | 53.50 |
| 10/7/2008 13:59 | | | 5.20 | 53.42 |
| 10/7/2008 14:00 | | | 5.19 | 52.36 |
| 10/7/2008 14:01 | | | 4.98 | 51.81 |
| 10/7/2008 14:02 | | | 5.12 | 51.69 |
| 10/7/2008 14:03 | | | 5.17 | 51.57 |
| 10/7/2008 14:04 | | | 5.17 | 51.96 |
| 10/7/2008 14:05 | | | 4.99 | 52.58 |
| 10/7/2008 14:06 | | | 5.12 | 52.91 |
| 10/7/2008 14:07 | | | 5.08 | 54.52 |
| 10/7/2008 14:08 | | | 5.03 | 66.82 |
| 10/7/2008 14:09 | | | 5.02 | 69.18 |
| 10/7/2008 14:10 | | | 4.88 | 69.04 |
| 10/7/2008 14:11 | | | 4.90 | 69.28 |
| 10/7/2008 14:12 | | | 5.19 | 68.68 |
| 10/7/2008 14:13 | | | 5.07 | 69.30 |
| 10/7/2008 14:14 | | | 5.23 | 68.87 |
| 10/7/2008 14:15 | | | 5.27 | 69.18 |
| 10/7/2008 14:16 | | | 5.48 | 68.79 |
| 10/7/2008 14:17 | | | 5.51 | 69.74 |
| 10/7/2008 14:18 | | | 5.51 | 69.37 |
| 10/7/2008 14:19 | | | 5.57 | 68.70 |
| 10/7/2008 14:20 | | | 5.51 | 68.80 |
| 10/7/2008 14:21 | | | 5.72 | 68.62 |
| 10/7/2008 14:22 | | | 5.64 | 68.45 |
| 10/7/2008 14:23 | | | 5.72 | 67.73 |
| 10/7/2008 14:24 | | | 5.73 | 67.59 |

Stratification Test.

Pt. 2

Pt 3

| | | | | |
|---|---|---|---|---|
| 10/7/2008 14:25 | | | [illegible] | [illegible] |
| 10/7/2008 14:26 | | | 5.68 | 68.31 |
| 10/7/2008 14:27 | | | 5.56 | 68.35 |
| 10/7/2008 14:28 | | | 5.47 | 68.81 |
| 10/7/2008 14:29 | | | 5.48 | 68.14 |
| 10/7/2008 14:30 | | | 5.62 | 68.29 |
| [illegible]/7/2008 14:31 | | | 5.71 | 67.48 |
| 7/2008 14:32 | | | 5.52 | 66.67 |
| 10/7/2008 14:33 | | | 5.75 | 65.98 |
| 10/7/2008 14:34 | | | 5.54 | 65.24 |
| 10/7/2008 14:35 | | | 5.68 | 64.92 |
| 10/7/2008 14:36 | | | 5.71 | 64.36 |
| 10/7/2008 14:37 | | | 5.53 | 64.52 |
| 10/7/2008 14:38 | | | 5.59 | 65.00 |
| 10/7/2008 14:39 | | | 5.60 | 64.84 |
| 10/7/2008 14:40 | | | 5.65 | 64.67 |
| 10/7/2008 14:41 | | | 5.52 | 65.16 |
| 10/7/2008 14:42 | | | 5.63 | 65.04 |
| 10/7/2008 14:43 | | | 5.61 | 65.35 |
| 10/7/2008 14:44 | 2.74 | | 5.60 | 65.23 |
| 10/7/2008 14:45 | 119.73 | 18.40 | 5.69 | 65.78 |
| 10/7/2008 14:46 | 74.93 | 19.11 | 5.60 | 65.92 |
| 10/7/2008 14:47 | 148.01 | 18.45 | 5.79 | 66.32 |
| 10/7/2008 14:48 | 112.40 | 19.07 | 5.65 | 66.48 |
| 10/7/2008 14:49 | 110.99 | 18.81 | 5.73 | 66.13 |
| 10/7/2008 14:50 | 95.89 | 18.96 | 5.69 | 66.10 |
| 10/7/2008 14:51 | 120.99 | 18.48 | 5.67 | 66.02 |
| 10/7/2008 14:52 | 80.42 | 18.87 | 5.62 | 65.48 |
| 10/7/2008 14:53 | 85.09 | 18.86 | 5.65 | 65.31 |
| 10/7/2008 14:54 | 71.52 | 18.66 | 5.60 | 65.20 |
| 10/7/2008 14:55 | 121.78 | 17.99 | 5.76 | 65.06 |
| 10/7/2008 14:56 | 99.91 | 18.41 | 5.65 | 64.96 |
| [illegible]/7/2008 14:57 | 85.56 | 18.73 | 5.57 | 64.61 |
| [illegible]0/7/2008 14:58 | 88.18 | 18.59 | 5.69 | 57.36 |
| 10/7/2008 14:59 | 123.00 | 18.04 | 5.73 | 51.92 |
| 10/7/2008 15:00 | 102.07 | 18.31 | 5.66 | 51.68 |
| 10/7/2008 15:01 | 77.66 | 18.49 | 5.59 | 51.89 |
| 10/7/2008 15:02 | 92.62 | 18.03 | 5.67 | 51.97 |
| 10/7/2008 15:03 | 113.70 | 17.83 | 5.72 | 52.44 |
| 10/7/2008 15:04 | 120.67 | 17.93 | 5.61 | 52.59 |
| 10/7/2008 15:05 | 52.03 | 18.64 | 5.51 | 52.32 |
| 10/7/2008 15:06 | 93.60 | 17.79 | 5.63 | 52.46 |
| 10/7/2008 15:07 | 60.91 | 18.24 | 5.57 | 53.35 |
| 10/7/2008 15:08 | 119.66 | 17.65 | 5.65 | 53.71 |
| 10/7/2008 15:09 | 57.67 | 18.29 | 5.42 | 54.55 |
| 10/7/2008 15:10 | 82.78 | 17.55 | 5.57 | 55.54 |
| 10/7/2008 15:11 | 135.14 | 17.11 | 5.67 | 67.03 |
| 10/7/2008 15:12 | 84.22 | 17.94 | 5.48 | 70.61 |
| 10/7/2008 15:13 | 114.40 | 17.64 | 5.71 | 68.84 |
| 10/7/2008 15:14 | 90.17 | 17.97 | 5.42 | 69.71 |
| 10/7/2008 15:15 | 60.35 | 18.28 | 5.49 | 69.82 |
| 10/7/2008 15:16 | 92.84 | 17.56 | 5.55 | 70.13 |
| 10/7/2008 15:17 | 62.19 | 18.19 | 5.48 | 69.80 |
| 10/7/2008 15:18 | 123.63 | 17.54 | 5.74 | 69.50 |
| 10/7/2008 15:19 | 97.33 | 17.93 | 5.49 | 69.82 |
| 10/7/2008 15:20 | 89.29 | 18.23 | 5.58 | 69.77 |
| 10/7/2008 15:21 | 65.57 | 18.42 | 5.61 | 69.91 |
| 10/7/2008 15:22 | 87.19 | 18.20 | 5.58 | 70.48 |
| [illegible]0/7/2008 15:23 | 97.08 | 18.19 | 5.64 | 70.82 |
| 10/7/2008 15:24 | 67.18 | 18.53 | 5.48 | 71.53 |
| 10/7/2008 15:25 | 68.55 | 18.49 | 5.54 | 72.36 |
| 10/7/2008 15:26 | 129.83 | 17.59 | 5.79 | 71.61 |
| 10/7/2008 15:27 | 87.77 | 18.36 | 5.64 | 71.18 |
| 10/7/2008 15:28 | 80.13 | 18.52 | 5.69 | 71.66 |
| 10/7/2008 15:29 | 70.95 | 18.52 | 5.58 | 71.86 |
| [illegible] | [illegible] | [illegible] | [illegible] | 72.06 |

Run 1

| | | | | |
|---|---|---|---|---|
| 10/7/2008 15:31 | 97.08 | 18.07 | 5.71 | 71.85 |
| 10/7/2008 15:32 | 77.32 | 18.31 | 5.74 | 71.68 |
| 10/7/2008 15:33 | 85.83 | 18.36 | 5.73 | 71.31 |
| 10/7/2008 15:34 | 58.85 | 18.75 | 5.69 | 71.20 |
| 10/7/2008 15:35 | 62.26 | 18.49 | 5.67 | 71.60 |
| 10/7/2008 15:36 | 100.65 | 18.24 | 5.81 | 71.92 |
| `/7/2008 15:37 | 83.16 | 18.33 | 5.60 | 72.48 |
| ,7/2008 15:38 | 93.34 | 18.32 | 5.81 | 71.72 |
| 10/7/2008 15:39 | 83.40 | 18.47 | 5.62 | 72.08 |
| 10/7/2008 15:40 | 60.23 | 18.66 | 5.66 | 72.29 |
| 10/7/2008 15:41 | 109.21 | 18.06 | 5.76 | 72.38 |
| 10/7/2008 15:42 | 58.87 | 18.32 | 4.40 | 61.02 |
| 10/7/2008 15:43 | 4.21 | 4.64 | -0.11 | 4.90 |
| 10/7/2008 15:44 | -1.06 | 0.57 | -0.01 | 2.62 |
| 10/7/2008 15:45 | -1.06 | 0.37 | -0.01 | 2.14 |
| 10/7/2008 15:46 | -1.03 | 0.29 | -0.02 | 1.94 |
| 10/7/2008 15:47 | -0.99 | 0.25 | 4.31 | 1.81 |
| 10/7/2008 15:48 | -1.02 | 0.19 | 11.85 | 1.56 |
| 10/7/2008 15:49 | -1.00 | 0.19 | 11.92 | 1.48 |
| 10/7/2008 15:50 | -0.96 | 0.19 | 11.94 | 1.46 |
| 10/7/2008 15:51 | -1.06 | 0.19 | 10.37 | 1.43 |
| 10/7/2008 15:52 | -1.09 | 0.19 | 0.07 | 1.51 |
| 10/7/2008 15:53 | -1.06 | 0.19 | 0.01 | 1.53 |
| 10/7/2008 15:54 | -1.13 | 0.19 | 0.00 | 1.50 |
| 10/7/2008 15:55 | -1.13 | 0.19 | -0.01 | 1.48 |
| 10/7/2008 15:56 | -1.12 | 0.19 | -0.01 | 1.46 |
| 10/7/2008 15:57 | -1.13 | 0.19 | -0.01 | 1.43 |
| 10/7/2008 15:58 | -1.06 | 0.24 | -0.01 | 1.44 |
| 10/7/2008 15:59 | -1.09 | 0.32 | -0.01 | 3.10 |
| 10/7/2008 16:00 | -0.87 | 0.39 | -0.01 | 45.50 |
| 10/7/2008 16:01 | -0.76 | 0.26 | -0.01 | 50.70 |
| 10/7/2008 16:02 | -0.59 | 0.19 | -0.02 | 51.66 |
| )/7/2008 16:03 | -0.85 | 0.19 | -0.02 | 51.90 |
| ,0/7/2008 16:04 | -0.80 | 0.19 | -0.02 | 52.04 |
| 10/7/2008 16:05 | -0.76 | 0.19 | -0.02 | 52.12 |
| 10/7/2008 16:06 | -0.76 | 0.19 | -0.02 | 52.15 |
| 10/7/2008 16:07 | -0.76 | 0.19 | -0.02 | 52.22 |
| 10/7/2008 16:08 | -0.76 | 0.19 | -0.02 | 52.29 |
| 10/7/2008 16:09 | -0.76 | 0.19 | -0.03 | 52.31 |
| 10/7/2008 16:10 | -0.79 | 0.19 | -0.02 | 32.67 |
| 10/7/2008 16:11 | -1.13 | 0.09 | -0.02 | 2.86 |
| 10/7/2008 16:12 | -1.13 | 0.09 | 0.01 | 1.98 |
| 10/7/2008 16:13 | -0.06 | 0.11 | 1.07 | 12.99 |
| 10/7/2008 16:14 | 64.81 | 13.24 | 6.27 | 67.20 |
| 10/7/2008 16:15 | 73.64 | 19.54 | 6.13 | 75.58 |
| 10/7/2008 16:16 | 64.41 | 20.17 | 6.21 | 74.74 |
| 10/7/2008 16:17 | 46.87 | 20.17 | 6.11 | 73.61 |
| 10/7/2008 16:18 | 44.94 | 19.68 | 6.22 | 72.80 |
| 10/7/2008 16:19 | 68.34 | 18.84 | 6.30 | 71.16 |
| 10/7/2008 16:20 | 65.37 | 19.01 | 6.25 | 71.98 |
| 10/7/2008 16:21 | 62.94 | 19.14 | 6.24 | 71.77 |
| 10/7/2008 16:22 | 46.84 | 19.55 | 6.28 | 72.08 |
| 10/7/2008 16:23 | 123.91 | 18.24 | 6.32 | 72.66 |
| 10/7/2008 16:24 | 46.71 | 19.55 | 6.02 | 73.46 |
| 10/7/2008 16:25 | 75.11 | 19.54 | 6.23 | 72.70 |
| 10/7/2008 16:26 | 53.14 | 19.48 | 6.02 | 73.47 |
| 10/7/2008 16:27 | 85.17 | 19.18 | 6.25 | 72.28 |
| 10/7/2008 16:28 | 83.58 | 19.26 | 6.14 | 72.06 |
| ,0/7/2008 16:29 | 71.10 | 19.44 | 6.25 | 71.92 |
| 10/7/2008 16:30 | 83.37 | 19.35 | 6.13 | 72.28 |
| 10/7/2008 16:31 | 57.74 | 19.63 | 6.17 | 71.67 |
| 10/7/2008 16:32 | 78.68 | 19.08 | 6.33 | 71.17 |
| 10/7/2008 16:33 | 106.51 | 18.87 | 6.21 | 70.95 |
| 10/7/2008 16:34 | 49.56 | 19.72 | 6.28 | 71.53 |
| 10/7/2008 16:35 | 70.14 | 19.21 | 6.16 | 72.18 |
| 10/7/2008 16:36 | 48.06 | 19.88 | 6.19 | 72.37 |

Run 2

| | | | | |
|---|---|---|---|---|
| 10/7/2008 16:38 | 53.93 | 19.58 | 6.23 | 72.07 |
| 10/7/2008 16:39 | 60.03 | 19.29 | 6.19 | 72.59 |
| 10/7/2008 16:40 | 57.32 | 19.58 | 6.21 | 73.03 |
| 10/7/2008 16:41 | 57.01 | 19.58 | 6.10 | 73.03 |
| 10/7/2008 16:42 | 30.46 | 19.98 | 6.17 | 72.89 |
| 10/7/2008 16:43 | 53.30 | 19.41 | 6.22 | 73.59 |
| 10/7/2008 16:44 | 51.04 | 19.74 | 6.09 | 73.44 |
| 10/7/2008 16:45 | 31.11 | 20.08 | 6.10 | 72.81 |
| 10/7/2008 16:46 | 63.60 | 19.24 | 6.28 | 72.69 |
| 10/7/2008 16:47 | 61.31 | 19.21 | 6.23 | 72.55 |
| 10/7/2008 16:48 | 55.27 | 19.33 | 6.14 | 73.00 |
| 10/7/2008 16:49 | 51.98 | 19.41 | 6.25 | 72.78 |
| 10/7/2008 16:50 | 53.64 | 19.21 | 6.20 | 73.15 |
| 10/7/2008 16:51 | 39.47 | 19.61 | 6.14 | 73.05 |
| 10/7/2008 16:52 | 65.54 | 19.04 | 6.22 | 72.99 |
| 10/7/2008 16:53 | 47.43 | 19.20 | 6.18 | 72.69 |
| 10/7/2008 16:54 | 99.91 | 18.62 | 6.39 | 72.96 |
| 10/7/2008 16:55 | 80.35 | 18.85 | 6.28 | 72.76 |
| 10/7/2008 16:56 | 70.99 | 19.01 | 6.30 | 73.65 |
| 10/7/2008 16:57 | 84.92 | 18.71 | 6.12 | 73.97 |
| 10/7/2008 16:58 | 57.70 | 19.37 | 6.21 | 74.19 |
| 10/7/2008 16:59 | 84.41 | 18.71 | 6.27 | 74.04 |
| 10/7/2008 17:00 | 69.71 | 18.75 | 6.19 | 73.98 |
| 10/7/2008 17:01 | 102.04 | 18.41 | 6.18 | 74.02 |
| 10/7/2008 17:02 | 77.89 | 18.48 | 6.16 | 74.35 |
| 10/7/2008 17:03 | 91.62 | 18.36 | 6.27 | 73.74 |
| 10/7/2008 17:04 | 104.29 | 18.01 | 6.27 | 73.96 |
| 10/7/2008 17:05 | 127.57 | 18.28 | 6.50 | 73.55 |
| 10/7/2008 17:06 | 178.22 | 18.17 | 6.54 | 73.35 |
| 10/7/2008 17:07 | 168.45 | 18.24 | 6.42 | 73.61 |
| 10/7/2008 17:08 | 141.20 | 18.26 | 6.41 | 73.78 |
| 10/7/2008 17:09 | 121.11 | 18.34 | 6.30 | 74.12 |
| 10/7/2008 17:10 | 80.61 | 18.67 | 6.29 | 73.96 |
| 10/7/2008 17:11 | 122.91 | 17.94 | 6.43 | 73.74 |
| 10/7/2008 17:12 | 120.36 | 17.64 | 6.36 | 73.51 |
| 10/7/2008 17:13 | 74.76 | 18.06 | 6.27 | 73.66 |
| 10/7/2008 17:14 | 80.50 | 18.13 | 6.34 | 73.86 |
| 10/7/2008 17:15 | 88.10 | 17.80 | 6.38 | 73.99 |
| 10/7/2008 17:16 | 82.70 | 17.78 | 6.31 | 73.57 |
| 10/7/2008 17:17 | 84.97 | 17.60 | 6.41 | 73.76 |
| 10/7/2008 17:18 | 154.52 | 17.01 | 6.59 | 75.44 |
| 10/7/2008 17:19 | 56.94 | 11.10 | 1.98 | 28.38 |
| 10/7/2008 17:20 | -0.56 | 1.03 | 0.04 | 3.34 |
| 10/7/2008 17:21 | -0.23 | 0.60 | 0.02 | 2.36 |
| 10/7/2008 17:22 | -0.12 | 0.44 | 0.02 | 2.00 |
| 10/7/2008 17:23 | -0.05 | 0.32 | 9.53 | 1.69 |
| 10/7/2008 17:24 | -0.15 | 0.24 | 12.02 | 1.50 |
| 10/7/2008 17:25 | -0.08 | 0.19 | 12.03 | 1.43 |
| 10/7/2008 17:26 | 0.07 | 0.19 | 7.14 | 18.62 |
| 10/7/2008 17:27 | 0.12 | 0.19 | 0.05 | 50.37 |
| 10/7/2008 17:28 | 0.21 | 0.19 | 0.05 | 51.71 |
| 10/7/2008 17:29 | 0.30 | 0.19 | 0.03 | 52.07 |
| 10/7/2008 17:30 | 0.17 | 0.19 | 0.02 | 52.21 |
| 10/7/2008 17:31 | 0.12 | 0.19 | 0.02 | 52.32 |
| 10/7/2008 17:32 | 0.16 | 0.19 | 0.02 | 52.32 |
| 10/7/2008 17:33 | 0.06 | 0.19 | 0.02 | 16.03 |
| 10/7/2008 17:34 | -0.05 | 0.19 | 0.01 | 2.61 |
| 10/7/2008 17:35 | -0.06 | 0.19 | 0.01 | 1.94 |
| 10/7/2008 17:36 | 16.05 | 2.14 | 2.65 | 26.18 |
| 10/7/2008 17:37 | 95.54 | 16.73 | 6.45 | 69.50 |
| 10/7/2008 17:38 | 88.59 | 17.86 | 6.45 | 73.96 |
| 10/7/2008 17:39 | 72.44 | 18.23 | 6.37 | 73.57 |
| 10/7/2008 17:40 | 103.82 | 18.11 | 6.55 | 72.38 |
| 10/7/2008 17:41 | 85.44 | 18.20 | 6.36 | 71.62 |

Run 3

| | | | | |
|---|---|---|---|---|
| 10/7/2008 17:43 | 62.34 | 18.79 | 6.34 | 70.10 |
| 10/7/2008 17:44 | 84.28 | 18.65 | 6.38 | 71.16 |
| 10/7/2008 17:45 | 52.58 | 19.09 | 6.35 | 71.18 |
| 10/7/2008 17:46 | 119.11 | 18.36 | 6.45 | 71.70 |
| 10/7/2008 17:47 | 85.75 | 18.62 | 6.48 | 71.02 |
| 10/7/2008 17:48 | 74.28 | 18.89 | 6.43 | 70.85 |
| 10/7/2008 17:49 | 65.98 | 18.89 | 6.33 | 70.79 |
| 10/7/2008 17:50 | 73.84 | 18.66 | 6.40 | 71.34 |
| 10/7/2008 17:51 | 121.21 | 18.43 | 6.39 | 71.83 |
| 10/7/2008 17:52 | 81.87 | 18.48 | 6.26 | 71.61 |
| 10/7/2008 17:53 | 73.84 | 18.33 | 6.35 | 71.04 |
| 10/7/2008 17:54 | 81.71 | 18.18 | 6.29 | 71.48 |
| 10/7/2008 17:55 | 103.77 | 17.97 | 6.32 | 71.29 |
| 10/7/2008 17:56 | 88.25 | 18.09 | 6.30 | 71.24 |
| 10/7/2008 17:57 | 70.62 | 18.49 | 6.27 | 71.08 |
| 10/7/2008 17:58 | 101.46 | 18.02 | 6.30 | 71.43 |
| 10/7/2008 17:59 | 79.46 | 18.14 | 6.23 | 71.52 |
| 10/7/2008 18:00 | 87.32 | 18.04 | 6.20 | 71.48 |
| 10/7/2008 18:01 | 77.80 | 18.11 | 6.22 | 71.30 |
| 10/7/2008 18:02 | 83.89 | 17.98 | 6.13 | 72.09 |
| 10/7/2008 18:03 | 112.01 | 17.44 | 6.20 | 71.62 |
| 10/7/2008 18:04 | 109.52 | 17.34 | 6.15 | 69.24 |
| 10/7/2008 18:05 | 64.95 | 17.84 | 5.95 | 69.14 |
| 10/7/2008 18:06 | 109.59 | 17.30 | 6.24 | 68.91 |
| 10/7/2008 18:07 | 120.82 | 17.27 | 6.10 | 68.77 |
| 10/7/2008 18:08 | 65.95 | 18.07 | 6.12 | 68.81 |
| 10/7/2008 18:09 | 133.72 | 17.12 | 6.14 | 69.02 |
| 10/7/2008 18:10 | 73.50 | 18.02 | 6.07 | 67.70 |
| 10/7/2008 18:11 | 89.20 | 17.79 | 6.13 | 65.52 |
| 10/7/2008 18:12 | 76.94 | 17.80 | 6.03 | 65.35 |
| 10/7/2008 18:13 | 93.01 | 17.63 | 6.10 | 65.45 |
| 10/7/2008 18:14 | 84.69 | 17.66 | 5.95 | 65.10 |
| 10/7/2008 18:15 | 110.77 | 17.44 | 6.21 | 63.86 |
| 10/7/2008 18:16 | 95.45 | 17.72 | 6.07 | 63.95 |
| 10/7/2008 18:17 | 67.32 | 17.82 | 5.99 | 63.16 |
| 10/7/2008 18:18 | 124.19 | 17.25 | 6.19 | 63.22 |
| 10/7/2008 18:19 | 118.79 | 17.32 | 6.01 | 62.67 |
| 10/7/2008 18:20 | 79.87 | 17.75 | 6.13 | 62.30 |
| 10/7/2008 18:21 | 135.94 | 17.24 | 6.20 | 62.36 |
| 10/7/2008 18:22 | 100.55 | 17.68 | 6.08 | 62.96 |
| 10/7/2008 18:23 | 77.00 | 17.84 | 6.08 | 63.12 |
| 10/7/2008 18:24 | 113.37 | 17.44 | 6.19 | 62.37 |
| 10/7/2008 18:25 | 79.39 | 17.76 | 6.06 | 62.18 |
| 10/7/2008 18:26 | 90.64 | 17.41 | 6.14 | 61.66 |
| 10/7/2008 18:27 | 137.05 | 16.89 | 6.23 | 61.74 |
| 10/7/2008 18:28 | 101.90 | 17.25 | 6.13 | 61.58 |
| 10/7/2008 18:29 | 71.74 | 17.62 | 6.02 | 61.64 |
| 10/7/2008 18:30 | 100.63 | 17.15 | 6.17 | 61.53 |
| 10/7/2008 18:31 | 108.66 | 16.85 | 6.07 | 61.44 |
| 10/7/2008 18:32 | 105.20 | 17.09 | 6.15 | 61.56 |
| 10/7/2008 18:33 | 127.28 | 16.91 | 6.11 | 61.99 |
| 10/7/2008 18:34 | 76.88 | 17.43 | 5.97 | 61.92 |
| 10/7/2008 18:35 | 82.98 | 17.20 | 6.14 | 61.97 |
| 10/7/2008 18:36 | 106.29 | 16.93 | 6.08 | 61.55 |
| 10/7/2008 18:37 | 71.74 | 17.44 | 6.11 | 60.89 |
| 10/7/2008 18:38 | 108.69 | 16.87 | 6.30 | 60.75 |
| 10/7/2008 18:39 | 102.82 | 16.93 | 6.16 | 61.40 |
| 10/7/2008 18:40 | 64.24 | 17.36 | 5.66 | 58.63 |
| 10/7/2008 18:41 | 16.65 | 6.27 | 0.11 | 5.94 |
| 10/7/2008 18:42 | 0.52 | 0.91 | 0.04 | 2.34 |
| 10/7/2008 18:43 | 0.51 | 0.62 | 0.03 | 1.86 |
| 10/7/2008 18:44 | 0.59 | 0.45 | 0.03 | 1.69 |
| 10/7/2008 18:45 | 0.52 | 0.35 | 9.96 | 1.50 |
| 10/7/2008 18:46 | 0.56 | 0.29 | 12.06 | 1.38 |
| 10/7/2008 18:47 | 0.64 | 0.21 | 12.05 | 1.37 |
| 10/7/2008 18:48 | 0.62 | 0.19 | 7.87 | 14.44 |

| | | | | |
|---|---|---|---|---|
| 10/7/2008 18:49 | 0.83 | 0.29 | 0.04 | 51.19 |
| 10/7/2008 18:50 | 0.82 | 0.29 | 0.04 | 51.92 |
| 10/7/2008 18:51 | 0.92 | 0.28 | 0.04 | 52.26 |
| 10/7/2008 18:52 | 0.81 | 0.19 | 0.03 | 52.48 |
| 10/7/2008 18:53 | 0.83 | 0.19 | 0.03 | 52.64 |
| 10/7/2008 18:54 | 0.81 | 0.19 | 0.02 | 26.92 |
| 10/7/2008 18:55 | 0.79 | 0.19 | 0.02 | 3.26 |
| 10/7/2008 18:56 | 0.50 | 0.19 | 0.02 | 2.21 |
| 10/7/2008 18:57 | 0.57 | 0.19 | 0.02 | 1.83 |
| 10/7/2008 18:58 | 0.57 | 0.19 | 0.01 | 1.66 |
| 10/7/2008 18:59 | 0.55 | 0.19 | 0.02 | 13.31 |
| 10/7/2008 19:00 | 7.51 | 0.20 | 2.14 | 60.53 |
| 10/7/2008 19:01 | 95.22 | 13.67 | 6.32 | 68.09 |
| 10/7/2008 19:02 | 98.36 | 16.55 | 6.28 | 68.38 |
| 10/7/2008 19:03 | 103.85 | 16.67 | 6.34 | 67.92 |
| 10/7/2008 19:04 | 68.29 | 17.11 | 6.25 | 66.57 |
| 10/7/2008 19:05 | 124.09 | 16.47 | 6.40 | 66.76 |
| 10/7/2008 19:06 | 79.30 | 16.96 | 6.31 | 66.71 |
| 10/7/2008 19:07 | 149.50 | 16.40 | 6.41 | 67.29 |
| 10/7/2008 19:08 | 84.55 | 17.20 | 6.33 | 67.62 |
| 10/7/2008 19:09 | 87.92 | 16.75 | 6.33 | 67.46 |
| 10/7/2008 19:10 | 110.18 | 16.66 | 6.39 | 67.68 |
| 10/7/2008 19:11 | 83.98 | 17.05 | 6.36 | 66.98 |
| 10/7/2008 19:12 | 123.47 | 16.46 | 6.44 | 66.99 |
| 10/7/2008 19:13 | 121.63 | 16.72 | 6.39 | 66.33 |
| 10/7/2008 19:14 | 84.38 | 17.32 | 6.30 | 65.74 |
| 10/7/2008 19:15 | 78.46 | 17.18 | 6.36 | 65.00 |
| 10/7/2008 19:16 | 121.85 | 16.53 | 6.46 | 65.27 |
| 10/7/2008 19:17 | 98.69 | 16.90 | 6.25 | 64.68 |
| 10/7/2008 19:18 | 84.25 | 17.24 | 6.38 | 64.56 |
| 10/7/2008 19:19 | 134.63 | 16.62 | 6.39 | 64.60 |
| 10/7/2008 19:20 | 82.84 | 17.28 | 6.28 | 63.74 |
| 10/7/2008 19:21 | 88.21 | 17.29 | 6.42 | 63.65 |
| 10/7/2008 19:22 | 120.64 | 16.60 | 6.30 | 63.22 |
| 10/7/2008 19:23 | 72.49 | 17.28 | 6.33 | 63.65 |
| 10/7/2008 19:24 | 131.42 | 16.61 | 6.42 | 63.87 |
| 10/7/2008 19:25 | 76.18 | 17.23 | 6.23 | 63.89 |
| 10/7/2008 19:26 | 90.97 | 17.25 | 6.42 | 63.58 |
| 10/7/2008 19:27 | 105.93 | 16.88 | 6.33 | 62.92 |
| 10/7/2008 19:28 | 117.18 | 16.94 | 6.53 | 63.05 |
| 10/7/2008 19:29 | 79.37 | 17.30 | 6.28 | 62.88 |
| 10/7/2008 19:30 | 116.37 | 16.82 | 6.48 | 63.10 |
| 10/7/2008 19:31 | 85.09 | 17.03 | 6.30 | 62.86 |
| 10/7/2008 19:32 | 125.64 | 16.91 | 6.48 | 62.73 |
| 10/7/2008 19:33 | 87.36 | 17.05 | 6.36 | 62.41 |
| 10/7/2008 19:34 | 104.91 | 16.93 | 6.41 | 63.01 |
| 10/7/2008 19:35 | 110.20 | 16.96 | 6.34 | 62.88 |
| 10/7/2008 19:36 | 72.35 | 17.48 | 6.37 | 62.55 |
| 10/7/2008 19:37 | 131.87 | 16.70 | 6.41 | 62.60 |
| 10/7/2008 19:38 | 90.63 | 17.23 | 6.40 | 63.12 |
| 10/7/2008 19:39 | 103.38 | 17.03 | 6.34 | 62.82 |
| 10/7/2008 19:40 | 87.59 | 17.51 | 6.40 | 62.69 |
| 10/7/2008 19:41 | 122.99 | 16.76 | 6.48 | 63.09 |
| 10/7/2008 19:42 | 97.28 | 16.96 | 6.32 | 62.87 |
| 10/7/2008 19:43 | 84.81 | 17.06 | 6.41 | 63.47 |
| 10/7/2008 19:44 | 144.75 | 16.61 | 6.48 | 63.52 |
| 10/7/2008 19:45 | 76.07 | 17.33 | 6.28 | 63.47 |
| 10/7/2008 19:46 | 122.22 | 16.96 | 6.48 | 63.36 |
| 10/7/2008 19:47 | 113.15 | 16.94 | 6.29 | 63.32 |
| 10/7/2008 19:48 | 80.04 | 17.39 | 6.35 | 63.43 |
| 10/7/2008 19:49 | 86.54 | 16.94 | 6.32 | 64.01 |
| 10/7/2008 19:50 | 112.04 | 16.69 | 6.40 | 64.65 |
| 10/7/2008 19:51 | 85.64 | 17.06 | 6.24 | 64.70 |
| 10/7/2008 19:52 | 103.35 | 16.94 | 6.43 | 65.32 |
| 10/7/2008 19:53 | 104.23 | 16.94 | 6.28 | 65.90 |

Run 4

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 10/7/2008 19:55 | 125.92 | 16.79 | 6.32 | | | 66.24 | |
| 10/7/2008 19:56 | 83.66 | 17.23 | 6.31 | | | 65.97 | |
| 10/7/2008 19:57 | 91.82 | 17.11 | 6.33 | | | 65.82 | |
| 10/7/2008 19:58 | 102.94 | 16.93 | 6.34 | | | 65.04 | |
| 10/7/2008 19:59 | 85.06 | 17.11 | 6.33 | | | 65.51 | |
| 10/7/2008 20:00 | 108.35 | 16.86 | 6.41 | | | 66.26 | |
| 10/7/2008 20:01 | 124.93 | 16.62 | 6.29 | | | 66.60 | |
| 10/7/2008 20:02 | 68.77 | 17.35 | 6.28 | | | 66.47 | |
| 10/7/2008 20:03 | 131.07 | 16.57 | 6.36 | | | 67.57 | |
| 10/7/2008 20:04 | 59.07 | 13.02 | 2.23 | | | 29.10 | |
| 10/7/2008 20:05 | 0.91 | 1.37 | 0.04 | | | 3.10 | |
| 10/7/2008 20:06 | 0.70 | 0.83 | 0.04 | | | 2.24 | |
| 10/7/2008 20:07 | 0.71 | 0.62 | 0.03 | | | 1.96 | |
| 10/7/2008 20:08 | 0.67 | 0.46 | 7.70 | | | 1.78 | |
| 10/7/2008 20:09 | 0.70 | 0.36 | 12.04 | | | 1.59 | |
| 10/7/2008 20:10 | 0.71 | 0.29 | 12.04 | | | 1.56 | |
| 10/7/2008 20:11 | 0.67 | 0.29 | 12.06 | | | 1.51 | |
| 10/7/2008 20:12 | 0.74 | 0.19 | 7.13 | | | 18.32 | |
| 10/7/2008 20:13 | 1.01 | 0.29 | 0.05 | | | 50.28 | |
| 10/7/2008 20:14 | 0.97 | 0.29 | 0.03 | | | 51.88 | |
| 10/7/2008 20:15 | 0.91 | 0.29 | 0.02 | | | 52.55 | |
| 10/7/2008 20:16 | 0.94 | 0.29 | 0.02 | | | 52.80 | |
| 10/7/2008 20:17 | 0.94 | 0.29 | 0.02 | | | 52.95 | |
| 10/7/2008 20:18 | 0.94 | 0.25 | 13.11 | | | 27.92 | |
| 10/7/2008 20:19 | 0.77 | 0.19 | 20.82 | | | 4.44 | |
| 10/7/2008 20:20 | 0.70 | 0.19 | 20.85 | | | 3.12 | |
| 10/7/2008 20:21 | 0.74 | 0.19 | 20.88 | | | 2.47 | |
| 10/7/2008 20:22 | 0.77 | 0.19 | 20.89 | | | 2.20 | |
| 10/7/2008 20:23 | 0.81 | 0.19 | 20.89 | | | 2.12 | |

Citgo Refining and Chemicals, Inc.
West Plant SRU
Corpus Christi, Texas
SWL Project No. 08091128
File Name: 10-08-08 06-43

| Date and Time | CO | NOx | O2 | THC | CO2 | SO2 | Flow |
|---|---|---|---|---|---|---|---|
| MM/DD/YY HH:MM | ppm | ppm | % | ppm | % | ppm | lpm |
| 10/8/2008 06:44 | -2.61 | 0.09 | 20.51 | | | 0.79 | |
| 10/8/2008 06:45 | -2.87 | 0.10 | 21.39 | | | 0.82 | |
| 10/8/2008 06:46 | -2.56 | 0.10 | 11.75 | | | 23.34 | |
| 10/8/2008 06:47 | -2.09 | 0.10 | 0.28 | | | 35.02 | |
| 10/8/2008 06:48 | 0.16 | 0.10 | 0.55 | | | 33.18 | |
| 10/8/2008 06:49 | 0.06 | 0.10 | 0.23 | | | 19.89 | |
| 10/8/2008 06:50 | -0.04 | 0.10 | 0.10 | | | 22.11 | |
| 10/8/2008 06:51 | -0.11 | 0.10 | 0.09 | | | 1.81 | |
| 10/8/2008 06:52 | -0.14 | 0.10 | 0.10 | | | 0.75 | |
| 10/8/2008 06:53 | -0.08 | 5.92 | 0.12 | | | 0.60 | |
| 10/8/2008 06:54 | 0.08 | 49.32 | 0.12 | | | 0.51 | |
| 10/8/2008 06:55 | 0.08 | 51.11 | 0.13 | | | 0.44 | |
| 10/8/2008 06:56 | 0.05 | 51.54 | 0.14 | | | 0.38 | |
| 10/8/2008 06:57 | 1.17 | 51.57 | 0.15 | | | 0.39 | |
| 10/8/2008 06:58 | 38.69 | 11.84 | 0.16 | | | 0.38 | |
| 10/8/2008 06:59 | 46.11 | 0.27 | 0.17 | | | 0.35 | |
| 10/8/2008 07:00 | 46.05 | 0.18 | 0.17 | | | 0.33 | |
| 10/8/2008 07:01 | 42.97 | 0.10 | 0.17 | | | 14.57 | |
| 10/8/2008 07:02 | 3.91 | 0.10 | 0.18 | | | 50.34 | |
| 10/8/2008 07:03 | 0.18 | 0.10 | 0.18 | | | 51.48 | |
| 10/8/2008 07:04 | 0.22 | 0.09 | 0.19 | | | 51.86 | |
| 10/8/2008 07:05 | 0.15 | 0.09 | 0.19 | | | 52.02 | |
| 10/8/2008 07:06 | 0.29 | 0.09 | 5.14 | | | 51.47 | |
| 10/8/2008 07:07 | 0.44 | 0.09 | 3.97 | | | 51.96 | |
| 10/8/2008 07:08 | 0.40 | 0.09 | 0.21 | | | 52.34 | |
| 10/8/2008 07:09 | 0.43 | 0.09 | 0.08 | | | 52.37 | |
| 10/8/2008 07:10 | 0.56 | 0.18 | 0.09 | | | 19.62 | |
| 10/8/2008 07:11 | 0.23 | 0.09 | 0.07 | | | 1.31 | |
| 10/8/2008 07:12 | 0.14 | 0.09 | 2.95 | | | 0.84 | |

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|---|---|---|---|---|
| 10/8/2008 07:13 | 0.23 | 0.09 | 12.18 | 0.61 |
| 10/8/2008 07:14 | 0.24 | 0.09 | 8.84 | 0.61 |
| 10/8/2008 07:15 | 0.28 | 0.09 | 0.10 | 0.68 |
| 10/8/2008 07:16 | 0.36 | 0.09 | 0.07 | 0.72 |
| 10/8/2008 07:17 | 0.11 | 0.09 | 4.71 | 32.13 |
| 10/8/2008 07:18 | 0.01 | 5.38 | 6.98 | 57.09 |
| 10/8/2008 07:19 | -0.08 | 23.73 | 6.83 | 61.44 |
| 10/8/2008 07:20 | -0.47 | 24.05 | 6.86 | 60.09 |
| 10/8/2008 07:21 | -0.49 | 24.29 | 6.95 | 59.42 |
| 10/8/2008 07:22 | 0.22 | 23.69 | 6.87 | 59.48 |
| 10/8/2008 07:23 | -0.04 | 23.92 | 6.87 | 57.69 |
| 10/8/2008 07:24 | -0.04 | 24.08 | 6.83 | 57.86 |
| 10/8/2008 07:25 | -0.07 | 24.09 | 6.84 | 57.71 |
| 10/8/2008 07:26 | 0.22 | 23.94 | 6.79 | 57.60 |
| 10/8/2008 07:27 | 0.14 | 24.20 | 6.82 | 58.17 |
| 10/8/2008 07:28 | 0.44 | 24.04 | 6.83 | 58.51 |
| 10/8/2008 07:29 | 0.62 | 23.80 | 6.80 | 58.70 |
| 10/8/2008 07:30 | 0.60 | 23.85 | 6.75 | 58.95 |
| 10/8/2008 07:31 | 0.65 | 24.04 | 6.67 | 59.02 |
| 10/8/2008 07:32 | 0.39 | 24.49 | 6.64 | 58.51 |
| 10/8/2008 07:33 | 0.11 | 24.72 | 6.68 | 58.38 |
| 10/8/2008 07:34 | 0.34 | 24.60 | 6.65 | 58.05 |
| 10/8/2008 07:35 | 0.21 | 24.41 | 6.75 | 57.87 |
| 10/8/2008 07:36 | 0.50 | 23.90 | 6.82 | 57.57 |
| 10/8/2008 07:37 | 0.91 | 23.60 | 6.98 | 57.20 |
| 10/8/2008 07:38 | 1.82 | 22.77 | 6.96 | 57.37 |
| 10/8/2008 07:39 | 2.60 | 22.44 | 7.04 | 57.42 |
| 10/8/2008 07:40 | 2.65 | 22.64 | 7.17 | 57.88 |
| 10/8/2008 07:41 | 5.65 | 21.74 | 7.09 | 57.69 |
| 10/8/2008 07:42 | 6.22 | 21.63 | 7.12 | 57.79 |
| 10/8/2008 07:43 | 6.17 | 21.70 | 7.19 | 57.71 |
| 10/8/2008 07:44 | 10.77 | 21.30 | 7.11 | 57.77 |
| 10/8/2008 07:45 | 10.90 | 21.06 | 7.08 | 58.00 |
| 10/8/2008 07:46 | 9.08 | 21.23 | 7.04 | 58.49 |
| 10/8/2008 07:47 | 12.05 | 20.83 | 7.06 | 58.85 |
| 10/8/2008 07:48 | 12.39 | 20.99 | 7.06 | 59.28 |
| 10/8/2008 07:49 | 14.25 | 20.97 | 6.90 | 59.12 |
| 10/8/2008 07:50 | 12.52 | 21.31 | 6.92 | 59.49 |
| 10/8/2008 07:51 | 10.60 | 21.81 | 6.92 | 59.18 |
| 10/8/2008 07:52 | 9.39 | 22.09 | 6.93 | 59.09 |
| 10/8/2008 07:53 | 10.04 | 22.13 | 6.96 | 59.31 |
| 10/8/2008 07:54 | 12.60 | 21.61 | 7.16 | 59.38 |
| 10/8/2008 07:55 | 23.49 | 21.36 | 7.10 | 59.37 |
| 10/8/2008 07:56 | 45.80 | 19.97 | 7.11 | 59.52 |
| 10/8/2008 07:57 | 43.94 | 20.05 | 7.33 | 59.91 |
| 10/8/2008 07:58 | 92.22 | 19.31 | 7.13 | 60.51 |
| 10/8/2008 07:59 | 104.91 | 19.49 | 7.12 | 60.24 |
| 10/8/2008 08:00 | 59.61 | 20.34 | 7.22 | 60.56 |
| 10/8/2008 08:01 | 112.46 | 19.40 | 7.09 | 50.09 |
| 10/8/2008 08:02 | 75.19 | 19.87 | 7.20 | 47.90 |
| 10/8/2008 08:03 | 88.17 | 19.80 | 7.11 | 47.90 |
| 10/8/2008 08:04 | 82.57 | 19.66 | 7.12 | 47.97 |
| 10/8/2008 08:05 | 74.56 | 19.89 | 7.09 | 48.37 |
| 10/8/2008 08:06 | 107.45 | 19.61 | 7.05 | 47.96 |
| 10/8/2008 08:07 | 75.98 | 20.34 | 7.13 | 48.19 |
| 10/8/2008 08:08 | 88.26 | 20.05 | 6.91 | 47.96 |
| 10/8/2008 08:09 | 72.06 | 20.20 | 7.08 | 47.45 |
| 10/8/2008 08:10 | 81.92 | 20.32 | 7.00 | 47.87 |
| 10/8/2008 08:11 | 99.57 | 19.74 | 6.92 | 48.02 |
| 10/8/2008 08:12 | 72.10 | 20.43 | 6.94 | 48.12 |
| 10/8/2008 08:13 | 68.34 | 20.61 | 6.94 | 50.90 |
| 10/8/2008 08:14 | 90.70 | 20.29 | 6.79 | 61.19 |
| 10/8/2008 08:15 | 59.23 | 20.97 | 6.86 | 61.90 |
| 10/8/2008 08:16 | 54.58 | 20.88 | 6.92 | 61.38 |
| 10/8/2008 08:17 | 73.96 | 20.59 | 6.82 | 61.20 |

Run 5

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|---|---|---|---|---|
| 10/8/2008 08:19 | 51.11 | 21.39 | 6.77 | 61.14 |
| 10/8/2008 08:20 | 47.21 | 21.10 | 6.83 | 61.10 |
| 10/8/2008 08:21 | 102.15 | 20.56 | 6.86 | 61.27 |
| 10/8/2008 08:22 | 44.33 | 21.32 | 6.65 | 61.40 |
| 10/8/2008 08:23 | 63.99 | 20.59 | 6.86 | 61.25 |
| 10/8/2008 08:24 | 80.33 | 20.24 | 6.78 | 61.30 |
| '8/2008 08:25 | 49.57 | 20.67 | 6.70 | 60.94 |
| 8/2008 08:26 | 68.91 | 20.51 | 6.69 | 61.25 |
| 10/8/2008 08:27 | 62.88 | 20.55 | 6.64 | 60.84 |
| 10/8/2008 08:28 | 63.00 | 20.79 | 6.64 | 60.46 |
| 10/8/2008 08:29 | 65.89 | 20.73 | 6.61 | 60.63 |
| 10/8/2008 08:30 | 72.57 | 20.74 | 6.59 | 61.08 |
| 10/8/2008 08:31 | 57.68 | 20.75 | 6.56 | 61.32 |
| 10/8/2008 08:32 | 47.18 | 20.96 | 6.52 | 61.41 |
| 10/8/2008 08:33 | 89.19 | 20.28 | 6.55 | 61.45 |
| 10/8/2008 08:34 | 56.02 | 20.90 | 6.48 | 61.93 |
| 10/8/2008 08:35 | 82.63 | 20.37 | 6.50 | 61.59 |
| 10/8/2008 08:36 | 69.37 | 20.47 | 6.43 | 61.56 |
| 10/8/2008 08:37 | 68.89 | 20.43 | 6.40 | 61.41 |
| 10/8/2008 08:38 | 62.38 | 20.65 | 6.36 | 61.55 |
| 10/8/2008 08:39 | 52.52 | 20.73 | 6.31 | 61.77 |
| 10/8/2008 08:40 | 77.16 | 20.25 | 6.33 | 61.54 |
| 10/8/2008 08:41 | 57.68 | 20.44 | 6.22 | 61.43 |
| 10/8/2008 08:42 | 60.04 | 20.56 | 6.29 | 61.21 |
| 10/8/2008 08:43 | 69.25 | 20.52 | 6.28 | 60.04 |
| 10/8/2008 08:44 | 62.50 | 20.69 | 6.19 | 60.21 |
| 10/8/2008 08:45 | 59.51 | 20.72 | 6.22 | 59.59 |
| 10/8/2008 08:46 | 57.80 | 20.43 | 4.56 | 47.48 |
| 10/8/2008 08:47 | 6.00 | 3.75 | -0.16 | 4.16 |
| 10/8/2008 08:48 | 2.47 | 0.91 | 0.00 | 2.29 |
| 10/8/2008 08:49 | 2.40 | 0.64 | -0.01 | 1.91 |
| 10/8/2008 08:50 | 2.38 | 0.49 | 5.34 | 1.69 |
| )/8/2008 08:51 | 0.39 | 0.36 | 12.02 | 1.47 |
| ,0/8/2008 08:52 | 0.04 | 0.29 | 12.03 | 1.39 |
| 10/8/2008 08:53 | 0.07 | 0.29 | 8.49 | 1.39 |
| 10/8/2008 08:54 | 0.07 | 0.24 | 0.04 | 1.48 |
| 10/8/2008 08:55 | 0.14 | 29.99 | 0.01 | 1.51 |
| 10/8/2008 08:56 | 0.14 | 52.08 | 0.00 | 1.43 |
| 10/8/2008 08:57 | 0.17 | 51.44 | -0.01 | 1.42 |
| 10/8/2008 08:58 | 0.20 | 51.40 | -0.02 | 1.39 |
| 10/8/2008 08:59 | 15.55 | 39.43 | 0.00 | 1.46 |
| 10/8/2008 09:00 | 45.03 | 0.89 | -0.01 | 1.58 |
| 10/8/2008 09:01 | 45.20 | 0.39 | -0.01 | 1.63 |
| 10/8/2008 09:02 | 45.20 | 0.29 | -0.01 | 1.65 |
| 10/8/2008 09:03 | 30.37 | 0.29 | -0.01 | 30.31 |
| 10/8/2008 09:04 | 0.57 | 0.29 | -0.02 | 51.68 |
| 10/8/2008 09:05 | 0.37 | 0.21 | -0.02 | 52.85 |
| 10/8/2008 09:06 | 0.37 | 0.19 | -0.03 | 53.18 |
| 10/8/2008 09:07 | 0.51 | 0.19 | -0.01 | 28.10 |
| 10/8/2008 09:08 | 0.07 | 0.19 | 0.00 | 3.10 |
| 10/8/2008 09:09 | 0.11 | 0.19 | 0.00 | 2.31 |
| 10/8/2008 09:10 | 25.20 | 7.49 | 5.19 | 30.93 |
| 10/8/2008 09:11 | 56.43 | 19.16 | 6.46 | 50.72 |
| 10/8/2008 09:12 | 48.57 | 19.56 | 6.39 | 51.84 |
| 10/8/2008 09:13 | 37.34 | 20.06 | 6.42 | 50.75 |
| 10/8/2008 09:14 | 54.57 | 19.53 | 6.47 | 49.02 |
| 10/8/2008 09:15 | 37.10 | 19.95 | 6.41 | 48.18 |
| 10/8/2008 09:16 | 52.47 | 19.65 | 6.49 | 48.80 |
| 10/8/2008 09:17 | 43.44 | 19.80 | 6.36 | 49.09 |
| 10/8/2008 09:18 | 43.50 | 19.77 | 6.49 | 49.44 |
| 10/8/2008 09:19 | 69.34 | 19.49 | 6.58 | 49.62 |
| 10/8/2008 09:20 | 51.43 | 19.94 | 6.46 | 51.33 |
| 10/8/2008 09:21 | 40.31 | 20.28 | 6.48 | 61.87 |
| 10/8/2008 09:22 | 40.10 | 20.06 | 6.50 | 63.11 |
| 10/8/2008 09:23 | 55.69 | 19.60 | 6.63 | 62.56 |
| 10/8/2008 09:24 | 61.67 | 19.56 | 6.48 | 62.84 |

Run6

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|---|---|---|---|---|
| 10/8/2008 09:25 | 48.60 | 19.94 | 6.94 | |
| 10/8/2008 09:26 | 55.36 | 19.61 | 6.57 | 62.86 |
| 10/8/2008 09:27 | 38.91 | 20.07 | 6.43 | 63.30 |
| 10/8/2008 09:28 | 61.95 | 19.53 | 6.59 | 64.00 |
| 10/8/2008 09:29 | 54.68 | 19.51 | 6.42 | 64.10 |
| 10/8/2008 09:30 | 38.14 | 20.05 | 6.53 | 64.32 |
| 10/8/2008 09:31 | 72.87 | 19.33 | 6.54 | 64.29 |
| 10/8/2008 09:32 | 40.54 | 19.98 | 6.49 | 64.17 |
| 10/8/2008 09:33 | 55.07 | 19.59 | 6.62 | 64.44 |
| 10/8/2008 09:34 | 66.25 | 19.33 | 6.58 | 64.71 |
| 10/8/2008 09:35 | 41.19 | 20.09 | 6.57 | 64.19 |
| 10/8/2008 09:36 | 73.83 | 19.73 | 6.73 | 64.62 |
| 10/8/2008 09:37 | 48.91 | 20.08 | 6.49 | 64.56 |
| 10/8/2008 09:38 | 41.27 | 20.14 | 6.66 | 65.28 |
| 10/8/2008 09:39 | 82.63 | 19.01 | 6.62 | 64.96 |
| 10/8/2008 09:40 | 41.23 | 19.88 | 6.70 | 65.38 |
| 10/8/2008 09:41 | 94.57 | 18.85 | 6.80 | 65.23 |
| 10/8/2008 09:42 | 58.87 | 19.56 | 6.59 | 65.19 |
| 10/8/2008 09:43 | 30.31 | 20.14 | 6.62 | 65.69 |
| 10/8/2008 09:44 | 61.96 | 19.32 | 6.75 | 65.67 |
| 10/8/2008 09:45 | 50.26 | 19.46 | 6.68 | 65.44 |
| 10/8/2008 09:46 | 46.85 | 19.60 | 6.75 | 65.32 |
| 10/8/2008 09:47 | 78.90 | 18.97 | 6.74 | 65.58 |
| 10/8/2008 09:48 | 43.12 | 19.77 | 6.67 | 66.11 |
| 10/8/2008 09:49 | 78.60 | 19.00 | 6.77 | 66.02 |
| 10/8/2008 09:50 | 51.53 | 19.46 | 6.68 | 66.11 |
| 10/8/2008 09:51 | 67.06 | 19.26 | 6.81 | 65.52 |
| 10/8/2008 09:52 | 60.21 | 19.15 | 6.69 | 65.68 |
| 10/8/2008 09:53 | 47.10 | 19.44 | 6.75 | 65.95 |
| 10/8/2008 09:54 | 83.72 | 18.84 | 6.77 | 65.91 |
| 10/8/2008 09:55 | 43.21 | 19.52 | 6.72 | 66.10 |
| 10/8/2008 09:56 | 61.13 | 19.08 | 6.86 | 66.49 |
| 10/8/2008 09:57 | 69.31 | 18.73 | 6.73 | 66.30 |
| 10/8/2008 09:58 | 44.86 | 19.16 | 6.82 | 66.26 |
| 10/8/2008 09:59 | 91.23 | 18.38 | 6.87 | 66.32 |
| 10/8/2008 10:00 | 53.57 | 19.40 | 6.76 | 66.31 |
| 10/8/2008 10:01 | 40.04 | 19.49 | 6.76 | 66.12 |
| 10/8/2008 10:02 | 62.11 | 18.88 | 6.87 | 66.38 |
| 10/8/2008 10:03 | 70.82 | 18.67 | 6.93 | 66.22 |
| 10/8/2008 10:04 | 61.14 | 19.13 | 6.85 | 65.94 |
| 10/8/2008 10:05 | 40.78 | 19.57 | 6.84 | 66.03 |
| 10/8/2008 10:06 | 87.78 | 18.75 | 7.02 | 65.92 |
| 10/8/2008 10:07 | 72.50 | 19.05 | 6.88 | 65.98 |
| 10/8/2008 10:08 | 32.64 | 19.73 | 6.83 | 66.55 |
| 10/8/2008 10:09 | 74.28 | 18.83 | 7.08 | 65.97 |
| 10/8/2008 10:10 | 81.96 | 18.90 | 6.95 | 66.12 |
| 10/8/2008 10:11 | 37.54 | 19.73 | 6.96 | 64.07 |
| 10/8/2008 10:12 | 66.98 | 19.16 | 7.01 | 53.50 |
| 10/8/2008 10:13 | 35.02 | 20.06 | 6.94 | 52.66 |
| 10/8/2008 10:14 | 42.56 | 17.14 | 3.52 | 30.38 |
| 10/8/2008 10:15 | 0.54 | 1.95 | 0.00 | 3.43 |
| 10/8/2008 10:16 | -0.92 | 0.86 | -0.01 | 2.56 |
| 10/8/2008 10:17 | -0.93 | 0.63 | 0.63 | 2.33 |
| 10/8/2008 10:18 | -0.89 | 0.42 | 11.78 | 2.03 |
| 10/8/2008 10:19 | -0.93 | 0.32 | 11.99 | 1.90 |
| 10/8/2008 10:20 | -0.89 | 0.27 | 12.00 | 1.85 |
| 10/8/2008 10:21 | -0.97 | 0.19 | 8.59 | 1.83 |
| 10/8/2008 10:22 | -1.03 | 0.19 | 0.03 | 2.28 |
| 10/8/2008 10:23 | -0.83 | 0.21 | 0.00 | 44.59 |
| 10/8/2008 10:24 | -0.75 | 0.19 | 0.00 | 52.30 |
| 10/8/2008 10:25 | -0.79 | 0.19 | -0.01 | 53.03 |
| 10/8/2008 10:26 | -0.76 | 0.19 | -0.01 | 53.89 |
| 10/8/2008 10:27 | -0.91 | 0.19 | -0.01 | 22.35 |
| 10/8/2008 10:28 | 0.31 | 0.21 | 0.97 | 8.99 |
| 10/8/2008 10:29 | 52.35 | 12.39 | 7.01 | 57.60 |
| | | | | 67.76 |

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|---|---|---|---|---|
| 10/8/2008 10:31 | 85.63 | 19.39 | 7.14 | 67.06 |
| 10/8/2008 10:32 | 77.00 | 19.86 | 7.16 | 65.75 |
| 10/8/2008 10:33 | 88.53 | 19.85 | 7.11 | 64.98 |
| 10/8/2008 10:34 | 51.23 | 20.42 | 7.02 | 63.80 |
| 10/8/2008 10:35 | 40.81 | 20.71 | 7.12 | 64.10 |
| 10/8/2008 10:36 | 55.65 | 19.95 | 7.14 | 64.55 |
| '8/2008 10:37 | 36.79 | 20.51 | 7.07 | 64.53 |
| 8/2008 10:38 | 48.74 | 20.13 | 7.17 | 64.93 |
| 10/8/2008 10:39 | 55.82 | 19.82 | 7.10 | 65.23 |
| 10/8/2008 10:40 | 39.38 | 20.21 | 7.14 | 65.70 |
| 10/8/2008 10:41 | 48.63 | 20.18 | 7.14 | 65.72 |
| 10/8/2008 10:42 | 37.44 | 20.44 | 7.07 | 65.88 |
| 10/8/2008 10:43 | 45.70 | 20.48 | 7.12 | 65.74 |
| 10/8/2008 10:44 | 37.20 | 20.53 | 7.11 | 65.35 |
| 10/8/2008 10:45 | 34.32 | 20.65 | 7.13 | 65.56 |
| 10/8/2008 10:46 | 39.14 | 20.46 | 7.07 | 65.11 |
| 10/8/2008 10:47 | 39.62 | 20.46 | 7.14 | 65.81 |
| 10/8/2008 10:48 | 52.81 | 20.20 | 7.13 | 66.28 |
| 10/8/2008 10:49 | 39.76 | 20.97 | 7.06 | 66.30 |
| 10/8/2008 10:50 | 29.01 | 21.30 | 7.03 | 66.39 |
| 10/8/2008 10:51 | 32.49 | 20.97 | 7.16 | 65.87 |
| 10/8/2008 10:52 | 49.69 | 20.33 | 7.20 | 65.71 |
| 10/8/2008 10:53 | 37.39 | 20.64 | 7.10 | 65.57 |
| 10/8/2008 10:54 | 52.46 | 20.50 | 7.28 | 65.36 |
| 10/8/2008 10:55 | 47.69 | 20.35 | 7.10 | 65.75 |
| 10/8/2008 10:56 | 28.41 | 20.93 | 7.14 | 65.07 |
| 10/8/2008 10:57 | 53.97 | 19.96 | 7.21 | 65.32 |
| 10/8/2008 10:58 | 41.21 | 20.26 | 7.10 | 65.76 |
| 10/8/2008 10:59 | 32.07 | 20.45 | 7.03 | 65.67 |
| 10/8/2008 11:00 | 46.26 | 19.97 | 7.08 | 66.50 |
| 10/8/2008 11:01 | 54.26 | 19.87 | 7.05 | 66.58 |
| 10/8/2008 11:02 | 48.50 | 20.10 | 6.93 | 66.65 |
| )/8/2008 11:03 | 34.84 | 20.64 | 6.93 | 66.79 |
| 0/8/2008 11:04 | 59.16 | 20.10 | 6.93 | 67.05 |
| 10/8/2008 11:05 | 36.18 | 20.80 | 6.83 | 67.43 |
| 10/8/2008 11:06 | 44.56 | 20.81 | 6.89 | 67.43 |
| 10/8/2008 11:07 | 35.23 | 20.99 | 6.75 | 67.78 |
| 10/8/2008 11:08 | 48.33 | 20.75 | 6.86 | 67.34 |
| 10/8/2008 11:09 | 29.31 | 21.15 | 6.76 | 67.31 |
| 10/8/2008 11:10 | 48.59 | 20.89 | 6.90 | 67.73 |
| 10/8/2008 11:11 | 46.83 | 20.81 | 6.78 | 67.51 |
| 10/8/2008 11:12 | 29.11 | 21.70 | 6.74 | 67.73 |
| 10/8/2008 11:13 | 26.90 | 21.42 | 6.78 | 60.38 |
| 10/8/2008 11:14 | 32.73 | 21.14 | 6.82 | 53.83 |
| 10/8/2008 11:15 | 48.96 | 20.59 | 6.87 | 53.51 |
| 10/8/2008 11:16 | 38.18 | 20.73 | 6.73 | 53.73 |
| 10/8/2008 11:17 | 24.37 | 21.43 | 6.73 | 53.81 |
| 10/8/2008 11:18 | 46.23 | 20.23 | 6.81 | 53.97 |
| 10/8/2008 11:19 | 34.45 | 20.50 | 6.77 | 53.77 |
| 10/8/2008 11:20 | 36.03 | 20.60 | 6.76 | 53.61 |
| 10/8/2008 11:21 | 32.55 | 20.60 | 6.75 | 54.36 |
| 10/8/2008 11:22 | 35.24 | 20.23 | 6.72 | 54.47 |
| 10/8/2008 11:23 | 42.33 | 20.11 | 6.78 | 53.91 |
| 10/8/2008 11:24 | 39.87 | 20.37 | 6.76 | 53.84 |
| 10/8/2008 11:25 | 40.31 | 20.48 | 6.67 | 54.32 |
| 10/8/2008 11:26 | 19.50 | 21.50 | 6.64 | 64.37 |
| 10/8/2008 11:27 | 47.44 | 20.42 | 6.78 | 69.38 |
| 10/8/2008 11:28 | 31.34 | 20.91 | 6.57 | 67.91 |
| 10/8/2008 11:29 | 47.59 | 20.81 | 6.74 | 67.66 |
| 10/8/2008 11:30 | 54.35 | 20.33 | 6.67 | 67.92 |
| 10/8/2008 11:31 | 69.71 | 20.47 | 6.79 | 67.57 |
| 10/8/2008 11:32 | 79.49 | 20.54 | 6.65 | 67.61 |
| 10/8/2008 11:33 | 33.53 | 21.41 | 6.54 | 66.99 |
| 10/8/2008 11:34 | 29.72 | 21.00 | 5.14 | 56.19 |
| 10/8/2008 11:35 | 4.20 | 6.51 | 0.04 | 4.91 |
| [illegible] | [illegible] | 1.18 | 0.01 | 2.56 |

Run 7

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|---|---|---|---|---|
| 10/8/2008 11:37 | -0.80 | 0.60 | 0.01 | 1.87 |
| 10/8/2008 11:38 | -0.77 | 0.60 | 7.70 | 1.68 |
| 10/8/2008 11:39 | -0.68 | 0.41 | 12.04 | 2.34 |
| 10/8/2008 11:40 | -0.61 | 0.31 | 11.82 | 47.01 |
| 10/8/2008 11:41 | -0.38 | 0.29 | 0.34 | 51.90 |
| 10/8/2008 11:42 | -0.22 | 0.29 | 0.02 | 52.77 |
| 10/8/2008 11:43 | -0.13 | 0.29 | 0.01 | 53.15 |
| 10/8/2008 11:44 | -0.16 | 0.29 | 0.01 | 53.33 |
| 10/8/2008 11:45 | -0.01 | 0.19 | 0.00 | 24.13 |
| 10/8/2008 11:46 | -0.13 | 0.19 | 0.00 | 3.40 |
| 10/8/2008 11:47 | -0.33 | 0.19 | 0.00 | 2.87 |
| 10/8/2008 11:48 | -0.28 | 0.19 | 0.00 | 60.95 |
| 10/8/2008 11:49 | 14.26 | 10.60 | 5.98 | 68.31 |
| 10/8/2008 11:50 | 42.79 | 20.10 | 6.55 | 68.90 |
| 10/8/2008 11:51 | 37.27 | 20.26 | 6.40 | 67.94 |
| 10/8/2008 11:52 | 27.19 | 20.77 | 6.52 | 68.05 |
| 10/8/2008 11:53 | 58.30 | 20.00 | 6.58 | 67.43 |
| 10/8/2008 11:54 | 41.07 | 20.57 | 6.47 | 66.81 |
| 10/8/2008 11:55 | 31.54 | 21.21 | 6.50 | 66.43 |
| 10/8/2008 11:56 | 36.42 | 20.80 | 6.55 | 65.68 |
| 10/8/2008 11:57 | 47.93 | 20.55 | 6.57 | 65.73 |
| 10/8/2008 11:58 | 34.53 | 21.11 | 6.49 | 65.97 |
| 10/8/2008 11:59 | 53.71 | 20.55 | 6.55 | 66.46 |
| 10/8/2008 12:00 | 28.47 | 21.09 | 6.45 | 67.15 |
| 10/8/2008 12:01 | 49.34 | 20.73 | 6.55 | 67.35 |
| 10/8/2008 12:02 | 43.69 | 20.84 | 6.35 | 66.55 |
| 10/8/2008 12:03 | 23.84 | 21.53 | 6.40 | 66.49 |
| 10/8/2008 12:04 | 40.83 | 20.66 | 6.51 | 66.61 |
| 10/8/2008 12:05 | 49.39 | 20.58 | 6.44 | 66.58 |
| 10/8/2008 12:06 | 33.00 | 21.53 | 6.40 | 66.83 |
| 10/8/2008 12:07 | 32.86 | 21.36 | 6.48 | 67.70 |
| 10/8/2008 12:08 | 57.56 | 20.63 | 6.41 | 67.70 |
| 10/8/2008 12:09 | 27.95 | 21.56 | 6.45 | 68.10 |
| 10/8/2008 12:10 | 60.14 | 20.44 | 6.56 | 67.28 |
| 10/8/2008 12:11 | 35.74 | 21.28 | 6.36 | 66.73 |
| 10/8/2008 12:12 | 31.29 | 21.38 | 6.44 | 62.15 |
| 10/8/2008 12:13 | 50.91 | 20.58 | 6.47 | 54.00 |
| 10/8/2008 12:14 | 26.84 | 21.31 | 6.31 | 53.41 |
| 10/8/2008 12:15 | 44.24 | 20.81 | 6.50 | 53.58 |
| 10/8/2008 12:16 | 37.27 | 20.79 | 6.38 | 53.16 |
| 10/8/2008 12:17 | 42.37 | 20.83 | 6.47 | 52.88 |
| 10/8/2008 12:18 | 41.94 | 20.63 | 6.41 | 53.55 |
| 10/8/2008 12:19 | 39.25 | 21.31 | 6.44 | 53.53 |
| 10/8/2008 12:20 | 52.10 | 20.71 | 6.38 | 53.75 |
| 10/8/2008 12:21 | 46.77 | 21.05 | 6.38 | 53.79 |
| 10/8/2008 12:22 | 38.96 | 21.15 | 6.33 | 53.33 |
| 10/8/2008 12:23 | 29.63 | 21.48 | 6.31 | 53.68 |
| 10/8/2008 12:24 | 36.01 | 20.89 | 6.42 | 53.69 |
| 10/8/2008 12:25 | 64.93 | 20.31 | 6.37 | 61.82 |
| 10/8/2008 12:26 | 29.50 | 21.38 | 6.33 | 68.88 |
| 10/8/2008 12:27 | 67.49 | 20.23 | 6.44 | 68.45 |
| 10/8/2008 12:28 | 37.30 | 20.99 | 6.28 | 68.16 |
| 10/8/2008 12:29 | 41.27 | 20.87 | 6.39 | 68.07 |
| 10/8/2008 12:30 | 42.86 | 20.72 | 6.25 | 68.42 |
| 10/8/2008 12:31 | 25.98 | 21.28 | 6.25 | 68.77 |
| 10/8/2008 12:32 | 60.70 | 20.19 | 6.40 | 69.00 |
| 10/8/2008 12:33 | 38.73 | 20.92 | 6.20 | 69.47 |
| 10/8/2008 12:34 | 27.08 | 21.36 | 6.24 | 69.62 |
| 10/8/2008 12:35 | 55.87 | 20.12 | 6.38 | 69.38 |
| 10/8/2008 12:36 | 40.17 | 20.73 | 6.24 | 69.09 |
| 10/8/2008 12:37 | 32.02 | 20.99 | 6.26 | 69.56 |
| 10/8/2008 12:38 | 28.24 | 21.09 | 6.23 | 69.17 |
| 10/8/2008 12:39 | 50.30 | 20.55 | 6.37 | 69.23 |
| 10/8/2008 12:40 | 37.01 | 21.25 | 6.33 | 68.95 |
| 10/8/2008 12:41 | 56.15 | 20.39 | 6.31 | 69.20 |

Run 8

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|---|---|---|---|---|
| 10/8/2008 12:43 | 51.38 | 20.65 | 6.33 | 69.21 |
| 10/8/2008 12:44 | 29.91 | 20.99 | 6.22 | 69.62 |
| 10/8/2008 12:45 | 43.30 | 20.91 | 6.32 | 69.63 |
| 10/8/2008 12:46 | 31.85 | 20.94 | 6.26 | 69.46 |
| 10/8/2008 12:47 | 50.33 | 20.66 | 6.39 | 69.06 |
| 10/8/2008 12:48 | 31.51 | 20.89 | 6.22 | 69.08 |
| [illegible]/8/2008 12:49 | 26.84 | 21.08 | 6.28 | 69.15 |
| [illegible]8/2008 12:50 | 70.55 | 20.11 | 6.38 | 69.56 |
| 10/8/2008 12:51 | 35.73 | 20.55 | 6.24 | 68.71 |
| 10/8/2008 12:52 | 46.71 | 20.59 | 6.42 | 68.78 |
| 10/8/2008 12:53 | 49.84 | 20.49 | 6.30 | 68.46 |
| 10/8/2008 12:54 | 35.49 | 20.96 | 4.91 | 56.16 |
| 10/8/2008 12:55 | 5.00 | 6.38 | 0.02 | 4.82 |
| 10/8/2008 12:56 | 0.64 | 1.26 | 0.00 | 2.57 |
| 10/8/2008 12:57 | 0.58 | 0.90 | 0.00 | 2.13 |
| 10/8/2008 12:58 | 0.59 | 0.68 | 7.34 | 1.90 |
| 10/8/2008 12:59 | 0.61 | 0.47 | 12.04 | 1.68 |
| 10/8/2008 13:00 | 0.67 | 0.37 | 12.04 | 1.66 |
| 10/8/2008 13:01 | 3.44 | 0.29 | 8.51 | 1.70 |
| 10/8/2008 13:02 | 42.27 | 0.37 | 0.04 | 1.95 |
| 10/8/2008 13:03 | 45.84 | 0.29 | 0.02 | 2.00 |
| 10/8/2008 13:04 | 45.97 | 0.29 | 0.01 | 2.06 |
| 10/8/2008 13:05 | 37.96 | 5.37 | 0.00 | 1.99 |
| 10/8/2008 13:06 | 1.91 | 47.87 | -0.01 | 1.85 |
| 10/8/2008 13:07 | 0.84 | 51.16 | 0.00 | 1.80 |
| 10/8/2008 13:08 | 0.91 | 51.06 | -0.01 | 1.79 |
| 10/8/2008 13:09 | 0.84 | 51.00 | -0.01 | 1.78 |
| 10/8/2008 13:10 | 0.94 | 44.61 | -0.01 | 28.17 |
| 10/8/2008 13:11 | 1.04 | 1.23 | -0.02 | 52.01 |
| 10/8/2008 13:12 | 1.11 | 0.42 | -0.02 | 53.04 |
| 10/8/2008 13:13 | 1.11 | 0.30 | -0.02 | 53.31 |
| 10/8/2008 13:14 | 1.07 | 0.29 | -0.01 | 49.77 |
| [illegible]/8/2008 13:15 | 0.94 | 0.25 | -0.02 | 4.94 |
| [illegible]0/8/2008 13:16 | 0.77 | 0.19 | -0.02 | 2.77 |
| 10/8/2008 13:17 | 0.77 | 0.19 | -0.02 | 2.37 |
| 10/8/2008 13:18 | 15.71 | 9.11 | 4.93 | 51.30 |
| 10/8/2008 13:19 | 37.74 | 19.88 | 6.27 | 70.33 |
| 10/8/2008 13:20 | 46.80 | 20.32 | 6.31 | 70.77 |
| 10/8/2008 13:21 | 41.17 | 20.63 | 6.18 | 70.48 |
| 10/8/2008 13:22 | 21.44 | 21.23 | 6.13 | 66.81 |
| 10/8/2008 13:23 | 40.16 | 20.66 | 6.32 | 55.33 |
| 10/8/2008 13:24 | 41.13 | 20.62 | 6.23 | 54.36 |
| 10/8/2008 13:25 | 29.91 | 21.02 | 6.18 | 54.03 |
| 10/8/2008 13:26 | 46.32 | 20.86 | 6.30 | 53.95 |
| 10/8/2008 13:27 | 41.28 | 20.79 | 6.24 | 54.32 |
| 10/8/2008 13:28 | 36.04 | 21.18 | 6.22 | 53.80 |
| 10/8/2008 13:29 | 32.33 | 21.35 | 6.17 | 54.50 |
| 10/8/2008 13:30 | 40.20 | 21.01 | 6.19 | 54.56 |
| 10/8/2008 13:31 | 36.71 | 20.85 | 6.15 | 54.61 |
| 10/8/2008 13:32 | 34.97 | 21.08 | 6.11 | 55.30 |
| 10/8/2008 13:33 | 35.18 | 20.73 | 6.14 | 55.07 |
| 10/8/2008 13:34 | 45.52 | 20.50 | 6.26 | 54.90 |
| 10/8/2008 13:35 | 41.63 | 20.51 | 6.11 | 59.44 |
| 10/8/2008 13:36 | 41.35 | 20.86 | 6.23 | 69.94 |
| 10/8/2008 13:37 | 53.39 | 20.46 | 6.10 | 70.33 |
| 10/8/2008 13:38 | 23.32 | 21.52 | 6.07 | 69.32 |
| 10/8/2008 13:39 | 41.91 | 20.83 | 6.20 | 69.27 |
| 10/8/2008 13:40 | 40.65 | 20.66 | 6.07 | 69.19 |
| [illegible]0/8/2008 13:41 | 38.04 | 20.66 | 6.18 | 68.75 |
| 10/8/2008 13:42 | 33.91 | 20.61 | 6.02 | 68.92 |
| 10/8/2008 13:43 | 46.73 | 20.37 | 6.19 | 68.87 |
| 10/8/2008 13:44 | 48.20 | 20.29 | 6.14 | 68.99 |
| 10/8/2008 13:45 | 31.25 | 20.81 | 6.00 | 69.22 |
| 10/8/2008 13:46 | 22.83 | 21.20 | 6.01 | 69.69 |
| 10/8/2008 13:47 | 21.20 | 21.05 | 5.92 | 70.65 |
| 10/8/2008 13:48 | 23.77 | 20.99 | 6.12 | 69.79 |

