Clean Air Engineering

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Ms. Dolly Potter
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Solvay Minerals, Inc.
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Green River, Wyoming 82935

REPORT ON VOLATILE ORGANIC TESTING

Performed for:

SOLVAY MINERALS, INC.
EP-5 CALCINER STACK
GREEN RIVER, WYOMING

Client Reference No: C02493
CAE Project No: 7594-1
Revision 0: February 9, 1996

To the best of our knowledge, the data presented in this report are accurate and complete.

Submitted by,

Michael Pierce
Project Manager
(303)650-9745

CONTENTS

1 PROJECT OVERVIEW 1-1
Table 1-1: EP-5 Calciner Profile 1-1
Table 1-2: Compound (CAS) Numbers 1-2
Table 1-3: Summary of Test Results 1-2

2 RESULTS 2-1
Table 2-1: EP-5 Calciner - Total Non-Methane Hydrocarbons 2-1
Table 2-2: EP-5 Calciner - Volatile Organic Compounds 2-2

3 DESCRIPTION OF INSTALLATION 3-1
Figure 3-1: Soda Ash Process Schematic 3-2

4 METHODOLOGY 4-1
Table 4-1: Summary of Sampling Procedures 4-1
SAMPLING POINT DETERMINATION 4-2
Figure 4-1: EP-5 Calciner Stack Sampling Point Determination (EPA Method 1) 4-2
VELOCITY AND VOLUMETRIC FLOW RATE - EPA METHOD 2 4-3
Figure 4-2: Velocity Sampling Apparatus (EPA Method 2) 4-3
GAS COMPOSITION AND MOLECULAR WEIGHT - EPA METHOD 3 4-4
MOISTURE CONTENT - EPA METHOD 4 4-4
Figure 4-3: Moisture Sampling Apparatus (EPA Method 4) 4-5
VOLATILE EMISSIONS TESTING - EPA METHOD 18 4-6
Table 4-2: HP-GC Operating Conditions 4-6
TOTAL HYDROCARBONS - EPA METHOD 25A 4-7
Figure 4-4: EPA Methods 25A and 18 Monitoring System Schematic 4-8

5 APPENDIX 5-1
SAMPLE CALCULATIONS ..... A
PARAMETERS ..... B
CALIBRATION DATA C
FIELD DATA ..... D
FIELD DATA PRINTOUTS ..... E
OPERATING DATA ..... F
PERTINENT CERTIFICATIONS ..... G

SOLVAY2018_6_000930

Project Overview

SOLVAY2016_6_000931

PROJECT OVERVIEW

Solvay Minerals, Inc. (Solvay) contracted Clean Air Engineering to perform volatile organic emissions testing at their facility located west of Green River, Wyoming. The facility processes trona into soda ash, which is used in a variety of manufacturing processes.

Testing was performed at the Gas Fired Calciner (EP-5) Stack on October 29, 1995. Three one hour EPA Method 1-4, 18, and 25A runs were used to determine emissions of volatile organic compounds.

It was determined on site that 2-butanone was co-eluting with benzene. Therefore, quantification of this compound was not possible.

Four analyses were performed for each method 18 test run. When an injection was reported below the detection limit (BDL), the value of zero was used to calculate the average concentration of that run.

Based upon the calculated limits of detection, the Method 18 data (specific organics) at low concentrations cannot be accurately quantified. Organic detection limits can be found in Appendix E, Field Data Print Outs.

Coordinating the field testing were:

D. Potter - Solvay Minerals, Inc.
S. Cook - Solvay Minerals, Inc.
S. Ferguson - Clean Air Engineering

The source identification information is shown in Table 1-1.

Table 1-1:
EP-5 Calciner Profile

Unit Identification Number	AD No. 48, EP-5
Process	Calciner
Fuel	Natural Gas
Heat Content	1080 Btu/ft
Stack Height	180 feet
Stack Diameter	125.5 inches
Diameters to Upstream Disturbance	Approximately 5.5
Diameters to Downstream Disturbance	Approximately 9.0
Primary Control Equipment	Flakt ESP

SOLVAY2016_6_000932

PROJECT OVERVIEW

Chemical abstract service (CAS) numbers and molecular weights are listed in Table 1-2.

Table 1-2:
Compound (CAS) Numbers

Compound Name	Molecular Weight	CAS No.
Acrylonitrile	53.06	107-13-1
1,1,1,-Trichloroethane	133.42	71-55-6
1,3 Butadiene	54.09	106-99-0
Benzene	78.11	71-43-2
Ethane	30.07	74-84-0
Ethylbenzene	106.17	100-41-4
Hexane	86.18	110-54-6
Methane	16.04	74-82-8
Methylene Chloride	84.94	75-09-2
Toluene	92.14	108-88-3
Trichloroethene	131.40	79-01-6
THCs (as propane)	44.09	74-98-6
Styrene	104.14	100-42-5
Xylene	106.16	1330-20-7

A summary of test results is shown in Table 1-3.

Table 1-3:
Summary of Test Results

Source Constituent	Sampling Method	Average Emission (ppmdv)	Average Emission (lb/hr)	Average Emission (lb/ton of trona)
EP-5 Calciner Stack (140 tons/hr feed rate)				
Organic Compounds	EPA M 18			
Benzene		3.07	2.13	0.015
Hexane		2.01	1.54	0.011
Methane		148.4	21.2	0.151
Total Hydrocarbons (propane)	EPA M 25A	171.3	67.3	0.480
Total Non-Methane Hydrocarbons (propane)		--	46.1	0.329

The test conditions and results of analysis are presented in Tables 2-1 and-2-2 on pages 2-1 through 2-2.

SOLVAY2016_S_000933

Results

SOLVAY2016_6_000934

RESULTS

Table 2-1:
EP-5 Calciner - Total Non-Methane Hydrocarbons

Run No.		1	2	3	Average
Date (1995)		October 29	October 29	October 29	
Start Time (approx.)		09:19	10:48	12:14	
Stop Time (approx.)		10:19	11:48	13:14	
Process Conditions[1]					
Feed rate (tons/hr of trona)		140	140	140	**140**
Gas Conditions[2]					
T_s	Temperature (°F)	311	315	315	**314**
O_2	Oxygen (dry volume %)	9.0	9.0	9.0	**9.0**
CO_2	Carbon dioxide (dry volume %)	13.7	13.8	13.8	**13.8**
B_{wo}	Moisture (volume %)	35.37	36.77	37.21	**36.45**
Q_{std}	Standard conditions (dscfm)	57,670	57,280	56,730	**57,227**
Total Hydrocarbons (as propane)					
C	Concentration (ppmdv)	159.5	161.2	193.1	**171.3**
E	Emission rate (lb/hr)	63.2	63.4	75.2	**67.3**
E	Emission rate (lb/ton of trona)	0.451	0.453	0.537	**0.480**
Methane					
C	Concentration (ppmdv)	128.4	148.2	168.5	**148.4**
E	Emission rate (lb/hr)	18.5	21.2	23.9	**21.2**
E	Emission rate (lb/ton of trona)	0.132	0.151	0.171	**0.151**
Total Non-Methane Hydrocarbons (as propane)					
E	Emission rate (lb/hr)	44.7	42.2	51.3	**46.1**
E	Emission rate (lb/ton of trona)	0.319	0.301	0.367	**0.329**

[1] Feed rate provided by Solvay Minerals, Inc.

[2] Gas conditions taken from simultaneous velocity-moisture testing.

RESULTS

Table 2-2:
EP-5 Calciner - Volatile Organic Compounds

Run No.		1	2	3	Average
Date (1995)		October 29	October 29	October 29	
Start Time (approx.)		09:18	10:51	12:13	
Stop Time (approx.)		10:18	11:51	13:12	
Process Conditions[1]					
	Feed rate(ton of trona/hr)	140	140	140	**140**
Gas Conditions[2]					
B_{wo}	Moisture (% by volume)	35.37	36.77	37.21	**36.45**
Q_{stc}	Volumetric flow rate, standard (dscfm)	57,670	57,280	56,730	**57,227**
1,1,1-Trichloroethane					
C	Concentration (ppmdv)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/hr)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	**BDL**
1,3 Butadiene					
C	Concentration (ppmdv)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/hr)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	**BDL**
Acrylonitrile					
C	Concentration (ppmdv)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/hr)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	**BDL**
Benzene					
C	Concentration (ppmdv)	2.65	2.86	3.69	**3.07**
E	Emission rate (lb/hr)	1.86	1.99	2.55	**2.13**
E	Emission rate (lb/ton of trona)	0.013	0.014	0.018	**0.015**
Ethyl Benzene					
C	Concentration (ppmdv)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/hr)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	**BDL**
Hexane					
C	Concentration (ppmdv)	1.83	1.80	2.39	**2.01**
E	Emission rate (lb/hr)	1.41	1.39	1.82	**1.54**
E	Emission rate (lb/ton of trona)	0.010	0.010	0.013	**0.011**
Methylene Chloride					
C	Concentration (ppmdv)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/hr)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	**BDL**
Styrene					
C	Concentration (ppmdv)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/hr)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	**BDL**
Toluene					
C	Concentration (ppmdv)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/hr)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	**BDL**
Trichloroethene					
C	Concentration (ppmdv)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/hr)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	**BDL**
Xylene					
C	Concentration (ppmdv)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/hr)	BDL	BDL	BDL	**BDL**
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	**BDL**

BDL indicates value was below the detection limit.
[1] Process conditions provided by Solvay Minerals, Inc.
[2] Gas conditions are taken from simultaneous velocity-moisture testing.

Description of Installation

SOLVAY2016_6_000937

SOLVAY MINERALS

January 8, 1996

Michael Pierce
CAE
7000 N. Broadway
Building 2 Unit 200
Denver, CO 80221

Dear Michael:

Enclosed you will find copies of pages from CAE Projects #7594, 7594-1, and 7594-2 with necessary corrections. The majority of changes are merely clarification of verbiage and a minor change to the process schematic. I do however, have a question on Project No. 7594-2, runs #1 and #2 of the THC testing. I believe the run #1 velocity pressure in incorrect, possibly all of the data was not included in figuring it. On run #2, I was not able to read the raw delta p data, so I am not certain if it is correct or not.

I have also included a copy of MD-229, Solvay Minerals' permit to convert the calciners from coal-fired to gas. This may be appropriate to include in Project #7594, which is the testing performed to demonstrate compliance of the permitted limits set forth in that permit.

Please make the necessary revisions to these reports and issue three (3) copies of each final report to me.

If you have any questions, feel free to contact me at (307) 872-6571.

Sincerely,

Dolly A. Potter

Dolly A. Potter

Enclosures

126 1203 763

SOLVAY2016_6_000938

Solvay Minerals, Inc.
P.O. Box 1167, Green River, Wyoming 82935 307/875-6500 Fax: 307/872-6510

Clean Air Engineering

500 W. Wood St. • Palatine, IL 60067 • 708-991-3300

February 9, 1996

Ms. Dolly Potter
Environmental Engineer
Solvay Minerals, Inc.
20 miles west of Green River
Green River, Wyoming 82935

Dear Ms. Potter:

Enclosed are three copies of the final report on volatile organic, nitrogen oxide and particulate testing performed on EP 1 & 2 Calciner Stack. It details testing CAE performed at the Green River, Wyoming facility on October 26 through October 29, 1995.

You can reach me at (303)650-9745 if you have any questions about the data or comments about the report. We would also appreciate any comments you have regarding how we might better serve you in the future.

Respectfully submitted,

CLEAN AIR ENGINEERING

Michael Pierce

Michael Pierce
Project Manager

DESCRIPTION OF INSTALLATION

Solvay Minerals, Inc., located near Green River, Wyoming, is a mine and refinery with corporate offices in Houston, Texas. Soda ash operations at the Green River, Wyoming facility began initial production in May of 1982. On May 27, 1992 Solvay S.A. of Belgium purchased the Green River facilities from Tenneco, Inc. and changed the name to Solvay Minerals, Inc.

The primary raw material for the Green River facility is sodium sesquicarbonate which is commonly referred to as trona. The trona is mined at the plant site from an ore bed located 1,500 feet below the surface. The trona is hoisted to the surface before refining into soda ash and other sodium-based products.

The caustic/sulfite system is fed unfiltered saturated sodium carbonate solution from the soda ash process. Insolubles are separated by settling and filtration. At this point the caustic carbonate liquor is reacted with lime forming caustic soda. The remaining sodium carbonate liquor is reacted with sulfur dioxide forming sodium sulfite. At the completion of the refining process the caustic soda and the sodium sulfite are stored pending shipment.

The trona that is fed to the soda ash calciners is heated, resulting in thermal calcination of the sodium sesquicarbonate forming a crude soda ash. The crude soda ash is dissolved in water and the insolubles are separated from the solution by settling and filtration. The insolubles are disposed of in the mine void. The high-purity saturated solution of sodium carbonate is then fed to crystallizers where a large amount of water is removed and a slurry of sodium carbonate monohydrate crystals is formed. This slurry is then further dewatered and washed by a series of cyclones and centrifuges. The resulting monohydrate crystals are fed through dryers forming a high quality soda ash, which then is ready for storage and shipment.

The facility is equipped with baghouses, scrubbers and electrostatic precipitators (ESP) to control emissions.

A schematic of the process is shown in Figure 3-1.

SOLVAY2015_5_000940

DESCRIPTION OF INSTALLATION

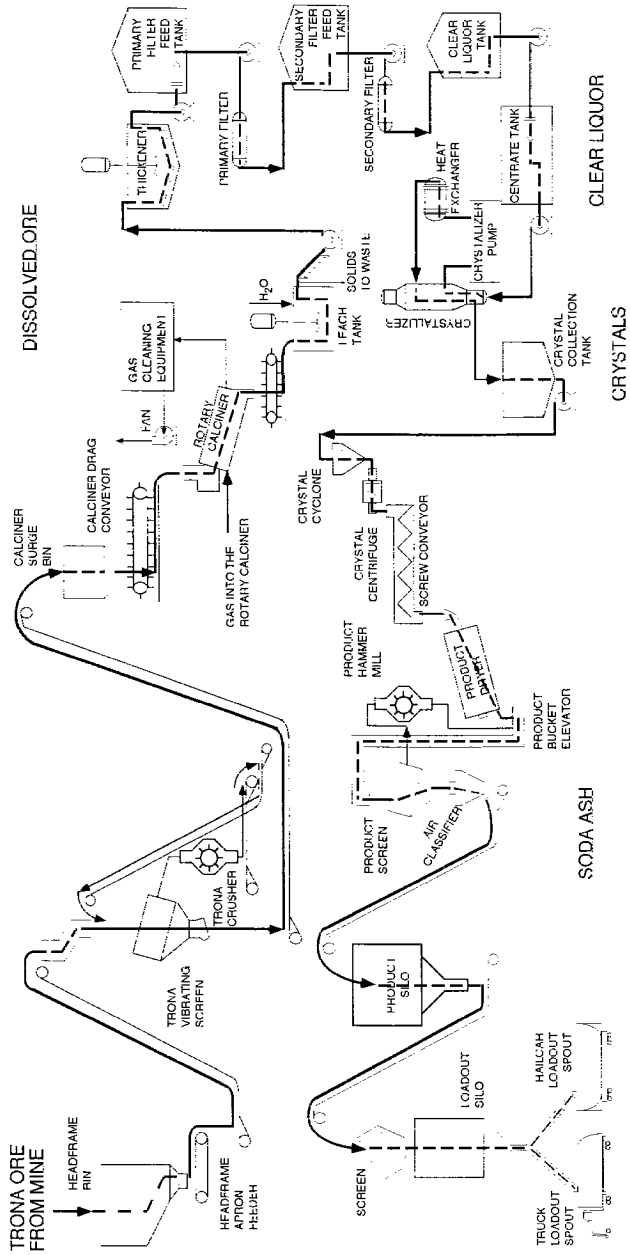


Figure 3-1: Soda Ash Process Schematic

SOLVAY 2015 5 000941

Methodology

METHODOLOGY

The sampling followed procedures as detailed in U.S. Environmental Protection Agency (EPA) Methods 1, 2, 3, 4, 18 and 25A. The following table summarizes the methods and their respective sources.

Table 4-1:
Summary of Sampling Procedures

Title 40 CFR Part 60 Appendix A	
Method 1	"Sample and Velocity Traverses for Stationary Sources"
Method 2	"Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)"
Method 3	"Gas Analysis for the Determination of Dry Molecular Weight"
Method 4	"Determination of Moisture Content in Stack Gases"
Method 18	"Measurement of Gaseous Organic Compound Emissions by Gas Chromatography"
Method 25A	"Determination of Total Gaseous Organic Concentrations using a Flame Ionization Analyzer (FIA)"

These methods appear in detail in Title 40 of the Code of Federal Regulations (CFR).

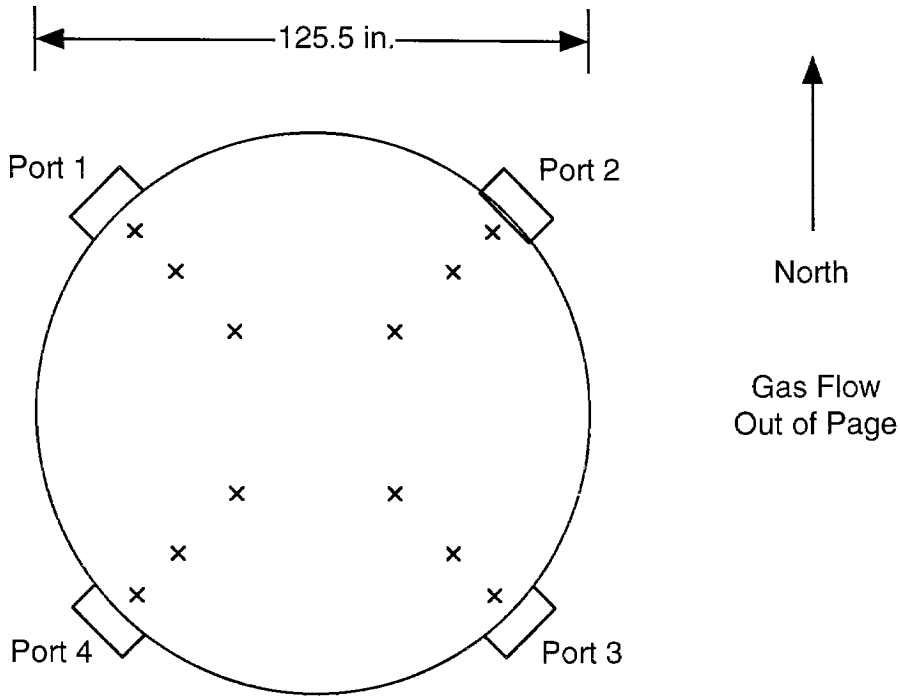
These sampling, recovery and analytical procedures are summarized on pages 4-2 through 4-8.

All equipment was calibrated at the Clean Air Engineering laboratory prior to shipment to the job site. A post calibration was performed on each meter box at the conclusion of testing to verify that calibration was maintained throughout the test program. Calibration sheets can be found in Appendix Section C.

SOLVAY2015_5_000943

METHODOLOGY

SAMPLING POINT DETERMINATION



Traverse- Point	Port to Point Distance (in.)
1	37.1
2	18.3
3	5.5

Diameters to upstream disturbance: 9.0 Limit: 2.0
Diameters to downstream disturbance: 5.5 Limit: 0.5

Figure 4-1: EP-5 Calciner Stack Sampling Point Determination (EPA Method 1)

SOLVAY2015 6 000944

METHODOLOGY

VELOCITY AND VOLUMETRIC FLOW RATE - EPA METHOD 2

EPA Method 2 was used to determine the gas velocity and flow rate at the EP-5 Calciner Stack. Figure 4-2 shows the major components of the Method 2 sampling apparatus.

Each set of velocity determinations included the measurement of gas velocity pressure and gas temperature at each of the EPA Method 1 traverse points. The velocity pressures were measured with a Type S pitot tube. Gas temperature measurements were made using a Type K thermocouple and digital pyrometer.

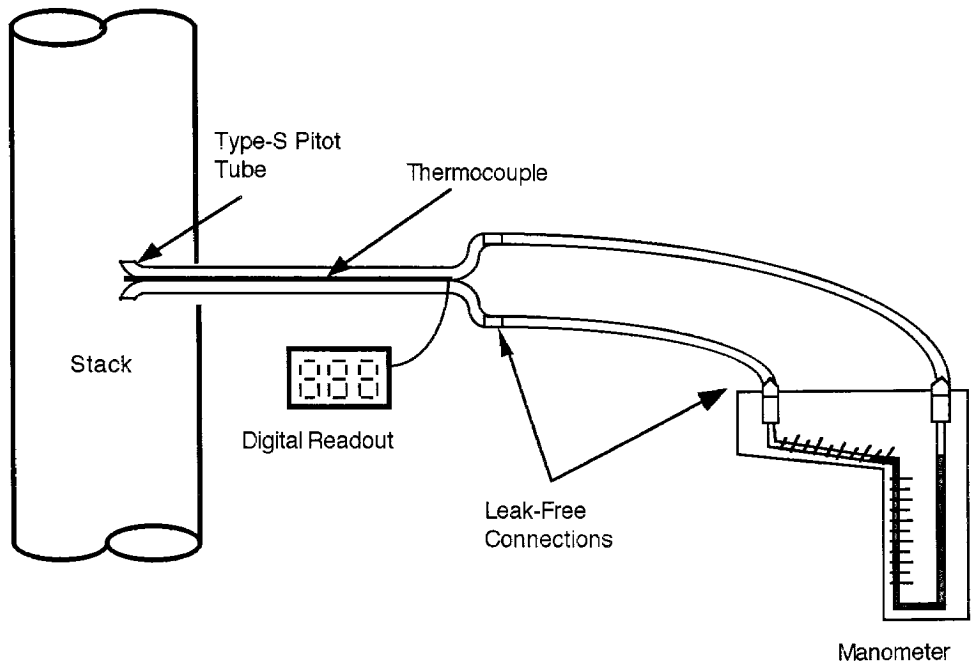


Figure 4-2: Velocity Sampling Apparatus (EPA Method 2)

METHODOLOGY

GAS COMPOSITION AND MOLECULAR WEIGHT - EPA METHOD 3

In order to determine the oxygen (O_2) concentration, carbon dioxide (CO_2) concentration and gas molecular weight, a time-integrated sample of the gas was obtained and analyzed in accordance with EPA Method 3. The gas sample was collected into a vinyl sample bag from the Method 4 testing. The contents of the bag were analyzed for O_2 and CO_2 concentrations using an Orsat gas analyzer.

MOISTURE CONTENT - EPA METHOD 4

The flue gas moisture content at the EP-5 Calciner Stack was determined in accordance with EPA Method 4. Figure 4-3 shows the major components of the EPA Method 4 sampling apparatus. The gas moisture was determined by quantitatively condensing the water in a chilled knock-out jar train. The amount of moisture condensed was determined volumetrically. A dry gas meter was used to measure the volume of gas sampled. The amount of water condensed and the volume of gas sampled were used to calculate the gas moisture content in accordance with EPA Method 4 calculations.

After passing through the probe, the sample gas entered a knock-out jar condenser system for drying of the gas. The condenser system consisted of four leak-free glass knock-out jars and rubber leak-free connectors. The first two knockout jars each contained 100 milliliters of distilled water. The third knock-out jar was empty, and the fourth contained 300 grams of silica gel. All four of the knock-out jars were placed in an ice bath for the duration of the test.

The metering system included a vacuum gauge, a leak-free pump, thermometers accurate to within ±5.0°F and a dry gas meter accurate to within 2%.

Before and after each test, the sample apparatus was leak checked. A leakage rate of less than the 0.02 cfm was considered acceptable.

SOLVAY2015_6_000946

METHODOLOGY

MOISTURE CONTENT (CONTINUED)

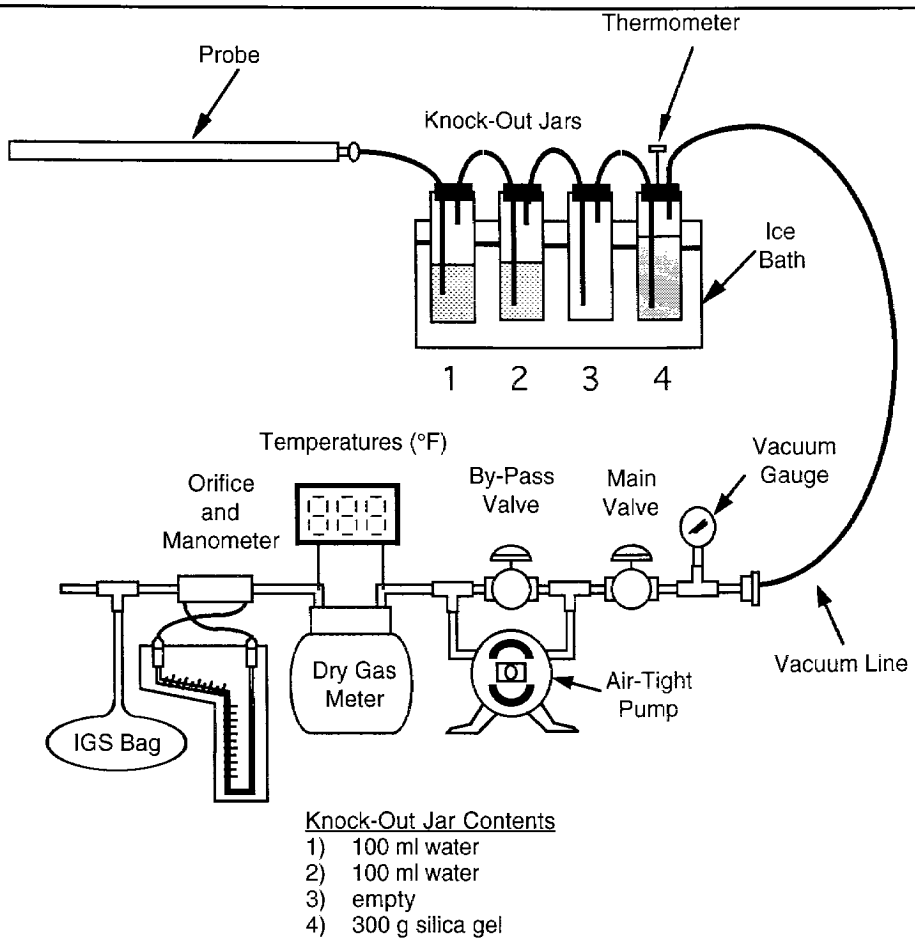


Figure 4-3: Moisture Sampling Apparatus (EPA Method 4)

SOLVAY2015_5_000947

METHODOLOGY

VOLATILE EMISSIONS TESTING - EPA METHOD 18

The analytical method used for on-site gas chromatography for air is detailed in the U.S. EPA Method 18: "Measurement of Gaseous Organic Compound Emissions by Gas Chromatography."

Figure 4-4 illustrates a general schematic of the monitoring system set up. A Hewlett Packard Benchtop Gas Chromatograph (GC) equipped with an FID (flame ionization detector) and TCD (thermal conductivity detector), was calibrated with a standard mixture containing the compounds of interest. An initial calibration consisting of five points was performed immediately after mobilization to the site. A known concentration of each compound was injected into the GC via a gas sampling valve. A continuous flow of gas was pushed through the valve at a constant rate and a five milliliter sample loop was filled with calibration gas.

In addition, an MTI 200 Gas Chromatograph coupled with a thermal conductivity detector was used for methane and ethane measurements.

At each test location a heated sample line was connected to the source and fed to the on-site GC. Data from the chromatograms was reduced by first identifying peaks. Compound identification is based upon retention time. Peaks from the sample gas were matched with retention times of the peaks from the known standards. Areas were calculated using a computer integrator. The area of the each peak was mathematically compared to the concentration for the standard most similar in area or the average response factor. Results were calculated in ppm of each analyte.

Table 4-2:
HP-GC Operating Conditions

Injection Temperature	250 F
Detector Temperature	250 F
Injection Size	5 ml
Carrier Type	Nitrogen
Carrier Flow Rate	26.5 ml/min
Ramp	40 F for 4 minutes, then 10 F/min to 100 F for 4 minutes
Column	Suplelco 1 GP 5% SP 1200/1.75% Bentone 34 on 100/120 Supelcoport 6 ft by 0.125 in stainless steel

SOLVAY2016_6_000948

METHODOLOGY

TOTAL HYDROCARBONS - EPA METHOD 25A

Gaseous monitoring of total hydrocarbon (THC) emissions from the EP-5 Calciner Stack was performed using EPA Method 25A. A gas sample was continuously extracted from the stack and delivered to a Flame Ionization Analyzer (FIA) which measured the THC concentration in the gas on a wet volumetric basis. The analyzer was calibrated on-site using certified mixtures of calibration gases.

Figure 4-4 contains a general schematic of the THC monitoring system. The system utilized a heated stainless steel probe for gas withdrawal. The end of the probe was equipped with a heated glass fiber filter for particulate removal. The exit of the probe was connected to a heated three-way stainless steel valve which facilitated system calibrations. A heated Teflon sample line delivered the sample gases from the stack to the instrumental system, which was located at ground level. The heated sample line was designed to maintain the gas temperature above 250°F in order to prevent condensation of stack gas moisture within the line.

The gas stream remained heated and was transported directly into a J.U.M. Engineering Model VE-7 Flame Ionization Analyzer. The THC analyzer contained a heated pump for gas delivery.

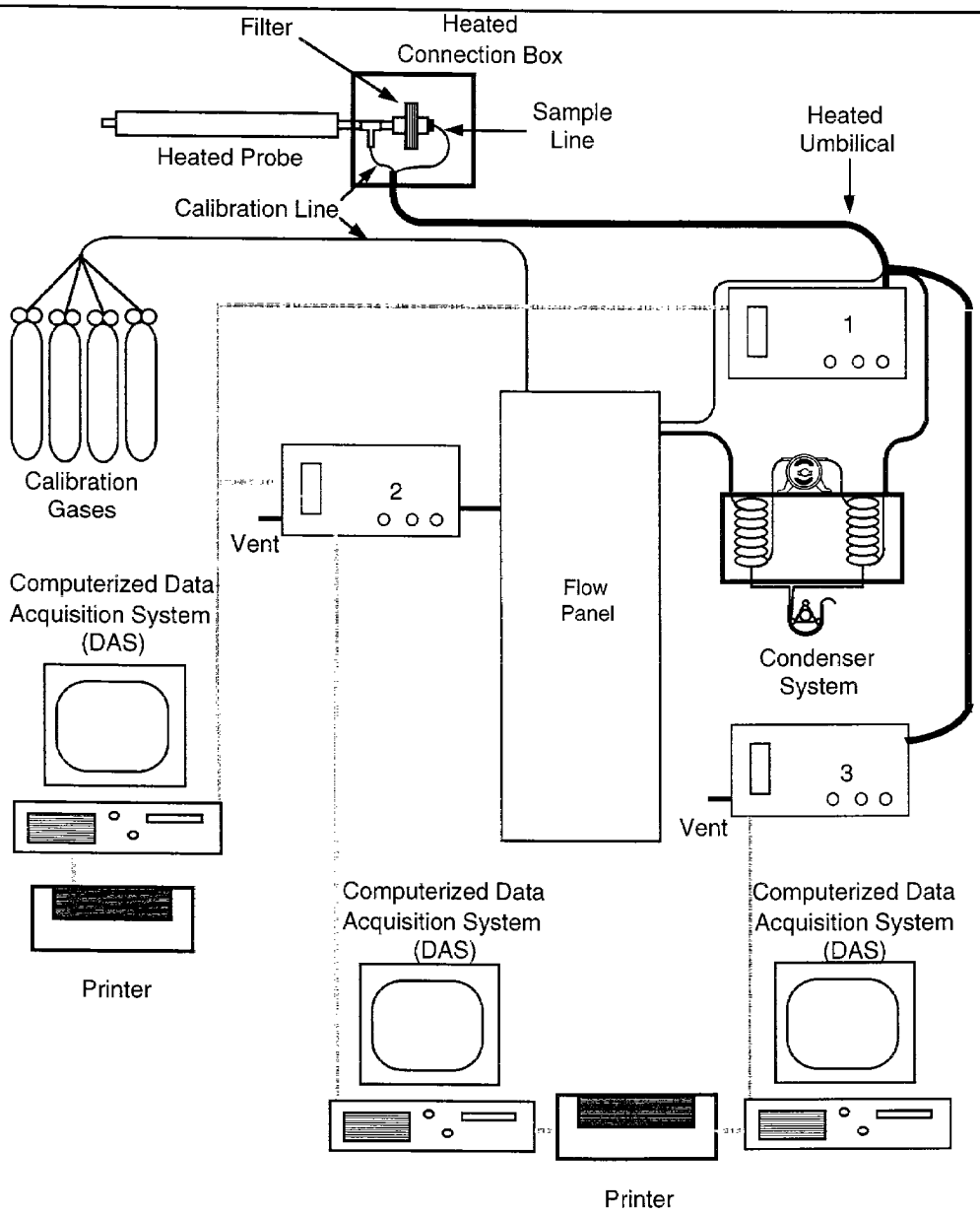
The analyzer was calibrated according to the reference method procedures using EPA Protocol No. 1 certified gas mixtures of propane in nitrogen. Before testing, the analyzer was calibrated by introducing zero and high-level (80-90% of span) gases into the sampling line at the exit of the heated probe and making any appropriate analyzer adjustments based on the analyzer response. Then, the calibration error of the system was determined by introducing low-level (25-35% of span) and mid-level (45-55% of span) gases into the analyzer system and recording the response without any adjustments made to the analyzer. The calibration errors for the low-level and mid-level gases were demonstrated to be less than 5% of the respective gas cylinder values.

Immediately following each of the three test runs, the zero gas and one up-scale gas were introduced into the sampling system to check for calibration drift. In order for a test run to be considered valid, the calibration drift between the pre-test and post-test calibrations were required to be demonstrated to be less than 3% of the analyzer span. The results of the pre-test and post-test drift checks were used to correct the average flue gas concentration measured during each test run for analyzer drift during that period.

SOLVAY2016_6_000949

METHODOLOGY

TOTAL HYDROCARBONS (CONTINUED)



No	Gas	Monitor	Range Used	Calibration Gas Concentrations
1)	THC	JUM 2938	0-1000 ppm	248.9 ppm, 564.5 ppm, 840.0 ppm
2)	GC	MTI 200 Gas Chromatograph		
3)	GC	HP Gas Chromatograph		

Figure 4-4: EPA Methods 25A and 18 Monitoring System Schematic

SOLVAY2016_6_000950

Appendix

APPENDIX

SAMPLE CALCULATIONS ..... A
PARAMETERS ..... B
CALIBRATION DATA C
FIELD DATA ..... D
FIELD DATA PRINTOUTS ..... E
OPERATING DATA ..... F
PERTINENT CERTIFICATIONS ..... G

A

SAMPLE CALCULATIONS

A

SAMPLE CALCULATIONS
EP-5 CALCINER STACK - RUN 1

The tables presenting the results are generated electronically from raw data. It may not be possible to exactly duplicate these results using a calculator. The reference method data, results and all calculations are carried to sixteen decimal places throughout. The final table is formatted to an appropriate number of significant figures.

1. Volume of water collected (wscf)

$$V_{wstd} = (0.04707)(V_{lc})$$
$$= (0.04707)(318.5)$$
$$= 14.99 \text{ wscf}$$

Where:

V_{lc}	total volume of liquid collected in impingers and silica gel (ml)
V_{wstd}	volume of water collected at standard conditions (ft^3)
0.04707	conversion factor (ft^3/ml)

2. Volume of gas metered, standard conditions (dscf)

$$V_{mstd} = \frac{(17.64)(V_m)\left(P_{bar} + \frac{\Delta H}{13.6}\right)(Y_d)}{(460 + T_m)}$$
$$= \frac{(17.64)(34.67)\left(23.69 + \frac{1.8}{13.6}\right)(0.9963)}{(460 + 70)}$$
$$= 27.39 \text{ dscf}$$

Where:

P_{bar}	barometric pressure (in. Hg)
T_m	average dry gas meter temperature (°F)
V_m	volume of gas sample through the dry gas meter at meter conditions (ft^3)
V_{mstd}	volume of gas sample through the dry gas meter at standard conditions (ft^3)
Y_d	gas meter correction factor (dimensionless)
ΔH	average pressure drop across meter box orifice (in. H_2O)
17.64	conversion factor (°R/in. Hg)
13.6	conversion factor (in. H_2O/in. Hg)
460	°F to °R conversion constant

SAMPLE CALCULATIONS (CONTINUED)

3. Sample gas pressure (in. Hg)

$$P_s = P_{bar} + \left(\frac{P_g}{13.6}\right)$$

$$= 23.69 + \left(\frac{-0.3}{13.6}\right)$$

$$= 23.67 \text{ in. Hg}$$

Where:

P_{bar}	barometric pressure (in. Hg)
P_g	sample gas static pressure (in. H_2O)
P_s	absolute sample gas pressure (in. Hg)
13.6	conversion factor (in. H_2O/in. Hg)

4. Actual vapor pressure (in. Hg)[1]

$$P_v = P_s$$

$$= 23.67 \text{ in. Hg}$$

Where:

P_v	vapor pressure, actual (in. Hg)
P_s	absolute sample gas pressure (in. Hg)

5. Moisture content (%)

$$B_{wo} = \frac{V_{wstd}}{V_{mstd} + V_{wstd}}$$

$$= \frac{14.99}{27.39 + 14.99}$$

$$= 0.3537$$

$$\times 100\% = 35.37\ \%$$

Where:

B_{wo}	proportion of water vapor in the gas stream by volume (%)
V_{mstd}	volume of gas sample through the dry gas meter at standard conditions (ft^3)
V_{wstd}	volume of water collected at standard conditions (ft^3)

[1] For effluent gas temperatures over 212°F, P_v is assumed to be equal to P_s.

SAMPLE CALCULATIONS (CONTINUED)

6. Saturated moisture content (%)

$$B_{ws} = \frac{(P_v)}{(P_s)}$$

$$= \frac{(23.67)}{(23.67)}$$

$$= 1.00$$

$$\times 100\% = 100\,\%$$

Where:

B_{ws}	proportion of water vapor in the gas stream by volume at saturated conditions (%)
P_s	absolute sample gas pressure (in. Hg)
P_v	vapor pressure, actual (in. Hg)

Whichever moisture value is smaller is used for B_{wo} in the following calculations.

7. Molecular weight of dry gas stream (lb/lb·mole)

$$M_d = M_{CO_2}\frac{(CO_2)}{(100)} + M_{O_2}\frac{(O_2)}{(100)} + M_{CO+N_2}\frac{(CO+N_2)}{(100)}$$

$$= 44.0\frac{(13.7)}{(100)} + 32.0\frac{(9.0)}{(100)} + 28.0\frac{(77.3)}{(100)}$$

$$= 30.55\frac{\text{lb}}{\text{lb}\cdot\text{mole}}$$

Where:

M_d	dry molecular weight of sample gas (lb/lb·mole)
M_{CO_2}	molecular weight of carbon dioxide (lb/lb·mole)
M_{O_2}	molecular weight of oxygen (lb/lb·mole)
$M_{CO}+N_2$	molecular weight of carbon monoxide and nitrogen (lb/lb·mole)
CO_2	proportion of carbon dioxide in the gas stream by volume (%)
O_2	proportion of oxygen in the gas stream by volume (%)
$CO+N_2$	proportion of carbon monoxide and nitrogen in the gas stream by volume (%)
100	conversion factor (%)

SAMPLE CALCULATIONS (CONTINUED)

8. Molecular weight of sample gas (lb/lb·mole)

$$M_s = (M_d)(1 - B_{wo}) + (M_{H_2O})(B_{wo})$$
$$= (30.55)(1 - 0.3537) + (18.0)(0.3537)$$
$$= 26.11 \frac{\text{lb}}{\text{lb} \cdot \text{mole}}$$

Where:

B_{wo}	proportion of water vapor in the gas stream by volume
M_d	dry molecular weight of sample gas (lb/lb·mole)
M_{H_2O}	molecular weight of water (lb/lb·mole)
M_s	molecular weight of sample gas, wet basis (lb/lb·mole)

9. Velocity of sample gas (ft/sec)

$$V_s = (K_p)(C_P)\left(\overline{\sqrt{\Delta P}}\right)\left(\sqrt{\frac{(\overline{T_s} + 460)}{(M_s)(P_s)}}\right)$$
$$= (85.49)(0.84)(0.399)\left(\sqrt{\frac{(311 + 460)}{(26.11)(23.67)}}\right)$$
$$= 32.0 \frac{\text{ft}}{\text{sec}}$$

Where:

K_p	velocity pressure constant $\left(\frac{\text{ft}}{\text{sec}}\left[\frac{(\text{lb/lb} \cdot \text{mole})(\text{in. Hg})}{(°\text{R})(\text{in. H}_2\text{O})}\right]\right)$
C_p	pitot tube coefficient
M_s	molecular weight of sample gas, wet basis (lb/lb·mole)
P_s	absolute sample gas pressure (in. Hg)
T_s	average sample gas temperature (°F)
V_s	sample gas velocity (ft/sec)
$\sqrt{\Delta P}$	average square roots of velocity heads of sample gas (in. H_2O)
460	°F to °R conversion constant

10. Total flow of sample gas (acfm)

$$Q_a = (60)(A_s)(V_s)$$
$$= (60)(85.90)(32.0)$$
$$= 164,800 \text{ acfm}$$

Where:

A_s	cross sectional area of sampling location (ft^2)
Q_a	volumetric flow rate at actual conditions (acfm)
V_s	sample gas velocity (ft/sec)
60	conversion factor (sec/min)

SAMPLE CALCULATIONS (CONTINUED)

11. Total flow of sample gas (dscfm)

$$Q_{std} = \frac{(Q_a)(P_s)(17.64)(1 - B_{wo})}{(\overline{T_s} + 460)}$$

$$= \frac{(164,800)(23.67)(17.64)(1 - 0.3537)}{(311 + 460)}$$

$$= 57,670 \text{ dscfm}$$

Where:

B_{wo}	proportion of water vapor in the gas stream by volume
P_s	absolute sample gas pressure (in. Hg)
Q_a	volumetric flow rate at actual conditions (acfm)
Q_{std}	volumetric flow rate at standard conditions, dry basis (dscfm)
T_s	average sample gas temperature (°F)
17.64	conversion factor (°R/in. Hg)
460	°F to °R conversion constant

12. Continuous emissions monitoring for total hydrocarbons (drift corrected in ppmwv)

$$C_{gas} = \left((C_{avg}) - \left(\frac{C_{oi} + C_{of}}{2}\right)\right)\frac{(C_{ma})}{\left(\left(\frac{C_{mi} + C_{mf}}{2}\right) - \left(\frac{C_{oi} + C_{of}}{2}\right)\right)}$$

$$= \left((105.7) - \left(\frac{6.1 + 10.5}{2}\right)\right)\frac{(248.9)}{\left(\left(\frac{246.5 + 240.7}{2}\right) - \left(\frac{6.1 + 10.5}{2}\right)\right)}$$

$$= 103.1 \text{ ppmwv}$$

Where:

C_{gas}	concentration corrected for drift (ppmwv)
C_{avg}	measured concentration in the gas stream (ppmwv)
C_{ma}	actual concentration of the upscale calibration gas (ppm)
C_{mi}	initial system calibration bias check response for the upscale calibration gas (ppm)
C_{mf}	final system calibration bias check response for the upscale calibration gas (ppm)
C_{oi}	initial system calibration bias check response for the zero gas (ppm)
C_{of}	final system calibration bias check response for the zero gas (ppm)

SAMPLE CALCULATIONS (CONTINUED)

13. Continuous emissions monitoring for total hydrocarbons as propane (moisture corrected to ppmdv)[1]

$$C_{ppmdv} = \frac{(C_{ppmwv})}{(1 - B_{wo})}$$

$$= \frac{(103.1)}{(1 - 0.3537)}$$

$$= 159.5 \text{ ppmdv}$$

Where:

B_{wo}	proportion of water vapor in the gas stream by volume
C_{ppmdv}	concentration calibrated for drift (ppmdv)
C_{ppmwv}	concentration calibrated for drift (ppmwv)

14. Continuous emissions monitoring for total hydrocarbons (lb/hr)[2]

$$E_{lb/hr} = \frac{(C_{ppm})(M_{THC})(Q_{std})(60)}{(385.3)(10^6)}$$

$$= \frac{(159.5)(44.10)(57,670)(60)}{(385.3)(10^6)}$$

$$= 63.2 \frac{lb}{hr}$$

Where:

C	measured concentration in the gas stream (ppmdv)
$E_{lb/hr}$	emission rate (lb/hr)
Q_{std}	volumetric flow rate at standard conditions, dry basis (dscfm)
M_{THC}	molecular weight of total hydrocarbons
10^6	conversion factor (ppm)
385.3	conversion factor (ft^3/lb·mole)
60	conversion factor (min/hr)

[1] The calculations for methane and volatile organic compounds are performed in a similar manner.

[2] The calculations for methane and volatile organic compounds are performed in a similar manner using their respective molecular weights.

SAMPLE CALCULATIONS (CONTINUED)

15. Continuous emissions monitoring for total hydrocarbons (lb/ton of trona)[1]

$$E_{lb/ton\ of\ trona} = \frac{(E_{lb/hr})}{(E_{ton\ of\ trona/hr})} = \frac{(63.2)}{(140)} = 0.451\ \frac{lb}{ton\ of\ trona}$$

Where:

$E_{lb/hr}$	emission rate (lb/hr)
$E_{ton\ of\ trona/hr}$	feed rate (ton of trona/hr)
$E_{lb/ton\ of\ trona}$	emission rate (lb/ton of trona)

16. Total non-methane hydrocarbons (lb/hr)

$$E_{lb/hr} = (E_{lb/hr THC's}) - (E_{lb/hr\ methane}) = (63.2) - (18.5) = 44.7\ lb/hr\ total\ non-methane\ hydrocarbons$$

Where:

$E_{lb/hr}$	emission rate (lb/hr-total non-methane hydrocarbons)
$E_{lb/hr\ THC's}$	emission rate (total hydrocarbons)
$E_{lb/hr\ methane}$	emission rate (methane)

METHOD 18 SAMPLE CALCULATIONS
EP-5 CALCINER STACK - RUN 1
BUTADIENE (GAS) and HEXANE (LIQUID)

17. Volume of air used to dilute calibration standards (L)--tedlar bag preparation of G.C. calibration standards

$$V_m = \left(\frac{V_{pre} + V_{post}}{2}\right)(t) = \left(\frac{2.51 + 2.51}{2}\right)(15.0) = 37.65L$$

Where:

V_m	volume of air used to dilute calibration standards (L)
V_{pre}	air flow measured before filling bag (L/min)
V_{post}	air flow measured after filling bag (L/min)
t	time used to fill bag (min)

[1] The calculations for methane and volatile organic compounds are performed in a similar manner.

SAMPLE CALCULATIONS (CONTINUED)

18. Organic standard concentration (ppm)--tedlar bag preparation of gas phase G.C. calibration standards

$$C_s = \frac{(V_g)(F_g)}{(V_m)}(1{,}000{,}000)$$

$$= \frac{(0.07)(1.0)}{(37650)}(1{,}000{,}000)$$

$$= 1.86\,\text{ppm}$$

Where:

C_s	concentration of calibration standard in tedlar bag (ppm)
V_g	volume of gas phase calibration standard added to tedlar bag (mL)
V_m	volume of air used to dilute calibration standards (mL)
F_g	percent purity of calibration gas added to bag
1,000,000	conversion of ratio to ppmwv

19. Organic standard concentration (ppm)--tedlar bag preparation of liquid phase G.C. calibration standards

$$C_s = \frac{(\partial)(V_l)(T)}{(M_{wt})(453.6)(V_m)(P)}(21.85)(28.3)(1{,}000)$$

$$= \frac{(0.663)(1.0)(529.67)}{(86.18)(453.6)(37.65)(23.78)}(21.85)(28.3)(1{,}000)$$

$$= 6.20\,\text{ppm}$$

Where:

C_s	concentration of calibration standard in tedlar bag (ppm)
∂	density of liquid phase calibration standard (g/mL)
V_l	volume of liquid phase calibration standard added to tedlar bag (µL)
T	bag temperature (°R)
21.85	ideal gas constant (in Hg-ft^3/lbmol-°R)
28.3	conversion factor for liters to cubic feet (L/ ft^3)
1,000	conversion factor to ppm
M_{wt}	molecular weight (lb/lbmol)
453.6	conversion factor for grams to pounds (g/lb)
V_m	volume of air used to dilute calibration standards (L)
P	bag pressure (in Hg.)

SAMPLE CALCULATIONS (CONTINUED)

20. Calibration standard G.C. response factor (ppm/units of area)--(hexane G.C. calibration)

$$F_r = \frac{(C_s)}{(\bar{A})}$$

$$= \frac{(6.20)}{(185885)}$$

$$= 3.337E-05 \text{ ppm / units of area}$$

Where:

F_r	calibration standard G.C. response factor (ppm/units of area)
C_s	concentration of calibration standard in tedlar bag (ppm)
$\bar{A}$	average peak area obtained from 3 to 4 injects per tedlar bag (units of area)

Note: The above equation is used to obtain a response factor for each calibration standard from one calibration bag. To calibrate the G.C., several calibration bags with known concentrations are used. A calibration curve of concentration vs. area is then developed. A linear regression is used to determine the concentration from the peak area, as shown below.