Run 9

| | | | | |
|---|---|---|---|---|
| 10/8/2008 13:49 | 32.85 | 20.41 | 6.19 | |
| 10/8/2008 13:50 | 37.00 | 20.75 | 6.18 | 69.44 |
| 10/8/2008 13:51 | 36.05 | 20.79 | 6.15 | 69.36 |
| 10/8/2008 13:52 | 31.08 | 20.68 | 6.10 | 69.34 |
| 10/8/2008 13:53 | 33.66 | 20.72 | 6.15 | 69.87 |
| 10/8/2008 13:54 | 40.00 | 20.55 | 6.13 | 70.28 |
| [illegible]/8/2008 13:55 | 44.02 | 20.27 | 6.10 | 70.68 |
| [illegible]8/2008 13:56 | 26.40 | 21.15 | 6.11 | 69.88 |
| 10/8/2008 13:57 | 54.01 | 20.34 | 6.20 | 70.38 |
| 10/8/2008 13:58 | 30.43 | 21.13 | 6.03 | 70.14 |
| 10/8/2008 13:59 | 36.09 | 20.85 | 6.18 | 70.42 |
| 10/8/2008 14:00 | 43.60 | 20.63 | 6.11 | 70.05 |
| 10/8/2008 14:01 | 51.29 | 20.80 | 6.27 | 70.59 |
| 10/8/2008 14:02 | 41.79 | 21.03 | 6.10 | 70.87 |
| 10/8/2008 14:03 | 32.09 | 21.56 | 6.19 | 70.80 |
| 10/8/2008 14:04 | 55.39 | 20.63 | 6.26 | 71.01 |
| 10/8/2008 14:05 | 42.62 | 21.10 | 6.10 | 71.05 |
| 10/8/2008 14:06 | 32.40 | 21.34 | 6.12 | 71.29 |
| 10/8/2008 14:07 | 30.32 | 21.42 | 6.15 | 71.58 |
| 10/8/2008 14:08 | 41.49 | 20.80 | 6.18 | 71.60 |
| 10/8/2008 14:09 | 47.77 | 20.61 | 6.15 | 71.68 |
| 10/8/2008 14:10 | 31.58 | 21.26 | 6.09 | 71.90 |
| 10/8/2008 14:11 | 35.26 | 20.97 | 6.19 | 71.92 |
| 10/8/2008 14:12 | 45.14 | 20.76 | 6.17 | 71.40 |
| 10/8/2008 14:13 | 33.17 | 21.16 | 6.15 | 71.23 |
| 10/8/2008 14:14 | 38.84 | 20.94 | 6.23 | 71.72 |
| 10/8/2008 14:15 | 44.52 | 20.73 | 6.08 | 72.60 |
| 10/8/2008 14:16 | 23.00 | 21.22 | 6.10 | 72.63 |
| 10/8/2008 14:17 | 61.84 | 19.96 | 6.26 | 72.22 |
| 10/8/2008 14:18 | 29.44 | 20.81 | 6.13 | 72.39 |
| 10/8/2008 14:19 | 53.46 | 20.09 | 6.28 | 72.08 |
| 10/8/2008 14:20 | 37.74 | 20.45 | 6.18 | 71.74 |
| [illegible]/8/2008 14:21 | 40.04 | 20.75 | 6.23 | 71.49 |
| 10/8/2008 14:22 | 40.93 | 20.50 | 5.99 | 68.69 |
| 10/8/2008 14:23 | 14.68 | 10.17 | 0.12 | 7.47 |
| 10/8/2008 14:24 | 0.70 | 1.44 | 0.00 | 2.94 |
| 10/8/2008 14:25 | 0.70 | 1.00 | 0.00 | 2.43 |
| 10/8/2008 14:26 | 0.67 | 0.75 | 1.13 | 2.24 |
| 10/8/2008 14:27 | 0.64 | 0.53 | 11.90 | 1.95 |
| 10/8/2008 14:28 | 0.67 | 0.39 | 12.00 | 1.87 |
| 10/8/2008 14:29 | 0.70 | 0.31 | 12.02 | 1.81 |
| 10/8/2008 14:30 | 0.64 | 0.29 | 11.99 | 1.84 |
| 10/8/2008 14:31 | 0.81 | 0.29 | 0.84 | 45.19 |
| 10/8/2008 14:32 | 1.05 | 0.29 | 0.01 | 52.34 |
| 10/8/2008 14:33 | 1.00 | 0.29 | 0.00 | 53.16 |
| 10/8/2008 14:34 | 0.96 | 0.29 | 0.00 | 53.45 |
| 10/8/2008 14:35 | 0.90 | 0.29 | 0.00 | 53.58 |
| 10/8/2008 14:36 | 1.01 | 0.29 | -0.01 | 42.89 |
| 10/8/2008 14:37 | 0.73 | 0.19 | 0.04 | 5.16 |
| 10/8/2008 14:38 | 28.66 | 10.26 | 6.18 | 64.68 |
| 10/8/2008 14:39 | 30.18 | 19.99 | 6.40 | 73.60 |
| 10/8/2008 14:40 | 62.84 | 19.32 | 6.56 | 74.90 |
| 10/8/2008 14:41 | 27.87 | 20.57 | 6.39 | 74.01 |
| 10/8/2008 14:42 | 49.57 | 20.20 | 6.53 | 72.73 |
| 10/8/2008 14:43 | 42.57 | 20.15 | 6.38 | 72.99 |
| 10/8/2008 14:44 | 35.74 | 20.68 | 6.51 | 72.80 |
| 10/8/2008 14:45 | 50.57 | 20.15 | 6.50 | 72.79 |
| 10/8/2008 14:46 | 34.00 | 20.63 | 6.53 | 72.45 |
| 10/8/2008 14:47 | 48.60 | 20.12 | 6.52 | 71.65 |
| 10/8/2008 14:48 | 26.78 | 20.86 | 6.47 | 72.34 |
| 10/8/2008 14:49 | 39.53 | 20.08 | 6.55 | 73.38 |
| 10/8/2008 14:50 | 60.00 | 19.80 | 6.57 | 73.24 |
| 10/8/2008 14:51 | 42.09 | 20.53 | 6.49 | 73.23 |
| 10/8/2008 14:52 | 38.00 | 20.42 | 6.51 | 73.04 |
| 10/8/2008 14:53 | 38.87 | 20.50 | 6.54 | 73.00 |
| [illegible] | [illegible] | [illegible] | [illegible] | 72.72 |

Run 10

| | | | | |
|---|---|---|---|---|
| 10/8/2008 14:55 | 45.73 | 20.39 | 6.62 | 72.57 |
| 10/8/2008 14:56 | 48.90 | 20.11 | 6.58 | 71.91 |
| 10/8/2008 14:57 | 32.25 | 20.90 | 6.47 | 72.57 |
| 10/8/2008 14:58 | 39.33 | 20.34 | 6.61 | 72.74 |
| 10/8/2008 14:59 | 48.52 | 20.23 | 6.58 | 72.80 |
| 10/8/2008 15:00 | 29.57 | 21.03 | 6.54 | 72.57 |
| 8/2008 15:01 | 45.30 | 20.22 | 6.55 | 73.01 |
| 8/2008 15:02 | 37.84 | 20.32 | 6.58 | 73.48 |
| 10/8/2008 15:03 | 53.52 | 19.87 | 6.68 | 73.20 |
| 10/8/2008 15:04 | 42.15 | 20.23 | 6.60 | 73.68 |
| 10/8/2008 15:05 | 37.42 | 20.43 | 6.64 | 74.26 |
| 10/8/2008 15:06 | 78.65 | 19.68 | 6.75 | 73.88 |
| 10/8/2008 15:07 | 30.52 | 20.86 | 6.54 | 74.00 |
| 10/8/2008 15:08 | 31.61 | 20.69 | 6.67 | 72.72 |
| 10/8/2008 15:09 | 48.64 | 20.15 | 6.67 | 73.29 |
| 10/8/2008 15:10 | 31.77 | 20.93 | 6.72 | 73.15 |
| 10/8/2008 15:11 | 48.69 | 20.01 | 6.77 | 73.33 |
| 10/8/2008 15:12 | 40.65 | 20.53 | 6.71 | 73.18 |
| 10/8/2008 15:13 | 41.14 | 20.76 | 6.81 | 73.27 |
| 10/8/2008 15:14 | 66.55 | 19.76 | 6.82 | 73.20 |
| 10/8/2008 15:15 | 26.06 | 20.99 | 6.65 | 73.18 |
| 10/8/2008 15:16 | 51.07 | 20.11 | 6.85 | 73.54 |
| 10/8/2008 15:17 | 45.02 | 20.03 | 6.68 | 73.24 |
| 10/8/2008 15:18 | 37.52 | 20.81 | 6.87 | 73.47 |
| 10/8/2008 15:19 | 63.85 | 19.76 | 6.83 | 73.45 |
| 10/8/2008 15:20 | 29.59 | 20.91 | 6.76 | 73.08 |
| 10/8/2008 15:21 | 36.34 | 20.58 | 6.84 | 73.73 |
| 10/8/2008 15:22 | 58.09 | 19.78 | 6.91 | 73.82 |
| 10/8/2008 15:23 | 63.66 | 19.61 | 6.81 | 73.90 |
| 10/8/2008 15:24 | 30.74 | 20.69 | 6.86 | 73.64 |
| 10/8/2008 15:25 | 62.36 | 19.83 | 6.96 | 74.13 |
| 10/8/2008 15:26 | 47.87 | 20.01 | 6.79 | 74.03 |
| )/8/2008 15:27 | 31.51 | 20.79 | 6.81 | 73.37 |
| 10/8/2008 15:28 | 39.78 | 20.40 | 6.87 | 73.77 |
| 10/8/2008 15:29 | 51.85 | 20.16 | 6.92 | 74.01 |
| 10/8/2008 15:30 | 35.17 | 20.84 | 6.91 | 73.46 |
| 10/8/2008 15:31 | 46.89 | 20.56 | 6.98 | 73.72 |
| 10/8/2008 15:32 | 37.78 | 20.59 | 6.75 | 73.46 |
| 10/8/2008 15:33 | 31.96 | 20.76 | 6.94 | 73.19 |
| 10/8/2008 15:34 | 74.07 | 19.58 | 6.94 | 73.45 |
| 10/8/2008 15:35 | 33.49 | 20.75 | 6.87 | 73.23 |
| 10/8/2008 15:36 | 54.18 | 20.02 | 7.02 | 73.15 |
| 10/8/2008 15:37 | 39.38 | 20.24 | 6.87 | 72.62 |
| 10/8/2008 15:38 | 21.63 | 20.81 | 6.80 | 73.24 |
| 10/8/2008 15:39 | 49.01 | 19.51 | 7.02 | 73.35 |
| 10/8/2008 15:40 | 73.58 | 19.10 | 6.99 | 73.80 |
| 10/8/2008 15:41 | 47.97 | 20.10 | 6.95 | 73.33 |
| 10/8/2008 15:42 | 43.51 | 20.51 | 6.98 | 72.82 |
| 10/8/2008 15:43 | 30.14 | 16.05 | 2.06 | 28.33 |
| 10/8/2008 15:44 | 0.67 | 2.00 | 0.01 | 3.57 |
| 10/8/2008 15:45 | 0.57 | 1.27 | 0.00 | 2.63 |
| 10/8/2008 15:46 | 0.63 | 0.91 | 5.89 | 2.28 |
| 10/8/2008 15:47 | 0.61 | 0.62 | 12.00 | 1.95 |
| 10/8/2008 15:48 | 0.67 | 0.49 | 12.00 | 1.89 |
| 10/8/2008 15:49 | 3.41 | 0.39 | 8.65 | 1.92 |
| 10/8/2008 15:50 | 41.71 | 0.47 | 0.05 | 2.21 |
| 10/8/2008 15:51 | 45.84 | 0.39 | 0.01 | 2.24 |
| 10/8/2008 15:52 | 45.84 | 0.39 | 0.01 | 2.25 |
| )0/8/2008 15:53 | 40.52 | 1.03 | 0.00 | 2.15 |
| 10/8/2008 15:54 | 2.80 | 44.61 | -0.01 | 1.95 |
| 10/8/2008 15:55 | 0.84 | 50.87 | -0.01 | 1.88 |
| 10/8/2008 15:56 | 0.85 | 50.82 | -0.01 | 1.87 |
| 10/8/2008 15:57 | 0.79 | 50.80 | -0.01 | 1.88 |
| 10/8/2008 15:58 | 0.94 | 37.31 | -0.01 | 35.57 |
| 10/8/2008 15:59 | 0.97 | 0.82 | -0.01 | 52.08 |
| | 0.94 | 0.44 | -0.01 | 52.97 |

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|---|---|---|---|---|
| 10/8/2008 16:01 | 1.01 | 0.30 | 0.01 | 53.45 |
| 10/8/2008 16:02 | 0.96 | 0.29 | -0.01 | 33.97 |
| 10/8/2008 16:03 | 1.07 | 0.29 | -0.02 | 3.79 |
| 10/8/2008 16:04 | 0.76 | 0.19 | -0.02 | 2.82 |
| 10/8/2008 16:05 | 0.74 | 0.19 | -0.02 | 2.50 |
| 10/8/2008 16:06 | 0.74 | 0.19 | -0.03 | 2.34 |
| 10/8/2008 16:07 | 0.80 | 0.19 | -0.02 | 54.53 |
| 10/8/2008 16:08 | 18.45 | 6.96 | 5.75 | 70.58 |
| 10/8/2008 16:09 | 53.70 | 19.37 | 7.05 | 71.84 |
| 10/8/2008 16:10 | 35.31 | 20.36 | 6.89 | 71.59 |
| 10/8/2008 16:11 | 41.36 | 20.47 | 7.02 | 72.58 |
| 10/8/2008 16:12 | 51.70 | 19.95 | 6.93 | 71.51 |
| 10/8/2008 16:13 | 30.04 | 20.86 | 6.85 | 71.72 |
| 10/8/2008 16:14 | 45.34 | 20.31 | 6.85 | 71.65 |
| 10/8/2008 16:15 | 35.15 | 20.58 | 6.81 | 71.09 |
| 10/8/2008 16:16 | 50.14 | 20.23 | 6.90 | 70.48 |
| 10/8/2008 16:17 | 42.51 | 20.41 | 6.82 | 70.19 |
| 10/8/2008 16:18 | 34.03 | 20.80 | 6.84 | 70.58 |
| 10/8/2008 16:19 | 58.78 | 20.38 | 6.94 | 70.79 |
| 10/8/2008 16:20 | 50.91 | 20.71 | 6.76 | 70.82 |
| 10/8/2008 16:21 | 32.83 | 21.12 | 6.74 | 70.73 |
| 10/8/2008 16:22 | 29.96 | 21.16 | 6.73 | 70.74 |
| 10/8/2008 16:23 | 46.92 | 20.61 | 6.75 | 71.08 |
| 10/8/2008 16:24 | 31.09 | 20.95 | 6.65 | 70.79 |
| 10/8/2008 16:25 | 60.45 | 20.25 | 6.80 | 70.85 |
| 10/8/2008 16:26 | 38.06 | 21.08 | 6.61 | 71.07 |
| 10/8/2008 16:27 | 23.21 | 21.88 | 6.53 | 71.08 |
| 10/8/2008 16:28 | 43.79 | 20.85 | 6.70 | 70.84 |
| 10/8/2008 16:29 | 39.74 | 21.19 | 6.61 | 71.13 |
| 10/8/2008 16:30 | 38.00 | 21.59 | 6.58 | 71.52 |
| 10/8/2008 16:31 | 41.42 | 21.48 | 6.49 | 71.15 |
| 10/8/2008 16:32 | 24.22 | 21.79 | 6.53 | 71.38 |
| 10/8/2008 16:33 | 48.92 | 20.84 | 6.60 | 71.02 |
| 10/8/2008 16:34 | 36.91 | 21.32 | 6.53 | 71.49 |
| 10/8/2008 16:35 | 61.04 | 20.68 | 6.58 | 71.08 |
| 10/8/2008 16:36 | 24.86 | 21.72 | 6.34 | 71.37 |
| 10/8/2008 16:37 | 35.53 | 21.37 | 6.55 | 71.03 |
| 10/8/2008 16:38 | 50.12 | 20.56 | 6.46 | 71.83 |
| 10/8/2008 16:39 | 29.49 | 21.64 | 6.39 | 72.00 |
| 10/8/2008 16:40 | 51.06 | 21.22 | 6.46 | 71.89 |
| 10/8/2008 16:41 | 30.77 | 21.71 | 6.36 | 71.80 |
| 10/8/2008 16:42 | 28.02 | 21.62 | 6.36 | 71.49 |
| 10/8/2008 16:43 | 40.50 | 20.90 | 6.48 | 71.75 |
| 10/8/2008 16:44 | 60.38 | 20.70 | 6.44 | 72.18 |
| 10/8/2008 16:45 | 30.45 | 21.53 | 6.26 | 71.88 |
| 10/8/2008 16:46 | 34.93 | 21.13 | 6.46 | 71.94 |
| 10/8/2008 16:47 | 36.52 | 20.78 | 6.30 | 72.09 |
| 10/8/2008 16:48 | 27.31 | 21.38 | 6.39 | 72.22 |
| 10/8/2008 16:49 | 50.30 | 20.48 | 6.37 | 72.27 |
| 10/8/2008 16:50 | 27.88 | 21.47 | 6.29 | 71.91 |
| 10/8/2008 16:51 | 39.36 | 21.11 | 6.47 | 72.45 |
| 10/8/2008 16:52 | 47.31 | 20.58 | 6.31 | 72.24 |
| 10/8/2008 16:53 | 28.71 | 21.43 | 6.39 | 72.28 |
| 10/8/2008 16:54 | 47.07 | 20.51 | 6.37 | 72.26 |
| 10/8/2008 16:55 | 33.24 | 21.19 | 6.34 | 72.46 |
| 10/8/2008 16:56 | 48.35 | 20.81 | 6.38 | 71.96 |
| 10/8/2008 16:57 | 23.82 | 21.58 | 6.27 | 71.84 |
| 10/8/2008 16:58 | 37.03 | 20.82 | 6.40 | 72.31 |
| 10/8/2008 16:59 | 44.77 | 20.49 | 6.35 | 72.57 |
| 10/8/2008 17:00 | 28.97 | 21.03 | 6.33 | 73.58 |
| 10/8/2008 17:01 | 40.47 | 20.66 | 6.27 | 73.55 |
| 10/8/2008 17:02 | 33.50 | 20.97 | 6.27 | 73.78 |
| 10/8/2008 17:03 | 39.34 | 20.65 | 6.29 | 73.42 |
| 10/8/2008 17:04 | 30.31 | 20.89 | 6.30 | 73.48 |
| 10/8/2008 17:05 | 48.67 | 20.21 | 6.39 | 72.95 |

Run 11

| | | | | |
|---|---|---|---|---|
| 10/8/2008 17:07 | 38.17 | 21.08 | 6.28 | 73.32 |
| 10/8/2008 17:08 | 21.21 | 21.67 | 6.24 | 73.17 |
| 10/8/2008 17:09 | 72.33 | 19.97 | 6.49 | 73.29 |
| 10/8/2008 17:10 | 46.64 | 20.73 | 6.25 | 73.50 |
| 10/8/2008 17:11 | 28.04 | 21.33 | 6.33 | 73.13 |
| 10/8/2008 17:12 | 44.27 | 20.44 | 6.37 | 29.66 |
| '8/2008 17:13 | 26.31 | 14.54 | 1.99 | 3.58 |
| 8/2008 17:14 | 0.94 | 2.01 | 0.02 | 2.61 |
| 10/8/2008 17:15 | 0.84 | 1.28 | 0.00 | 2.34 |
| 10/8/2008 17:16 | | | 0.00 | 2.19 |
| 10/8/2008 17:17 | | | 4.59 | 1.92 |
| 10/8/2008 17:18 | | | 12.00 | 1.90 |
| 10/8/2008 17:19 | | | 12.01 | 17.22 |
| 10/8/2008 17:20 | | | 7.59 | 51.19 |
| 10/8/2008 17:21 | | | 0.03 | 52.83 |
| 10/8/2008 17:22 | | | 0.01 | 53.41 |
| 10/8/2008 17:23 | | | 0.01 | 53.66 |
| 10/8/2008 17:24 | | | 0.00 | 53.85 |
| 10/8/2008 17:25 | | | 0.00 | 22.92 |
| 10/8/2008 17:26 | | | 0.00 | 3.88 |
| 10/8/2008 17:27 | | | 0.00 | 25.87 |
| 10/8/2008 17:28 | | | 2.16 | 71.90 |
| 10/8/2008 17:29 | | 0.14 | 6.50 | 75.37 |
| 10/8/2008 17:30 | | 0.21 | 6.44 | 75.30 |
| 10/8/2008 17:31 | | 1.11 | 6.53 | 75.16 |
| 10/8/2008 17:32 | | 40.06 | 6.52 | 74.02 |
| 10/8/2008 17:33 | | 52.68 | 6.42 | 73.30 |
| 10/8/2008 17:34 | | 52.78 | 6.50 | 72.67 |
| 10/8/2008 17:35 | | 52.79 | 6.52 | 73.23 |
| 10/8/2008 17:36 | | 52.77 | 6.49 | 73.03 |
| 10/8/2008 17:37 | | 52.78 | 6.56 | 73.11 |
| 10/8/2008 17:38 | | 52.80 | 6.43 | 73.71 |
| /8/2008 17:39 | | 52.80 | 6.54 | 74.11 |
| 0/8/2008 17:40 | | 52.74 | 6.60 | 73.72 |
| 10/8/2008 17:41 | | 52.71 | 6.38 | 73.56 |
| 10/8/2008 17:42 | | 52.72 | 6.50 | 74.11 |
| 10/8/2008 17:43 | | 52.69 | 6.54 | 74.30 |
| 10/8/2008 17:44 | | 52.68 | 6.42 | 74.62 |
| 10/8/2008 17:45 | | 52.62 | 6.61 | 74.51 |
| 10/8/2008 17:46 | | 52.66 | 6.47 | 74.03 |
| 10/8/2008 17:47 | | 52.59 | 6.56 | 74.27 |
| 10/8/2008 17:48 | | 52.62 | 6.55 | 74.21 |
| 10/8/2008 17:49 | | 52.54 | 6.46 | 73.84 |
| 10/8/2008 17:50 | | 52.57 | 6.63 | 72.83 |
| 10/8/2008 17:51 | | 52.60 | 6.60 | 72.69 |
| 10/8/2008 17:52 | | 52.62 | 6.56 | 72.59 |
| 10/8/2008 17:53 | | 52.60 | 6.65 | 72.33 |
| 10/8/2008 17:54 | | 52.55 | 6.51 | 72.75 |
| 10/8/2008 17:55 | | 52.52 | 6.55 | 73.08 |
| 10/8/2008 17:56 | | 52.55 | 6.72 | 72.89 |
| 10/8/2008 17:57 | | 52.52 | 6.62 | 72.11 |
| 10/8/2008 17:58 | | 52.52 | 6.58 | 72.24 |
| 10/8/2008 17:59 | | 52.54 | 6.59 | 72.47 |
| 10/8/2008 18:00 | | 52.51 | 6.63 | 72.26 |
| 10/8/2008 18:01 | | 52.51 | 6.65 | 71.34 |
| 10/8/2008 18:02 | | 52.46 | 6.63 | 71.31 |
| 10/8/2008 18:03 | | 52.45 | 6.60 | 70.68 |
| 10/8/2008 18:04 | | 52.42 | 6.59 | 69.42 |
| 10/8/2008 18:05 | | 52.37 | 6.70 | 68.30 |
| 10/8/2008 18:06 | | 52.37 | 6.59 | 68.45 |
| 10/8/2008 18:07 | | 52.40 | 6.71 | 68.10 |
| 10/8/2008 18:08 | | 52.32 | 6.63 | 67.93 |
| 10/8/2008 18:09 | | 52.30 | 6.66 | 67.99 |
| 10/8/2008 18:10 | | 52.31 | 6.74 | 67.27 |
| 10/8/2008 18:11 | | 52.27 | 6.63 | 66.52 |
| 10/8/2008 18:12 | | 52.25 | 6.69 | |

NOx Converter Efficiency

| | | | |
|---|---|---|---|
| 10/8/2008 18:13 | 52.22 | 6.69 | 66.86 |
| 10/8/2008 18:14 | 52.22 | 6.70 | 66.83 |
| 10/8/2008 18:15 | 52.16 | 6.73 | 66.35 |
| 10/8/2008 18:16 | 52.14 | 6.69 | 66.77 |
| 10/8/2008 18:17 | 52.09 | 6.71 | 66.21 |
| 10/8/2008 18:18 | 52.12 | 6.76 | 66.12 |
| 10/8/2008 18:19 | 52.09 | 6.76 | 66.49 |
| 10/8/2008 18:20 | 52.00 | 6.86 | 66.56 |
| 10/8/2008 18:21 | 52.00 | 6.70 | 66.67 |
| 10/8/2008 18:22 | 51.92 | 6.76 | 67.36 |
| 10/8/2008 18:23 | 51.89 | 6.87 | 67.59 |
| 10/8/2008 18:24 | 51.72 | 6.74 | 67.83 |
| 10/8/2008 18:25 | 51.54 | 6.88 | 69.92 |
| 10/8/2008 18:26 | 51.34 | 6.79 | 67.95 |
| 10/8/2008 18:27 | 51.05 | 6.72 | 67.23 |
| 10/8/2008 18:28 | 50.40 | 6.91 | 67.29 |
| 10/8/2008 18:29 | 45.25 | 6.83 | 67.36 |
| 10/8/2008 18:30 | | 6.76 | 66.86 |
| 10/8/2008 18:31 | | 6.91 | 67.07 |
| 10/8/2008 18:32 | | 5.16 | 53.99 |
| 10/8/2008 18:33 | | 0.14 | 5.17 |
| 10/8/2008 18:34 | | 0.13 | 2.92 |
| 10/8/2008 18:35 | | 0.06 | 2.37 |
| 10/8/2008 18:36 | | 0.04 | 2.14 |
| 10/8/2008 18:37 | | 0.50 | 2.06 |
| 10/8/2008 18:38 | | 11.79 | 1.91 |
| 10/8/2008 18:39 | | 12.02 | 1.84 |
| 10/8/2008 18:40 | | 12.03 | 1.81 |
| 10/8/2008 18:41 | | 11.04 | 4.45 |
| 10/8/2008 18:42 | | 0.20 | 48.39 |
| 10/8/2008 18:43 | | 0.10 | 52.11 |
| 10/8/2008 18:44 | | 0.09 | 52.85 |
| 10/8/2008 18:45 | | 0.09 | 53.12 |
| 10/8/2008 18:46 | | 0.08 | 53.31 |
| 10/8/2008 18:47 | | 0.07 | 53.43 |
| 10/8/2008 18:48 | | 0.12 | 12.38 |
| 10/8/2008 18:49 | | 19.27 | 4.45 |

File Name: C:\CPData\SampleData\H2S.CAL
Version: 1

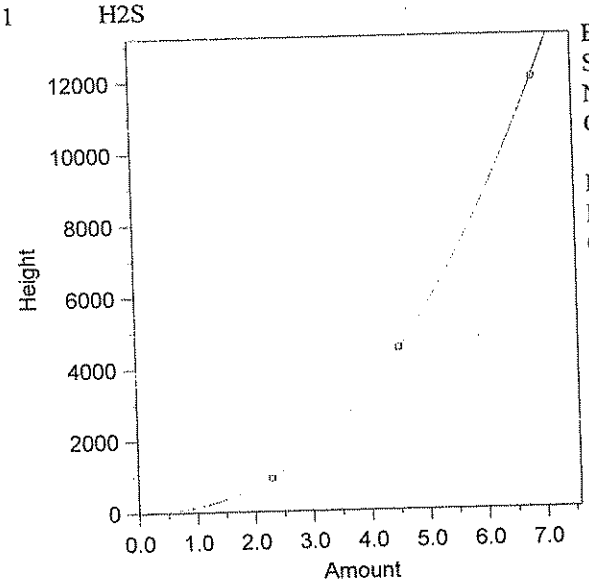
Creator: John Johnston
Description:
Reason for change:

External standard calibration
Standard injection volume: 1
Standard sample weight: 1
Area reject threshold: 100
Reference peak area reject threshold: 100
Amount units: ppm
No default component

Method of calculating data point averages: Equal weight for all updates
Print calibration update report

All levels are normal data points.

1 H2S




Expected retention time: 0.93 minutes
Search window: 0.03 minutes
No retention time reference component
Group number: 0

High alarm limit: 0.1
Low alarm limit: 100
Component constant: 0.23

Single peak quantification by height

Y = 133.4241 X^2.33258

Power fit with equal weighting, forced to origin
Coefficient of determination: 0.9999737
Average error: 0.316%
Average CF: 1047.061
RSD: 64.114%

| Level | Amount | Response | Cal Factor | Error, % | Source | Date and time |
|---|---|---|---|---|---|---|
| 1 | 2.29 | 920 | 401.7467 | -0.182 | Manual | 10/8/2008 5:51:30 AM |
| 2 | 4.51 | 4500 | 997.7827 | 0.475 | Manual | 10/8/2008 5:51:19 AM |
| 3 | 6.89 | 12000 | 1741.655 | -0.291 | Manual | 10/8/2008 5:50:55 AM |

**Southwestern Laboratories, Inc.**
**Air Emission Services**
**Houston, Texas**

| Company: Citgo Refining | Source: West SRU | Date: 10/8/2008 |
|---|---|---|

| Component | Top 3 ppm | Permeation Values Acceptable Drift Limit +/- 5% | | |
|---|---|---|---|---|
| $H_2S$ | 6.89 | 6.55 | to | 7.23 |

GC Model: Shimazdu 14A
Serial No.: C10552911934YS
Col. Temp.: 42°C Isothermal
Inj. Temp.: 135°C
H2 flow: 90 kPa
Air flow: 46 kPa

| Component | Top 5 ppm | Permeation Values Acceptable Drift Limit +/- 5% | | |
|---|---|---|---|---|
| $H_2S$ | 4.51 | 4.28 | to | 4.74 |

Chart speed: NA
Car. Gas flow: 128 kPa
Det. Temp.: 250°C
Inj. Vol.(ml): 100 µl
Sample flow: 100 ml/min
FPD Temp.: 250°C

| Component | Top 11 ppm | Permeation Values Acceptable Drift Limit +/- 5% | | |
|---|---|---|---|---|
| $H_2S$ | 2.29 | 2.18 | to | 2.40 |

**GC Calibration Values - Pretest**
**10/8/2008 AM**

| Injection 1 | Injection 2 | Injection 3 | Avg. of the 3 Inj. | Acceptable Drift Limit +/- 5% | | |
|---|---|---|---|---|---|---|
| 6.62 | 6.69 | 6.75 | 6.69 | 6.35 | to | 7.02 |

**GC Calibration Values - Post Test**
**10/8/2008 PM**

| Injection 1 | Injection 2 | Injection 3 | Avg. of the 3 Inj. | Acceptable Drift Limit +/- 5% | | |
|---|---|---|---|---|---|---|
| 6.67 | 6.69 | 6.68 | 6.68 | 6.35 | to | 7.01 |

**GC Calibration Values - Pretest**
**10/8/2008 AM**

| Injection 1 | Injection 2 | Injection 3 | Avg. of the 3 Inj. | Acceptable Drift Limit +/- 5% | | |
|---|---|---|---|---|---|---|
| 4.52 | 4.55 | 4.53 | 4.53 | 4.31 | to | 4.76 |

**GC Calibration Values - Post Test**
**10/8/2008 PM**

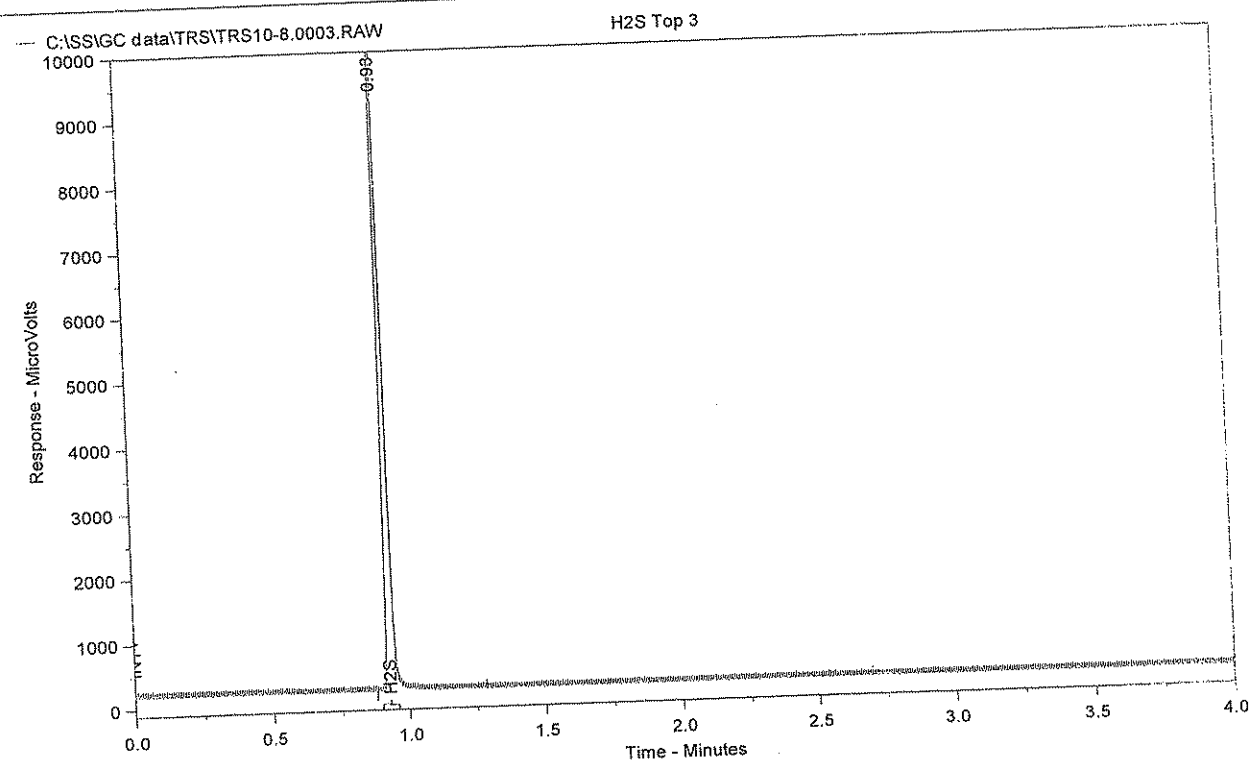
| Injection 1 | Injection 2 | Injection 3 | Avg. of the 3 Inj. | Acceptable Drift Limit +/- 5% | | |
|---|---|---|---|---|---|---|
| 4.39 | 4.41 | 4.39 | 4.40 | 4.18 | to | 4.62 |

**GC Calibration Values - Pretest**
**10/8/2008 AM**

| Injection 1 | Injection 2 | Injection 3 | Avg. of the 3 Inj. | Acceptable Drift Limit +/- 5% | | |
|---|---|---|---|---|---|---|
| 2.30 | 2.27 | 2.32 | 2.30 | 2.18 | to | 2.41 |

**GC Calibration Values - Post Test**
**10/8/2008 PM**

| Injection 1 | Injection 2 | Injection 3 | Avg. of the 3 Inj. | Acceptable Drift Limit +/- 5% | | |
|---|---|---|---|---|---|---|
| 2.31 | 2.27 | 2.24 | 2.27 | 2.16 | to | 2.39 |




Sample Name = **H2S Top 3**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\SS\GC data\TRS\TRS10-8.0003.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 5:02:10 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 6.62 | 10947.5 | 11823 | BB | 0.01 |

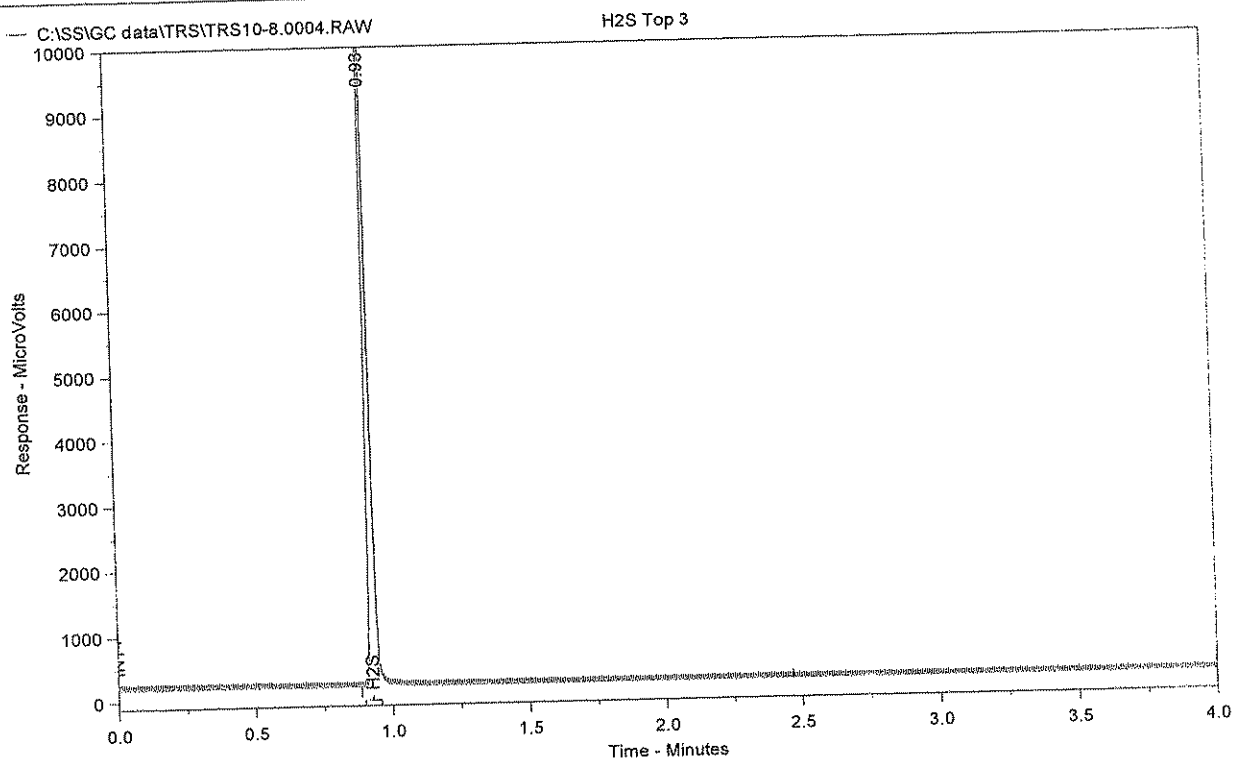
Total Area = 11823.25

Total Height = 10947.45

Total Amount = 6.61583



Printed on 10/8/2008 5:54:17 AM




Sample Name = **H2S Top 3**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\SS\GC data\TRS\TRS10-8.0004.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

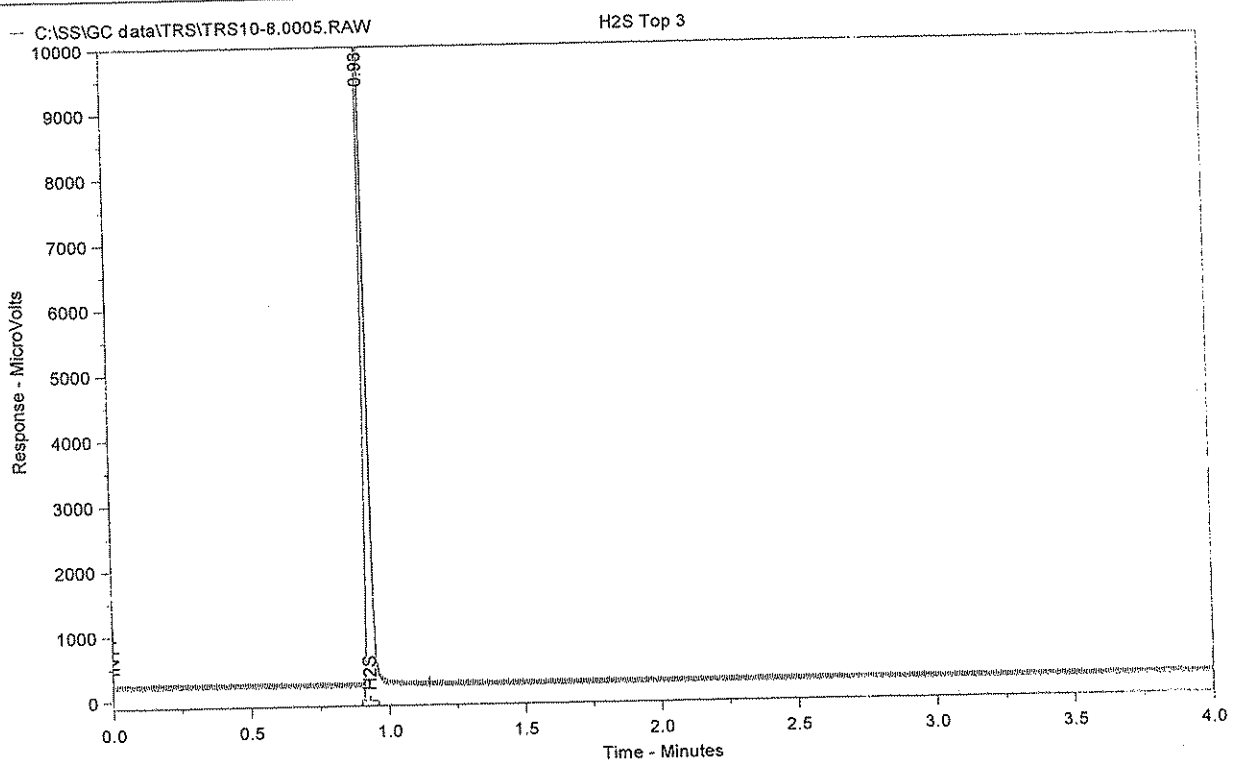
Date Taken (end) = 10/8/2008 5:08:10 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 6.69 | 11234.9 | 15086 | BB | 0.01 |

Total Area = 15086.09

Total Height = 11234.93

Total Amount = 6.689758




Sample Name = **H2S Top 3**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\SS\GC data\TRS\TRS10-8.0005.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

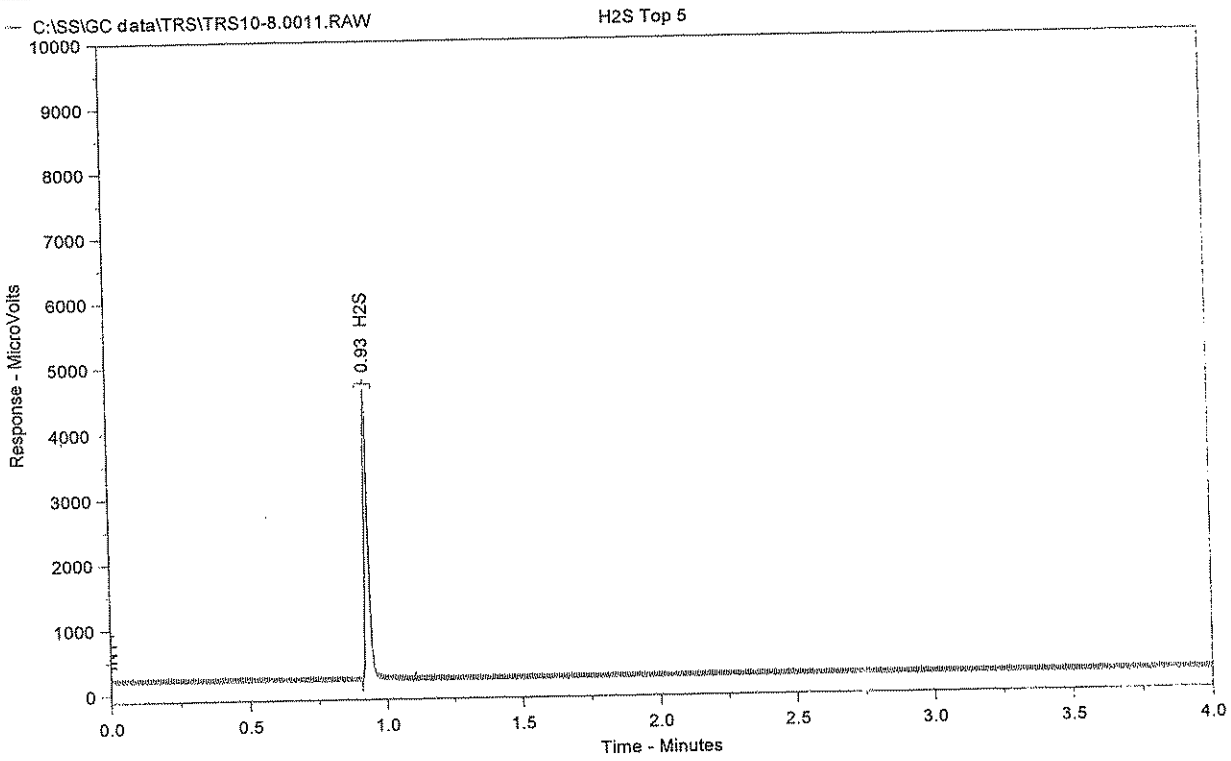
Date Taken (end) = 10/8/2008 5:14:10 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 6.75 | 11478.9 | 12053 | BB | 0.01 |

Total Area = 12052.59

Total Height = 11478.92

Total Amount = 6.75166




Sample Name = **H2S Top 5**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\SS\GC data\TRS\TRS10-8.0011.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

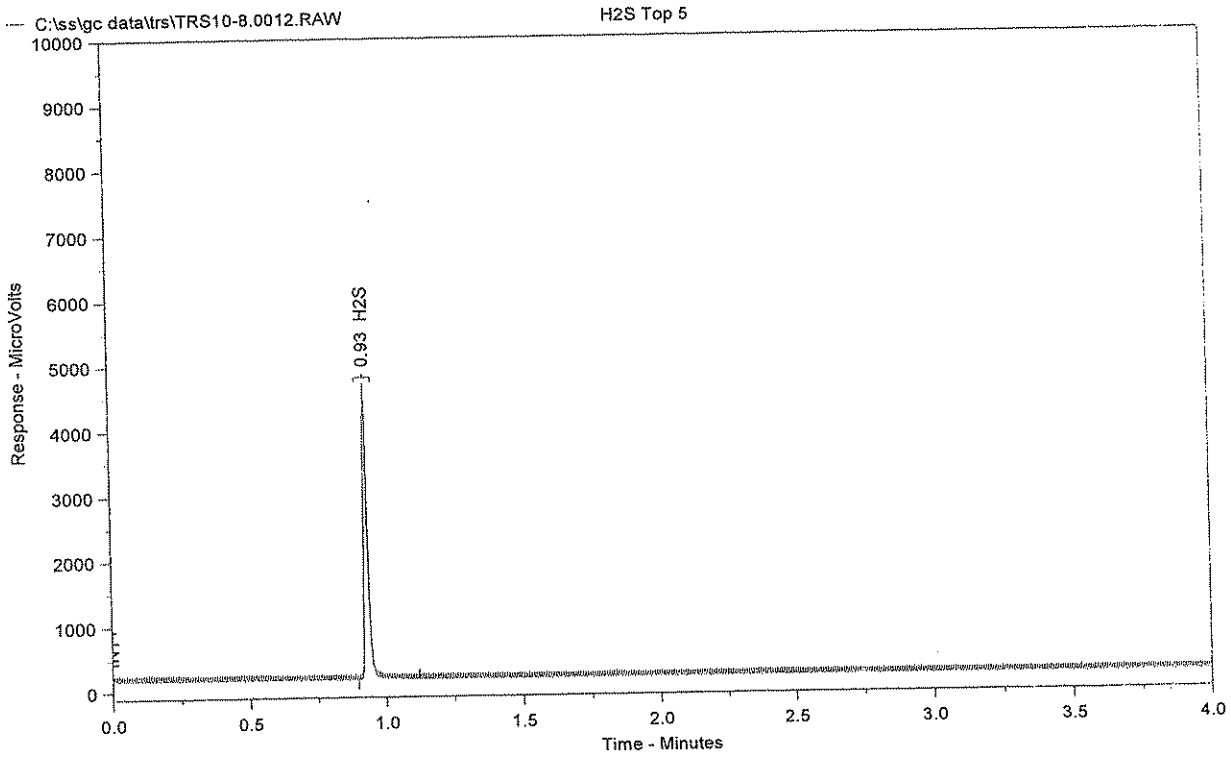
Date Taken (end) = 10/8/2008 5:50:10 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 4.52 | 4493.1 | 4860 | BB | 0.01 |

Total Area = 4860.151

Total Height = 4493.054

Total Amount = 4.516183




Sample Name = **H2S Top 5**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0012.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

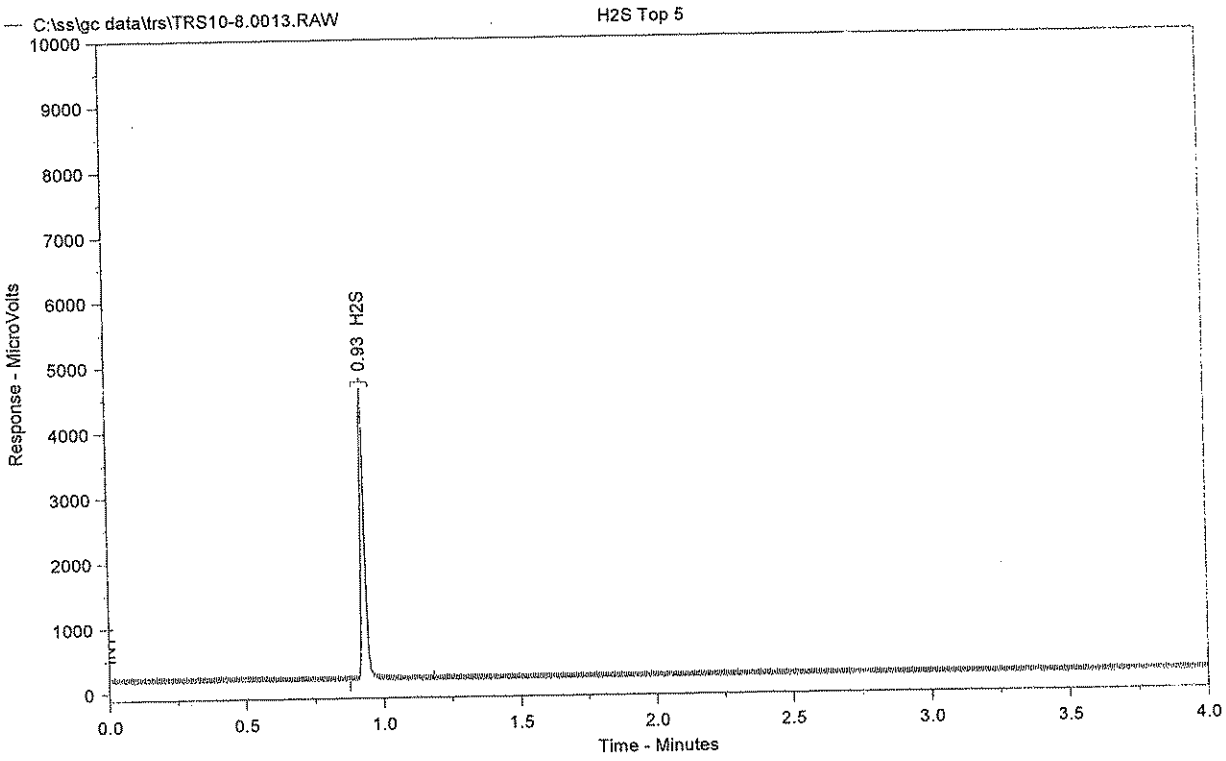
Date Taken (end) = 10/8/2008 5:56:11 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 4.55 | 4565.9 | 4927 | BB | 0.01 |

Total Area = 4927.047

Total Height = 4565.948

Total Amount = 4.547451




Sample Name = **H2S Top 5**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0013.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

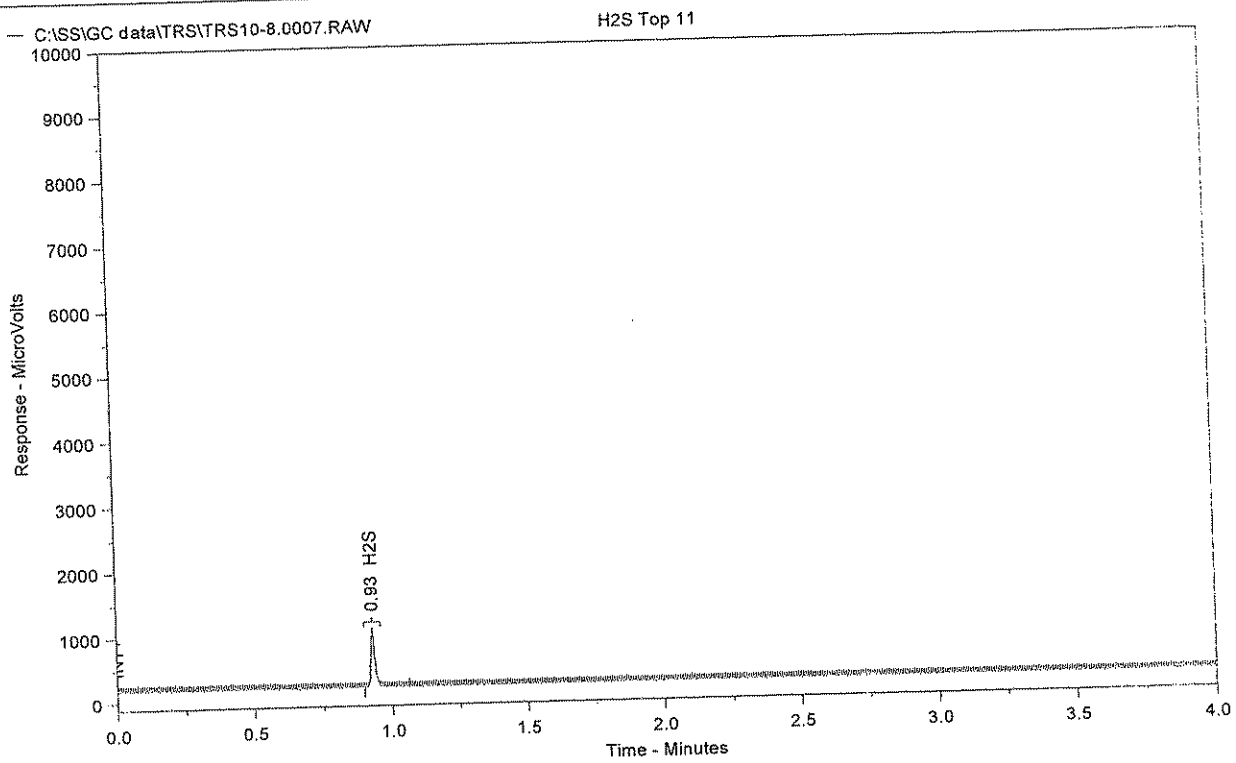
Date Taken (end) = 10/8/2008 6:02:11 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 4.53 | 4529.4 | 5189 | BB | 0.01 |

Total Area = 5189.483

Total Height = 4529.371

Total Amount = 4.531797




Sample Name = **H2S Top 11**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\SS\GC data\TRS\TRS10-8.0007.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

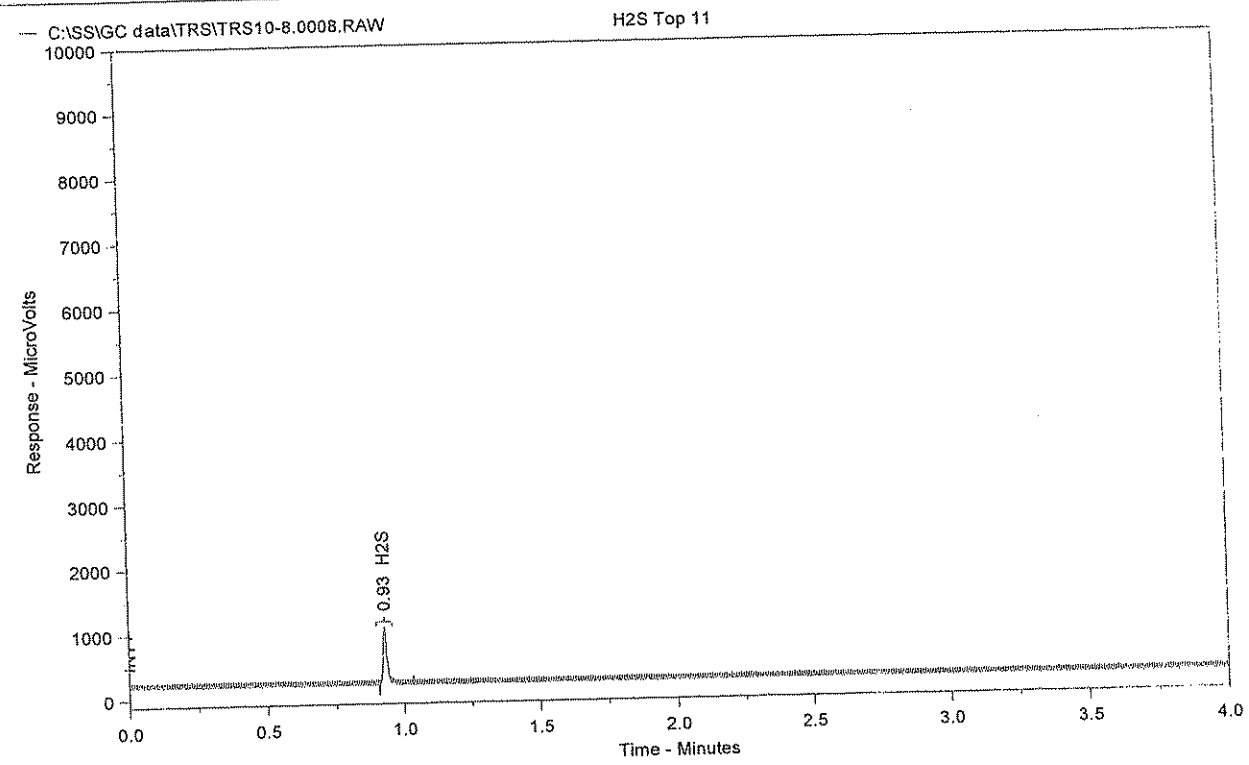
Date Taken (end) = 10/8/2008 5:26:10 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 2.30 | 935.1 | 1163 | BB | 0.01 |

Total Area = 1163.305

Total Height = 935.099

Total Amount = 2.304236




Sample Name = **H2S Top 11**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\SS\GC data\TRS\TRS10-8.0008.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

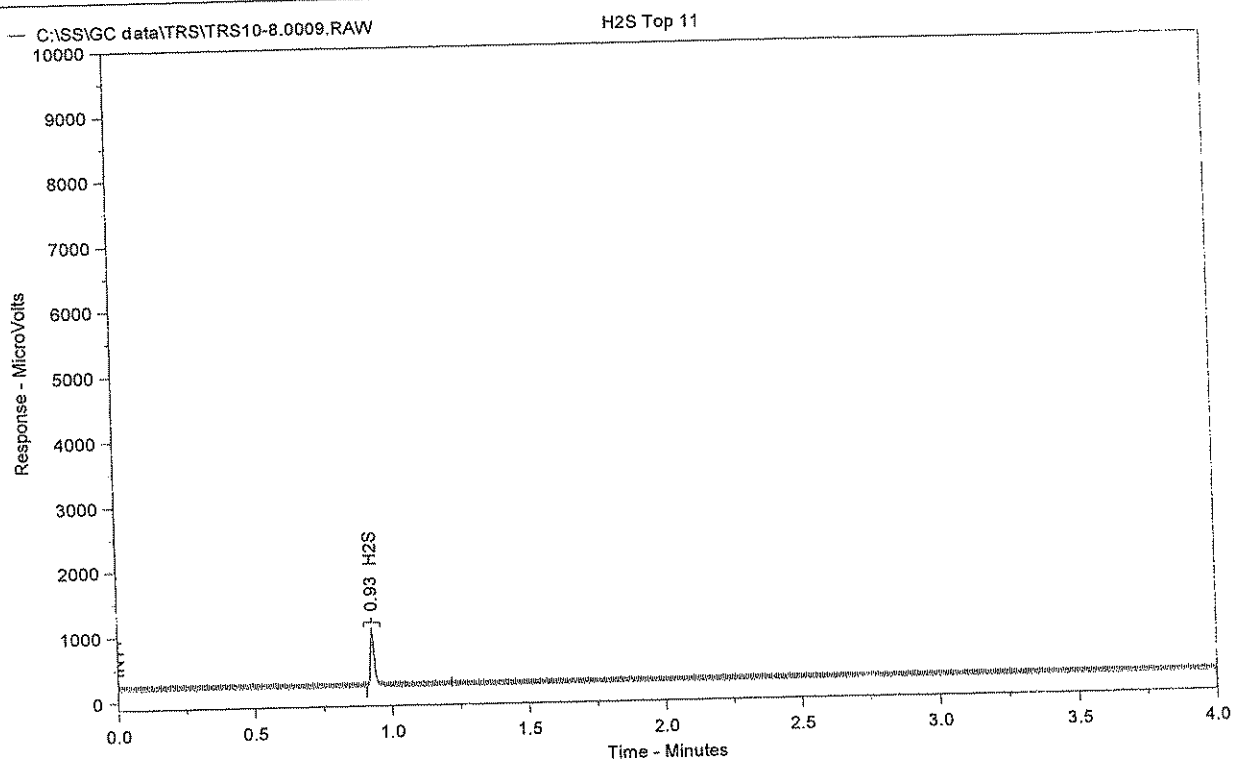
Date Taken (end) = 10/8/2008 5:32:10 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 2.27 | 900.1 | 1082 | BB | 0.01 |

Total Area = 1081.894

Total Height = 900.1124

Total Amount = 2.266873




Sample Name = **H2S Top 11**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\SS\GC data\TRS\TRS10-8.0009.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

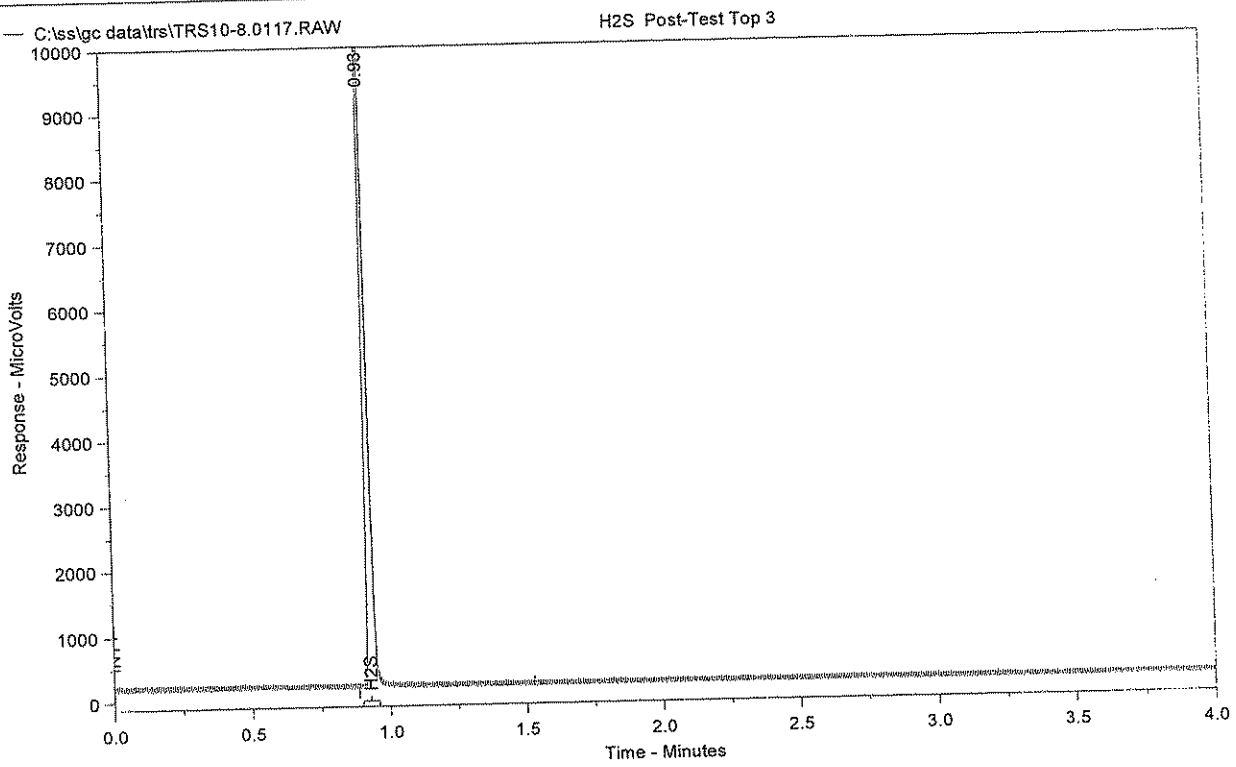
Date Taken (end) = 10/8/2008 5:38:10 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 2.32 | 946.1 | 1543 | BB | 0.01 |

Total Area = 1543.379

Total Height = 946.1273

Total Amount = 2.315847




Sample Name = **H2S Post-Test Top 3**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0117.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

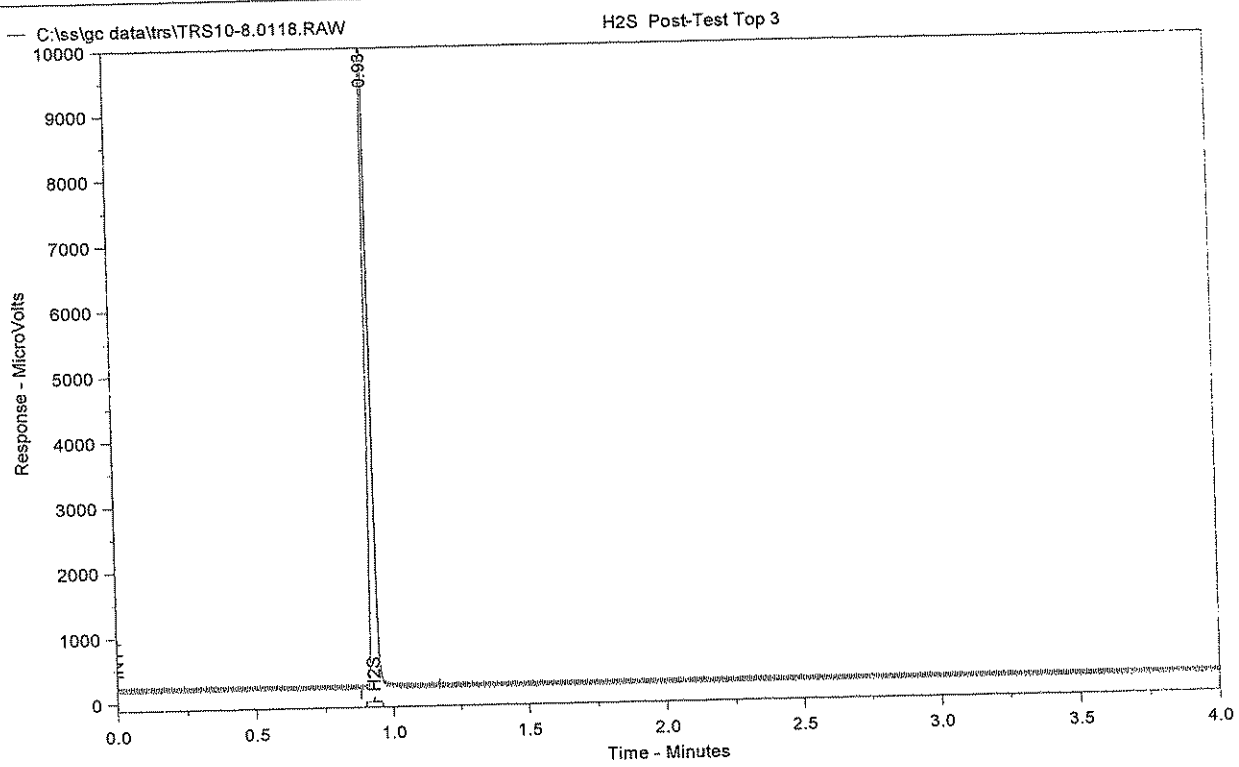
Date Taken (end) = 10/8/2008 5:38:55 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 6.67 | 11145.9 | 12151 | BB | 0.01 |

Total Area = 12151.14

Total Height = 11145.94

Total Amount = 6.666989




Sample Name = **H2S Post-Test Top 3**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0118.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

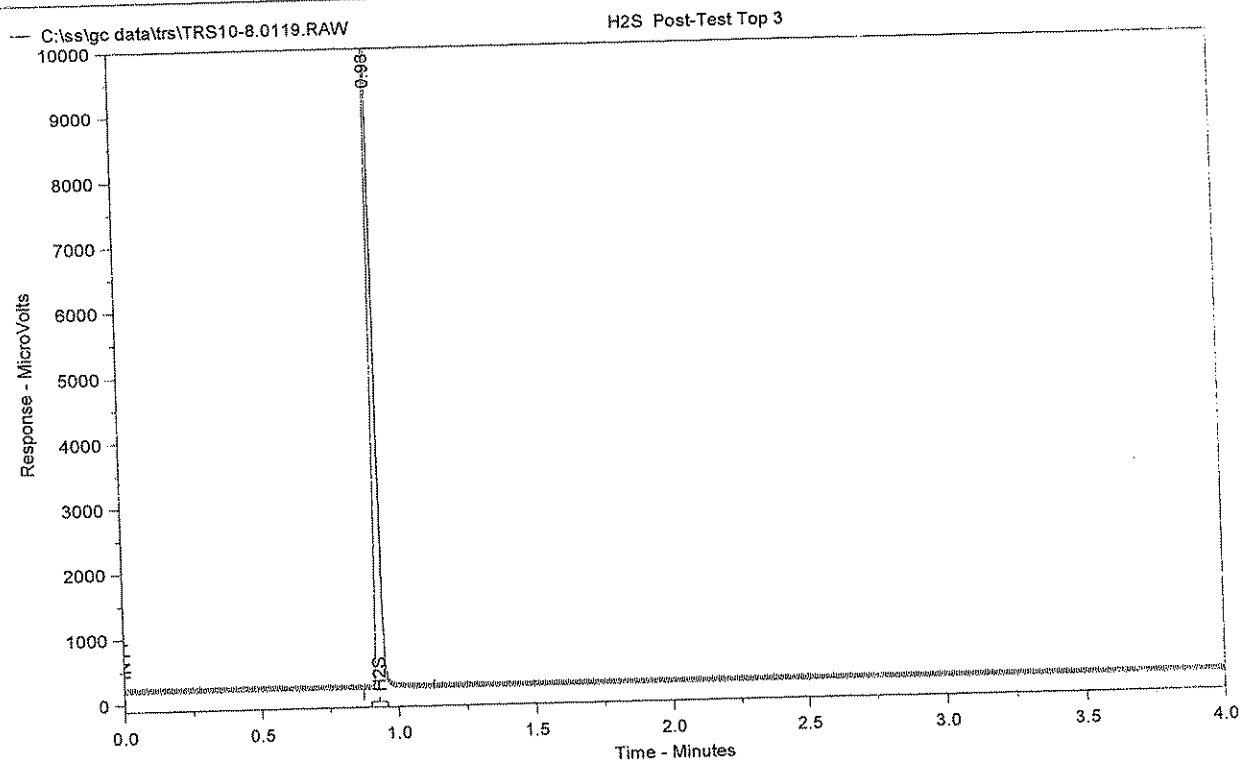
Date Taken (end) = 10/8/2008 5:44:56 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 6.69 | 11216.5 | 11413 | BB | 0.01 |

Total Area = 11413.43

Total Height = 11216.53

Total Amount = 6.685058




Sample Name = **H2S Post-Test Top 3**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0119.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

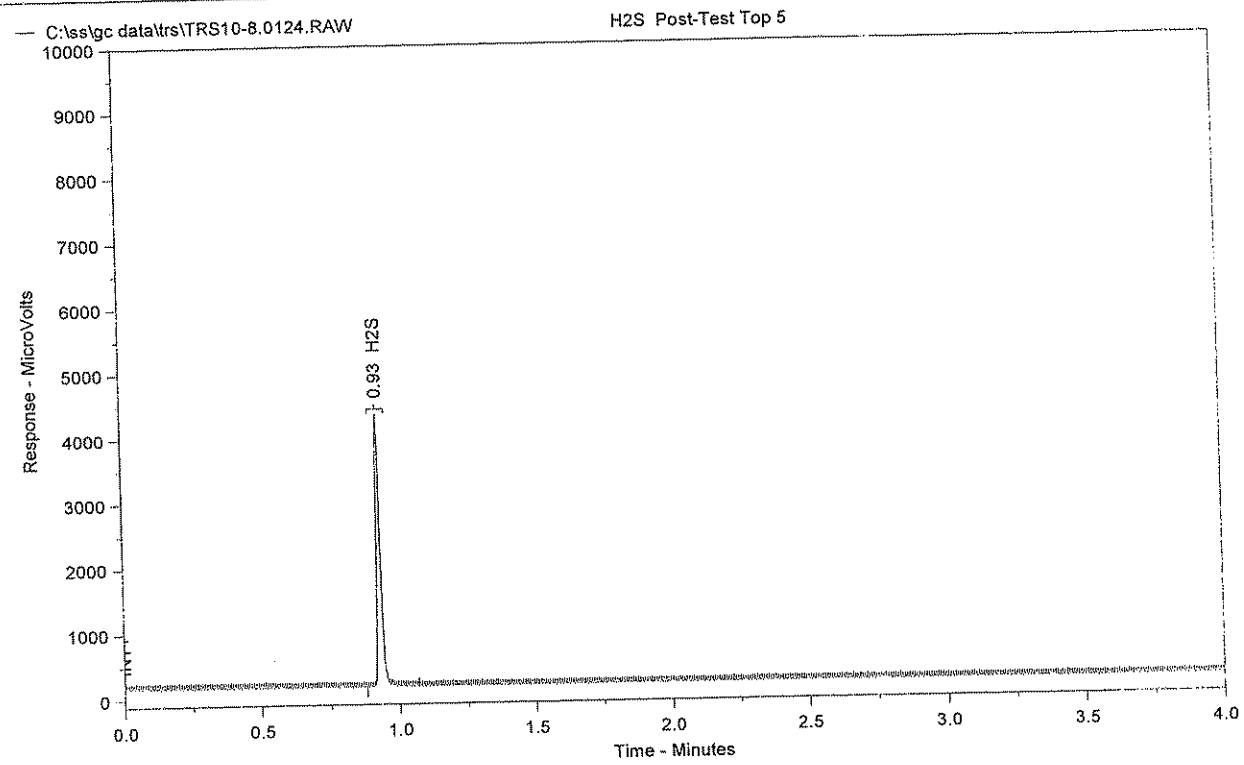
Date Taken (end) = 10/8/2008 5:50:56 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 6.68 | 11188.6 | 11431 | BB | 0.01 |

Total Area = 11431.12

Total Height = 11188.55

Total Amount = 6.677906




Sample Name = **H2S Post-Test Top 5**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0124.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

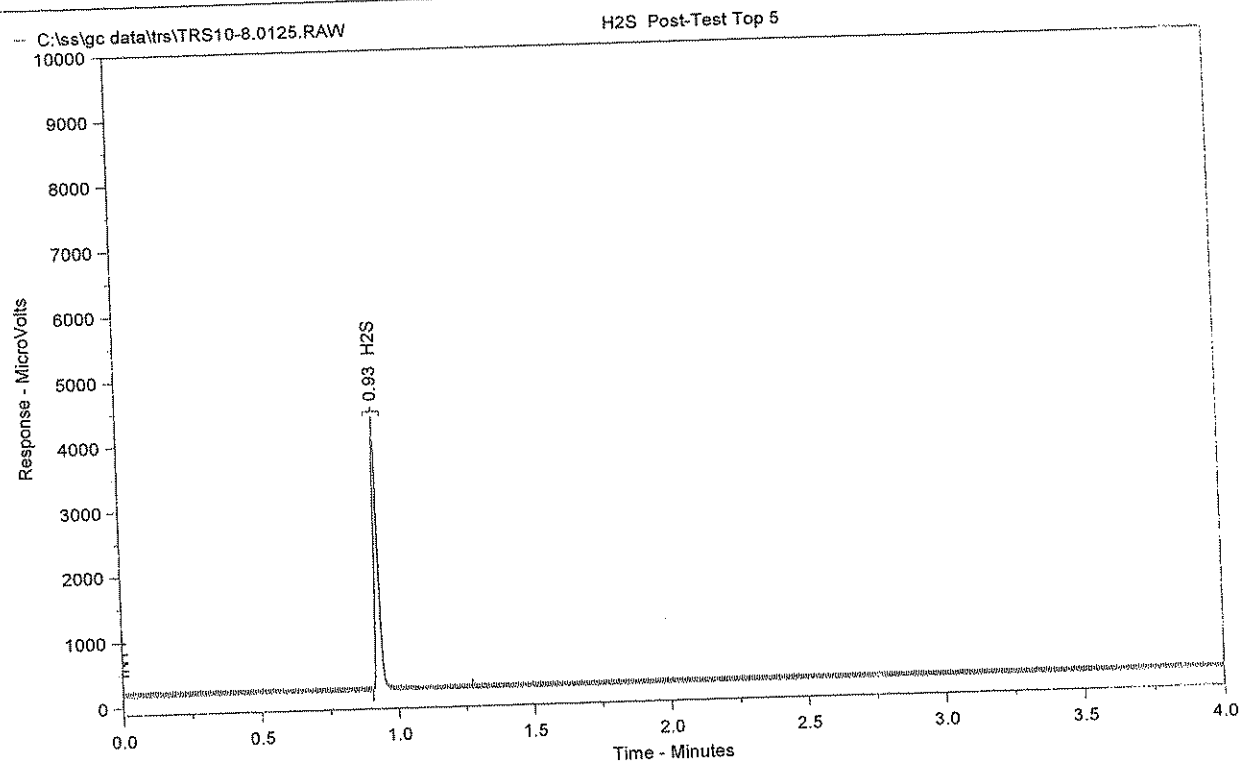
Date Taken (end) = 10/8/2008 6:20:56 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 4.39 | 4207.6 | 4412 | BB | 0.01 |

Total Area = 4412.328

Total Height = 4207.582

Total Amount = 4.390859




Sample Name = **H2S Post-Test Top 5**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0125.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