21. Limit of detection (ppmwv-hexane)

$$LOD = (Sd)(t_{0.99,(n-1)})$$

$$= \left(\sqrt{\frac{1}{n-1}\left[\sum_{i=1}^{n} X_i^2 - \left(\sum_{i=1}^{n} X_i\right)^2 \div n\right]}\right)(t_{0.99,(n-1)})$$

$$= \left(\sqrt{\frac{1}{11-1}\left[(5.08^2 + 4.97^2 ...) - (5.08 + 4.97...)^2 \div 11\right]}\right)(2.764)$$

$$= 0.46 \text{ ppmwv}$$

Where:

LOD	limit of detection (ppmwv)
Sd	Standard deviation of the results from from processing a calibration standrd with the linear regression equation
$t_{0.99,(n-1)}$	Students "T" value, appropiate for a 99% confidence level and a standard deviation estimate with n-1 degrees of freedom Obtained from 40 CFR App. B to Part 136 "Definition and Procedure for the Determination of the Method Detection Limit-Revision 1.11"

SAMPLE CALCULATIONS (CONTINUED)

22. Concentration of analyte in gas stream per inject (hexane ppmwv)

$$C_i = \frac{(A - b)}{m}$$

$$= \frac{(49022 - (-6960))}{(37900)}$$

$$= 1.477 \text{ ppmwv}$$

Where:

C_i	measured concentration of analyte in gas stream per inject (ppmwv)
A	peak area (units of area)
b	y-intercept from linear regression equation (units of area)
m	slope from linear regression equation (units of area/ppmwv)

23. Concentration of analyte in gas stream per run (hexane ppmwv)

$$C = \frac{(C_1 + C_2 + \ldots + C_n)}{n}$$

$$= 1.18 \text{ ppmwv}$$

Where:

C	average run concentration obtained from 3 to 4 injects per run (ppmwv)
C_1	measured concentration of analyte in gas stream per inject (ppmwv)
C_2	measured concentration of analyte in gas stream per inject (ppmwv)

B

PARAMETERS

B

SOLVAY MINERALS, INC.
CAE Project No: 7594-1
EP 5 Calciner Stack

VELOCITY AND MOISTURE PARAMETERS

Run No.		1	2	3
Date (1995)		October 29	October 29	October 29
Start Time (approx.)		09:20	10:49	12:15
Stop Time (approx.)		10:05	11:34	13:00
Sampling Conditions				
Y_d	Dry gas meter correction factor	0.9963	0.9963	0.9963
C_p	Pitot tube coefficient	0.84	0.84	0.84
P_g	Static pressure (in. H_2O)	-0.3	-0.2	-0.2
A_s	Sample location area (ft^2)	85.90	85.90	85.90
P_b	Barometric pressure (in. Hg)	23.69	23.69	23.69
O_2	Oxygen (dry volume %)	9.0	9.0	9.0
CO_2	Carbon dioxide (dry volume %)	13.7	13.8	13.8
V_{lc}	Liquid collected (ml)	318.5	338.5	348.5
V_m	Volume metered, meter conditions (ft^3)	34.67	35.17	35.86
T_m	Dry gas meter temperature (°F)	70	77	82
T_s	Stack temperature (°F)	311	315	315
ΔH	Meter box orifice pressure drop (in. H_2O)	1.80	1.80	1.80
Flow Results				
V_{wstd}	Volume of water collected (ft^3)	14.99	15.93	16.40
V_{mstd}	Volume metered, standard (ft^3)	27.39	27.40	27.68
P_s	Sample gas pressure, absolute (in. Hg)	23.67	23.68	23.68
P_v	Vapor pressure, actual (in. Hg)	23.67	23.68	23.68
B_{wo}	Moisture in sample (% by volume)	35.37	36.77	37.21
B_{ws}	Saturated moisture (% by volume)	100.00	100.00	100.00
$\sqrt{\Delta P}$	Velocity head ($\sqrt{in.}$ H_2O)	0.399	0.404	0.403
M_d	MW of sample gas, dry (lb/lb-mole)	30.55	30.57	30.57
M_s	MW of sample gas, wet (lb/lb-mole)	26.11	25.95	25.89
V_s	Velocity of sample (ft/sec)	32.0	32.6	32.5
Q_a	Volumetric flow rate, actual (acfm)	164,800	168,100	167,700
Q_{std}	Volumetric flow rate, standard (dscfm)	57,670	57,280	56,730

SOLVAY MINERALS, INC.
CAE Project No: 7594-1
EP-5 Calciner Stack

TOTAL HYDROCARBON PARAMETERS

Run No.		1	2	3
Date (1995)		October 29	October 29	October 29
Start Time (approx.)		09:19	10:48	12:14
Stop Time (approx.)		10:19	11:48	13:14
Process Conditions[1]				
Feed rate (tons/hr of trona)		140	140	140
Gas Conditions[2]				
O_2	Oxygen (dry volume %)	9.0	9.0	9.0
CO_2	Carbon dioxide (dry volume %)	13.7	13.8	13.8
B_{wo}	Moisture in sample (% by volume)	35.37	36.77	37.21
Q_{std}	Volumetric flow rate, standard (dscfm)	57,670	57,280	56,730
Total Hydrocarbons (as propane)				
Data Acquisition				
C	Effluent gas concentration (ppmwv)	105.7	104.7	124.7
Calibration Gases				
C_{bi}	Calibration bias check, initial zero gas	6.1	10.5	6.2
C_{mi}	Calibration bias check, initial upscale gas	246.5	240.7	246.5
C_{bf}	Calibration bias check, final zero gas	10.5	6.2	4.0
C_{mf}	Calibration bias check, final upscale gas	240.7	246.5	254.8
C_{ma}	Actual concentration of upscale gas	248.90	248.90	248.90
Calculated Results				
C_{gas}	Concentration drift corrected (ppmwv)	103.1	101.9	121.2
C_{gas}	Concentration moisture corrected (ppmdv)	159.5	161.2	193.1
E	Emission rate (lb/hr)	63.2	63.4	75.2
E	Emission rate (lb/ton of trona)	0.4512	0.4529	0.5373
Methane				
C	Effluent gas concentration (ppmdv)	128.4	148.2	168.5
E	Emission rate (lb/hr)	18.5	21.2	23.9
E	Emission rate (lb/ton of trona)	0.132	0.151	0.171
Total Non-Methane Hydrocarbons (as propane)				
E	Emission rate (lb/hr)	44.7	42.2	51.3
E	Emission rate (lb/ton of trona)	0.319	0.301	0.367

[1] Feed rate provided by Solvay Minerals, Inc.
[2] Gas conditions taken from simultaneous velocity-moisture testing

SOLVAY MINERALS, INC.
CAE Project No: 7594-1
EP-5 Calciner Stack

VOLATILE ORGANICS PARAMETERS

Run No.		1	2	3	Average
Date (1995)		October 29	October 29	October 29	
Start Time (approx.)		9:18	10:51	12:13	
Stop Time (approx.)		10:18	11:51	13:12	
Process Conditions[1]					
	Feed rate (ton of trona/hr)	140	140	140	140
Gas Conditions[2]					
B_{wo}	Moisture (% by volume)	35.37	36.77	37.21	36.45
Q_{std}	Volumetric flow rate, standard (dscfm)	57,670	57,280	56,730	57,227
1,1,1-Trichloroethane					
C	Concentration (ppmwv)	BDL	BDL	BDL	BDL
C	Concentration (ppmdv)	BDL	BDL	BDL	BDL
E	Emission rate (lb/hr)	BDL	BDL	BDL	BDL
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	BDL
1,3 Butadiene					
C	Concentration (ppmwv)	BDL	BDL	BDL	BDL
C	Concentration (ppmdv)	BDL	BDL	BDL	BDL
E	Emission rate (lb/hr)	BDL	BDL	BDL	BDL
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	BDL
Acrylonitrile					
C	Concentration (ppmwv)	BDL	BDL	BDL	BDL
C	Concentration (ppmdv)	BDL	BDL	BDL	BDL
E	Emission rate (lb/hr)	BDL	BDL	BDL	BDL
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	BDL
Benzene					
C	Concentration (ppmwv)	1.71	1.81	2.32	1.95
C	Concentration (ppmdv)	2.65	2.86	3.69	3.07
E	Emission rate (lb/hr)	1.86	1.99	2.55	2.13
E	Emission rate (lb/ton of trona)	0.013	0.014	0.018	0.015
Ethyl Benzene					
C	Concentration (ppmwv)	BDL	BDL	BDL	BDL
C	Concentration (ppmdv)	BDL	BDL	BDL	BDL
E	Emission rate (lb/hr)	BDL	BDL	BDL	BDL
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	BDL
Hexane					
C	Concentration (ppmwv)	1.18	1.14	1.50	1.27
C	Concentration (ppmdv)	1.83	1.80	2.39	2.01
E	Emission rate (lb/hr)	1.41	1.39	1.82	1.54
E	Emission rate (lb/ton of trona)	0.010	0.010	0.013	0.011
Methylene Chloride					
C	Concentration (ppmwv)	BDL	BDL	BDL	BDL
C	Concentration (ppmdv)	BDL	BDL	BDL	BDL
E	Emission rate (lb/hr)	BDL	BDL	BDL	BDL
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	BDL
Styrene					
C	Concentration (ppmwv)	BDL	BDL	BDL	BDL
C	Concentration (ppmdv)	BDL	BDL	BDL	BDL
E	Emission rate (lb/hr)	BDL	BDL	BDL	BDL
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	BDL

SOLVAY MINERALS, INC.
CAE Project No: 7594-1
EP-5 Calciner Stack

VOLATILE ORGANICS PARAMETERS

Run No.		1	2	3	Average
Date (1995)		October 29	October 29	October 29	
Start Time (approx.)		9:18	10:51	12:13	
Stop Time (approx.)		10:18	11:51	13:12	
Process Conditions[1]					
	Feed rate (ton of trona/hr)	140	140	140	140
Gas Conditions[2]					
B_{wo}	Moisture (% by volume)	35.37	36.77	37.21	36.45
Q_{std}	Volumetric flow rate, standard (dscfm)	57,670	57,280	56,730	57,227
Toluene					
C	Concentration (ppmwv)	BDL	BDL	BDL	BDL
C	Concentration (ppmdv)	BDL	BDL	BDL	BDL
E	Emission rate (lb/hr)	BDL	BDL	BDL	BDL
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	BDL
Trichloroethene					
C	Concentration (ppmwv)	BDL	BDL	BDL	BDL
C	Concentration (ppmdv)	BDL	BDL	BDL	BDL
E	Emission rate (lb/hr)	BDL	BDL	BDL	BDL
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	BDL
Xylene					
C	Concentration (ppmwv)	BDL	BDL	BDL	BDL
C	Concentration (ppmdv)	BDL	BDL	BDL	BDL
E	Emission rate (lb/hr)	BDL	BDL	BDL	BDL
E	Emission rate (lb/ton of trona)	BDL	BDL	BDL	BDL

BDL indicates value was below the detection limit.
[1] Process conditions provided by Solvay Minerals, Inc.
[2] Gas conditions are taken from simultaneous velocity-moisture test.

CALIBRATION DATA

C

Meter Box Post Test Calibration

Client/Owner: SOLVAY MINERALS

Date: 11-02-95

Project Number: 7594

Operator: D. CHIOVARE

Meter Box No.: 66-12	Meter Box Vacuum: 5 Hg	Meter Box Yd: .9963	Barometric Pressure: 25.10

				Standard Meter Gas Volume			Meter Box Gas Volume (ft^3)			Std. Meter Temperature (°F)			Meter Box Temperature (°F)					
Q	ΔH	ΔP	Y_{ds}	Initial	Final	V_{ds} Net	Initial	Final	V_d Net	In	Out	T_{ds} Ave.	In	T_o Out	T_d Ave.	Θ Time	Y_d	ΔH@
.58	1.4	-2.7	1.0000	0	10.008	10.008	758.109	768.134	10.025	65	65	65	82	73.5	77.75	14.43	1.0103	1.9110
.58	1.4	-2.6	1.0000	0	10.001	10.001	768.134	778.168	10.034	65	65	65	83	74	78.50	14.47	1.0104	1.9225
.58	1.4	-2.6	1.0000	0	10.001	10.001	778.168	788.213	10.045	65	65	65	83	74	78.50	14.50	1.0093	1.9305
																Average	1.0100	

Nomenclature	
P_b	Barometric Pressure (in. Hg)
Q	Flow Rate (cfm)
ΔH	Orifice Pressure Differential (in. H_20)
ΔP	Inlet Pressure Differential (in. H_20)
V_d	Gas Meter Volume - Dry (ft^3)
V_{ds}	Standard Meter Volume - Dry (ft^3)
T_d	Average Meter Box Temperature (°F)
T_o	Outlet Meter Box Temperature (°F)
T_{ds}	Average Standard Meter Temperature (°F)
Y_d	Meter Correction Factor (unitless)
Y_{ds}	Standard Meter Correction Factor (unitless)
ΔH@	Orifice Pressure Differential giving 0.75 cfm of air at 68°F and 29.92 in. Hg (in. H_20)

Equations

$$Y_d = (Y_{ds})\left[\frac{V_{ds}}{V_d}\right]\left[\frac{T_d + 460}{T_{ds} + 460}\right]\left[\frac{P_b + \Delta P/13.6}{P_b + \Delta H/13.6}\right]$$

$$\Delta H@ = \frac{0.0319(\Delta H)}{P_b(T_o + 460)}\left[\frac{(T_{ds} + 460)\,\Theta}{(V_{ds})(Y_{ds})}\right]^2$$

$$Q = \frac{17.64\,(V_{ds})(P_b)}{(T_{ds} + 460)(\Theta)}$$

SOLVAY2016_6_000973

002 Post Test-English
VS/TRG R2 2/7/94

Cle Air Engineering

Meter Box Full Test Calibration

Date: 10-02-95

Operator: D. CHIOVARE

Meter Box No.: 66-12	Meter Box ΔH@: 1.8909	Meter Box Yd: .9963	Barometric Pressure: 25.08

				Standard Meter Gas Volume			Meter Box Gas Volume (ft^3)			Std. Meter Temperature (°F)			Meter Box Temperature (°F)					
Q	ΔH	ΔP	Y_{ds}	Initial	Final	V_{ds} Net	Initial	Final	V_d Net	In	Out	T_{ds} Ave.	In	T_o Out	T_d Ave.	Θ Time	Y_d	ΔH@
.34	.5	-.9	1.0000	0	5.001	5.001	130.312	135.578	5.266	72	72	72	95	91.5	93.25	11.89	.9835	1.8443
.34	.5	-.9	1.0000	0	10.000	10.000	135.578	146.091	10.513	72	72	72	94	90.5	92.25	23.81	.9833	1.8536
.59	1.5	-2.0	1.0000	0	10.000	10.000	089.613	100.010	10.397	72	72	72	101	93	97	13.93	.9967	1.8947
.59	1.5	-1.8	1.0000	0	10.002	10.002	110.610	121.017	10.407	72	72	72	100	93	96.5	14.00	.9956	1.9130
.83	3.0	-3.1	1.0000	0	10.003	10.003	045.193	055.413	10.220	71	71	71	102.5	92	97.25	9.93	1.0089	1.9192
.83	3.0	-3.1	1.0000	0	17.505	17.886	055.413	073.299	17.886	71	71	71	103.5	92.5	98	17.39	1.0102	1.9203
																Average	.9963	1.8909

Nomenclature

- P_b Barometric Pressure (in. Hg)
- Q Flow Rate (cfm)
- ΔH Orifice Pressure Differential (in. H_20)
- ΔP Inlet Pressure Differential (in. H_20)
- V_d Gas Meter Volume - Dry (ft^3)
- V_{ds} Standard Meter Volume - Dry (ft^3)
- T_o Average Meter Box Temperature (°F)
- T_d Outlet Meter Box Temperature (°F)
- T_{ds} Average Standard Meter Temperature (°F)
- Y_d Meter Correction Factor (unitless)
- Y_{ds} Standard Meter Correction Factor (unitless)
- ΔH@ Orifice Pressure Differential giving 0.75 cfm of air at 68°F and 29.92 in. Hg (in. H_20)

Equations

$$Y_d = (Y_{ds})\left[\frac{V_{ds}}{V_d}\right]\left[\frac{T_d + 460}{T_{ds} + 460}\right]\left[\frac{P_b + \Delta P / 13.6}{P_b + \Delta H / 13.6}\right]$$

$$\Delta H@ = \frac{0.0319(\Delta H)}{P_b(T_o + 460)}\left[\frac{(T_{ds} + 460)\,\Theta}{(V_{ds})(Y_{ds})}\right]^2$$

$$Q = \frac{17.64\,(V_{ds})(P_b)}{(T_{ds} + 460)(\Theta)}$$

Calibrations

Vacuum Gauge		Thermometers		
Standard (in. Hg)	Vacuum Gauge	Standard (°F)	Inlet	Outlet

SOLVAY2016_000974

Pyrometer Calibration Sheet

PYROMETER NUMBER: 66-12 DATE: 10-02-95
CALIBRATED BY: D. CHIOVARE OFFICE DENVER

Calibration Reference Setting	FARENHEIT
50	50°
100	100°
150	150°
200	201°
250	252°
300	301°
350	351°
400	400°
450	449°
500	499°
550	549°
600	600°

CALIBRATION REFERENCE INFORMATION

Reference Used: Digimite/ Other: THERMOMETER/CALIBRATOR

Serial Number: T87031

Calibrated By: OMEGA Date Calibrated: 10-31-94

Calibration Report Number: 41091582 6

SAMPLE PROBE CALIBRATION DATA

Probe Type & I.D. number: 17-8-94-2 8' S type

Thermocouple Calibration

Reference Type: _____ Reference I.D. No: _____ Pyrometer I.D. No: _____ Degrees: F / C

Point No.	Target Temp.	Reference Temp	Indicated Temp	Temp Difference	% Difference
1	ice-32F				
2	ambient-70F				
3	hot oil-160F				
4	boiling H2O-212F				
5	hot oil-320F				

Specification: %Difference ≤ 1.5

Does assembly meet specifications? YES / NO— *If "NO" thermocouple must be replaced.*

Geometric Pitot Calibration — Diagram on reverse

Is pitot assembly in good repair? YES / NO If "NO" explain: _____

[Ø] "0" Pitot

Measurement		Specification
α1= 0	α2= 1	<10°
β1= 1	β2= 8	<5°
γ= 2	θ= 8	
Pa= .348	Pb= .348	Pa + Pb = A
A= .696	Dt= .350	

Calculations

z = A sin(γ)=	.0242	<0.125"
w = A sin(θ)=	0.0	<0.03125"

Does assembly meet specifications? YES / NO —— *If "YES" "S" pitot Cp=0.84; Std pitot Cp=0.99*
If "NO" wind tunnel calibration is required.

[ ] Standard Pitot

Measurement		Specification
Tube O.D.	"	(D)
Static Hole I.D.	"	(D X 0.1)
Length,		
Tip to Static	"	(8 X D Minimum)
Static to Bend	"	(8 X D Minimum)

Does assembly meet specifications? YES / NO

Wind Tunnel Pitot Calibration

Reference Pitot I.D. No: _____ Reference Pitot Cp: _____

SIDE A:

Trial No.	Reference ΔP	Probe ΔP	Probe Cp	Cp Deviation
1				
2				
3				
		Average Probe Cp=		
		Side A "S" =		

SIDE B:

Trial No.	Reference ΔP	Probe ΔP	Probe Cp	Cp Deviation
1				
2				
3				
		Average Probe Cp=		
		Side B "S" =		

Where,
Probe Cp=√(Reference ΔP / Probe ΔP)
Cp Deviation=Probe Cp - Average Probe Cp
"S" =√((Σ (Reference Cp - Cp Deviation))/2)

Specification
Avg Cp Side A - Avg Cp Side B < 0.01
and
"S" Side A and "S" Side B ≤ 0.02

Does assembly meet specifications? YES / NO —— *If "YES" Cp=Average of A and B Side Cp values.*
If "NO" pitot must be replaced.

PROBE Cp = .84 Calibrated by: EM Date: 8-29-95

SOLVAY2016_6_000976

Reference Method Sampling System

Client: SOLVAY MINERALS, INC.
Plant: GREEN RIVER, WY
Unit: EP-1-2
Location: STACK
Run #'s: 1-3

Job #: 7594
Operator: S.F.
Date: 10/27/95 - 10/29
Data Acquisition: Chart / Computer
File Names: RUN5 BIAS

Instrumentation Data for Reference Method:

#	Constituent	Manufacturer	Serial/Asset#	Range Used	Oper. Principle	Units Reported
1	NOx	TECO 10	2566	0-100	CHEMILUMINESCENCE	PPMd lb/hr lb/MMBtu
2	CO	TECO 48	2763	0-1000	GFC	PPMd lb/hr lb/MMBtu
3	THC	JUM	2938	0-1000	FID	PPMd lb/hr lb/MMBtu
4						
5						
6						

Reference Method System Performance Checks:

System Leak Check Passed:
System Response Time:
Calibration Error Check Passed:

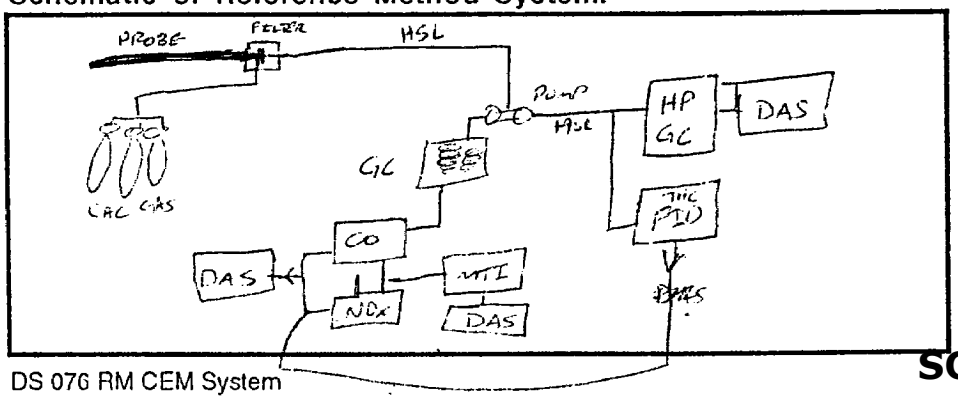
RATA: Yes (No) (circle one)
If yes, circle the units the RATA is based on, and include DS 077 to describe the facility's CEM system.

Calibration Materials Data:

#	Constituent	Concentration	Cylinder ID	Protocol?
1	NOx	46.00	ALM056815	(YES) / NO
2	NOx	83.70	ALM056735	(YES) / NO
3	CO	455.3	ALM009203	(YES) / NO
4	CO	848.8	ALM018577	(YES) / NO
5	THC PROPANE	248.9	AAL11968	(YES) / NO
6	THC PROPANE	564.5	AAL19102	(YES) / NO
7	THC PROPANE	840.0	ALM031351	(YES) / NO
8				YES / NO
9				YES / NO
10				YES / NO
11				YES / NO
12				YES / NO
13				YES / NO
14				YES / NO

Comments:

Schematic of Reference Method System:



DS 076 RM CEM System
EXCL/TRG.R1-2/4/94

SOLVAY2016-6-000977

Clean Air Engineering

Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (313) 589-2950 FAX: (313) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
CAE INSTRUMENTAL RENTAL
246 WOODWORK LANE
PALATINE, IL. 60067-9760

Assay Laboratory
Scott Specialty Gases, Inc.
1290 Combermere
Troy, MI 48083

Purchase Order 10084-71500
Scott Project # 559258

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure #G1, Section Number 3.0.4

Cylinder Number AAL11968
Cylinder Pressure 1900 psig
Certification Date 12-6-93
Previous Certification Dates None
Expiration Date 12-6-96

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Propane	248.9 ppm	±1% NIST Directly Traceable

Balance Gas: Nitrogen

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
CRM 2646	12-31-93	AAL-18432	973.2 ppm Propane in N_2

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
Prop: Beckman/400/1002059	12-6-93	Flame Ionization Detector

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components	First Triad Analysis	Second Triad Analysis	Calibration Curve
Propane	Date: 12-6-93 Response Units: mv Z1=0.00 R1=96.40 T1=24.60 R2=96.40 Z2=0.00 T2=24.60 Z3=0.00 T3=24.60 R3=96.40 Avg. Conc. of Cust. Cyl. 248.9 ppm		Concentration=A+Bx+Cx^2+Dx^3+Ex^4 r=0.99999 CRM 2646 Constants: A=0.7421058 B=10.10758 C=0 D=0 E=0
			Concentration=A+Bx+Cx^2+Dx^3+Ex^4
			Concentration=A+Bx+Cx^2+Dx^3+Ex^4

Special Notes

SOLVAY2016_6_000978

Analyst Frank P. Doran

Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (810) 589-2950 FAX:(810) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
C A E INSTRUMENT RENTAL
246 WOODWORK LANE
PALATINE, IL 60067

Assay Laboratory
Scott Specialty Gases, Inc
1290 Combermere
Troy, MI 48083

Purchase Order : 12021-71500
Scott Project # : 570587

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay and Certification of Gaseous Calibration Standards; Procedure G1; September, 1993.

Cylinder Number : AAL19102
Cylinder Pressure + : 1900 psig
Certificate Date : 9/7/94
Previous Certificate Date : None
Expiration Date : 9/7/97

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Propane	564.5 ppm	±1% NIST Directly Traceable

Balance Gas: Nitrogen

+Do not use when cylinder presssure is below 150 psig.
*Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
NTRM 2646	10/14/95	AAL18426	973.2 ppm Propane in Nitrogen

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
Propane : Beckman/400/1002059	8/15/94	Flame Ionization Detection

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components
Propane

First Triad Analysis

Date: 9/7/94	Response Units: mv	
Z1=0.00	R1=97.30	T1=56.60
R2=97.30	Z2=0.00	T2=56.30
Z3=0.00	T3=56.40	R3=97.30
Avg. Conc. of Cust. Cyl. 564.5 ppm		

Second Triad Analysis

Calibration Curve

Concentration=A+Bx+Cx^2+Dx^3+Ex^4	
r=1.00000	NTRM 2646
Constants:	A=0.049241000
B=10.002000000	C=0.000000000
D=0.000000000	E=0.000000000

Special Notes

Matt L. Bass
Analyst

SOLVAY2016_6_000979

MISP/P-1

Scott Specialty Gases, Inc.

1290 COMBERMERE STREET, TROY, MI 48083 (313) 589-2950 FAX: (313) 589-2134

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
C A E INSTRUMENT RENTAL
246 WOODWORK LANE
PALATINE IL 60067-9760

Assay Laboratory
Scott Specialty Gases, Inc.
1290 Combermere
Troy, MI 48083

Purchase Order 10367-71500
Scott Project # 560647

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure #G1, Section Number 3.0.4

Cylinder Number ALM031351
Cylinder Pressure 1900 psig
Certification Date 1-26-94
Previous Certification Dates None
Expiration Date 1-26-97

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Propane	840.0 ppm	±1% NIST Directly Traceable

Balance Gas: Nitrogen

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
CRM 2646	12-31-93	AAL-18432	973.2 ppm Propane in N_2

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
Prop: Beckman/400/1002059	1-6-94	Flame Ionization Detector

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components	First Triad Analysis	Second Triad Analysis	Calibration Curve
Propane	Date: 1-26-94 Response Units: mv Z1=0.00 R1=96.40 T1=83.20 R2=96.40 Z2=0.00 T2=83.20 Z3=0.00 T3=83.20 R3=96.40 Avg. Conc. of Cust. Cyl. 840.0 ppm		Concentration=A+Bx+Cx^2+Dx^3+Ex^4 r=0.99999 CRM 2646 Constants: A=0.7421058 B=10.10758 C=0 D=0 E=0
			Concentration=A+Bx+Cx^2+Dx^3+Ex^4
			Concentration=A+Bx+Cx^2+Dx^3+Ex^4

Special Notes

Analyst Frank P. Doran

SOLVAY2016_6_000980

Scott Specialty Gases, Inc.

Shipped From: 1290 COMBERMERE STREET
TROY MI 48083
Phone: 313-589-2950 Fax: 313-589-2134

CERTIFICATE OF ANALYSIS

C A E INSTRUMENT RENTAL
246 WOODWORK LANE
PALATINE IL 60067

PROJECT #: 05-43552
PO#: 6917-71500
ITEM #: 05022713 2AL
DATE: 11/03/92

CYLINDER #: ALM016855 ANALYTICAL ACCURACY: +-1%

COMPONENT	REQUESTED GAS CONC MOLES	ANALYSIS (MOLES)
METHANE	.95 PCT	.9550 PCT
AIR	BAL	BAL

ACUBLEND MASTER GAS
ALM028732 ALM030335

ANALYTICAL METHOD: AMG

ANALYST: [signature]
ANALYST

APPROVED BY: [signature]
SUPERVISOR

SOLVAY2016 6 000981

SOLVAY MINERALS, INC.
CAE Project No: 7594
10-25-95

Solvay Minerals, Inc.

Calibration Standards
10-26-95

Bag log

	METHANE	Ethane
Bag#2	9550 ppm	1053.2 ppm
Bag#3	4448 ppm	518.7 ppm
Bag#4	3236 ppm	712.2 ppm
Bag#5	7207 ppm	1760 ppm
Bag#6	143.4 ppm	

Bag#2

5	Methane RT	AREA	Ethane RT	AREA
1	6.36	147478176	11.9	26310762
2	6.36	192114432	11.9	35289124
3	6.38	193353776	11.9	35390364
4	6.36	192308704	11.9	34781256
5	6.38	193787024	11.9	35696468
		192890984		

Bag#3

5	Methane RT	AREA	Ethane RT	AREA
1	6.36	70752128	11.9	13638986
2	6.38	88497344	11.9	18302776
3	6.36	89237328	11.9	17964374
4	6.36	89072104	11.9	17974278
5	6.36	89681424	11.9	17612662
	avg	89122050		17963522.5

Bag#4

5	Methane RT	AREA	Ethane RT	AREA
1	6.36	50348028	11.9	21052592
2	6.36	59320164	11.9	25720328
3	6.36	60366840	11.9	26263828
4	6.38	60816120	11.9	26004636
5	6.36	60318776	11.9	26213200
	avg	60205475		26050498

Bag#5

5	Methane RT	AREA	Ethane RT	AREA
1	6.36	143950768	11.9	59611180
2	6.36	144605120	11.9	61160984
3	6.36	144664160	11.9	61087056
4	6.36	144184848	11.9	60118000
5	6.36	144174768	11.9	61461860
	avg	144315932.8		60687816

Bag#1

5	Methane RT	AREA	Ethane RT	AREA
1	0	0	11.9	8957543
2	0	0	11.9	10662718
3	0	0	11.9	10885855
4	0	0	11.9	11090676
5	0	0	11.9	10970825
				10168705.33

SOLVAY MINERALS, INC.
CAE Project No: 7594

Calibration Data
10/29/95

bag #2

5	Methane RT	Methane AREA	Ethane RT	Ethane AREA	Ethane AMT
1	6.32	176002656	11.8	31985900	929.663
2	6.32	193384624	11.8	35036104	1018.69
3	6.32	194895632	11.8	36271860	1054.75
4	6.32	194049888	11.8	34785756	1011.38
5	6.32	194689808	11.8	35788624	1040.65
		194254988		**35470586**	

bag #3

5	Methane RT	Methane AREA	Ethane RT	Ethane AREA	Ethane AMT
1	6.32	60495620	11.8	12368707	357.125
2	6.32	89415328	11.8	17857448	517.317
3	6.32	90347992	11.8	17759578	514.46
4	6.32	91762648	11.8	18001816	521.53
5	6.32	90915624	11.8	18111074	524.719
		90610398		**17932479**	

bag #4

5	Methane RT	Methane AREA	Ethane RT	Ethane AREA	Ethane AMT
1	6.3	56888720	11.8	24216444	702.907
2	6.3	61797960	11.8	25290696	734.26
3	6.32	63280520	11.8	26282586	763.209
4	6.3	61835540	11.8	25878920	751.428
5	6.32	62061208	11.8	25841212	750.327
		62243807		**25823353.5**	

bag #5

5	Methane RT	Methane AREA	Ethane RT	Ethane AREA	Ethane AMT
1	6.29	145200320	11.7	72320152	2106.84
2	6.29	147658688	11.7	60248468	1754.52
3	6.3	147630528	11.8	61072424	1778.57
4	6.32	148227184	11.8	62746184	1827.42
5	6.3	148410192	11.8	61381664	1787.6
	avg	**147425382.4**		**61362185**	

bag #8

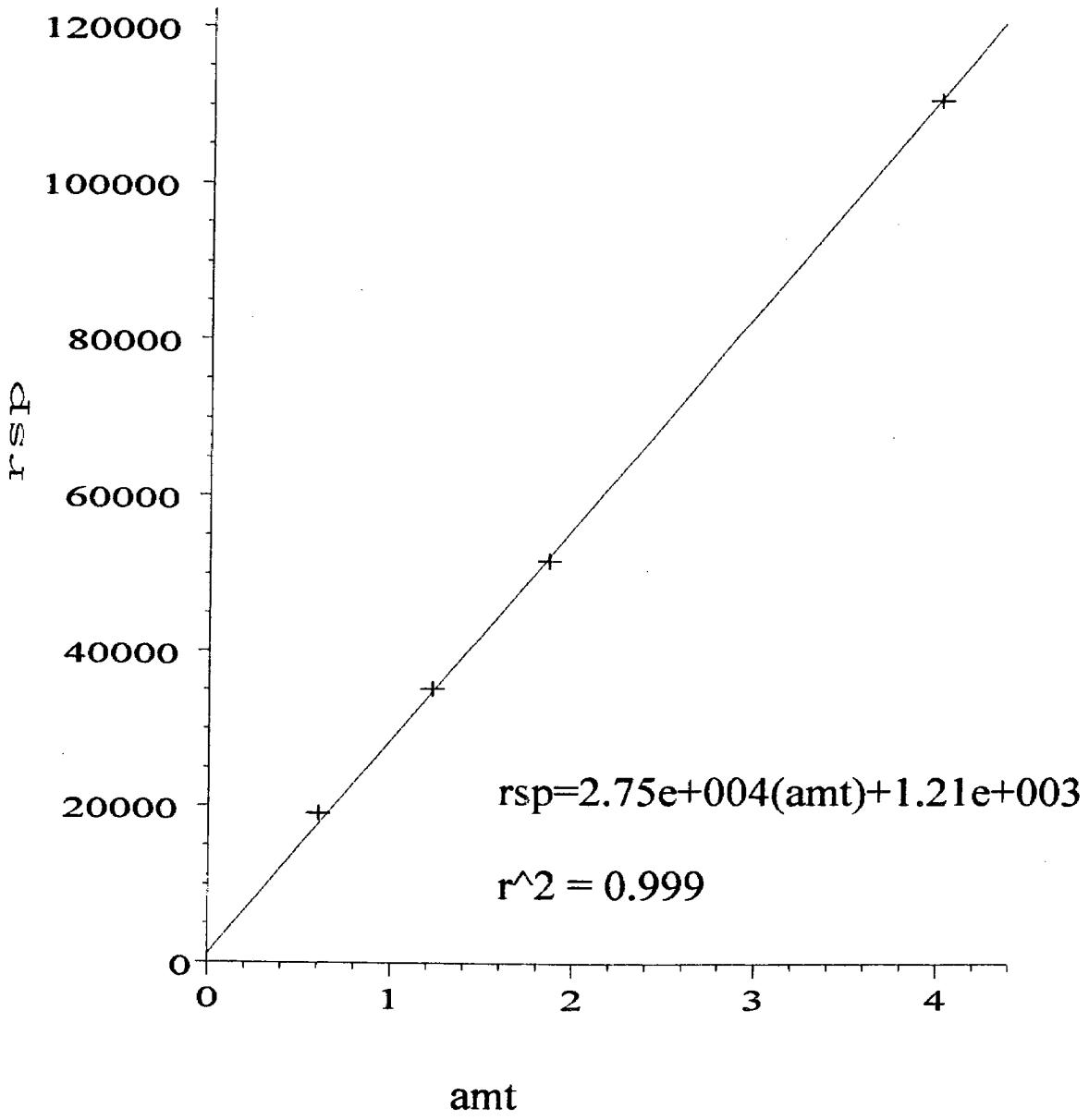
5	Methane RT	Methane AREA	Ethane RT	Ethane AREA	Ethane AMT
1	6.5	5008394	0	0	0
2	6.52	7891602	0	0	0
3	6.52	8061246	0	0	0
4	6.52	8145092	0	0	0
5	6.5	7959874	0	0	0
		8014453.5			

bag #6

5	Methane RT	Methane AREA	Ethane RT	Ethane AREA	Ethane AMT
1	0	0	0	0	0
2	6.48	910340	0	0	0
3	6.48	824824	0	0	0
4	6.48	867290	0	0	0
5	6.48	931782	0	0	0
		883559			

5	Methane RT	Methane AREA	Ethane RT	Ethane AREA	Ethane AMT
1	6.5	1920528	0	0	0
2	6.48	3244760	0	0	0
3	6.5	3030104	0	0	0
4	6.48	3028174	0	0	0
5	6.5	2954248	0	0	0
		3064321.5			

Butadiene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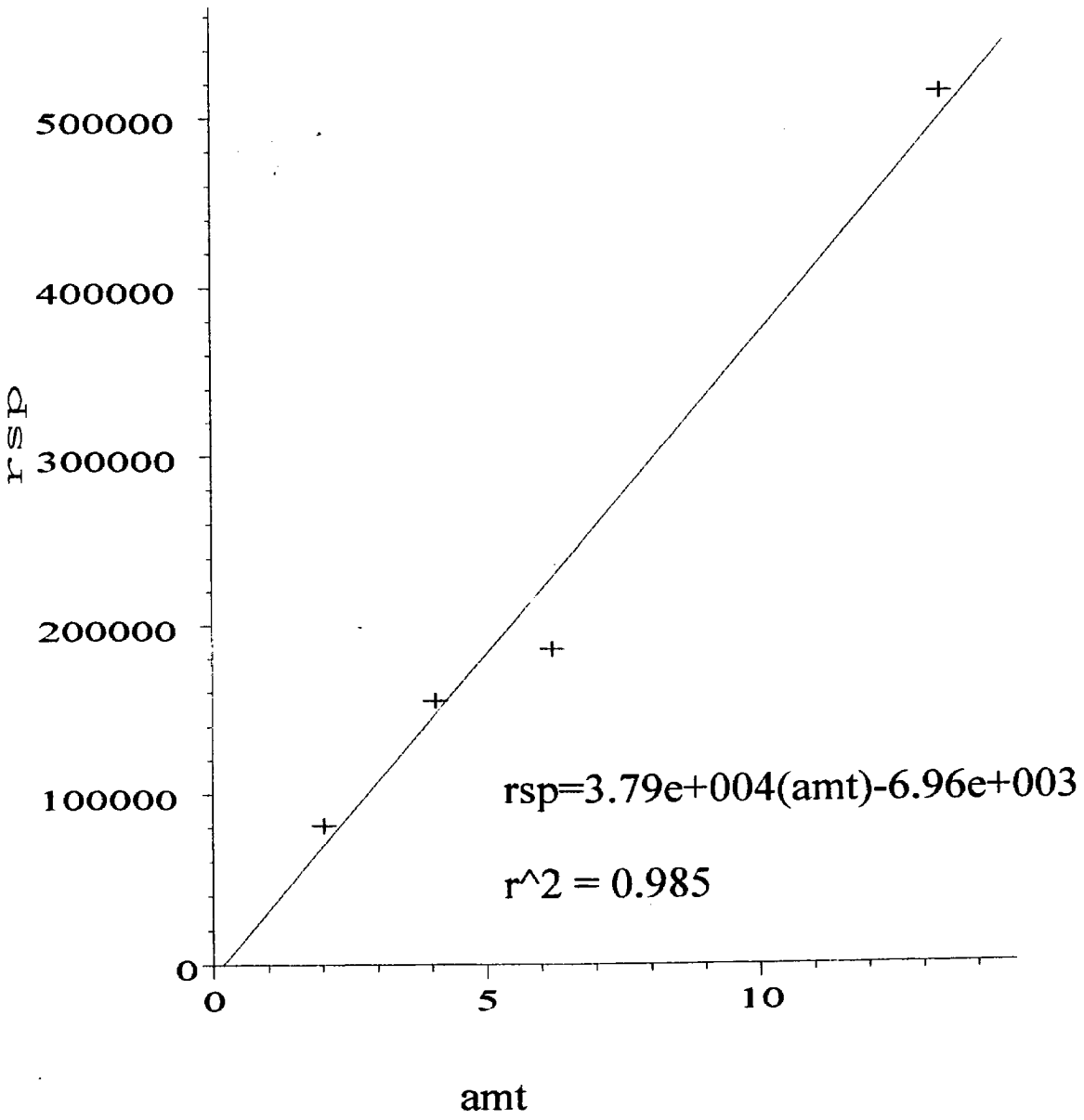
100000
80000
60000
40000
20000
0
rsp
0
1
2
3
4
amt
rsp=2.75e+004(amt)+1.21e+003
r^2 = 0.999

Hexane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300000
200000
100000
0
rsp
0
5
10
amt
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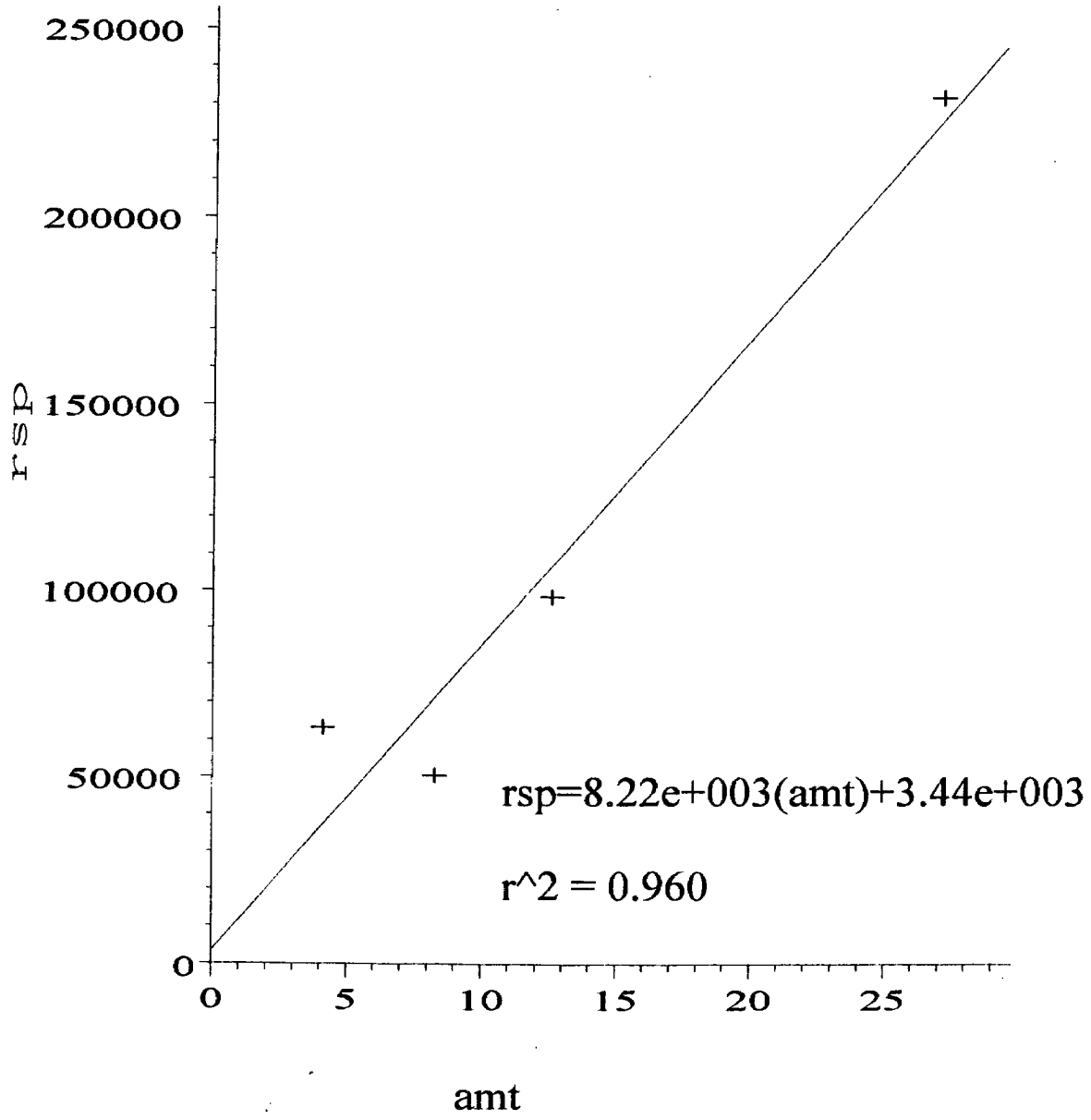
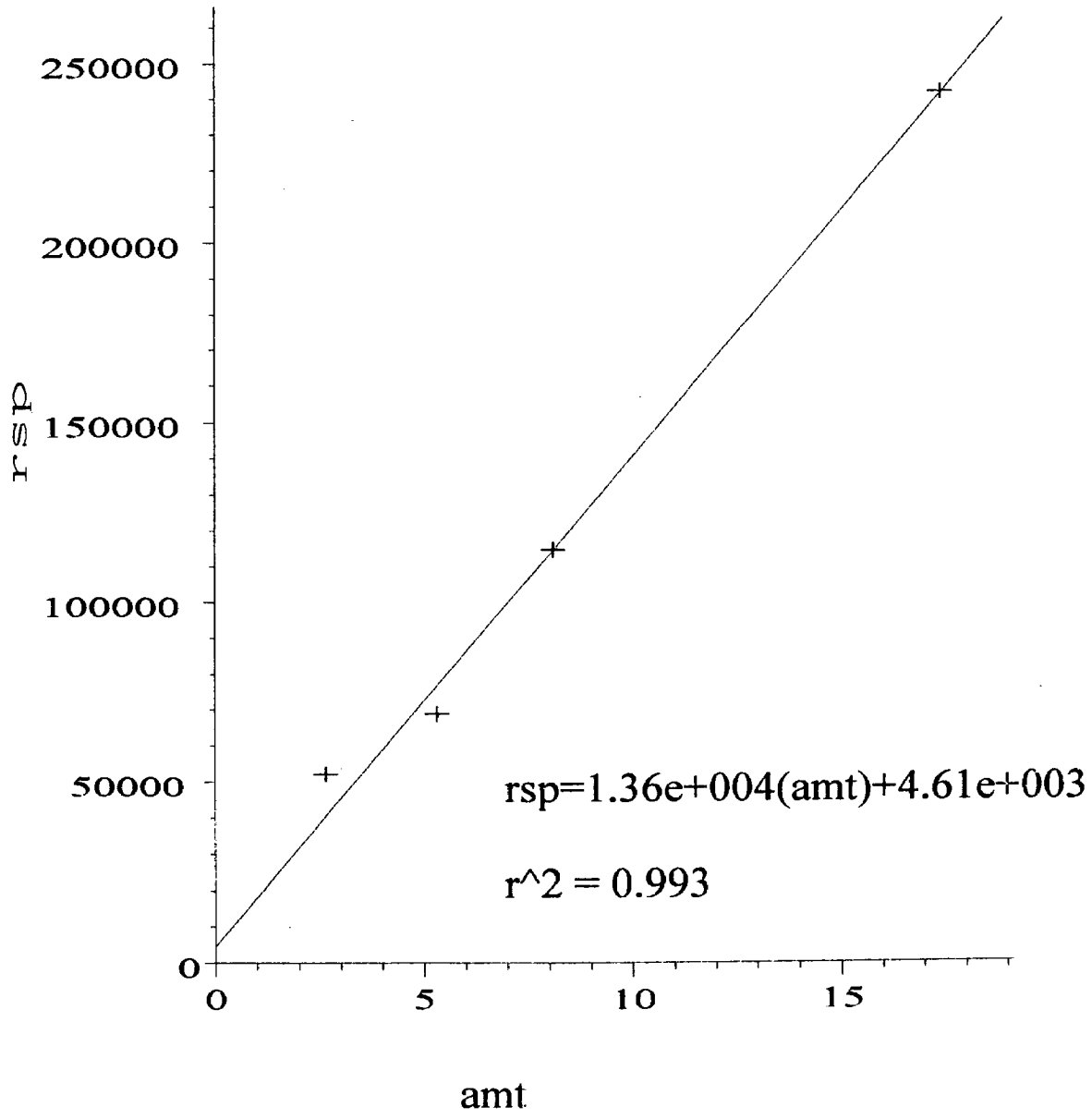
r^2 = 0.985