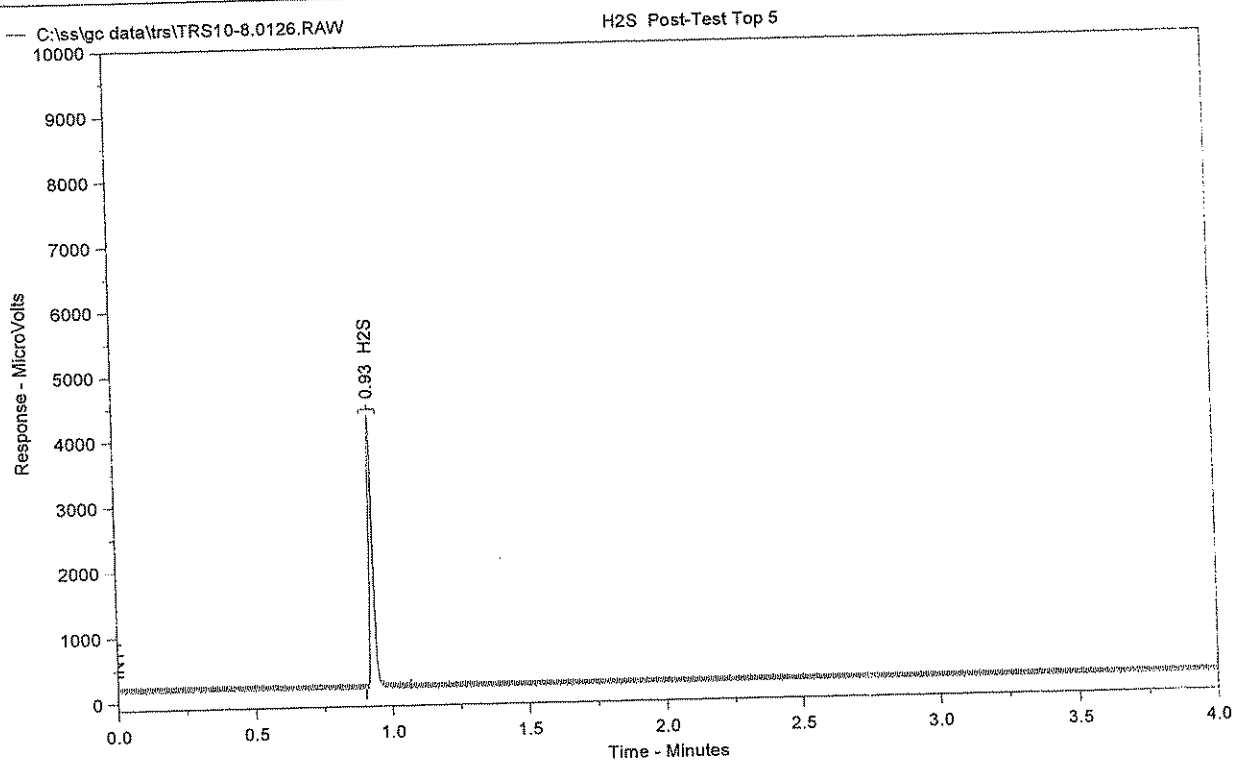
Date Taken (end) = 10/8/2008 6:26:57 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 4.41 | 4241.1 | 4688 | BB | 0.01 |

Total Area = 4687.933

Total Height = 4241.076

Total Amount = 4.405809




Sample Name = **H2S Post-Test Top 5**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0126.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

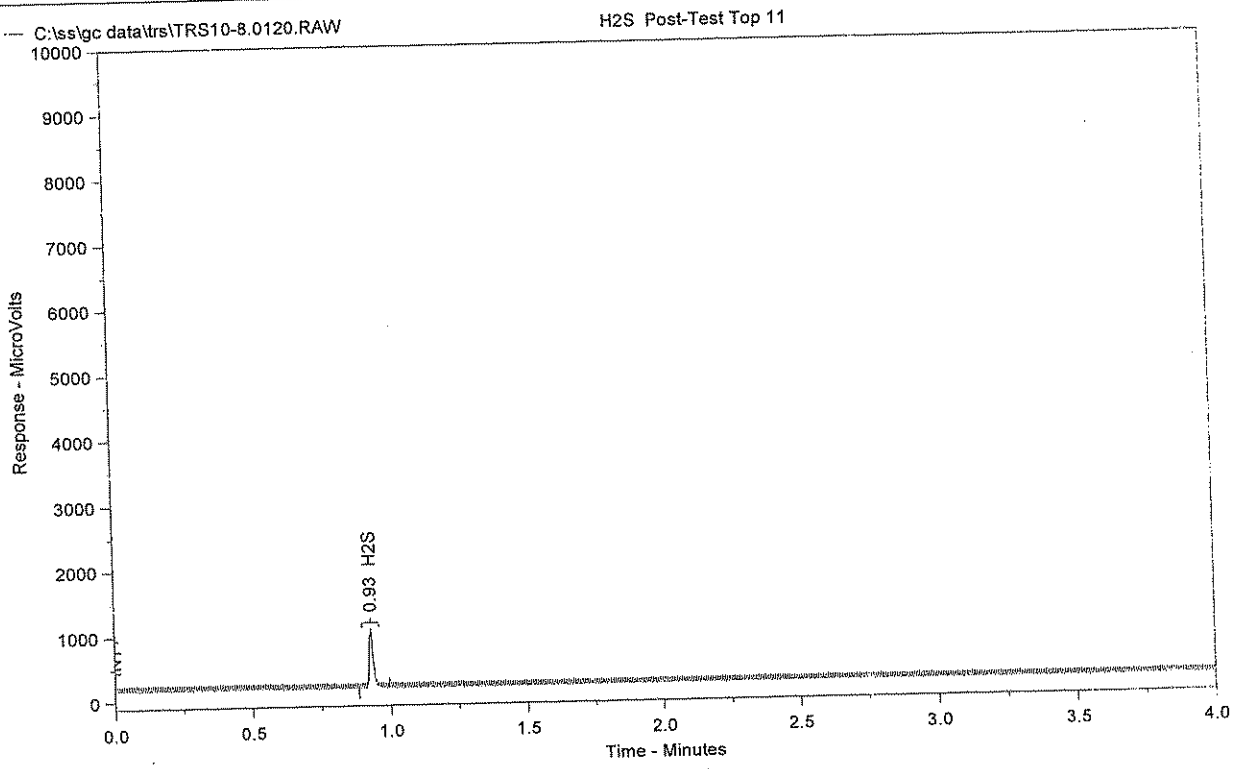
Date Taken (end) = 10/8/2008 6:32:57 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 4.39 | 4207.5 | 4391 | BB | 0.01 |

Total Area = 4390.628

Total Height = 4207.45

Total Amount = 4.3908




Sample Name = **H2S Post-Test Top 11**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0120.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

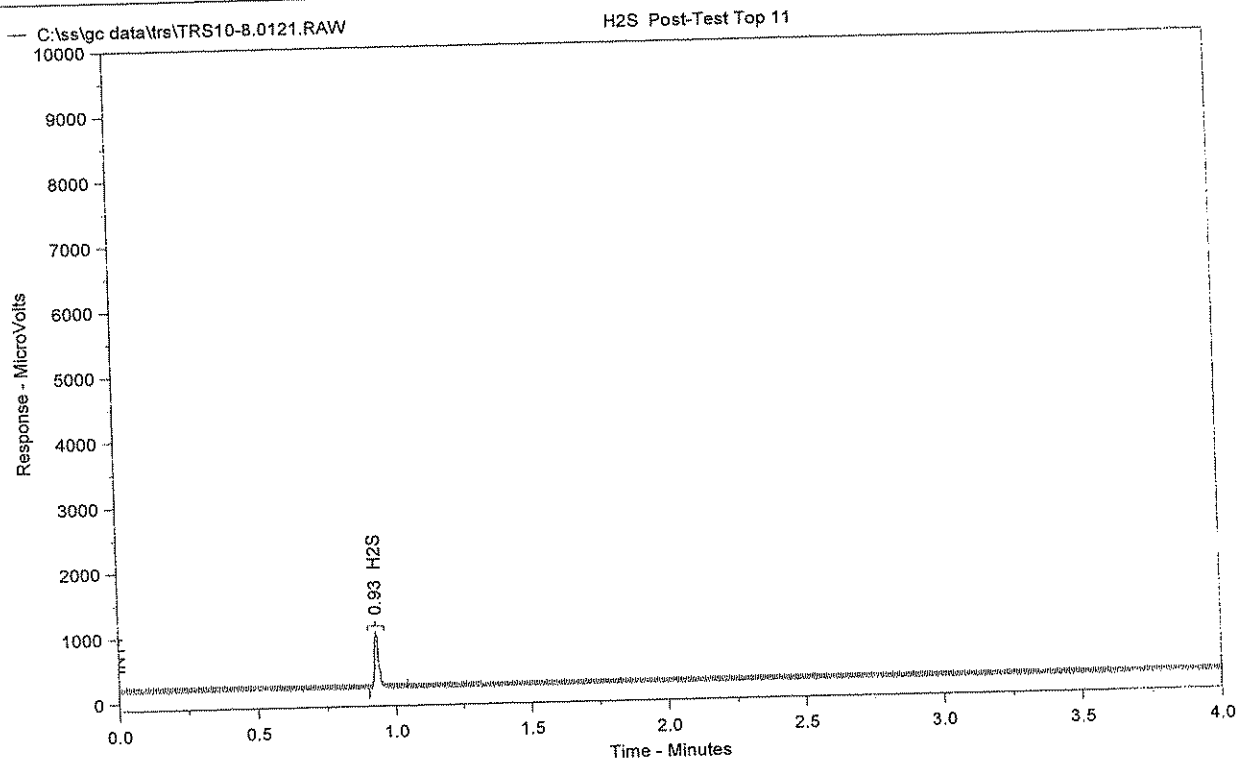
Date Taken (end) = 10/8/2008 5:56:56 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 2.31 | 936.0 | 1070 | BB | 0.01 |

Total Area = 1069.783

Total Height = 936.0228

Total Amount = 2.305212




Sample Name = **H2S Post-Test Top 11**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0121.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

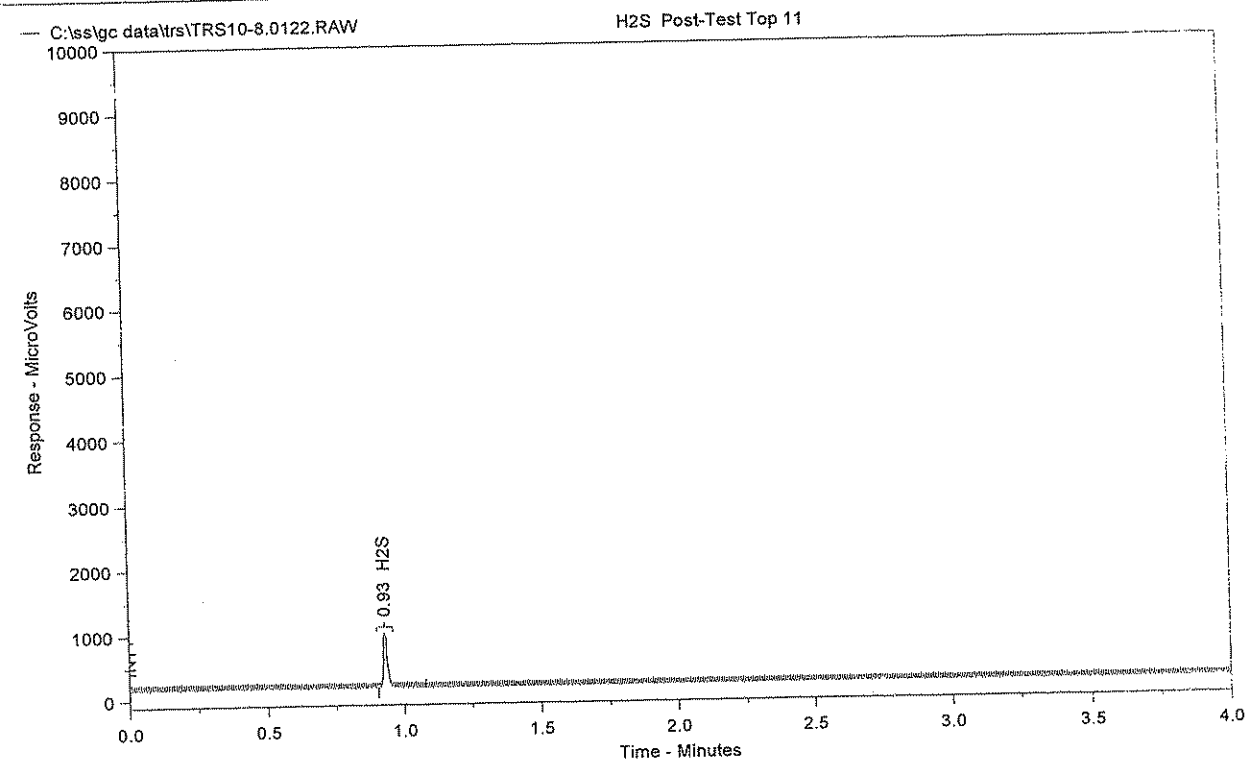
Date Taken (end) = 10/8/2008 6:02:56 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 2.27 | 898.6 | 1121 | BB | 0.01 |

Total Area = 1120.897

Total Height = 898.6444

Total Amount = 2.265287




Sample Name = **H2S Post-Test Top 11**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0122.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 6:08:56 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 2.24 | 874.6 | 1207 | BB | 0.01 |

Total Area = 1206.78

Total Height = 874.6268

Total Amount = 2.239131

**Southwestern Laboratories, Inc.**
**Air Emission Services**
**Houston, Texas**

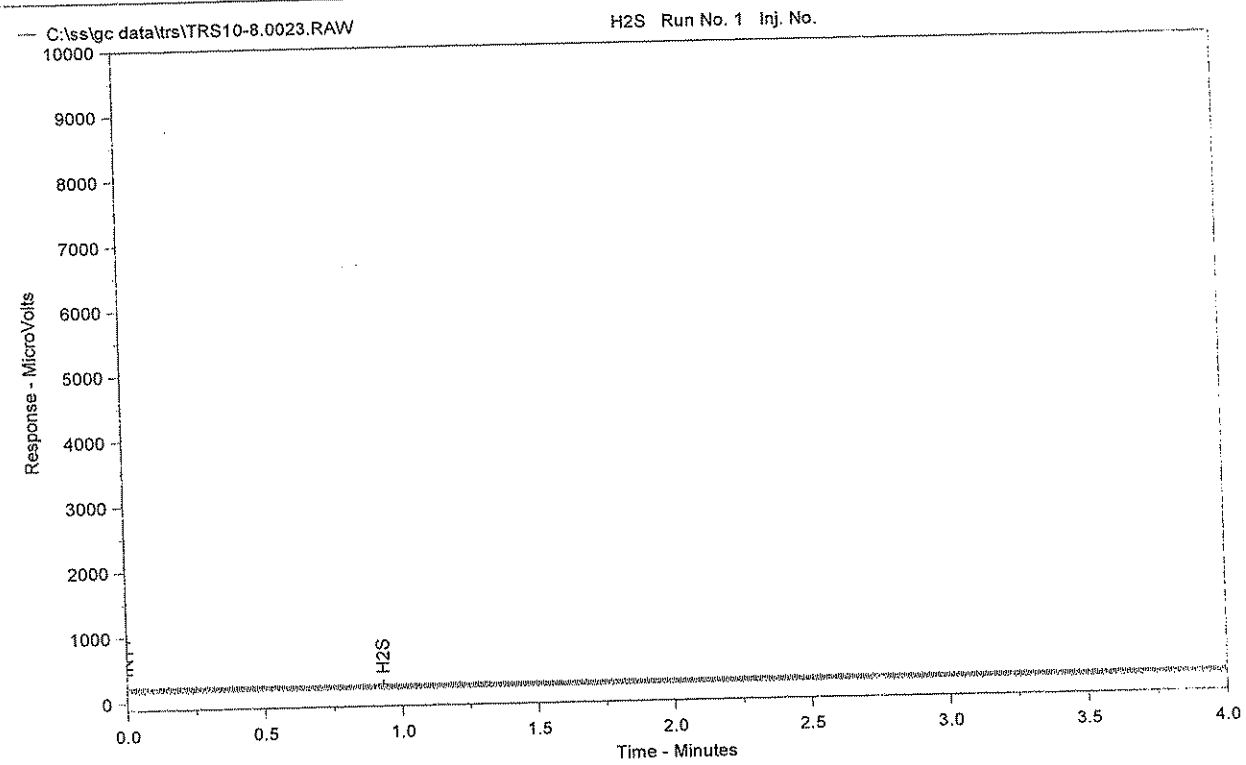
**Citgo Refining - West SRU**

| $H_2S$ Run No.1 | | | | | | | Date 10/8/2008 | | | | Time 0745-1045 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inj.1 ppmvd | Inj.2 ppmvd | Inj.3 ppmvd | Inj.4 ppmvd | Inj.5 ppmvd | Inj.6 ppmvd | Inj.7 ppmvd | Inj.8 ppmvd | Inj.9 ppmvd | Inj.10 ppmvd | Inj.11 ppmvd | Inj.12 ppmvd | Inj.13 ppmvd | Inj.14 ppmvd |
| $H_2S$ | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 |
| | Inj.15 ppmvd | Inj.16 ppmvd | Inj.17 ppmvd | Inj.18 ppmvd | Inj.19 ppmvd | Inj.20 ppmvd | Inj.21 ppmvd | Inj.22 ppmvd | Inj.23 ppmvd | Inj.24 ppmvd | Inj.25 ppmvd | Inj.26 ppmvd | Inj.27 ppmvd | Inj.28 ppmvd |
| $H_2S$ | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 |
| | Inj. 29 ppmvd | Inj. 30 ppmvd | Avg. H2S ppmvd | Line Loss % | Corr. Avg. H2S ppmvd | $O_2$ % | 3% $O_2$ ppmvd | Allowable Limit 3% $O_2$ ppmvd | Percent of Allowable Limit % | Qsd dscf/hr | $H_2S$ lb/hr | $H_2S$ lb/hr | Allowable Limit $H_2S$ lb/hr | Percent of Allowable Limit % |
| $H_2S$ | < 0.88 | < 0.88 | < 0.88 | 0.86 | < 1.02 | 6.74 | < 1.29 | 10 | < 13 | 675,742.2 | < 9.0334E-08 | < 0.06 | 0.50 | < 12.2 |

| $H_2S$ Run No.2 | | | | | | | Date 10/8/2008 | | | | Time 1046-1346 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inj.1 ppmvd | Inj.2 ppmvd | Inj.3 ppmvd | Inj.4 ppmvd | Inj.5 ppmvd | Inj.6 ppmvd | Inj.7 ppmvd | Inj.8 ppmvd | Inj.9 ppmvd | Inj.10 ppmvd | Inj.11 ppmvd | Inj.12 ppmvd | Inj.13 ppmvd | Inj.14 ppmvd |
| $H_2S$ | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 |
| | Inj.15 ppmvd | Inj.16 ppmvd | Inj.17 ppmvd | Inj.18 ppmvd | Inj.19 ppmvd | Inj.20 ppmvd | Inj.21 ppmvd | Inj.22 ppmvd | Inj.23 ppmvd | Inj.24 ppmvd | Inj.25 ppmvd | Inj.26 ppmvd | Inj.27 ppmvd | Inj.28 ppmvd |
| $H_2S$ | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 |
| | Inj. 29 ppmvd | Inj. 30 ppmvd | Avg. H2S ppmvd | Line Loss % | Corr. Avg. H2S ppmvd | $O_2$ % | 3% $O_2$ ppmvd | Allowable Limit 3% $O_2$ ppmvd | Percent of Allowable Limit % | Qsd dscf/hr | $H_2S$ lb/hr | $H_2S$ lb/hr | Allowable Limit $H_2S$ lb/hr | Percent of Allowable Limit % |
| $H_2S$ | < 0.88 | < 0.88 | < 0.88 | 0.86 | < 1.02 | 6.36 | < 1.26 | 10 | < 13 | 580,526.6 | < 9.0334E-08 | < 0.05 | 0.50 | < 10.5 |

| $H_2S$ Run No.3 | | | | | | | Date 10/8/2008 | | | | Time 1347-1647 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inj.1 ppmvd | Inj.2 ppmvd | Inj.3 ppmvd | Inj.4 ppmvd | Inj.5 ppmvd | Inj.6 ppmvd | Inj.7 ppmvd | Inj.8 ppmvd | Inj.9 ppmvd | Inj.10 ppmvd | Inj.11 ppmvd | Inj.12 ppmvd | Inj.13 ppmvd | Inj.14 ppmvd |
| $H_2S$ | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 |
| | Inj.15 ppmvd | Inj.16 ppmvd | Inj.17 ppmvd | Inj.18 ppmvd | Inj.19 ppmvd | Inj.20 ppmvd | Inj.21 ppmvd | Inj.22 ppmvd | Inj.23 ppmvd | Inj.24 ppmvd | Inj.25 ppmvd | Inj.26 ppmvd | Inj.27 ppmvd | Inj.28 ppmvd |
| $H_2S$ | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 | < 0.88 |
| | Inj. 29 ppmvd | | Avg. H2S ppmvd | Line Loss % | Corr. Avg. H2S ppmvd | $O_2$ % | 3% $O_2$ ppmvd | Allowable Limit 3% $O_2$ ppmvd | Percent of Allowable Limit % | Qsd dscf/hr | $H_2S$ lb/hr | $H_2S$ lb/hr | Allowable Limit $H_2S$ lb/hr | Percent of Allowable Limit % |
| $H_2S$ | < 0.88 | | < 0.88 | 0.86 | < 1.02 | 6.71 | < 1.29 | 10 | < 13 | 736,679.2 | < 9.0334E-08 | < 0.07 | 0.50 | < 13.3 |

Note: Non Detectable compounds are treated as zero.




Sample Name = **H2S Run No. 1 Inj. No.**

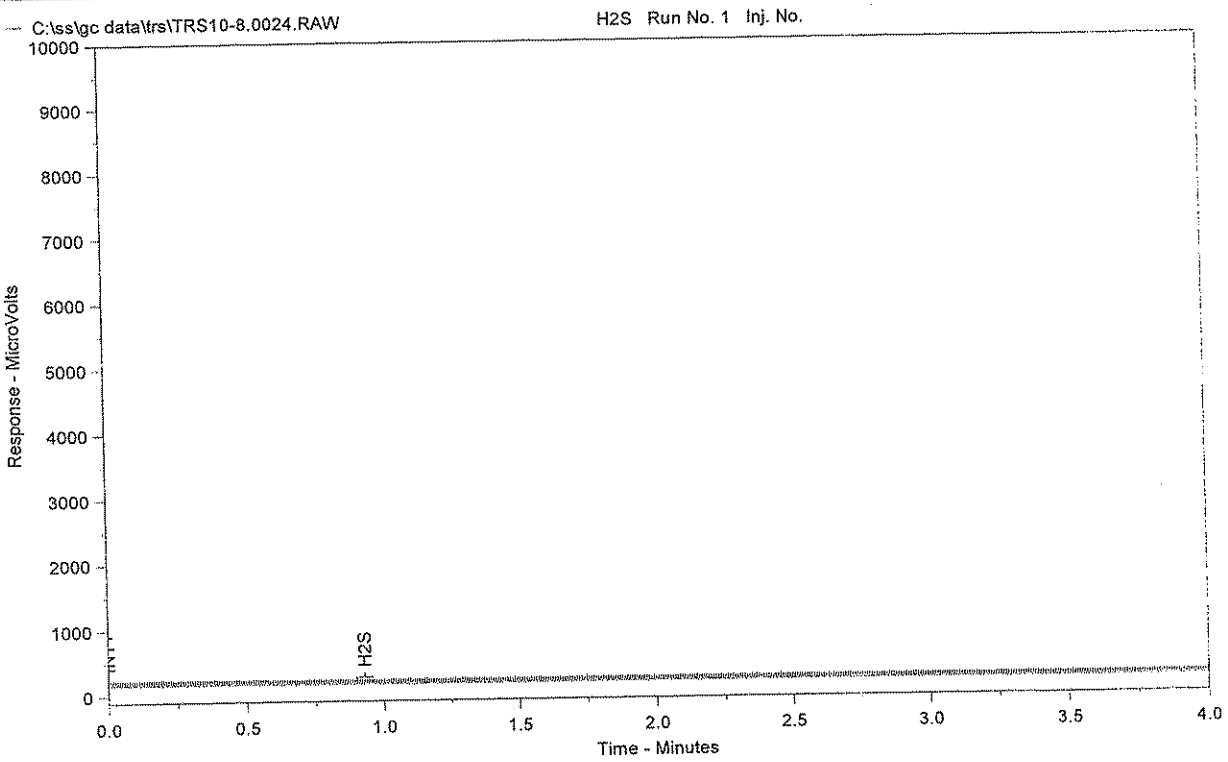
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0023.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 7:49:15 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 2

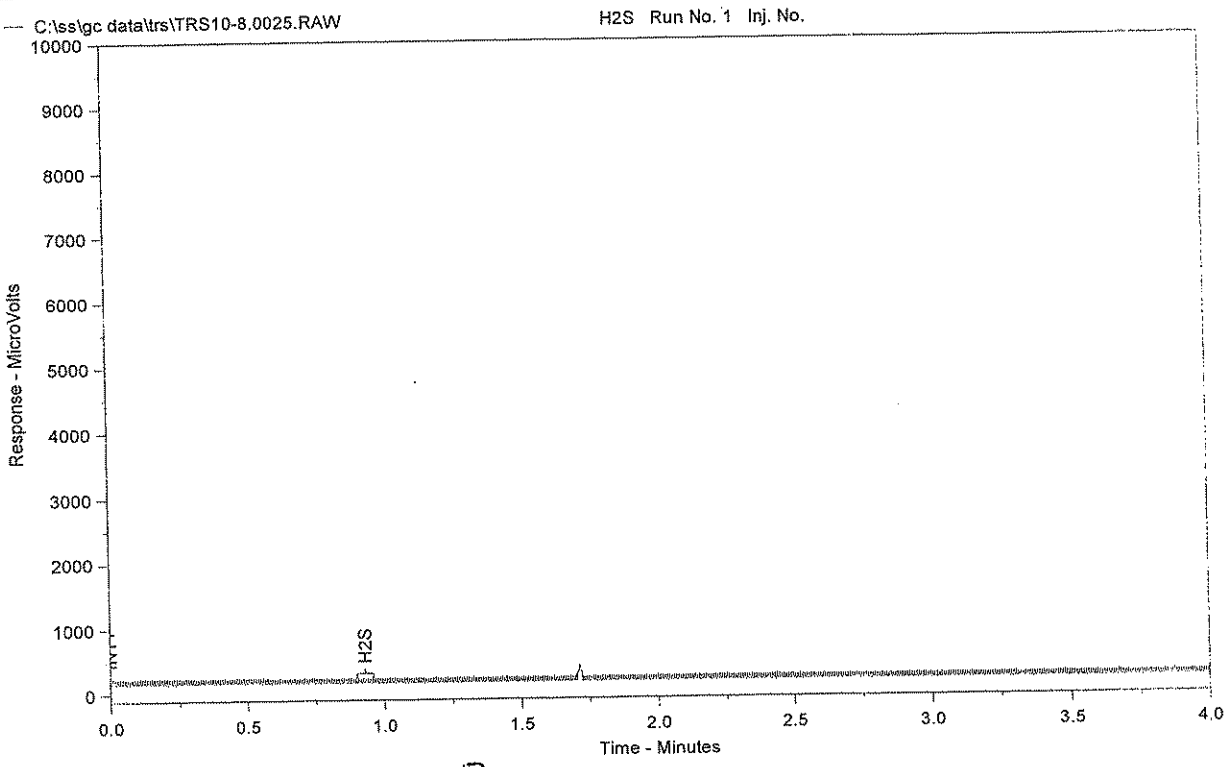
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0024.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 7:55:15 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 3

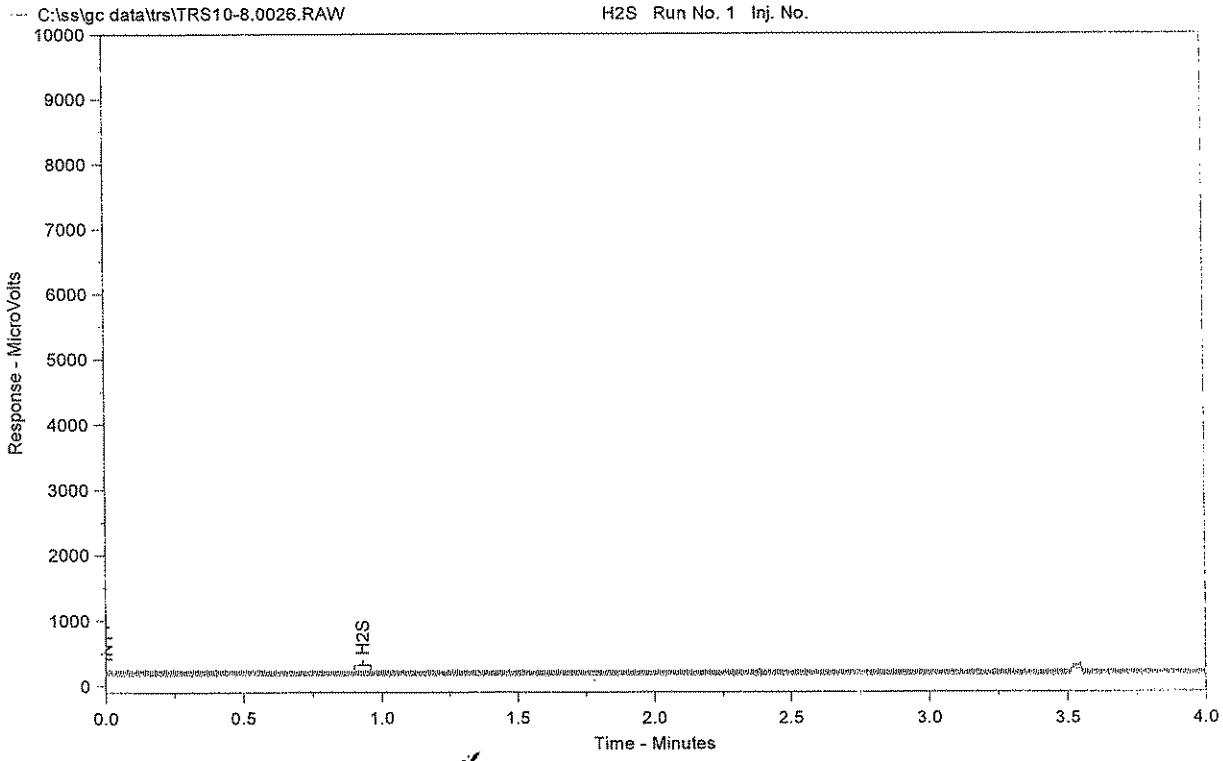
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0025.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 8:01:15 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 4

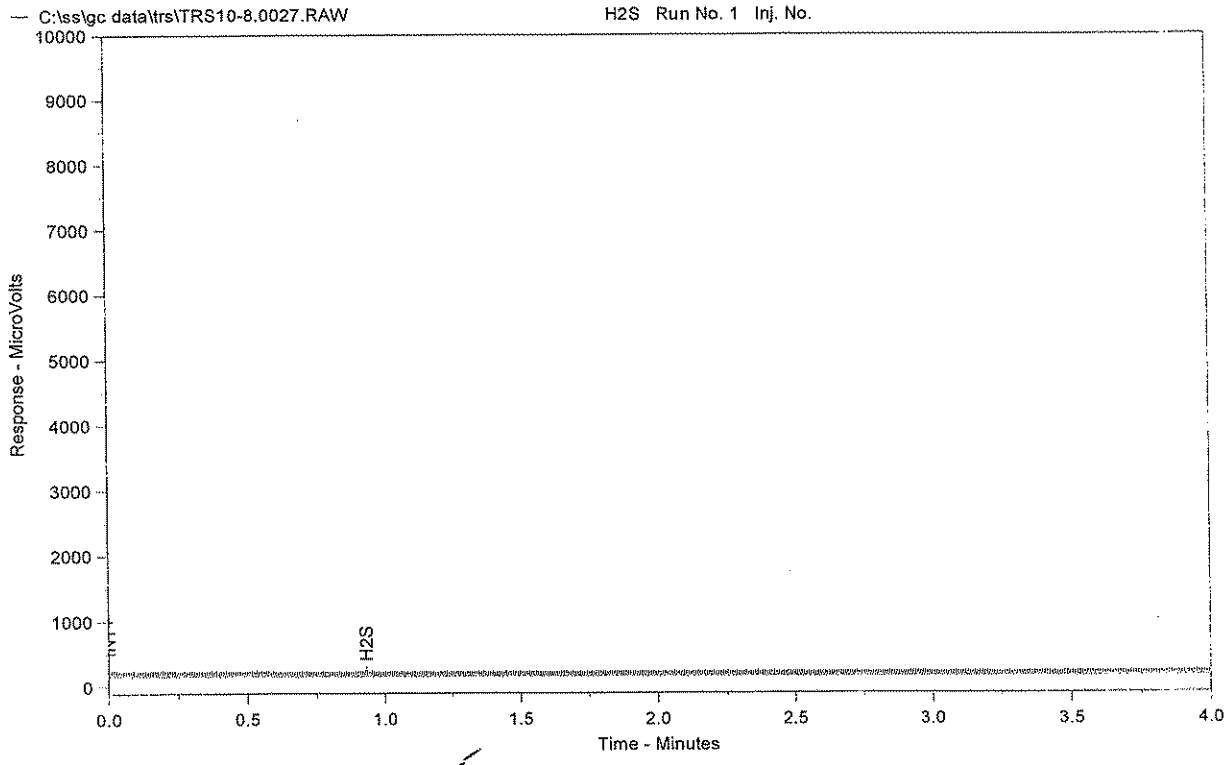
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0026.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 8:07:15 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 6

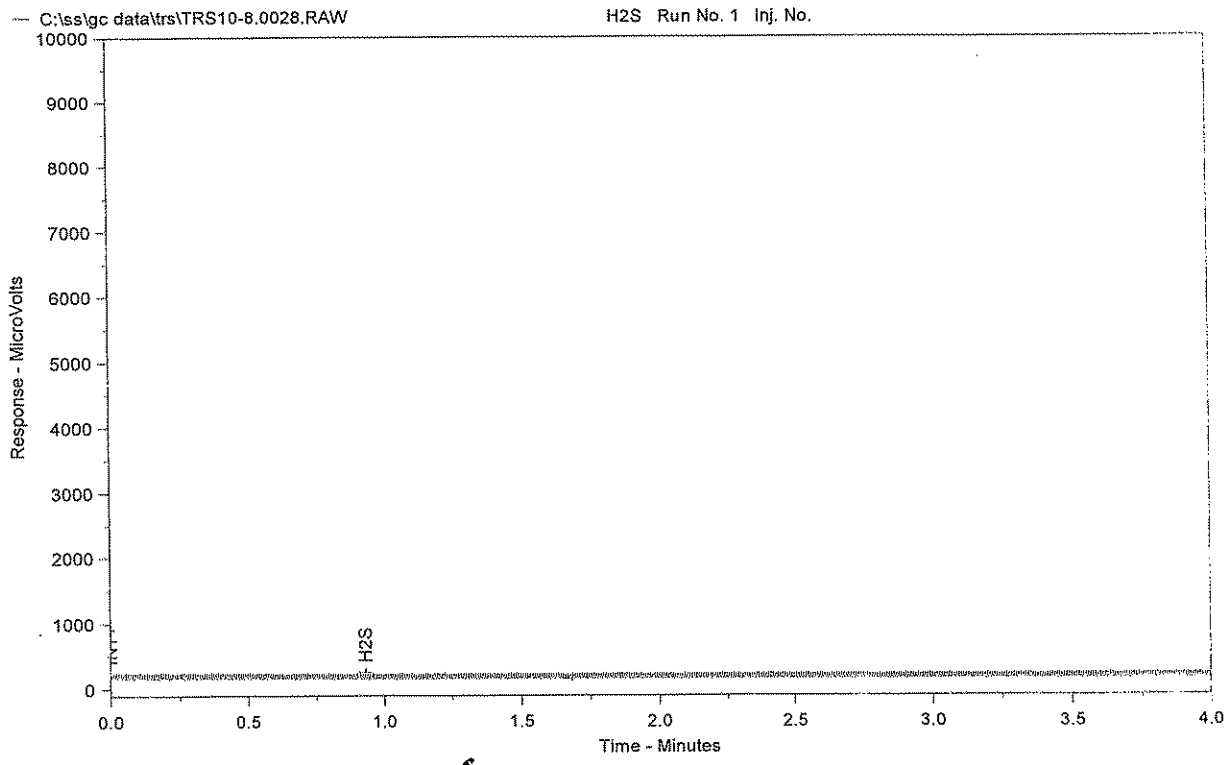
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0027.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 8:13:15 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 6

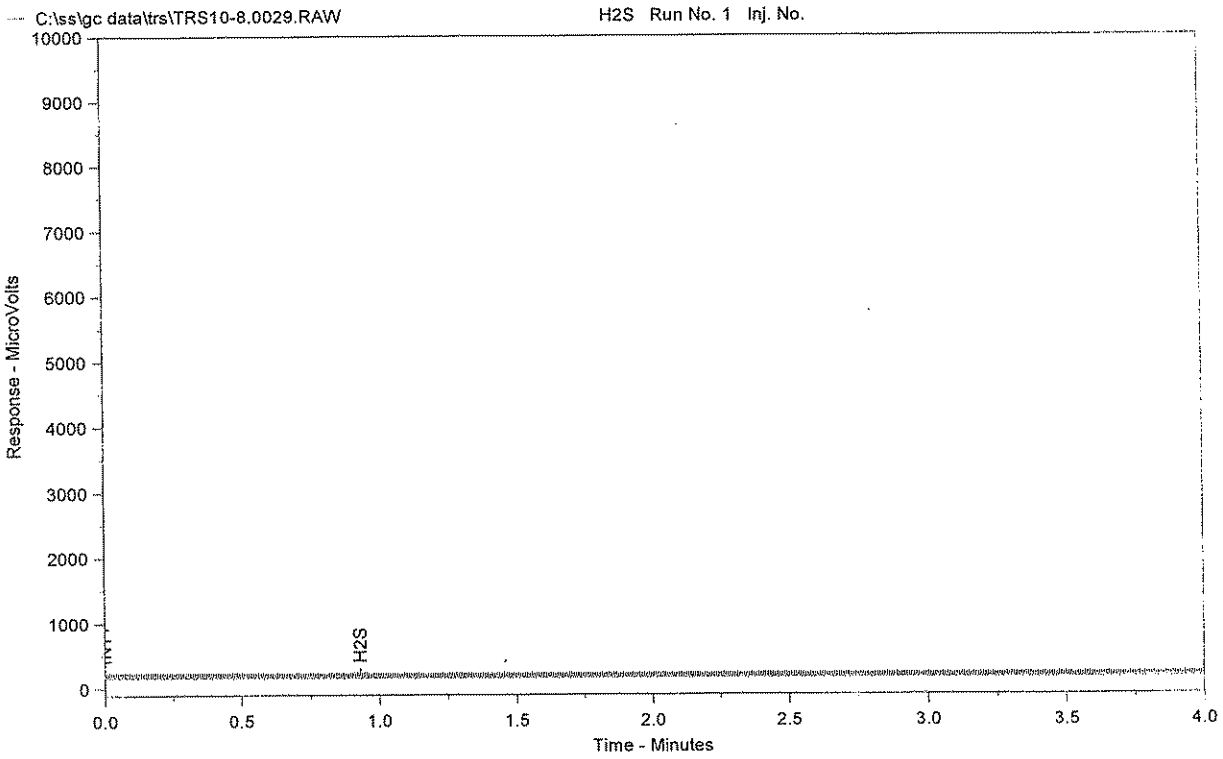
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0028.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 8:19:15 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 7

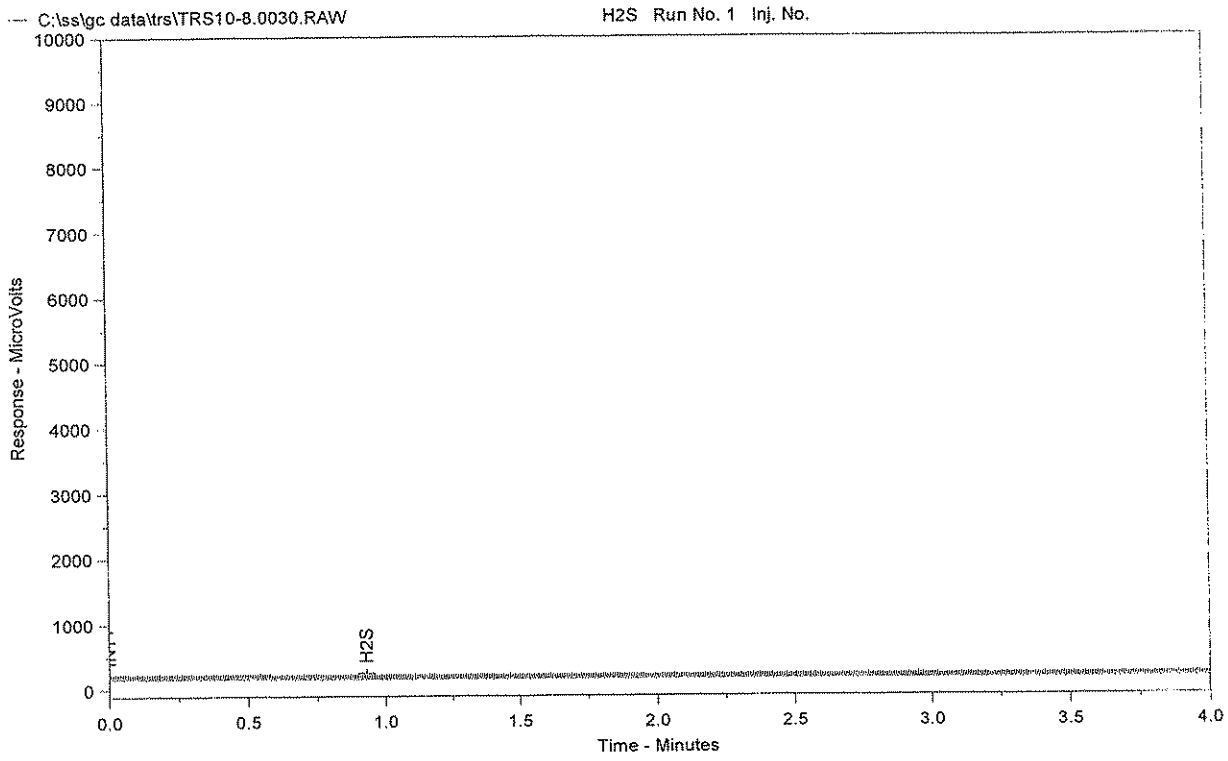
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0029.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 8:25:15 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 8

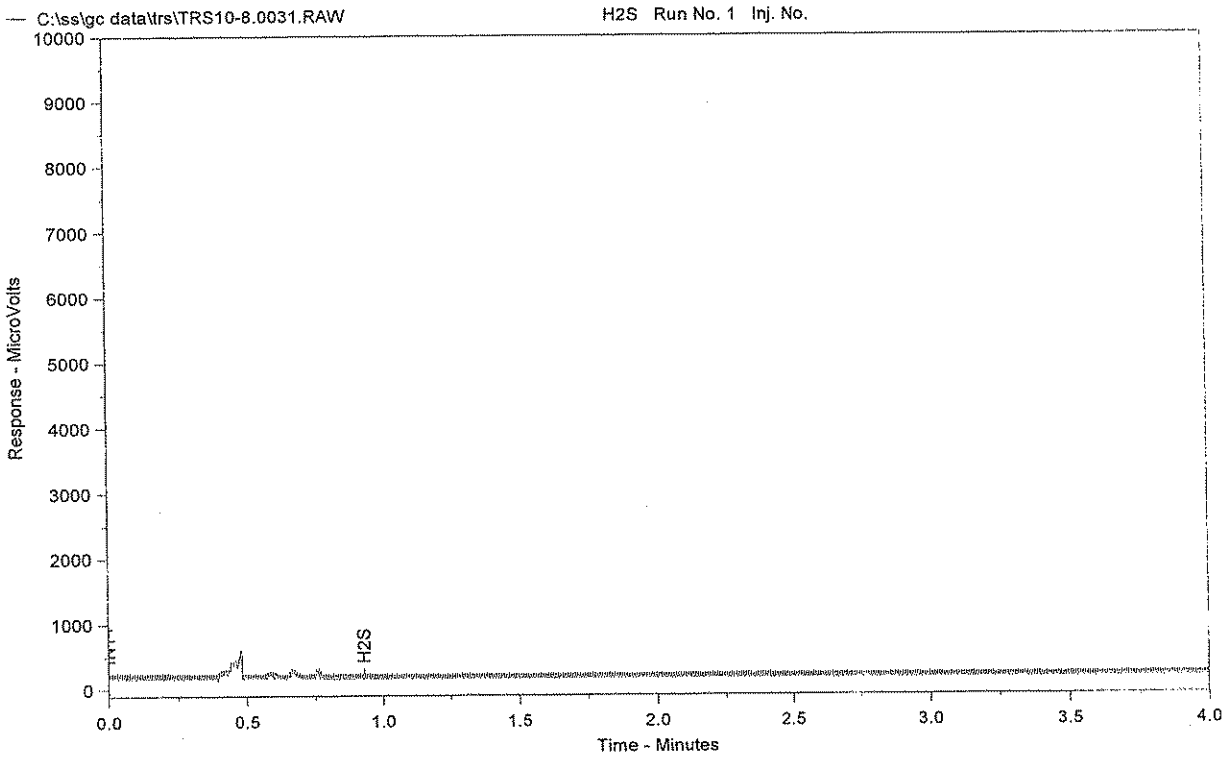
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0030.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 8:31:16 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 9

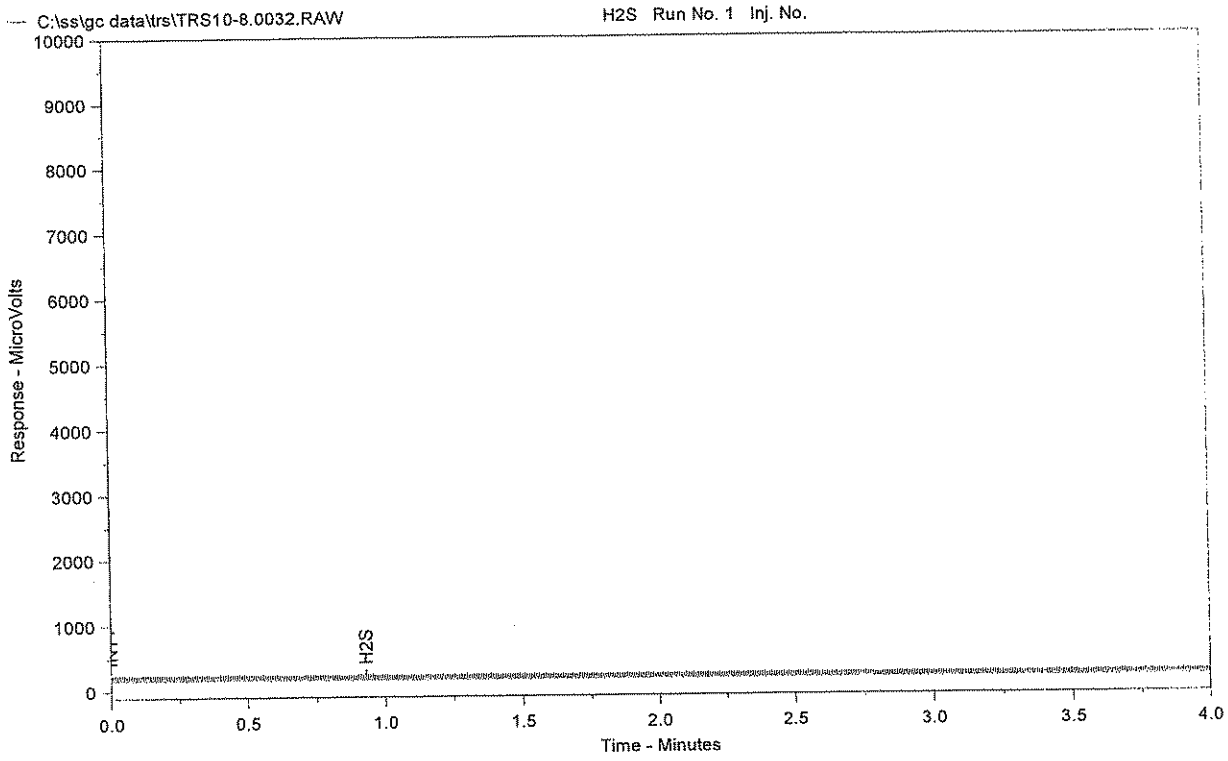
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0031.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 8:37:16 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 10

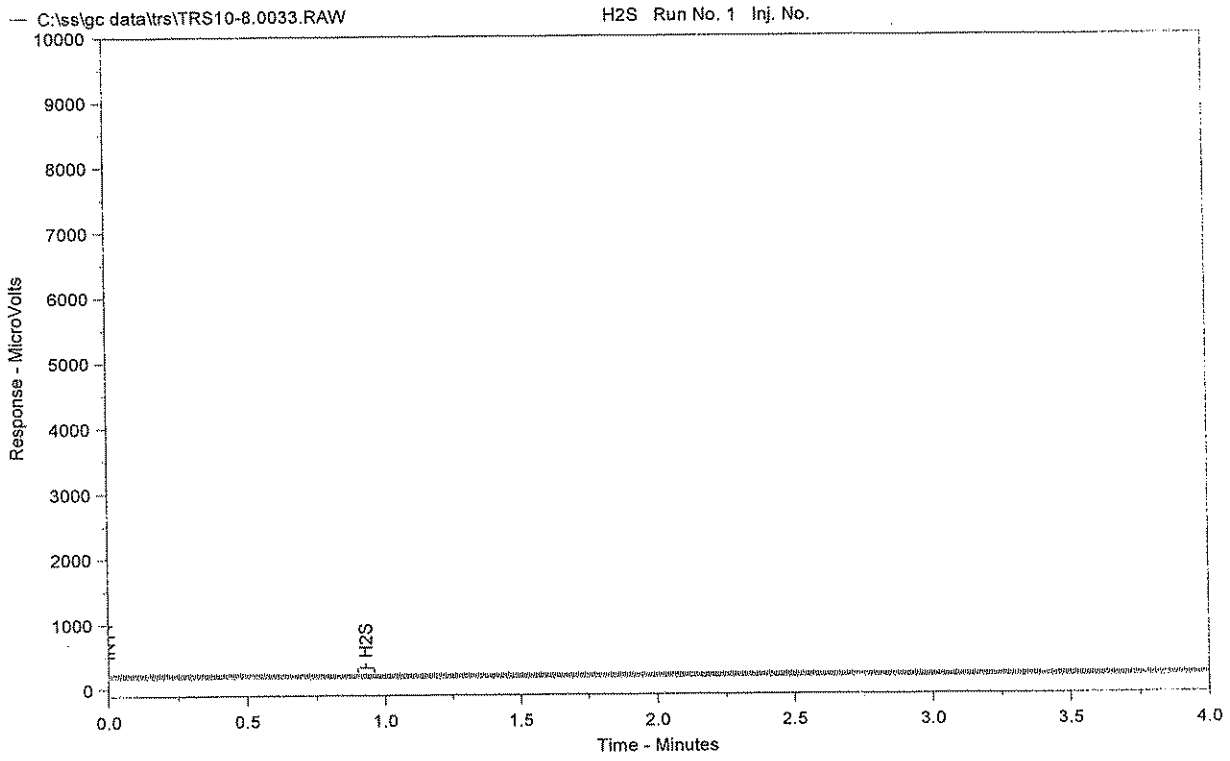
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0032.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 8:43:16 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.**

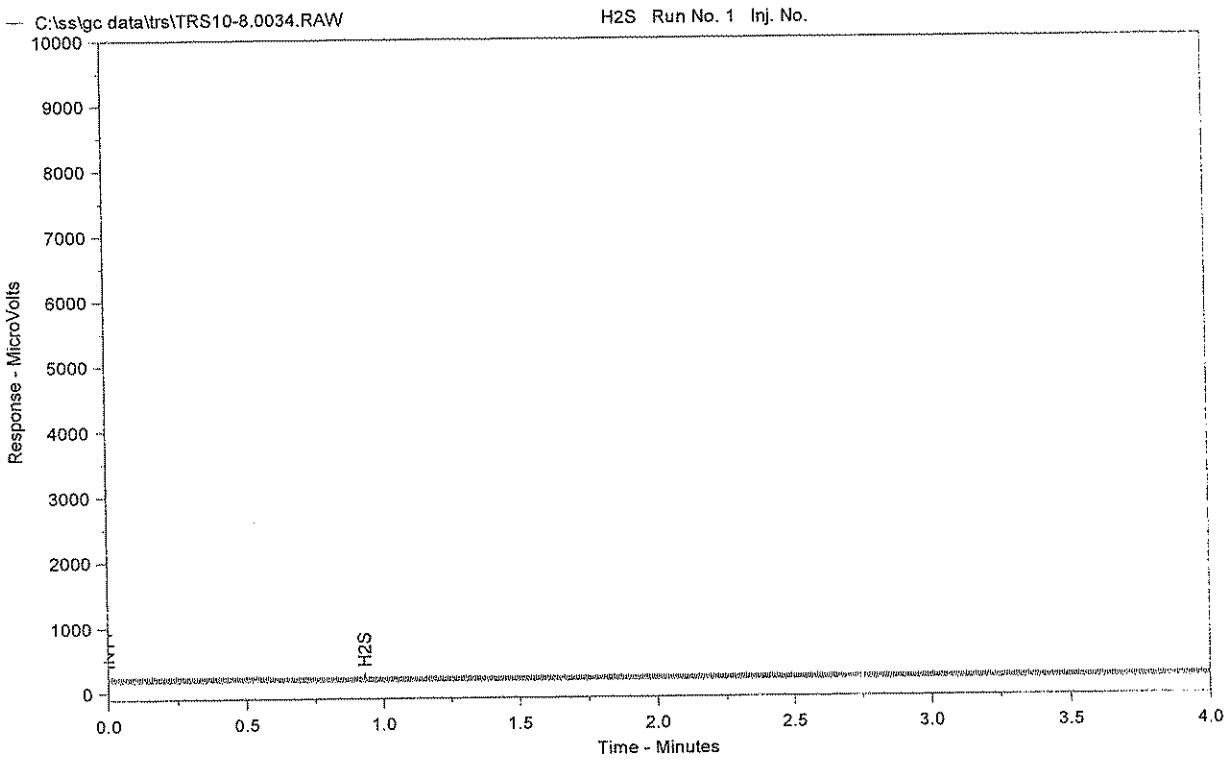
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0033.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 8:49:16 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 12

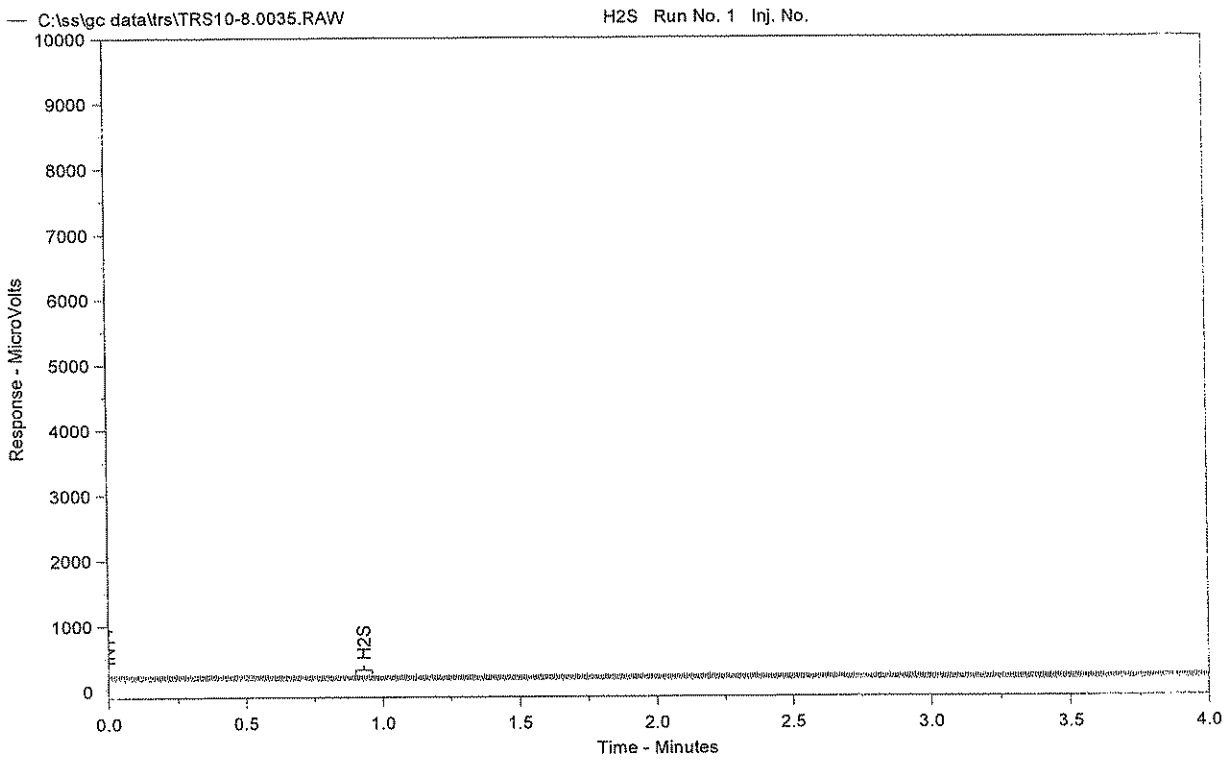
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0034.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 8:55:16 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 13

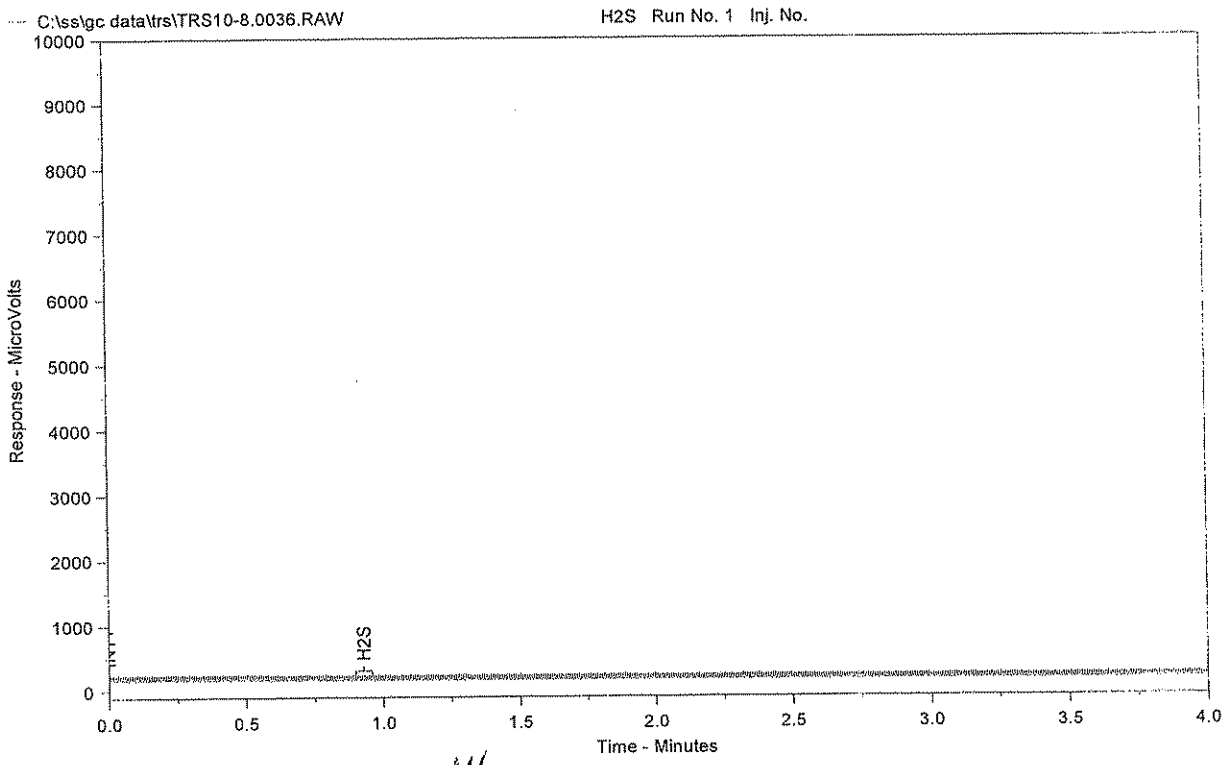
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0035.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 9:01:16 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 14

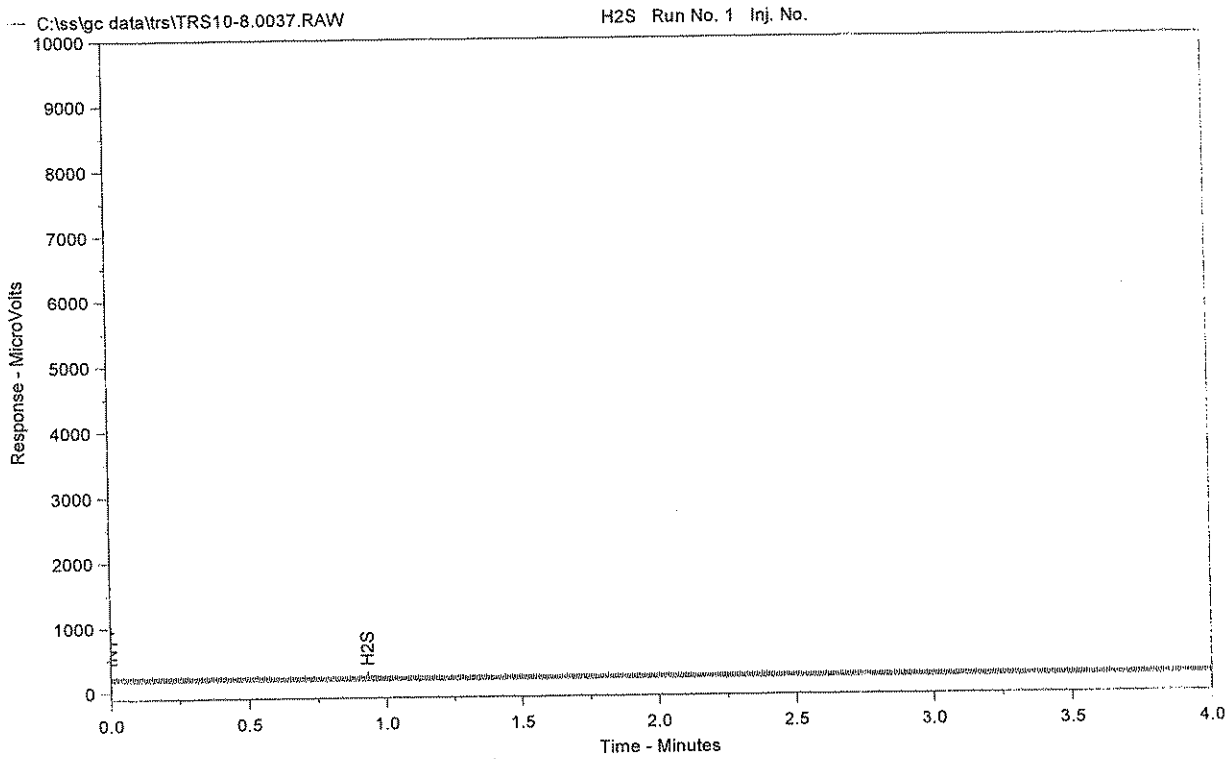
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0036.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 9:07:16 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S** **Run No. 1** **Inj. No.** 15

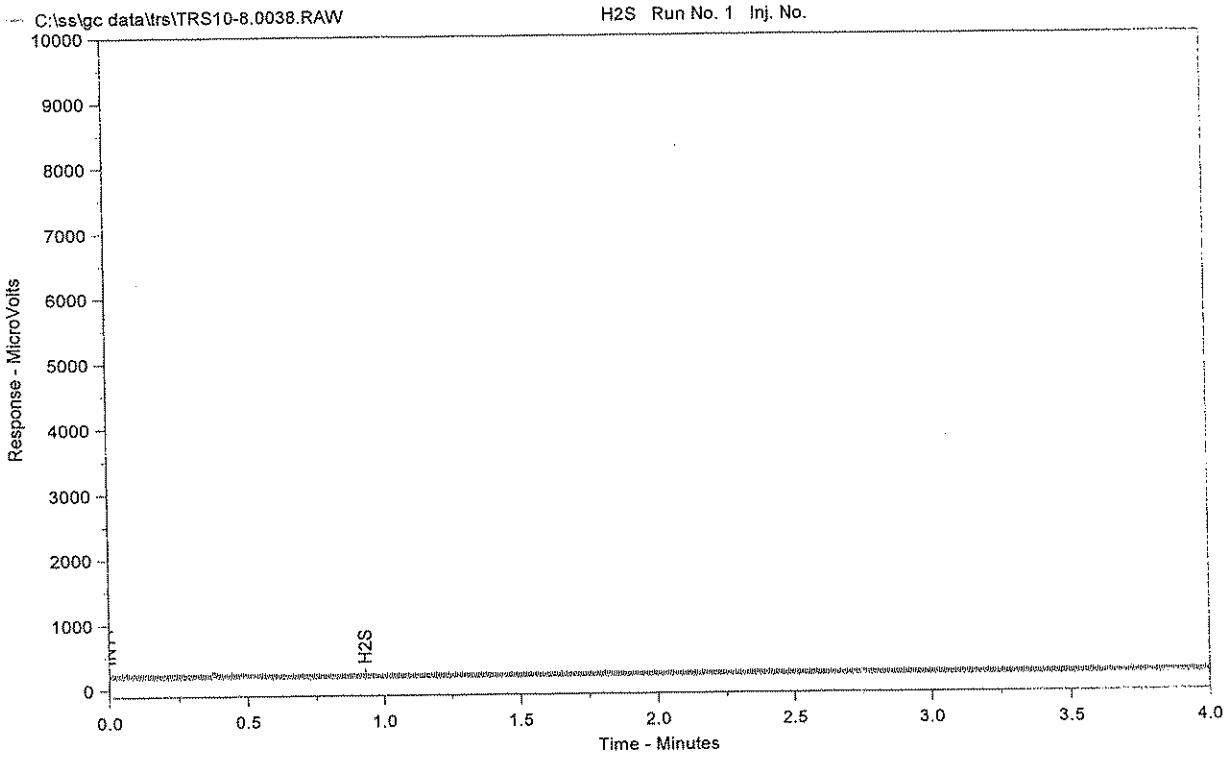
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0037.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 9:13:16 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 16

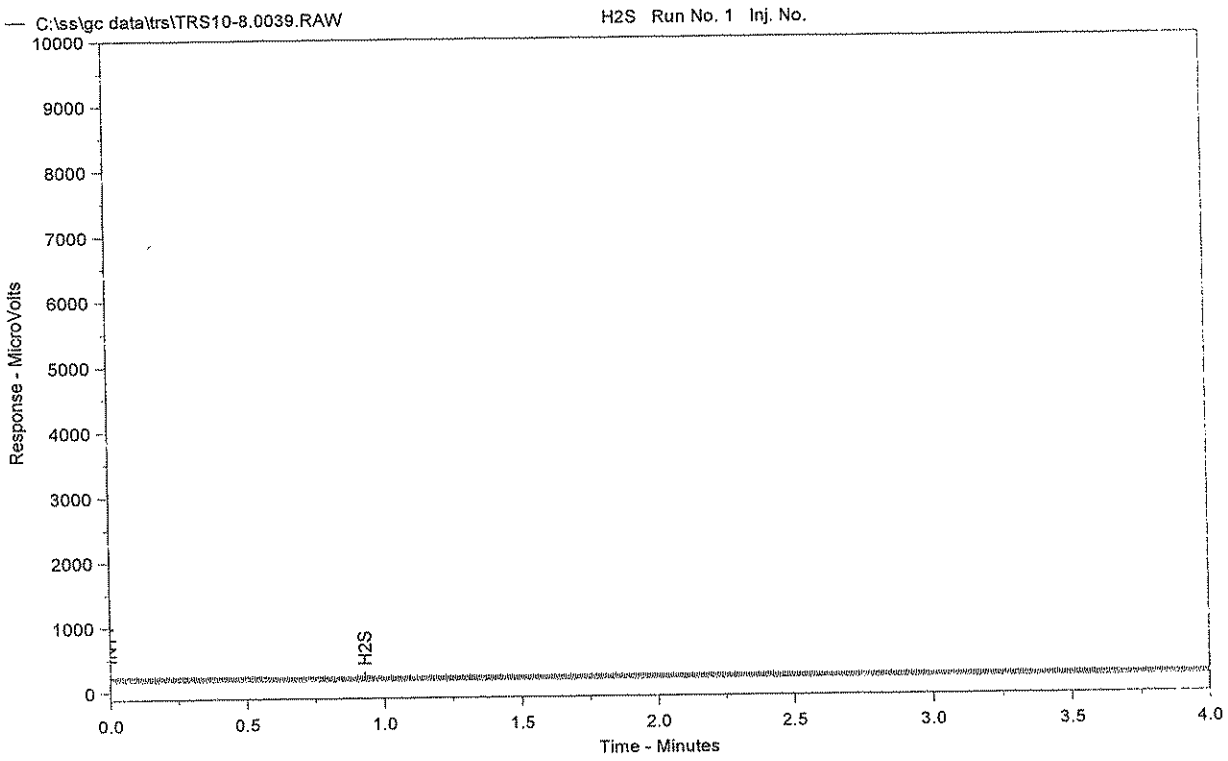
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0038.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 9:19:16 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 17

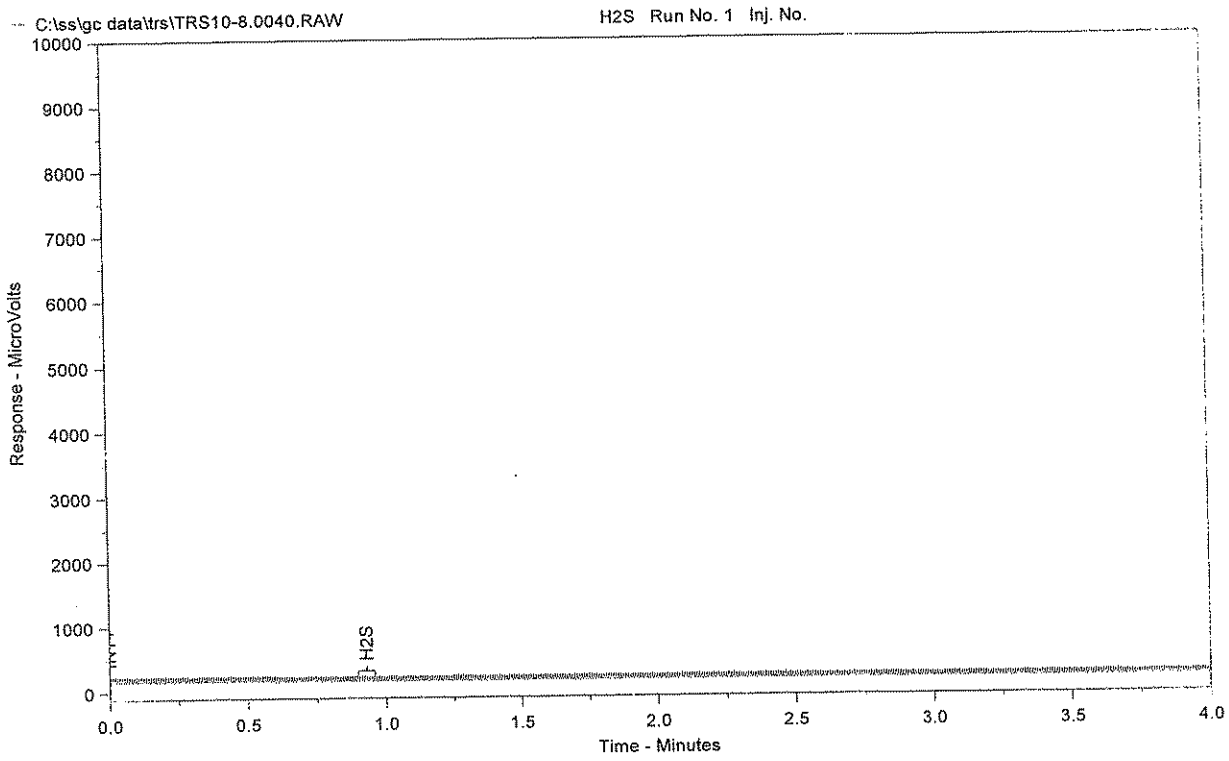
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0039.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 9:25:16 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 18

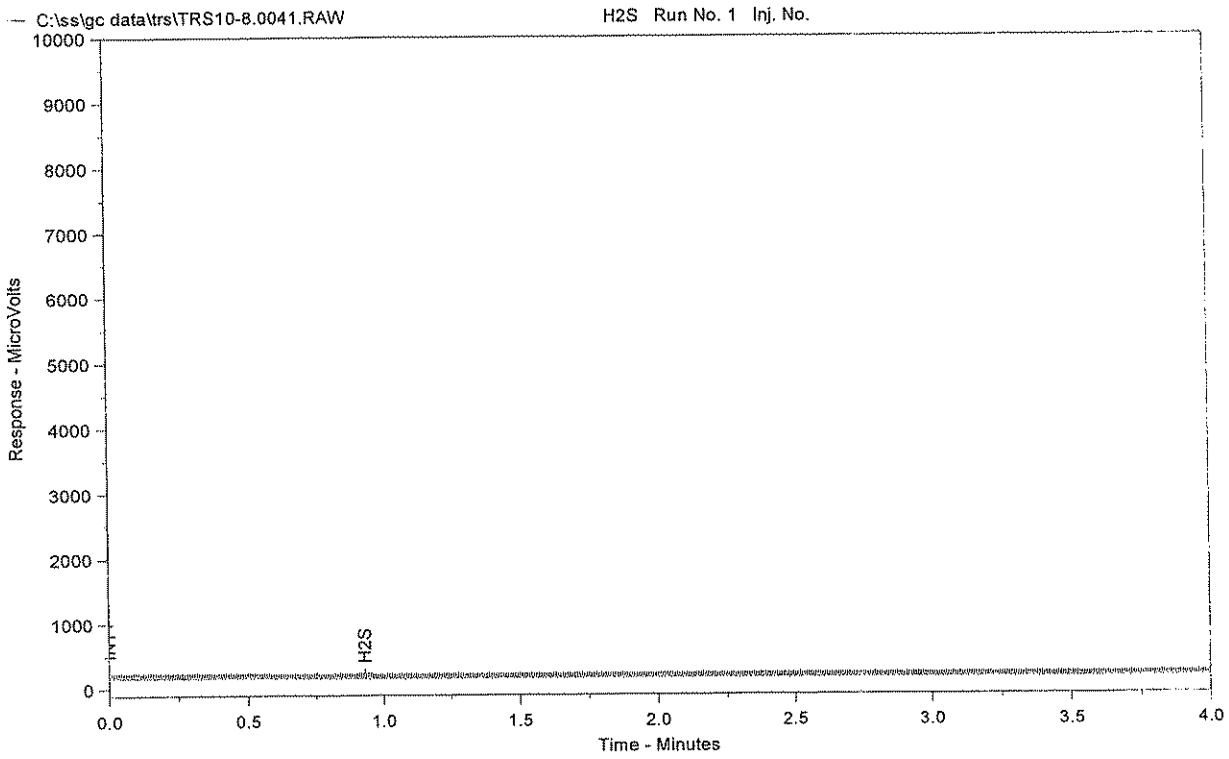
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0040.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 9:31:16 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 1

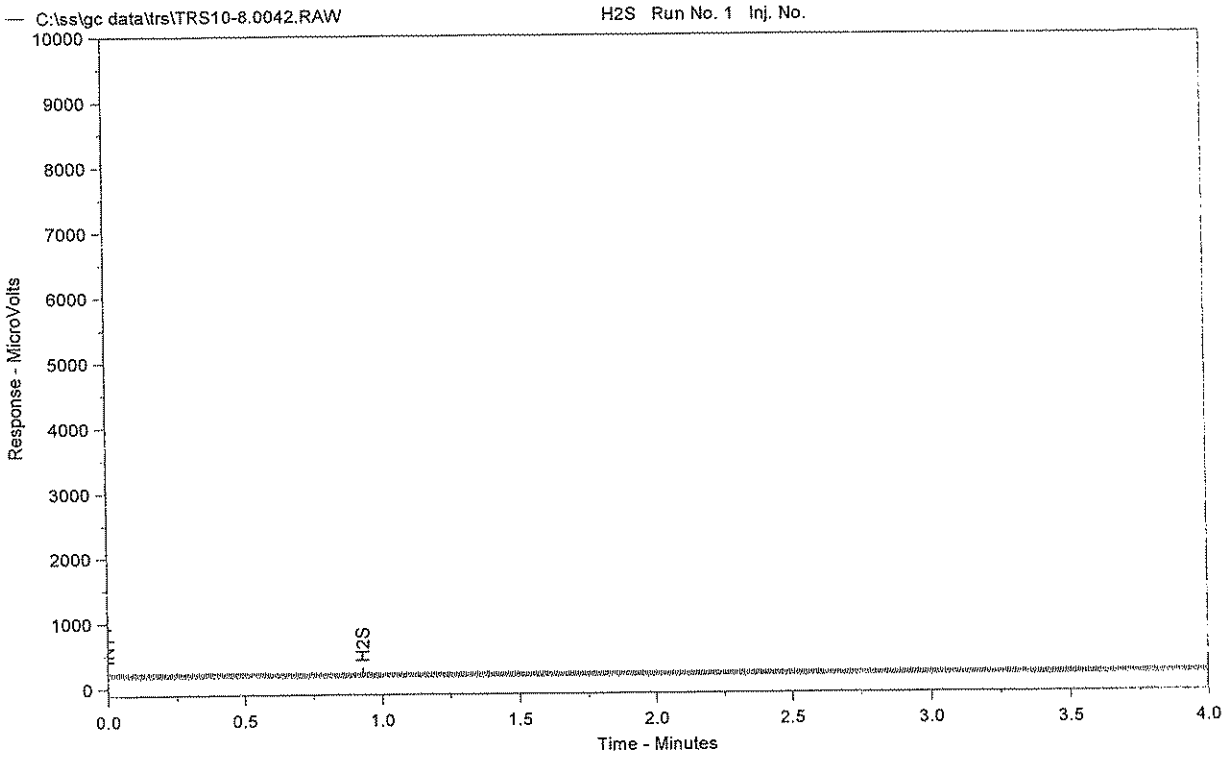
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0041.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 9:37:17 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 20