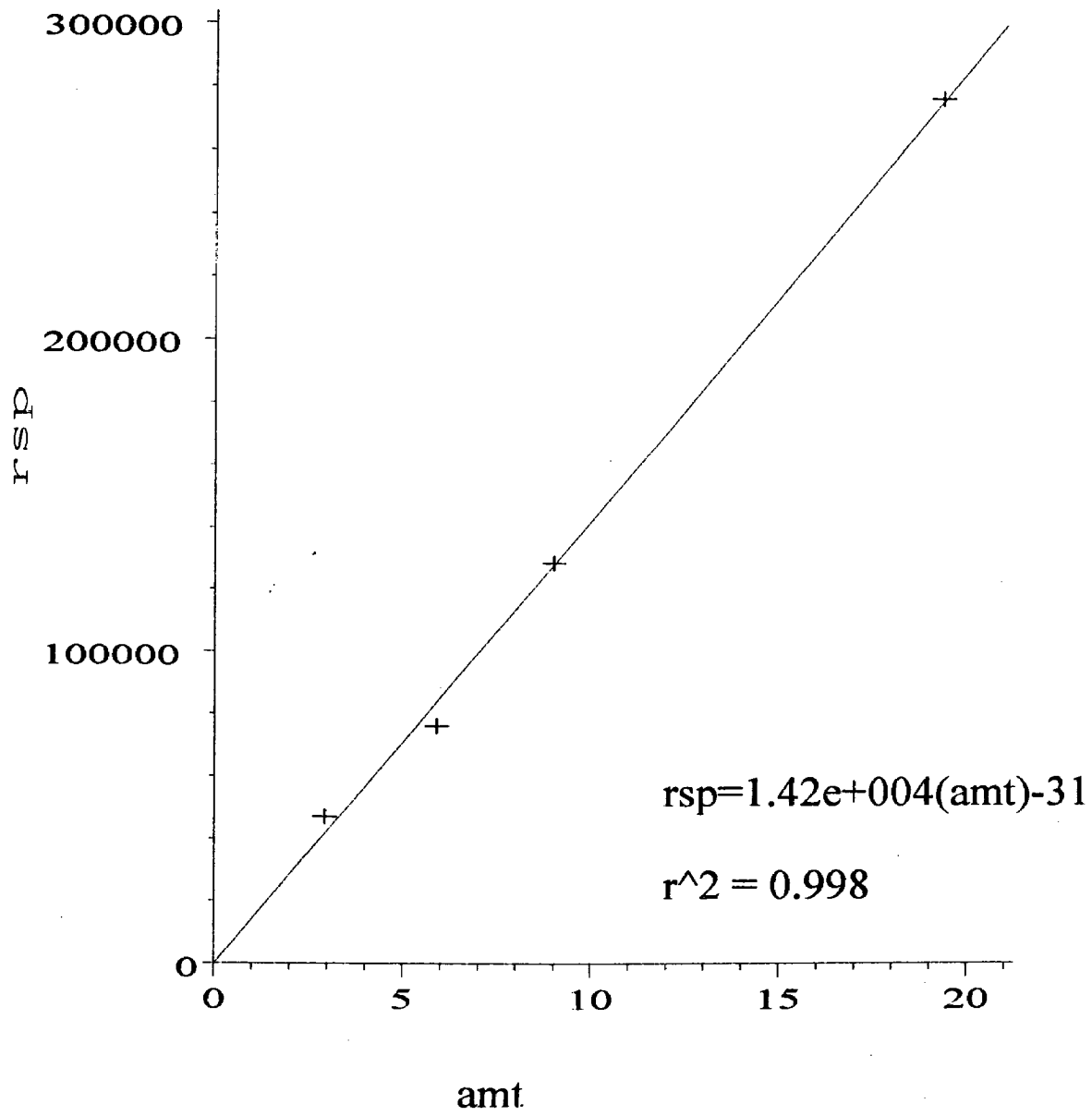
Methylene Chloride



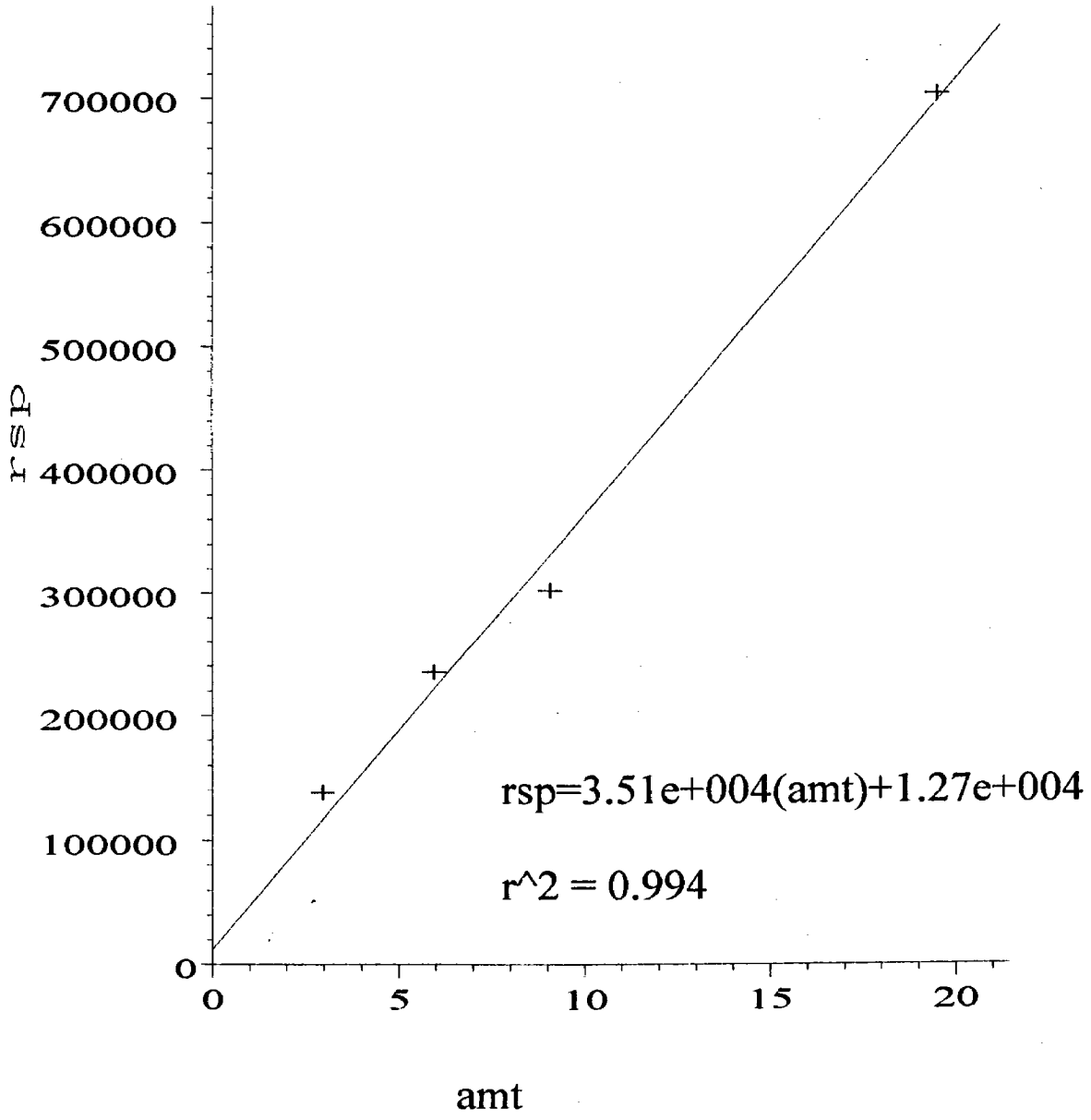
Trichloroethane



Trichloroethylene



Benzene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600000
500000
400000
300000
200000
100000
0
rsp
0
5
10
15
20
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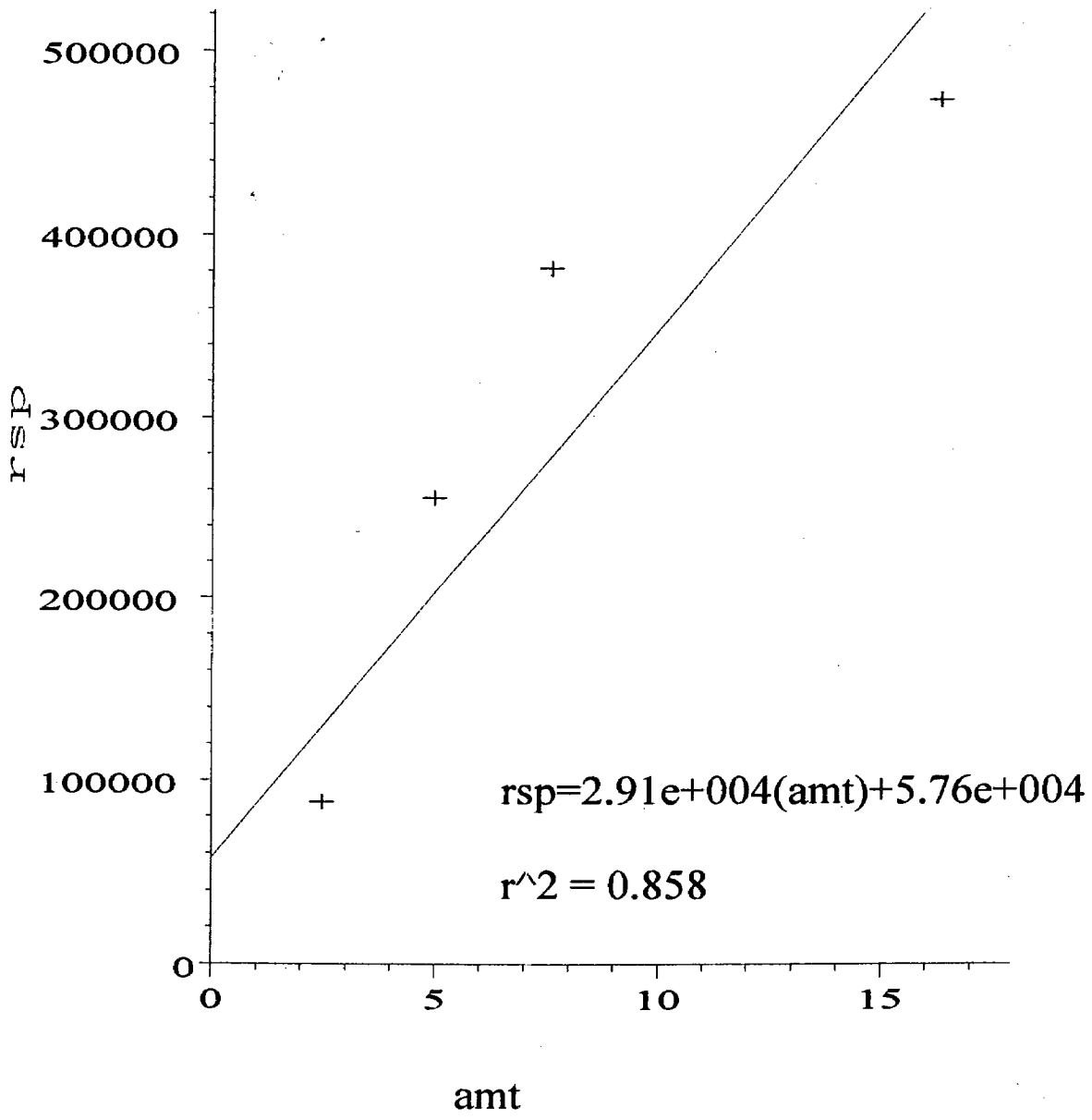
r^2 = 0.994

Toluene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200000
100000
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rsp
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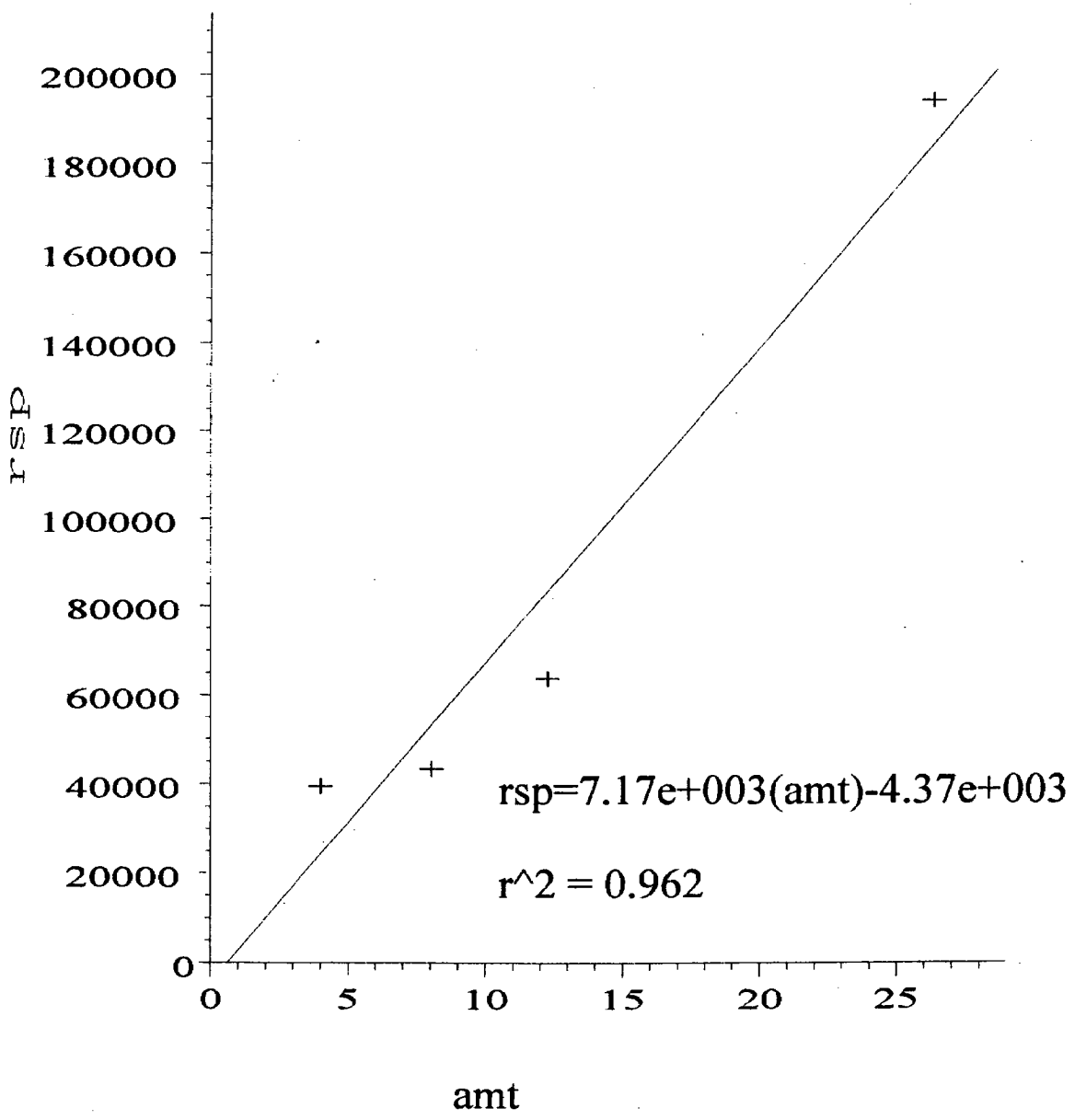
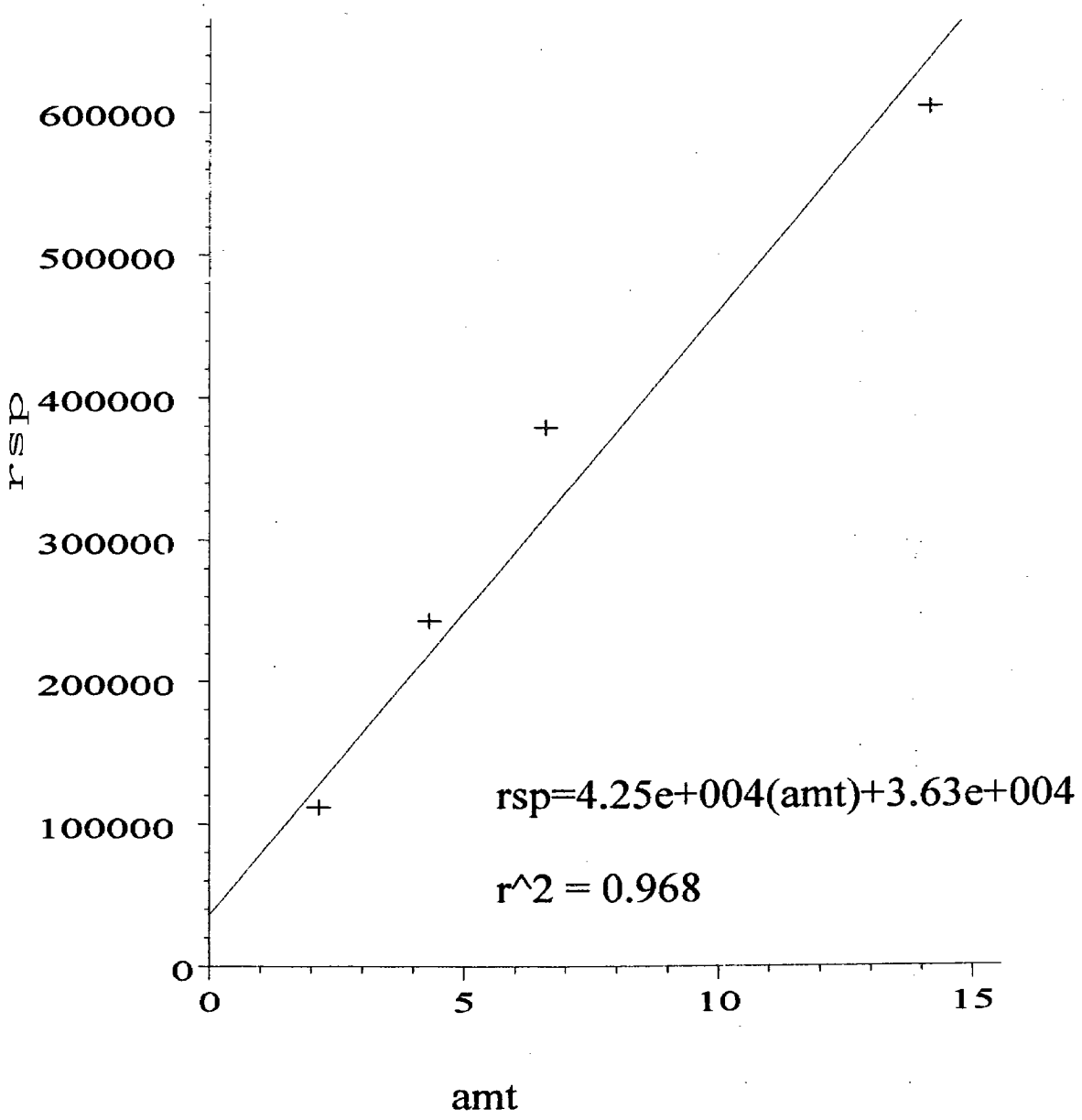
5
10
15
amt
rsp=2.91e+004(amt)+5.76e+004
r^2 = 0.858

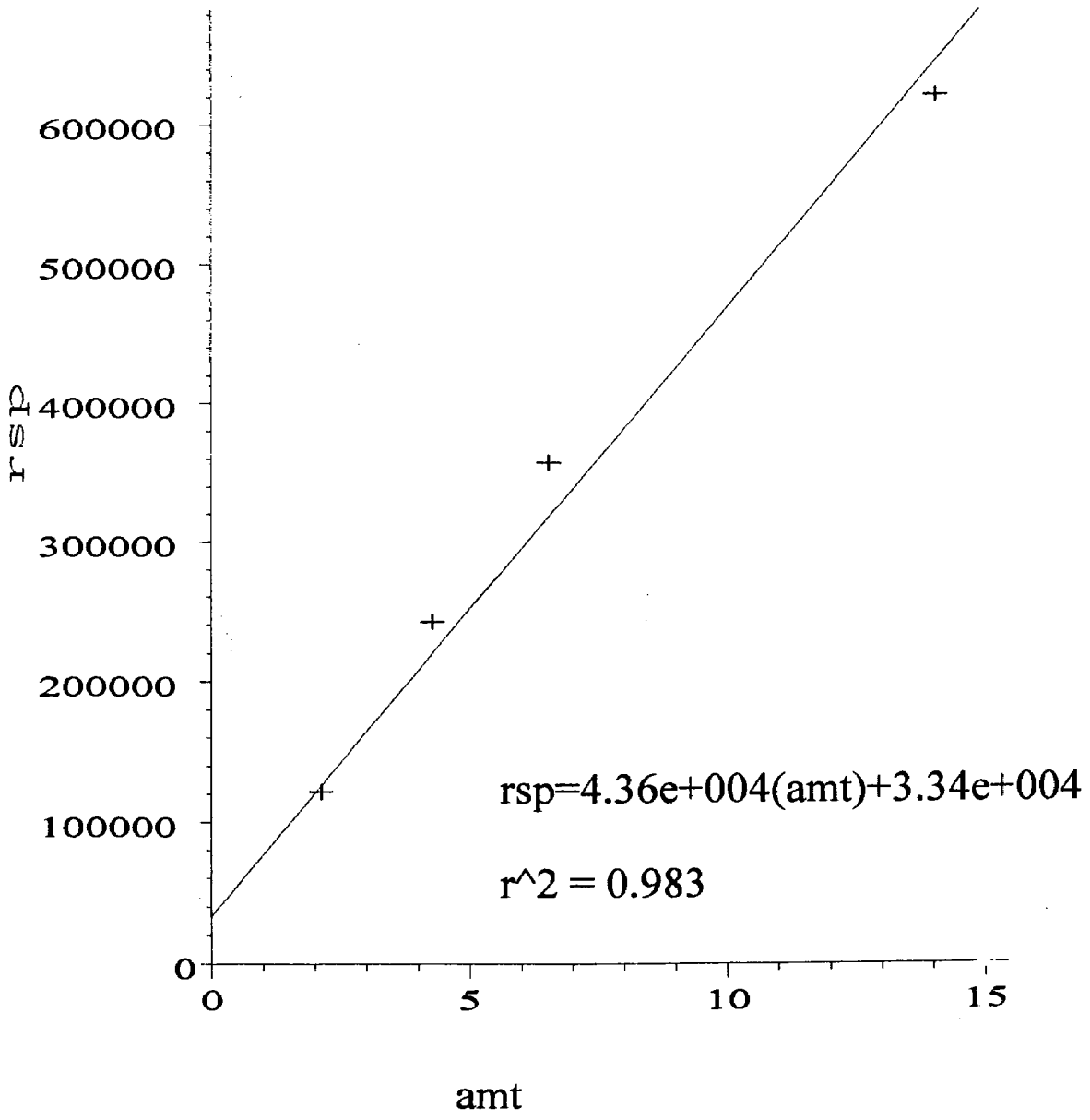
Acrylonitrile



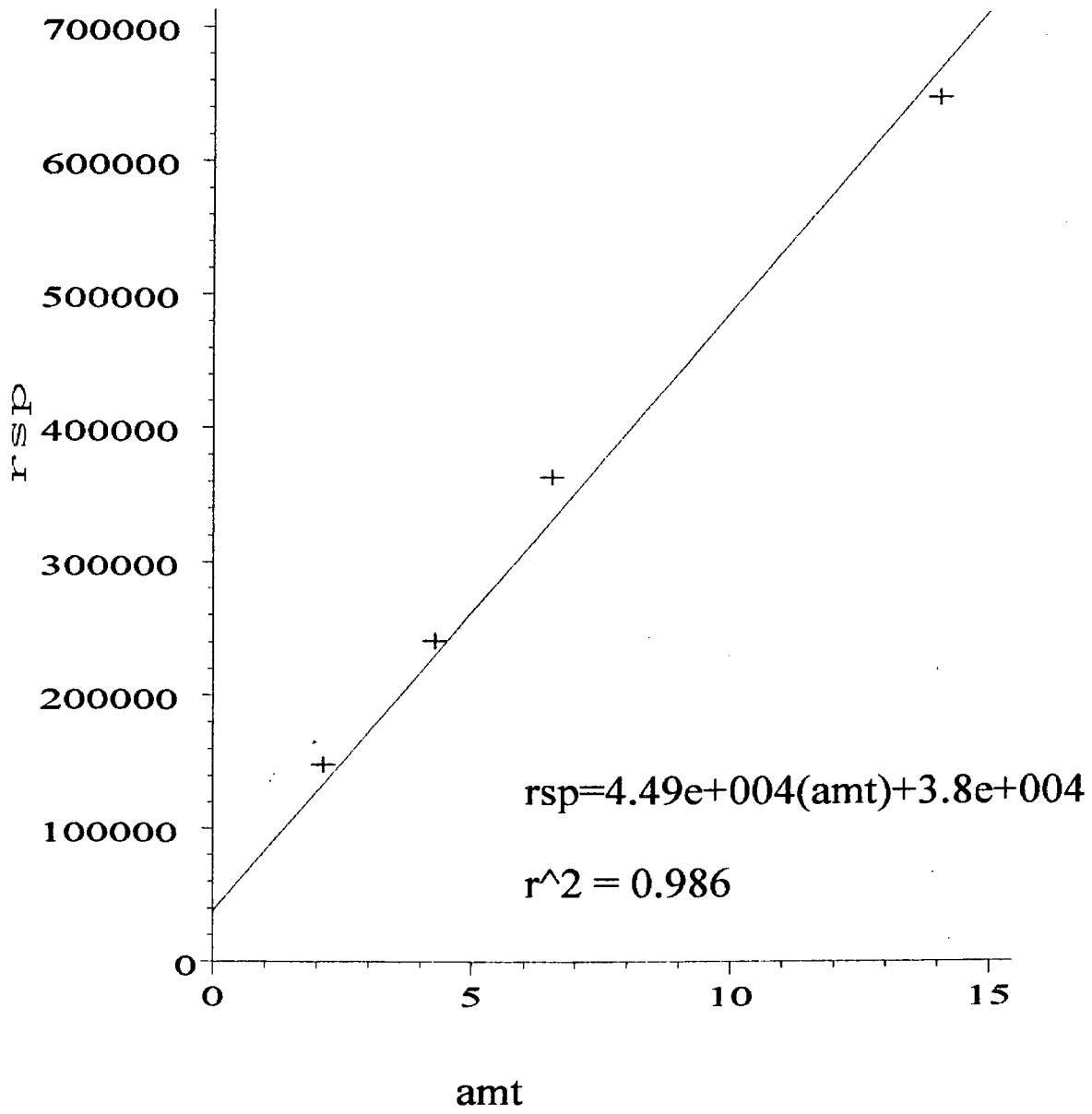
Ethylbenzene



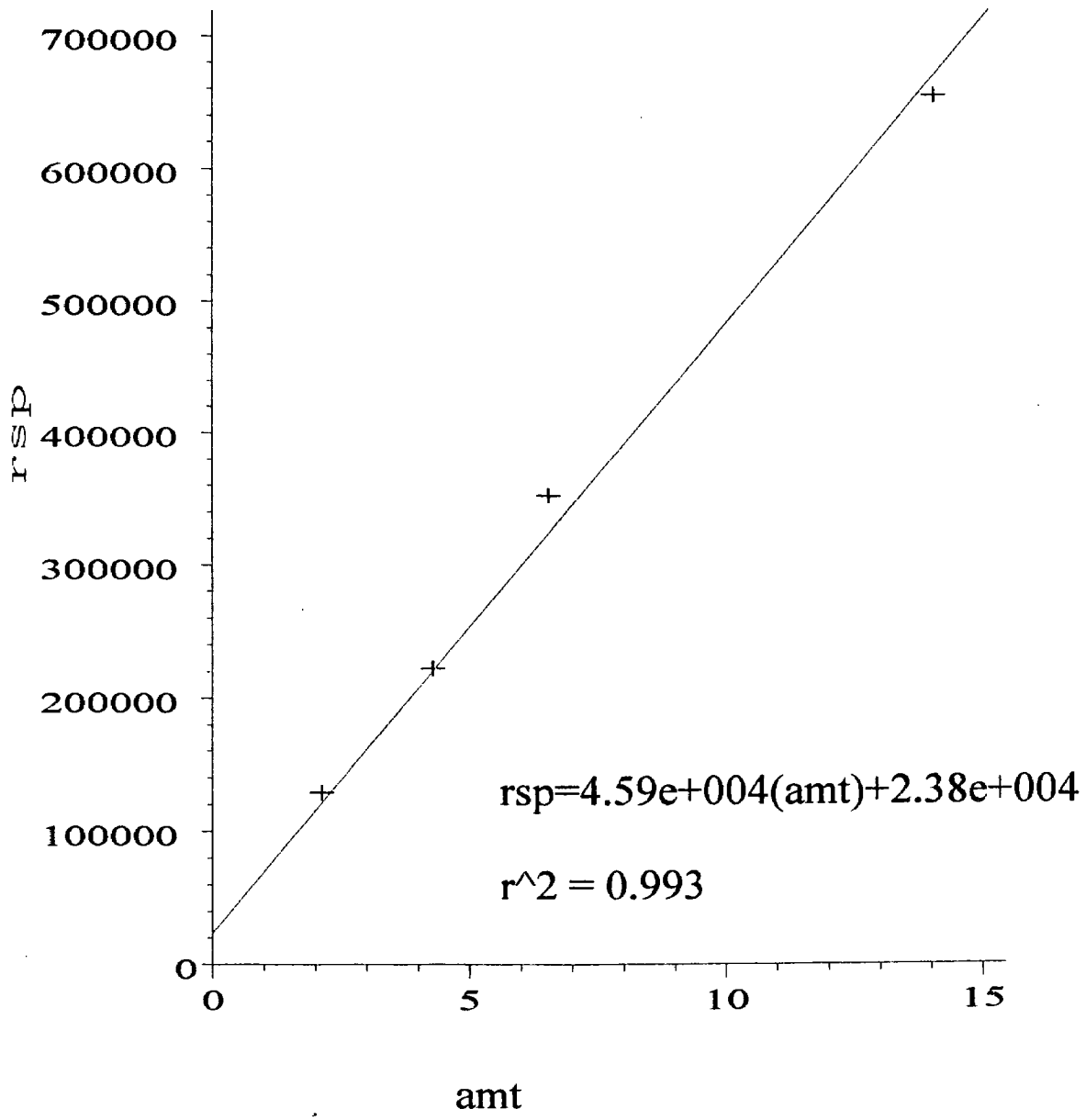
o-Xylene


600000
500000
400000
300000
200000
100000
0
rsp
0
5
10
15
amt
rsp=4.36e+004(amt)+3.34e+004
r^2 = 0.983

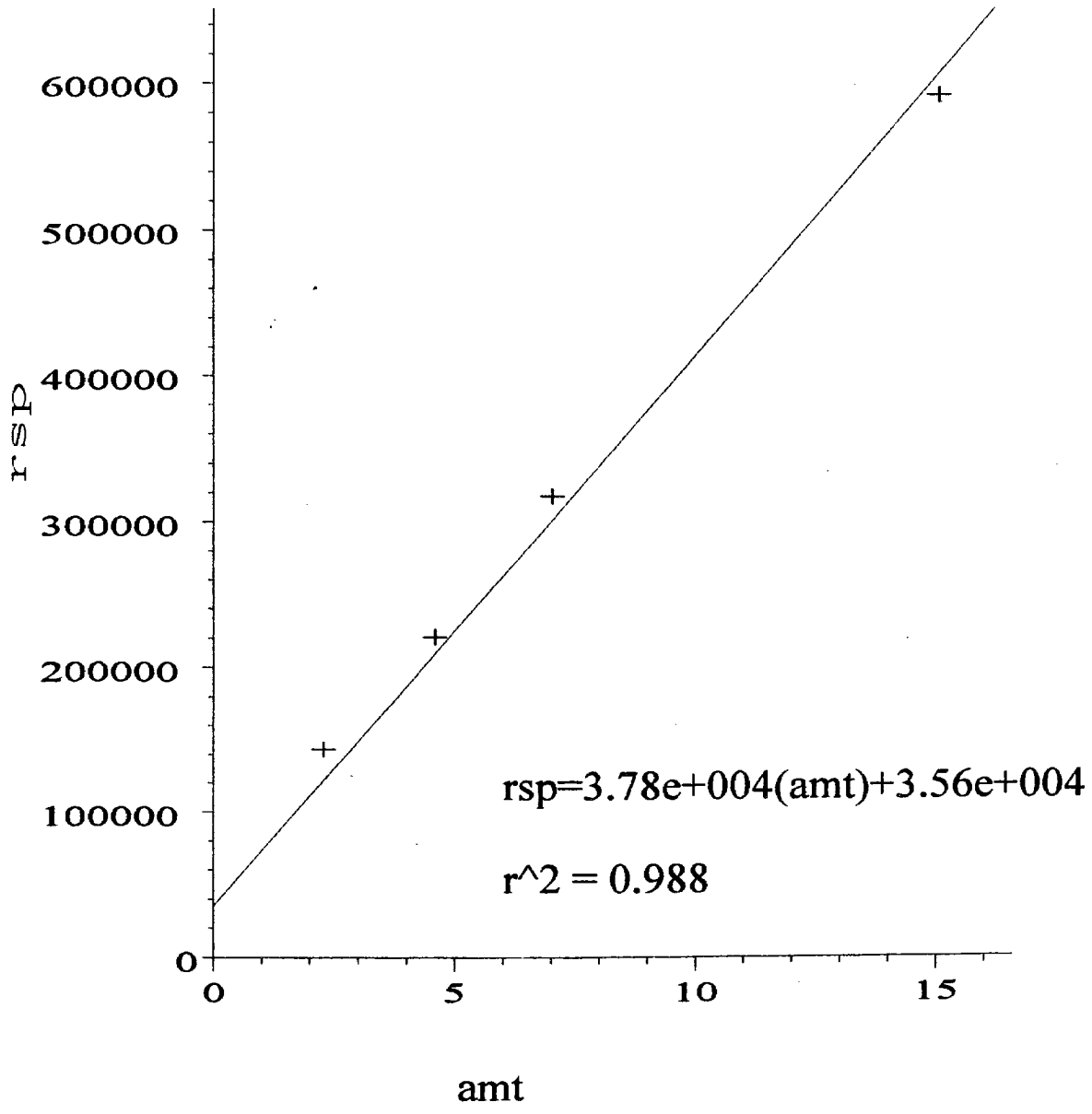
m-Xylene

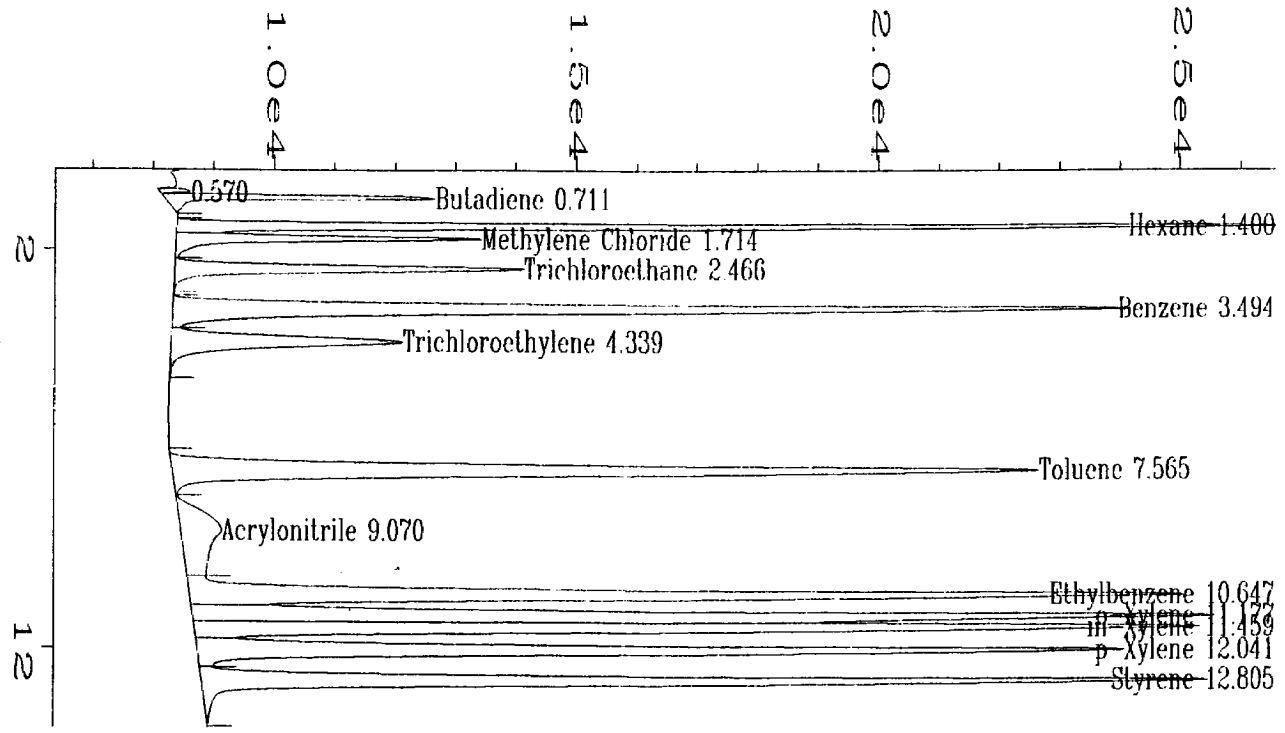

700000
600000
500000
400000
300000
200000
100000
0
rsp
0
5
10
15
amt
rsp=4.49e+004(amt)+3.8e+004
r^2 = 0.986

p-Xylene


700000
600000
500000
400000
300000
200000
100000
0
rsp
0
5
10
15
amt
rsp=4.59e+004(amt)+2.38e+004
r^2 = 0.993

Styrene


600000
500000
400000
300000
200000
100000
0
rsp
0
5
10
15
amt
rsp=3.78e+004(amt)+3.56e+004
r^2 = 0.988



Area Percent Report

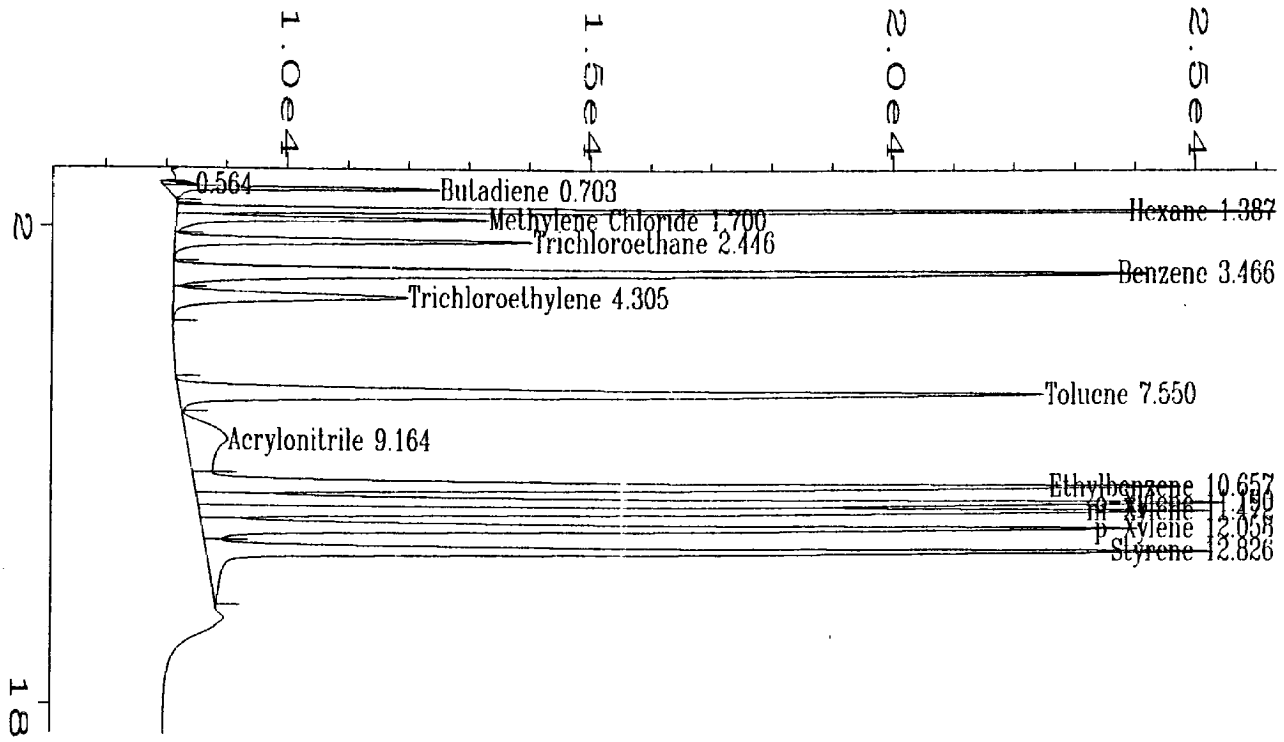
Data File Name : D:\HP\SOLVAY\CAL\BG2_0002.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag2
Run Time Bar Code:
Acquired on : 25 Oct 95 09:04 PM
Report Created on: 16 Dec 95 03:55 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\CAL\BG2_0002.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.570	2844	501	PV	0.074	0.1358
2	0.711	35052	4463	VB	0.126	1.6736
3	1.400	153237	19192	BV	0.129	7.3168
4	1.714	49108	5040	VV	0.145	2.3448
5	2.466	67432	5777	VB	0.180	3.2197
6	3.494	232255	15858	BV	0.225	11.0898
7	4.339	71650	3820	VB	0.285	3.4212
8	7.565	247044	14339	BV	0.267	11.7959
9	9.070	50629	682	VV	0.908	2.4174
10	10.647	250975	16436	VV	0.238	11.9836
11	11.177	242793	16913	VV	0.218	11.5929
12	11.459	239634	16652	VV	0.218	11.4421
13	12.041	223185	15342	VV	0.227	10.6567
14	12.805	228485	16649	VBA	0.214	10.9097

Total area = 2094323



Area Percent Report

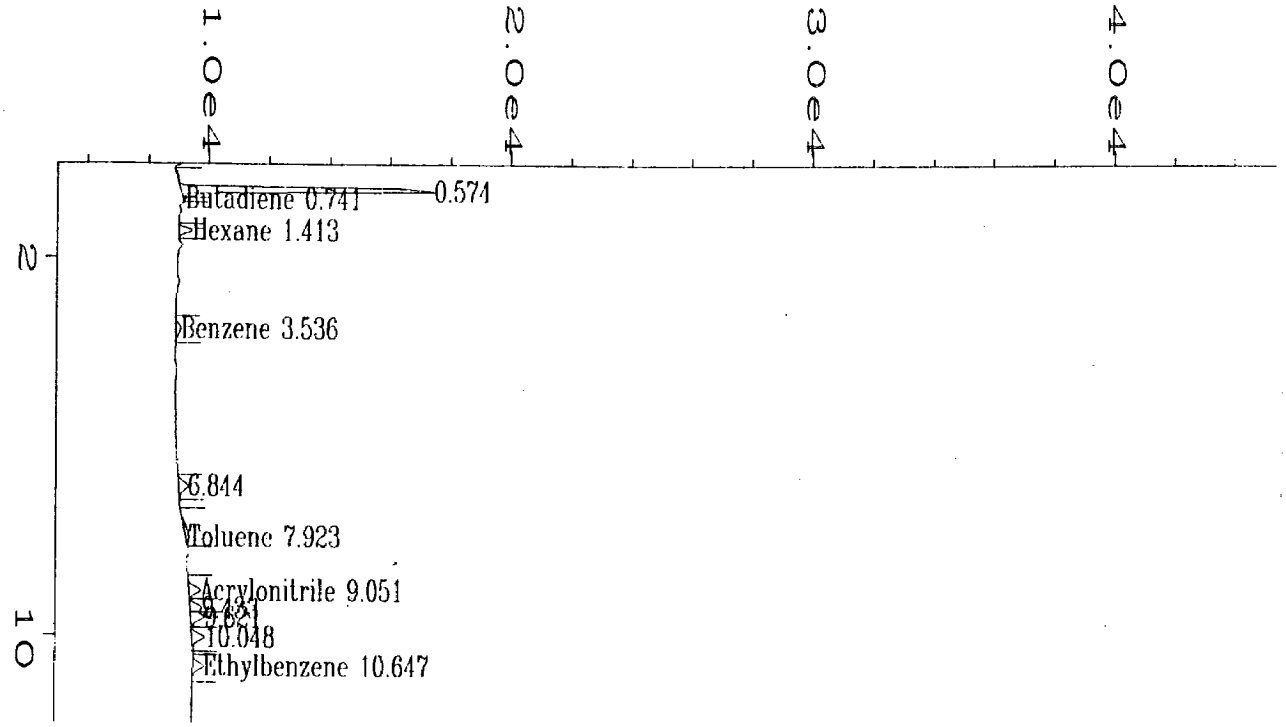
Data File Name : D:\HP\SOLVAY\CAL\BG2_0003.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag2
Run Time Bar Code:
Acquired on : 25 Oct 95 09:22 PM
Report Created on: 16 Dec 95 03:55 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\CAL\BG2_0003.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.564	3051	534	PV	0.074	0.1432
2	0.703	34873	4504	VB	0.125	1.6374
3	1.387	155843	19524	BV	0.129	7.3174
4	1.700	50136	5150	VV	0.146	2.3541
5	2.446	68909	5903	VV	0.178	3.2355
6	3.466	235609	16142	PV	0.224	11.0627
7	4.305	72170	3875	VB	0.282	3.3886
8	7.550	250665	14298	BV	0.272	11.7696
9	9.164	50841	674	VV	0.945	2.3872
10	10.657	252645	16432	VV	0.240	11.8625
11	11.190	245147	17007	VV	0.219	11.5105
12	11.472	242576	16741	VV	0.220	11.3898
13	12.058	227469	15439	VV	0.229	10.6805
14	12.826	239834	16627	VB	0.222	11.2610

Total area = 2129768



Area Percent Report

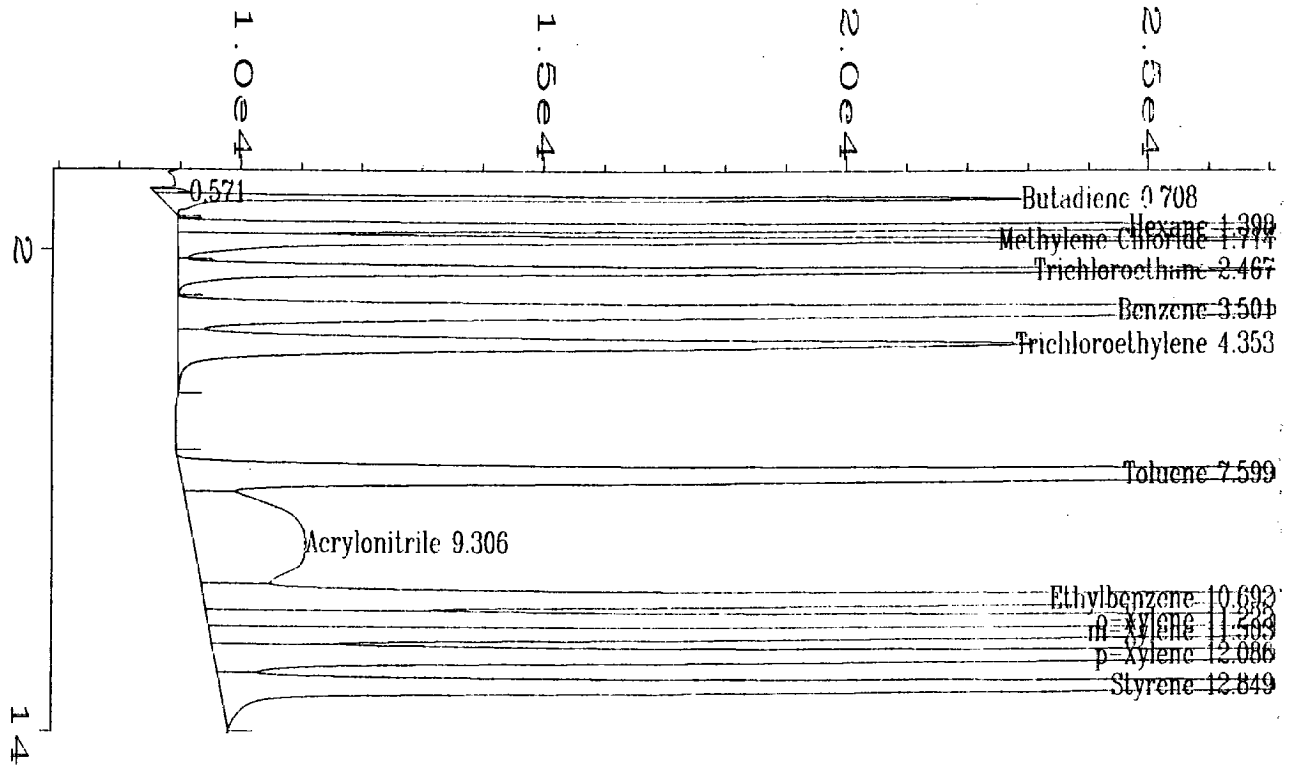
Data File Name : D:\HP\SOLVAY\CAL\BLANK_01.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : blank
Run Time Bar Code:
Acquired on : 25 Oct 95 07:32 PM
Report Created on: 16 Dec 95 03:56 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\CAL\BLANK_01.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.574	56791	8385	BV	0.091	61.8889
2	0.741	241	72	VB	0.043	0.2627
3	1.413	3389	434	BV	0.114	3.6937
4	3.536	2355	164	BB	0.181	2.5665
5	6.844	3964	298	BB	0.170	4.3204
6	7.923	2617	109	BB	0.293	2.8518
7	9.051	4252	377	BV	0.143	4.6341
8	9.433	3995	391	VV	0.129	4.3535
9	9.621	5028	441	VV	0.141	5.4790
10	10.048	4907	412	VB	0.149	5.3474
11	10.647	4223	348	BB	0.152	4.6020

Total area = 91763



Area Percent Report

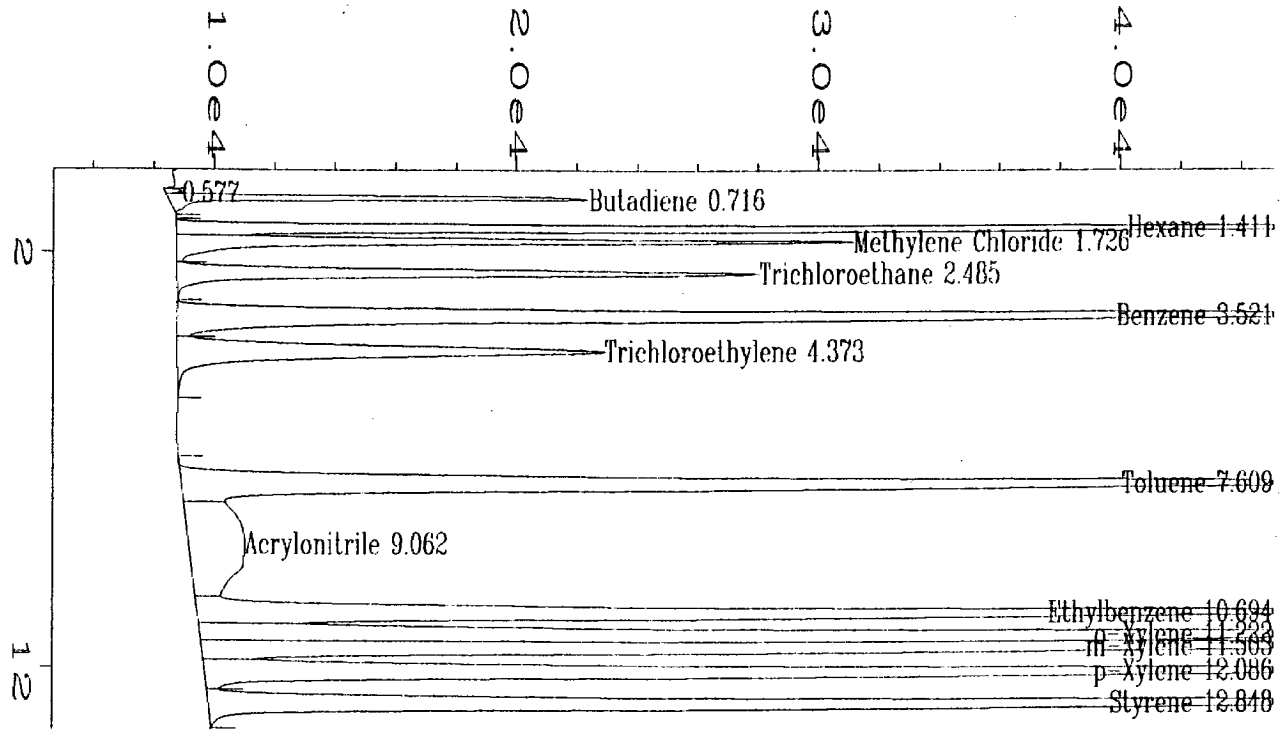
Data File Name : D:\HP\SOLVAY\CAL\BG3_0001.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag3
Run Time Bar Code:
Acquired on : 25 Oct 95 07:48 PM
Report Created on: 16 Dec 95 03:55 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\CAL\BG3_0001.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.571	3270	571	PV	0.073	0.0482
2	0.708	108445	14239	VB	0.124	1.5997
3	1.398	490964	61100	BV	0.130	7.2423
4	1.714	219118	22581	VV	0.147	3.2323
5	2.467	227780	19489	VV	0.180	3.3600
6	3.501	705000	48139	VV	0.224	10.3996
7	4.353	267507	14169	VB	0.287	3.9460
8	7.599	761755	44288	BV	0.267	11.2368
9	9.306	217649	1850	VV	1.492	3.2106
10	10.692	696281	45814	VV	0.237	10.2710
11	11.222	740984	52130	VV	0.216	10.9304
12	11.503	748691	52469	VV	0.217	11.0441
13	12.086	775174	53820	VV	0.225	11.4347
14	12.849	816495	60542	VBA	0.211	12.0443

Total area = 6779113



Area Percent Report

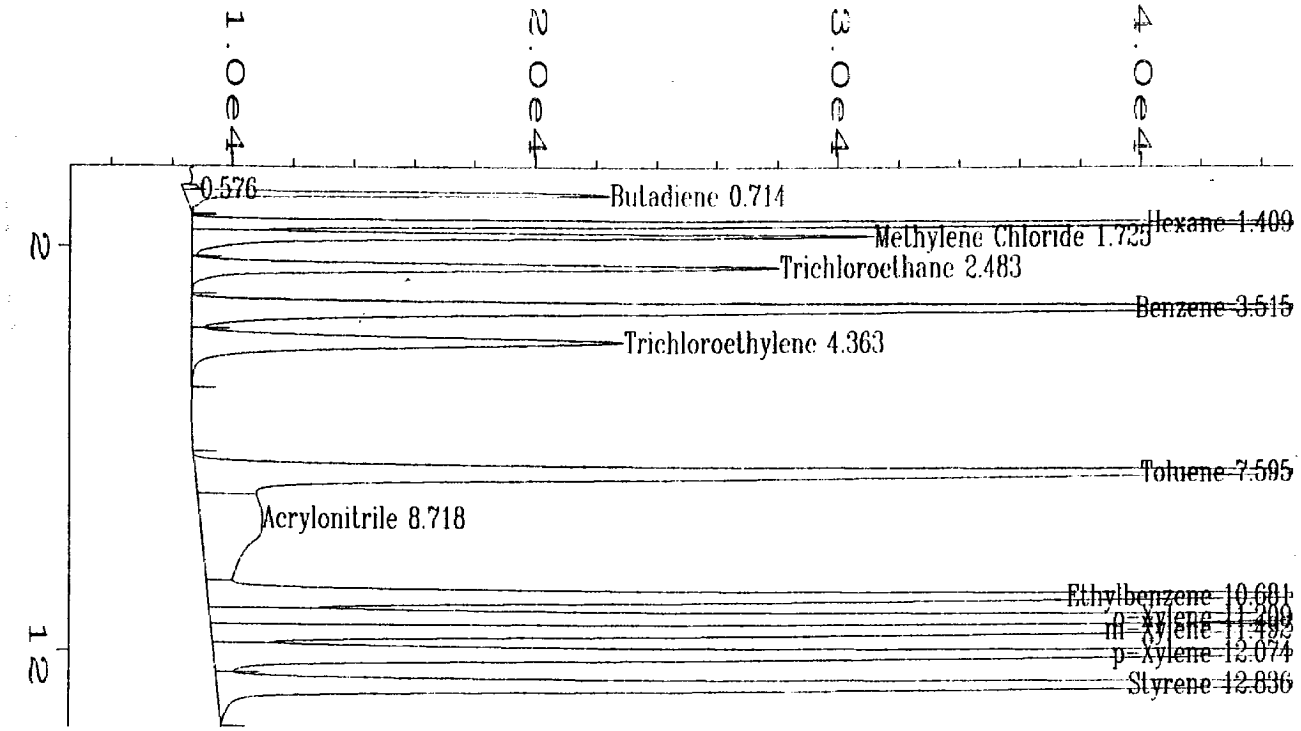
Data File Name : D:\HP\SOLVAY\CAL\BG3_0002.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag3
Run Time Bar Code:
Acquired on : 25 Oct 95 08:09 PM
Report Created on: 16 Dec 95 03:55 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\CAL\BG3_0002.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.577	3124	540	PV	0.075	0.0467
2	0.716	106122	13898	VB	0.124	1.5867
3	1.411	486250	60457	BV	0.130	7.2700
4	1.726	217925	22413	VV	0.148	3.2582
5	2.485	226297	19266	VV	0.181	3.3834
6	3.521	701200	47810	VV	0.224	10.4838
7	4.373	267540	14144	VB	0.287	4.0001
8	7.609	762663	44169	BV	0.267	11.4028
9	9.062	212883	1855	VV	1.444	3.1829
10	10.694	683416	45399	VV	0.235	10.2179
11	11.222	733102	51775	VV	0.216	10.9608
12	11.503	735663	51797	VV	0.216	10.9991
13	12.086	760848	53363	VV	0.223	11.3756
14	12.848	791378	59811	VBA	0.207	11.8321