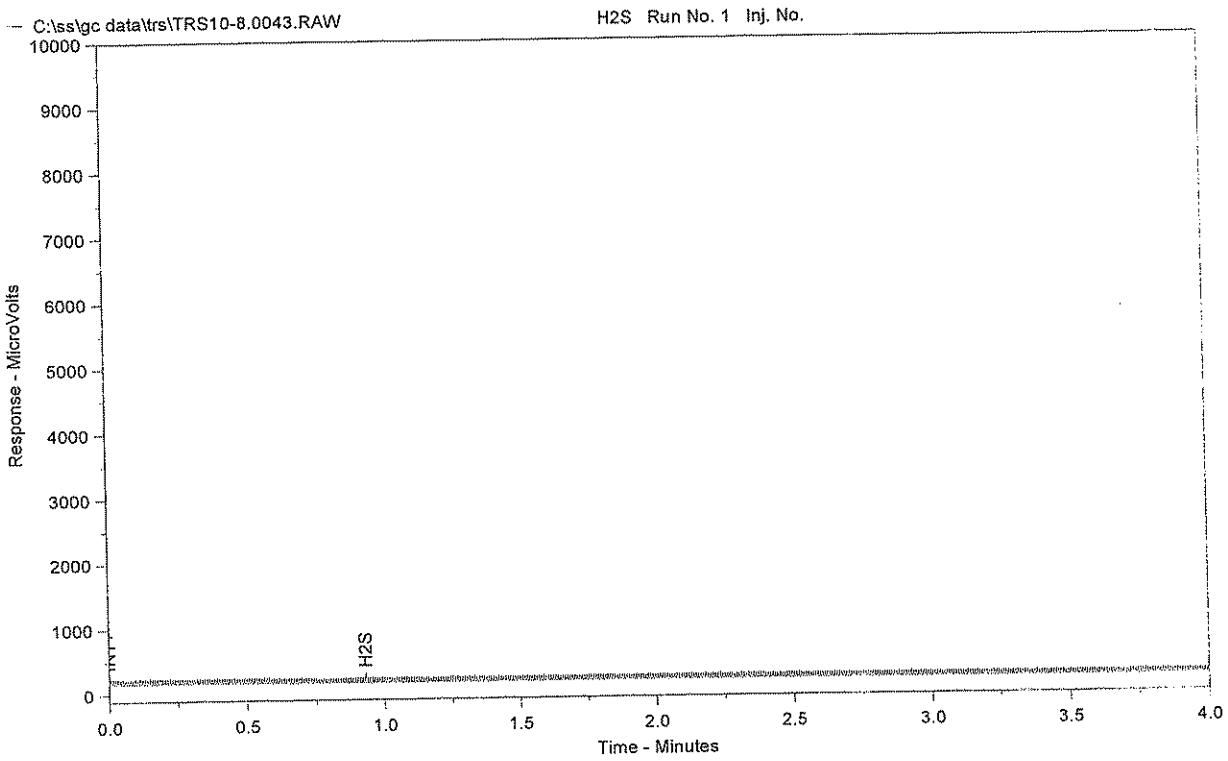
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0042.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 9:43:17 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 21

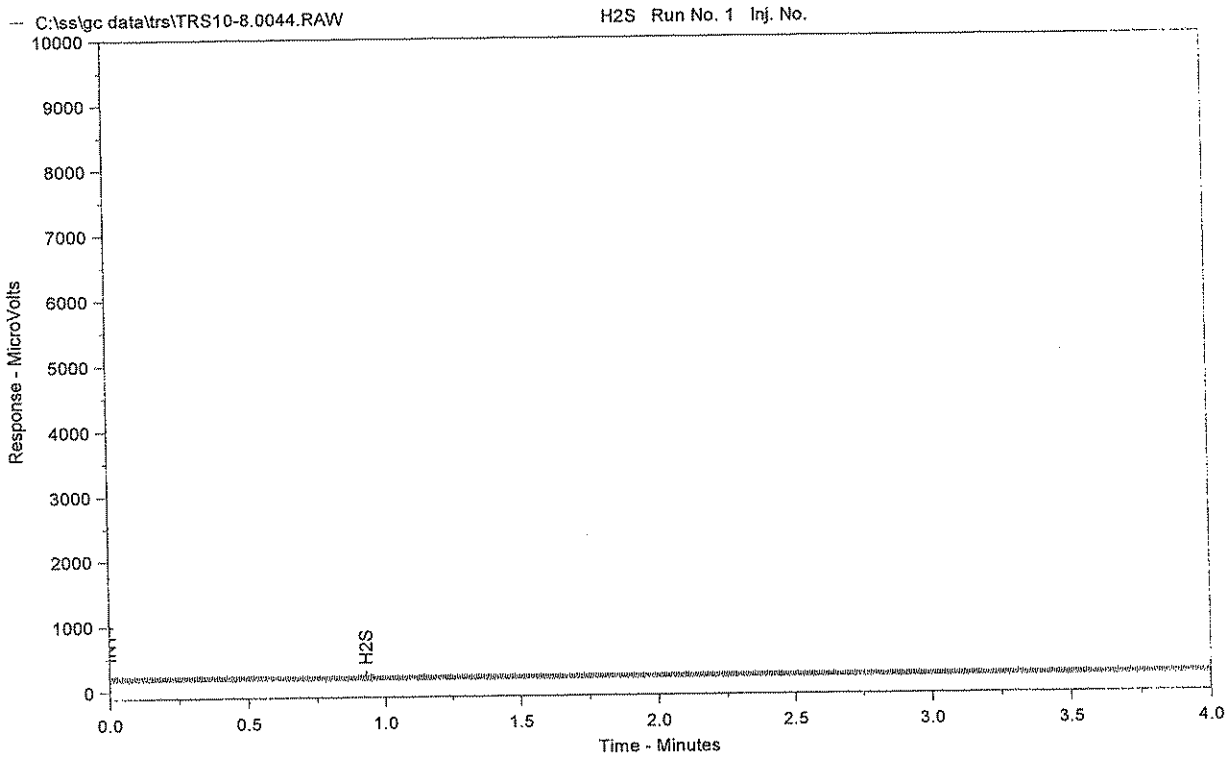
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0043.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 9:49:17 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 22

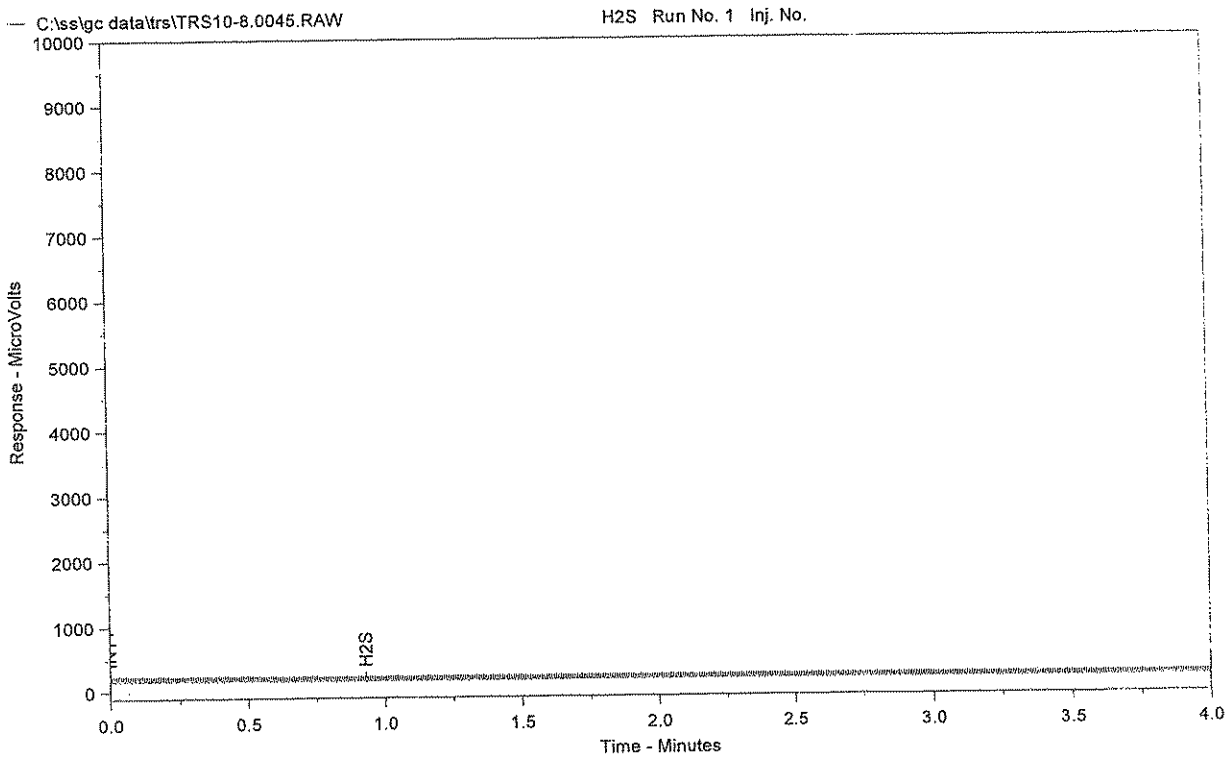
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0044.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 9:55:17 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 23

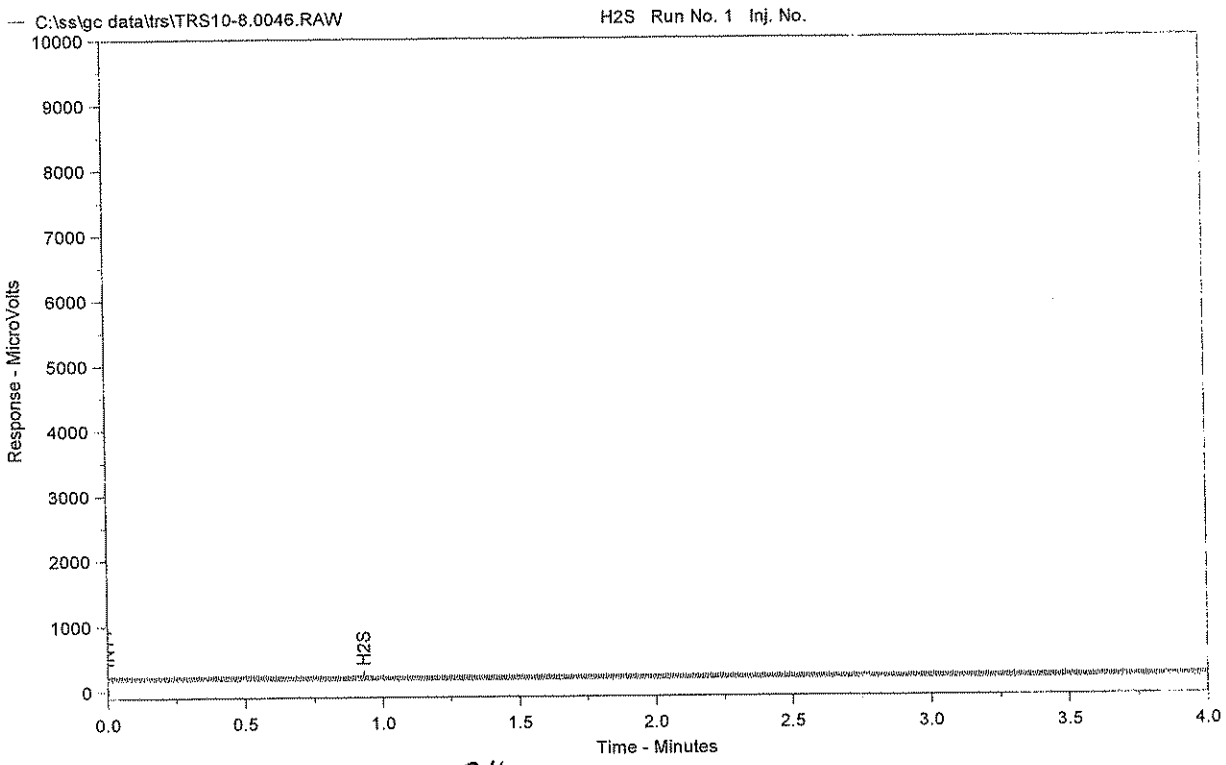
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0045.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 10:01:17 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 24

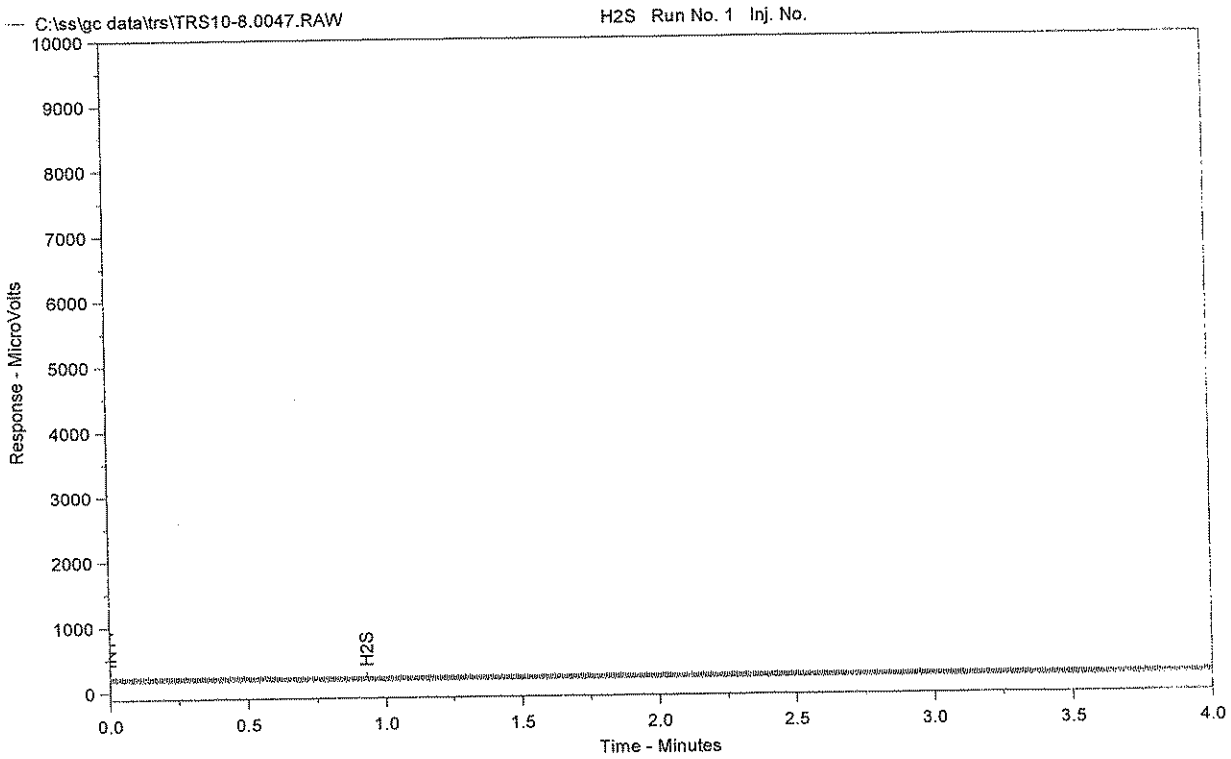
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0046.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 10:07:17 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S** **Run No. 1** **Inj. No.** 25

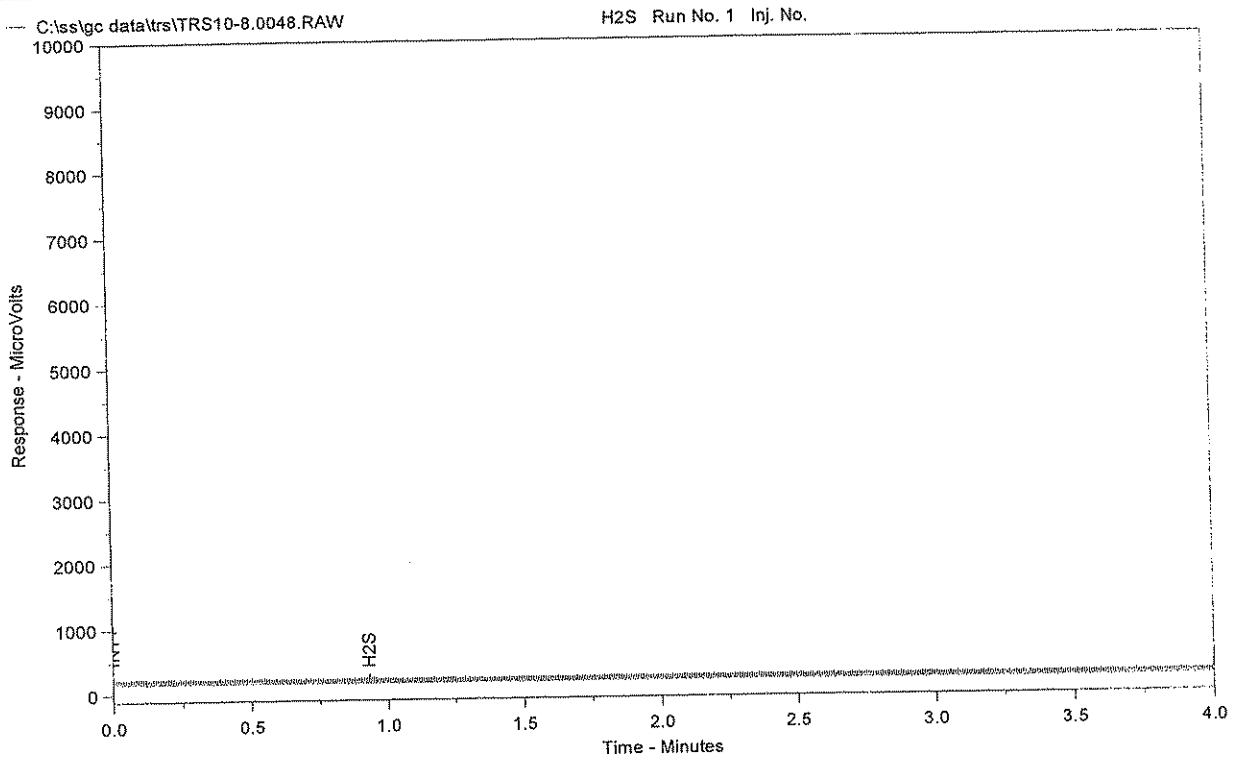
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0047.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 10:13:17 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 26

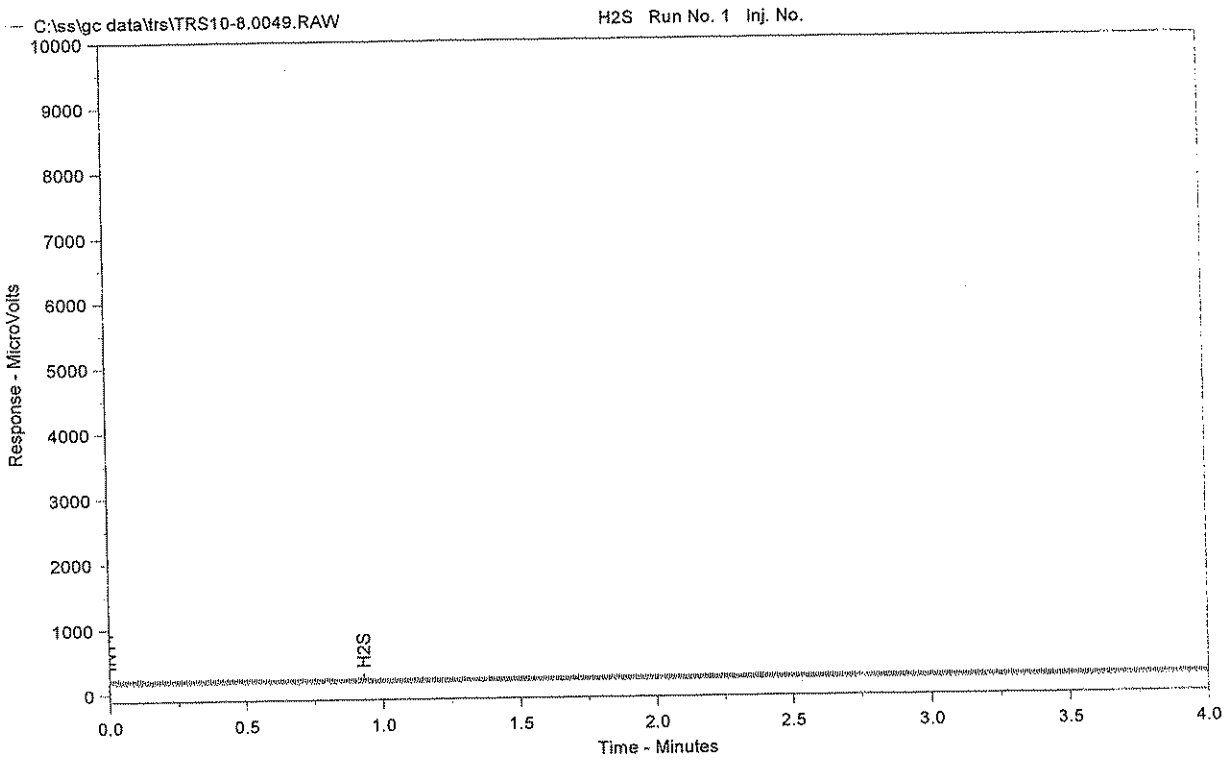
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0048.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 10:19:17 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S** **Run No. 1** **Inj. No.** 27

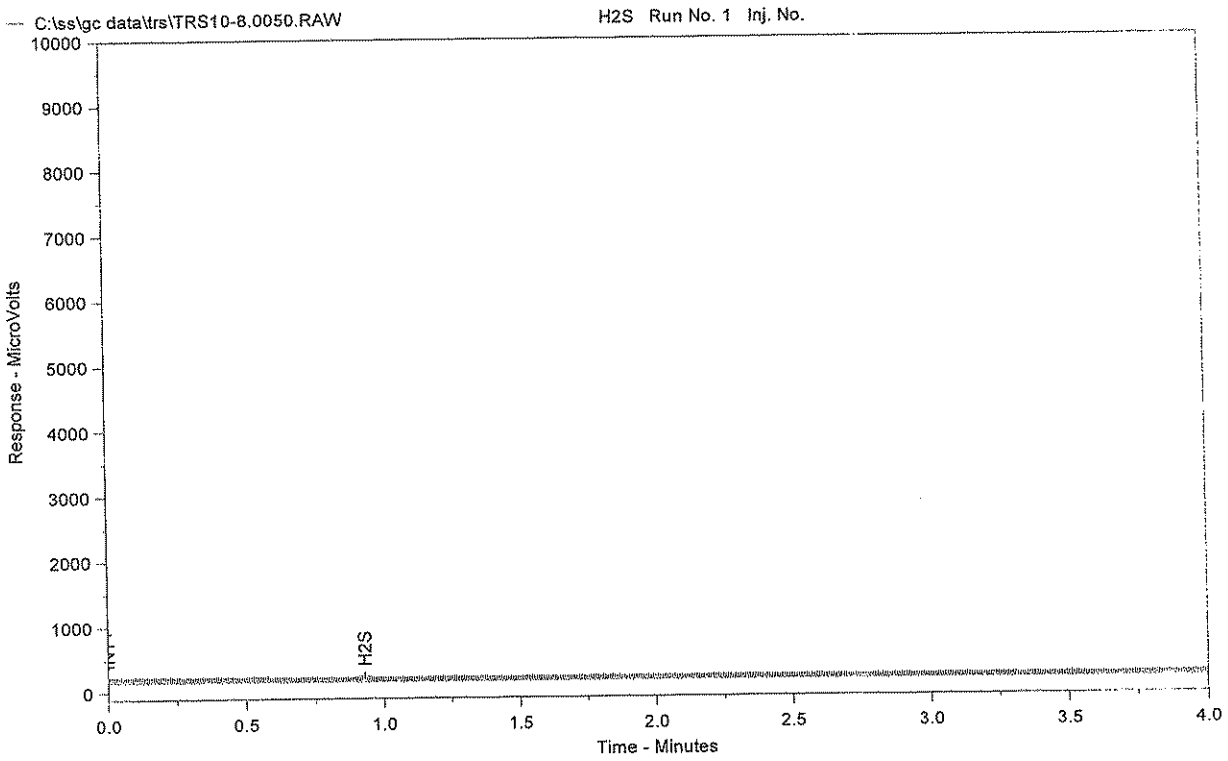
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0049.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 10:25:17 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 28

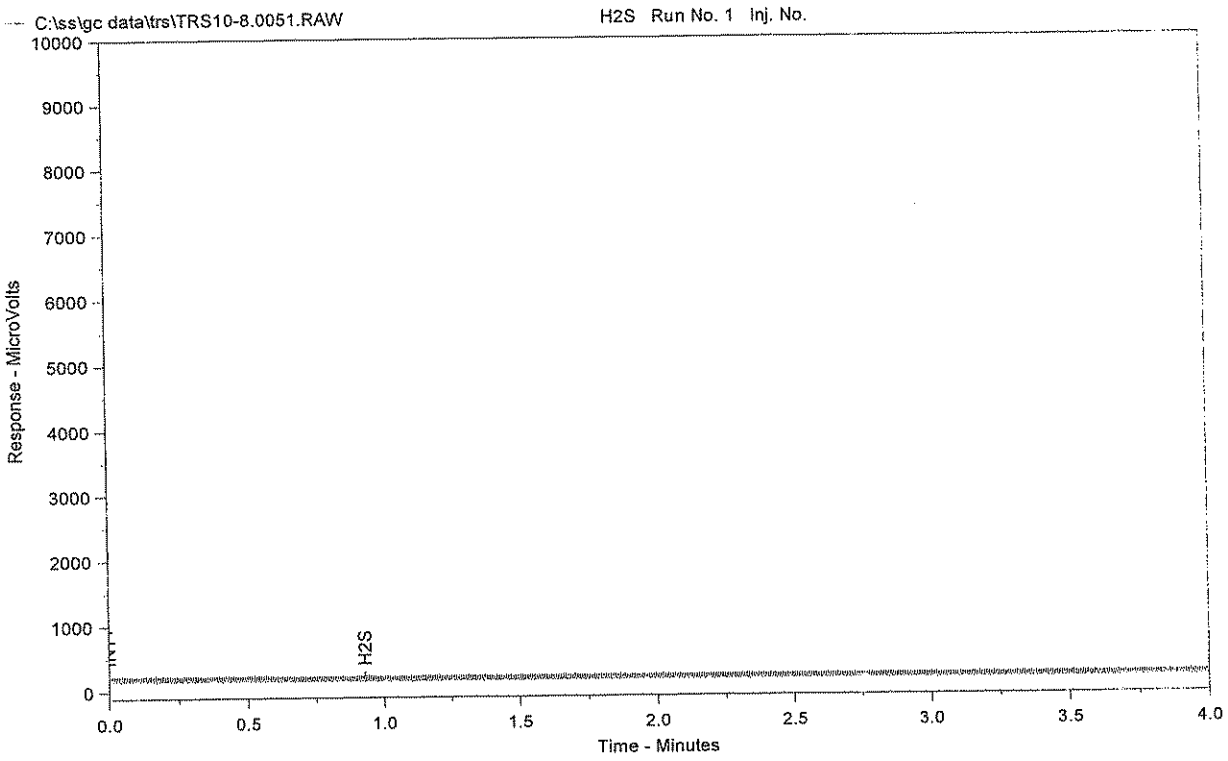
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0050.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 10:31:17 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S** **Run No. 1** **Inj. No.** 29

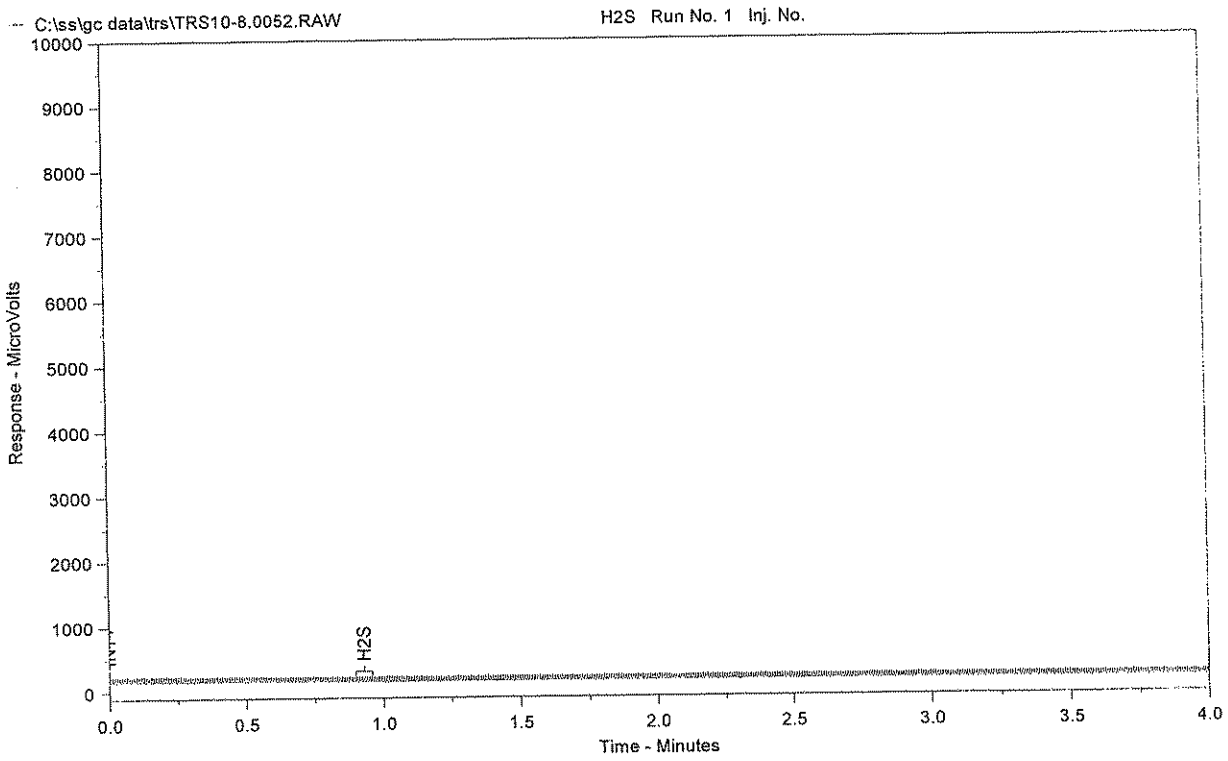
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0051.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 10:37:18 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 1 Inj. No.** 30

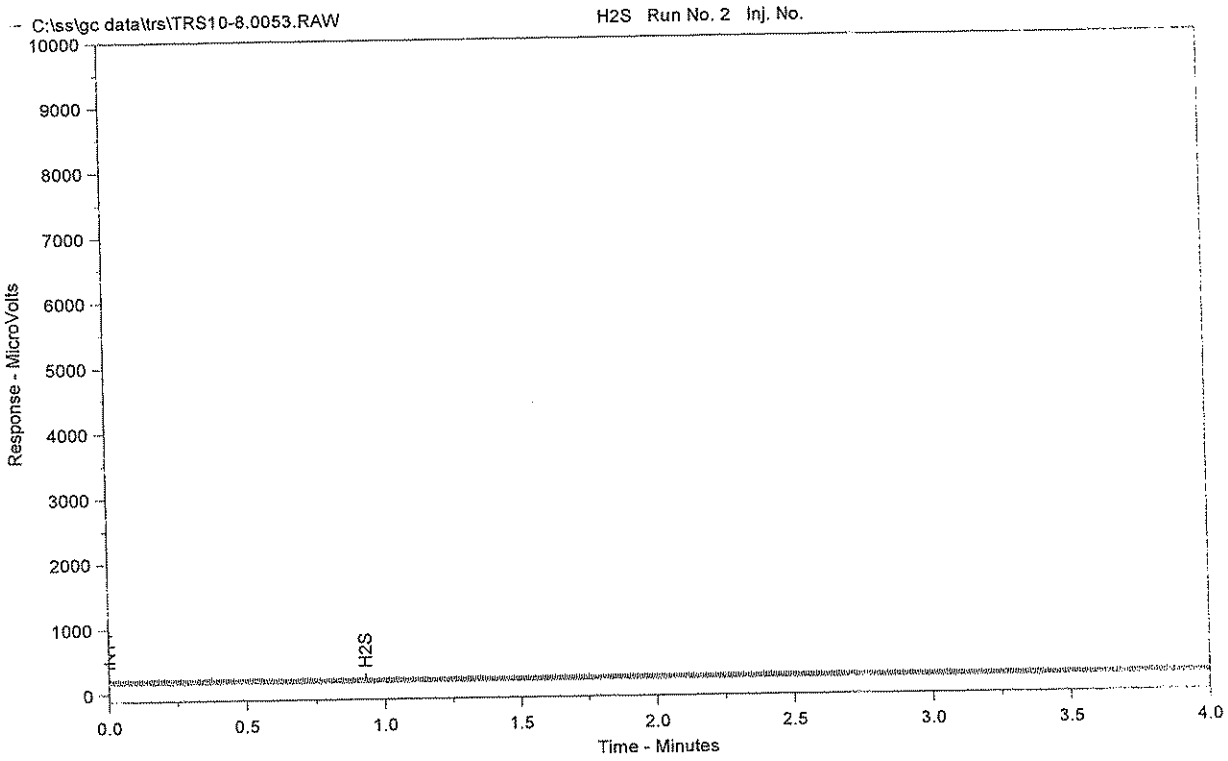
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0052.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 10:43:18 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.**

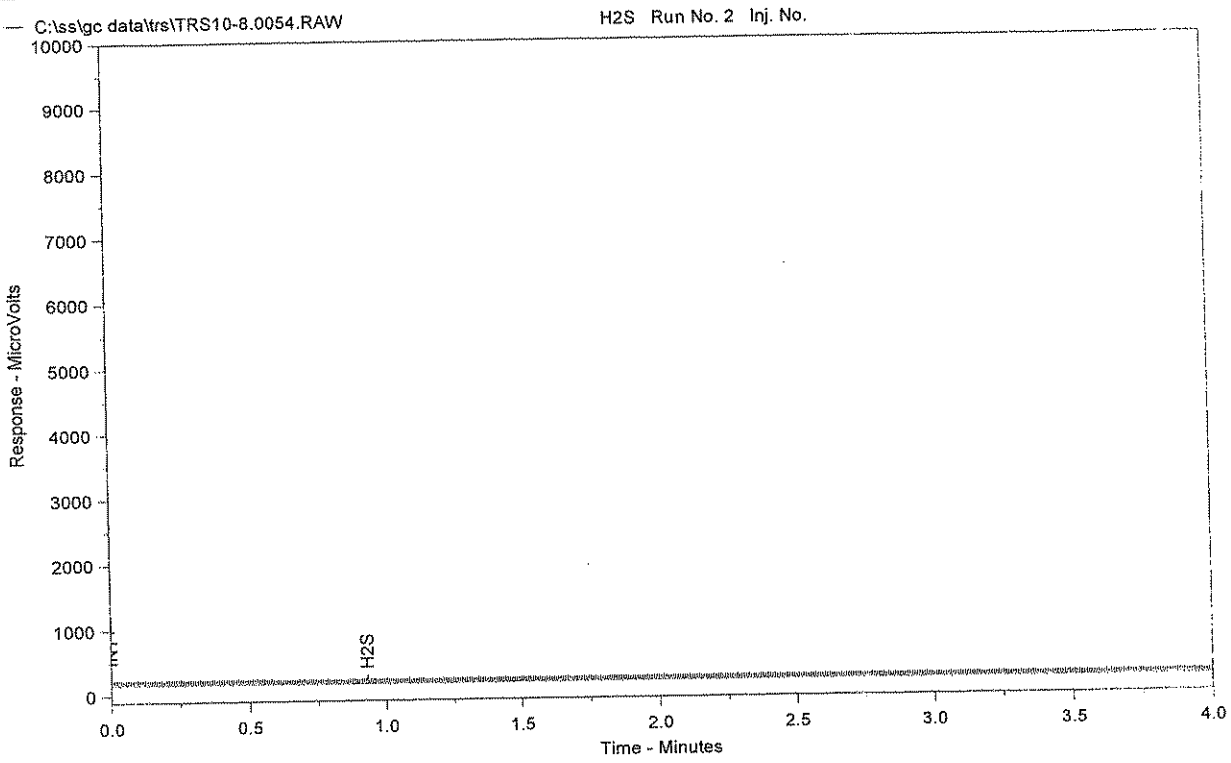
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0053.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 10:50:03 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 2

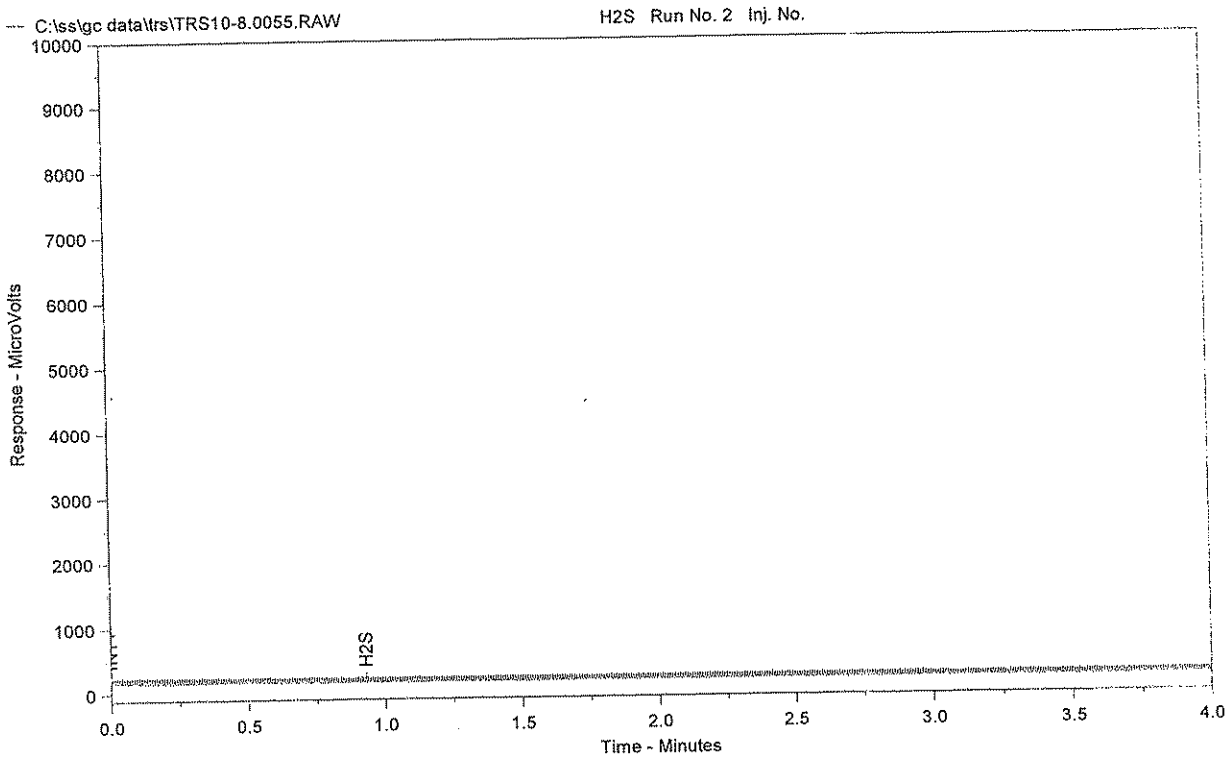
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0054.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 10:56:04 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 3

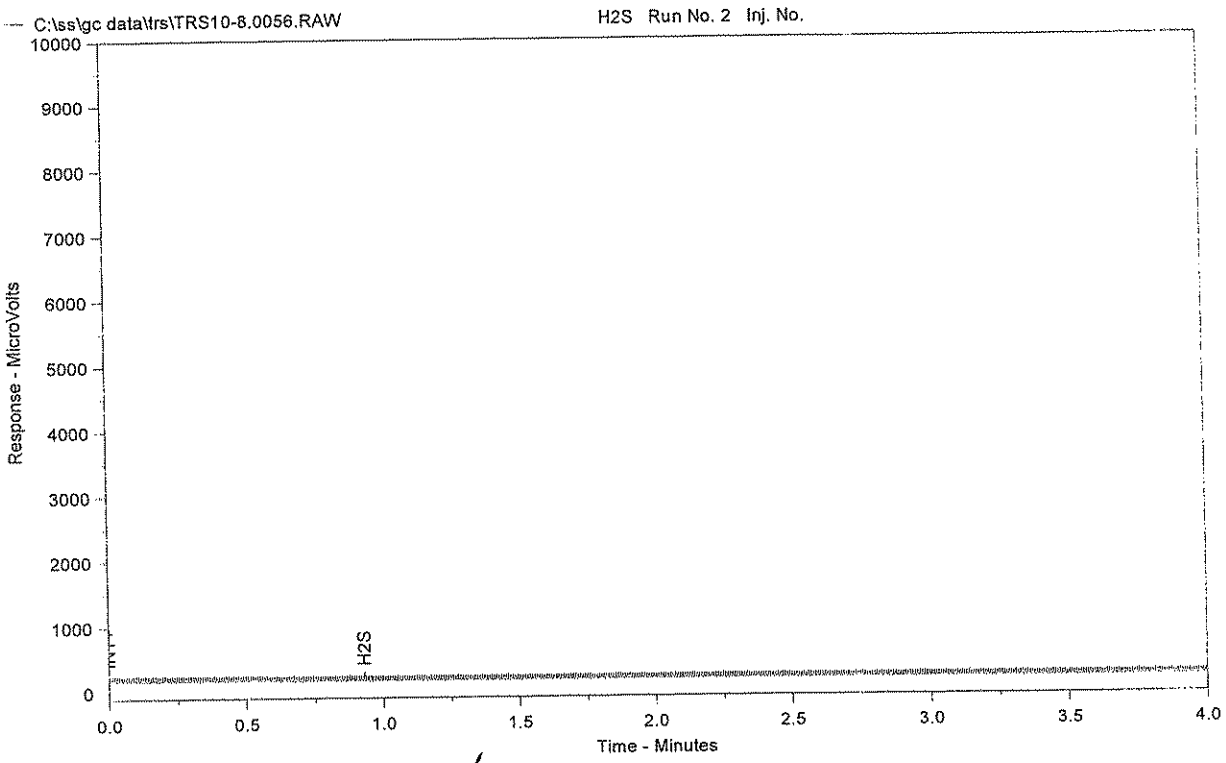
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0055.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 11:02:04 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 4

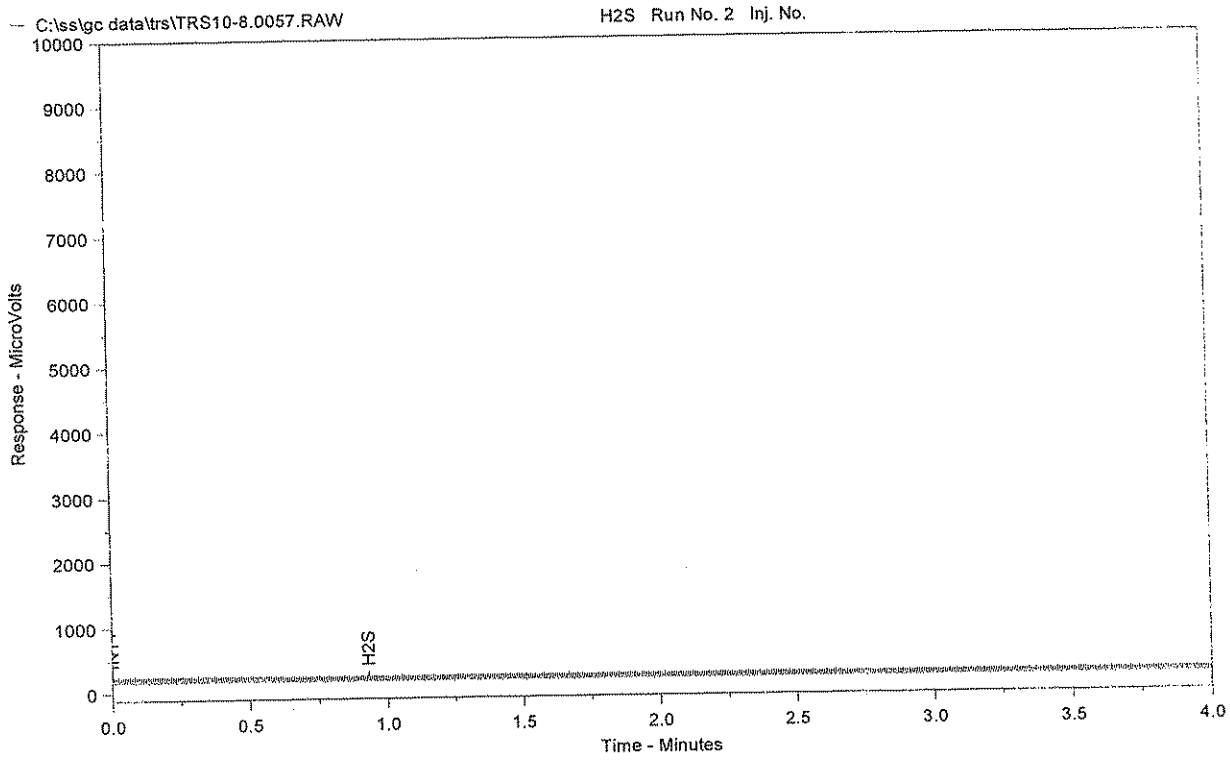
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0056.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 11:08:04 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 5

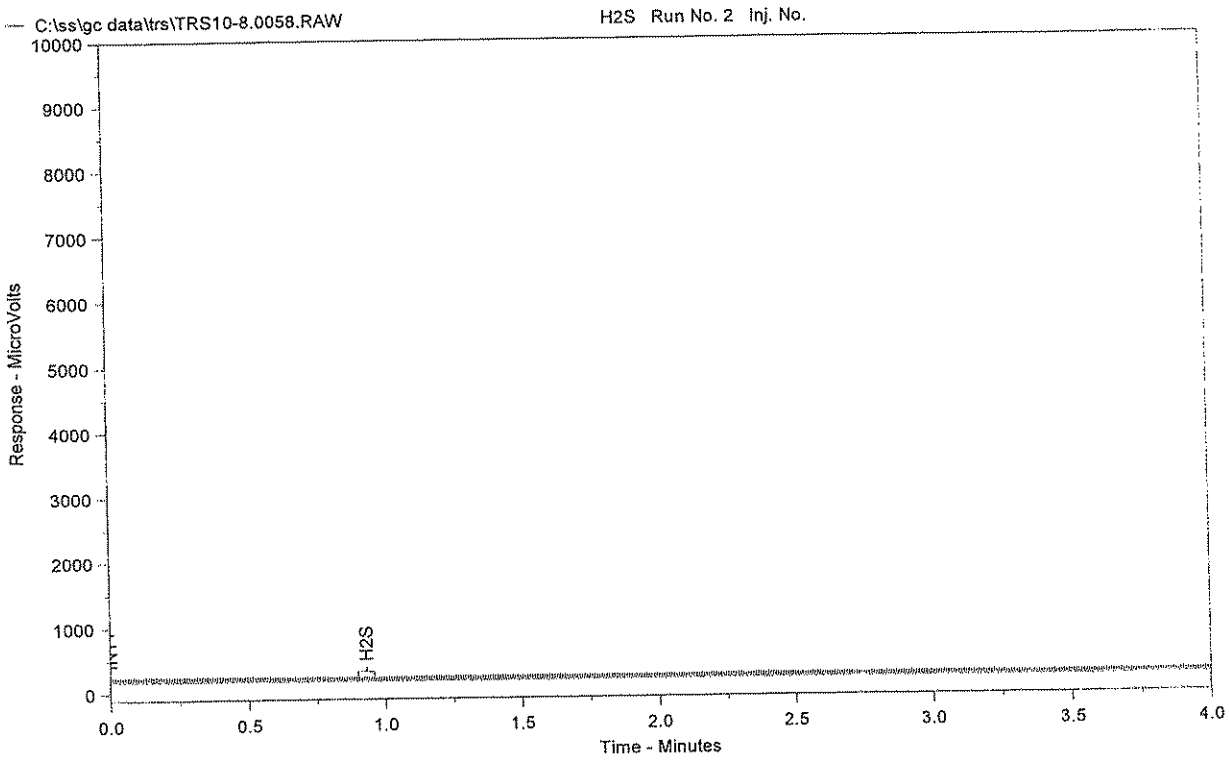
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0057.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 11:14:04 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S** **Run No. 2** **Inj. No.** 6

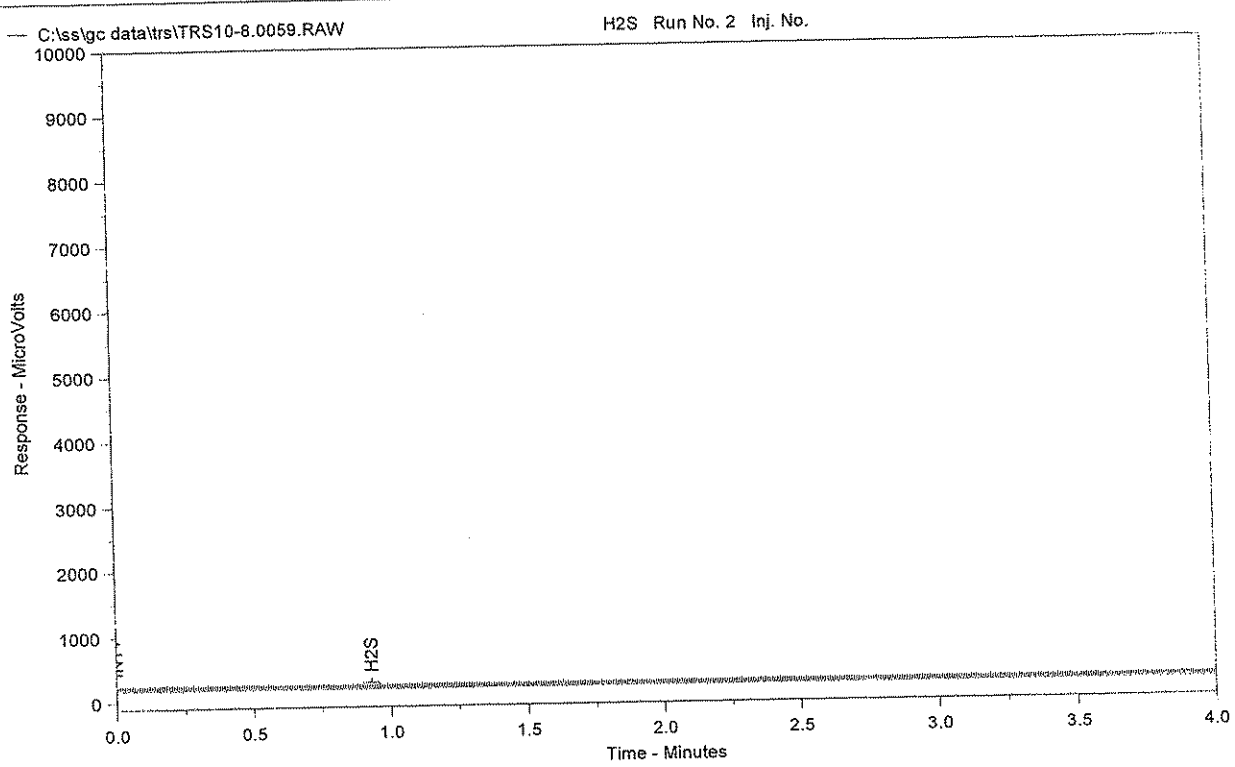
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0058.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 11:20:04 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 1

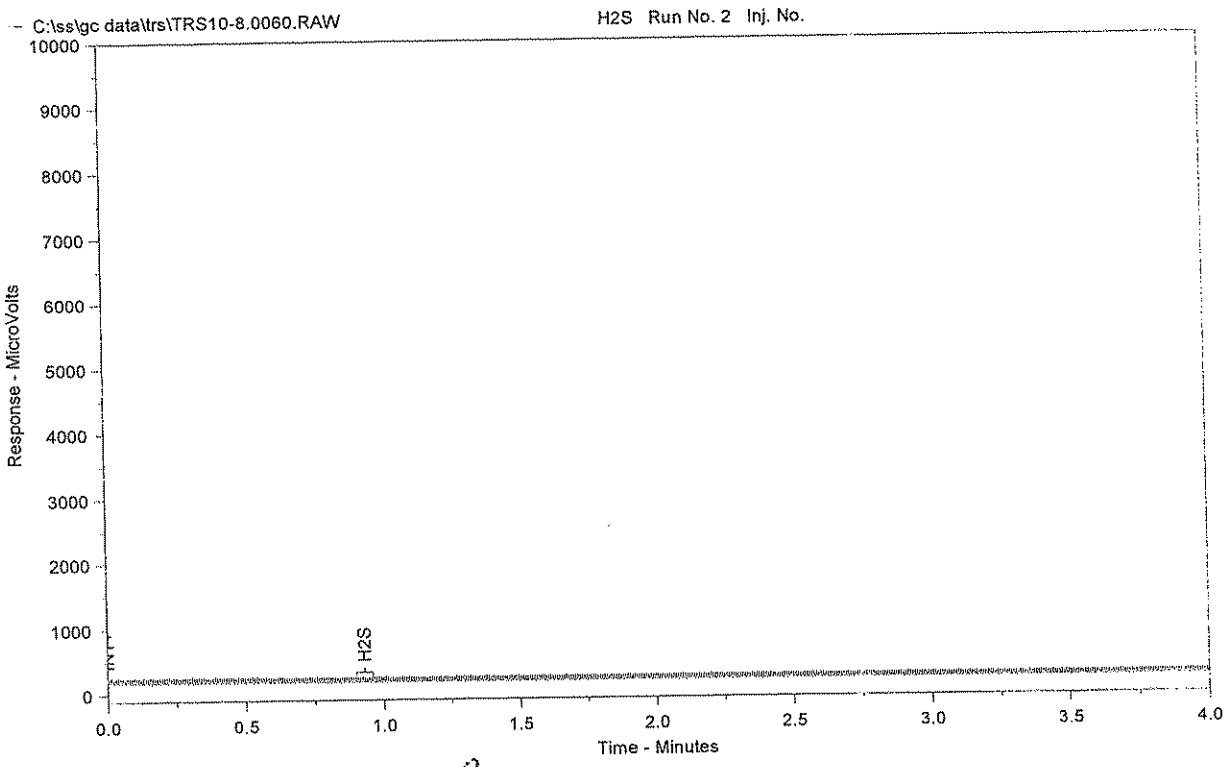
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0059.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 11:26:04 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 2

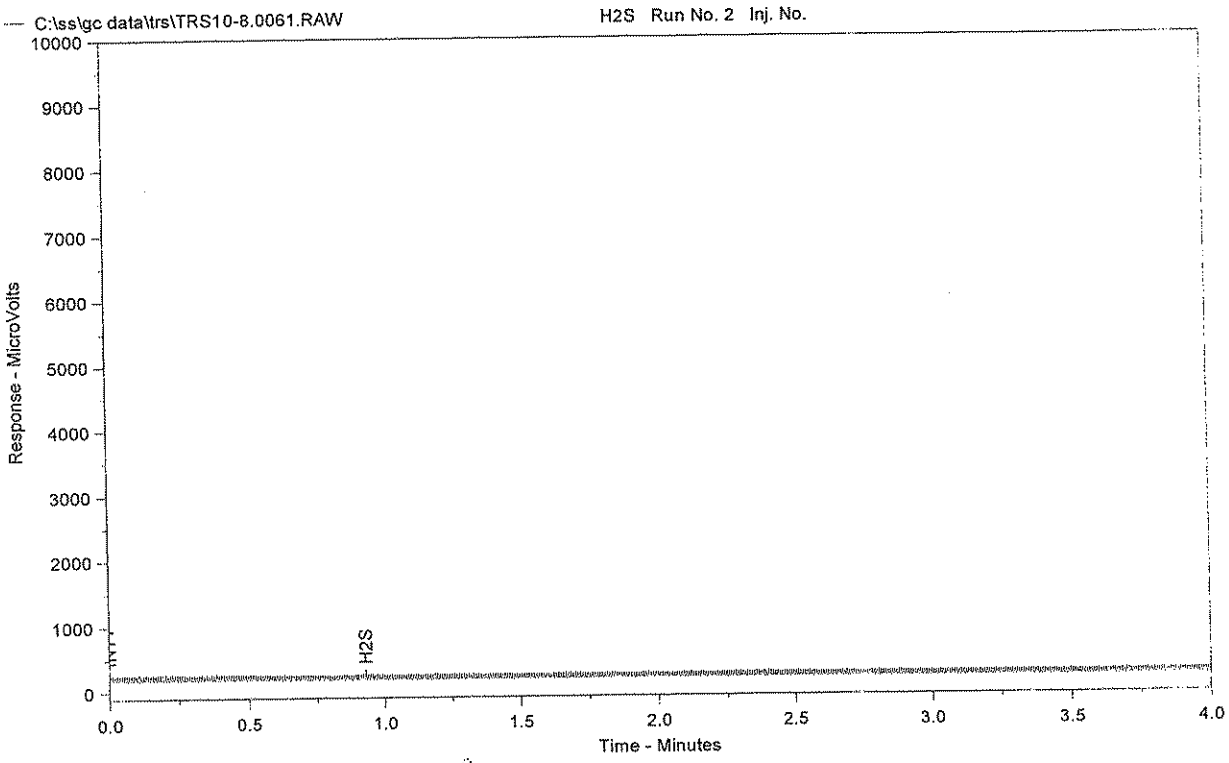
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0060.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 11:32:04 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 9

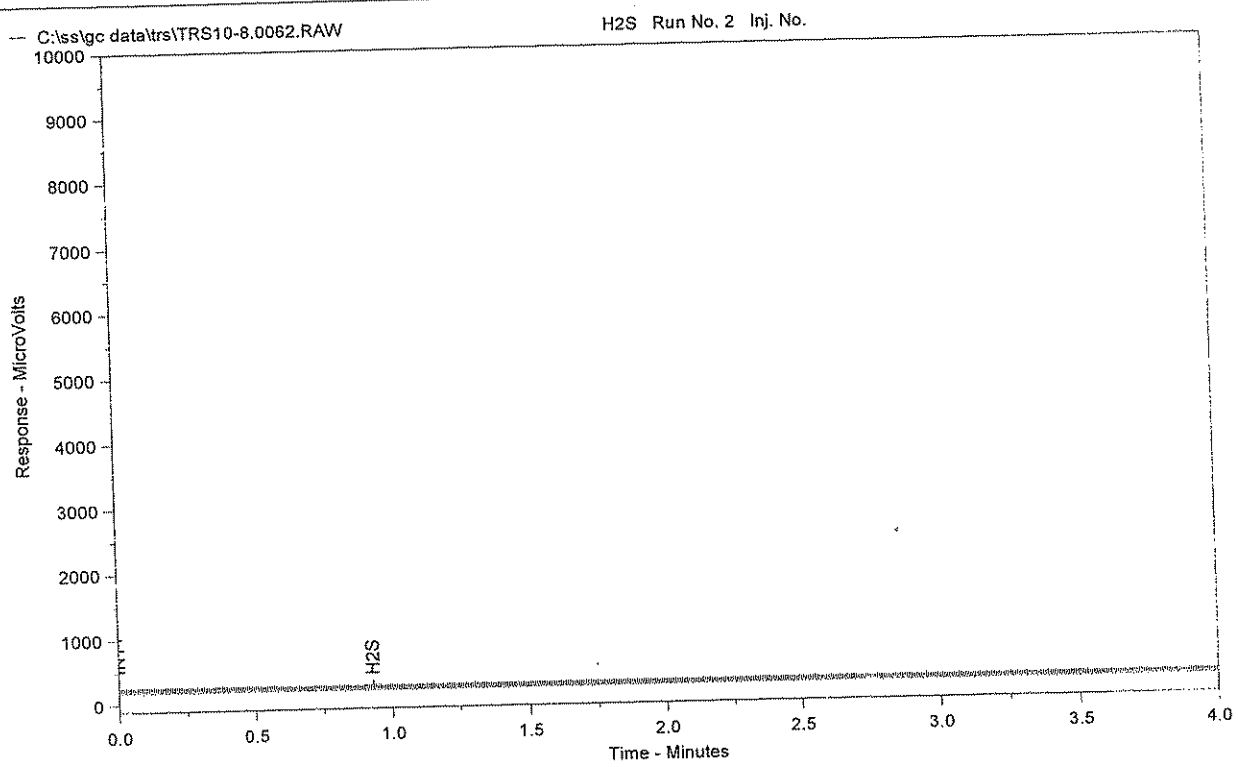
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0061.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 11:38:05 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 10

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0062.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

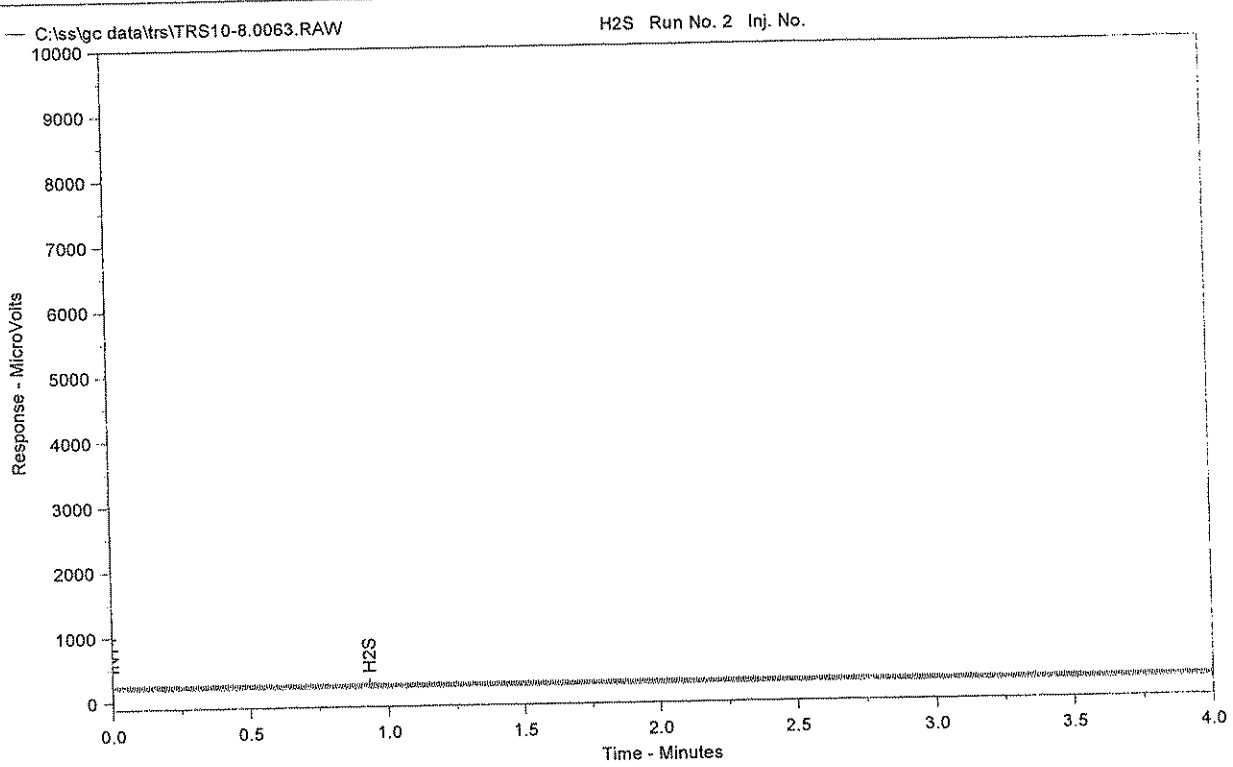
Date Taken (end) = 10/8/2008 11:44:05 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0

Total Height = 0

Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 11

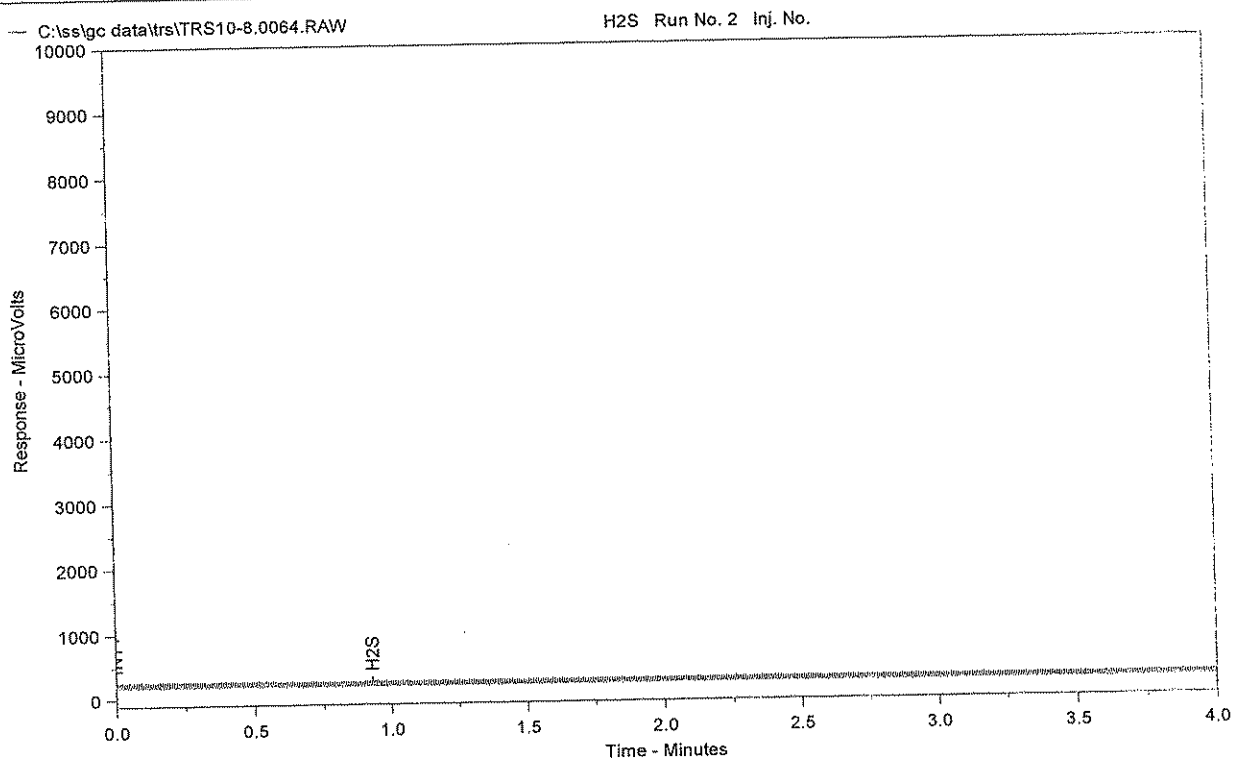
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0063.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 11:50:05 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 12

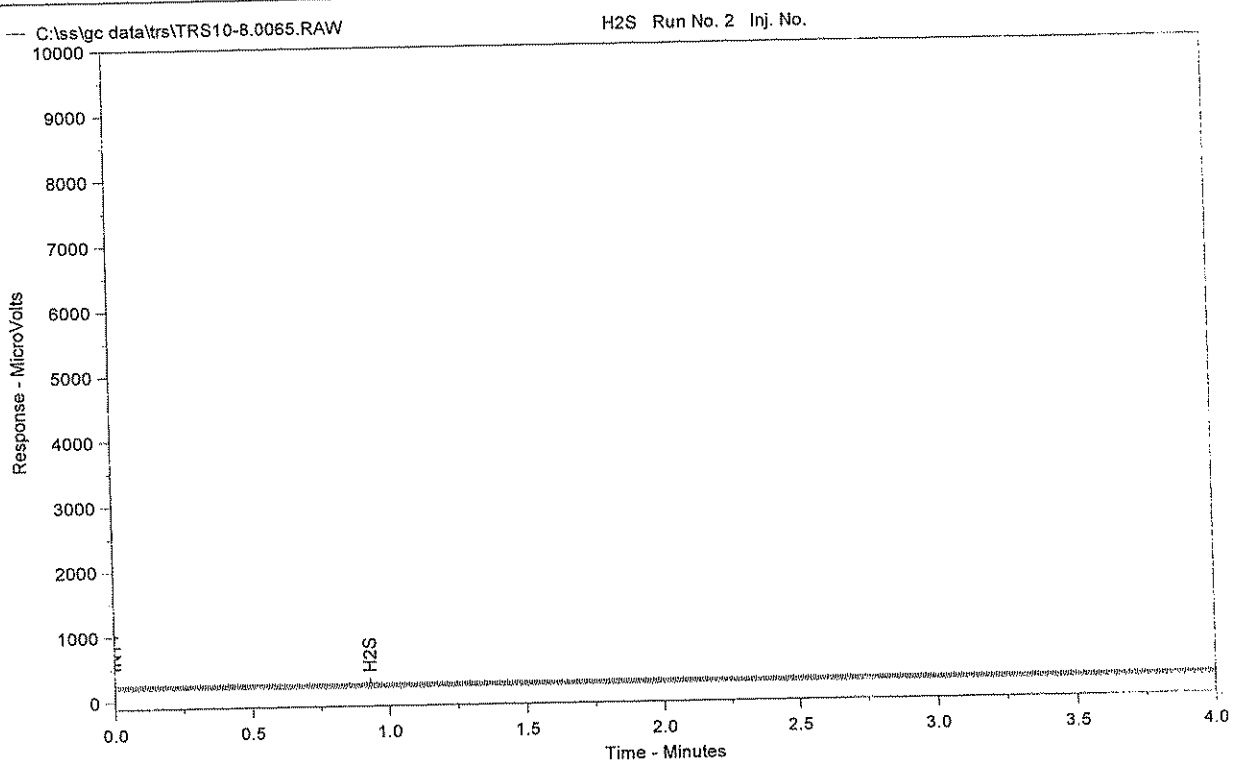
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0064.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 11:56:05 AM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 13

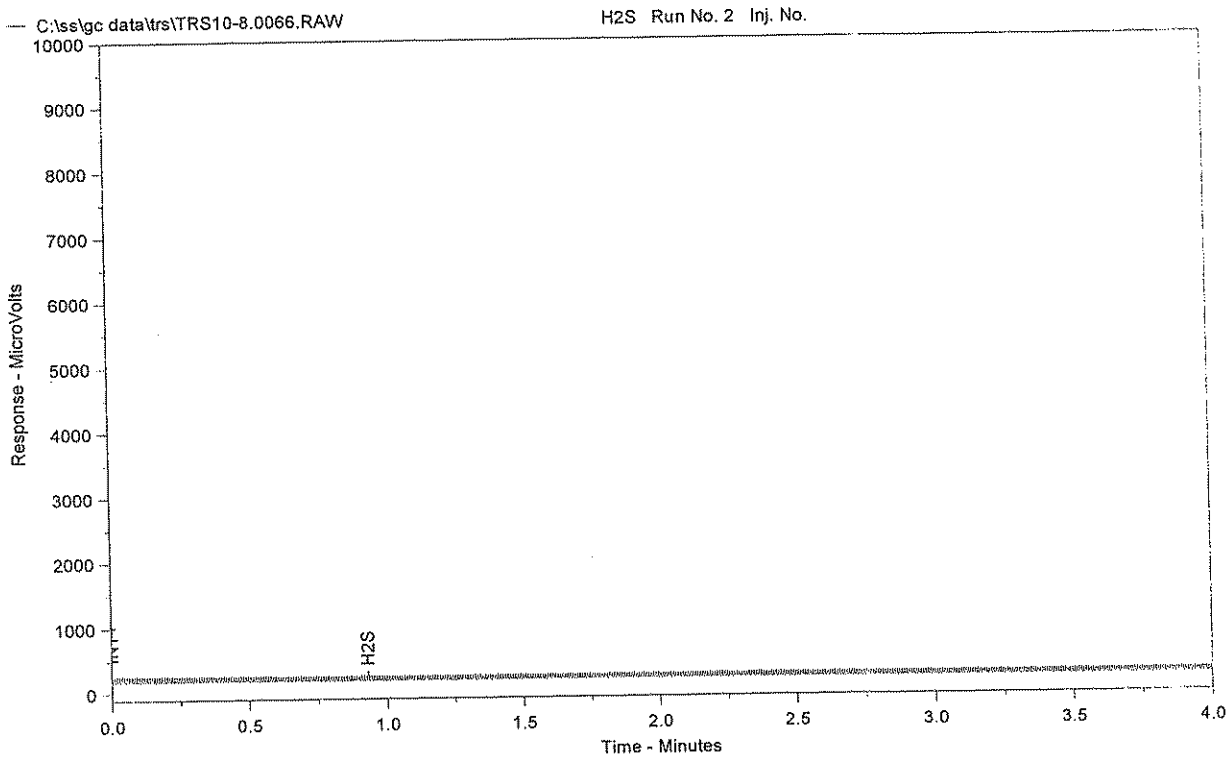
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0065.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 12:02:05 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 14

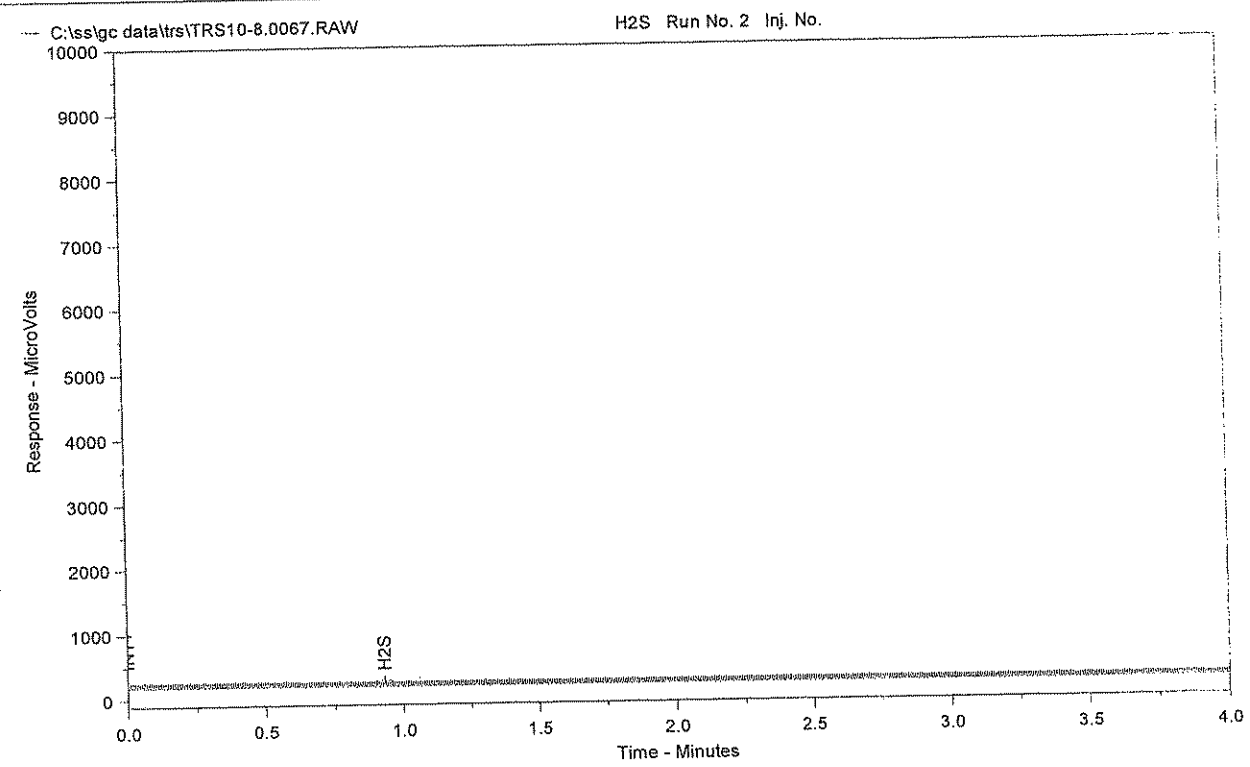
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0066.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 12:08:05 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 15