Total area = 6688412



Area Percent Report

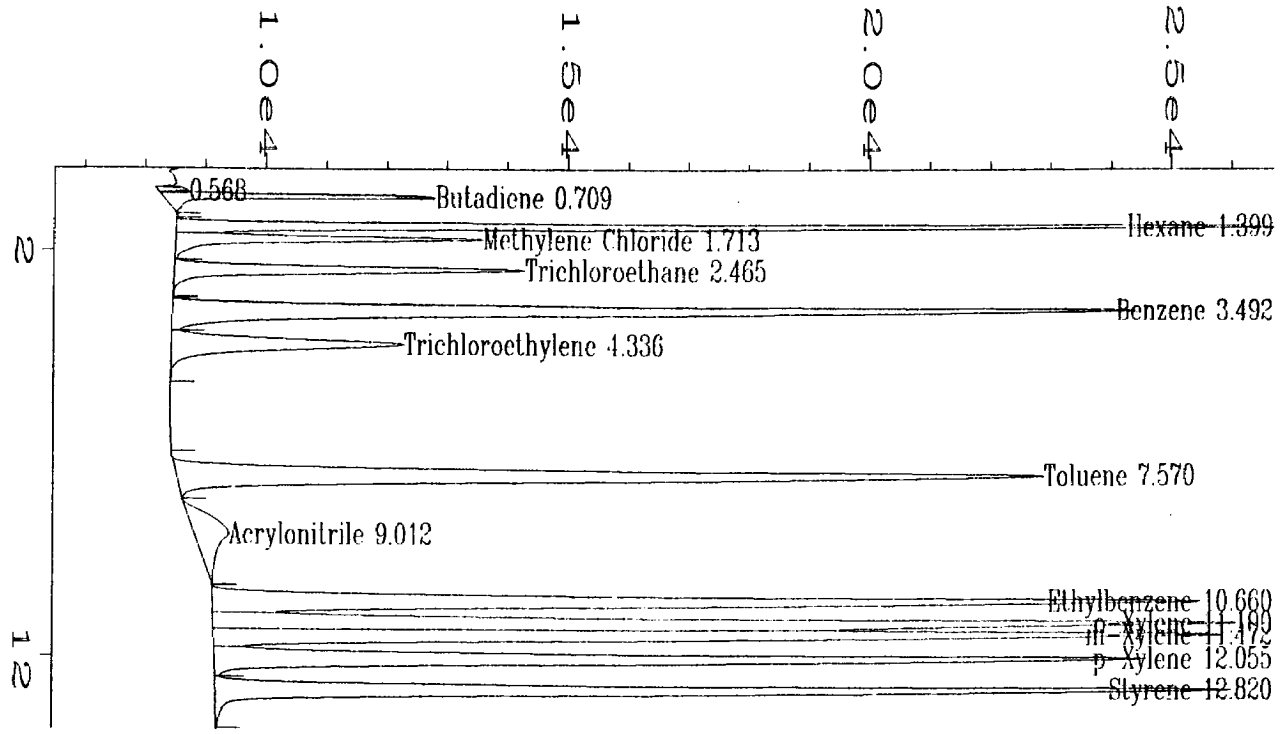
Data File Name : D:\HP\SOLVAY\CAL\BG3_0003.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag3
Run Time Bar Code:
Acquired on : 25 Oct 95 08:27 PM
Report Created on: 16 Dec 95 03:56 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\CAL\BG3_0003.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.576	3215	557	PV	0.074	0.0471
2	0.714	107488	14028	VB	0.124	1.5759
3	1.409	489541	60526	BV	0.131	7.1773
4	1.725	219076	22549	VV	0.148	3.2119
5	2.483	226968	19417	VV	0.180	3.3276
6	3.515	705106	48257	PV	0.224	10.3377
7	4.363	268335	14278	VB	0.286	3.9341
8	7.595	793117	44505	BV	0.274	11.6281
9	8.718	210047	2052	VV	1.285	3.0795
10	10.681	697535	46184	VV	0.234	10.2267
11	11.209	747801	52629	VV	0.216	10.9637
12	11.492	751641	52652	VV	0.216	11.0200
13	12.074	782611	54322	VV	0.223	11.4740
14	12.836	818229	60715	VBA	0.209	11.9962

Total area = 6820710



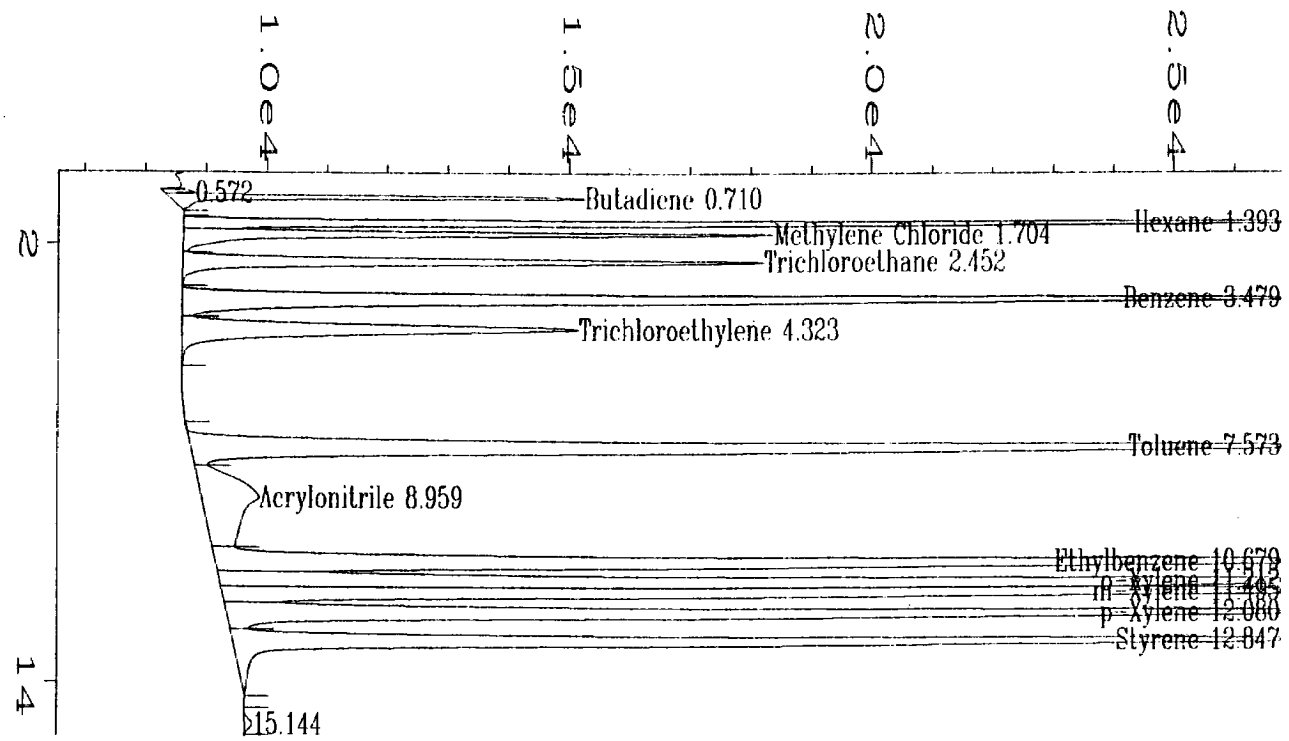
Area Percent Report

Data File Name	: D:\HP\SOLVAY\CAL\BG2_0001.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: bag2	Injection Number	:
Run Time Bar Code:		Sequence Line	:
Acquired on	: 25 Oct 95 08:45 PM	Instrument Method	: SOLVAY.MTH
Report Created on	: 16 Dec 95 03:54 PM	Analysis Method	: SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\CAL\BG2_0001.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.568	2806	497	PV	0.076	0.1360
2	0.709	35503	4492	VB	0.127	1.7211
3	1.399	154018	19240	BV	0.129	7.4664
4	1.713	49605	5081	VV	0.146	2.4047
5	2.465	67799	5814	VV	0.180	3.2867
6	3.492	234024	15970	PV	0.225	11.3448
7	4.336	72374	3849	VB	0.287	3.5085
8	7.570	247146	14361	BV	0.267	11.9809
9	9.012	33777	570	PB	0.768	1.6374
10	10.660	241780	16362	BV	0.232	11.7208
11	11.190	240501	16953	VV	0.216	11.6588
12	11.472	237366	16704	VV	0.216	11.5068
13	12.055	219602	15413	VV	0.223	10.6457
14	12.820	226528	16830	VBA	0.210	10.9814

Total area = 2062830



Area Percent Report

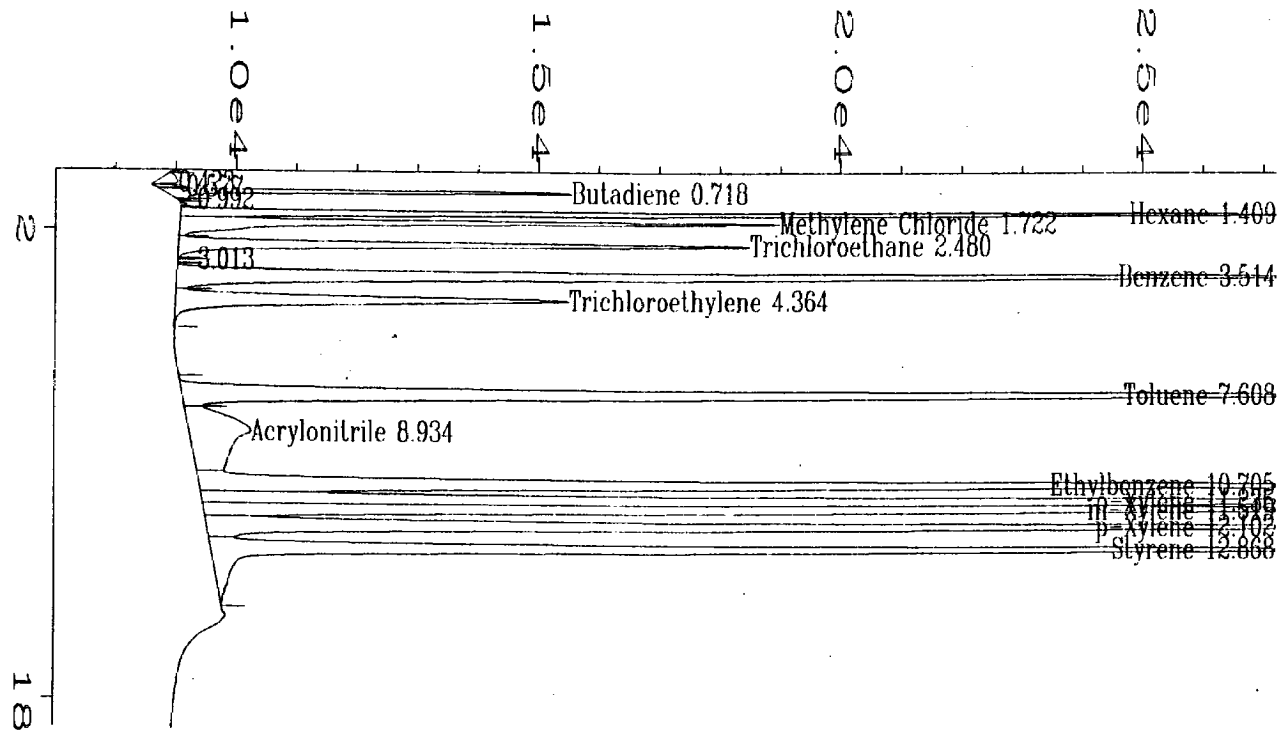
Data File Name : D:\HP\SOLVAY\CAL\BG1_0003.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag1
Run Time Bar Code:
Acquired on : 26 Oct 95 11:59 AM
Report Created on: 16 Dec 95 03:54 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\CAL\BG1_0003.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.572	2879	510	PV	0.076	0.0938
2	0.710	52343	6864	VB	0.124	1.7063
3	1.393	182043	22858	BV	0.128	5.9343
4	1.704	94295	9755	VV	0.146	3.0739
5	2.452	111899	9603	VV	0.179	3.6477
6	3.479	297207	20269	PV	0.224	9.6885
7	4.323	122904	6544	VB	0.285	4.0065
8	7.573	371127	21310	BV	0.270	12.0981
9	8.959	80802	950	VV	1.009	2.6340
10	10.679	372751	24538	VV	0.236	12.1511
11	11.212	352983	24636	VV	0.218	11.5067
12	11.495	353411	24580	VV	0.218	11.5206
13	12.080	345903	23831	VV	0.225	11.2759
14	12.847	324737	23311	VB	0.215	10.5859
15	15.144	2357	129	BBA	0.269	0.0768

Total area = 3067641



Area Percent Report

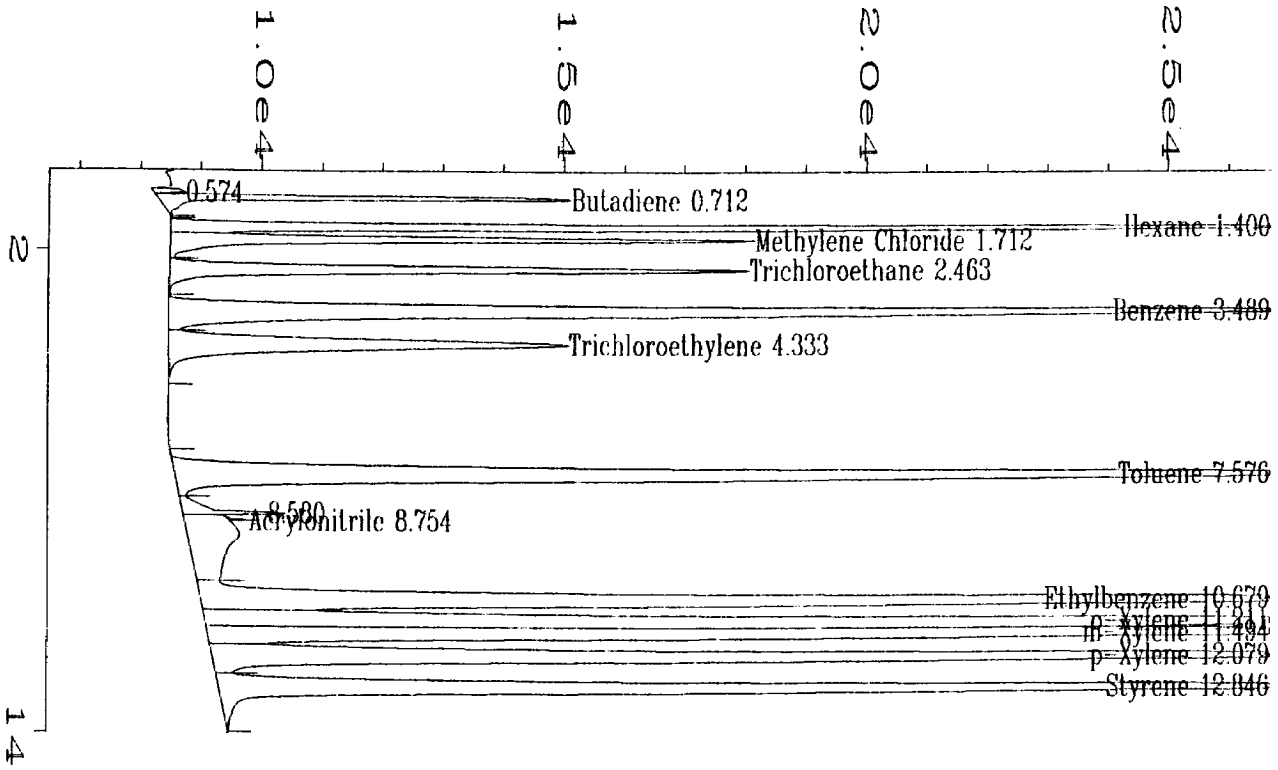
Data File Name : D:\HP\SOLVAY\CAL\BG1_0005.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag1
Run Time Bar Code:
Acquired on : 26 Oct 95 12:51 PM
Report Created on: 16 Dec 95 03:54 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\CAL\BG1_0005.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.423	5360	387	BV	0.177	0.1707
2	0.577	2797	496	PV	0.073	0.0891
3	0.718	51885	6763	VV	0.124	1.6524
4	0.992	671	339	VB	0.028	0.0214
5	1.409	180660	22450	BV	0.130	5.7535
6	1.722	103380	9918	VV	0.155	3.2924
7	2.480	111026	9453	VV	0.181	3.5359
8	3.013	496	471	VB	0.024	0.0158
9	3.514	295470	20061	BV	0.225	9.4099
10	4.364	122249	6503	VB	0.286	3.8933
11	7.608	373473	21501	BV	0.269	11.8941
12	8.934	91097	1021	VV	1.072	2.9012
13	10.705	378704	24963	VV	0.235	12.0607
14	11.235	360197	25217	VV	0.217	11.4713
15	11.519	360188	25065	VV	0.217	11.4710
16	12.102	355560	24351	VV	0.226	11.3236
17	12.868	346779	24133	VV	0.220	11.0440

Total area = 3139993



Area Percent Report

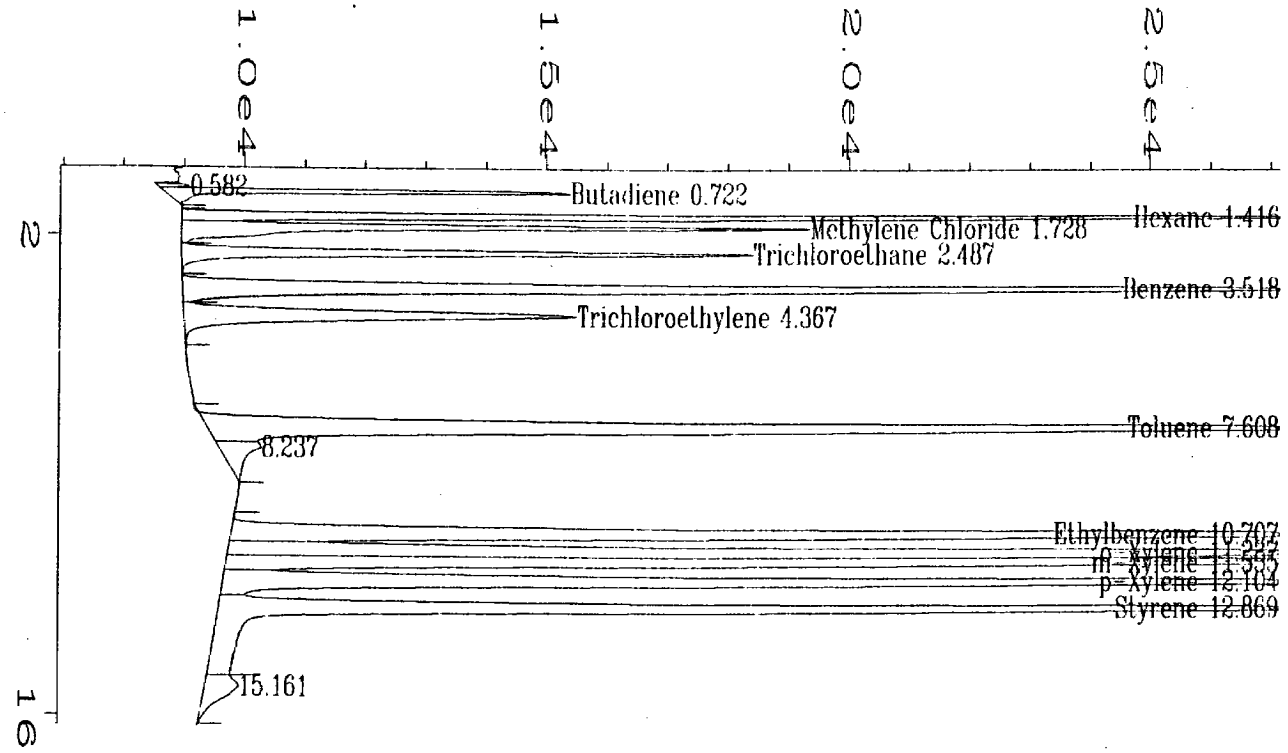
Data File Name : D:\HP\SOLVAY\CAL\BG1_0002.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag1
Run Time Bar Code:
Acquired on : 26 Oct 95 11:41 AM
Report Created on: 16 Dec 95 03:53 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\CAL\BG1_0002.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.574	2922	516	PV	0.076	0.0942
2	0.712	52662	6821	VB	0.125	1.6983
3	1.400	181265	22712	BV	0.129	5.8456
4	1.712	93264	9660	VV	0.146	3.0077
5	2.463	111447	9577	VV	0.179	3.5941
6	3.489	298281	20329	PV	0.224	9.6193
7	4.333	124218	6599	VB	0.285	4.0059
8	7.576	374939	21553	BV	0.270	12.0914
9	8.580	14075	1429	VV	0.137	0.4539
10	8.754	60922	1089	VV	0.809	1.9647
11	10.679	381018	25047	VV	0.237	12.2875
12	11.211	362094	25308	VV	0.218	11.6772
13	11.494	361591	25209	VV	0.218	11.6610
14	12.079	353972	24469	VV	0.226	11.4153
15	12.846	328196	23983	VBA	0.213	10.5840

Total area = 3100866



Area Percent Report

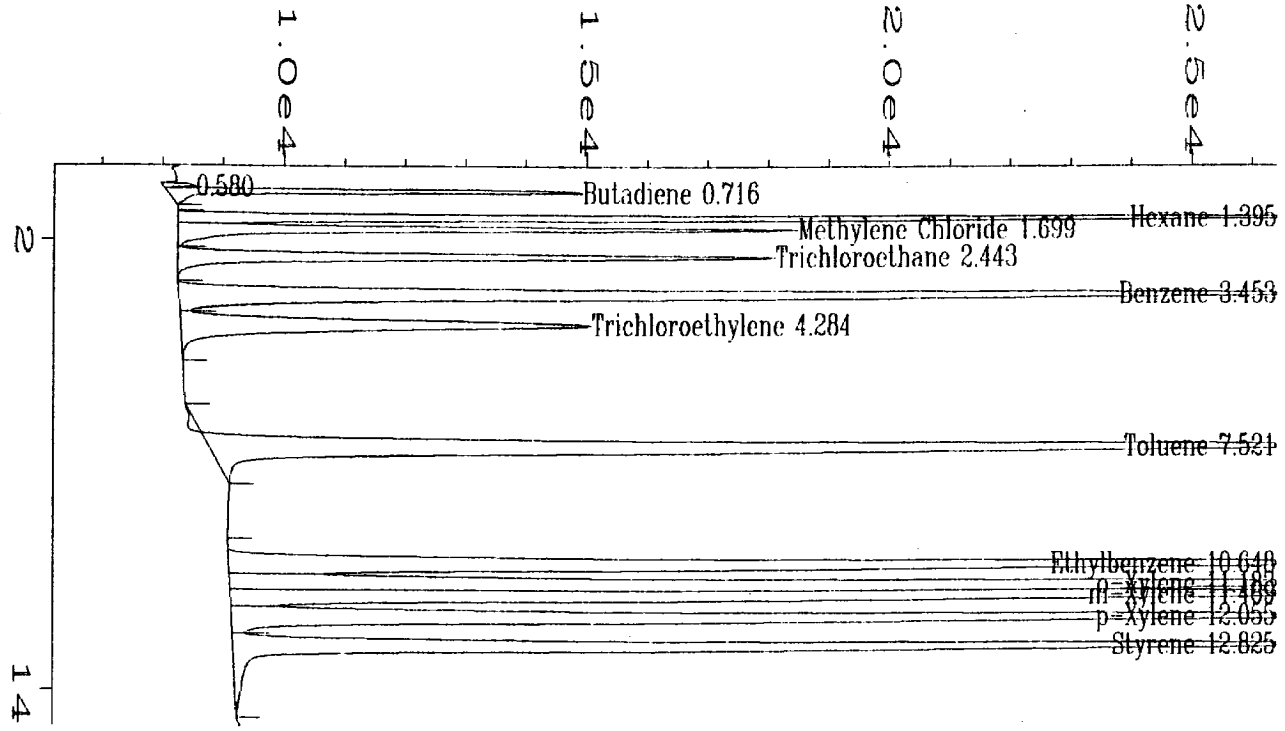
Data File Name : D:\HP\SOLVAY\CAL\BG1_0004.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag1
Run Time Bar Code:
Acquired on : 26 Oct 95 12:30 PM
Report Created on: 16 Dec 95 03:54 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\CAL\BG1_0004.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.582	2933	513	PV	0.074	0.0954
2	0.722	53185	6727	VB	0.128	1.7290
3	1.416	179677	22309	BV	0.130	5.8412
4	1.728	112286	10398	VV	0.159	3.6504
5	2.487	110665	9459	VB	0.180	3.5977
6	3.518	294027	20093	BV	0.224	9.5587
7	4.367	121097	6504	VB	0.283	3.9368
8	7.608	368599	21256	BV	0.268	11.9830
9	8.237	23132	705	VB	0.413	0.7520
10	10.707	360506	24392	BV	0.231	11.7199
11	11.237	351602	24688	VV	0.201	11.4304
12	11.555	360366	25515	VV	0.213	11.7154
13	12.104	347672	24006	VV	0.225	11.3027
14	12.869	364901	23828	VV	0.231	11.8628
15	15.161	25364	562	VBA	0.574	0.8246