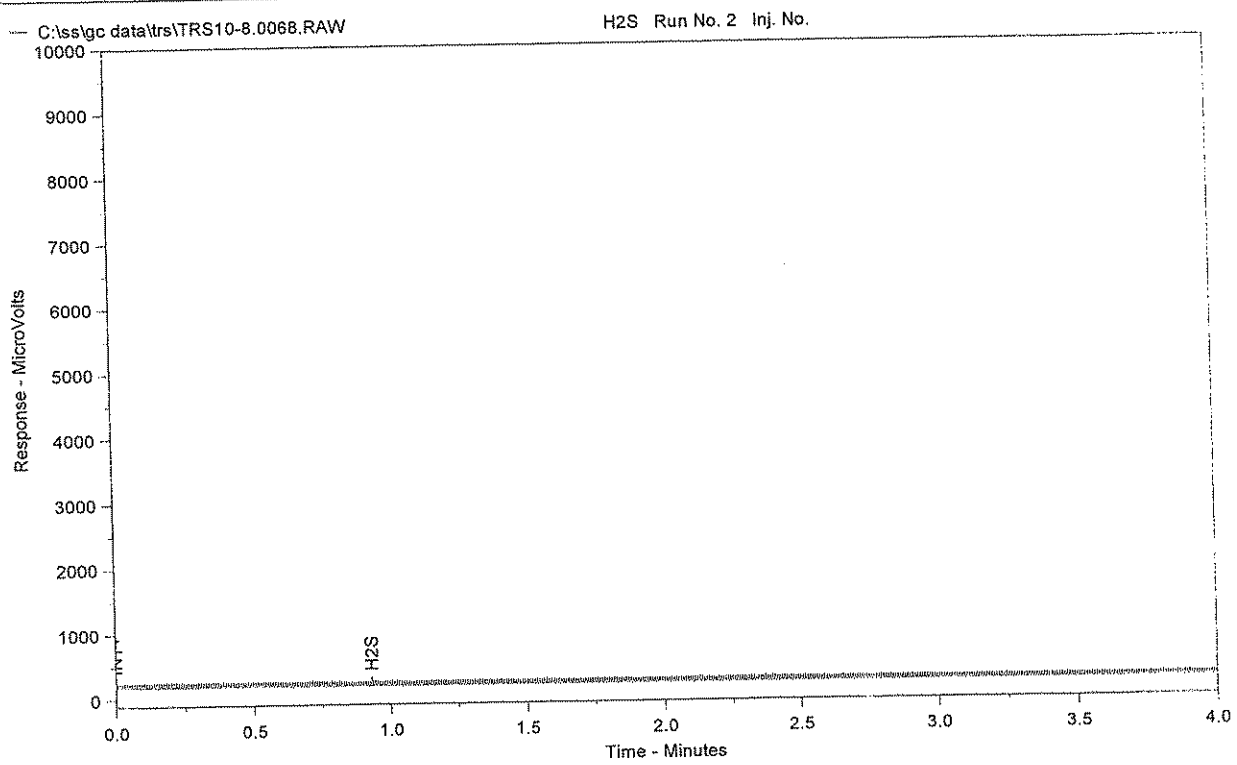
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0067.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 12:14:05 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 16

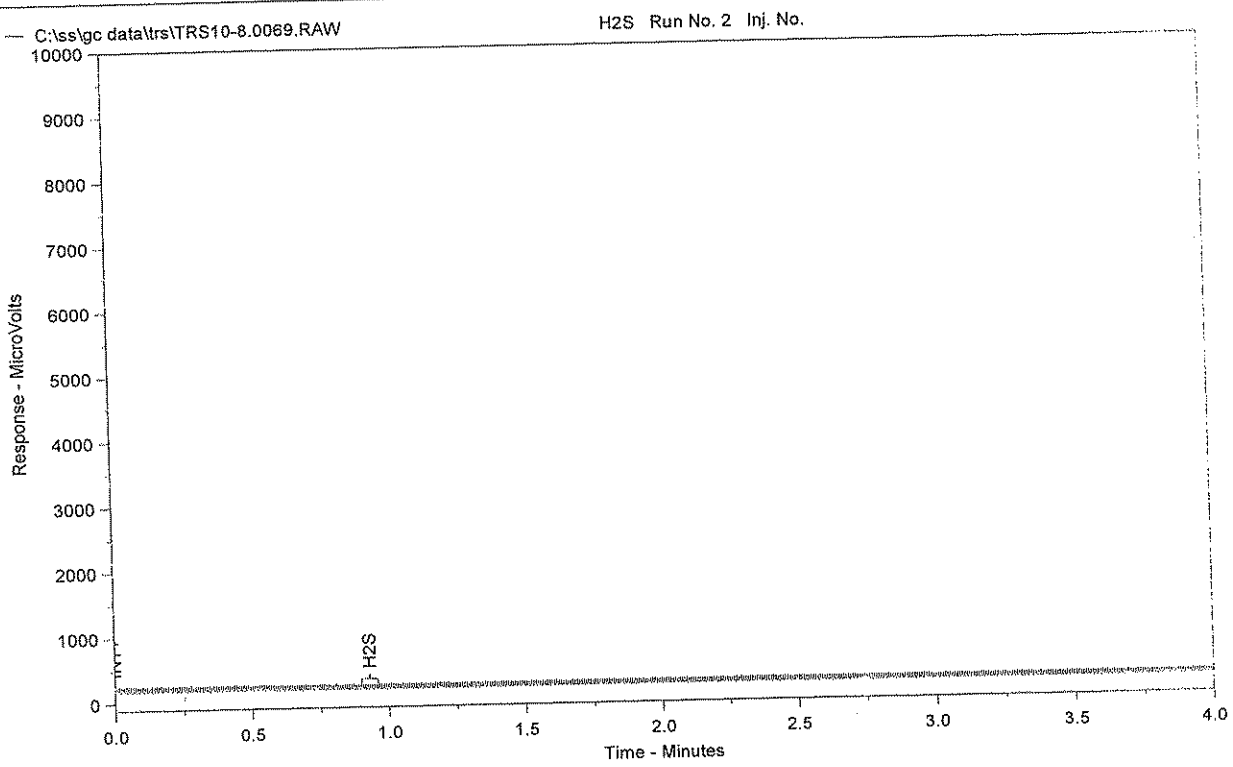
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0068.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 12:20:05 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 17

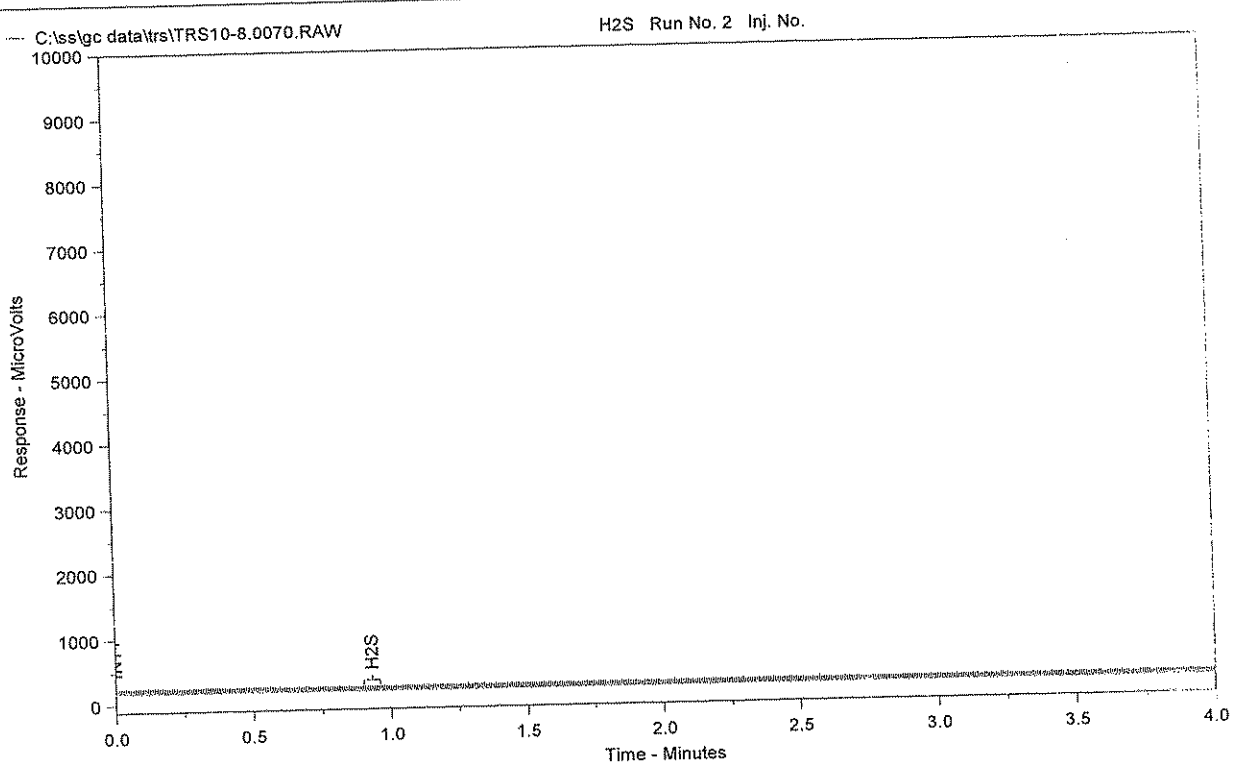
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0069.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 12:26:05 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 18

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0070.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

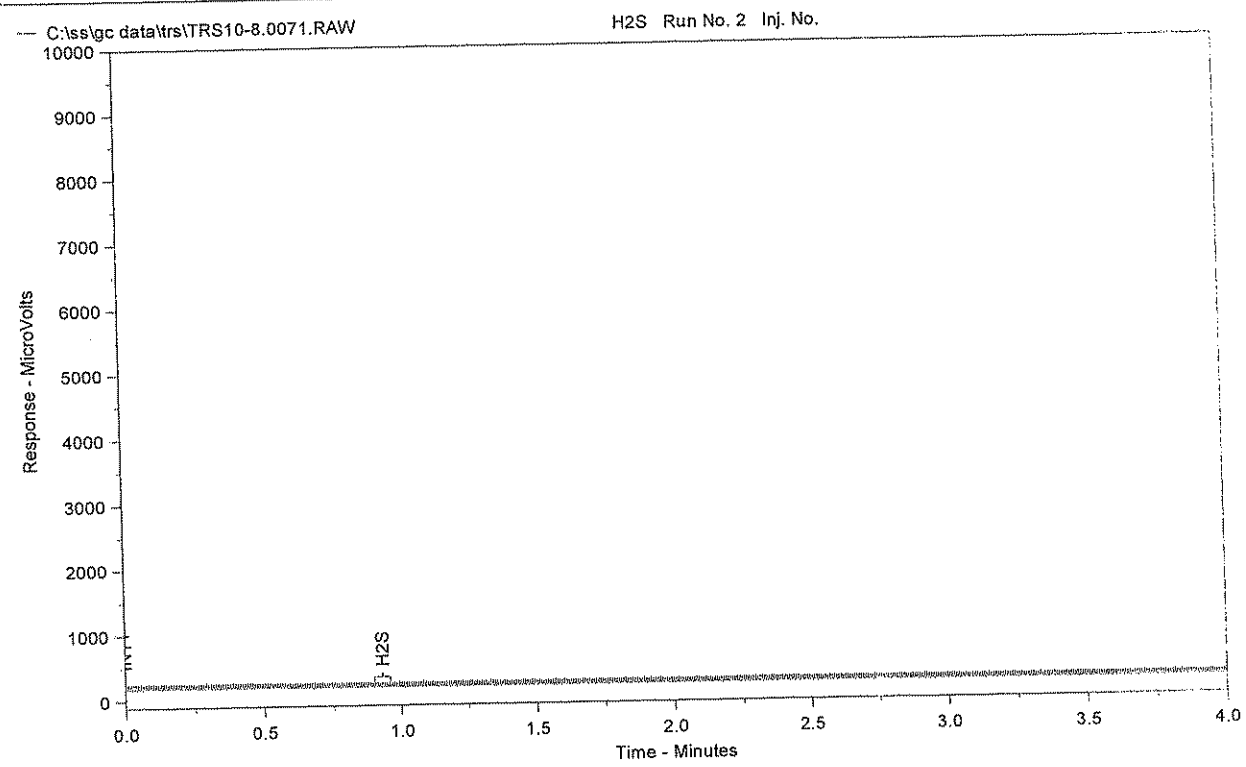
Date Taken (end) = 10/8/2008 12:32:05 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0

Total Height = 0

Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 10

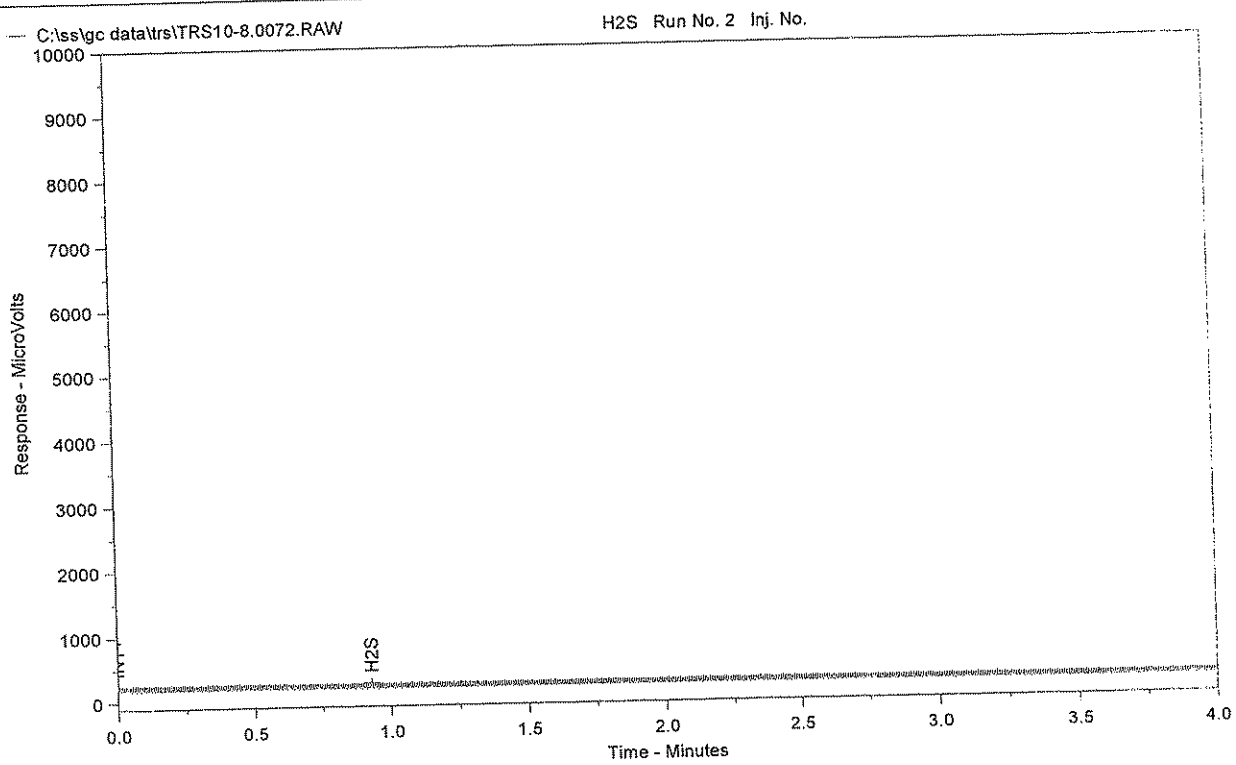
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0071.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 12:38:05 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 2.0

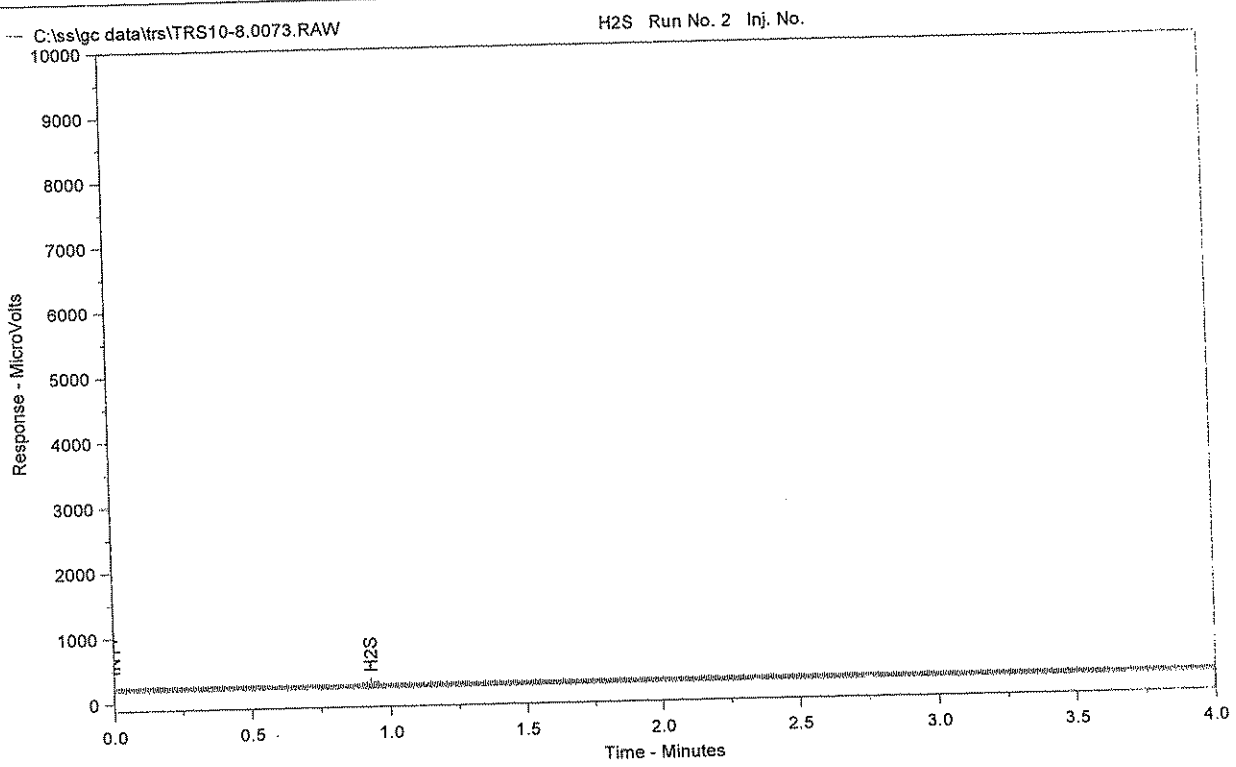
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0072.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 12:44:06 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 21

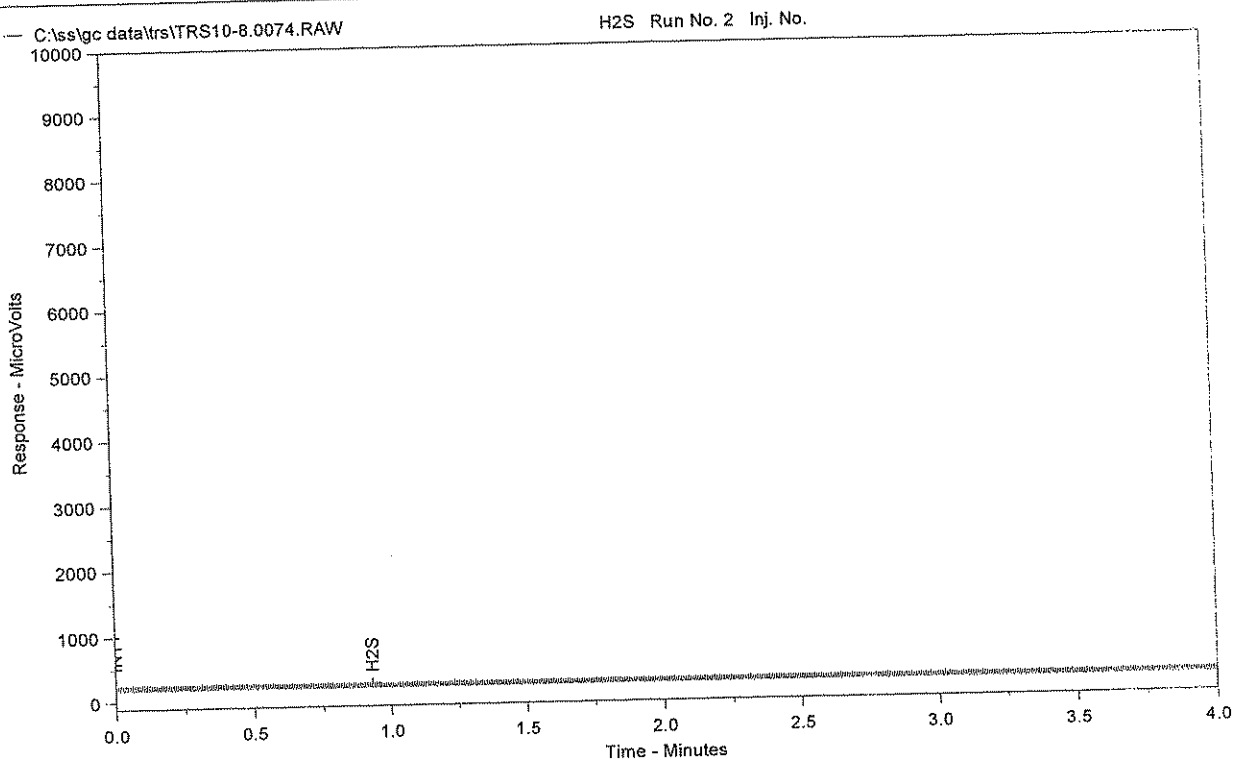
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0073.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 12:50:06 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 22

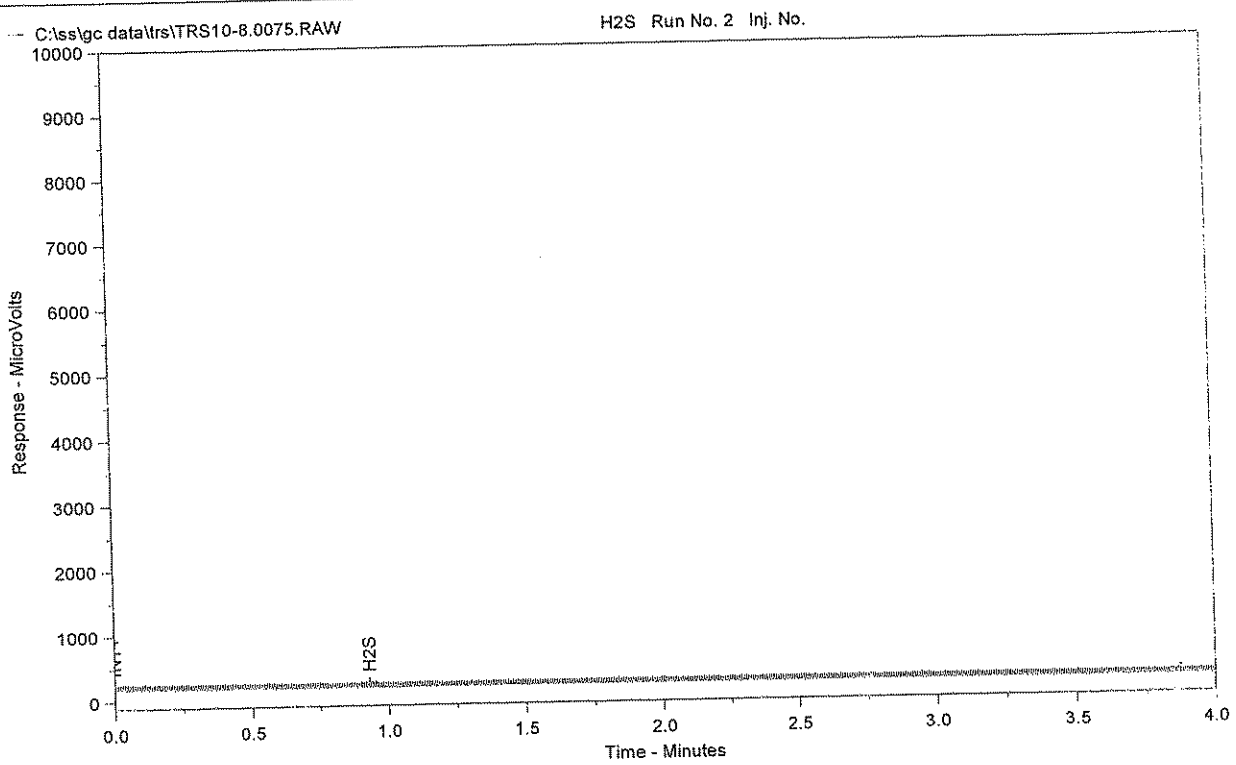
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0074.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 12:56:06 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 23

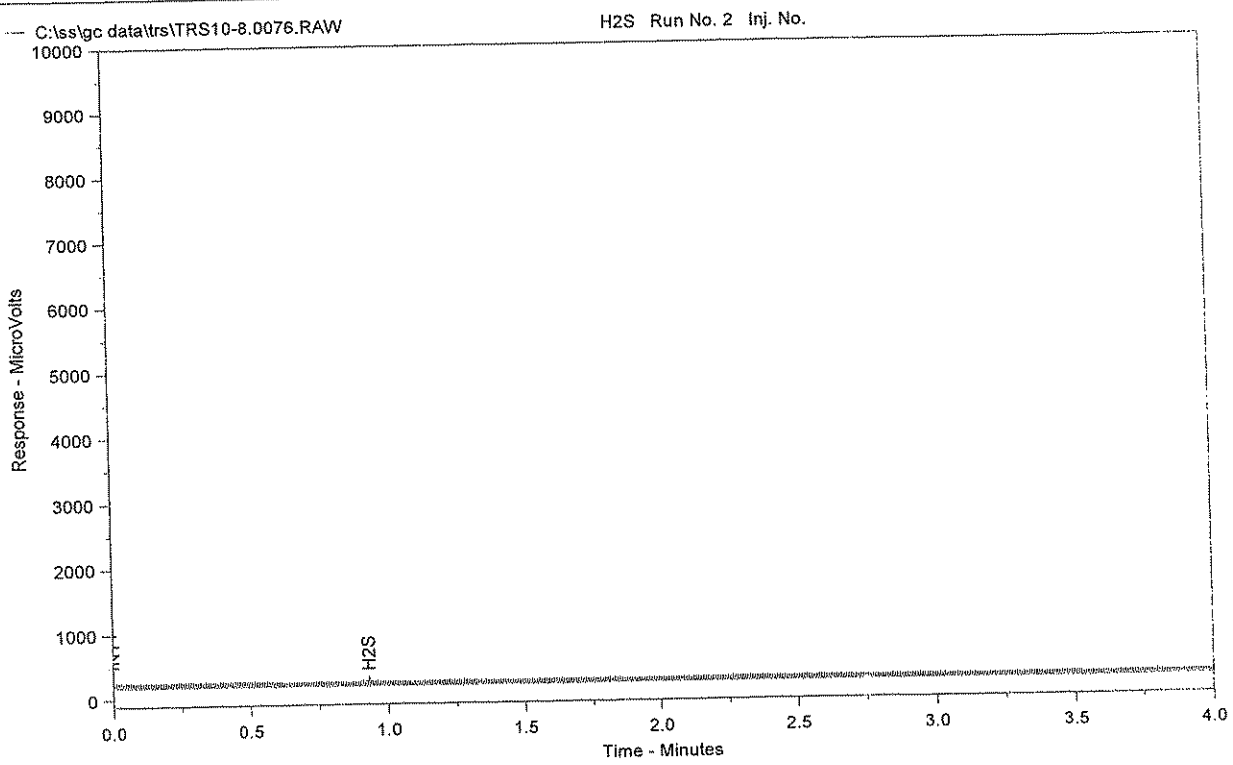
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0075.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 1:02:06 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 24

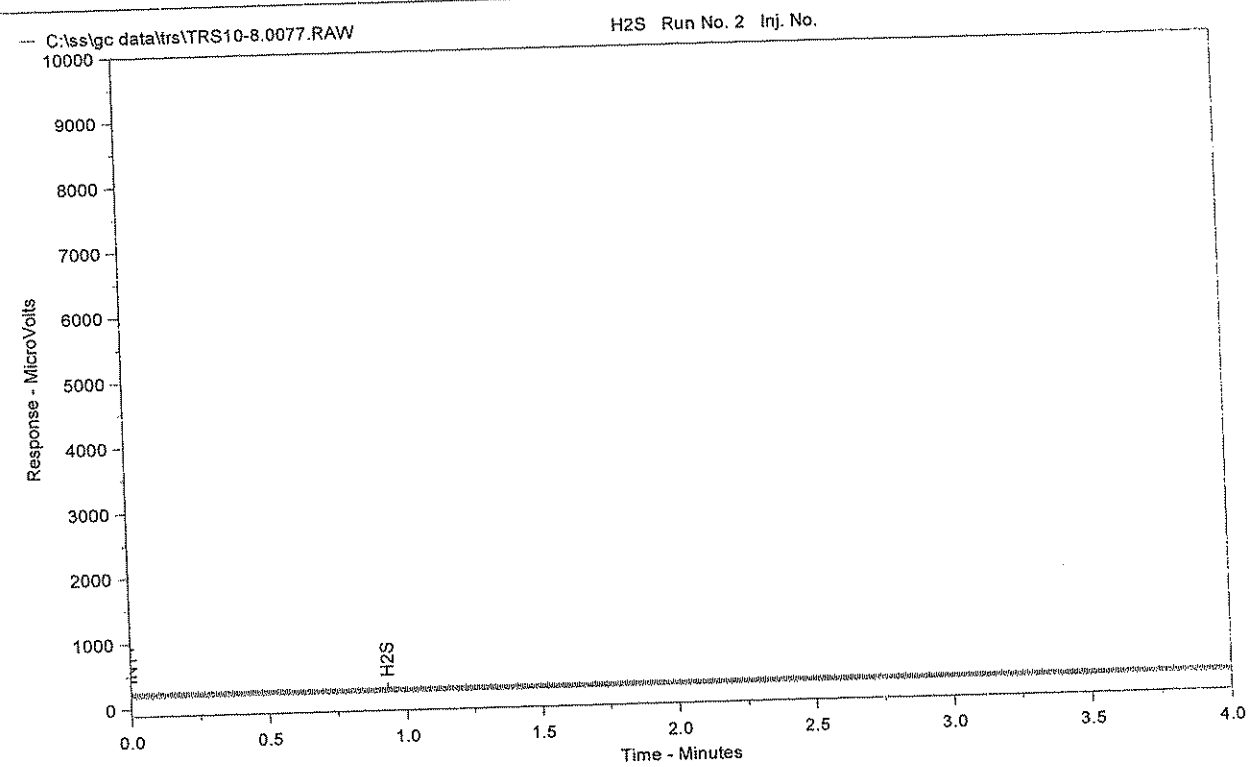
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0076.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 1:08:06 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 25

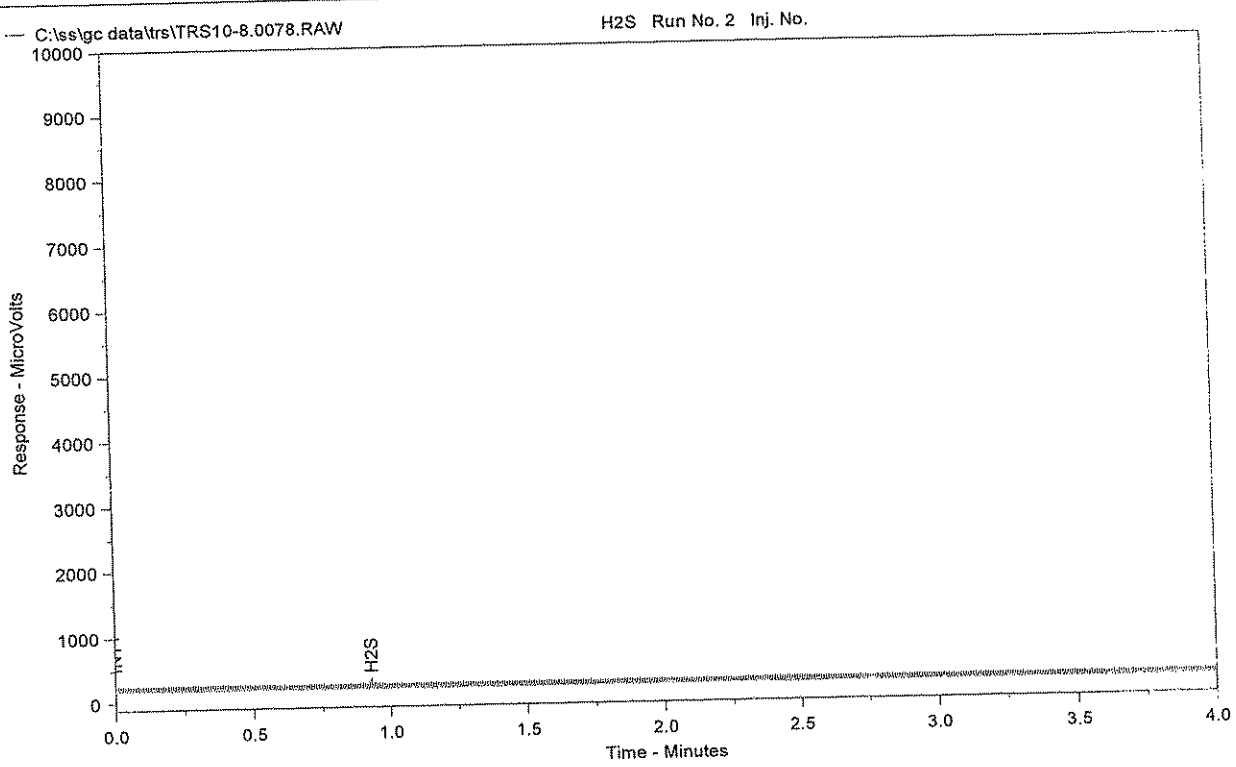
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0077.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 1:14:06 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 26

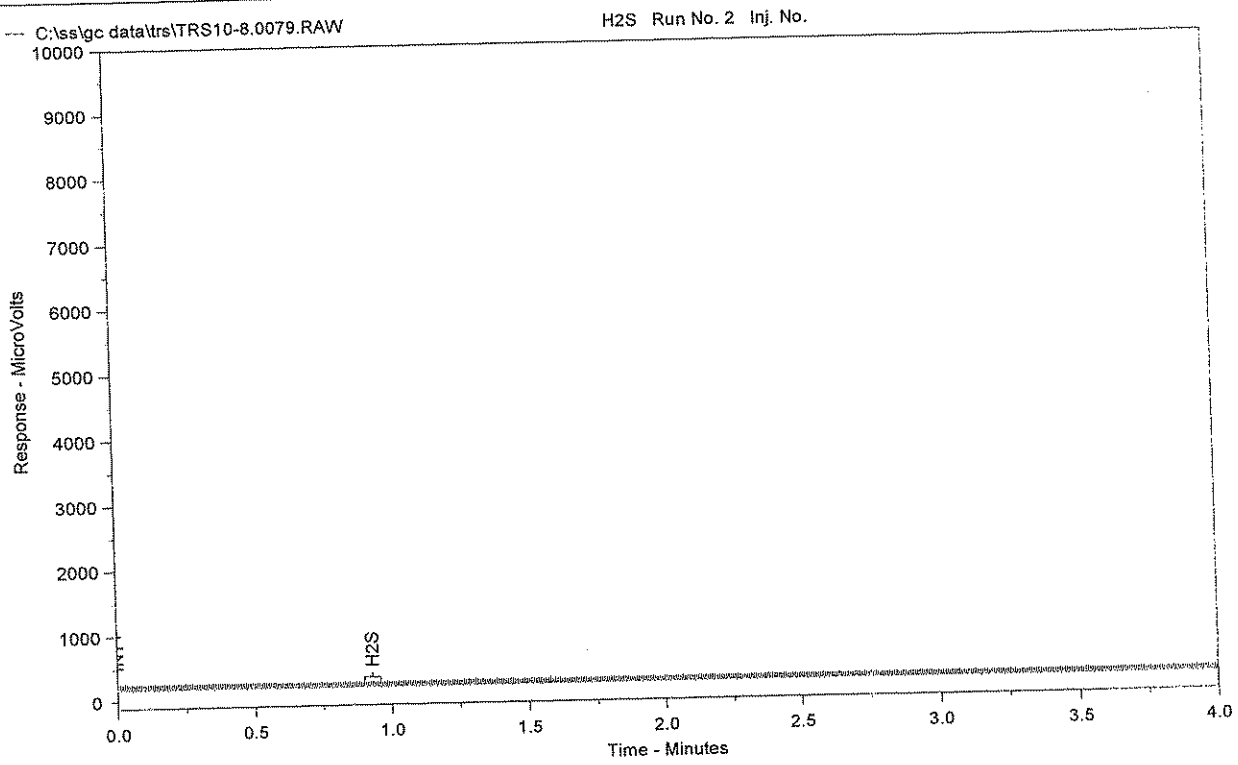
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0078.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 1:20:06 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 27

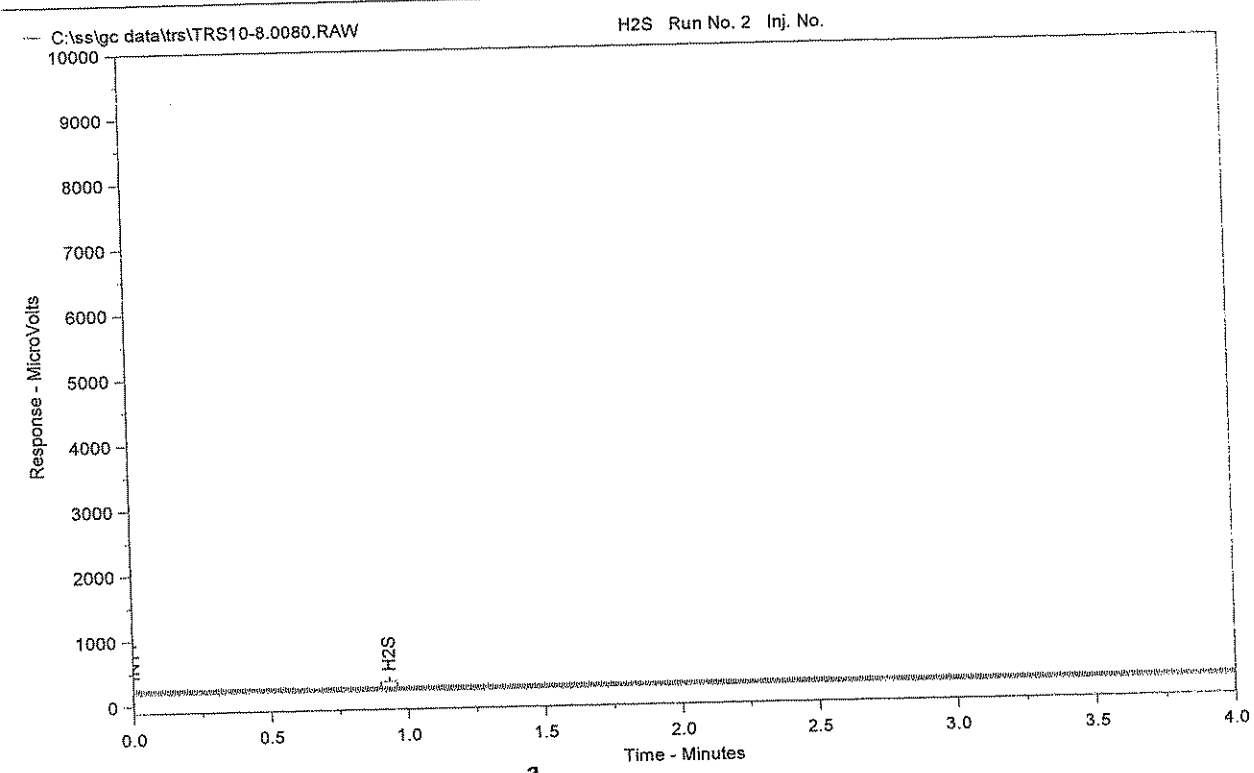
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0079.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 1:26:06 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 28

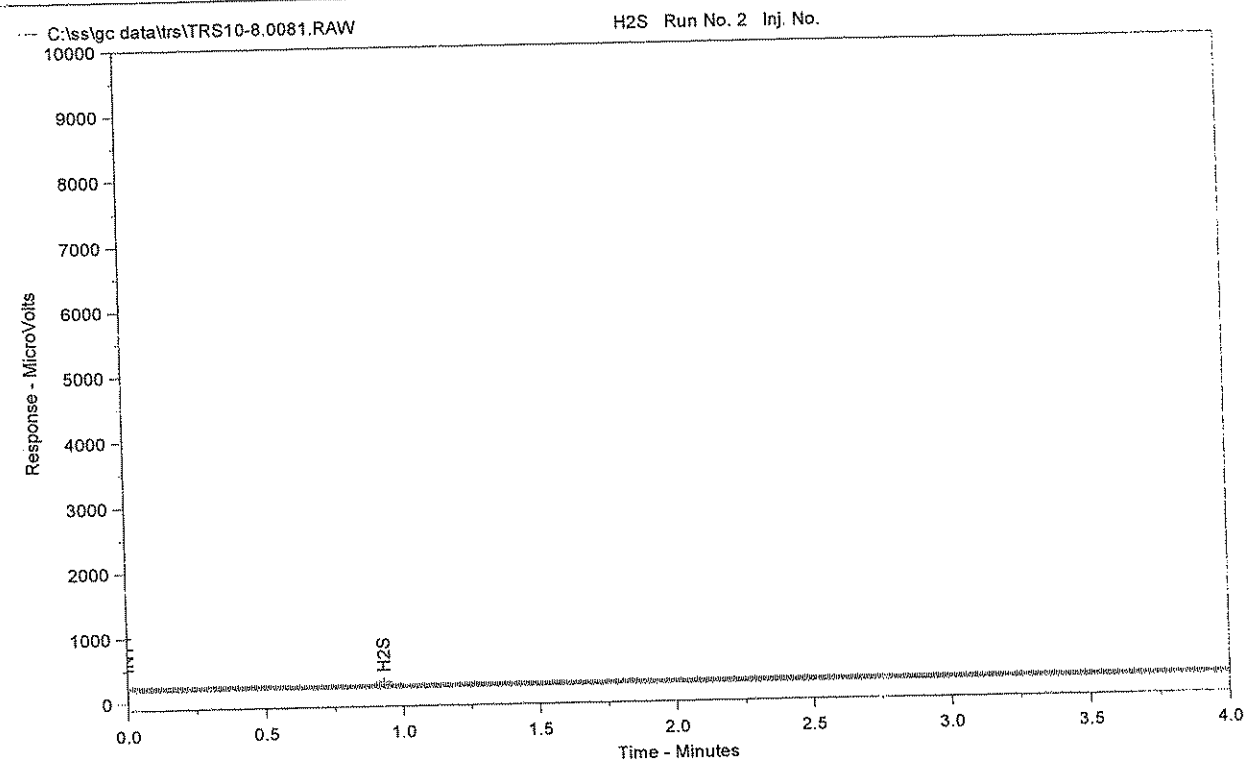
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0080.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 1:32:06 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 29

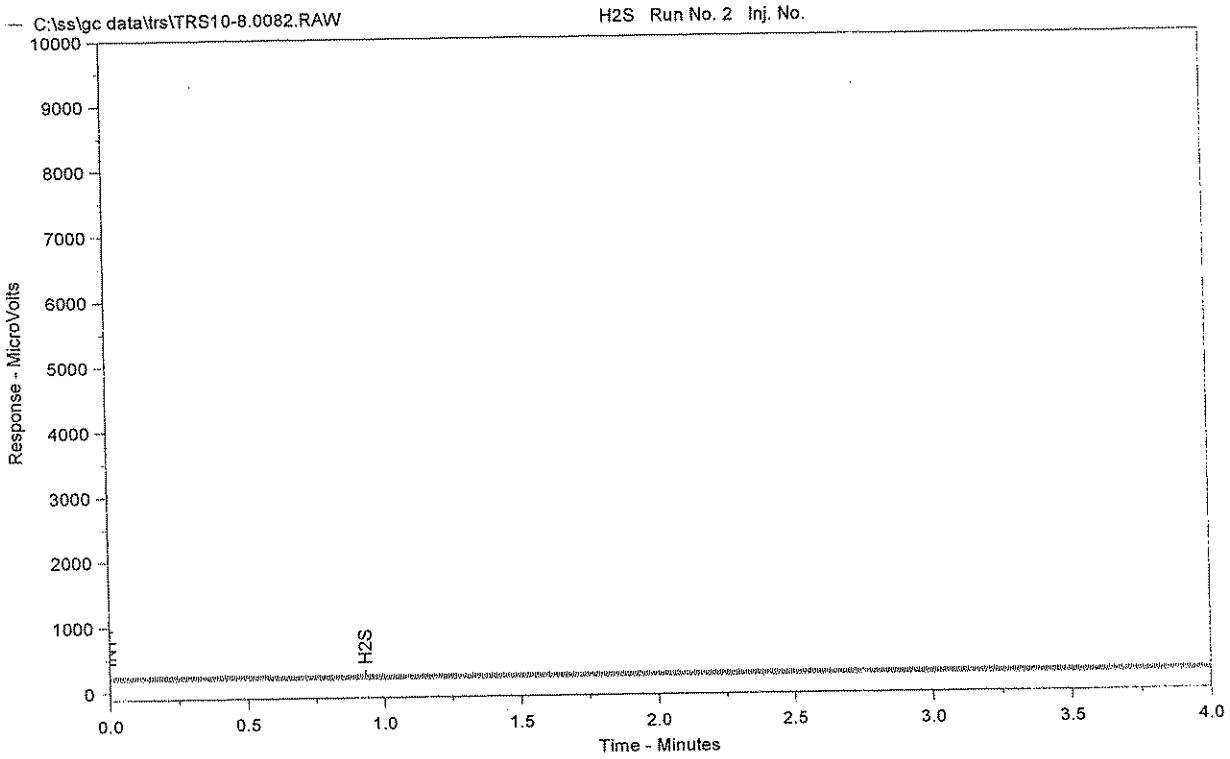
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0081.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 1:38:06 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 2 Inj. No.** 30

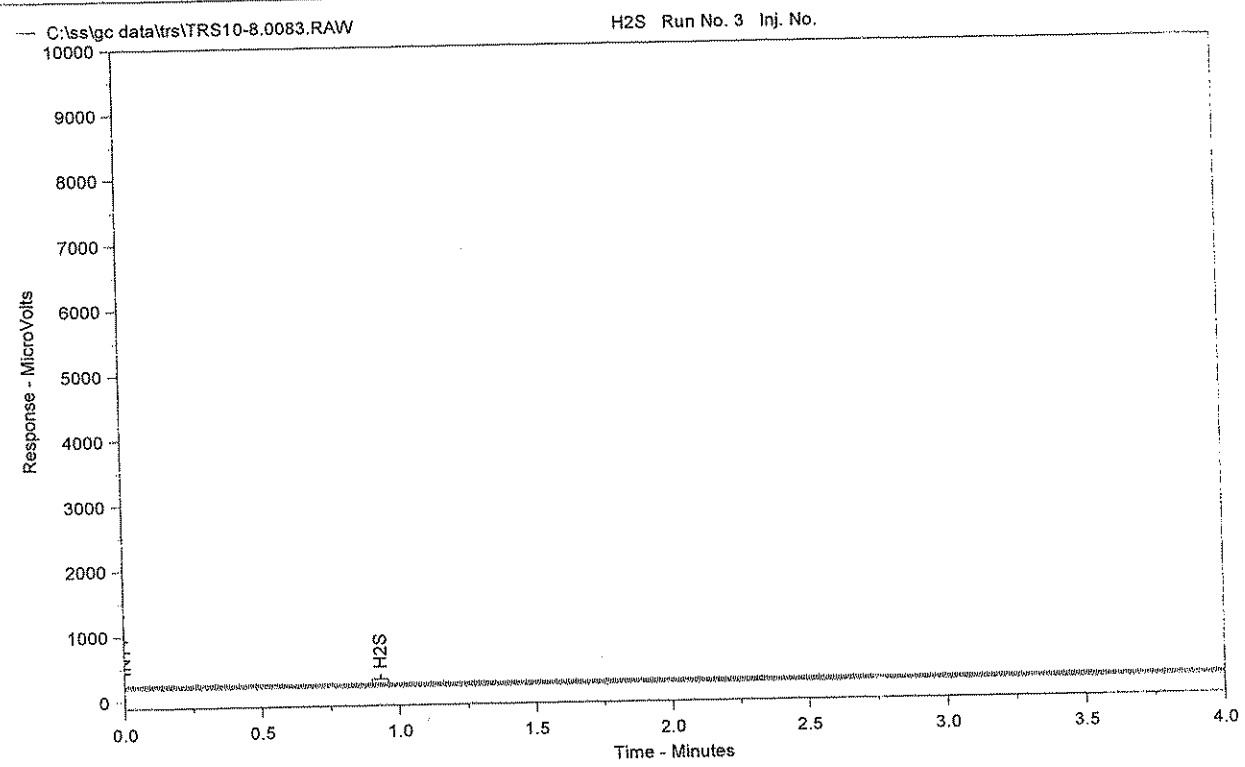
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0082.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 1:44:06 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.**

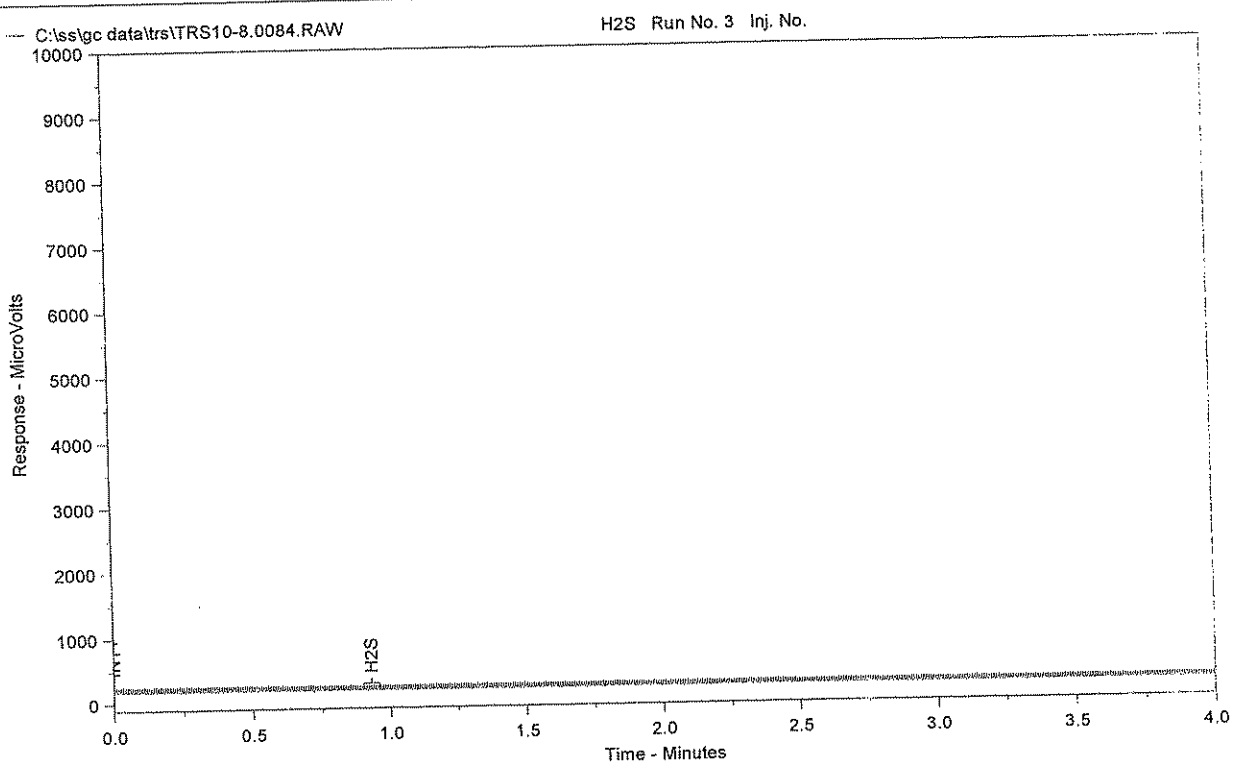
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0083.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 1:50:31 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 2

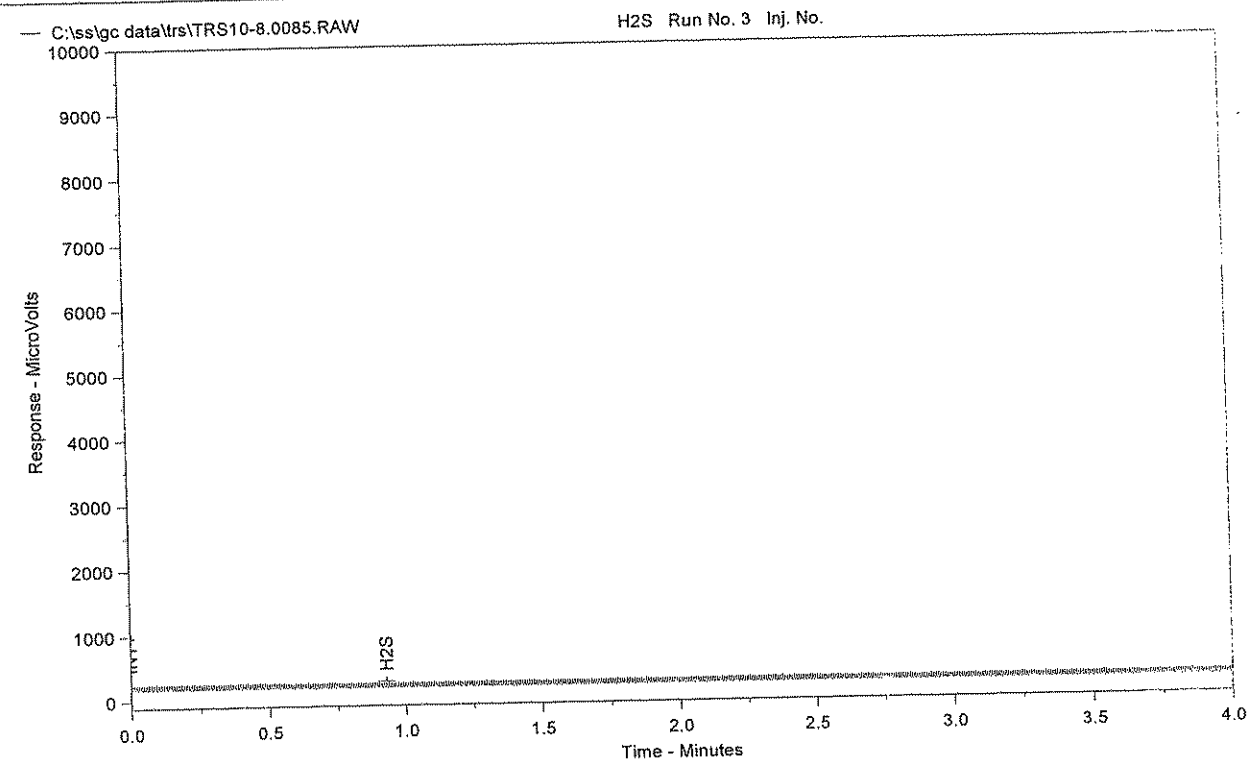
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0084.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 1:56:31 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 3

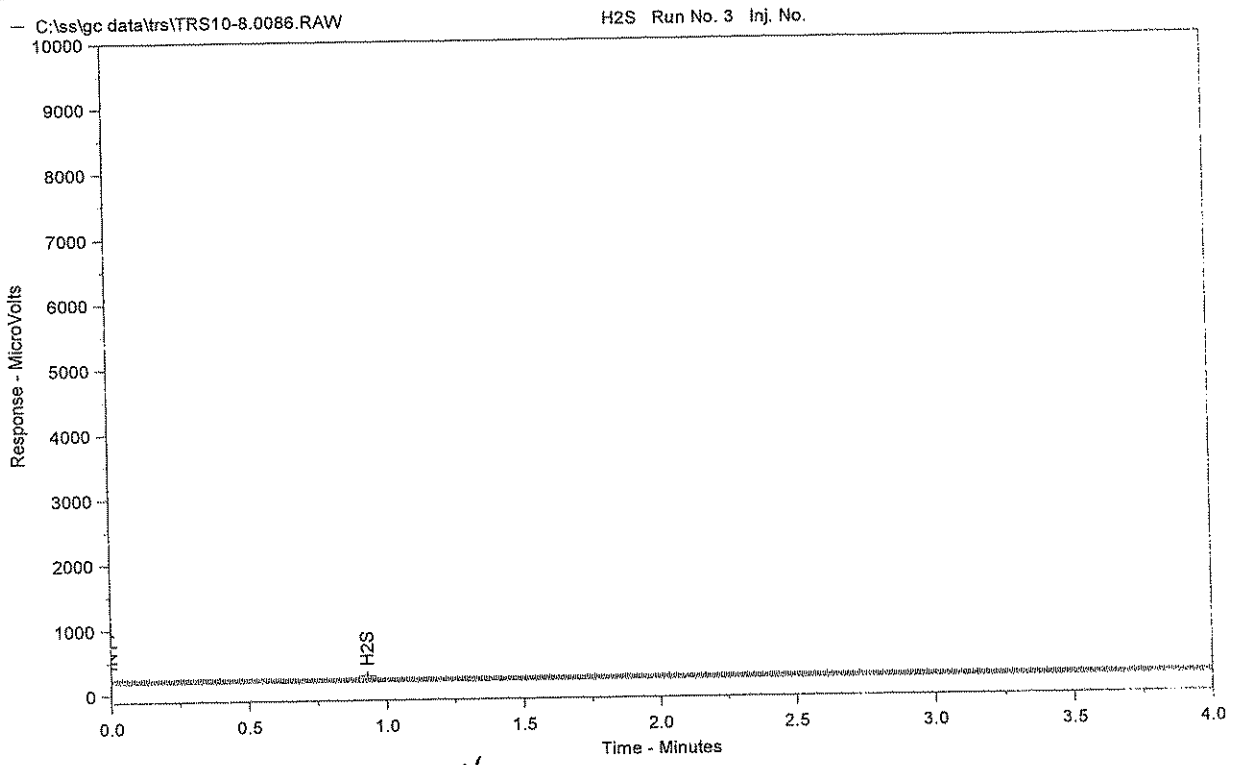
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0085.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 2:02:31 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 4

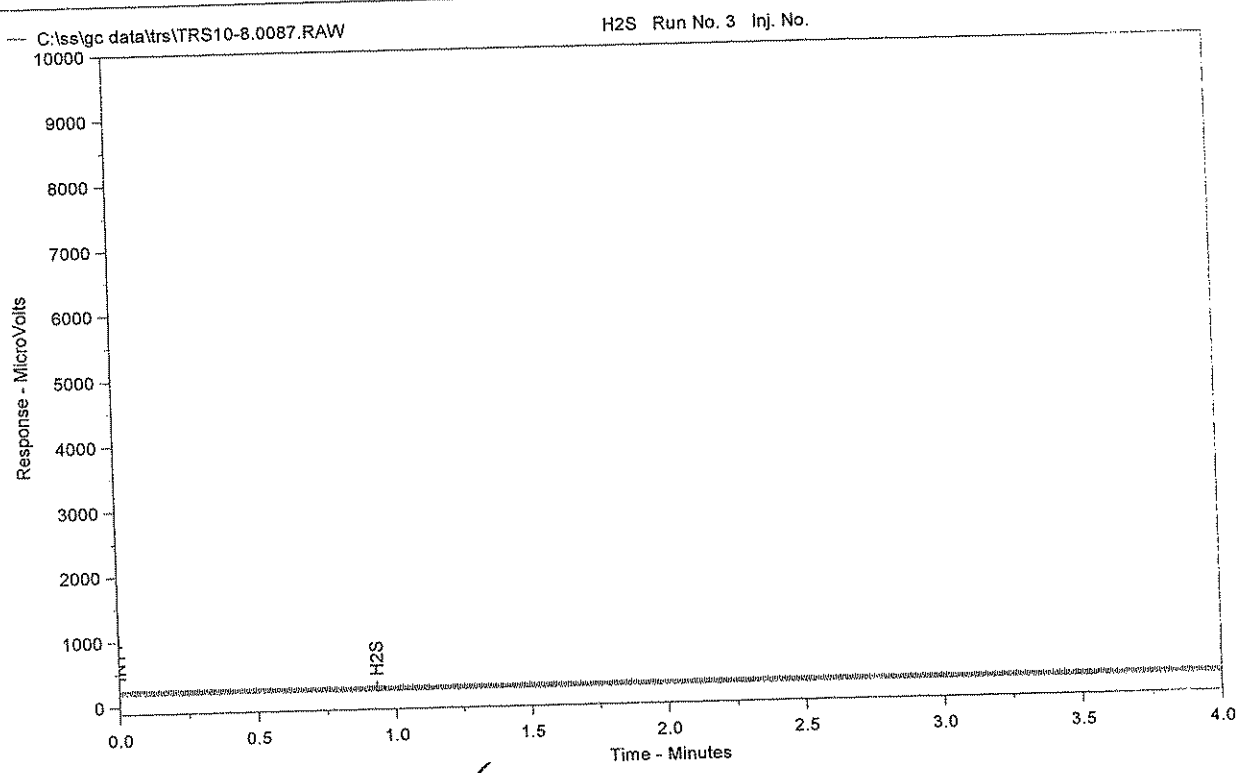
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0086.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 2:08:31 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 6

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0087.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

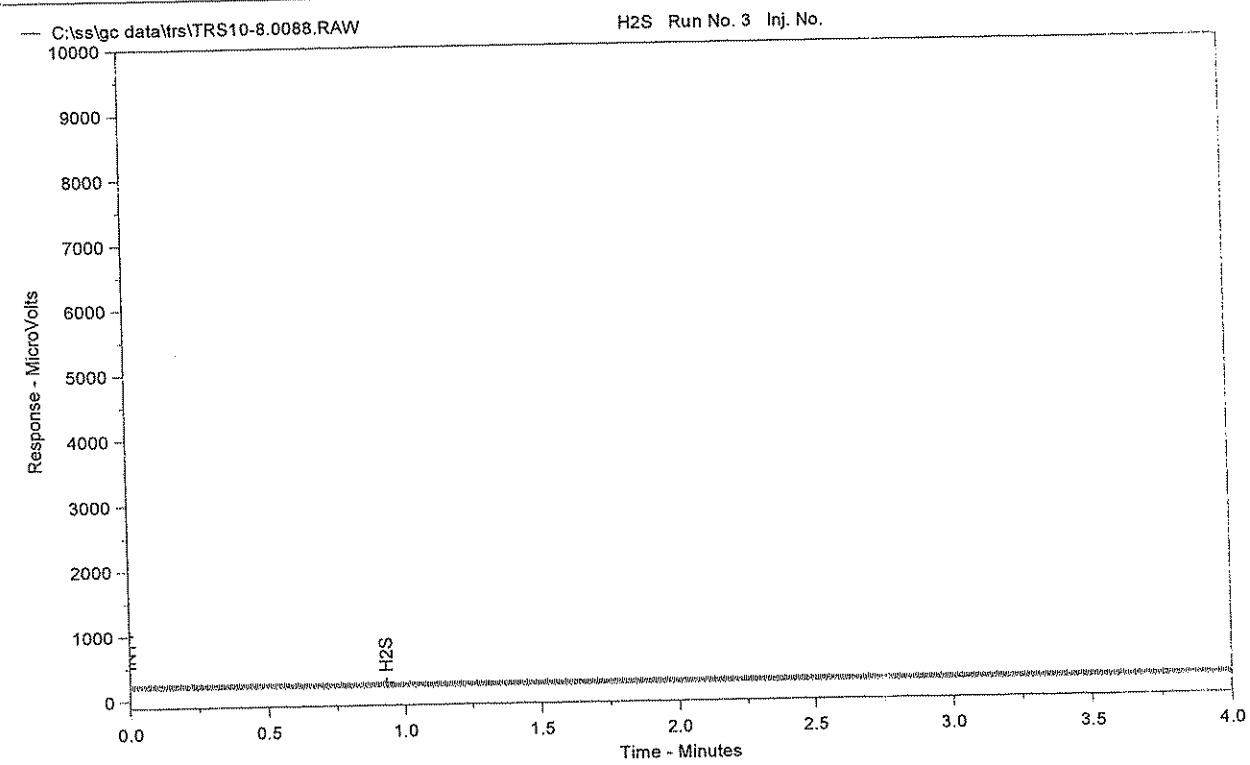
Date Taken (end) = 10/8/2008 2:14:32 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0

Total Height = 0

Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 6

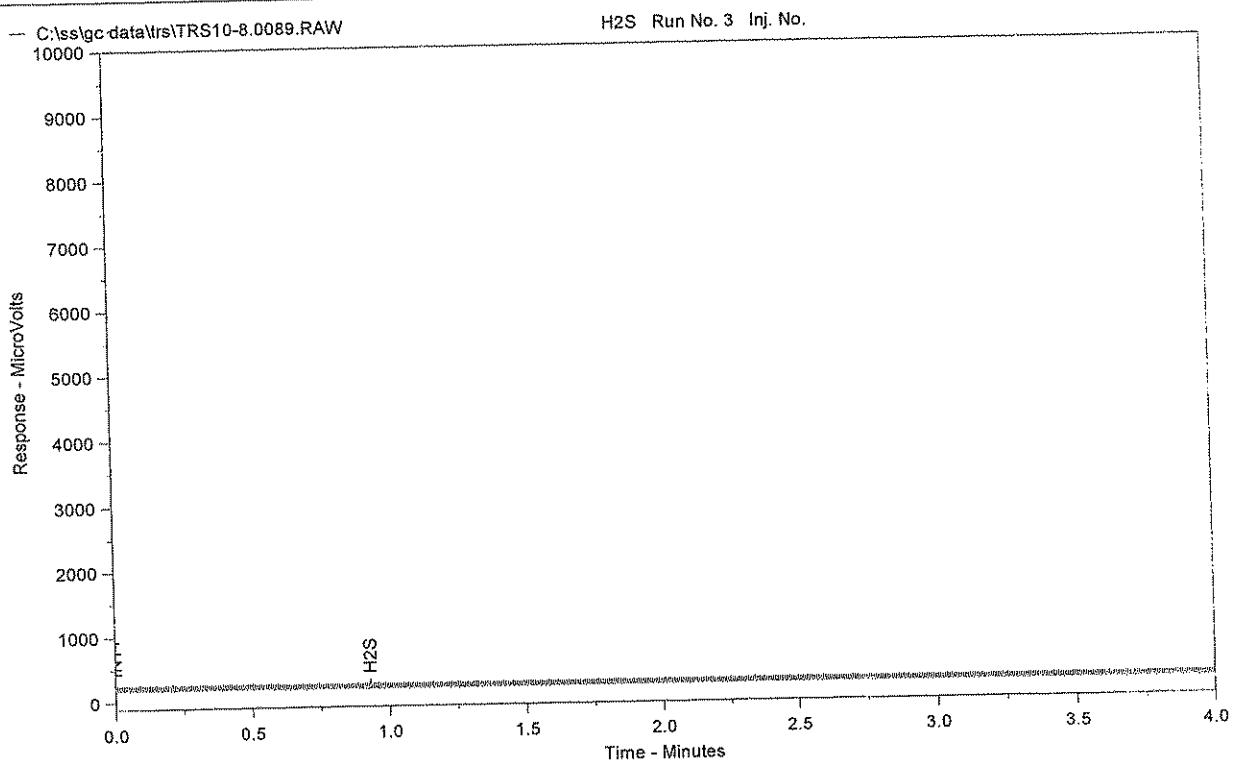
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0088.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 2:20:32 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 1

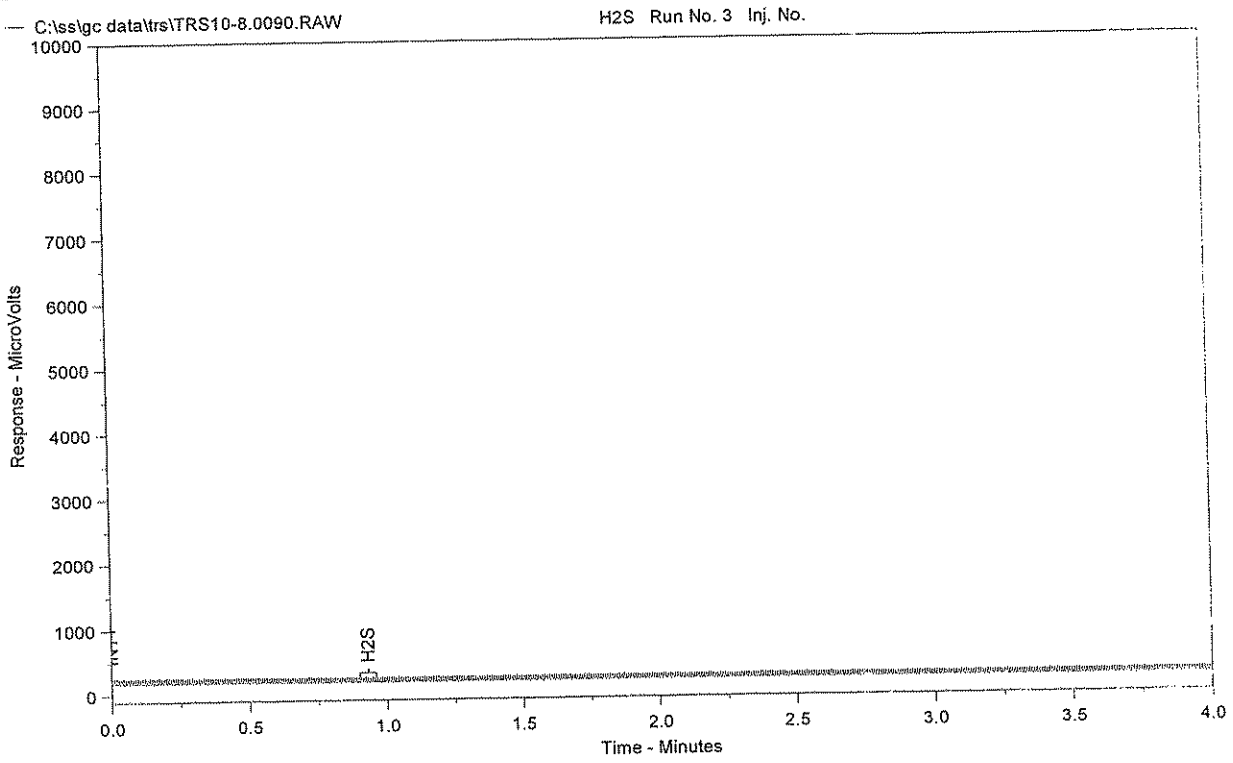
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0089.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 2:26:32 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 8

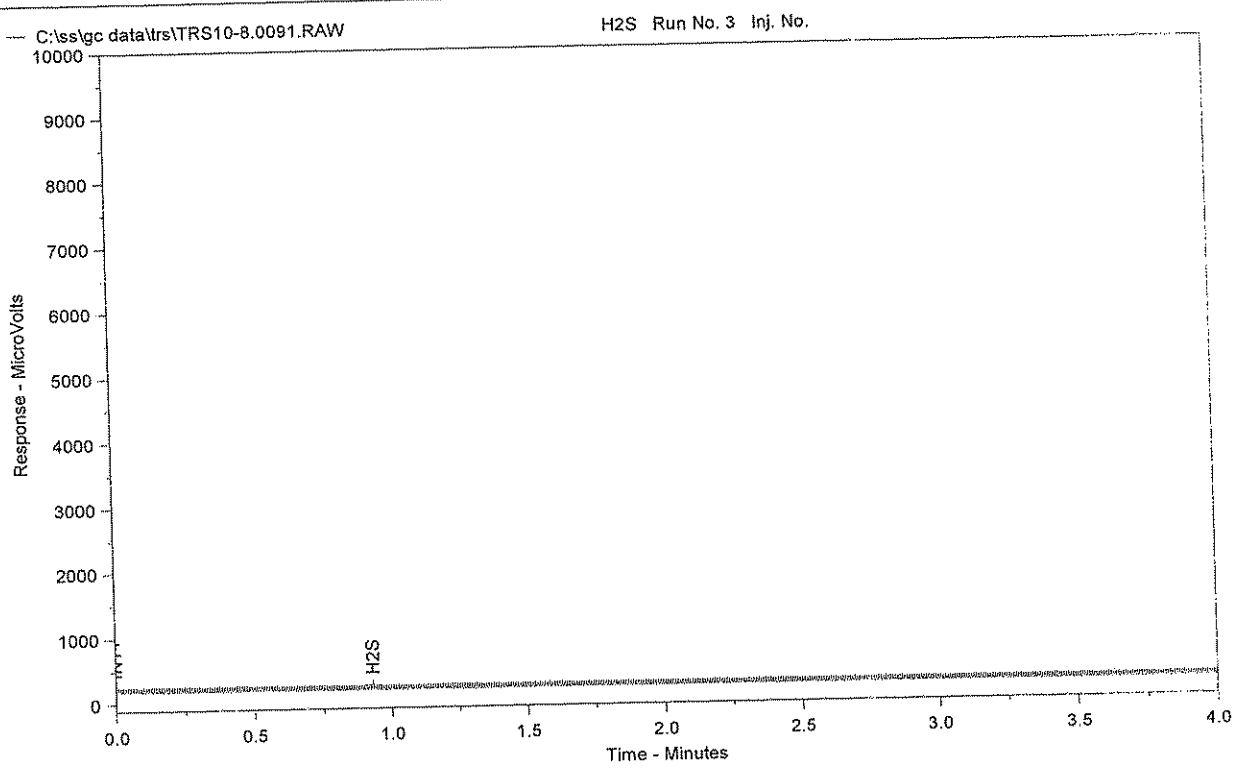
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0090.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 2:32:32 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 109

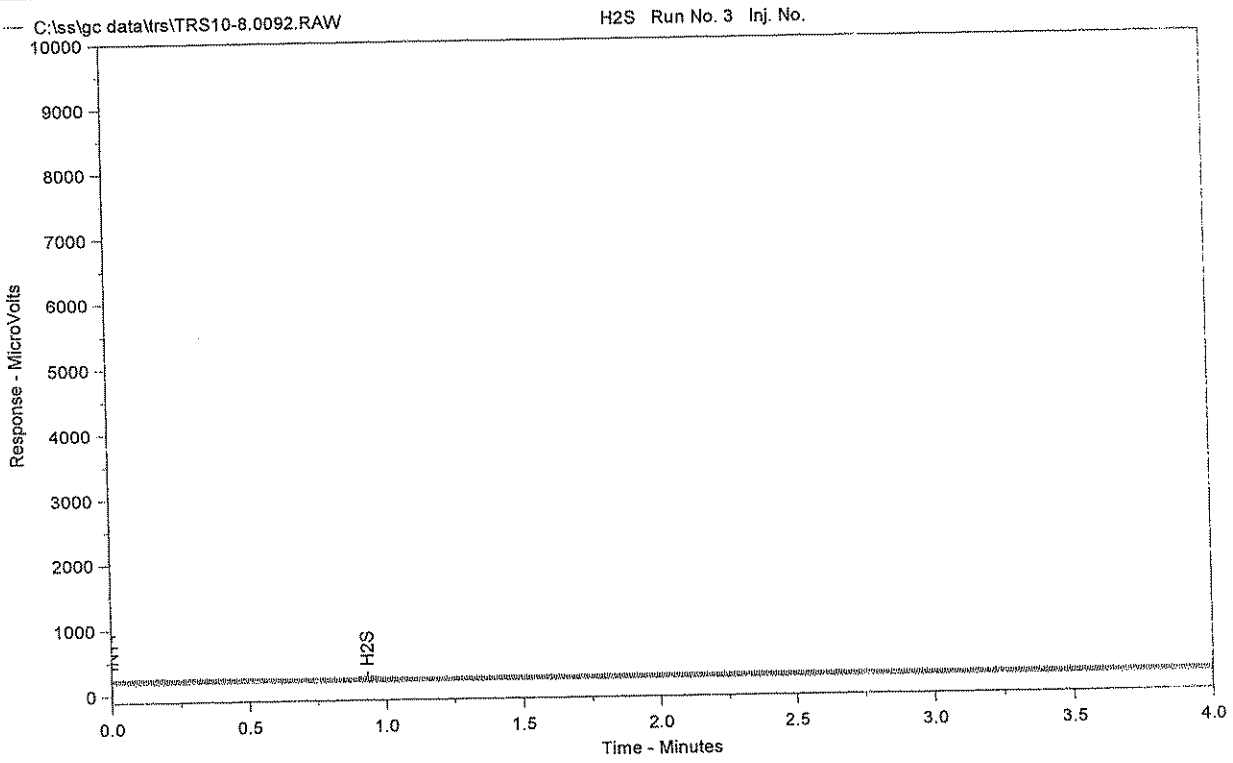
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0091.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 2:38:32 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** #10

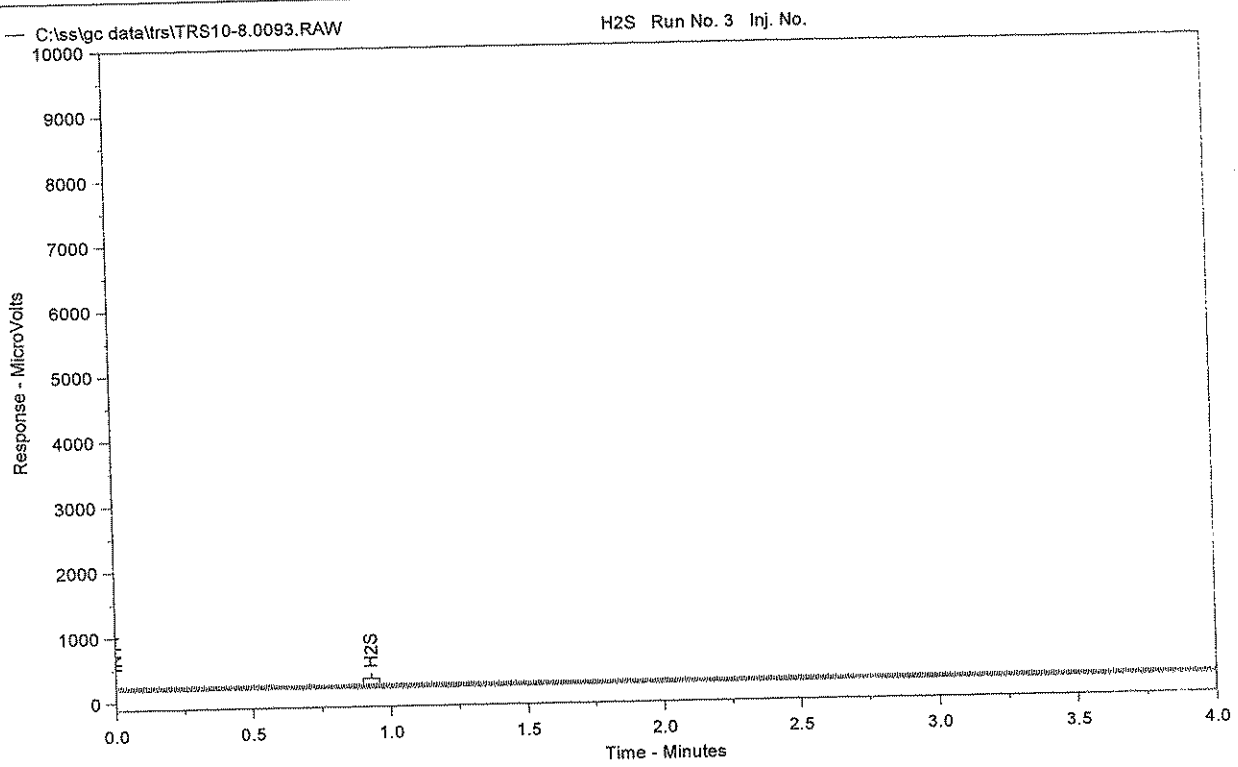
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0092.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 2:44:32 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 1211

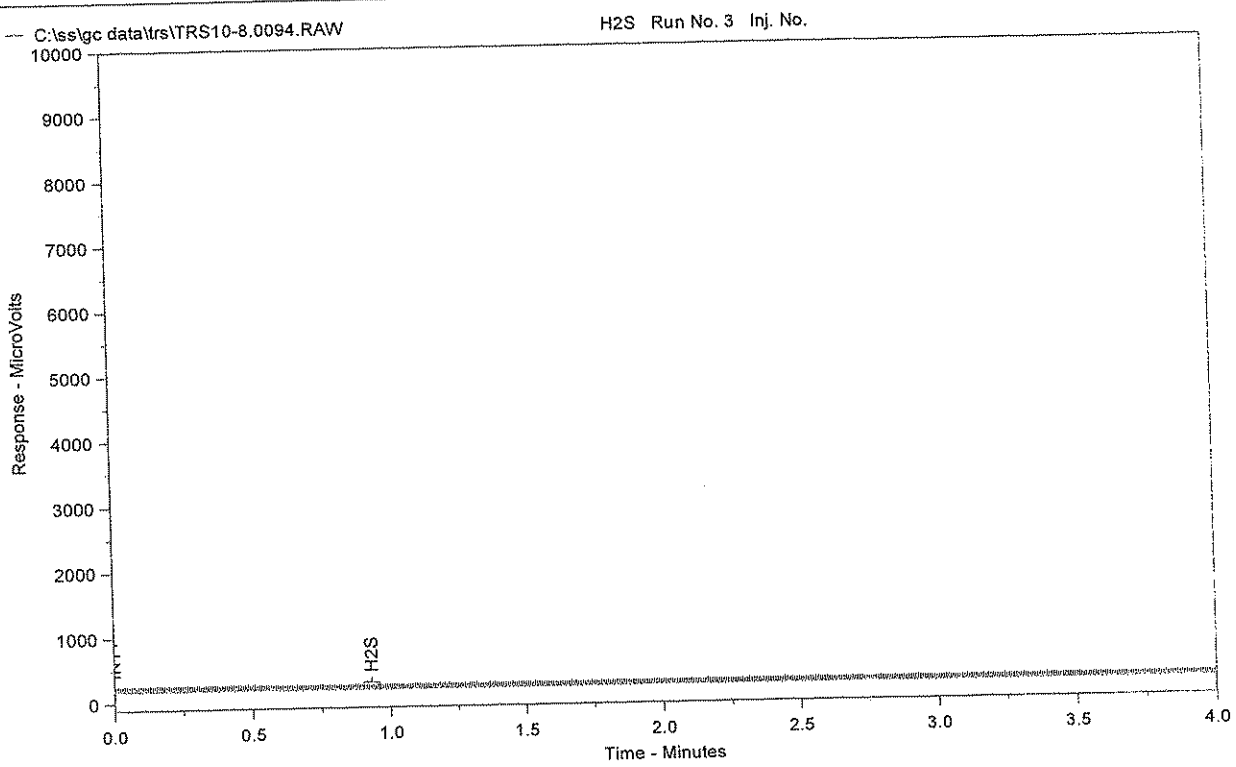
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0093.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 2:50:32 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 12

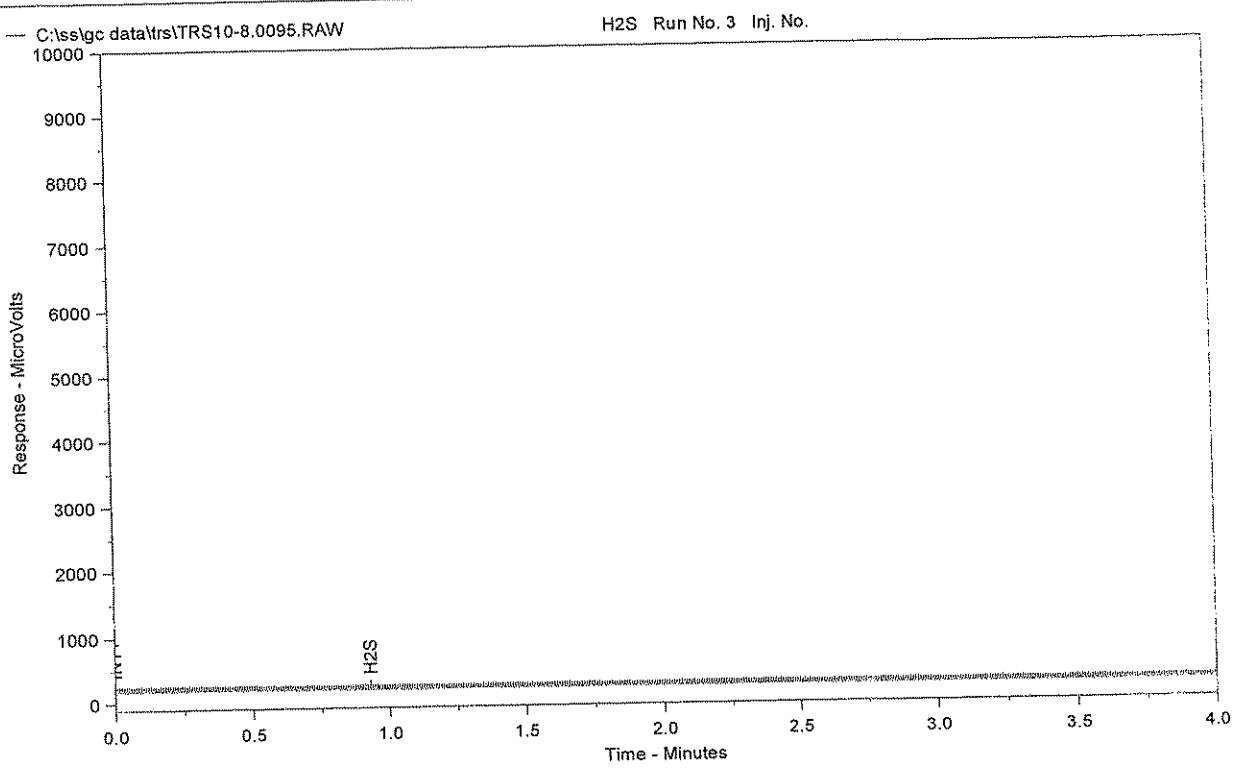
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0094.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 2:56:32 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 14 13

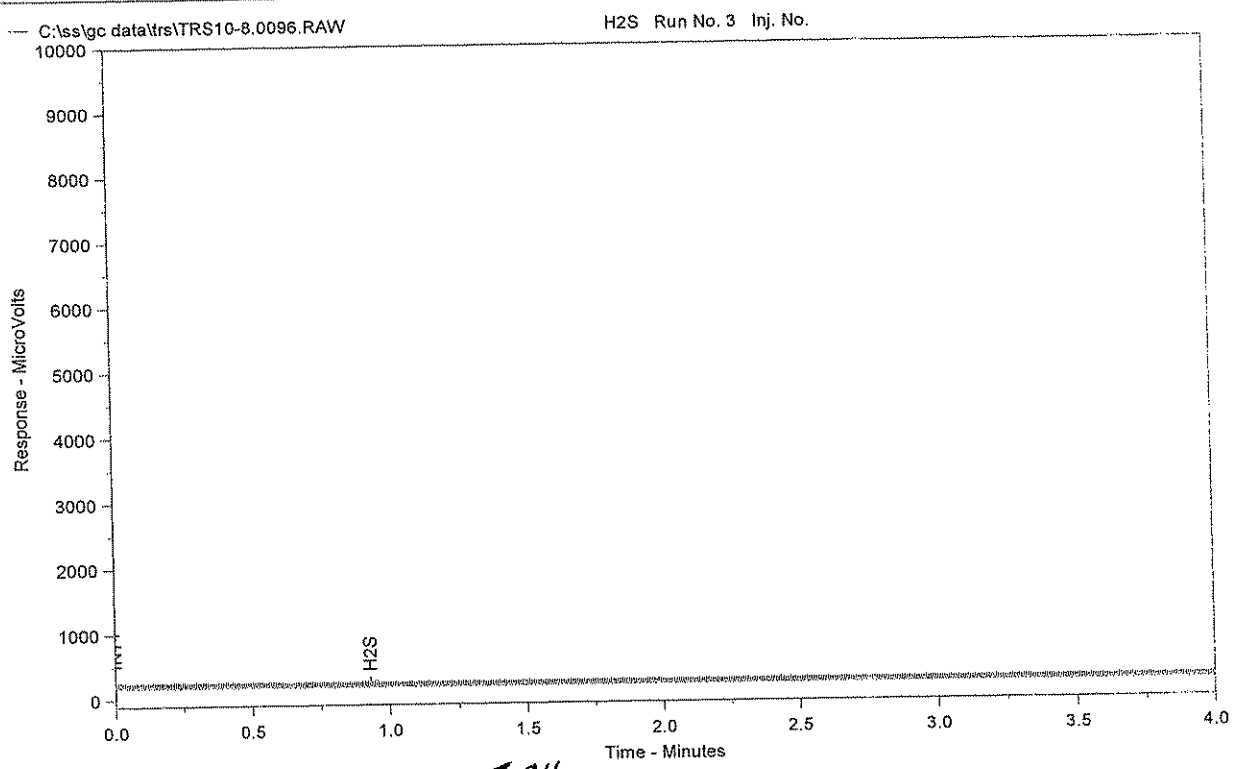
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0095.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 3:02:32 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S** **Run No. 3** **Inj. No.** 15 14

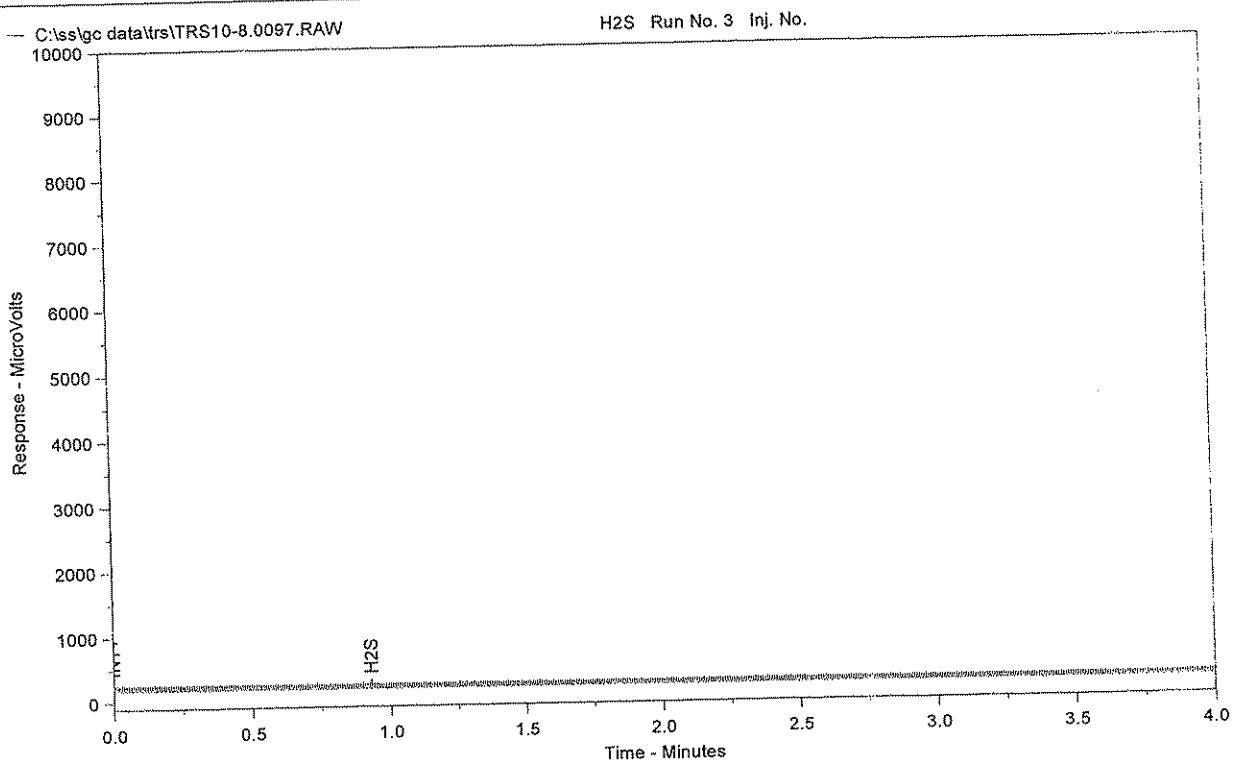
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0096.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 3:08:32 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 16 15

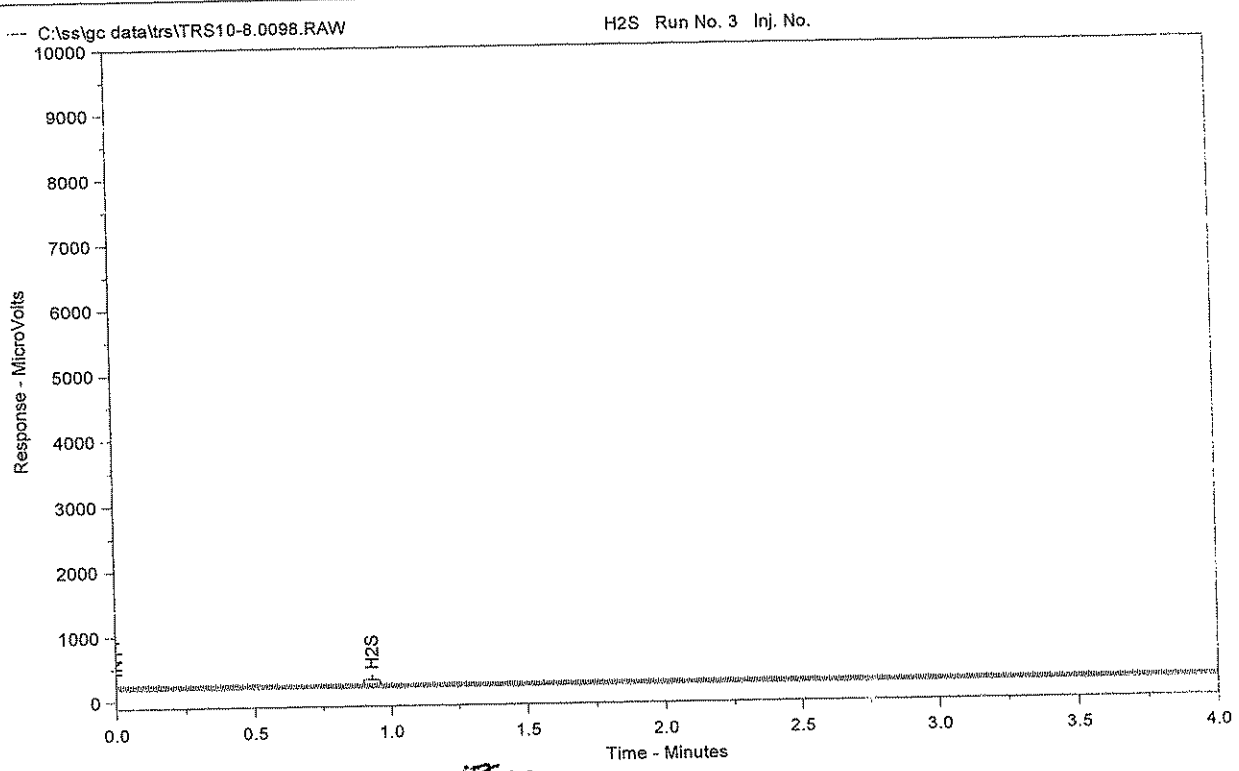
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0097.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 3:14:33 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 17 16

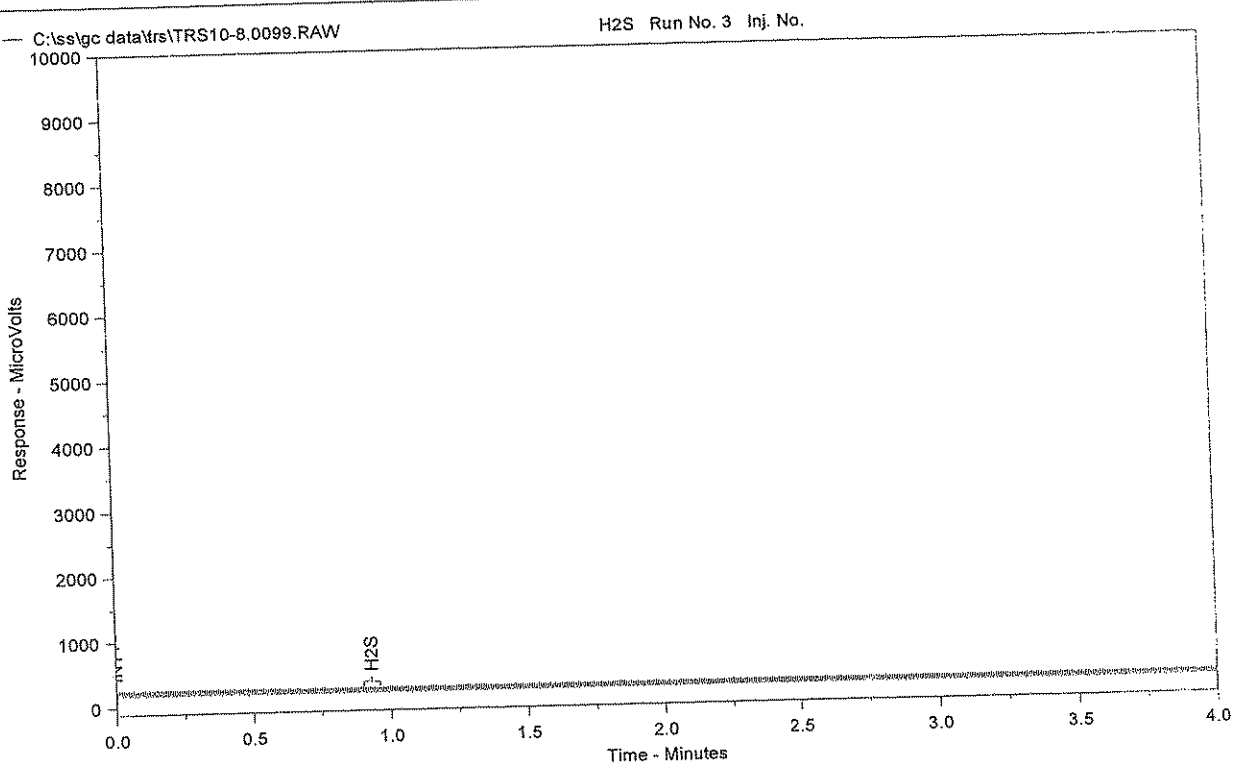
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0098.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 3:20:33 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 48 17

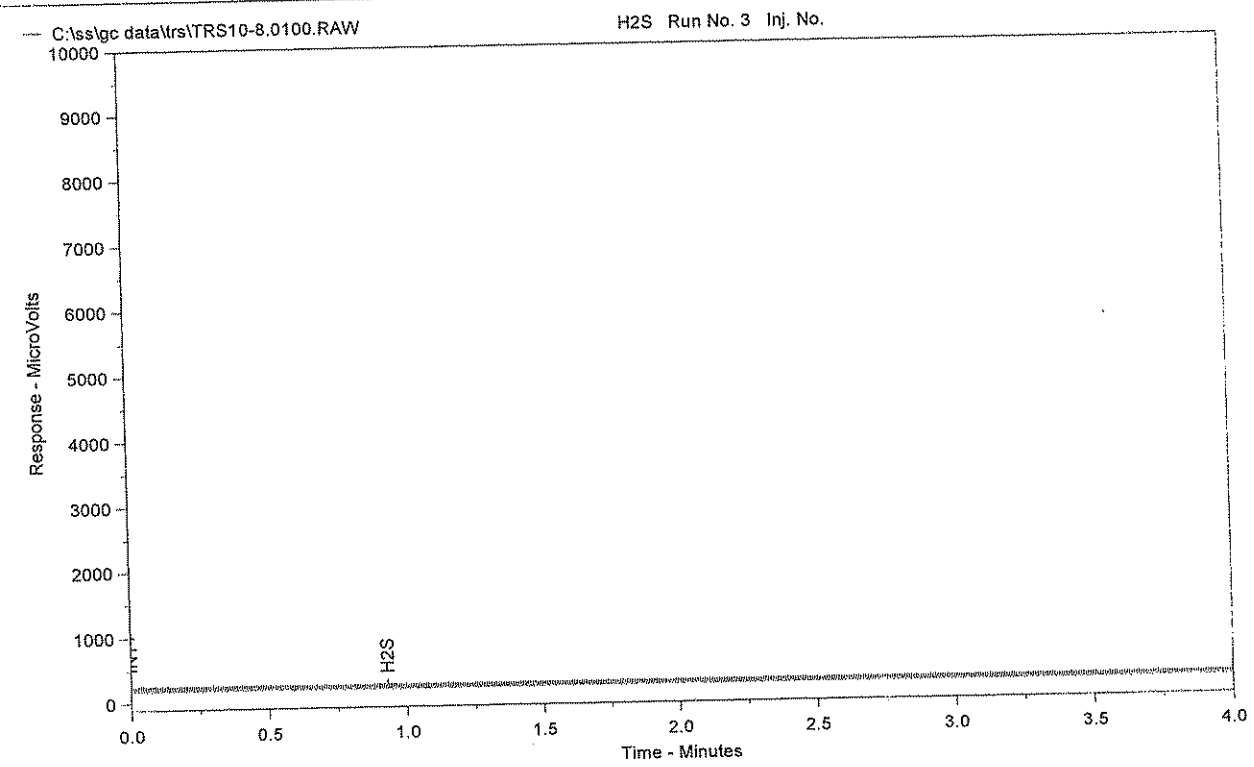
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0099.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 3:26:33 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 19 18

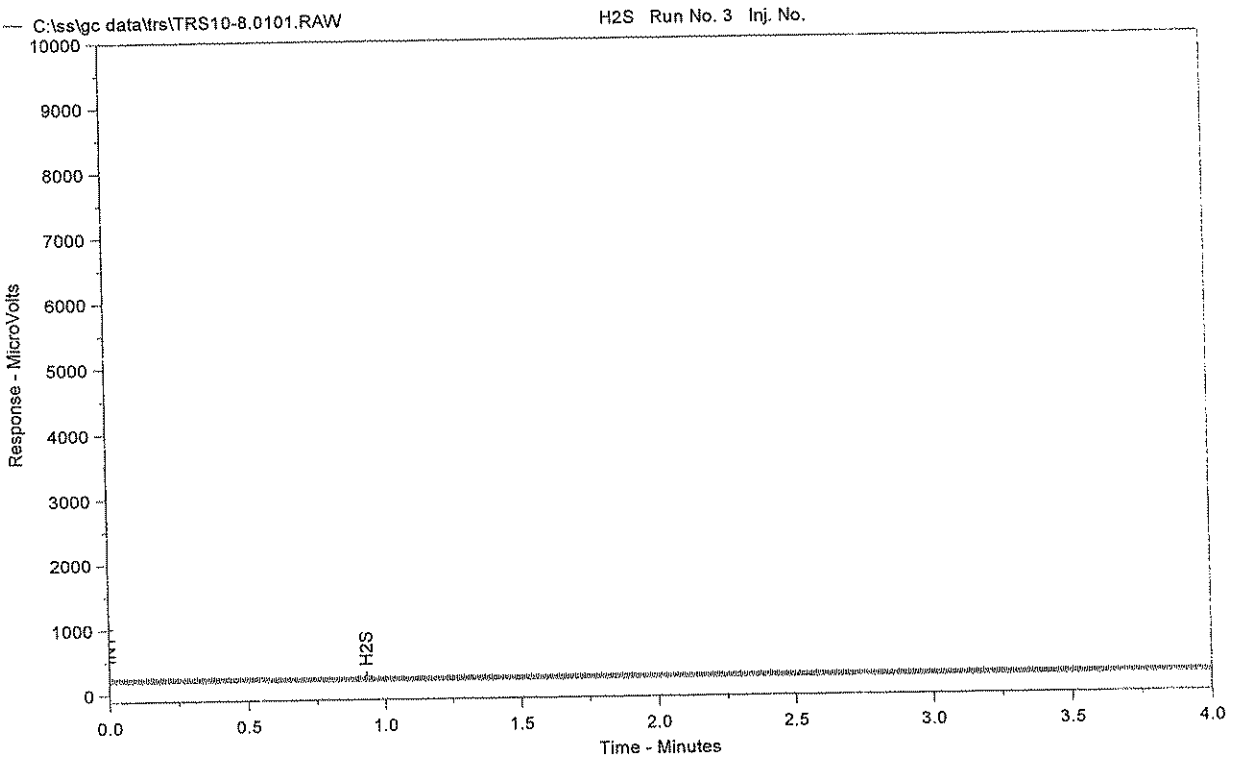
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0100.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 3:32:33 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 2019

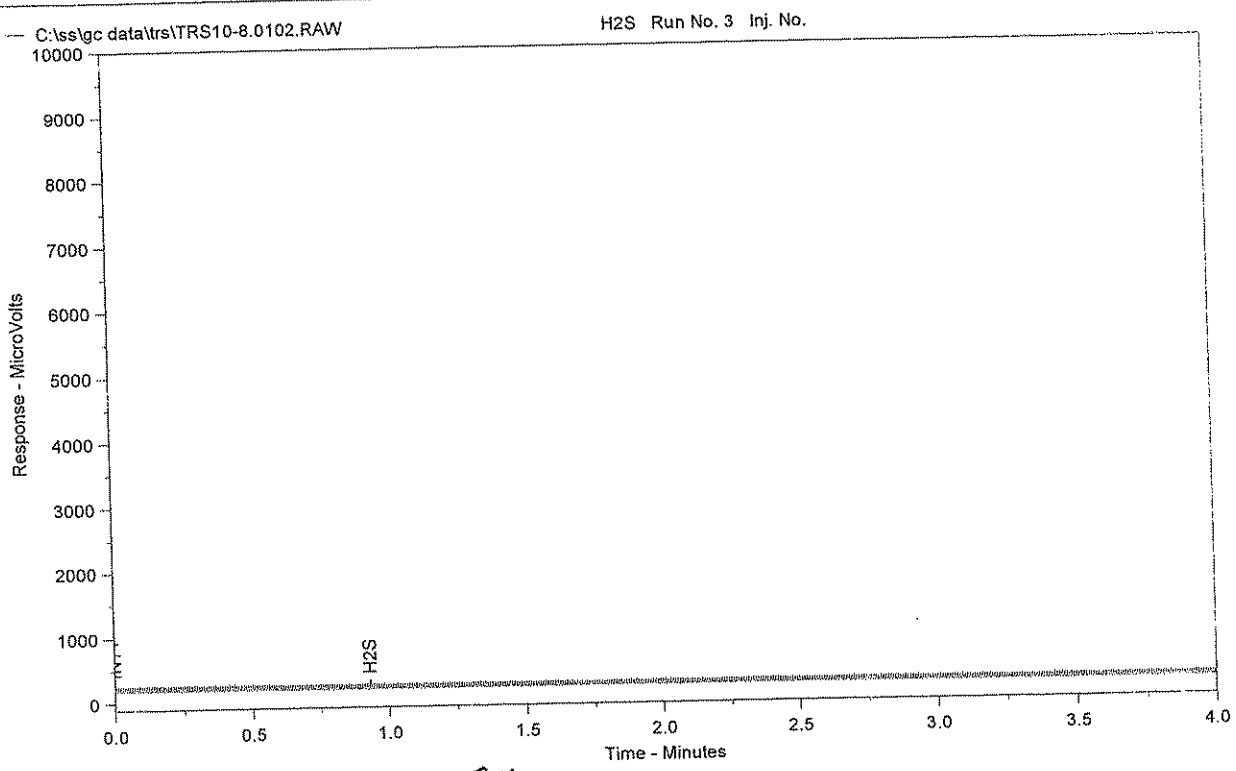
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0101.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 3:38:33 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 20

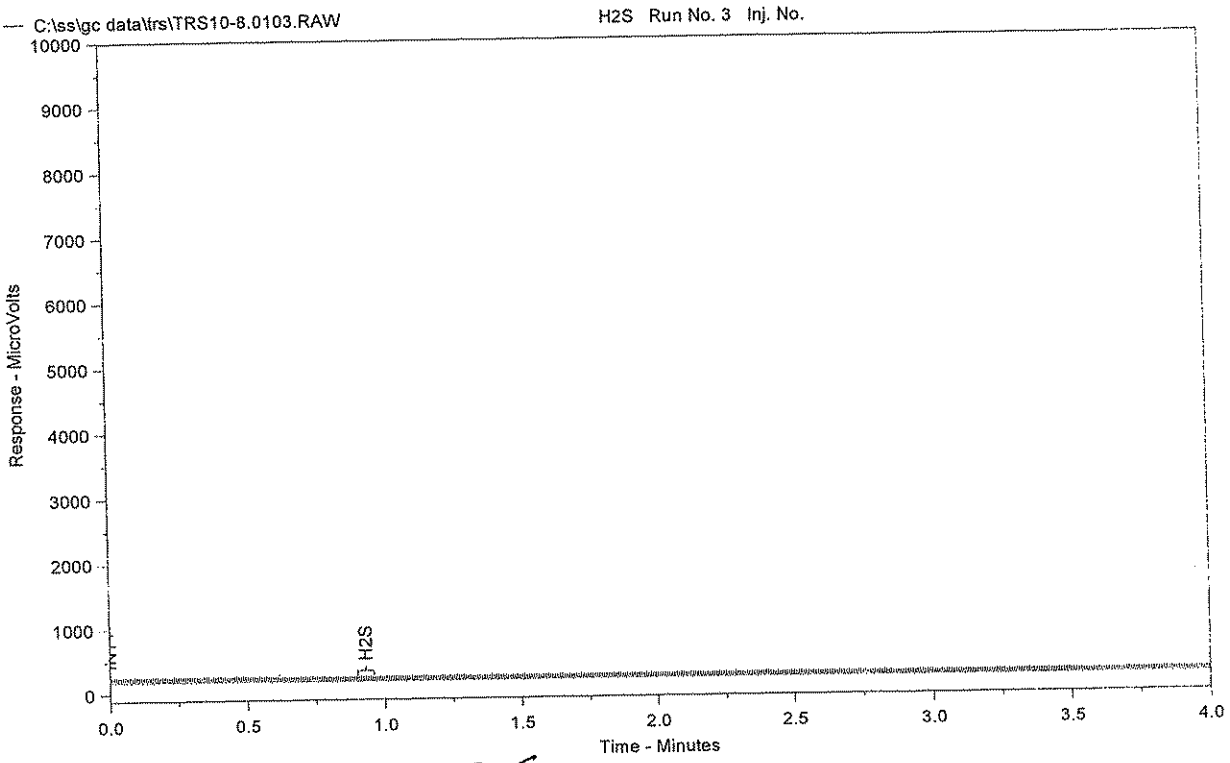
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0102.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 3:44:33 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 2221

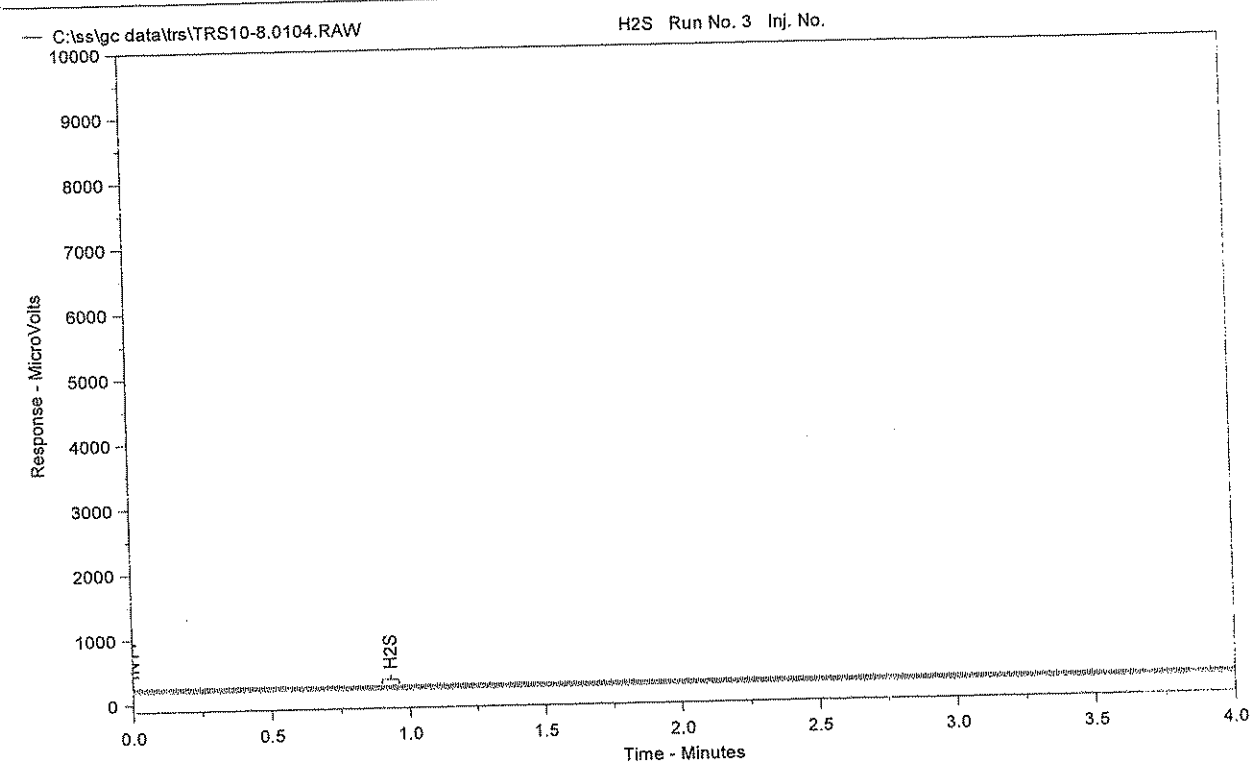
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0103.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 3:50:33 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 2322

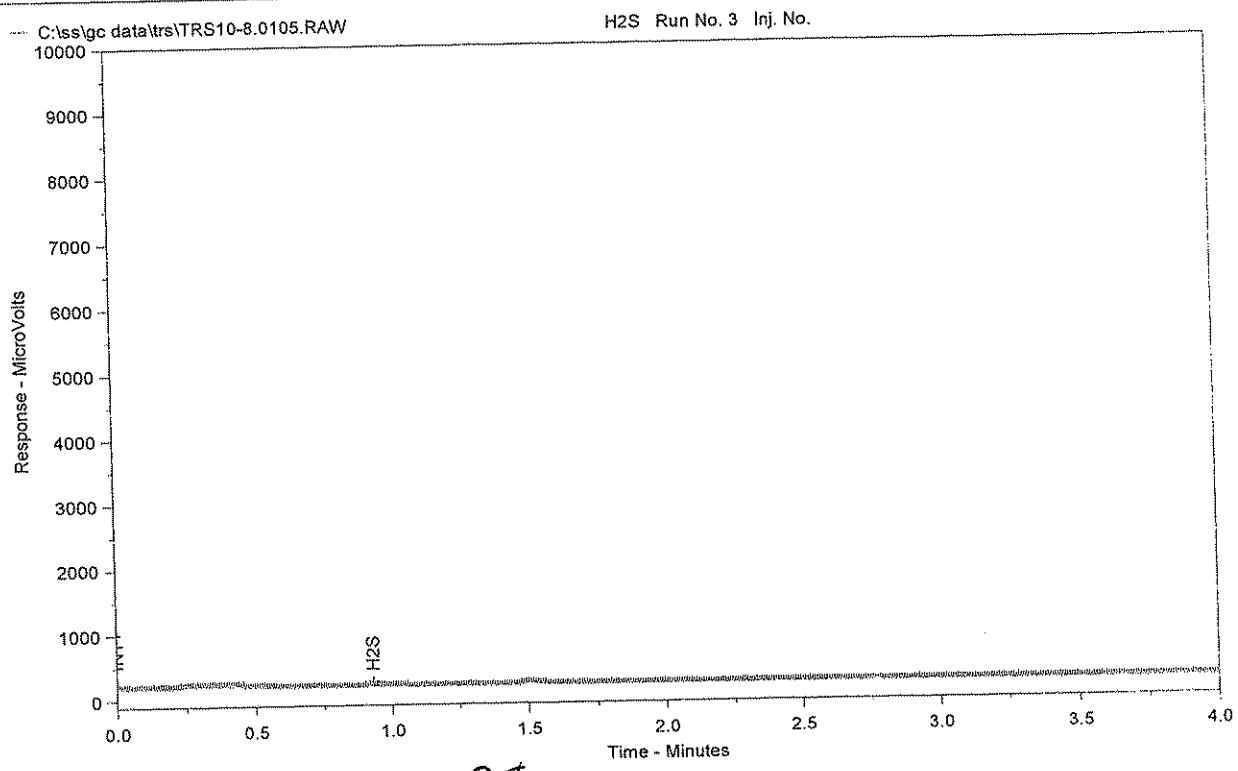
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0104.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 3:56:33 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 2423

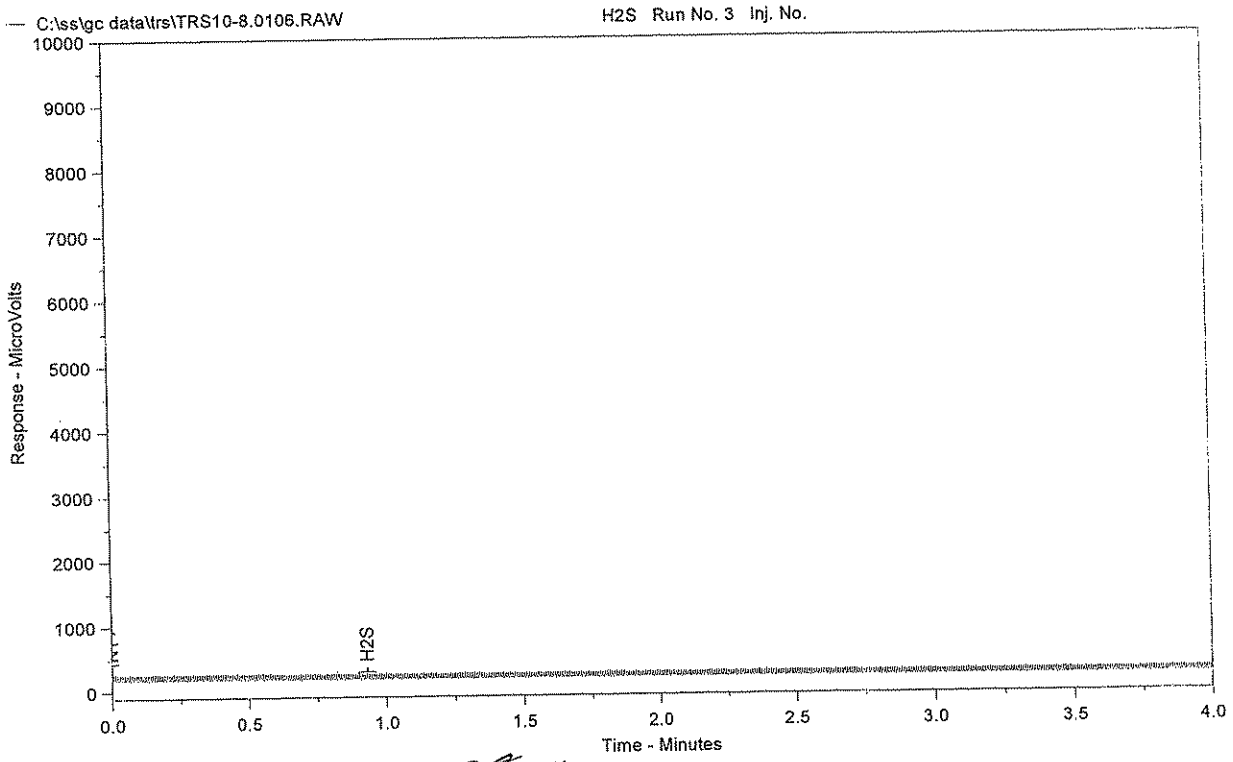
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0105.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 4:02:33 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 2524

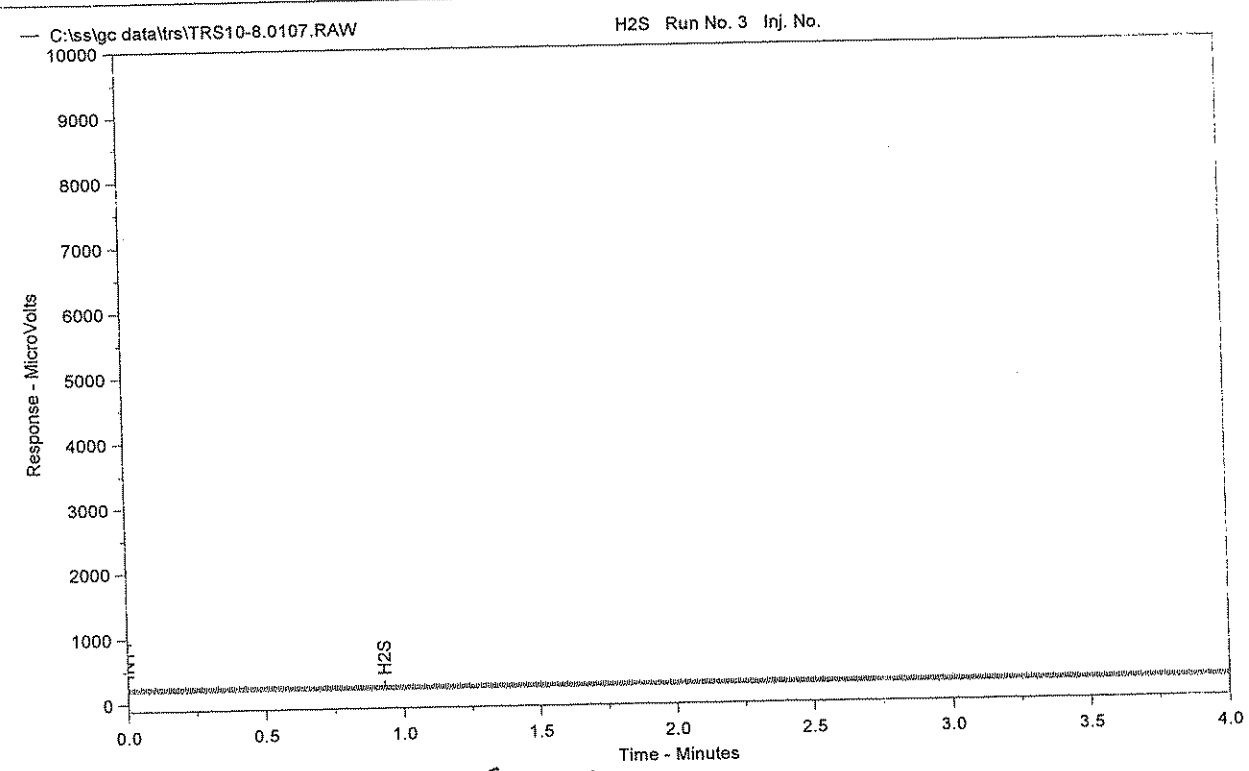
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0106.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 4:08:33 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 26 25

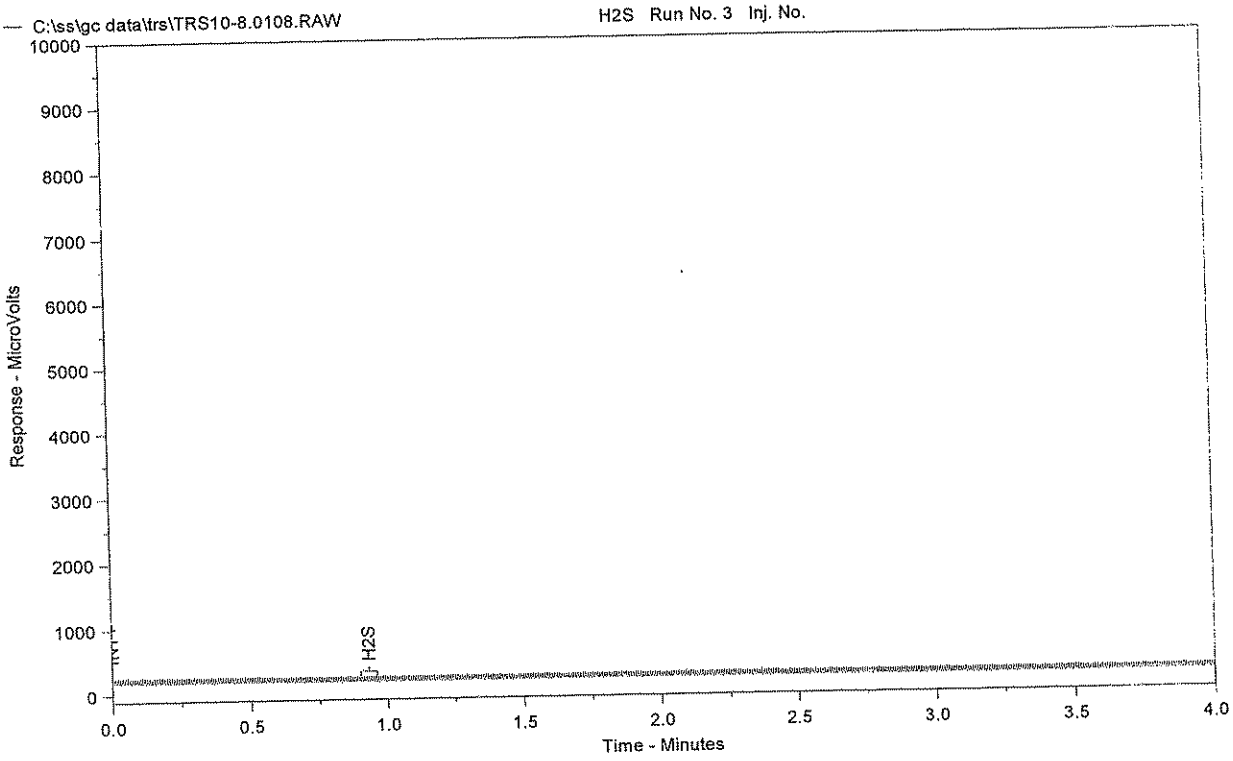
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0107.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 4:14:33 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 2726

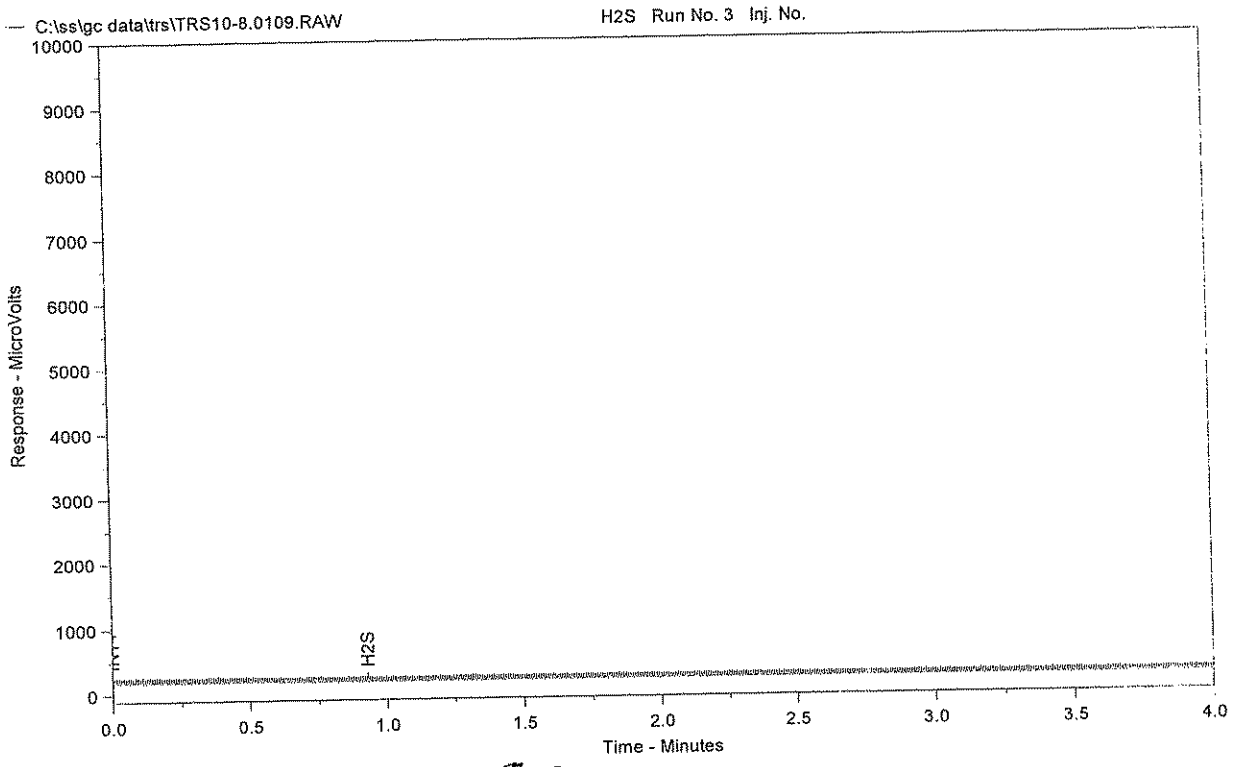
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0108.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 4:20:34 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 2827

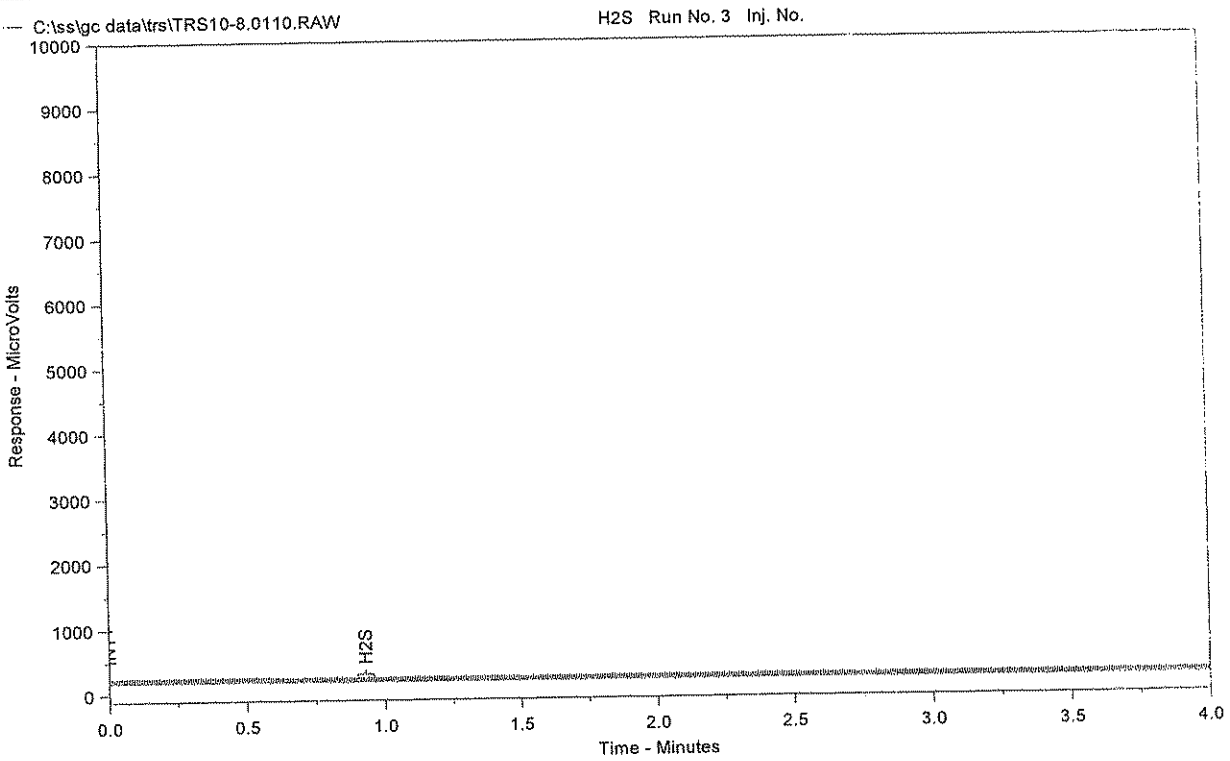
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0109.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 4:26:34 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 2728

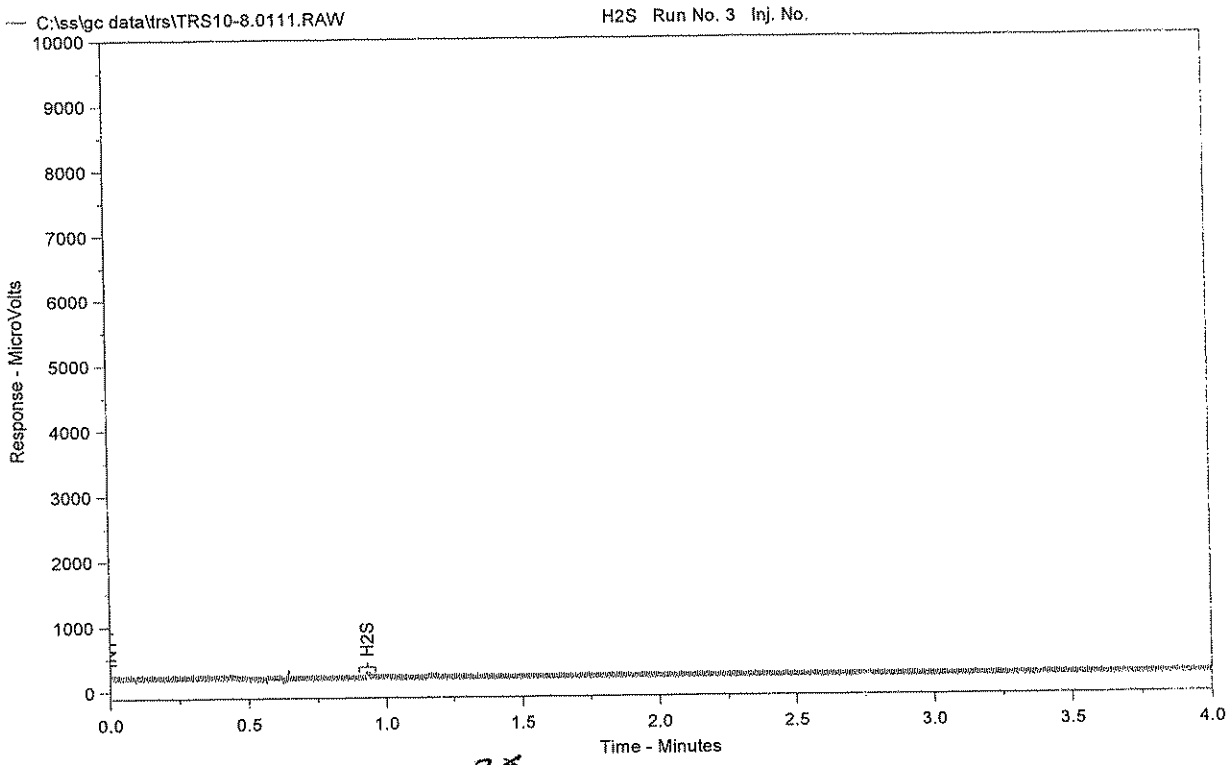
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0110.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 4:32:34 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Run No. 3 Inj. No.** 3029

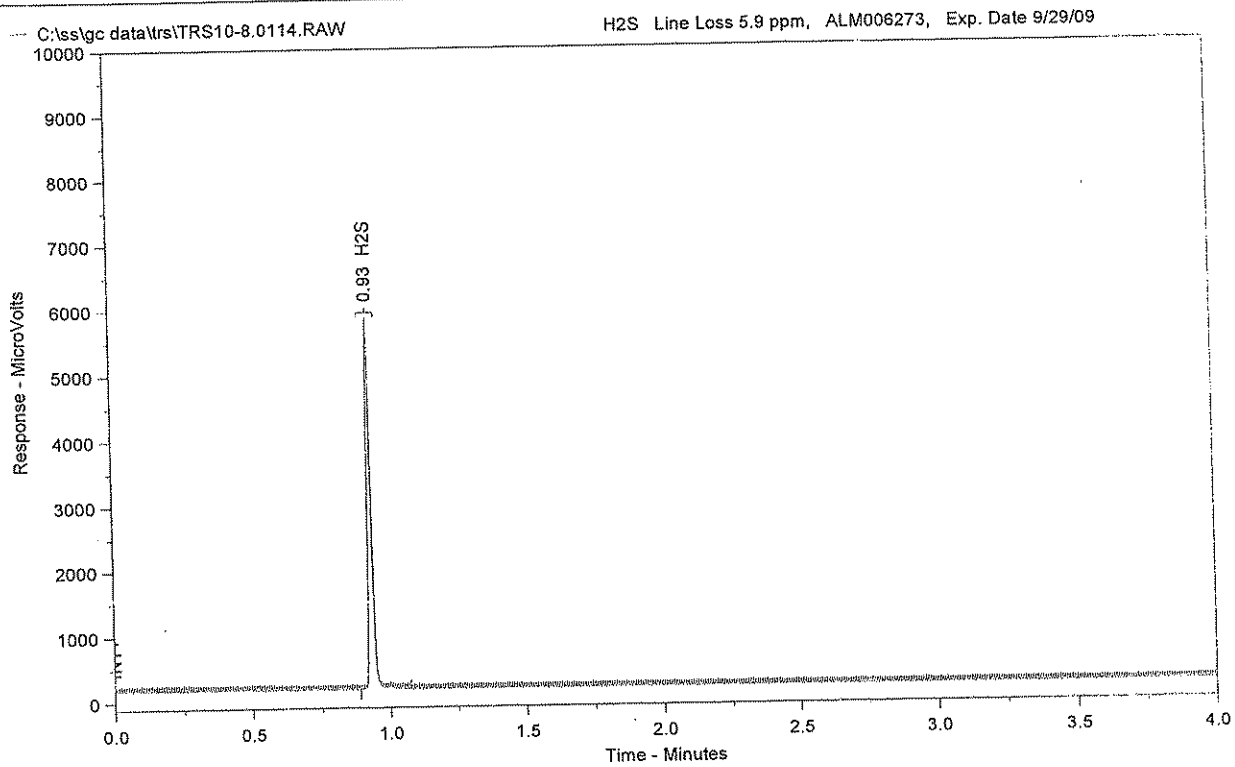
Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0111.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 4:38:34 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|

Total Area = 0 Total Height = 0 Total Amount = 0




Sample Name = **H2S Line Loss 5.9 ppm, ALM006273, Exp. Date 9/29/09**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0114.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 5:19:01 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 5.01 | 5718.8 | 5895 | BB | 0.01 |

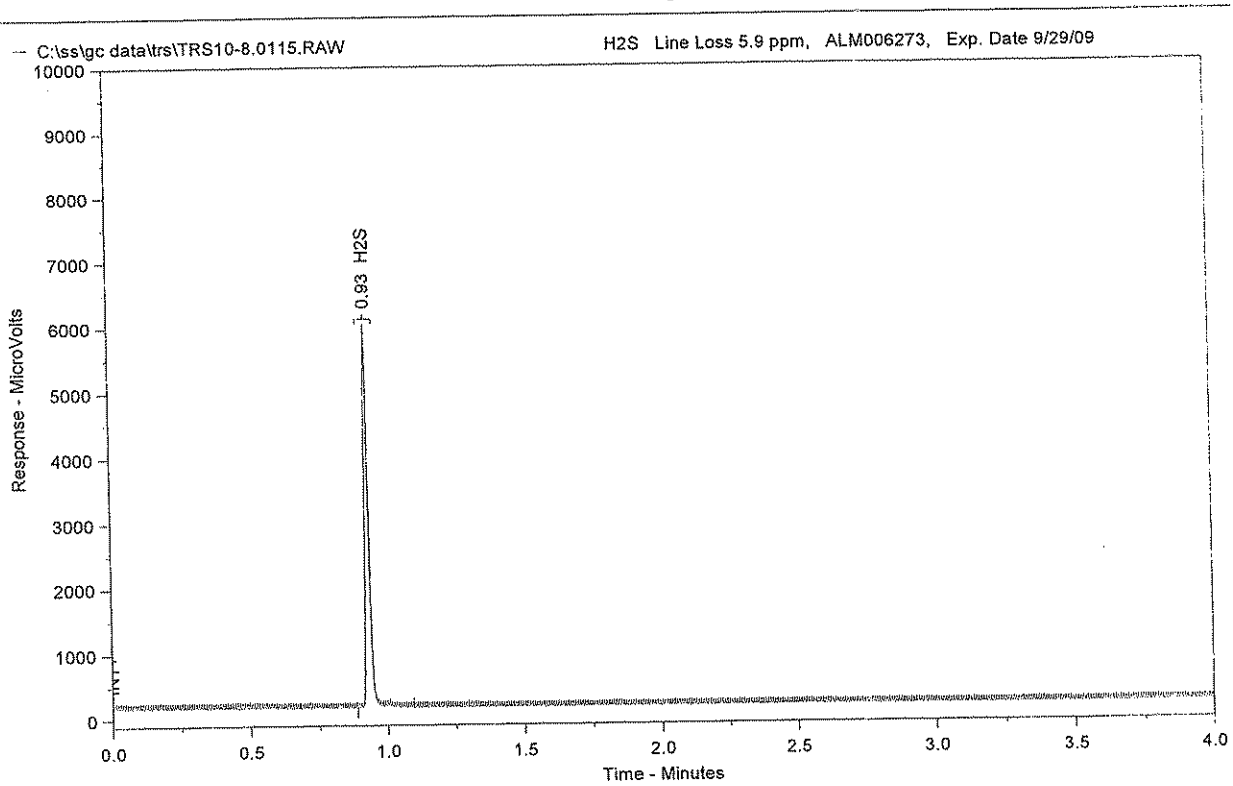
Total Area = 5895.441 Total Height = 5718.831 Total Amount = 5.008246

3 inj Avg (TRS10-8.0014.Raw - .0016.Raw) = 5.06ppm ± 5% Limit: 4.81ppm to 5.31ppm

20% Line Loss Limit: ~~4.05ppm~~ $\frac{H_2S\ Std}{}$ = 5.9ppm ± 4.72ppm to 7.08ppm

ALM006273 Exp. 9/29/09

$$\text{Line Loss} = \frac{5.06\text{ppm}}{5.9\text{ppm Std}} = 0.86$$




Sample Name = **H2S Line Loss 5.9 ppm, ALM006273, Exp. Date 9/29/09**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0115.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

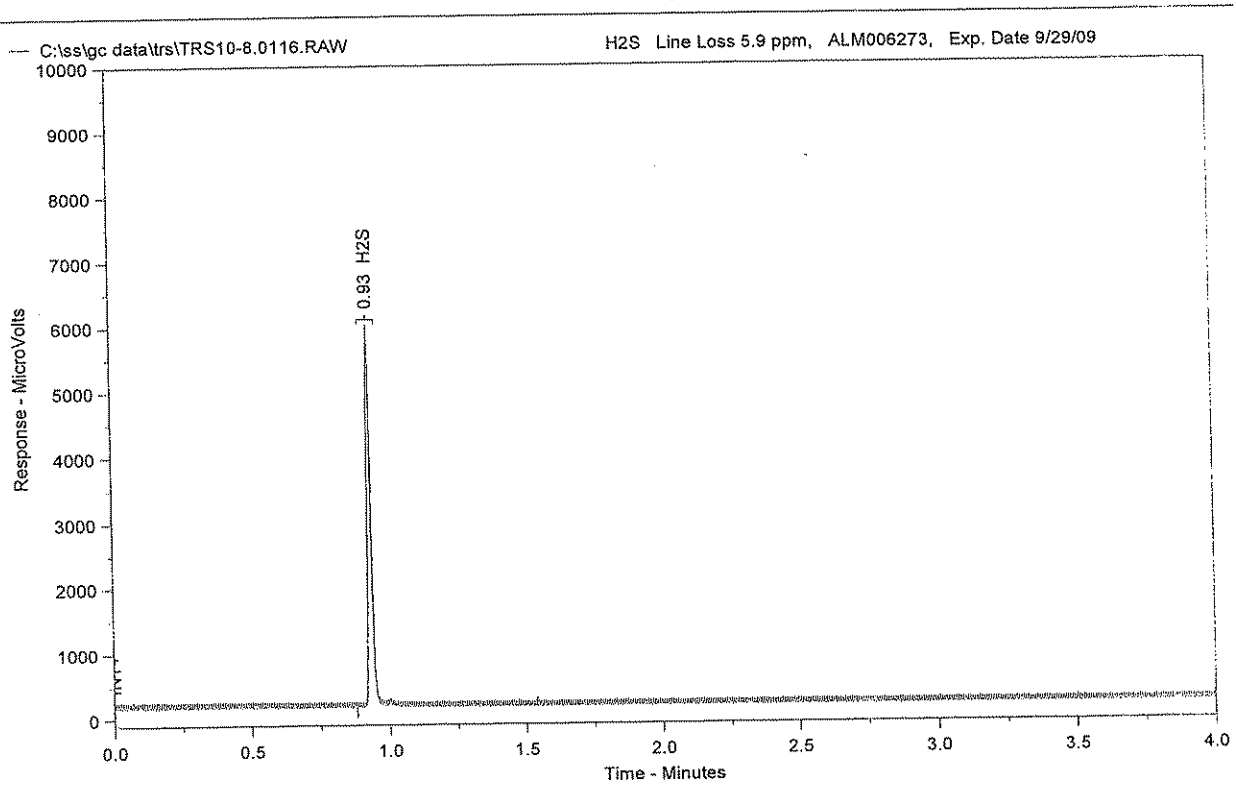
Date Taken (end) = 10/8/2008 5:25:02 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 5.09 | 5932.6 | 6097 | BB | 0.01 |

Total Area = 6097.071

Total Height = 5932.578

Total Amount = 5.087655




Sample Name = **H2S Line Loss 5.9 ppm, ALM006273, Exp. Date 9/29/09**

Instrument = Instrument 1
Heading 1 = Air = 46, H2 = 85, He = 128; 100 uL Sample Loop
Heading 2 = 0.0 Evnt 92, 0.6 Evnt -92, 6.0 Retn; 42C Isothermal

Raw File Name = **C:\ss\gc data\trs\TRS10-8.0116.RAW**
Method File Name = C:\CPData\SampleData\TRS.MET
Calibration File Name = C:\CPData\SampleData\H2S.CAL

Date Taken (end) = 10/8/2008 5:31:02 PM
Method Version = 1
Calibration Version = 1

| Peak # | Ret. Time | Name | Amount | Height | Area | Type | Width |
|---|---|---|---|---|---|---|---|
| 1 | 0.93 | H2S | 5.07 | 5876.2 | 7249 | BB | 0.01 |

Total Area = 7248.77

Total Height = 5876.229

Total Amount = 5.066881

Citgo Operational Data

| Run | Start Time | End Time | Incinerator Duty MMBtu/Hr | Incinerator Temp deg F |
|---|---|---|---|---|
| | 7-Oct | | | |
| | 8-Oct | | | |
| 1 | 10/7/2008 14:40 | 10/7/2008 15:40 | 12.08 | 1300 |
| 2 | 10/7/2008 16:17 | 10/7/2008 17:17 | 11.84 | 1299 |
| 3 | 10/7/2008 17:39 | 10/7/2008 18:39 | 12.36 | 1300 |
| 4 | 10/7/2008 19:02 | 10/7/2008 20:02 | 12.17 | 1300 |
| 5 | 10/8/2008 7:45 | 10/8/2008 8:45 | 12.43 | 1305 |
| 6 | 10/8/2008 9:12 | 10/8/2008 10:12 | 12.30 | 1300 |
| 7 | 10/8/2008 10:31 | 10/8/2008 11:31 | 12.96 | 1300 |
| 8 | 10/8/2008 11:52 | 10/8/2008 12:52 | 13.01 | 1300 |
| 9 | 10/8/2008 13:31 | 10/8/2008 14:31 | 12.48 | 1301 |
| 10 | 10/8/2008 14:40 | 10/8/2008 15:40 | 11.58 | 1300 |
| 11 | 10/8/2008 16:10 | 10/8/2008 17:10 | 11.57 | 1300 |
| 12 | 10/8/2008 17:31 | 10/8/2008 18:31 | 11.07 | 1300 |
| | 7-Oct | | | |
| | 8-Oct | | | |
| Average | | | 12.15 | 1300 |

# DEFINITIONS

Standard Conditions: 68° and 29.92 inches of mercury

Stack Conditions: Stack temperature, pressure and moisture

# NOMENCLATURE

| | |
|---|---|
| ACFM | Volumetric stack gas flow in cubic feet per minute at stack conditions |
| AMT | Average temperature at meter in degrees Rankin |
| An | Area of nozzle in square feet |
| As | Area of stack in square feet |
| C | Total pollutant concentration in grains per dry standard cubic feet |
| CEMS | Continuous emission monitoring system |
| CFM | Cubic feet per minute |
| CGA | Cylinder gas audit |
| $CO_2$ | Carbon dioxide |
| CO | Carbon monoxide |
| Cp | Pitot tube correction factor (PTCF) |
| Cs | Partial pollutant concentration in grains or grams per dry standard cubic foot (total less impinger catch) |
| De | Equivalent stack diameter of rectangular stack |

$$De = \left[\frac{2LW}{L+W}\right]$$

| | |
|---|---|
| DGMCF | Dry gas meter correction factor |
| DI | Deionized water |
| dscf | dry standard cubic feet |

## NOMENCLATURE (Continued)

| | |
|---|---|
| EA | Excess Air (expressed as percent) |
| FPD | Flame photometric detector |
| FID | Flame ionization detector |
| °F | Temperature in degrees Fahrenheit |
| GC | Gas chromatograph |
| GPC | Grams of particulate caught (total) |
| g | Grams |
| gr | Grains |
| Hg | Mercury |
| $H_2O$ | Water |
| $H_2SO_4$ | Sulfuric Acid |
| I | Isokinetics as percent |
| IMPI | Grams of particulate caught in impinger |
| IMPP | Grams of particulate caught before impinger (total less impinger catch) |
| MWSG | Molecular weight of stack gas in grams/gram-mole (g/g-mole) or pounds/pound-mole (lb/lb-mole) |
| $N_2$ | Nitrogen |
| NOx | Total oxides of nitrogen |
| $O_2$ | Oxygen |
| Pb | Barometric pressure in inches of mercury |
| PM | Particulate Matter |
| $PM_{10}$ | Particulate Matter less than 10 microns |

## NOMENCLATURE (Continued)

| | |
|---|---|
| Pm | Meter pressure in inches of mercury |
| ppm | Parts per million (Volume/Volume or mass/mass) |
| $P_r$ | Barometric pressure of reference barometer |
| Ps | Absolute pressure in stack in inches of mercury |
| PMR | True pollutant mass rate in pounds per hour |
| PMRs | Pollutant mass rate for the "front half" in pounds per hour (total less impinger catch) |
| Qsd | Dry volumetric stack gas flow rate corrected to standard conditions in dscf/hr |
| °R | Temperature in degrees Rankin (equivalent to °F + 460°) |
| RA | Relative accuracy |
| RATA | Relative accuracy test audit |
| Std.P | Pressure at standard conditions (29.92 inches of mercury) |
| $SO_2$ | Sulfur dioxide |
| $SO_3$ | Sulfur trioxide |
| Std.T | Temperature at standard conditions (528°R) |
| THC | Total Hydrocarbons |
| TG | Total weight of water collected in silica gel, in grams |
| TRS | Total Reduced Sulfur Compounds |
| $T_r$ | Temperature of reference thermometer |
| Ts | Stack gas temperature in degrees Rankin |
| $T_t$ | Temperature of test thermometer |

## NOMENCLATURE (Continued)

| | |
|---|---|
| TWW | Total water wash volume collected in impingers and silica gel, in milliliters (ml) NOTE: Density of $H_2O$ equals 1 g/ml |
| VOC | Total Volatile Organic Compounds |
| Vm(Std) | Total gas sampled converted to standard conditions, dry basis, in cubic feet |
| Vs | Stack gas velocity in feet per second |
| $\Delta H$ | Pressure differential across the orifice meter in inches of water |
| $\Delta P$ | Stack gas velocity head in inches of water |
| $\Theta$ | Sample time in minutes |

# SOURCE SAMPLING CALCULATIONS

## FLOW CALCULATIONS

Pitot Tube Constant

$$Vs\ ft/sec = 85.49 \times Cp \times \sqrt{\Delta P}\ avg.\ (in\ H_2O) \times \sqrt{\frac{Ts\ avg.\ (°R)}{MWSG\ (lb/lb\text{-}mole) \times Ps\ (in\ Hg)}}$$

Pitot Tube Correction Factor

Stack Temperature

Molecular Weight of the Stack Gas

Stack Pressure

Pitot Tube Constant

$$85.49 \frac{ft}{sec} \left[ \frac{(lb/lb\text{-}mole)\ (in\ Hg)}{(R)\ (in\ H_2O)} \right]^{1/2}$$

$$ACFM\ ft^3/min = Vs\ (ft/sec) \times 60\ sec/min \times As\ (ft^2)$$

Area of the Stack

68°F = 528°R
Standard Temperature

Stack Pressure

Percent Moisture

$$Qsd\ dscf/hr = 60\ min/hr \times \left(1.00 - \frac{\%H_2O}{100}\right) \times ACFM\ (ft^3/min) \times \frac{528}{Ts\ avg.\ (°R)} \times \frac{Ps\ (in\ Hg)}{29.92}$$

Stack Temperature

Standard Pressure

# DERIVATIONS OF EQUATIONS

**Fuel and Operations Data**

$$\text{Fuel F Factor (dscf/MMBtu)} = \frac{10^6[3.64(\%H) + 1.53(\%C) + 0.57(\%S) + 0.14(\%N) - 0.46(\%O_2)]}{\text{Gross Calorific Value (BTU/lb)}}$$

Density ($lb/ft^3$) = Gas Mixture Molecular Weight/385

Gross Calorific Value - GCV (BTU/lb) = High Heat of Combustion ($BTU/ft^3$) x (1/mixture density ($lb/ft^3$))

Fuel Flow Rate (FFR) = Fuel Flow Rate in $ft^3/hr$, lb/hr or gal/hr

FFR (lb/hr) = FFR ($ft^3/hr$) x Gas Mixture Density ($lb/ft^3$)

FFR (lb/hr) = FFR (gal/hr) x Liquid Density (lb/gal)

Operating Rate (MMBtu/hr) = FFR ($ft^3/hr$) x Gross Calorific Value ($BTU/ft^3$) x $1 \times 10^{-6}$

Operating Rate (MMBtu/hr) = FFR (lb/hr) x Gross Calorific Value (Btu/lb) x $1 \times 10^{-6}$

**Pollutant Emissions Equations**

lb/dscf = (ppm x MW x $6.242 \times 10^{-8}$)/24.04 (Note: MW for NOx = 46, MW for CO = 28)

lb/MMBtu @ 0% $O_2$ = lb/dscf x Fuel F Factor (dscf/MMBtu) x [20.9/20.9 - $\%O_2$ (dry)]

Emission Rate (lb/hr) = lb/MMBtu x GCV x FFR x $1 \times 10^{-6}$
Note: if FFR is $ft^3/hr$, GCV is $Btu/ft^3$
if FFR is lb/hr, GCV is Btu/lb

$SO_2$, ppm (dry) @ 0% $O_2$ = $SO_2$ ppm (dry) x [20.9/20.9-$\%O_2$(dry)]

Grams/Horsepower - Hour (g/hp-hr) = (Emission Rate lb/hr x 454)/Horsepower

**Stork Southwestern Laboratories, Inc.**
**Air Emissions Services Division**
**Houston, Texas**

## ANNUAL METER BOX CALIBRATION

Box No. M-7

Wet Test Meter No. 11547

Vacuum 5 in Hg. Date 5/29/2008

Barometric Pressure, Pb 30.04 in. Hg

| Inputs | | | | | | | | | | Results | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Orifice Manometer setting Delta H in H2O | Gas Volume of wet test meter Vw ft³ | Gas Volume of dry gas meter Vd ft³ | Temperature Wet test meter Tw °F | Dry Gas Meter: Inlet Tdi °F | Outlet Tdo °F | Average Td °F | Time Min. | Time Sec. | Time @ Min. | Y | Delta H@ |
| 0.25 | 3.000 | 3.024 | 73 / 73 | 72 / 73 | 72 / 73 | 72.50 | 10 | 39 | 10.650 | 0.9905 | 1.7737 |
| 0.50 | 5.000 | 5.022 | 73 / 73 | 74 / 78 | 73 / 75 | 75.00 | 12 | 36 | 12.600 | 0.9981 | 1.7792 |
| 1.00 | 5.000 | 5.032 | 73 / 73 | 76 / 80 | 74 / 76 | 76.50 | 8 | 54 | 8.900 | 0.9977 | 1.7705 |
| 2.00 | 10.000 | 10.174 | 73 / 73 | 79 / 87 | 75 / 78 | 79.75 | 13 | 14 | 13.233 | 0.9905 | 1.9453 |
| | | | | | | | | | **Average:** | **0.9942** | **1.8172** |

**Equations**

Delta H

$$\frac{\text{Delta H}}{13.6}$$

Y

$$\frac{Vw * Pb * (Td + 460)}{Vd * (Pb + \text{Delta H}/13.6) * (Tw + 460)}$$

Delta H@

$$\frac{0.0317 * \text{Delta H}}{Pb} * \frac{(Tw + 460)\theta}{Vw}$$

Is the Delta H@ within ±0.15 of $\overline{\text{Delta H @}}$

[x] yes, then $\overline{\text{Delta H@}}$ is valid.

[ ] no, then repair and recalibrate.

Is the Ý within ±0.02 of $\overline{Y}$

[x] yes, then $\overline{Y}$ is valid.

[ ] no, then repair and recalibrate.

Southwestern Laboratories

Randy Moore

Stork Southwestern Laboratories, Inc.
Air Emission Services

GAMMA CALIBRATION FORM

PROJECT Crlgo - West SRU PROJECT NO. 08091128 DATE 10-16-08

UNIT West SRU

METER BOX NO. M-7 CURRENT GAMMA 0.9948

AVERAGE Δ H 1.0 ACCEPTABLE LIMITS

MAXIMUM VACUUM 2 .9945 TO 1.0439

BAROMETRIC PRESSURE 30.15 in. Hg

WET TEST METER ID 5375

| DRY GAS METER VOLUME Vd | TEMPERATURES | | | | GAMMAS |
|---|---|---|---|---|---|
| | WET TEST METER Tw °F | DRY GAS METER | | | |
| | | INLET Tdi °F | OUTLET Tdo °F | AVERAGE Td °F | |
| 770.209 | 71 / 71 | 74 / 74 | 71 / 71 | 73 | 0.9945 |
| 769.202 | | | | | |
| 771.214 | 71 / 71 | 73 / 73 | 71 / 71 | 72 | 0.9946 |
| 770.209 | | | | | |
| 772.217 | 71 / 71 | 74 / 74 | 71 / 71 | 73 | 0.9984 |
| 771.214 | | | | | |
| | | | AVERAGE GAMMA | | 0.9958 ✓ |

$$\frac{Vw\ Pb\ (Td + 460)}{Vd\ (Pb + \Delta H/13.6)\ (Tw + 460)} = \text{GAMMA}$$

$$\frac{1 \quad 30.15 \quad 533}{1.007 \quad 30.22 \quad 531} = 0.9945 \checkmark$$

$$\frac{1 \quad 30.15 \quad 532}{1.005 \quad 30.22 \quad 531} = 0.9946 \checkmark$$

$$\frac{1 \quad 30.15 \quad 533}{1.003 \quad 30.22 \quad 531} = 0.9984 \checkmark$$

Gus G

Stork Southwestern Laboratories, Inc.

# CERTIFICATE OF CALIBRATION

This certifies that your American AL-20 Wet Test Meter
Serial No. 11547
Has been calibrated with a American Bell Prover
Serial No. 1768
It is traceable to the N.I.S.T., Reference No. 12169734

| Rate of Flow | % of Proof |
|---|---|
| **60 CFH** | **100.0 %** |

**Calibrated by Carl Poe Co., Inc.**
4600 Allen Street Houston, Texas 77007
(713) 861-3816 * Fax: (713) 861-8299

January 30, 2008
Date

Charles Cook
Signature

# CERTIFICATE OF CALIBRATION

This certifies that your 100 CFH Precision Model 63123 Wet-Test Gas Meter
Serial No. 5287
Has been calibrated with an American Bell Prover
Serial No. 1768
It is traceable to the N.I.S.T., Reference No. 12169734

| Rate of Flow | % Proof |
|---|---|
| **50 CFH** | **100 %** |

**Calibrated by Carl Poe Co., Inc.**
4600 Allen Street Houston, Texas 77007
(713) 861-3816 * Fax: (713) 861-8299

February 25, 2008
Date

Charles Cook
Signature

# Southwestern Laboratories, Inc.

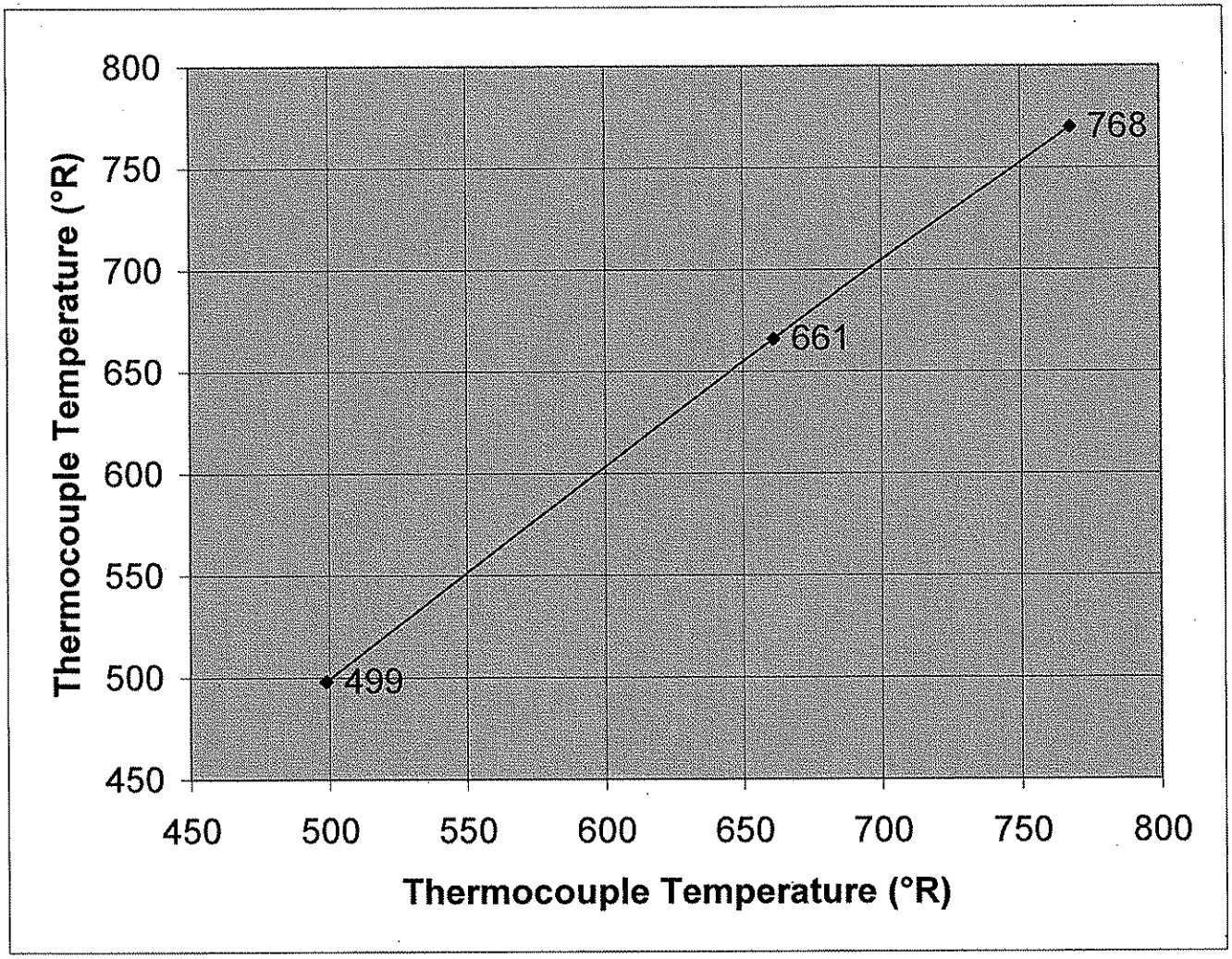
## Temperature Sensor Calibration Data

Date: 6/27/2008 Thermocouple No. : I-10B

Ambient Temperature: 70 °F Barometric Pressure: 29.95 Inches Hg

Calibrator: AP Reference (mercury-in-glass) : 5378

| Reference Point Source | Reference Thermometer Temperature | | | Thermocouple Temperature | | Temperature Difference * |
|---|---|---|---|---|---|---|
| | °C | °F | °R | °F | °R | % |
| Ice Water | 3.3 | 38 | 498 | 39 | 499 | -0.2 |
| Boiling Water | 96.7 | 206 | 666 | 201 | 661 | 0.8 |
| Boiling Oil | 154.4 | 310 | 770 | 308 | 768 | 0.3 |




* [(Ref. Temp. (°R) - Thermocouple Temp. (°R) ) / Ref. Temp. (°R) ] x 100 ≤ 1.5% Absolute Value

G:\ss\AirExcel\ThermoCal\I-10B.xls

**Stork Southwestern Laboratories, Inc.**

**THERMOMETER AND BAROMETER POST TEST QA**

| | | |
|---|---|---|
| Project: Citgo | Unit: West SRU | By: GG |
| Project No.: 0809 1128 | Location: Corpus Christi TX | Date: 10/17/08 |

***Thermometer Calibration***

| Thermocouple | | Thermometer | | Reference Temperature °R (Tr)* | ** Percent Difference |
|---|---|---|---|---|---|
| Temperatures | ID No. | ID No. | Temperature °R (Tt) | | |
| Stack @ Temp. 1 (Amb.): | I 10 B | M-7 | 529 | 530 | -0.1887 |
| Stack @ Temp. 2 (Mid): | I-10 B | M-7 | 615 | 618 | -0.4854 |
| Stack @ Temp. 3 (Stack): | I-10 B | M-7 | 785 | 788 | -0.3807 |
| Last Imp. @ Ambient: | IC 3 | M-7 | 528 | 530 | -0.3774 |
| Filter Box @ 250°F: | N/A | N/A | N/A | N/A | N/A |
| Probe Heater @ 250°F: | N/A | N/A | N/A | N/A | N/A |
| DGM @ Ambient: | N/A | N/A | N/A | N/A | N/A |
| Inlet: | M-7 | M-7 | 531 | 531 | 0 |
| Outlet: | M-7 | M-7 | 530 | 531 | -0.1883 |
| Aux. @ <5°C (41°F): | N/A | N/A | N/A | N/A | N/A |

*Mercury-in-Glass Thermometer ID Number: 5418

** Percent Difference = $\frac{Tt - Tr}{Tr}$ x 100 = < or = 1.5%

Are Values Within Specification? yes Initials GG

***Barometer Calibration***

Aneroid "Hg (Pb) Reference "Hg (Pr)*

"Lab"

Field Barometer ID Number: T-2

*Mercurial Barometer

Difference = Pb - Pr

30.13 - 30.15 = -.02 < or = 0.1 "Hg

Is The Value Within Specification? yes Initials GG

# Southwestern Laboratories, Inc.
Houston, Texas

## ANNUAL PITOT TUBE CALIBRATION

Pitot Tube Identification Number: I-10B Date: 6/13/2008

Calibrated By: By Construction Guidelines

| | "A" Side Calibration | | | |
|---|---|---|---|---|
| Run No. | $\Delta P_{std}$ In. $H_2O$ | $\Delta P_s$ In. $H_2O$ | $C_{p\,(s)}$ | Absolute Deviation $C_{p\,(s)} - C_{p\,(A)}$ |
| 1 | N/A | N/A | 0.840 | N/A |
| 2 | N/A | N/A | 0.840 | N/A |
| 3 | N/A | N/A | 0.840 | N/A |
| | | $C_{p\,(A)}$ | 0.840 | |

**Average Deviation $C_{p\,(A)}$ = N/A**

| | "B" Side Calibration | | | |
|---|---|---|---|---|
| Run No. | $\Delta P_{std}$ In. $H_2O$ | $\Delta P_s$ In. $H_2O$ | $C_{p\,(s)}$ | Absolute Deviation Cp (s) - Cp (B) |
| 1 | N/A | N/A | 0.840 | N/A |
| 2 | N/A | N/A | 0.840 | N/A |
| 3 | N/A | N/A | 0.840 | N/A |
| | | Cp (B) | 0.840 | |

**Average Deviation $C_{p\,(B)}$ = N/A**

**NOTE: 0.84 assigned by adherence to construction guidelines**

**Deviation between $C_{p\,(A)}$ and $C_{p\,(B)}$ = 0.000**
**The Deviation between $C_{p\,(A)}$ and $C_{p\,(B)}$ is <= 0.01 and therefore is valid.**

# Stork SwL Analyzer QA

| Project Name: | Citgo Refining & Chemicals, Inc. | Date | 10/7/2008 |
|---|---|---|---|
| Project No.: | 08091128 West Plant SRU | Initials | MG |

| EPA Protocol Gases | | | |
|---|---|---|---|
| Cylinder Pollutant | Cylinder Value | Cylinder Number | Expiration Date |
| NOx - Low | | | |
| NOx - Mid | 51.5 | ALM058419 | 3/7/2009 |
| NOx - High | 95.1 | AAL070752 | 3/29/2009 |
| CO - Low | | | |
| CO - Mid | 45.8 | ALM044300 | 5/10/2010 |
| CO - High | 95.1 | 1L1042 | 8/1/2009 |
| O2 - Low | | | |
| O2 - Mid | 12.0 | ALM041061 | 9/30/2011 |
| O2 - High | 21.0 | ALM054036 | 4/18/2009 |

| Parameter: | NOx | CALIBRATION ERROR | | | |
|---|---|---|---|---|---|
| Analyzer: | Thermo Environmental Instruments, Inc. | | | Span: | 95.10 |
| Model: | 42 CHL Chemiluminescent | | | Serial: | 42CHL-72502-371 |
| GASES | Cylinder Value | Analyzer Response | Difference | % Difference | Is Linearity Within +or- 2% |
| Zero | 0.00 | 0.09 | 0.1 | 0.09% | Yes |
| EPA Protocol No. 1 | | | | | |
| Low-Level | 0.00 | ### | 0.00 | 0.00% | Yes |
| Mid-Level | 51.50 | 51.28 | -0.22 | -0.23% | Yes |
| High-Level | 95.10 | 95.03 | -0.07 | -0.07% | Yes |

| Parameter: | CO | CALIBRATION ERROR | | | |
|---|---|---|---|---|---|
| Analyzer: | Thermo Environmental Instruments, Inc. | | | Span: | 95.10 |
| Model: | 48H Gas Filter Correlation | | | Serial: | 0400504184 |
| GASES | Cylinder Value | Analyzer Response | Difference | % Difference | Is Linearity Within +or- 2% |
| Zero | 0.00 | 0.14 | 0.1 | 0.15% | Yes |
| EPA Protocol | | | | | |
| Low-Level | 0.00 | # | 0.00 | 0.00% | Yes |
| Mid-Level | 45.80 | 45.64 | -0.16 | -0.17% | Yes |
| High-Level | 95.10 | 95.16 | 0.06 | 0.06% | Yes |

| Parameter: | O2 | CALIBRATION ERROR | | | |
|---|---|---|---|---|---|
| Analyzer: | Servomex | | | Span: | 21.00 |
| Model: | 1420B Paramagnetic | | | Serial: | 01420/B274 |
| GASES | Cylinder Value | Analyzer Response | Difference | % Difference | Is Linearity Within +or- 2% |
| Zero | 0.00 | 0.03 | 0.0 | 0.14% | Yes |
| EPA Protocol | | | | | |
| Low-Level | 0.00 | ### | 0.00 | 0.00% | Yes |
| Mid-Level | 12.00 | 12.11 | 0.11 | 0.52% | Yes |
| High-Level | 21.00 | 20.98 | -0.02 | -0.10% | Yes |

* % Difference = Difference/Span Value x 100

## NOx - SYSTEM BIAS

Bias = (System Response - Analyzer Response) / Span

Span Value 95.1

| | Zero | Span |
|---|---|---|
| Analyzer Cal. Response | 0.09 | 51.28 |
| System Cal. Response | 0.19 | 51.43 |

The Zero Bias ( 0.11% ) is within +/- 5%
The Span Bias ( 0.16% ) is within +/- 5%

| Manifold Pressure | |
|---|---|
| Sampling | 4 psi |
| Calibration | 4 psi |
| **Temperatures** | |
| Sample Line | 260 F |
| Knockout | 39 F |

## CONVERSION EFFICIENCY

| | | | | |
|---|---|---|---|---|
| Span Value | 95.1 | Highest Peak Value | 52.80 | % Difference |
| Analyzer Mode | NOx | Ending Value | 52.37 | 0.81% |
| | | | | must be <= 2% |

## CO - SYSTEM BIAS

Bias = (System Response - Analyzer Response) / Span

Span Value 95.1

| | Zero | Span |
|---|---|---|
| Analyzer Cal. Response | 0.14 | 45.64 |
| System Cal. Response | -0.03 | 45.34 |

The Zero Bias ( -0.18% ) is within +/- 5%
The Span Bias ( -0.32% ) is within +/- 5%

## O2 - SYSTEM BIAS

Bias = (System Response - Analyzer Response) / Span

Span Value 21

| | Zero | Span |
|---|---|---|
| Analyzer Cal. Response | 0.03 | 12.11 |
| System Cal. Response | 0.07 | 11.99 |

The Zero Bias ( 0.19% ) is within +/- 5%
The Span Bias ( -0.57% ) is within +/- 5%

# Stork SwL SO2 Analyzer QA

| Project Name: | Citgo Refining & Chemicals, Inc. | Date | 10/7/2008 |
|---|---|---|---|
| Project No.: | 08091128 West Plant SRU | Initials | MG |

| EPA Protocol No. 1 Gases | | | |
|---|---|---|---|
| Cylinder Pollutant | Cylinder Value | Cylinder Number | Expiration Date |
| $SO_2$ - Low | | | |
| $SO_2$ - Mid | 53.1 | ALM049185 | 4/10/2010 |
| $SO_2$ - High | 91.4 | ALM013736 | 2/26/2010 |

| Parameter: | $SO_2$ | CALIBRATION ERROR | | | |
|---|---|---|---|---|---|
| Analyzer: | Ametek Western Research | | | Scale: | 91.4 |
| Model: | 921 CE SO2 | | | Serial: | AW-921-S216 |
| GASES | Cylinder Value | Analyzer Response | Difference | % Difference | Is CE Within +or- 2% |
| Zero | 0.00 | -0.03 | 0.0 | -0.03% | Yes |
| EPA Protocol No. 1 | | | | | |
| Low-Level | 0.00 | ### | 0.00 | 0.00% | Yes |
| Mid-Level | 53.10 | 53.15 | 0.05 | 0.05% | Yes |
| High-Level | 91.40 | 91.93 | 0.53 | 0.58% | Yes |

| $SO_2$ - SYSTEM BIAS | | | | |
|---|---|---|---|---|
| Bias = (System Response - Analyzer Response) / Span | | | | |
| Span Value | | 91.4 | | |
| | | Zero | Span | |
| Analyzer Cal. Response | | -0.03 | 53.15 | |
| System Cal. Response | | 0.14 | 52.54 | |
| The Zero Bias ( | 0.19% ) | | is | within +/- 5% |
| The Span Bias ( | -0.67% ) | | is | within +/- 5% |

| Manifold Pressure | |
|---|---|
| Sampling | 4 psi |
| Calibration | 4 psi |
| **Temperatures** | |
| Sample Line | 260 F |
| Knockout | 39 F |

* % Difference = Difference/Span Value x 100

go Refining and Chemicals, Inc.
west Plant SRU
Corpus Christi, Texas
SwL Project No. 08091128
File Name: 10-07-08_11-20

| Date and Time | CO | NOx | O2 | THC | CO2 | SO2 | Flow |
|---|---|---|---|---|---|---|---|
| MM/DD/YY HH:MM | ppm | ppm | % | ppm | % | ppm | lpm |
| 10/7/2008 11:21 | 0.16 | -0.01 | 20.44 | | | 0.14 | |
| 10/7/2008 11:22 | 0.44 | -0.01 | 15.18 | | | 0.88 | |
| 10/7/2008 11:23 | 0.75 | 0.25 | 0.11 | | | 2.00 | |
| 10/7/2008 11:24 | 0.53 | -0.01 | 0.11 | | | 0.19 | |
| 10/7/2008 11:25 | 0.48 | -0.01 | 0.12 | | | 0.15 | |
| 10/7/2008 11:26 | 0.54 | -0.01 | 0.12 | | | 0.14 | |
| 10/7/2008 11:27 | 0.57 | -0.01 | 0.14 | | | 0.14 | |
| 10/7/2008 11:28 | 0.56 | -0.01 | 0.15 | | | 0.14 | |
| 10/7/2008 11:29 | 0.55 | -0.01 | 0.16 | | | 0.14 | |
| 10/7/2008 11:30 | 0.57 | -0.01 | 0.17 | | | 0.14 | |
| 10/7/2008 11:31 | 0.51 | -0.01 | 0.17 | | | 0.14 | |
| 10/7/2008 11:32 | 0.51 | -0.01 | 0.18 | | | 0.14 | |
| 10/7/2008 11:33 | 0.50 | -0.01 | 0.18 | | | 0.14 | |
| 10/7/2008 11:34 | 0.57 | -0.01 | 0.19 | | | 0.14 | |
| 10/7/2008 11:35 | 0.51 | -0.01 | 0.20 | | | 0.42 | |
| 10/7/2008 11:36 | 0.57 | -0.01 | 0.05 | | | 0.19 | |
| 10/7/2008 11:37 | 0.59 | -0.01 | 0.02 | | | 0.06 | |
| 10/7/2008 11:38 | 0.53 | 0.01 | 0.02 | | | -0.04 | |
| 10/7/2008 11:39 | -0.03 | 0.09 | 0.03 | | | -0.06 | |
| 10/7/2008 11:40 | -0.02 | 0.09 | 0.01 | | | -0.07 | |
| 10/7/2008 11:41 | 0.14 | 0.09 | 0.01 | | | -0.07 | |
| 10/7/2008 11:42 | 0.10 | 0.09 | 0.02 | | | -0.04 | |
| 10/7/2008 11:43 | 0.14 | 0.09 | 0.03 | | | -0.01 | |
| 10/7/2008 11:44 | 0.14 | 0.09 | 0.03 | | | -0.03 | |
| 10/7/2008 11:45 | 0.14 | 0.09 | 0.03 | | | -0.02 | |
| 10/7/2008 11:46 | 0.17 | 0.09 | 0.03 | | | -0.03 | |
| 10/7/2008 11:47 | 0.17 | 0.09 | 0.04 | | | -0.04 | |
| 10/7/2008 11:48 | 0.14 | 0.09 | 0.04 | | | -0.04 | |
| 10/7/2008 11:49 | 53.08 | 1.02 | 15.37 | | | 49.99 | |
| 10/7/2008 11:50 | 97.02 | 70.61 | 21.03 | | | 72.68 | |
| 10/7/2008 11:51 | 98.26 | 98.78 | 20.99 | | | 53.32 | |
| 10/7/2008 11:52 | 98.59 | 99.22 | 21.09 | | | 53.28 | |
| 10/7/2008 11:53 | 94.19 | 99.56 | 21.14 | | | 53.19 | |
| 10/7/2008 11:54 | 93.97 | 99.63 | 21.11 | | | 53.09 | |
| 10/7/2008 11:55 | 94.00 | 96.28 | 21.02 | | | 52.74 | |
| 10/7/2008 11:56 | 94.87 | 88.37 | 19.93 | | | 52.71 | |
| 10/7/2008 11:57 | 95.13 | 74.49 | 20.13 | | | 51.70 | |
| 10/7/2008 11:58 | 95.10 | 94.53 | 20.98 | | | 53.37 | |
| 10/7/2008 11:59 | 95.16 | 94.06 | 21.04 | | | 53.75 | |
| 10/7/2008 12:00 | 95.20 | 94.35 | 20.99 | | | 53.47 | |
| 10/7/2008 12:01 | 71.25 | 94.90 | 16.89 | | | 53.12 | |
| 10/7/2008 12:02 | 45.64 | 94.45 | 12.16 | | | 53.15 | |
| 10/7/2008 12:03 | 45.66 | 95.13 | 12.12 | | | 77.76 | |
| 10/7/2008 12:04 | 45.63 | 94.93 | 12.11 | | | 91.14 | |
| 10/7/2008 12:05 | 45.64 | 94.85 | 12.11 | | | 92.53 | |
| 10/7/2008 12:06 | 45.63 | 95.27 | 12.11 | | | 92.71 | |
| 10/7/2008 12:07 | 45.67 | 95.07 | 12.11 | | | 92.47 | |
| 10/7/2008 12:08 | 45.60 | 95.03 | 12.11 | | | 92.14 | |
| 10/7/2008 12:09 | 45.73 | 95.01 | 12.11 | | | 91.97 | |
| 10/7/2008 12:10 | 45.67 | 94.78 | 12.11 | | | 91.97 | |
| 10/7/2008 12:11 | 45.70 | 94.67 | 12.11 | | | 92.06 | |
| 10/7/2008 12:12 | 45.77 | 94.64 | 12.61 | | | 91.93 | |

Calibration Error

| | | | | |
|---|---|---|---|---|
| 10/7/2008 12:14 | 45.60 | 94.62 | 13.14 | 90.79 |
| 10/7/2008 12:15 | 45.27 | 87.49 | 0.18 | 83.74 |
| 10/7/2008 12:16 | 6.14 | 47.97 | 0.19 | 1.34 |
| 10/7/2008 12:17 | 0.11 | 47.30 | 0.27 | 0.21 |
| 10/7/2008 12:18 | 0.11 | 50.36 | 0.03 | 0.17 |
| 10/7/2008 12:19 | 0.07 | 53.21 | 0.02 | 0.15 |
| 7/2008 12:20 | 0.07 | 52.54 | 0.05 | 0.13 |
| 10/7/2008 12:21 | 0.04 | 51.02 | 0.06 | 0.16 |
| 10/7/2008 12:22 | 0.04 | 51.40 | 0.06 | 0.14 |
| 10/7/2008 12:23 | 0.04 | 51.28 | 0.07 | 0.13 |
| 10/7/2008 12:24 | -0.03 | 51.13 | 0.07 | 0.13 |
| 10/7/2008 12:25 | -0.06 | 42.24 | 0.09 | 0.15 |
| 10/7/2008 12:26 | 0.04 | 1.10 | 2.98 | 0.15 |
| 10/7/2008 12:27 | -0.03 | 0.40 | 11.87 | 0.15 |
| 10/7/2008 12:28 | -0.03 | 0.29 | 11.91 | 0.14 |
| 10/7/2008 12:29 | -0.06 | 0.23 | 11.92 | 0.14 |
| 10/7/2008 12:30 | -0.03 | 0.19 | 11.98 | 0.13 |
| 10/7/2008 12:31 | -0.02 | 0.19 | 11.99 | 0.13 |
| 10/7/2008 12:32 | -0.10 | 0.19 | 11.99 | 0.14 |
| 10/7/2008 12:33 | -0.09 | 0.19 | 12.00 | 0.13 |
| 10/7/2008 12:34 | -0.13 | 0.19 | 12.00 | 0.14 |
| 10/7/2008 12:35 | 2.62 | 0.17 | 8.91 | 0.15 |
| 10/7/2008 12:36 | 41.85 | 0.19 | 0.22 | 0.13 |
| 10/7/2008 12:37 | 45.34 | 0.19 | 0.20 | 0.15 |
| 10/7/2008 12:38 | 45.34 | 0.19 | 0.19 | 0.14 |
| 10/7/2008 12:39 | 45.15 | 0.19 | 0.18 | 0.13 |
| 10/7/2008 12:40 | 22.97 | 17.51 | 0.16 | 0.13 |
| 10/7/2008 12:41 | 0.00 | 49.86 | -0.01 | 0.10 |
| 10/7/2008 12:42 | -0.06 | 50.47 | -0.01 | 0.08 |
| 10/7/2008 12:43 | 0.04 | 50.45 | -0.01 | 0.08 |
| 10/7/2008 12:44 | -0.10 | 51.09 | 0.04 | 0.08 |
| 10/7/2008 12:45 | -0.09 | 51.50 | 0.05 | 0.08 |
| 10/7/2008 12:46 | -0.09 | 51.43 | 0.05 | 0.08 |
| 10/7/2008 12:47 | -0.13 | 51.45 | 0.05 | 0.09 |
| 10/7/2008 12:48 | -0.20 | 50.34 | 3.72 | 0.13 |
| 10/7/2008 12:49 | -0.02 | 22.28 | 0.59 | 40.26 |
| 10/7/2008 12:50 | 0.04 | 0.37 | -0.01 | 49.78 |
| 10/7/2008 12:51 | 0.07 | 0.24 | 0.00 | 51.15 |
| 10/7/2008 12:52 | -0.03 | 0.19 | 0.00 | 51.61 |
| 10/7/2008 12:53 | 0.01 | 0.19 | 0.00 | 51.89 |
| 10/7/2008 12:54 | 0.00 | 0.19 | 0.00 | 52.07 |
| 10/7/2008 12:55 | -0.03 | 0.19 | 0.00 | 52.18 |
| 10/7/2008 12:56 | 0.00 | 0.19 | 0.00 | 52.30 |
| 10/7/2008 12:57 | -0.06 | 0.19 | 0.00 | 52.36 |
| 10/7/2008 12:58 | -0.06 | 0.19 | 0.00 | 52.42 |
| 10/7/2008 12:59 | -0.03 | 0.19 | 0.01 | 52.45 |
| 10/7/2008 13:00 | -0.09 | 0.19 | 0.00 | 52.48 |
| 10/7/2008 13:01 | -0.05 | 0.19 | 0.01 | 52.54 |
| 10/7/2008 13:02 | -0.03 | 0.19 | 0.01 | 52.55 |
| 10/7/2008 13:03 | -0.04 | 0.19 | 0.03 | 37.81 |
| 10/7/2008 13:04 | -0.33 | 0.11 | 0.07 | 2.32 |
| 10/7/2008 13:05 | -0.36 | 0.09 | 0.08 | 1.16 |
| 10/7/2008 13:06 | -0.33 | 0.09 | 0.08 | 0.79 |
| 10/7/2008 13:07 | -0.36 | 0.09 | 0.08 | 0.61 |
| 10/7/2008 13:08 | -0.37 | 0.09 | 0.08 | 0.49 |
| 10/7/2008 13:09 | -0.39 | 0.09 | 0.00 | 0.40 |
| 10/7/2008 13:10 | -0.36 | 0.09 | -0.02 | 0.34 |
| 9/7/2008 13:11 | -0.38 | 0.09 | -0.02 | 0.33 |
| 10/7/2008 13:12 | -0.33 | 0.09 | -0.02 | 0.29 |
| 10/7/2008 13:13 | -0.36 | 0.09 | -0.02 | 0.23 |
| 10/7/2008 13:14 | -0.37 | 0.09 | -0.01 | 0.25 |
| 10/7/2008 13:15 | -0.42 | 0.09 | -0.01 | 0.23 |
| 10/7/2008 13:16 | -0.40 | 0.09 | -0.01 | 0.19 |
| 10/7/2008 13:17 | -0.43 | 0.09 | -0.01 | 0.19 |
| 10/7/2008 13:18 | -0.43 | 0.09 | -0.01 | 0.18 |

Line Bias

| | | | | |
|---|---|---|---|---|
| 10/8/2008 17:08 | 21.21 | 21.67 | 6.24 | 73.32 |
| 10/8/2008 17:09 | 72.33 | 19.97 | 6.49 | 73.17 |
| 10/8/2008 17:10 | 46.64 | 20.73 | 6.25 | 73.29 |
| 10/8/2008 17:11 | 28.04 | 21.33 | 6.33 | 73.50 |
| 10/8/2008 17:12 | 44.27 | 20.44 | 6.37 | 73.13 |
| 10/8/2008 17:13 | 26.31 | 14.54 | 1.99 | 29.66 |
| )/2008 17:14 | 0.94 | 2.01 | 0.02 | 3.58 |
| 10/8/2008 17:15 | 0.84 | 1.28 | 0.00 | 2.61 |
| 10/8/2008 17:16 | | | 0.00 | 2.34 |
| 10/8/2008 17:17 | | | 4.59 | 2.19 |
| 10/8/2008 17:18 | | | 12.00 | 1.92 |
| 10/8/2008 17:19 | | | 12.01 | 1.90 |
| 10/8/2008 17:20 | | | 7.59 | 17.22 |
| 10/8/2008 17:21 | | | 0.03 | 51.19 |
| 10/8/2008 17:22 | | | 0.01 | 52.83 |
| 10/8/2008 17:23 | | | 0.01 | 53.41 |
| 10/8/2008 17:24 | | | 0.00 | 53.66 |
| 10/8/2008 17:25 | | | 0.00 | 53.65 |
| 10/8/2008 17:26 | | | 0.00 | 22.92 |
| 10/8/2008 17:27 | | | 0.00 | 3.88 |
| 10/8/2008 17:28 | | | 2.16 | 25.87 |
| 10/8/2008 17:29 | | 0.14 | 6.50 | 71.90 |
| 10/8/2008 17:30 | | 0.21 | 6.44 | 75.37 |
| 10/8/2008 17:31 | | 1.11 | 6.53 | 75.30 |
| 10/8/2008 17:32 | | 40.06 | 6.52 | 75.16 |
| 10/8/2008 17:33 | | 52.68 | 6.42 | 74.02 |
| 10/8/2008 17:34 | | 52.78 | 6.50 | 73.30 |
| 10/8/2008 17:35 | | 52.79 | 6.52 | 72.67 |
| 10/8/2008 17:36 | | 52.77 | 6.49 | 73.23 |
| 10/8/2008 17:37 | | 52.78 | 6.56 | 73.03 |
| 10/8/2008 17:38 | | 52.80 | 6.43 | 73.11 |
| )/8/2008 17:39 | | 52.80 | 6.54 | 73.71 |
| /8/2008 17:40 | | 52.74 | 6.60 | 74.11 |
| 10/8/2008 17:41 | | 52.71 | 6.38 | 73.72 |
| 10/8/2008 17:42 | | 52.72 | 6.50 | 73.56 |
| 10/8/2008 17:43 | | 52.69 | 6.54 | 74.11 |
| 10/8/2008 17:44 | | 52.68 | 6.42 | 74.30 |
| 10/8/2008 17:45 | | 52.62 | 6.61 | 74.62 |
| 10/8/2008 17:46 | | 52.66 | 6.47 | 74.51 |
| 10/8/2008 17:47 | | 52.59 | 6.56 | 74.03 |
| 10/8/2008 17:48 | | 52.62 | 6.55 | 74.27 |
| 10/8/2008 17:49 | | 52.54 | 6.46 | 74.21 |
| 10/8/2008 17:50 | | 52.57 | 6.63 | 73.84 |
| 10/8/2008 17:51 | | 52.60 | 6.60 | 72.83 |
| 10/8/2008 17:52 | | 52.62 | 6.56 | 72.69 |
| 10/8/2008 17:53 | | 52.60 | 6.65 | 72.59 |
| 10/8/2008 17:54 | | 52.55 | 6.51 | 72.33 |
| 10/8/2008 17:55 | | 52.52 | 6.55 | 72.75 |
| 10/8/2008 17:56 | | 52.55 | 6.72 | 73.08 |
| 10/8/2008 17:57 | | 52.52 | 6.62 | 72.89 |
| 10/8/2008 17:58 | | 52.52 | 6.58 | 72.11 |
| 10/8/2008 17:59 | | 52.54 | 6.59 | 72.24 |
| 10/8/2008 18:00 | | 52.51 | 6.63 | 72.47 |
| 10/8/2008 18:01 | | 52.51 | 6.65 | 72.26 |
| 10/8/2008 18:02 | | 52.46 | 6.63 | 71.34 |
| 10/8/2008 18:03 | | 52.45 | 6.60 | 71.31 |
| 10/8/2008 18:04 | | 52.42 | 6.59 | 70.68 |
| )/8/2008 18:05 | | 52.37 | 6.70 | 69.42 |
| 10/8/2008 18:06 | | 52.37 | 6.59 | 68.30 |
| 10/8/2008 18:07 | | 52.40 | 6.71 | 68.45 |
| 10/8/2008 18:08 | | 52.32 | 6.63 | 68.10 |
| 10/8/2008 18:09 | | 52.30 | 6.66 | 67.93 |
| 10/8/2008 18:10 | | 52.31 | 6.74 | 67.99 |
| 10/8/2008 18:11 | | 52.27 | 6.63 | 67.27 |
| 10/8/2008 18:12 | | 52.25 | 6.69 | 66.52 |

Nox Converter Efficiency

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

# RATA CLASS

*Dual-Analyzed Calibration Standard*

9810 BAY AREA BLVD, PASADENA, TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

## CERTIFICATE OF ACCURACY: EPA Protocol Gas

**Assay Laboratory**

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 14112547
Project No.: 04-68019-001

**Customer**

STORK SOUTHWESTERN LABORATORIES
PHIL YOKLEY
CO2/O2 BIN
222 CAVALCADE ST
HOUSTON TX 77009

## ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

**Cylinder Number:** ALM041061 **Certification Date:** 30Sep2008 **Exp. Date:** 30Sep2011

**Cylinder Pressure***:** 1900 PSIG

| COMPONENT | CERTIFIED CONCENTRATION (Moles) | | ANALYTICAL ACCURACY** | TRACEABILITY |
|---|---|---|---|---|
| OXYGEN | 12.0 | % | +/- 1% | Direct NIST and NMi |
| NITROGEN | | BALANCE | | |

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

## REFERENCE STANDARD

| TYPE/SRM NO. | EXPIRATION DATE | CYLINDER NUMBER | CONCENTRATION | COMPONENT |
|---|---|---|---|---|
| NTRM 2350 | 01Apr2012 | A6820 | 23.51 % | OXYGEN |

## INSTRUMENTATION

| INSTRUMENT/MODEL/SERIAL# | DATE LAST CALIBRATED | ANALYTICAL PRINCIPLE |
|---|---|---|
| SERVOMEX/MODEL 244A/701/716 | 09Sep2008 | PARAMAGNETIC |

## ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

**First Triad Analysis**

**OXYGEN**

Date: 30Sep2008 Response Unit:VOLTS

| | | |
|---|---|---|
| Z1=0.00000 | R1=0.99000 | T1=0.50520 |
| R2=0.99000 | Z2=0.00040 | T2=0.50500 |
| Z3=0.00040 | T3=0.50490 | R3=0.98970 |

Avg. Concentration: 11.97 %

**Second Triad Analysis**

**Calibration Curve**

Concentration=A+Bx+Cx2+Dx3+Ex4

r=0.9999979

| | |
|---|---|
| Constants: | A=-0.0037599 |
| B=23.69719774 | C= |
| D= | E= |

APPROVED BY: DAVID KELLY

# RATA CLASS

## Scott Specialty Gases

*Dual-Analyzed Calibration Standard*

9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

## CERTIFICATE OF ACCURACY: EPA Protocol Gas

**Assay Laboratory**

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: 14112049
Project No.: 04-43432-006

**Customer**

STORK SOUTHWESTERN LABORATORIES
Phil Yokley
PROPANE BIN
222 CAVALCADE ST
HOUSTON TX 77009

### ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

**Cylinder Number:** ALM054036 **Certification Date:** 18Apr2006 **Exp. Date:** 18Apr2009
**Cylinder Pressure***:** 2000 PSIG

| COMPONENT | CERTIFIED CONCENTRATION (Moles) | ANALYTICAL ACCURACY** | TRACEABILITY |
|---|---|---|---|
| OXYGEN | 21.0 % | +/- 1% | Direct NIST and NMi |
| NITROGEN | BALANCE | | |

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

### REFERENCE STANDARD

| TYPE/SRM NO. | EXPIRATION DATE | CYLINDER NUMBER | CONCENTRATION | COMPONENT |
|---|---|---|---|---|
| NTRM 2350 | 01May2009 | K003567 | 23.48 % | OXYGEN |

### INSTRUMENTATION

| INSTRUMENT/MODEL/SERIAL# | DATE LAST CALIBRATED | ANALYTICAL PRINCIPLE |
|---|---|---|
| SERVOMEX/MODEL 244A/701/716 | 07Apr2006 | PARAMAGNETIC |

### ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

**First Triad Analysis**

OXYGEN

| | | |
|---|---|---|
| Date: 18Apr2006 | Response Unit:VOLTS | |
| Z1=0.00000 | R1=0.98510 | T1=0.87970 |
| R2=0.98520 | Z2=0.00000 | T2=0.88030 |
| Z3=0.00000 | T3=0.88030 | R3=0.98540 |
| Avg. Concentration: | 20.97 % | |

**Second Triad Analysis**

**Calibration Curve**

Concentration=A+Bx+Cx2+Dx3+Ex4
r=0.9999999

| | |
|---|---|
| Constants: | A=0.003703653 |
| B=23.84241031 | C= |
| D= | E= |

APPROVED BY: DAVID KELLY

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

# RATA CLASS

*Dual-Analyzed Calibration Standard*

9810 BAY AREA BLVD, PASADENA, TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

## CERTIFICATE OF ACCURACY: EPA Protocol Gas

**Assay Laboratory**

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 14112448
Project No.: 04-62824-001

**Customer**

STORK SOUTHWESTERN LABORATORIES
PHIL YOKLEY
SO2 BIN
222 CAVALCADE ST
HOUSTON TX 77009

## ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

**Cylinder Number:** ALM049185 **Certification Date:** 10Apr2008 **Exp. Date:** 10Apr2010

**Cylinder Pressure***:** 1960 PSIG

| COMPONENT | CERTIFIED CONCENTRATION (Moles) | | ANALYTICAL ACCURACY** | TRACEABILITY |
|---|---|---|---|---|
| SULFUR DIOXIDE * | 53.1 | PPM | +/- 1% | Direct NIST and NMi |
| NITROGEN | | BALANCE | | |

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997

* This Protocol has been certified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/96 and will not correlate with uncorrected Prot

## REFERENCE STANDARD

| TYPE/SRM NO. | EXPIRATION DATE | CYLINDER NUMBER | CONCENTRATION | COMPONENT |
|---|---|---|---|---|
| NTRM 1694 | 15Aug2009 | AAL18592 | 97 81 PPM | SULFUR DIOXIDE |

## INSTRUMENTATION

| INSTRUMENT/MODEL/SERIAL# | DATE LAST CALIBRATED | ANALYTICAL PRINCIPLE |
|---|---|---|
| FTIR//000929060 | 10Mar2008 | FTIR |

## ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

**SULFUR DIOXIDE ***

**First Triad Analysis**

Date: 03Apr2008 Response Unit:PPM

| | | |
|---|---|---|
| Z1=0.02746 | R1=97.84001 | T1=53.11384 |
| R2=97.86047 | Z2=0 03551 | T2=53.13241 |
| Z3=0.04343 | T3=53.14831 | R3=97.97694 |

Avg. Concentration: 53.07 PPM

**Second Triad Analysis**

Date: 10Apr2008 Response Unit: PPM

| | | |
|---|---|---|
| Z1=0.00033 | R1=97.84298 | T1=53.15973 |
| R2=97.88459 | Z2=0.11723 | T2=53.24897 |
| Z3=0.13565 | T3=53.32927 | R3=97.96510 |

Avg. Concentration: 53.16 PPM

**Calibration Curve**

Concentration=A+Bx+Cx2+Dx3+Ex4

r=9.99994E-1

| | |
|---|---|
| Constants: | A=0.00000E+0 |
| B=1.03452E+0 | C=-1.70000E-4 |
| D=0.00000E+0 | E=0.00000E+0 |

APPROVED BY: _____

RAMIEN JR

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

# RATA CLASS

*Dual-Analyzed Calibration Standard*

9810 BAY AREA BLVD, PASADENA, TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

## CERTIFICATE OF ACCURACY: EPA Protocol Gas

**Assay Laboratory**

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 14112422
Project No.: 04-61651-009

**Customer**

STORK SOUTHWESTERN LABORATORIES
PHIL YOKLEY
P O BOX 8768
HOUSTON TX 77248-8768

## ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

**Cylinder Number:** ALM013736 **Certification Date:** 26Feb2008 **Exp. Date:** 26Feb2010

**Cylinder Pressure***:** 1981 PSIG

| COMPONENT | CERTIFIED CONCENTRATION (Moles) | | ANALYTICAL ACCURACY** | TRACEABILITY |
|---|---|---|---|---|
| SULFUR DIOXIDE * | 91.4 | PPM | +/- 1% | Direct NIST and NMi |
| NITROGEN | | BALANCE | | |

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

* This Protocol has been certified using corrected NIST SO2 standard values, per EPA guidance dated 7/24/96 and will not correlate with uncorrected Prot

## REFERENCE STANDARD

| TYPE/SRM NO. | EXPIRATION DATE | CYLINDER NUMBER | CONCENTRATION | COMPONENT |
|---|---|---|---|---|
| NTRM 1693 | 01Nov2010 | ALM034319 | 50.18 PPM | SULFUR DIOXIDE |

## INSTRUMENTATION

| INSTRUMENT/MODEL/SERIAL# | DATE LAST CALIBRATED | ANALYTICAL PRINCIPLE |
|---|---|---|
| FTIR//000929060 | 19Feb2008 | FTIR |

## ANALYZER READINGS

(Z = Zero Gas R = Reference Gas T = Test Gas r = Correlation Coefficient)

SULFUR DIOXIDE *

**First Triad Analysis**

Date: 19Feb2008 Response Unit:PPM

| | | |
|---|---|---|
| Z1 = -0.00281 | R1 = 50.31541 | T1 = 91.52373 |
| R2 = 50.39320 | Z2 = 0.09893 | T2 = 91.59765 |
| Z3 = 0.09993 | T3 = 91.61668 | R3 = 50.42071 |

Avg. Concentration: 91.27 PPM

**Second Triad Analysis**

Date: 26Feb2008 Response Unit: PPM

| | | |
|---|---|---|
| Z1 = 0.00302 | R1 = 50.12608 | T1 = 91.33328 |
| R2 = 50.19382 | Z2 = 0.03566 | T2 = 91.46416 |
| Z3 = 0.06983 | T3 = 91.46695 | R3 = 50.20415 |

Avg. Concentration: 91.46 PPM

**Calibration Curve**

Concentration = A + Bx + Cx2 + Dx3 + Ex4

r = 9.99997E-1

| | |
|---|---|
| Constants: | A = 0.00000E+0 |
| B = 1.00293E+0 | C = -9.10000E-5 |
| D = 0.00000E+0 | E = 0.00000E+0 |

APPROVED BY: _____
RAMIEN JR

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

# RATA CLASS

*Dual-Analyzed Calibration Standard*

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

## CERTIFICATE OF ACCURACY: EPA Protocol Gas

**Assay Laboratory**

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 1411-2513
Project No.: 04-66223-001

**Customer**

STORK SOUTHWESTERN LABORATORIES
RUSS DIRAIMO
CO BIN
222 CAVALCADE ST
HOUSTON TX 77009

## ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

**Cylinder Number:** ALM058419 **Certification Date:** 08Mar2007 **Exp. Date:** 07Mar2009

**Cylinder Pressure***:** 1993 PSIG

| COMPONENT | CERTIFIED CONCENTRATION (Moles) | | ANALYTICAL ACCURACY** | TRACEABILITY |
|---|---|---|---|---|
| NITRIC OXIDE | 51.5 | PPM | +/- 1% | Direct NIST and NMi |
| NITROGEN - OXYGEN FREE | | BALANCE | | |
| TOTAL OXIDES OF NITROGEN | 51.5 | PPM | | Reference Value Only |

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

**REFERENCE STANDARD**

| TYPE/SRM NO. | EXPIRATION DATE | CYLINDER NUMBER | CONCENTRATION | COMPONENT |
|---|---|---|---|---|
| NTRM 1683 | 15Aug2009 | AAL070665 | 49.82 PPM | NITRIC OXIDE |

**INSTRUMENTATION**

| INSTRUMENT/MODEL/SERIAL# | DATE LAST CALIBRATED | ANALYTICAL PRINCIPLE |
|---|---|---|
| FTIR//1602651 | 27Feb2007 | FTIR |

## ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

**First Triad Analysis**

NITRIC OXIDE

| | | |
|---|---|---|
| Date: 01Mar2007 | Response Unit:PPM | |
| Z1=0.03401 | R1=50.01627 | T1=51.75174 |
| R2=50.10784 | Z2=0.03908 | T2=51.79798 |
| Z3=0.04141 | T3=51.88341 | R3=50.12851 |
| Avg. Concentration: | 51.54 | PPM |

**Second Triad Analysis**

| | | |
|---|---|---|
| Date: 08Mar2007 | Response Unit: PPM | |
| Z1=-0.15681 | R1=49.85123 | T1=51.49375 |
| R2=49.85643 | Z2=-0.13049 | T2=51.52715 |
| Z3=-0.10837 | T3=51.63533 | R3=49.95522 |
| Avg. Concentration: | 51.48 | PPM |

**Calibration Curve**

Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99985E-1

| | |
|---|---|
| Constants: | A=0.00000E+0 |
| B=5.25998E-1 | C=5.90000E-5 |
| D=0.00000E+0 | E=0.00000E+0 |

APPROVED BY: Nora P. Pike
for LaVail Washington

RATA CLASS

*Dual-Analyzed Calibration Standard*

Scott Specialty Gases
9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-585

## CERTIFICATE OF ACCURACY: EPA Protocol Gas

**Assay Laboratory**

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: 14112231
Project No.: 04-52756-007

**Customer**

STORK SOUTHWESTERN LABORATORIES
Phil Yokley
CO BIN
222 CAVALCADE ST
HOUSTON TX 77009

### ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

**Cylinder Number:** AAL070752 **Certification Date:** 30Mar2007 **Exp. Date:** 29Mar2009
**Cylinder Pressure***:** 1939 PSIG

| COMPONENT | CERTIFIED CONCENTRATION (Moles) | | ANALYTICAL ACCURACY** | TRACEABILITY |
|---|---|---|---|---|
| NITRIC OXIDE | 95.1 | PPM | +/- 1% | Direct NIST and NMi |
| NITROGEN - OXYGEN FREE | | BALANCE | | |
| TOTAL OXIDES OF NITROGEN | 95.1 | PPM | | Reference Value Only |

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

### REFERENCE STANDARD

| TYPE/SRM NO. | EXPIRATION DATE | CYLINDER NUMBER | CONCENTRATION | COMPONENT |
|---|---|---|---|---|
| NTRM 1684 | 01Jun2009 | AAL070668 | 98.40 PPM | NITRIC OXIDE |

### INSTRUMENTATION

| INSTRUMENT/MODEL/SERIAL# | DATE LAST CALIBRATED | ANALYTICAL PRINCIPLE |
|---|---|---|
| FTIR//1602651 | 30Mar2007 | FTIR |

### ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

NITRIC OXIDE

**First Triad Analysis**

Date: 23Mar2007 Response Unit:PPM
Z1=-0.03056 R1=98.36908 T1=94.93567
R2=98.39771 Z2=-0.01466 T2=95.00451
Z3=-0.00016 T3=95.08217 R3=98.48101
Avg. Concentration: 94.99 PPM

**Second Triad Analysis**

Date: 30Mar2007 Response Unit: PPM
Z1=-0.08534 R1=98.57143 T1=95.30366
R2=98.69688 Z2=0.01719 T2=95.48790
Z3=0.16834 T3=95.55137 R3=98.72980
Avg. Concentration: 95.19 PPM

**Calibration Curve**

Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99996E-1
Constants: A=0.00000E+0
B=9.08968E-1 C=1.60000E-4
D=0.00000E+0 E=0.00000E+0

APPROVED BY: _____
Tom Nguyen

RATA CLASS

# Scott Specialty Gases

*Dual-Analyzed Calibration Standard*

AIR LIQUIDE AMERICA SPECIALTY GASES LLC
9810 BAY AREA BLVD, PASADENA, TX 77507
Phone: 281-474-5800 Fax: 281-474-5857

## CERTIFICATE OF ACCURACY: EPA Protocol Gas

**Assay Laboratory**

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA, TX 77507

P.O. No.: 14112398
Project No.: 04-60145-002

**Customer**

STORK SOUTHWESTERN LABORATORIES
PHIL YOKLEY
PROPANE BIN
222 CAVALCADE ST
HOUSTON TX 77009

### ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

**Cylinder Number:** ALM044300 **Certification Date:** 11May2007 **Exp. Date:** 10May2010
**Cylinder Pressure***:** 1942 PSIG

| COMPONENT | CERTIFIED CONCENTRATION (Moles) | ANALYTICAL ACCURACY** | TRACEABILITY |
|---|---|---|---|
| CARBON MONOXIDE | 45.8 PPM | +/- 1% | Direct NIST and NMi |
| NITROGEN | BALANCE | | |

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

### REFERENCE STANDARD

| TYPE/SRM NO. | EXPIRATION DATE | CYLINDER NUMBER | CONCENTRATION | COMPONENT |
|---|---|---|---|---|
| NTRM 1678 | 15Aug2009 | ALM038728 | 51.13 PPM | CARBON MONOXIDE |

### INSTRUMENTATION

| INSTRUMENT/MODEL/SERIAL# | DATE LAST CALIBRATED | ANALYTICAL PRINCIPLE |
|---|---|---|
| FTIR//1602651 | 26Apr2007 | FTIR |

### ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

**First Triad Analysis**

CARBON MONOXIDE

Date: 04May2007 Response Unit:PPM

| | | |
|---|---|---|
| Z1=0.00137 | R1=51.24195 | T1=45.85934 |
| R2=51.27874 | Z2=0.00790 | T2=45.87202 |
| Z3=0.01854 | T3=45.97350 | R3=51.30134 |

Avg. Concentration: 45.77 PPM

**Second Triad Analysis**

Date: 11May2007 Response Unit: PPM

| | | |
|---|---|---|
| Z1=-0.01715 | R1=51.35220 | T1=45.94153 |
| R2=51.37949 | Z2=0.01303 | T2=45.94223 |
| Z3=0.02928 | T3=45.97012 | R3=51.42369 |

Avg. Concentration: 45.72 PPM

**Calibration Curve**

Concentration=A+Bx+Cx2+Dx3+Ex4
r=9.99999E-1

| | |
|---|---|
| Constants: | A=0.00000E+0 |
| B=9.79274E-1 | C=6.99000E-4 |
| D=1.00000E-6 | E=0.00000E+0 |

APPROVED BY: for Tom Nguyen

RATA CLASS

# Scott Specialty Gases

*Dual-Analyzed Calibration Standard*

9810 BAY AREA BLVD,PASADENA,TX 77507 Phone: 281-474-5800 Fax: 281-474-5857

## CERTIFICATE OF ACCURACY: EPA Protocol Gas

**Assay Laboratory**

SCOTT SPECIALTY GASES
9810 BAY AREA BLVD
PASADENA,TX 77507

P.O. No.: 14112111
Project No.: 04-46291-008

**Customer**

STORK SOUTHWESTERN LABORATORIES

222 CAVALCADE ST
HOUSTON TX 77009

### ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

**Cylinder Number:** 1L1042 **Certification Date:** 02Aug2006 **Exp. Date:** 01Aug2009

**Cylinder Pressure***:** 1980 PSIG

| COMPONENT | CERTIFIED CONCENTRATION (Moles) | | ANALYTICAL ACCURACY** | TRACEABILITY |
|---|---|---|---|---|
| CARBON MONOXIDE | 95.1 | PPM | +/- 1% | Direct NIST and NMi |
| NITROGEN | | BALANCE | | |

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.

### REFERENCE STANDARD

| TYPE/SRM NO. | EXPIRATION DATE | CYLINDER NUMBER | CONCENTRATION | COMPONENT |
|---|---|---|---|---|
| NTRM 1679 | 02Apr2007 | ALM027398 | 94.90 PPM | CARBON MONOXIDE |

### INSTRUMENTATION

| INSTRUMENT/MODEL/SERIAL# | DATE LAST CALIBRATED | ANALYTICAL PRINCIPLE |
|---|---|---|
| FTIR//1602651 | 01Aug2006 | FTIR |

### ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

**First Triad Analysis**

CARBON MONOXIDE

Date: 26Jul2006 Response Unit:PPM

| | | |
|---|---|---|
| Z1=-0.01535 | R1=95.03063 | T1=95.37877 |
| R2=95.07446 | Z2=0.02886 | T2=95.41659 |
| Z3=0.06696 | T3=95.41738 | R3=95.16130 |

Avg. Concentration: 95.21 PPM

**Second Triad Analysis**

Date: 02Aug2006 Response Unit: PPM

| | | |
|---|---|---|
| Z1=0.03149 | R1=96.99507 | T1=97.12147 |
| R2=97.04601 | Z2=0.04239 | T2=97.15011 |
| Z3=0.10007 | T3=97.16846 | R3=97.17672 |

Avg. Concentration: 94.97 PPM

**Calibration Curve**

Concentration=A+Bx+Cx2+Dx3+Ex4

r=9.99999E-1

| | |
|---|---|
| Constants: | A=0.00000E+0 |
| B=8.38475E-1 | C=9.30000E-5 |
| D=3.00000E-6 | E=0.00000E+0 |

APPROVED BY: _____
Lara Nash

AIR LIQUIDE

Scott Specialty Gases
Air Liquide America Specialty Gases LLC

# CERTIFIED MASTER CLASS

*Single-Certified Calibration Standard*

9810 BAY AREA BLVD, PASADENA, TX 77507

Phone: 281-474-5800 Fax: 281-474-5857

## CERTIFICATE OF ACCURACY: Certified Master Class Calibration Standard

**Product Information**
Project No.: 04-67979-001
Item No.: 6 M H2S
P.O. No.: 14112543
Folio #: 6 M H2S
Cylinder Number: ALM006273
Cylinder Size: AL
Certification Date: 29Sep2008
Expiration Date: 29Sep2009

**Customer**

STORK SOUTHWESTERN LABORATORIES
PHIL YOKLEY
MSC BIN
222 CAVALCADE ST
HOUSTON, TX 77009

## CERTIFIED CONCENTRATION

| Component Name | Concentration (Moles) | | Accuracy (+/-%) |
|---|---|---|---|
| HYDROGEN SULFIDE | 5.9 | PPM | 2 |
| NITROGEN | | BALANCE | |

## TRACEABILITY

**Traceable To**

Scott Reference Standard

APPROVED BY: ROGER NGUYEN

SUPERVISOR: SUSAN BRANDON

DATE: 09/29/2008

# 3 Point Stratification Test

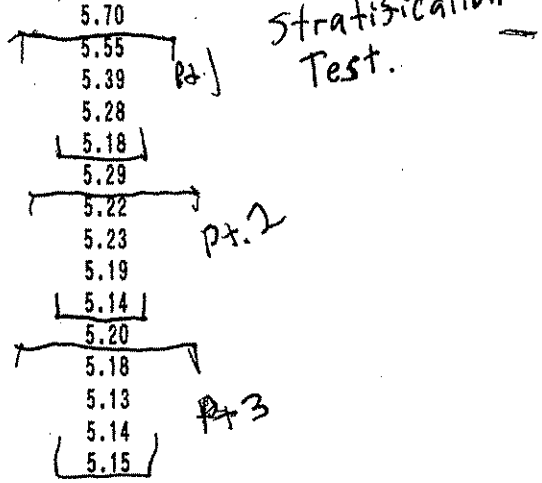
| | |
|---|---|
| Plant: | Citgo Refining & Chemical |
| Source: | West Plant SRU |
| Stork SwL Project No.: | 08091128 |

| **Pollutant:** | | O2 |
|---|---|---|
| **Point No.** | | **Emissions** |
| 1 | | 5.55 |
| | | 5.39 |
| | | 5.28 |
| | | 5.18 |
| **Avg.** | | **5.35** |
| 2 | | 5.22 |
| | | 5.23 |
| | | 5.19 |
| | | 5.14 |
| **Avg.** | | **5.20** |
| 3 | | 5.18 |
| | | 5.13 |
| | | 5.14 |
| | | 5.15 |
| **Avg.** | | **5.15** |
| **Average:** | | **5.23** |
| | **5% =** | **0.26** |
| | **10% =** | **0.52** |

**Each traverse point less than 5% of Average? [ Yes ]**

**Each traverse point less than 10% of Average? [ Yes ]**

| | | | | |
|---|---|---|---|---|
| 10/7/2008 13:20 | -0.39 | 0.09 | -0.01 | 0.18 |
| 10/7/2008 13:21 | -0.34 | 0.09 | -0.01 | 0.17 |
| 10/7/2008 13:22 | -0.38 | 0.09 | -0.01 | 0.17 |
| 10/7/2008 13:23 | -0.44 | 0.09 | -0.01 | 0.18 |
| 10/7/2008 13:24 | -0.38 | 0.09 | -0.01 | 0.19 |
| 10/7/2008 13:25 | -0.36 | 0.09 | -0.01 | 0.16 |
| 7/2008 13:26 | -0.36 | 0.09 | 0.00 | 0.19 |
| /7/2008 13:27 | -0.33 | 0.09 | -0.01 | 0.19 |
| 10/7/2008 13:28 | -0.40 | 0.09 | 0.00 | 0.20 |
| 10/7/2008 13:29 | -0.35 | 0.09 | 0.00 | 0.21 |
| 10/7/2008 13:30 | -0.35 | 0.09 | 0.00 | 0.20 |
| 10/7/2008 13:31 | -0.33 | 0.09 | 0.00 | 0.21 |
| 10/7/2008 13:32 | -0.30 | 0.09 | 0.00 | 0.20 |
| 10/7/2008 13:33 | -0.35 | 0.09 | 0.00 | 0.21 |
| 10/7/2008 13:34 | -0.36 | 0.09 | 0.00 | 0.18 |
| 10/7/2008 13:35 | -0.33 | 0.09 | 0.00 | 0.20 |
| 10/7/2008 13:36 | -0.36 | 0.09 | 0.00 | 0.21 |
| 10/7/2008 13:37 | -0.44 | 0.09 | 0.00 | 0.22 |
| 10/7/2008 13:38 | -0.45 | 0.09 | 0.00 | 0.22 |
| 10/7/2008 13:39 | -0.40 | 0.09 | 0.00 | 0.21 |
| 10/7/2008 13:40 | -0.42 | 0.09 | 0.00 | 0.21 |
| 10/7/2008 13:41 | 1.00 | 5.62 | 3.69 | 30.56 |
| 10/7/2008 13:42 | -0.27 | 22.53 | 5.70 | 68.35 |
| 10/7/2008 13:43 | -1.55 | 21.41 | 5.70 | 65.42 |
| 10/7/2008 13:44 | -1.38 | 21.24 | 5.55 | 68.99 |
| 10/7/2008 13:45 | | | 5.39 | 69.51 |
| 10/7/2008 13:46 | | | 5.28 | 70.45 |
| 10/7/2008 13:47 | | | 5.18 | 70.93 |
| 10/7/2008 13:48 | | | 5.29 | 69.20 |
| 10/7/2008 13:49 | | | 5.22 | 68.76 |
| 10/7/2008 13:50 | | | 5.23 | 68.03 |
| 0/7/2008 13:51 | | | 5.19 | 65.53 |
| /7/2008 13:52 | | | 5.14 | 65.97 |
| 10/7/2008 13:53 | | | 5.20 | 66.38 |
| 10/7/2008 13:54 | | | 5.18 | 66.32 |
| 10/7/2008 13:55 | | | 5.13 | 57.01 |
| 10/7/2008 13:56 | | | 5.14 | 53.61 |
| 10/7/2008 13:57 | | | 5.15 | 53.54 |
| 10/7/2008 13:58 | | | 5.20 | 53.50 |
| 10/7/2008 13:59 | | | 5.20 | 53.42 |
| 10/7/2008 14:00 | | | 5.19 | 52.36 |
| 10/7/2008 14:01 | | | 4.98 | 51.81 |
| 10/7/2008 14:02 | | | 5.12 | 51.69 |
| 10/7/2008 14:03 | | | 5.17 | 51.57 |
| 10/7/2008 14:04 | | | 5.17 | 51.96 |
| 10/7/2008 14:05 | | | 4.99 | 52.58 |
| 10/7/2008 14:06 | | | 5.12 | 52.91 |
| 10/7/2008 14:07 | | | 5.08 | 54.52 |
| 10/7/2008 14:08 | | | 5.03 | 66.82 |
| 10/7/2008 14:09 | | | 5.02 | 69.18 |
| 10/7/2008 14:10 | | | 4.88 | 69.04 |
| 10/7/2008 14:11 | | | 4.90 | 69.28 |
| 10/7/2008 14:12 | | | 5.19 | 68.68 |
| 10/7/2008 14:13 | | | 5.07 | 69.30 |
| 10/7/2008 14:14 | | | 5.23 | 68.87 |
| 10/7/2008 14:15 | | | 5.27 | 69.18 |
| 10/7/2008 14:16 | | | 5.48 | 68.79 |
| 7/7/2008 14:17 | | | 5.51 | 69.74 |
| 0/7/2008 14:18 | | | 5.51 | 69.37 |
| 10/7/2008 14:19 | | | 5.57 | 68.70 |
| 10/7/2008 14:20 | | | 5.51 | 68.80 |
| 10/7/2008 14:21 | | | 5.72 | 68.62 |
| 10/7/2008 14:22 | | | 5.64 | 68.45 |
| 10/7/2008 14:23 | | | 5.72 | 67.73 |
| 10/7/2008 14:24 | | | 5.73 | 67.59 |



Southwestern Laboratories, Inc.
Air Emission Services
Houston, Texas

## TRS Permeation Device - VICI Metronics Dynacalibrator

Dilution with Chambers 1 and 2

| Pollutant Name | Pollutant Permeation Rate ng/min @ 30°C | Molecular Weight g/g-mole | Top 0 ppm | Top 1 ppm | Top 2 ppm | Top 3 ppm | Top 4 ppm. | Top 5 ppm | Top 6 ppm | Top 7 ppm | Top 8 ppm | Top 9 ppm | Top 10 ppm | Top 11 ppm | Top 12 ppm | Top 13 ppm | Top 14 ppm | Top 15 ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $H_2S$ | 10,520 | 34 | 20.51 | 15.45 | 9.56 | 6.89 | 5.42 | 4.51 | 3.85 | 3.36 | 3.02 | 2.72 | 2.50 | 2.29 | 2.14 | 2.01 | 1.89 | 1.78 |

Dilution with Chambers 1 and 2

| Pollutant Name | Bottom 0 ppm | Bottom 1 ppm | Bottom 2 ppm | Bottom 3 ppm | Bottom 4 ppm | Bottom 5 ppm | Bottom 6 ppm | Bottom 7 ppm | Bottom 8 ppm | Bottom 9 ppm | Bottom 10 ppm | Bottom 11 ppm | Bottom 12 ppm | Bottom 13 ppm | Bottom 14 ppm | Bottom 15 ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H2S | 370 | 967 | 1,772 | 2,568 | 3380 | 4,153 | 4,960 | 5,707 | 6,455 | 7,222 | 7,962 | 8,676 | 9,335 | 10,067 | 10,763 | 11,525 |
| | 20.45 | 7.83 | 4.27 | 2.95 | 2.24 | 1.82 | 1.53 | 1.33 | 1.17 | 1.05 | 0.95 | 0.87 | 0.81 | 0.75 | 0.70 | 0.66 |

| | | | | |
|---|---|---|---|---|
| $H_2S$ | 10,520 | 0 | 10,520 | H2S Certificate No. 10-31961 Sept. 29, 2008 |

# CERTIFICATE

**The permeation rate of the DYNACAL® PERMEATION DEVICE listed below is certified traceable to N.I.S.T. standards.**

| | |
|---|---|
| Chemical Fill | : Hydrogen Sulfide |
| Device Type | : Standard #10 |
| Length /Geometry | : 20.0 cm |
| Part Number: | : 111-200-0110-10-C30 |
| Method of Certification | : Gravimetric |
| Certification Number | : 10-31961 |
| Rate | : 10,520 ng/min +/- 0.38 % at 30 Degrees C |
| Note | |
| Date : September 29, 2008 | By |
| Customer : Stork Southwestern Lab | |
| Order No. : M039627 | |

VICI

**VICI Metronics, Inc.**
26295 Twelve Trees Lane NW
Poulsbo, WA 98370
(360) 697-9199 Fax: (360) 697-6682

VICI

**VICI Metronics Inc.**

calibration gas standards

VICI METRONICS INC.

DYNACALIBRATOR FLOWMETER CALIBRATION DATA

- READ AT CENTER OF FLOAT -
10 LPM

| | | | | |
|---|---|---|---|---|
| Certification number: | 06-1447 | | | |
| Model: | 500-16bb-YD | Date: | 11/28/2006 | |
| Serial number: | MU-1410 | Amb. Temp: | 22.29 | Deg C |
| Flow tube type: | B-125-60 | Pressure: | 1011.8 | mb |
| Float material: | Glass | Humidity: | 57 | % |
| Flowmeter serial #: | 644486 | By: | PP | |

**Top Float**

| Float Setting | Dilution Flow (cc/min) | Dilution w/ carrier #1 (cc/min) | Dilution w/ carrier #2 (cc/min) | Dilution w/ carrier #1 & #2 (cc/min) |
|---|---|---|---|---|
| 0 | 0 | 185 | 184 | 369 |
| 1 | 122 | 306 | 306 | 490 |
| 2 | 424 | 608 | 608 | 792 |
| 3 | 729 | 914 | 913 | 1,098 |
| 4 | 1,027 | 1,211 | 1,211 | 1,396 |
| 5 | 1,311 | 1,495 | 1,495 | 1,679 |
| 6 | 1,597 | 1,782 | 1,782 | 1,966 |
| 7 | 1,882 | 2,067 | 2,066 | 2,251 |
| 8 | 2,137 | 2,322 | 2,321 | 2,506 |
| 9 | 2,413 | 2,597 | 2,597 | 2,782 |
| 10 | 2,656 | 2,841 | 2,840 | 3,025 |
| 11 | 2,933 | 3,117 | 3,117 | 3,301 |
| 12 | 3,163 | 3,348 | 3,347 | 3,532 |
| 13 | 3,401 | 3,586 | 3,585 | 3,770 |
| 14 | 3,642 | 3,827 | 3,826 | 4,011 |
| 15 | 3,893 | 4,078 | 4,077 | 4,262 |

**Carrier Flow:** Chamber #1: **185** cc/min
Chamber #2: **184** cc/min

Concentration (PPM) = K *[ Rate (ng/min)] /[ Total Flow (cc/min)]
All flow rate measurements are corrected to 25 deg C and 760 mm Hg.
Accuracy of flow rates +/- 1%.

Recalibration Date: 11/29/2007

Signature: _____

Certified by: PP

26272 Twelve Trees Lane NW ♦ Poulsbo, WA 98370, U.S.A. ♦ Phone: (360) 697 9199 Fax: (360) 697 6682

VICI
VICI Metronics Inc.
calibration gas standards

VICI METRONICS INC.

DYNACALIBRATOR TEMPERATURE CALIBRATION DATA

| | | | |
|---|---|---|---|
| Certification number: | 06-1447 | Date: | 11/28/2006 |
| Dynacalibrator Model: | 500-16bb-YD | By: | PP |
| Serial Number: | MU-1410 | | |

**Chamber 1**

| Temperature Set Point | Measured Temperature °C |
|---|---|
| 30.0 | 29.92 |

**Chamber 2**

| Temperature Set Point | Measured Temperature °C |
|---|---|
| 70.0 | 70.06 |

Signature: _____

Certified by: PP

Recalibration Date: 11/29/2007

26272 Twelve Trees Lane NW ♦ Poulsbo, WA 98370, U.S.A. ♦ Phone: (360) 697 9199 Fax: (360) 697 6682

VICI

**VICI Metronics Inc.**

calibration gas standards

11/28/2006

TRACEABILITY OF CALIBRATIONS
Certification Number: 06-1447
Dynacalibrator Model: 500-16bb-YD
Serial Number: MU-1410

I. TEMPERATURE

| Serial # | Range | Division |
|---|---|---|
| 10355 | 15-115 °C | 0.1 °C |
| 10361 | 15-115 °C | 0.1 °C |

Thermometers 10355 and 10361 were calibrated in August 2006 by Quality Control Services.

Temperatures were measured with a stem depth of 21cm. for both Standard Range thermometers (0-51°C) and Extended Range thermometers (15-115°C).

II. Stem depth is the distance from the lip of chamber to the end of mercury bulb.

FLOW RATES

The flowmeters of the Dynacalibrator are certified at all 15 major float settings using at least two different measurement techniques.

| Flow | Technique |
|---|---|
| 0 - 5 lpm | Volume Displacement - Bubble Flowmeter* |
| 10 cc - 30 lpm | Gilibrator #5591-B; Bubble Generator #8736-S and # 8767-H |
| 10 cc - 30 lpm | Gilibrator 2 #0506 102, #0506 054-S |
| 0.1 - 50 lpm | Dry Cal #B-843; Cell #S843 and #H463 |

All flow readings are corrected to 25°C and 760 mm Hg.
Traceability is maintained by recording serial numbers and NIST test numbers of the Volume standards used in the bubble flow measurements.

*NIST Traceable Graduated Tube

| | | |
|---|---|---|
| 100 cc | No. 1710 | Traceable to: NIST Buret #81 |
| 1,000 cc | No. 501 | Traceable to: NIST Buret #K10 |

| | | |
|---|---|---|
| Ambient Humidity: | Ruska LEM 2456-LEM S/N 58933 | Calibrated on: 09-29-2006 |
| Ambient Pressure : | Ruska LEM 2456-LEM S/N 58933 | Calibrated on: 09-29-2006 |
| Ambient Temperature : | Ruska LEM 2456-LEM S/N 58933 | Calibrated on: 09-29-2006 |

CALIBRATOR RECALIBRATION DATE: 11/29/2007

Signature: _____

Certified by: PP

26272 Twelve Trees Lane NW ♦ Poulsbo, WA 98370, U.S.A. ♦ Phone: (360) 697 9199 Fax: (360) 697 6682

STORK®

SwL SOUTHWESTERN LABORATORIES

PROJECT: Dynacalibrator QA PROJECT NO.: 0809/128

CALCD. BY: _____ CHKD BY: _____ DATE: _____

Dynacalibrator Model No.: 500-1666-HD S/N: MU-1410

| | Top 3 cc/min | Top 5 cc/min | Top 11 cc/min |
|---|---|---|---|
| 1 | 1,092 | 1665 | 3265 |
| 2 | 1,092 | 1664 | 3,268 |
| 3 | 1090 | 1666 | 3,266 |
| Avg. | 1,091 | 1,665 | 3,266 |
| Calibrator Std, cc/min | 1098 | 1679 | 3301 |
| %Diff: | -0.6% | -0.8% | -1.0% |

by Mini Buck M-5 S/N 052171

Temp. Chamber No. 1 = 30°C Measured = 29.9°C

$$\%\,Diff = \frac{303.0 - 302.9}{302.9} \times 100$$

$$= 0.03\%$$

# Certificate of Calibration

## *A.P. BUCK, INC. mini-BUCK CALIBRATOR™*

**Serial No:** 05 2171 **Date Calibrated :** 05-7-08 **Next Calibration due date :** 05-7-9

**Model No :** ☐ M-1 ☑ M-5 ☐ M-30 ☐ M-30B

### Applicable Measurement Standards

| Description | MFR. | Model | Serial # | N. I. S. T. |
|---|---|---|---|---|
| ☐ 100ml Burette | Kimble | 17027F-100 | 1220 | SPECIAL17027F |
| ☐ 1000ml Burette | Kimble | 17081 | 0002 | ASTM E542 |
| ☐ 1000ml Burette | Kimble | 17081 | 0003 | ASTM E542 |
| ☑ 1000ml Burette | Kimble | 17081 | 1003 | ASTM E542 |
| ☐ 1000ml Burette | Kimble | 17081 | 1004 | ASTM E542 |
| ☐ 1000ml Burette | Kimble | 17081 | 2087 | ASTM E542 |
| ☐ Stopwatch | Fisher | 14-649-5 | 72495994 | EL015 |
| ☑ Stopwatch | Fisher | 14-649-5 | 230268455 | EL015 |

**AMBIENT CONDITIONS:** Temperature 74±3° F Relative Humidity 50±10%

This instrument as received on 05-6-08 at A.P. Buck Inc.'s facility was found to be:

☐ Unable to calibrate as received due to condition of unit .
☑ Within specification of ± 0.5% of the display reading .
☐ Not in specification by ____ . ____ % High. ____ . ____ % Low of the display

The instrument listed above has been adjusted to nominal, utilizing a 1,000ml burette, and an electronic digital stop watch, which are traceable to the National Institute of Standards & Technology (NIST). The accuracy of the instruments used to perform calibration is greater than 4 to 1. The A.P. Buck, Inc. Calibration system is in compliance with ANSI Z540-1 and IEC guide 25.

☑ Unit within specifications after calibration.

Calibration was conducted with A.P. Buck, Inc. Calibration Procedure APB-1 Rev. 6.2 with a constant flow pump using the Bubble-meter method. A.P. Buck, Inc. guarantees the accuracy and repeatability of ± 0.5% for any display reading as described under the instruction manual "Principles of Operation". Responsibilities shall in no event, nor for any cause whatsoever, exceed the price charged for the calibration represented by this certification.

**QA APPROVAL BY:** Pedro A Vargas



A.P. BUCK, INC.
7101 Presidents Drive, Suite 110
Orlando, FL 32809
Phone: 407-851-8602 · Fax: 407-851-8910

BUCK
A.P. BUCK, INC.

| | |
|---|---|
| File Name: | C:\CPData\SampleData\TRS.MET |
| Version: | 1 |
| Creator: | Trailer 1 Operator |
| Description: | Bonhom Richard |
| Reason for change: | |

ACQUISITION PARAMETERS

| | |
|---|---|
| Run Time: | 4 minutes |
| Sampling Rate: | 10 per second |
| Acquire from Channel: | B |
| Auto-zero the Real-time Plot: | No |
| Real-time Plot Hi Scale: | 10000 uV |
| Real-time Plot Lo Scale: | -100 uV |
| Nelson box Voltage Range: | 3 V |
| HP GC Setpoint File Name: | |

REFERENCE CHROMATOGRAM

PROCESSING PARAMETERS

| | |
|---|---|
| Smoothing Type: | None |
| Smoothing Time: | 0 seconds |
| Subtract Baseline: | No |
| Initial Threshold: | 1 |
| Initial Peak Width: | 0.05 |
| Calibration File Name: | C:\CPData\SampleData\H2S.CAL |
| Produce ASCII Area Files: | No |
| Produce AIA Files: | No |
| Produce Bound Data Files: | No |
| Produce Plot MetaFiles: | No |
| Make Raw Files Read-Only: | No |

REPORT PARAMETERS

| | |
|---|---|
| Number of Copies of Each Report: | 1 |
| Chromatogram Plot: | Yes |
| Page Break After Plot: | No |
| Standard Report: | Short form |
| Number of Formatted Reports: | 0 |

PLOT PARAMETERS

| | |
|---|---|
| Number of Panels: | 1 |
| Height: | 4 inches |
| Width: | 5 inches |
| Position: | Full page width |
| Voltage Axis Scaling: | Manual |
| Voltage Axis Lo Scale: | -100 uV |
| Voltage Axis Hi Scale: | 10000 uV |
| Time Axis Scaling: | Entire run |

PLOT OPTIONS

| | |
|---|---|
| Force Black and White Printing: | Yes |
| Rotate Plot: | No |
| Show Search Windows: | Yes |
| Show Component Names only if peak is found: | No |
| Data Points as Dots: | No |
| Show Peak Tic Marks: | Yes |
| Show Peak Baselines: | No |

| | |
|---|---|
| Show Grid: | None |
| Show Peak Numbers: | No |
| Show Timed Events: | Yes |
| Show Peak Retention Times: | Yes |
| Show Axis Labels: | Yes |
| Show Axis Units: | Yes |
| Show Axis Spans: | No |
| Show Sample Name: | Yes |
| Show File Name: | Yes |
| Show Selected Peaks: | No |
| Show Peak Quantity: | None |
| Peak label Position: | At peak top |
| Enable SEC Processing: | No |
| SEC Calibration File Name: | |
| Show SEC Baseline: | No |
| Show Processing Range: | No |
| Show Column Range: | No |
| Show Calibration Range: | No |
| Show Mn Position: | Yes |
| Show Mw Position: | Yes |
| Show Mz Position: | No |
| Show Mz1 Position: | No |
| Show Mv Position: | No |
| Plot Differential Mole Fraction: | No |
| Plot Cumulative Mole Fraction: | No |
| Plot Differential Weight Fraction: | Yes |
| Plot Cumulative Weight Fraction: | Yes |
| Plot Differential Z Fraction: | No |
| Plot Cumulative Z Fraction: | No |
| Plot Differential Z+1 Fraction: | No |
| Plot Cumulative Z+1 Fraction: | No |
| Plot Differential Viscosity Fraction: | No |
| Plot Cumulative Viscosity Fraction: | No |
| Show File Legends: | No |
| Show Trace Legends: | No |
| Show Log-MW Scale: | No |
| MW Axis Scaling: | Automatic |
| Differential Axis Scaling: | Automatic |
| Cumulative Axis Scaling: | Automatic |

USER PROGRAMS

| | |
|---|---|
| Number of Process-Time User Programs: | 0 |

No Download-Time User Program

TIMED EVENTS

Number of Timed Events: 1

| Event # | Event Time, min. | Event Code | Event Type |
|---|---|---|---|
| 1 | 0 | INT+ | Turn on integration |

UNITS

| | |
|---|---|
| Time unit: | Minutes |
| Response unit: | MicroVolts |

## STORK SOUTHWESTERN LABORATORIES, INC.

### EMISSION RATE CALCULATIONS

FACILITY: Citgo

CITY, STATE: Corpus Christi, Tx

SOURCE NAME: West SRU

DATE: 10/8/08 RUN NO.: 8

% MOISTURE = 9.67 % (See Moisture Sample Data)

GAS ANALYSIS: % CO2 4.0 % O2 6.36 % N2 89.64

**MOLECULAR WEIGHT (MWSG) g/g mole:**

$H_2O$ - 0.0967 X 18 = 1.7406

$CO_2$ - 0.0400 X 0.9033 X 44 = 1.5898

$O_2$ - 0.0636 X 0.9033 X 32 = 1.8384

$N_2$ - 0.8964 X 0.9033 X 28 = 22.6721

MWSG = 27.8409

**VELOCITY TRAVERSE DATA:**

Cp = 0.840 $\sqrt{\text{AVE. DELTA P}}$ = 0.1553 Ts AVG. = ~~1303~~ 1763 °R Ps = 30.03

STACK DIAMETER = 82 inches As = 36.6737

**CALCULATIONS:**

Vs = 85.49 X Cp X $\sqrt{\text{avg Delta P}}$ X $\sqrt{(\text{Ts avg.} / (\text{MWSG X Ps}))}$ = 16.1947 ≅ 16.19

ACFM = Vs X 60 X As = 35,635.1742 ≅ 35,635.17

Qsd = 60 X (1.00 - (%H2O / 100)) X ACFM X (528 / Ts avg.) X (Ps / 29.92) = 580,547.15

**ISOKINETIC DATA: (if applicable)** N/A

Vm (std) = N/A NOZZLE DIA. = N/A An = N/A Θ N/A

PERCENT ISOKINETIC = $\frac{0.09450 \text{ X Ts X Vm(std)}}{\text{Ps X Vs X An X } \Theta \text{ X (1-\%H2O/100)}}$ = N/A

Revised April, 2002

JBJ

Stork SwL Analyzer Drift and Calculations QA

**Hand Check Calculations**

| | | |
|---|---|---|
| FACILITY: Citgo | ANALYST: MG & JBT | DATE: 10/8/08 |
| SOURCE NAME: West SRU | CITY, STATE: Corpus Christi, Tx | |

| | CO | NOx | $O_2$ | $CO_2$ | THC | $SO_2$ |
|---|---|---|---|---|---|---|
| **Span gas - $C_{ma}$** | 45.8 | 51.5 | 12.0 | — | — | 53.1 |
| **Scale (ppm,%) *** | 95.1 | 95.1 | ~~21.0~~ | — | — | 91.4 |

Difference = Final Reading - Initial Reading  %Zero = (Zero difference / Scale)*100  %Span = (Span difference / Scale)*100

| Run No. and Pollutant | ZERO Initial Reading | ZERO Final Reading | ZERO Difference (ppm, %) * | ZERO % Zero Drift | SPAN Initial Reading | SPAN Final Reading | SPAN Difference (ppm, %) * | SPAN % Span Drift |
|---|---|---|---|---|---|---|---|---|
| 8 CO | 0.07 | 0.58 | 0.51 | 0.54 | 45.20 | 45.84 | 0.64 | 0.67 |
| 8 NOx | 0.29 | 0.29 | 0.00 | 0.00 | 51.40 | 51.06 | -0.34 | -0.37 |
| 8 $O_2$ | 0.01 | 0.00 | -0.01 | -0.05 | 12.04 | 12.04 | 0.00 | 0.00 |
| — $CO_2$ | — | — | — | — | — | — | — | — |
| — THC | — | — | — | — | — | — | — | — |
| 8 $SO_2$ | 1.68 | 1.66 | -0.02 | -0.02 | 53.15 | 53.31 | 0.16 | 0.18 |

| F-Factor dscf/mmBtu | GCV | Fuel Flow Rate | Conversion Factor | Qsd |
|---|---|---|---|---|
| — | — | — | — | 580,526.6 |

$C_o$ = (Initial Zero Reading + Final Zero Reading)/2

$C_m$ = (Initial Span Reading + Final Span Reading)/2

$C_{gas}$ = ( $C_{avg.}$ - $C_o$ ) * ( $C_{ma}$ / ($C_m$-$C_o$) )

C = ( $C_{gas}$ * M.W. * 6.242e-8 ) / 24.04

lb/mmBtu = C * F-Factor * ( 20.9 / (20.9 - %O2 dry) )

lb/hr = lb/mmBtu * GCV * Fuel Flow Rate * Conversion Factor

lb/hr = lb/dscf x Qsd in dscf/hr

| Run No. and Pollutant | $C_{avg.}$ Uncorrected Stack Gas Concentration (ppm, %) * | $C_o$ Average of Zero Air | $C_m$ Average of Span Gas | $C_{gas}$ Corrected Stack Gas Concentration (ppm, %) * | M.W. Molecular Weight | C Concentration in lb/dscf | lb/mmBtu Emission Rate lb/mmBtu | lb/hr Emission Rate lb/hr |
|---|---|---|---|---|---|---|---|---|
| 8 CO | 41.48 | 0.325 | 45.52 | 41.71 | 28 | $3.0324e^{-6}$ | — | 1.76 |
| 8 NOx | 20.86 | 0.29 | 51.23 | 20.80 | 46 | $2.484e^{-6}$ | — | 1.44 |
| 8 $O_2$ | 6.38 | 0.005 | 12.04 | 6.36 | NA | NA | NA | NA |
| — $CO_2$ | — | — | — | — | NA | NA | NA | NA |
| — THC | — | — | — | — | 44.092 (as $C_3H_8$) | — | — | — |
| 8 $SO_2$ | 64.99 | 1.67 | 53.23 | 65.21 | 64 | $1.0836e^{-5}$ ~~$2.6445e^{-5}$~~ | — | 6.29 |

Note * $O_2$ and $CO_2$ are expressed in percent.

$SO_2 @ 0\% O_2 = 65.21 * \left(\frac{20.9}{20.9 - 6.36}\right) = 93.73$ ppm @ 0% $O_2$

222 BJ

STORK

SWL SOUTHWESTERN LABORATORIES

PROJECT: $H_2S$ Hand Calc. Run 2 PROJECT NO.: 08091128

CALCD. BY: JL CHKD BY: DATE: 10/8/08

Avg. $H_2S$ = 0.00 ppm ∴ using Lower Detection Limit (LDL) = 0.58 ppm

Line Loss was 0.86 ; Qsd = 580,526.6

Corrected $H_2S$ for Line Loss is:

$$H_2S = \frac{<0.58\ ppmvd}{0.86} = <1.02\ ppmvd$$

lb/dscf $H_2S$:

$$lb/dscf = \frac{ppmvd \times Mol.wt.(34) \times 0.242e^{-8}}{24.04}$$

$$lb_{H_2S}/dscf = \frac{<1.02 \times 34 \times 0.242e^{-8}}{24.04} = <9.0047e^{-8}$$

$H_2S$ lb/hr Emission Rate:

$$H_2S\ lb/hr = lb/dscf \times Qsd$$

$$= <9.0047e^{-8} \times 580,526.6$$

$H_2S$ lb/hr = <0.05 lb/hr

$H_2S$ Corr @ 3% $O_2$

$$H_2S\ @\ 3\%\ O_2 = <1.02 \times \left(\frac{17.9}{(20.9 - 6.36)}\right)$$

$$= <1.26\ ppm\ @\ 3\%\ O_2$$

| | | |
|---|---|---|
| Russ DiRaimo/SWL/MMA/StorkGroup | To | Thomas Bill |
| | cc | Chris Adams |
| 09/10/2008 09:13 AM | bcc | |
| | Subject | Citgo West Plant SRU Test Plan |

Tom:

Attached is the sampling plan for the upcoming test at the Citgo West Plant SRU. Please feel free to call if you have any questions. The purpose will be to evaluate the incinerator at a lower incinerator temperature.

Russell J. DiRaimo
Stork Southwestern Laboratories, Inc.
VP-AES Division
713/696-6265
713/408-4667 (cell)

CSP West Plant SRU 08091128.pdf
Stork SwL is a TCEQ NELAP accredited laboratory for stack sampling (Certificate No. T104704411-08-TX)

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September 8, 2008

Mr. Chris Adams
**Citgo Refining and Chemicals, Inc.**
P.O. Box 9176
1802 Nueces Bay Boulevard
Corpus Christi, Texas 78469-0321

Phone: 361/844-4376
Email: cadams@citgo.com

Re: Compliance Sampling Plan
EPA NSPS and TCEQ Compliance Test
West Plant SRU
TCEQ Permit 8778A, EPN 554-ME5
Corpus Christi, Texas
Stork SwL Project No. 08091128

Dear Mr. Adams:

This Compliance Sampling Plan is provided concerning the upcoming test on the West Plant sulfur recovery unit (SRU) incinerator (EPN 554-ME5). Stork Southwestern Laboratories (Stork SwL) performed a test on this unit in January, 2007 to satisfy Special Condition 28.C of testing after the start up of the new Train A. The TCEQ permit has recently been amended (Special Conditions dated September 2, 2008 and the MAERT dated May 16, 2008). We understand this test program will be performed to satisfy the EPA New Source Performance Standards (NSPS) contained in 40 CFR 60, Subpart J and the TCEQ Permit No. 8778A Special Condition 28 and 31 at increased production rates and/or decreased firebox temperatures. The test program will satisfy the following criteria:

- EPA NSPS Subpart J Compliance Test: this will consist of twelve (12), sixty (60) minute $SO_2/O_2$ test runs using EPA Methods 6C and 3A. The allowable limit is 250 ppmvd $SO_2$ @ 0% $O_2$.

- TCEQ Permit 8778A, Special Condition 28: this will consist of three (3) one (1) hour test runs to determine the concentration and emission rates (where applicable) of $SO_2$, CO and NOx using EPA Reference Methods 6C, 10 and 7E. In addition, $H_2S$ emissions will be performed using EPA Method 15, which will consist of three (3) three (3) hour test runs. Flow will be determined with each set using EPA Methods 1-4 (modified as noted in this compliance sampling plan). The TCEQ permit allowable limits are:

  $SO_2$: 250 ppmv (Special Condition No. 19) and 22.40 lb/hr (MAERT)
  $H_2S$: 10 ppmvd @ 3% $O_2$ (Special Condition 32) and 0.50 lb/hr (MAERT)
  NOx: 3.50 lb/hr (MAERT)
  CO: 3.90 lb/hr (MAERT)

- For the lb/hr emissions, Stork SwL will perform a multi point velocity temperature traverse and single point, constant rate moisture (Method 1, 2, 3 and modified Method 4) during three (3) of the sample runs.

Therefore the test program will consist of the following:

| Pollutant | No. of Samples | Duration of Run |
|---|---|---|
| $SO_2/O_2$ | 12 | 1 hour |
| $H_2S$ | 3 | 3 hours |
| NOx | 3 | 1 hour |
| CO | 3 | 1 hour |
| Flow/Moisture* | 3 | 1 hour |

* Flow and moisture will be determined with each of the $H_2S$, NOx, CO runs and three (3) of the $SO_2/O_2$ sample runs to determine compliance with the TCEQ permit.

Due to the time frame involved, Stork SwL expects to perform the test over a two (2) or three (3) day period on the SRU ($SO_2$ Run No. 1-6 on day 1, and $SO_2$ Run No. 7-12 on day 2 if possible). The average of Run No. 1-4, 5-8 and 9-12 will be used to determine compliance with the EPA NSPS Subpart J MACT limit. The three (3) runs performed with the flow traverses (and NOx, CO and $H_2S$) will be used to determine compliance with the TCEQ lb/hr permit limit. The average $O_2$ data measured during the corresponding $SO_2/O_2$ samples over each 3 hour $H_2S$ sample run will be used to correct the ppmvd data to a 3% $O_2$ basis.

Citgo will obtain and provide the pertinent operating data, as required by the TCEQ/EPA. The test will be conducted at the maximum achievable production rate.

The compliance emissions samples will be obtained as follows:

$SO_2/O_2$: Integrated, 60 minute samples will be taken using either a three (3) point traverse (0.4, 1.2 and 2.0 meters from the stack wall or 16.7%, 50.0% and 83.3% of stack diameter) or a single point (if stratification is not present and the test is not to include a CEMS RATA). The 3 point traverse using CEMS RATA sample points will be used if the data is to be also used to determine CEMS accuracy. The sample will be taken through a stainless steel or inconel probe (heated by the flue gas to prevent condensation), cooling coil (if needed), heat traced Teflon transport line, heated Teflon diaphragm pump, minimum contact moisture condenser, metering apparatus and introduced directly to the $SO_2/O_2$ analyzers. Analysis for $O_2$ will be performed on site in accordance with EPA Reference Method 3A, using a

paramagnetic analyzer (Servomex Model 1400 or equivalent). Analysis for $SO_2$ will be performed in accordance with EPA Reference Method 6C, using a photometric analyzer (Western Research/Ametek Model 721M or equivalent). Prior to sampling, a three (3) point calibration error/linearity test will be performed on each analyzer with zero gas (nitrogen) and EPA Protocol gases. Subsequent to each run the zero and one (1) upscale gas will be injected to determine system bias and drift.

NOx and CO: Integrated sixty (60) minute samples will be taken. The same sample points and sample system utilized for the $SO_2/O_2$ samples will be used. Prior to sampling, a three (3) point calibration error/linearity test will be performed on each analyzer (TECO 42C-HL Chemiluminescence for NOx and TECO 48H nondispersive infrared gas filter correlation for CO, or equivalent) with zero gas (nitrogen) and EPA Protocol gases. Subsequent to each run the zero and one (1) upscale gas will be injected to determine system bias and drift.

$H_2S$: Integrated, three (3) hour samples will be obtained for $H_2S$. The sample will be taken from a single point, located at least one (1) meter in the stack. The sample components will include a quartz lined probe (due to the high temperatures, Teflon cannot be used), out of stack heated Teflon filter, a chilled citrate buffer scrubber, unheated Teflon transport line to a gas chromatograph with a flame photometric detector (GC/FPD). The GC will be calibrated using permeation tubes. Each run will be composed of sixteen (16) analyses (injections) performed over a period of not less than 3 hours or more than 6 hours. At test conclusion, a line loss will be performed.

Flow: The flow will be measured using a multi –point velocity temperature traverse corresponding to three (3) of the $SO_2/O_2$ runs and with each NOx/CO/$H_2S$ run. The velocity measurements will be performed with inconel S-type pitot tubes (inconel is expected to be used due to the anticipated high stack temperatures) hooked to a water manometer. Temperature measurements will be made at the same points using a Type K thermocouple. Flue gas moisture will utilize a single point, constant rate impinger train system. In addition, flue gas $CO_2$ will be taken using Fyrite analyzers. These data will be used in the flue gas velocity and volumetric flow rate computations.

Note: In accordance with the updated Continuous Instrumental Test Methods (as contained in the Federal Register dated May 15, 2006, with an effective date of August 14, 2006), Stork SwL will conduct a stratification test (unless the test is also to be used for a CEMS RATA) on three (3) points, located at 16.7, 50.0 and 83.3% of diameter using either $SO_2$, NOx, CO or $O_2$ as the criteria. The

stratification will be determined with the following criteria:

- If the concentration at each traverse point is within either ± 5.0% of the mean or ± 0.5 ppm $SO_2$, NOx or CO or 0.3% $O_2$ (whichever is less restrictive), the gas stream is unstratified and single point samples are allowed from the point most closely matching the mean value. This point will be used for all pollutants of interest.

- If the concentration at each traverse point is greater than ± 5.0% of the mean or ± 0.5 ppm $SO_2$, NOx or CO or 0.3% $O_2$, but within 10.0% of the mean or ± 1.0 ppm $SO_2$, NOx or CO or 0.5% $O_2$ (whichever is less restrictive), the gas stream is considered minimally stratified and the three (3) points will be sampled for each run for all pollutants of interest.

- If the concentration of the selected gas exceeds the above criteria, then twelve (12) traverse points located in accordance with Table 1-2 of Method 1 are required. Please note that the $SO_2/O_2$ data may also be used for a CEMS RATA, and if so the 3 RATA test points will be required (which will therefore be used for $SO_2$, $O_2$, NOx and CO).

Emissions Calculations: The emissions will be computed on a zero % $O_2$ basis ($SO_2$ only), a 3% $O_2$ basis ($H_2S$ only) and a lb/hr basis ($SO_2$, NOx, CO, $H_2S$) using the following equations:

$$SO_2\ ppmvd\ @\ 0\%\ O_2 = SO_2\ ppmvd\ x \left[\frac{20.9}{20.9 - \%\ O_{2d}}\right]$$

$$H_2S\ ppmvd\ @\ 3\%\ O_2 = H_2S\ ppmvd\ x \left[\frac{17.9}{20.9 - \%\ O_{2d}}\right]$$

$$Pollutant\ lb/dscf = \frac{Pollutant\ ppmvd\ x\ Mol.Wt.\ x\ 6.242\ x\ 10^{-8}}{24.04}$$

$$Pollutant\ lb/hr = Pollutant\ lb/dscf\ x\ Qsd$$

Where:

| | |
|---|---|
| Molecular Weight = | 28 for CO, 46 for NOx, 64 for $SO_2$ and 34 for $H_2S$ |
| Qsd = | measured stack flow rate, dscf/hr |
| % $O_2$ = | % oxygen, measured by Stork SwL |

## Proposed Deviations to Test Methods

Stork SwL hereby requests to be allowed to use a single point, constant rate moisture sample, as due to the high flue gas temperatures, the moisture will be in the vapor state.

Stork SwL will prepare a full report which will meet TCEQ and EPA criteria within sixty (60) days of test completion as required by Special Condition 28.E of the TCEQ permit. Testing is currently scheduled for the week of October 6th, 2008.

We appreciate your interest in our firm and look forward to working with you.

Sincerely,

**STORK SOUTHWESTERN LABORATORIES, INC.**

Russell J. DiRaimo, P.E.
Vice President
Air Emissions Services Division

RJD:pjm

Enclosure TCEQ Permit 8778A: updated 9/2/08 (Special Conditions) and 5/16/08 (MAERT)
West Plant SRU Schematic

Cc: Mr. Thomas Bill – TCEQ Region 14

SPECIAL CONDITIONS

Permit Numbers 8778A and PSD-TX-408M3

EMISSIONS STANDARDS

1. This permit authorizes emissions only from those points listed in the attached table entitled "Emission Sources - Maximum Allowable Emission Rates," and the facilities covered by this permit are authorized to emit subject to the emission rate limits on that table and other operating conditions specified in the special conditions.

EMISSIONS CONTROLS AND OPERATING LIMITATIONS

2. Non-fugitive emissions from relief valves, safety valves, or rupture discs of gases containing volatile organic compounds (VOC) at a concentration of greater than 1 percent are not authorized by this permit unless authorized on the maximum allowable emission rates table (MAERT). Any releases directly to atmosphere from relief valves, safety valves, or rupture discs of gases containing VOC at a concentration greater than 1 weight percent are not consistent with good practice for minimizing emissions.

3. The total throughput for the delayed coking unit shall not exceed 46,034 barrels per stream day (BPSD) and 15,079,205 barrels per year (BPY). **(3/08)**

FEDERAL PROGRAM APPLICABILITIES

4. This facility shall comply with all applicable requirements of the U.S. Environmental Protection Agency (EPA) regulations on Standards of Performance for New Stationary Sources (NSPS) promulgated for the following:

   A. Petroleum Refineries in Title 40 Code of Federal Regulations (40 CFR) Part 60, Subparts A and J.

   B. Volatile Organic Liquid Storage Vessels for which Construction, Reconstruction, or Modification commenced after May 18, 1978, and prior to July 23, 1984, in 40 CFR Part 60, Subparts A and Ka.

5. This facility shall comply with all applicable requirements of the EPA regulations on National Emission Standards for Hazardous Air Pollutants (NESHAPS) for Source Categories promulgated for Petroleum Refineries in 40 CFR Part 63, Subparts A and CC.

STORAGE AND LOADING OF VOC

6. Storage tanks are subject to the following requirements. The control requirements specified in paragraphs A-F of this condition shall not apply (1) where the VOC has an aggregate partial pressure of less than 0.50 pound per square inch, absolute (psia) at the maximum feed temperature or 95 F, whichever is greater, or (2) to storage tanks smaller than 25,000 gallons.

   A. An internal floating deck or "roof" or equivalent control shall be installed in all tanks. The floating roof shall be equipped with one of the following closure devices between the wall of the storage vessel and the edge of the internal floating roof: (1) a liquid-mounted seal, (2) two continuous seals mounted one above the other, or (3) a mechanical shoe seal.

   B. An open-top tank containing a floating roof (external floating roof tank) which uses double seal or secondary seal technology shall be an approved control alternative to an internal floating roof tank provided the primary seal consists of either a mechanical shoe seal or a liquid-mounted seal and the secondary seal is rim-mounted. A weathershield is not approvable as a secondary seal unless specifically reviewed and determined to be vapor-tight.

   C. For any tank equipped with a floating roof, the permit holder shall perform the visual inspections and seal gap measurements as specified in 40 CFR § 60.113b, Testing and Procedures (as amended at 54 FR 32973, August 11, 1989), to verify fitting and seal integrity. Records shall be maintained of the dates seals were inspected and seal gap measurements made, results of inspections and measurements made (including raw data), and actions taken to correct any deficiencies noted.

   D. The floating roof design for new tanks shall incorporate sufficient flotation to conform to the requirements of API Code 650 dated November 1, 1998, except that an internal floating cover need not be designed to meet rainfall support requirements and the materials of construction may be steel or other materials.

   E. Uninsulated tank exterior surfaces exposed to the sun shall be white or aluminum. Storage tanks must be equipped with permanent submerged fill pipes.

F. The permit holder shall maintain an emissions record which includes calculated emissions of VOC from all storage tanks during the previous calendar month and the past consecutive 12-month period. The record shall include tank identification number, control method used, tank capacity in gallons, name of the material stored, VOC molecular weight, VOC monthly average temperature in degrees Fahrenheit, VOC vapor pressure at the monthly average material temperature in psia, VOC throughput for the previous month and year-to-date. Records of VOC monthly average temperature are not required to be kept for unheated tanks which receive liquids that are at or below ambient temperatures.

Emissions for tanks shall be calculated using: the publication titled "Technical Guidance Package for Chemical Sources - Storage Tanks," dated February 2001 or later. **(11/06)**

7. Tank Nos. 554-T1, 554-T2, 555-T1, 555-T2, 6001, and 6002 storing VOC with an aggregate partial pressure of less than 0.50 psia, or 1.5 psia for other storage tanks authorized by this permit at the maximum expected operating are exempted from Special Condition No. 6. **(11/06)**

8. The VOC associated with cooling tower water from Emission Point Nos. (EPNs) CT1 and 590-CT1 shall be monitored monthly for VOC leakage from heat exchangers with an approved air stripping method. All sampling and testing methods shall be subject to approval of the TCEQ Executive Director prior to their implementation. For all sampling required by this condition, the sample port for the water returning from the heat exchangers to the cooling tower shall be located on the top of the horizontal section of the water line returning to the cooling tower. **(3/08)**

The minimum detection level of the overall testing system shall be no greater than 0.15 part per million by weight (ppmw) VOC (concentration VOC in water entering the cooling towers). The minimum detection limit for the air stripped VOC shall be no greater than 2.50 ppmv (concentration VOC in the stripping air). Calibration standards shall include at least 0 ppmv and 10 ppmv VOC in air (as methane). Cooling water VOC concentrations above 0.15 ppmw indicate faulty equipment.

The appropriate equipment shall be maintained so as to minimize fugitive VOC emissions from the cooling towers. Faulty equipment shall be repaired at the earliest opportunity but no later than the next scheduled shutdown of the process unit in which the leak occurs.

Emissions from the cooling towers are not authorized if the VOC concentration of the water returning to the cooling towers exceeds 5 ppmw. The VOC concentrations above 5 ppmw are not subject to extensions for delay of repair under this permit condition. The results of the monitoring and maintenance efforts shall be recorded and such records shall be maintained for a period of five years. The records shall be made available to the TCEQ Executive Director or personnel of any air pollution program with jurisdiction upon request.

9. The facilities listed below shall not exceed the production rates listed below for each unit.

| Unit | Short-Term and Annual Production Rates |
|---|---|
| Mixed Distillate Hydrotreater (MDH) | 60,500 BPSD 20,075,000 BPY |
| Sulfur Recovery Unit (SRU) | 200 LTPD (Long ton per day) |
| Gasoline Merox Unit | 2,750 BPSD 912,500 BPY |
| Liquefied Petroleum Gas (LPG) Merox Unit | 5,500 BPSD 1,825,000 BPY |

10. Visible emissions from the Tail Gas Incinerator Stack (EPN 554-ME5) shall not exceed 10 percent opacity averaged over a six-minute period as determined by the EPA Reference Method 9, except for those periods described in Title 30 Texas Administrative Code (30 TAC) § 111.111 (a)(1)(E).

11. Visible emissions from each charge heater and reboiler heater exhaust stack shall not exceed 10 percent opacity averaged over a six-minute period as determined by the EPA Reference Method 9, except for those periods described in 30 TAC § 111.111 (a)(1)(E).

12. Solvent use in the Shell Claus Off-Gas Treating (SCOT) Unit is limited to monodiethanolamine. Use of any other solvent for normal operation or standby purposes requires prior authorization from the TCEQ Executive Director.

13. Piping, Valves, Connectors, Pumps, Agitators, and Compressors - 28VHP **(3/08)**

Except as may be provided for in the special conditions of this permit, the following requirements apply to the above-referenced equipment:

A. These conditions shall not apply (1) where the VOC has an aggregate partial pressure or vapor pressure of less than 0.044 psia at 68EF or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this condition shall be identified in a list or by one of the methods described below to be made readily available upon request.

The exempted components may be identified by one or more of the following methods:

(1) piping and instrumentation diagram (PID); or
(2) a written or electronic database.

B. Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes.

C. New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.

D. To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak-checking during plant operation. Difficult-to-monitor and unsafe-to-monitor valves, as defined by 30 TAC Chapter 115, shall be identified in a list to be made readily available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in subparagraph A above. If an unsafe-to-monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe-to-monitor times. A difficult-to-monitor component for which quarterly monitoring is specified may instead be monitored annually.

E. New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through.

Each open-ended valve or line shall be equipped with an appropriate sized cap, blind flange, plug, or a second valve to seal the line so that no leakage occurs. Except during sampling, both valves of a double block valve sampling system shall be closed. If the removal of a component for repair or replacement results in an open-ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 24 hours. If the repair or replacement is not completed within 24 hours, the line or valve must have a cap, blind flange, plug, or second valve installed.

F. Accessible valves shall be monitored by leak-checking for fugitive emissions at least quarterly using an approved gas analyzer. Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. For valves equipped with rupture discs, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity. All leaking discs shall be replaced at the earliest opportunity but no later than the next process shutdown.

A check of the reading of the pressure-sensing device to verify disc integrity shall be performed weekly and recorded in the unit log.

The gas analyzer shall conform to requirements listed in Method 21 of 40 CFR Part 60, Appendix A. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs are being monitored, the response factor shall be calculated for the average composition of the process fluid. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOC to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured.

Replacements for leaking components shall be re-monitored within 15 days of being placed back into VOC service.

G. Except as may be provided for in the special conditions of this permit, all pump, compressor, and agitator seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. Seal systems designed and operated to prevent emissions or seals equipped with an automatic seal failure detection and alarm system need not be monitored. These seal systems may include (but are not limited to) dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing

to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this condition and need not be monitored.

H. Damaged or leaking valves or connectors found to be emitting VOC in excess of 500 parts per million by volume (ppmv) or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. Damaged or leaking pump, compressor, and agitator seals found to be emitting VOC in excess of 2,000 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within 5 days. Records of the first attempt to repair shall be maintained.

I. Every reasonable effort shall be made to repair a leaking component, as specified in this paragraph, within 15 days after the leak is found. If the repair of a component would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging within 15 days of the detection of the leak. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC § 115.782(c)(1)(B)(i)(II). The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown as calculated in accordance with 30 TAC § 115.782(c)(1)(B)(i)(I), the TCEQ Regional Manager and any local programs shall be notified and may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.

J. Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. Records of physical inspections shall be noted in the operator=s log or equivalent.

K. Alternative monitoring frequency schedules of 30 TAC '' 115.352 - 115.359 or National Emission Standards for Organic Hazardous Air Pollutants, 40 CFR Part 63, Subpart H, may be used in lieu of Items F through G of this condition.

L. Compliance with the requirements of this condition does not assure compliance with requirements of 30 TAC Chapter 115, an applicable New Source Performance Standard (NSPS), or an applicable National Emission Standard for Hazardous Air Pollutants (NESHAPS) and does not constitute approval of alternative standards for these regulations.

14. Agitators that are affixed to fixed-roof storage tanks are exempt from the requirements stipulated in Special Condition No. 13G and H. The requirement to estimate cumulative daily emissions from all components in the delay of repair list as stipulated in Special Condition No. 13I shall only apply to components in the ULSD Unit (EPN 590-U590). **(3/08)**

15. Process Piping, Valves, Pumps, and Compressors in Ammonia ($NH_3$) Service within the SRU **(3/08)**

A. Checks for $NH_3$ leaks within the operating area shall be made once a shift utilizing audio, olfactory, and visual detection or other leak detection equipment.

B. Plant personnel shall take the following actions immediately following the detection of a leak:

(1) Isolate the leak within eight hours if possible;

(2) Commence repair or replacement of the leaking component within 24 hours if possible; and

(3) If isolation or repair is not possible within the prescribed time frames, the appropriate TCEQ Regional Office must be notified and a leak collection and/or containment system will be used until repair or replacement can be made. Proper containment shall include (but is not limited to) adjustment of bolts, fittings, packing glands, and pump/compressor seals as appropriate to contain and/or minimize the leak.

Records shall be maintained of all leaks, repairs, and replacements made. These records shall be maintained for a period of two years at the plant site and shall be made available at the request of TCEQ personnel.

16. Process Piping, Valves, Pumps, and Compressors in Hydrogen Sulfide ($H_2S$) Service within the SRU **(3/08)**

A. Checks for $H_2S$ leaks within the operating area shall be made once a shift. The method for performing these requirements shall be by checking with electronic personal monitoring equipment, lead acetate strip, other leak detection equipment capable of detecting $H_2S$ in parts per million (ppm), or verification of functioning ambient air $H_2S$ monitors.

B. Plant personnel shall take the following actions immediately following the detection of a leak:

(1) Isolate the leak within eight hours if possible;

(2) Commence repair or replacement of the leaking component within 12 hours if possible; and

(3) If isolation or repair is not possible within the prescribed time frames, the appropriate TCEQ Regional Office must be notified and a leak collection and/or containment system will be used until repair or replacement can be made. Proper containment shall include (but is not limited to) adjustment of bolts, fittings, packing glands, and pump/compressor seals as appropriate to contain and/or minimize the leak.

Records shall be maintained of all leaks, repairs, and replacements made. These records shall be maintained for a period of two years at the plant site and shall be made available at the request of TCEQ personnel.

17. New Process Piping, Valves, Pumps, and Compressors in Heavy Liquid Service (Fractionator Bottoms, Heavy Coker Gas Oil, and Kerosene Streams)

A. Audio, olfactory, and visual checks for leaks within the operating area shall be made once per week.

B. Upon detection of a leak, plant personnel shall take the following actions:

(1) Isolate the leak within eight hours if possible;

(2) First attempt at repair shall be made within five calendar days. Final repair shall be made within 15 calendar days. If the repair or replacement of a leaking component would require a unit shutdown, the repair may be delayed until the next scheduled shutdown.

Date and time of each inspection shall be noted in the operator's log or equivalent. Records shall be maintained at the plant site of all repairs and replacements made due to leaks.

18. The maximum $H_2S$ concentration in the fuel gas feed to the tail gas incinerator (TGI) shall not exceed 160 ppm. If the fuel gas is other than sweet natural gas, records of $H_2S$ concentration in the fuel gas shall be maintained for a period of two years and made immediately available to TCEQ personnel upon request.

19. The sulfur dioxide ($SO_2$) concentration in the exhaust gas of the TGI shall not exceed 250 ppmv.

20. The ULSD Charge Heater (EPN 590-H-1) and ULSD Reboiler Heater (EPN 590-H-2) shall be equipped and operated with ultra-low $NO_x$ burners and shall not exceed 0.035 pound $NO_x$/MMBtu fired duty or CO concentrations of 100 ppmv at 3% oxygen firing rates greater than 25% of maximum. The ULSD Charge Heater shall not exceed 250 ppmv of CO at turndown rates at or below 25%. **(9/08)**

COKE STOCKPILE OPERATING PRACTICES

21. Coke stockpiles shall be sprinkled with water and/or chemicals, as necessary, to control the emission of dust to the minimum level possible under existing conditions.

22. Water sprays shall be installed and operated, as necessary, at all material transfer points, except those which are enclosed, in order to control the emission of dust to the minimum level possible under existing conditions.

23. Road-generated emissions from coke operations shall be controlled, as necessary, in accordance with good housekeeping practice.

24. The undercarriage of all coke trucks leaving the plant site shall be washed with water; and the coke load shall be covered with a canvas or similar type of covering, firmly secured, to reduce particulate emissions.

25. The exposed surface of all coke loaded into railcars shall be sprayed with a chemical

sealant or firmly covered prior to transport.

26. The coke handling operation may store up to 12,000 tons of coke on an emergency basis for a maximum of 48 days per calendar year and 1,500 tons of coke in a one-day pile for 317 days per calendar year.

INITIAL DETERMINATION OF COMPLIANCE

27. Sampling ports and platform(s) shall be incorporated into the TGI Stack (EPN 554-ME5) according to the specifications set forth in the attachment entitled "Chapter 2, Stack Sampling Facilities." Alternate sampling facility designs may be submitted for approval by the TCEQ Regional Director or the Director of the TCEQ Compliance Support Division in Austin.

28. The holder of this permit shall perform stack sampling and other testing as required to establish the actual pattern and quantities of air contaminants being emitted into the atmosphere from the TGI Stack (EPN 554-ME5). Sampling shall be conducted in accordance with appropriate procedures of the TCEQ Sampling Procedures Manual and in accordance with appropriate EPA Reference Methods or equivalent methods. The holder of this permit is responsible for providing sampling and testing facilities and conducting the sampling and testing operations at his expense. (TGI Stack - tested January 3 and January 4, 2007)

A. The TCEQ Corpus Christi Regional Office shall be contacted as soon as testing is scheduled but not less than 45 days prior to sampling to schedule a pretest meeting.

The notice shall include:

(1) Date for pretest meeting.
(2) Date sampling will occur.
(3) Name of firm conducting sampling.
(4) Type of sampling equipment to be used.
(5) Method or procedure to be used in sampling.

The purpose of the pretest meeting is to review the necessary sampling and testing procedures, to provide the proper data forms for recording pertinent data, and to review the format procedures for submitting the test reports. A written proposed description of any deviation from sampling procedures specified in permit conditions or the TCEQ or EPA sampling procedures shall be made available to the TCEQ prior to the pretest meeting. The TCEQ Regional Director or the Director of the TCEQ

Compliance Support Division in Austin shall approve or disapprove of any deviation from specified sampling procedures.

Requests to waive testing for any pollutant specified in this condition shall be submitted to the TCEQ Office of Permitting, Registration, and Remediation, Air Permits Division. Test waivers and alternate/equivalent procedure proposals for NSPS testing which must have the EPA approval shall be submitted to the TCEQ Air Permits Division.

B. Air contaminants emitted from the TGI Stack (EPN 554-ME5) to be tested for include (but are not limited to) carbon monoxide, $H_2S$, $NO_x$, and $SO_2$. Testing shall be used to demonstrate compliance with Special Condition Nos. 20, 33, and 35. **(6/07)**

C. Sampling shall occur no later than 180 days after initial start-up of the new Train A burner with the oxygen ($O_2$) injection facilities and at such other times as may be required by the Executive Director of the TCEQ. Requests for additional time to perform sampling shall be submitted to the TCEQ Regional Office. Additional time to comply with the applicable requirements of 40 CFR Part 60 and 40 CFR Part 61 requires the EPA approval, and requests shall be submitted to the TCEQ Air Permits Division.

D. The plant shall operate at maximum production rates during stack emission testing. Primary operating parameters that enable determination of production rates shall be monitored and recorded during the stack test. These parameters are to be determined at the pretest meeting. If the plant is unable to operate at maximum rates during testing, then future production rates may be limited to the rates established during testing. Additional stack testing may be required when higher production rates are achieved.

E. Sampling reports shall comply with the attached provisions of Chapter 14 of the TCEQ Sampling Procedures Manual. The final sampling report shall be distributed as follows within 60 days after sampling is completed:

One copy to the TCEQ Corpus Christi Regional Office.
One copy to the EPA New Source Review Section, Dallas.
One copy to the TCEQ Compliance Support Division, Austin.

F. Sampling shall be performed to determine the ranges of SRU operation which comply with the ERs stated on the attached table entitled "Emission Sources - Maximum Allowable Emission Rates." The $SO_2$ continuous emission monitoring system

(CEMS) will be tested by appropriate methods to certify accuracy and then used to demonstrate continued compliance.

29. The holder of this permit shall perform stack sampling and other testing as required to establish the actual pattern and quantities of air contaminants being emitted into the atmosphere from the Coker Heater (EPN 521-H-1), the MDH Charge Heater (EPN-527-H1), the MDH Reboiler Heater (EPN 527-H2), the ULSD Charge Heater (EPN 590-H-1), and the ULSD Reboiler Heater (EPN 590-H-2). The holder of this permit is responsible for providing sampling and testing facilities and conducting the sampling and testing operations at his expense. (Coker - tested January 14, 1998, MDH - tested January 15 and January 16, 1998 [SOR], MDH - tested November 18 and November 20, 2003, [EOR], SRU - tested January 19, 1998)

A. The appropriate TCEQ Regional Office in the region where the source is located shall be contacted as soon as testing is scheduled, but not less than 45 days prior to sampling to schedule a pretest meeting.
The notice shall include:

(1) Date for pretest meeting.
(2) Date sampling will occur.
(3) Name of firm conducting sampling.
(4) Type of sampling equipment to be used.
(5) Method or procedure to be used in sampling.

The purpose of the pretest meeting is to review the necessary sampling and testing procedures, to provide the proper data forms for recording pertinent data, and to review the format procedures for submitting the test reports.

A written proposed description of any deviation from sampling procedures specified in permit conditions or the TCEQ or EPA sampling procedures shall be made available to the TCEQ prior to the pretest meeting. The TCEQ Regional Director or the Director of the TCEQ Compliance Support Division shall approve or disapprove of any deviation from specified sampling procedures.

Requests to waive testing for any pollutant specified in this condition shall be submitted to the TCEQ Office of Permitting, Registration, and Remediation, Air Permits Division in Austin. Test waivers and alternate/equivalent procedure proposals for NSPS testing which must have the EPA approval shall be submitted to the TCEQ Compliance Support Division in Austin.

B. Air contaminants emitted from the coker heater, MDH Heaters, ULSD Charge

Heater, ULSD Reboiler Heater to be tested for include (but are not limited to) $NO_x$ and CO. **(9/08)**

C. Sampling of the ULSD Reboiler Heater shall occur within 180 days of initial start-up and achievement of maximum ULSD process unit throughput and at such other times as may be required by the Executive Director of the TCEQ for the sources referenced in this condition. Requests for additional time to perform sampling shall be submitted to the TCEQ Regional Office. Additional time to comply with the applicable requirements of 40 CFR Part 60 and 40 CFR Part 61 requires the EPA approval, and requests shall be submitted to the TCEQ Office of Permitting, Registration, and Remediation, Air Permits Division in Austin. **(9/08)**

D. Sampling of the ULSD Charge Heater shall occur within 90 days of initial start-up at a turndown rate below 25% of the maximum firing rate to establish emission rates. An additional stack test must be performed within 180 days after the Charge Heater firing rate exceeds a turndown rate of 25% to demonstrate compliance with emission rate limits at maximum ULSD process unit throughput. Additional sampling shall also occur at such times as may be required by the Executive Director of the TCEQ for the sources referenced in this condition. Additional time to comply with the applicable requirements of 40 CFR Part 60 and 40 CFR Part 61 requires the EPA approval, and requests shall be submitted to the TCEQ Office of Permitting, Registration, and Remediation, Air Permits Division in Austin. **(9/08)**

E. The plant shall operate at maximum production rates during stack emission testing. Primary operating parameters that enable determination of production rate shall be monitored and recorded during the stack test. These parameters are to be determined at the pretest meeting. If the plant is unable to operate at maximum rates during testing, then future production rates may be limited to the rates established during testing. Additional stack testing may be required when higher production rates are achieved.

F. Copies of the final sampling report shall be forwarded to the TCEQ within 60 days after sampling is completed. Sampling reports shall comply with the attached provisions of Chapter 14 of the TCEQ Sampling Procedures Manual. The report shall be distributed to the appropriate TCEQ Regional Office. **(11/04)**

CONTINUOUS DEMONSTRATION OF COMPLIANCE

30. The holder of this permit shall install, calibrate, maintain, and operate a CEMS to measure and record the in-stack concentration of $O_2$ and $SO_2$ from the TGI Exhaust Stack (EPN 554-ME5).

    A. Each CEMS shall meet the design and performance specifications, pass the field tests, and meet the installation requirements, data analysis, and reporting requirements specified in Performance Specification No. 2 for $SO_2$ and No. 3 for $O_2$, 40 CFR Part 60, Appendix B. The performance specification tests shall be conducted prior to or during the sampling required by Special Condition No. 28, and written copies of the results shall be submitted within 60 days of test completion to the TCEQ Corpus Christi Regional Office and the TCEQ Compliance Support Division in Austin.

    B. Each system shall be automatically zeroed and spanned daily and corrective action taken when the 24-hour span drift exceeds two times the amount specified in 40 CFR Part 60, Appendix B. The CEMS calibration gas cylinder(s) shall be checked for the expiration date at least once a quarter. Records shall be kept at the plant site for two years and be made available for review by TCEQ personnel.

    C. The monitoring data shall be reduced to hourly average concentrations at least once everyday using a minimum of four equally-spaced data points from each one-hour period. At least 23 hourly averages shall be generated per day. The individual average concentrations shall be reduced to units of the permit allowable emission rates (ER) in parts per million by volume, dry (ppmvd) and pounds per hour (lbs/hr) at least once everyday.

    D. All cylinder gas audit (CGA) exceedances of 15 percent accuracy and any CEMS downtime not corrected within 24 hours shall be reported to the TCEQ Regional Director, and necessary corrective action shall be taken. Supplemental stack concentration measurements may be required at the discretion of the TCEQ Regional Director.

31. The tailgas incinerator (TGI) firebox exit temperature and oxygen concentration shall be continuously monitored and recorded. The temperature measurement device shall reduce the temperature readings to an averaging period of 6 minutes or less and record it at that frequency. The temperature monitor shall be installed, calibrated or replaced at least annually, and maintained according to the manufacturer's specifications. The device shall have an accuracy of the greater of ±2 percent of the temperature being measured expressed in degrees Celsius or ±2.5°C.

The tailgas incinerator exhaust stack flow rate shall be calculated using the measured waste gas flow, the measured fuel gas flow and the measured excess oxygen. The calculated flow shall be recorded.

Quality-assured (or valid) data for the thermocouple must be generated when the tail gas incinerator is operating. Loss of valid data due to periods of monitor break down, out-of-control operation (producing inaccurate data), repair, maintenance, or calibration may be exempted provided it does not exceed 5 percent of the time (in minutes) that the tailgas incinerator operated over the previous rolling 12-month period. The measurements missed shall be estimated using engineering judgment and the methods used recorded.

The TGI shall be operated with not less than the in-stack hourly oxygen concentration maintained during the last stack test that successfully demonstrates compliance with the MAERT performed in accordance with Special Condition No. 29. The firebox exit six-minute average temperature shall be maintained above the hourly average temperature maintained during the last stack test that successfully demonstrates compliance with the MAERT performed in accordance with Special Condition No. 29. The TGI firebox exit six-minute average temperature shall be maintained at not less than 1,350°F until such a time that a stack test is performed that successfully demonstrates compliance with the MAERT. **(9/08)**

32. The tail gas incinerator shall maintain the $H_2S$ concentration in the exhaust gas less than 10 ppmv on a dry basis, corrected to 3 percent $O_2$, or achieve a $H_2S$ destruction efficiency greater than 99.9 percent. **(6/07)**

33. If the fuel burned in the facilities in this permit is other than pipeline-quality, sweet natural gas, the holder of this permit shall notify the TCEQ Corpus Christi Regional Office and install, calibrate, maintain, and operate a CEMS to measure and record the $H_2S$ concentration of the refinery fuel gas burned in these permitted facilities.

    A. The CEMS shall meet the design and performance specifications, pass the field tests, meet the installation requirements, data analysis, and reporting requirements specified in the Performance Specification No. 7 for $H_2S$, 40 CFR Part 60, Appendix B.

    B. The system shall be automatically zeroed and spanned daily and corrective action taken when the 24-hour span drift exceeds two times the amounts specified in 40 CFR Part 60, Appendix B.

C. For heaters and boilers other than the MDH Charge Heater (EPN 527-H1) and MDH Reboiler Heater (EPN 527-H2), compliance with furnace ER $SO_2$ limits will be ensured through compliance with 40 CFR § 60.104 which sets fuel gas $H_2S$ concentration limits and 40 CFR § 60.105(a)(4) which outlines $H_2S$ monitoring requirements. For the MDH Charge Heater (EPN 527-H1) and MDH Reboiler Heater (EPN 527-H2), compliance with the $SO_2$ ER limits will be ensured though compliance with 40 CFR § 60.105(a)(4) which outlines $H_2S$ monitoring requirements and Special Condition No. 43 which specifies necessary additional recordkeeping to calculate ERs for these heaters.

D. All CGA exceedances of 15 percent accuracy and any CEMS downtime not corrected within 24 hours shall be reported to the TCEQ Regional Director, and necessary corrective action shall be taken. Supplemental stack concentration measurements may be required at the discretion of the TCEQ Regional Director.

34. The minimum sulfur recovery efficiency for these permitted units (taken as a whole) shall be 99.8 percent. The sulfur recovery efficiency shall be determined by calculation as follows:

$$\text{Efficiency} = \frac{(\text{S recovered})*(100)}{(\text{S recovered}) + (\text{S incinerator})}$$

Where: Efficiency = sulfur recovery efficiency, percent
S recovered = (elemental S in pit), lbs/hr
S incinerator = sulfur in incinerator stack, lbs/hr

The average sulfur emission reduction efficiency (sulfur recovery efficiency) shall be demonstrated for each 24-hour period by a mass balance calculation using data obtained from the incinerator stack $SO_2$ monitor, sulfur production records, and other process flow data.

Records and copies of the compliance calculations shall be maintained on-site for a period of two years and made immediately available to TCEQ personnel upon request.

35. The total sulfur recovered from SRUs 1 and 2 is limited to 125 LTPD using air and 200 LTPD using $O_2$ injection. Daily sulfur production records shall be maintained on-site for a period of two years and made immediately available to TCEQ personnel upon request. Records shall indicate if $O_2$ injection is being used. **(11/04)**

36. The holder of this permit shall install a parameter monitoring plan or predictive emissions monitor for the delayed coker. The parameters to be monitored should include (but are not limited to) $O_2$, fuel usage rate, and temperature.

OPERATIONAL CONDITIONS DURING SRU OR TAIL GAS CLEANUP UNIT (TGCU) DOWNTIME

37. In the event of any unscheduled SCOT (TGCU) downtime, the permit holder shall immediately begin implementation of necessary responses to ensure minimization of emissions during the downtime if the downtime is expected to last significantly longer than the time it will take to implement the appropriate response. As soon as possible after the event causing the SCOT downtime, the permit holder will obtain approval from the TCEQ Regional Office with concurrence from the TCEQ Office of Permitting, Registration, and Remediation, Air Permits Division, for the planned response.

    In the event that unscheduled SCOT downtime exceeds six days during any three-year period, starting from the date of this permit amendment, the permit holder shall reduce acid gas production by 25 percent until the SCOT re-establishes compliance with the permit allowable.

    For all SCOT downtime events, the permit holder shall submit a report to the TCEQ Regional Office. The report shall include (but not be limited to) a description of what caused the event, the responses taken, the timing of these responses, the total time between the beginning and the end of the event, the total pounds of $SO_2$ emissions during the time of excessive emission, the sulfur load at the time of the event, and the sulfur load after the minimization actions were taken. If the six days of SCOT downtime occurs during a three-year period as described above, a report describing the permit holder's plans to alleviate the problem and a schedule for implementing the plan shall be submitted to the TCEQ Office of Permitting, Registration, and Remediation, Air Permits Division, within six months.

STORAGE OF SOUR WATER

38. The storage of sour water shall comply with the following requirements:

    A. Sour water stripper feed Tank No. 552-T2 shall be equipped with an interface level detection device which will provide sour water/hydrocarbon interface level detection. This detector shall alert appropriate personnel immediately should the sour water/hydrocarbon interface go below 5 feet.

Sour water stripper feed Tank No. 552-T1 shall be manually checked for hydrocarbons at least once per day using tricock. If hydrocarbons are discovered at or below the 5-foot level, steps shall be taken to restore the sour water level back to that indicated level.

Records of all alerts and manual interface checks (tricock checks) shall be maintained.

All monitoring equipment shall be maintained and kept in operating condition according to manufacturer's specifications.

Tank roofs shall be kept floated at all times, except as authorized by permit or permit-by-rule.

B. Storage Tanks 552-T1 and 552-T2 shall have a minimum on-line retention time of three days based on actual sour water flow. For purpose of this special condition, minimal retention time shall be calculated based on a daily determination of the seven day average sour water volumes in each tank and the actual seven day average sour water flows from the tanks. **(9/08)**

There shall be at least three days of holdup (excess) capacity maintained for sour water storage. This capacity shall only be used for sour water storage when necessary to avoid flaring of acid gases due to reduced SRU complex capacity. It shall be restored within one week of the return of the sulfur recovery complex to normal operations. For purpose of this special condition, nominal holdup time (excess capacity) shall be calculated based on a daily determination of the seven day average sour water volumes in both tanks and the actual seven day average total sour water flow from the tanks.

C. Records of the levels of sour water stored in the tanks and sour water flow rates shall be maintained. **(11/06)**

39. Tank No. 552-T1 is currently authorized to store sour water. The permit holder requests to construct a second Tank (EPN 552-T2) to store sour water and to retrofit Tank No. 552-T1 with a floating roof in the permit amendment application dated August 28, 2006.

The construction, modification, and operations of the above tanks are scheduled into three phases as follows:

Phase I: The construction of the second Tank No. 552-T2 equipped with a double-sealed floating roof. The existing Tank No. 552-T1 continues to store sour water. During Phase I, Storage Tank No. 552-T1 shall have a minimum on-line retention time of one day based on a maximum sour water flow rate of 250 gpm. **(3/08)**

Phase II: The construction of Tank No. 552-T2 is completed and it begins to store sour water. Tank No. 552-T1 is shut down for retrofitting with a floating roof equipped with double seals. During Phase II, Storage Tank No. 552-T2 shall have a minimum on-line retention time of two days based on a maximum sour water flow rate of 250 gpm. **(9/07)**

Phase III: The retrofitting for Tank No. 552-T1 is completed. Both tanks are storing sour water. On-line retention time shall be governed by Special Condition No. 38. A permit alteration shall be submitted after the start-up of the retrofitted Tank No. 552-T1 to alter this special condition, and to reflect the allowable emissions based on the actual configurations of both Storage Tank Nos. 552-T1 and 552-T2 on the MAERT. **(9/08)**

RECORDKEEPING REQUIREMENTS

40. The following monitoring data shall be maintained by the permit holder at the plant site and shall be made immediately available to the EPA or TCEQ personnel upon request or any local air pollution control program having jurisdiction:

    A. Average hourly measured $SO_2$ concentration (ppmvd) from the TAI Stack (EPN 554-ME5).

    B. Keep all records of the initial performance test. After the initial determination of compliance, the holder of this permit shall maintain a raw data file of all CEMS measurements, including CEMS performance testing measurements, and all CEMS calibration checks and adjustments and maintenance performed on these systems. These data shall be maintained in a permanent form suitable for inspection at the plant site. The data from the CEMS will be used to determine compliance with permit conditions.

41. The following information shall be made and maintained at the plant site. The following records shall be submitted to the TCEQ Corpus Christi Regional Office on a semiannual basis:

The holder of this permit shall comply with the reporting and recordkeeping requirements of 40 CFR § 60.7 for each emission unit which is required to be continuously monitored. Each report shall contain the hours of operation of the facility, a report summary of the periods of noncomplying emissions, and each CEMS downtime by cause. For reporting purposes, noncomplying emissions are defined as follows:

Each one-hour period of operation (except during start-up or shutdown), during which the average emission of $SO_2$, as measured and recorded by each CEMS, exceeds the emission limit specified in Special Condition No. 19.

42. The holder of this permit shall maintain records of any Claus Unit, SCOT, and incinerator downtime by cause. The records shall indicate the date, time, and duration of any downtime and subsequent acid gas flaring. Compliance with this condition does not relieve the obligation of the permit holder to report upsets under 30 TAC Chapter 101. All records shall be made available upon request to the TCEQ representatives or to those of any local air pollution control program having jurisdiction.

43. The holder of this permit shall maintain records of the firing rate, fuel flow rate, and Btu value of the fuel for the Delayed Coker Heater (EBN 521-H1), MDH Charge Heater (EBN 527-H1) and MDH Reboiler Heater (EBN 527-H2), ULSD Charge Heater (EPN 590-H-1), ULSD Reboiler Heater (EPN 590-H-2). These records shall be maintained for a period of two years and shall be made available to representatives of the TCEQ upon request. **(9/08)**

44. Records of the daily throughput for the delayed coking unit, SRU, Gasoline Merox, LPG Merox, ULDS, and MDH unit shall be maintained. These records shall be made available to representatives of the TCEQ upon request and shall be maintained for a period of at least two years. **(11/04)**

Date September 2, 2008

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Permit Numbers 8778A and PSD-TX-408M3

This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

AIR CONTAMINANTS DATA

| Emission Point No. (1) | Source Name (2) | Air Contaminant Name (3) | Emission Rates * lb/hr | TPY** |
|---|---|---|---|---|
| 590-H-1 | ULSD Charge Heater | CO | 4.94 | (9) |
| | | $NO_x$ | 2.41 | (9) |
| | | $PM_{10}$ | 0.47 | (9) |
| | | $SO_2$ | 1.50 | (9) |
| | | VOC | 0.34 | (9) |
| 590-H-2 | ULSD Reboiler Heater | CO | 4.15 | (9) |
| | | $NO_x$ | 2.02 | (9) |
| | | $PM_{10}$ | 0.39 | (9) |
| | | $SO_2$ | 1.26 | (9) |
| | | VOC | 0.28 | (9) |
| 590-HCAP | ULSD Heater Cap | CO | | 31.83 |
| | | $NO_x$ | | 15.52 |
| | | $PM_{10}$ | | 3.01 |
| | | $SO_2$ | | 9.68 |
| | | VOC | | 2.18 |
| 521-H1 | Coker Heater | CO | 23.94 | 101.57 |
| | | $NO_x$ | 47.28 | 209.61 |
| | | $PM_{10}$ | 2.17 | 9 .19 |
| | | $SO_2$ | 6.48 | 27.50 |
| | | VOC | 1.57 | 6.65 |
| 527-H1 | MDH Charge Heater | CO | 5.10 | 22.30 |
| | | $NO_x$ | 7.40 | 32.60 |
| | | $PM_{10}$ | 0.46 | 2 .00 |
| | | $SO_2$ | 1.40 | 6 .10 |
| | | VOC | 0.33 | 1 .50 |

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

| Emission Point No. (1) | Source Name (2) | Air Contaminant Name (3) | Emission Rates * lb/hr | TPY** |
|---|---|---|---|---|
| 527-H2 | MDH Reboiler Heater | CO | 6.80 | 29.70 |
| | | $NO_x$ | 9.90 | 43.30 |
| | | $PM_{10}$ | 0.61 | 2.70 |
| | | $SO_2$ (5) | 5.70 | 25.00 |
| | | VOC | 0.44 | 1.90 |
| 552-S10 | Sour Water Stripper Flare (10) | VOC | 0.01 | 0.04 |
| | | $H_2S$ | 0.01 | 0.01 |
| | | $SO_2$ | 0.01 | 0.04 |
| | | CO | 0.11 | 0.47 |
| | | $NO_x$ | 0.02 | 0.07 |
| 554-ME5 | Tail Gas Incinerator | CO | 3.90 | 14.40 |
| | | COS | 1.80 | 4.40 |
| | | $CS_2$ | 0.32 | 0.76 |
| | | $H_2S$ | 0.50 | 1.10 |
| | | $NO_x$ | 3.50 | 9.20 |
| | | $PM_{10}$ | 0.19 | 0.49 |
| | | $SO_2$ | 22.40 | 53.40 |
| | | VOC | 2.30 | 5.50 |
| 554-T1 | Tank 1 - SCOT Area | MDEA | 0.01 | 0.01 |
| 554-T2 | Tank 2 - SCOT Area | MDEA | 0.11 | 0.01 |
| 555-S9 | Acid Gas Flare (10) | VOC | 0.01 | 0.04 |
| | | $H_2S$ | 0.01 | 0.01 |
| | | $SO_2$ | 0.01 | 0.04 |
| | | CO | 0.11 | 0.47 |
| | | $NO_x$ | 0.02 | 0.07 |
| 555-T1 | Tank 1 - Amine Area | MDEA | 0.01 | 0.01 |
| 555-T2 | Tank 2 - Amine Area | MDEA | 0.02 | 0.01 |

AIR CONTAMINANTS DATA

| Emission Point No. (1) | Source Name (2) | Air Contaminant Name (3) | Emission Rates * lb/hr | TPY** |
|---|---|---|---|---|
| 561-B3 | No. 3 Boiler | CO | 8.10 | 35.70 |
| | | $NO_x$ | 11.90 | 52.00 |
| | | $PM_{10}$ | 0.74 | 3.20 |
| | | $SO_2$ | 2.20 | 9.80 |
| | | VOC | 0.50 | 2.30 |
| 572-T13A | Storage Tank 13A | VOC | 1.60 | 3.90 |
| 572-T13B | Storage Tank 13B | VOC | 1.60 | 3.90 |
| 585-T6020 | Storage Tank 6020 | VOC | 4.40 | 3.30 |
| 585-T6021 | Storage Tank 6021 | VOC | 4.40 | 3.30 |
| 585-T6022 | Storage Tank 6022 | VOC | 4.40 | 3.30 |
| 585-T6023 | Storage Tank 6023 | VOC | 4.40 | 3.30 |
| 585-T6001 | Storage Tank 6001 | VOC | 24.60 | 10.60 |
| 585-T6002 | Storage Tank 6002 | VOC | 24.60 | 10.60 |
| 585-T6011 | Storage Tank 6011 | VOC | 0.76 | 1.40 |
| 585-T6012 | Storage Tank 6012 | VOC | 0.74 | 1.33 |
| 585-T6017 | Storage Tank 6017 | NaOH | 0.01 | 0.01 |
| 585-T6018 | Storage Tank 6018 | NaOH | 0.01 | 0.01 |
| 585-T6019 | Storage Tank 6019 | NaOH | 0.01 | 0.01 |
| 517-S14 | MDHU Process Fugitives (4) | $H_2S$ | 0.29 | 1.25 |
| | | $NH_3$ | 0.01 | 0.04 |
| | | VOC | 5.63 | 24.68 |

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

| Emission Point No. (1) | Source Name (2) | Air Contaminant Name (3) | Emission Rates * lb/hr | TPY |
|---|---|---|---|---|
| 521-F COKE | Coke Storage and Handling Facilities (4) | $PM_{10}$ | 3.99 | 17.48 |
| 553-FUG | SRU Process Fugitives (4) | VOC | 1.20 | 5.27 |
| | | $H_2S$ | 0.26 | 1.12 |
| | | $NH_3$ | 0.03 | 0.11 |
| 521-FUG | Coker Unit Fugitives (4) | VOC | 35.88 | 157.34 |
| | | $H_2S$ | 0.80 | 3.60 |
| 525/526FUG | WP Merox Fugitives (4) | VOC | 8.50 | 37.30 |
| | | $H_2S$ | 0.03 | 0.12 |
| FUG-FGS | Flare Gas Recovery Fugitives (4) | VOC | 0.08 | 0.34 |
| 590-U590 | ULSD Fugitives (4) | VOC | 4.58 | 20.08 |
| | | $H_2S$ | 0.18 | 0.79 |
| | | $NH_3$ | 0.01 | 0.03 |
| API-1 | CPI Seperator | VOC | 8.03 | 35.31 |
| 590-CT1 | Cooling Tower (4) | VOC | 0.13 | 0.55 |
| CT1 | Cooling Tower (4) | VOC | 1.26 | 5.52 |
| PHASE I | | | | |
| 552-T1 | Sour Water Tank (6) | $H_2S$ | 0.20 | 0.88 |
| | | VOC | 17.90 | 2.00 |
| | | $NH_3$ | 0.07 | .31 |
| PHASE II | | | | |
| 552-T2 | Sour Water Tank (7) | $H_2S$ | 0.01 | 0.01 |
| | | VOC | 0.10 | 0.36 |
| | | $NH_3$ | 0.01 | 0.01 |

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

| Emission Point No. (1) | Source Name (2) | Air Contaminant Name (3) | Emission Rates * lb/hr | TPY |
|---|---|---|---|---|
| PHASE III | | | | |
| 552-T1 | Sour Water Tank (8) | $H_2S$ | 0.01 | 0.01 |
| | | VOC | 0.08 | 0.26 |
| | | $NH_3$ | 0.01 | 0.01 |
| 552-T2 | Sour Water Tank (8) | $H_2S$ | 0.01 | 0.01 |
| | | VOC | 0.10 | 0.36 |
| | | $NH_3$ | 0.01 | 0.01 |

(1) Emission point identification - either specific equipment designation or emission point number from plot plan.

(2) Specific point source name. For fugitive sources use area name or fugitive source name Permit Numbers 8778A and PSD-TX-408M3.

(3) CO - carbon monoxide
$NO_x$ - total oxides of nitrogen
$PM_{10}$ - particulate matter (PM) equal to or less than 10 microns in diameter. Where PM is not listed, it shall be assumed that no PM greater than 10 microns is emitted.
$SO_2$ - sulfur dioxide
VOC - volatile organic compounds as defined in Title 30 Texas Administrative Code § 101.1
$H_2S$ - hydrogen sulfide
COS - carbonyl sulfide
$CS_2$ - carbon disulfide
MDEA - methyl diethyl amine
NaOH - sodium hydroxide
$NH_3$ - ammonia

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

(4) Emission rate is an estimate and compliance is demonstrated by meeting the requirements of the applicable special conditions and permit application representations.

(5) Includes 3.86 pounds an hour of $SO_2$ from burning the MEROX Unit vent gas. Merox vent gas contains 0.0056 mole sulfur per mole of vent gas.

(6) Phase I: Only Tank 552-T1 is storing sourwater as currently authorized while new Storage Tank 552-T2 is constructed as authorized by the amendment application dated August 28, 2006.

(7) Phase II: After new Tank 552-T2 has been constructed. Only Tank 552-T2 is storing sourwater while old Tank 552-T1 is shutdown for retrofitting with a floating roof.

(8) Phase III: After retrofitting of Tank 552-T1 has been completed, both Tanks 552-T1 and T552-T2 are storing sourwater.

(9) The total annual emissions rate for the ULSD Charge Heater and the ULSD Reboiler Heater are limited to the annual cap indicated under Emission Point Number (EPN) 590-HCAP.

(10) Pilot emissions only.

* Emission rates are based on and the facilities are limited by the following maximum operating schedule: 8,760 hrs/year.

** Compliance with annual emission limits is based on a rolling 12-month period.

Dated May 16, 2008

# RUSSELL J. DIRAIMO, P.E.

Vice President
Air Emissions Division
Southwestern Laboratories, Inc.

## EDUCATION

B.S. Civil and Environmental Engineering - University of Rhode Island, 1977

## CONTINUING EDUCATION

- Cause and Prevention of Grain Elevator Fires and Explosions, Texas A&M University, 1978.
- International Symposium on Grain Dust, Kansas State University, 1979
- "Controlling Exposure to Asbestos in the Office Environment", Houston Building Owners and Managers Association, Inc., 1985
- "Practices and Procedures for Asbestos Control", The National Asbestos Training Center, 1986
- "Hazardous Waste Site Operations and Emergency Response", 29 CFR 1910.120 40-hour training course, Industrial Hygiene & Safety Technology, Inc., 1987
- "Asbestos Hazardous Emergency Response Act", 40 CFR 763 Subpart D, Certified Inspector, Certified Management Planner, Texas A&M Extension Course, 1988
- OSHA 1910.119(h) Process Safety Management Training

## AWARDS AND HONORS:

Graduated High Distinction
Tau Beta Pi Honor Society
Phi Kappa Phi Honor Society

## PROFESSIONAL ENGINEERING REGISTRATION

Texas No. 53580

## PROFESSIONAL AFFILIATIONS

National Society of Professional Engineers (NSPE)
Texas Society of Professional Engineers (TSPE)
Air and Waste Management Association (AWMA)
Source Evaluation Society

**RUSSELL J. DIRAIMO, P.E.**

## QUALIFICATIONS SUMMARY

Throughout his career with SwL. (formerly Huntingdon Engineering and Environmental and Maxim Technologies, Inc.), Mr. DiRaimo has been involved with stationary source air pollution emissions testing first as a project engineer performing field work, followed by project management, and currently as Vice President in charge of the Air Emissions Services Division.

Mr. DiRaimo's experience includes projects located in Texas, Louisiana, New Mexico, Oklahoma, Alabama, Georgia, Mississippi, Arkansas and Puerto Rico, with the great majority of the projects centered in Texas.

Mr. DiRaimo has participated in over a thousand air pollution projects, including several hundred involving the determination of compliance with Texas Natural Resource Conservation Commission (TNRCC) and EPA permits and regulations.

Mr. DiRaimo's experience includes field experience performing air emissions tests of stationary sources including particulate matter, NOx, CO, VOCs, speciated VOCs, $NH_3$, HCl, $Cl_2$, SOx and $H_2SO_4$. In addition, he has project and department management experience involving source testing projects for the above listed pollutants plus speciated volatile organics, semivolatile organics, aldehydes, ketones, metals, dioxins and furans. Also included are several projects involving Continuous Emission Monitor System (CEMS) certifications and BIF related testing.

As VP of the Air Emissions Division, Mr. DiRaimo prepares Compliance Sampling Plans, performs Quality Assurance review of field, laboratory and calculation data, prepares compliance emissions test reports, and performs peer review of test reports prepared by others. In addition, he managed SwL's Analytical Chemistry laboratories which provided him with experience in the review of analytical data and the associated QA/QC requirements.

Mr. DiRaimo served as SwL's Project Manager of the BIF Trial Burn performed at the Solutia (formerly Monsanto) Chocolate Bayou, Texas facility. His responsibilities included assisting in the planning and scheduling, coordination of SwL's field crews and review and compilation of the field and QA/QC equipment data.

# PHILLIP W. YOKLEY

Air Emissions Program Manager - Air Emissions Services Division
Southwestern Laboratories, Inc.

## EDUCATION

B.S. - Environmental Health, East Tennessee State University - 1981

## CONTINUING EDUCATION

- Asbestos Abatement Training Program, the University of Texas, Arlington, Texas - May, 1987.
- Asbestos Technique Workshop, American Industrial Hygiene Association, Houston, Texas - April, 1987.
- Identification of Asbestos Utilizing Polarized Light Microscopy, McCrone Research Institute, Chicago, Illinois - 1986.
- In-Stack Opacity Monitor Audit Procedures, Environmental Protection Agency Regional Office, Annapolis, Maryland.
- Texas A & M Extension Course - "Asbestos Hazardous Emergency Response Act", 40 CFR 763 Subpart D, April, 1988. Certified Inspector; Certified Management Planner.
- Workshop on Sampling and Analysis Methods for Compliance with the "BIF" Regulation, USEPA, Durham, N.C., April, 1991.
- Attended 40 hour Occupational and Environmental Training Program on Hazardous Materials (CFR 1910.120) Houston, Texas, September, 1992 (including annual refresher courses).

## PROFESSIONAL AFFILIATIONS

Air and Waste Management Association (AWMA)
Source Evaluation Society

## QUALIFICATIONS SUMMARY

Mr. Yokley has performed stationary source air emissions testing services with SwL since 1985, initially as a field technician, then as a field supervisor, and currently as a project manager and Air Emissions Program Manager. He has performed testing in numerous states, with the great majority of sources being in Texas.

Mr. Yokley's direct field experience includes routine procedures such as particulates, NOx, CO, VOCs, as well as the specialized Trial Burn procedures including VOST, Modified Method 5, HCl/$Cl_2$, multiple metals, aldehydes/ketones, dioxins and furans. In addition, Mr. Yokley has performed particle size distribution sampling and analysis on numerous sources.

Mr. Yokley has performed project management, field supervision and on site testing for numerous types of sources including boilers, furnaces, incinerators, dryers, baghouse outlets, turbines, compressor engines and fluid catalytic cracking units. His experience includes involvement on several BIF interim status and recertification emissions test projects.

**PHILLIP W. YOKLEY**

Overall, Mr. Yokley has several years in stationary source sampling and analysis for air emissions. His experience includes direct field experience, plus compliance sampling plan preparations and presentations, scheduling, field work, laboratory analysis, data reduction/emission calculations, QA/QC of field instrument and laboratory data, report preparation, and peer review of air emissions reports prepared by others.

# JOHNDUNN B. JOHNSTON

Senior Project Manager - Air Emissions Services Division
Southwestern Laboratories, Inc.

## EDUCATION

B.S - Meteorology, Texas A & M University - 1989

## CONTINUING EDUCATION

- EPA, Effective Stack Height/Plume Rise, November 18, 1991
- EPA, Basic Air Pollution Meteorology, January 7, 1992
- EPA, Introduction to Dispersion Modeling, March 2, 1992
- Attended 40 hour Occupational and Environmental Training Program on Hazardous Materials (CFR 1910.120) Houston, Texas, September, 1992

## CERTIFIED TNRCC VISUAL EMISSION EVALUATOR

Since 1991

## PROFESSIONAL AFFILIATIONS

American Meteorological Society

## QUALIFICATIONS SUMMARY

Mr. Johnston has performed stationary source emission testing for SwL since 1991. Mr. Johnston initially started as a field technician, and has worked his way to a field supervisor and presently a project manager for SwL's Air Emissions Services Division. Mr. Johnston has field experience, performing EPA and TNRCC procedures for determining emissions such as particulate matter, NOx, CO, $SO_2$, $NH_3$, $H_2SO_4$, total VOCs, speciated VOCs (including the operation and recovery of the VOST and Modified Method 5 trains), multiple metals, aldehydes and ketones, HCl, $Cl_2$, total reduced sulfur, particle size, dioxins and furans on numerous sources in Texas and the Gulf Coast region. Mr. Johnston also has experience as a field supervisor and project manager for stack sampling projects. In this role, Mr. Johnston performs field testing, reviews the field data for acceptability of other team members, performs data reduction and emission test calculations, performs and/or reviews the equipment and analytical QA, and prepares the test reports for submittal to clients and regulatory agencies.

Mr. Johnston operates one of SwL's emission test trailers. He has developed and enhanced SwL's capabilities as it relates to onsite gas chromatographic analyses using GC/FID and GC/FPD techniques. He also has been instrumental in the development of SwL's computer programs and computer spreadsheets to assist in the data reduction, emission test calculations and QA review of field, laboratory and on line analyzer data.

# MANUEL A. GARCIA

Environmental Technician - Air Emissions Services Division
Southwestern Laboratories, Inc.

## CONTINUING EDUCATION

40 HAZWOPER – Hazardous Waste Operations and Emergency Response, February, 1999
80 Hour Hazardous Waste Worker Course Certificate, March 1999

## QUALIFICATIONS SUMMARY

Mr. Garcia has been involved in source sampling and analysis with SwL since 2000, and currently holds the position of Environmental Technician. He has participated in source emission test projects involving measurements for flow, particulate, sulfur oxides, fluorides and various other pollutants.

Mr. Garcia's other responsibilities include particulate analysis, equipment calibration and maintenance and related QA/QC procedures.

# GUSTAVO GONZALEZ

Environmental Technician - Air Emissions Services Division
Southwestern Laboratories, Inc.

## QUALIFICATIONS SUMMARY

Mr. Gonzalez has been involved in source sampling and analysis with SwL since 2008, and currently holds the position of Environmental Technician. He has participated in source emission test projects involving measurements for flow, particulate, sulfur oxides, fluorides and various other pollutants.

Mr. Gonzalez's other responsibilities include particulate analysis, equipment calibration and maintenance and related QA/QC procedures.

# This Is The Last Page

# Of Stork SwL's Report