Total area = 3076012



Area Percent Report

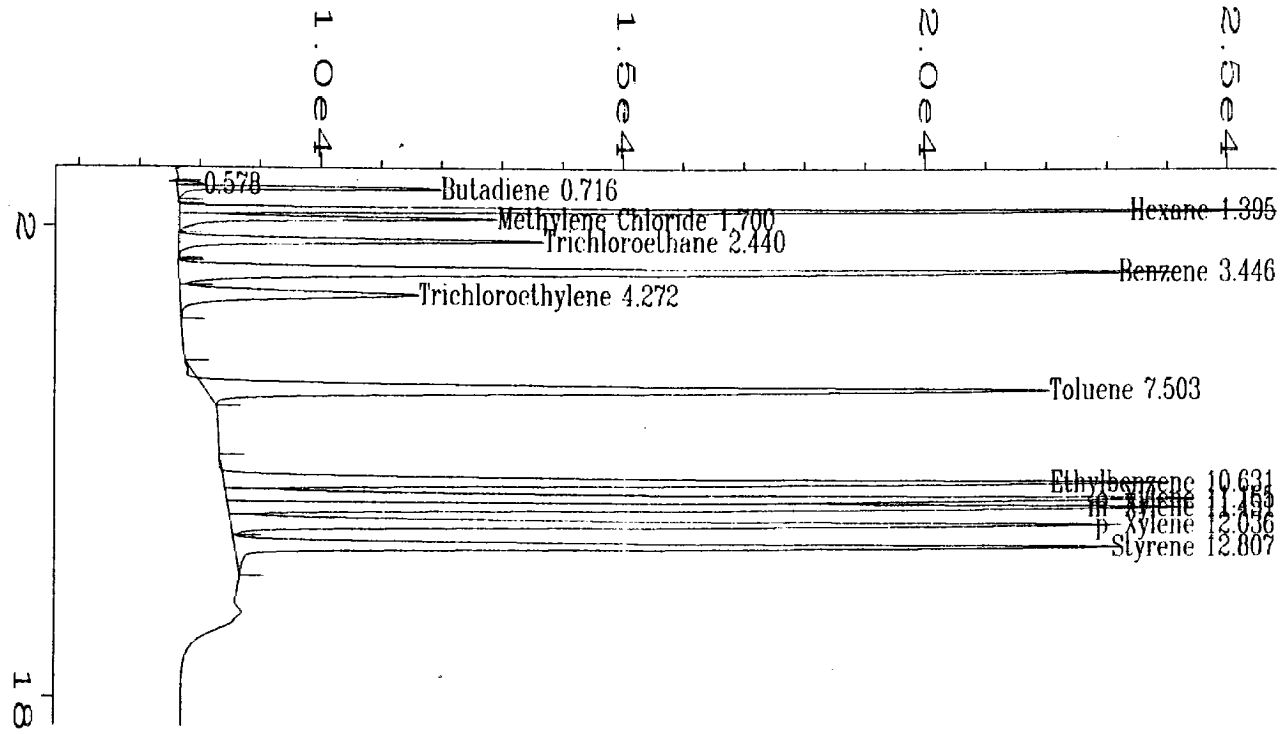
Data File Name : D:\HP\SOLVAY\CAL\BG1_0001.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag1
Run Time Bar Code:
Acquired on : 26 Oct 95 11:21 AM
Report Created on: 16 Dec 95 03:53 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\CAL\BG1_0001.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.580	3071	532	PV	0.076	0.1038
2	0.716	52264	6843	VB	0.125	1.7668
3	1.395	185614	23146	BV	0.129	6.2748
4	1.699	96923	10246	VV	0.144	3.2765
5	2.443	113892	9872	VV	0.178	3.8502
6	3.453	302295	20978	PV	0.221	10.2193
7	4.284	125218	6780	VB	0.284	4.2331
8	7.521	374837	21422	BB	0.272	12.6716
9	10.648	359972	24091	BV	0.233	12.1691
10	11.183	345072	24133	VV	0.218	11.6654
11	11.469	346545	24131	VV	0.217	11.7152
12	12.055	337474	23409	VV	0.224	11.4086
13	12.825	314902	22636	VV	0.215	10.6455

Total area = 2958079



Area Percent Report

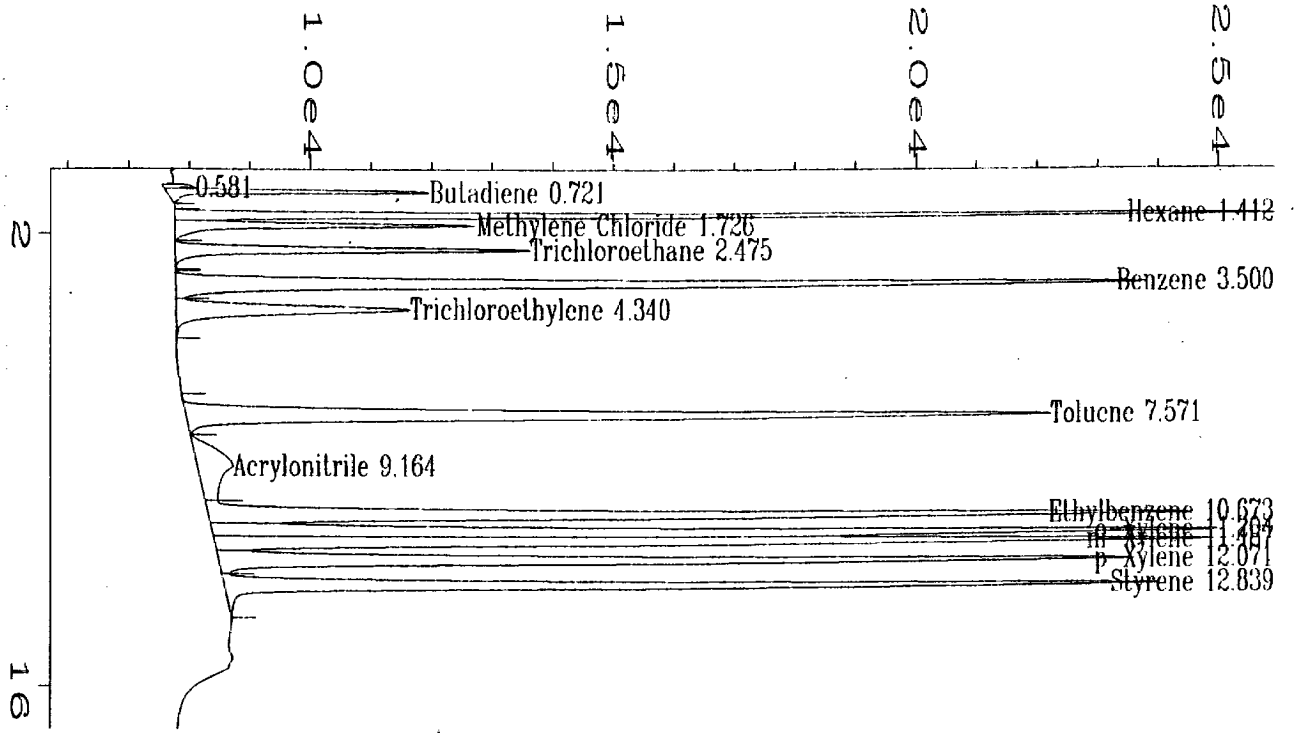
Data File Name : D:\HP\SOLVAY\10-27\BAG2_001.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag2
Run Time Bar Code:
Acquired on : 27 Oct 95 11:54 AM
Report Created on: 16 Dec 95 04:05 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-27\BAG2_001.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.578	2378	445	BV	0.072	0.1210
2	0.716	32819	4359	VB	0.104	1.6702
3	1.395	158836	19599	BV	0.131	8.0833
4	1.700	50713	5265	VV	0.147	2.5808
5	2.440	69721	6036	VB	0.178	3.5481
6	3.446	237425	16469	BV	0.221	12.0827
7	4.272	72735	3943	VB	0.284	3.7015
8	7.503	240375	13981	BB	0.269	12.2328
9	10.631	233168	15639	BV	0.234	11.8661
10	11.165	229605	16015	VV	0.218	11.6847
11	11.451	227597	15835	VV	0.218	11.5826
12	12.036	209270	14552	VV	0.224	10.6499
13	12.807	200357	14711	VB	0.211	10.1963

Total area = 1965000



Area Percent Report

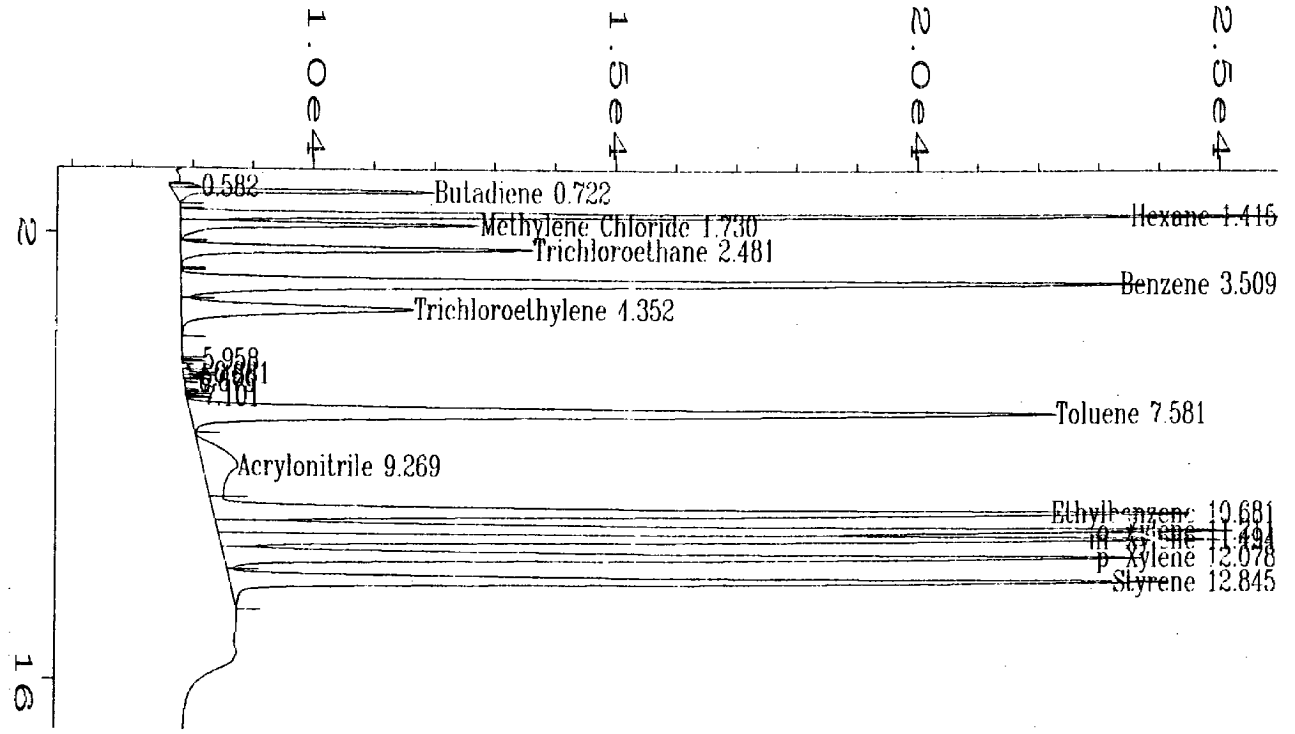
Data File Name : D:\HP\SOLVAY\10-27\BAG2_002.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag2
Run Time Bar Code:
Acquired on : 27 Oct 95 12:31 PM
Report Created on: 16 Dec 95 04:05 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-27\BAG2_002.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.581	3003	507	PV	0.077	0.1459
2	0.721	33846	4323	VB	0.106	1.6450
3	1.412	155999	19080	BV	0.132	7.5817
4	1.726	49533	4975	VV	0.151	2.4074
5	2.475	68489	5860	VB	0.180	3.3286
6	3.500	235208	16012	BV	0.224	11.4313
7	4.340	72783	3860	VB	0.288	3.5373
8	7.571	248237	14269	BV	0.271	12.0645
9	9.164	41536	583	VV	0.865	2.0187
10	10.673	245814	16210	VV	0.237	11.9468
11	11.204	239415	16690	VV	0.218	11.6358
12	11.487	235928	16456	VV	0.218	11.4663
13	12.071	217935	15108	VV	0.225	10.5918
14	12.839	209852	15411	VB	0.213	10.1990

Total area = 2057579



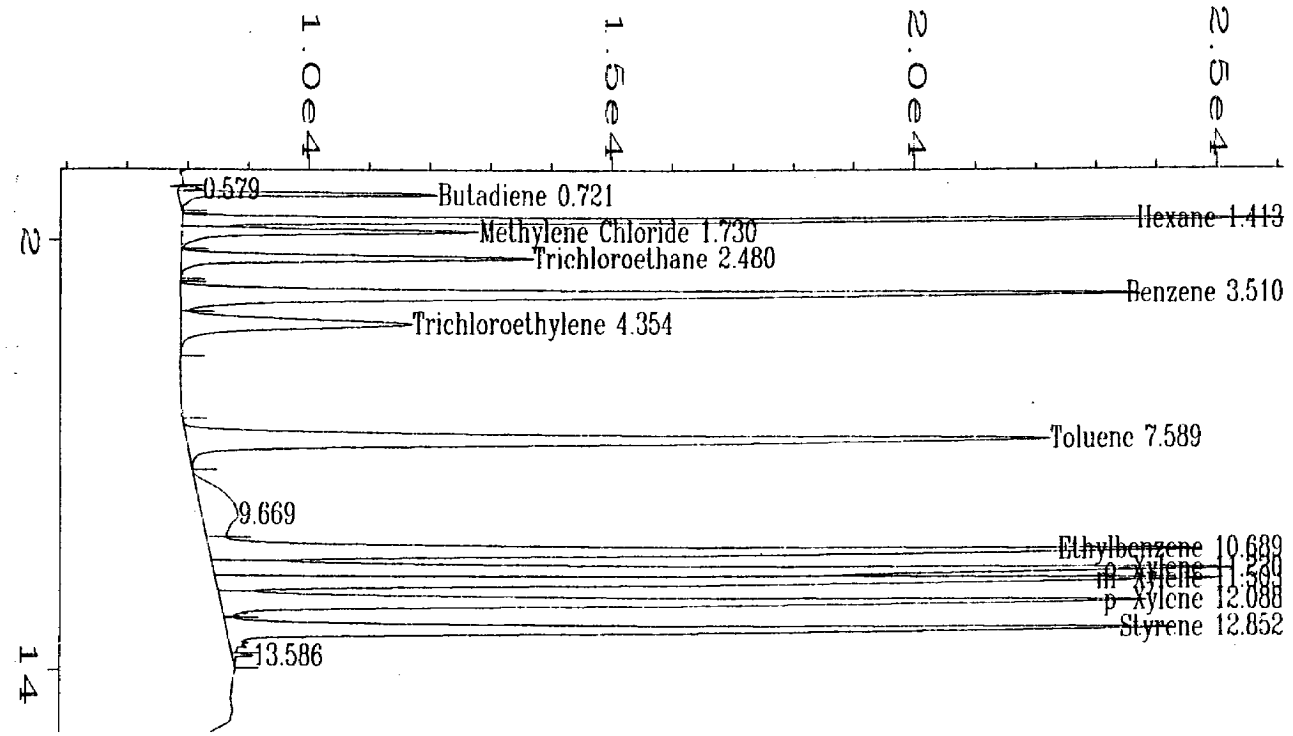
Area Percent Report

Data File Name : D:\HP\SOLVAY\10-27\BAG2_003.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag2
Run Time Bar Code:
Acquired on : 27 Oct 95 01:04 PM
Report Created on: 16 Dec 95 04:05 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-27\BAG2_003.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.582	3008	509	PV	0.078	0.1454
2	0.722	33972	4325	VB	0.106	1.6420
3	1.415	155627	19045	BV	0.132	7.5220
4	1.730	49417	4960	VV	0.151	2.3885
5	2.481	68212	5840	VB	0.179	3.2969
6	3.509	235019	15963	BV	0.225	11.3593
7	4.352	72730	3851	VB	0.290	3.5153
8	5.958	408	331	BV	0.032	0.0197
9	6.381	2187	590	PV	0.064	0.1057
10	6.486	1076	257	VV	0.071	0.0520
11	6.675	904	257	PB	0.127	0.0437
12	7.101	800	270	BV	0.049	0.0386
13	7.581	249019	14326	VV	0.270	12.0360
14	9.269	41601	584	VV	0.876	2.0107
15	10.681	247344	16319	VV	0.237	11.9550
16	11.211	240837	16810	VV	0.218	11.6405
17	11.494	237174	16564	VV	0.217	11.4634
18	12.078	219192	15222	VV	0.225	10.5943
19	12.845	210431	15541	VB	0.212	10.1709



Area Percent Report

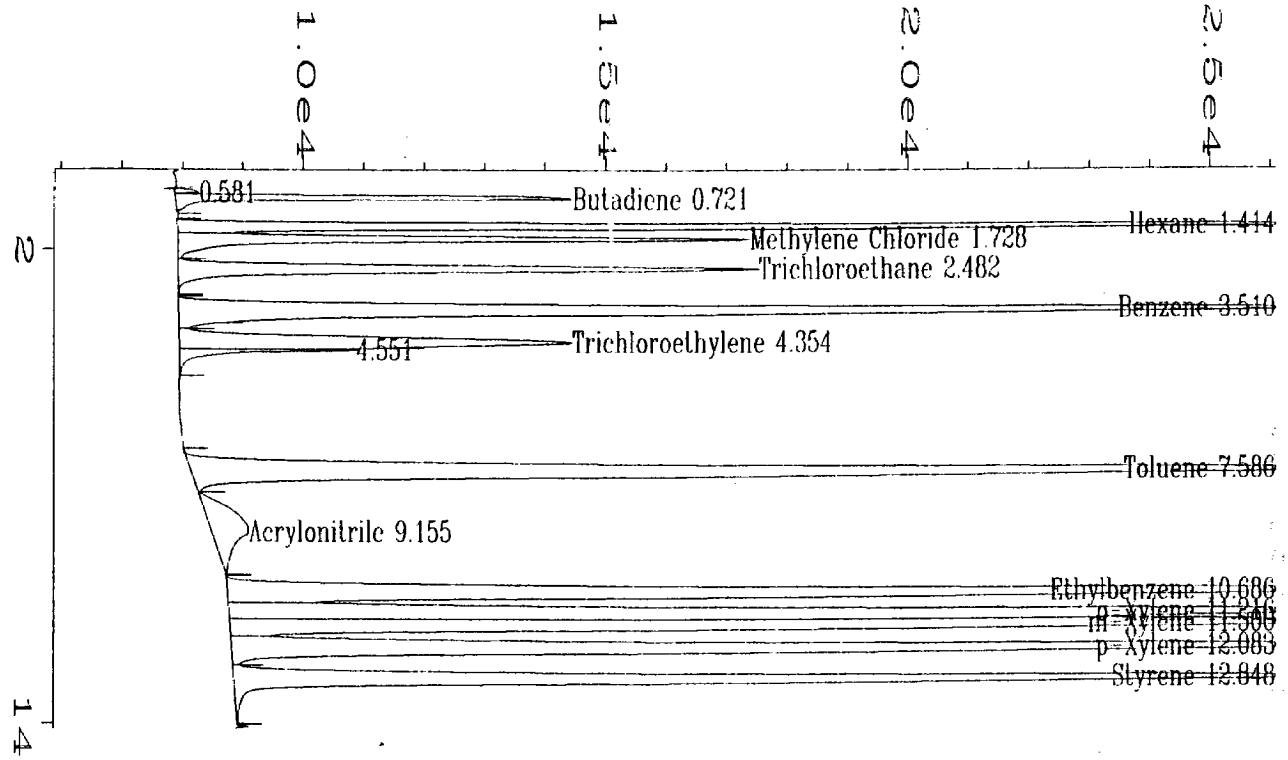
Data File Name : D:\HP\SOLVAY\10-27\BAG2_004.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag2
Run Time Bar Code:
Acquired on : 27 Oct 95 01:27 PM
Report Created on: 16 Dec 95 04:06 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-27\BAG2_004.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.579	1966	405	BV	0.065	0.0948
2	0.721	33183	4291	PB	0.104	1.6007
3	1.413	154713	19041	BV	0.131	7.4633
4	1.730	48882	4898	VV	0.151	2.3580
5	2.480	67795	5807	VB	0.180	3.2704
6	3.510	233522	15849	BV	0.225	11.2650
7	4.354	72215	3820	VB	0.287	3.4836
8	7.589	248506	14258	BV	0.270	11.9878
9	9.669	43595	601	PV	0.911	2.1030
10	10.689	249799	16358	VV	0.238	12.0502
11	11.220	241906	16852	VV	0.218	11.6694
12	11.503	238397	16608	VV	0.218	11.5002
13	12.088	222006	15267	VV	0.226	10.7095
14	12.852	214479	15627	VV	0.212	10.3464
15	13.586	2026	348	VB	0.112	0.0978

Total area = 2072990



Area Percent Report

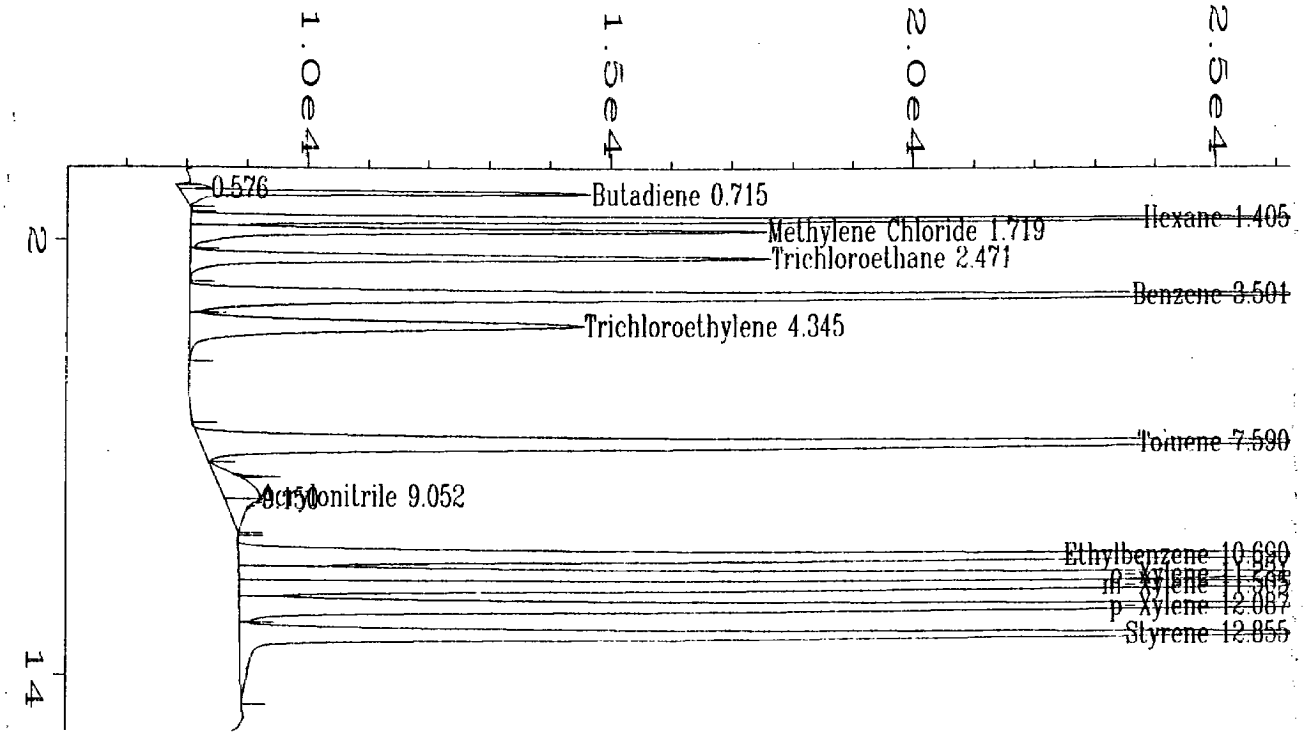
Data File Name : D:\HP\SOLVAY\10-27\BAG1_001.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag1
Run Time Bar Code:
Acquired on : 27 Oct 95 01:56 PM
Report Created on: 16 Dec 95 04:04 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-27\BAG1_001.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.581	2044	410	BV	0.066	0.0710
2	0.721	49844	6563	VB	0.104	1.7298
3	1.414	182683	22535	BV	0.131	6.3400
4	1.728	91424	9458	VV	0.148	3.1728
5	2.482	112089	9603	VB	0.179	3.8900
6	3.510	294429	20158	BV	0.224	10.2180
7	4.354	106890	6495	VV	0.246	3.7096
8	4.551	18682	2938	VB	0.106	0.6484
9	7.586	360959	20988	BV	0.267	12.5269
10	9.155	40566	608	VB	0.806	1.4078
11	10.686	350003	23634	BV	0.232	12.1467
12	11.216	332345	23462	VV	0.215	11.5339
13	11.500	334858	23513	VV	0.216	11.6211
14	12.083	323869	22752	VV	0.222	11.2397
15	12.848	280778	20819	VV	0.210	9.7443

Total area = 2881463



Area Percent Report

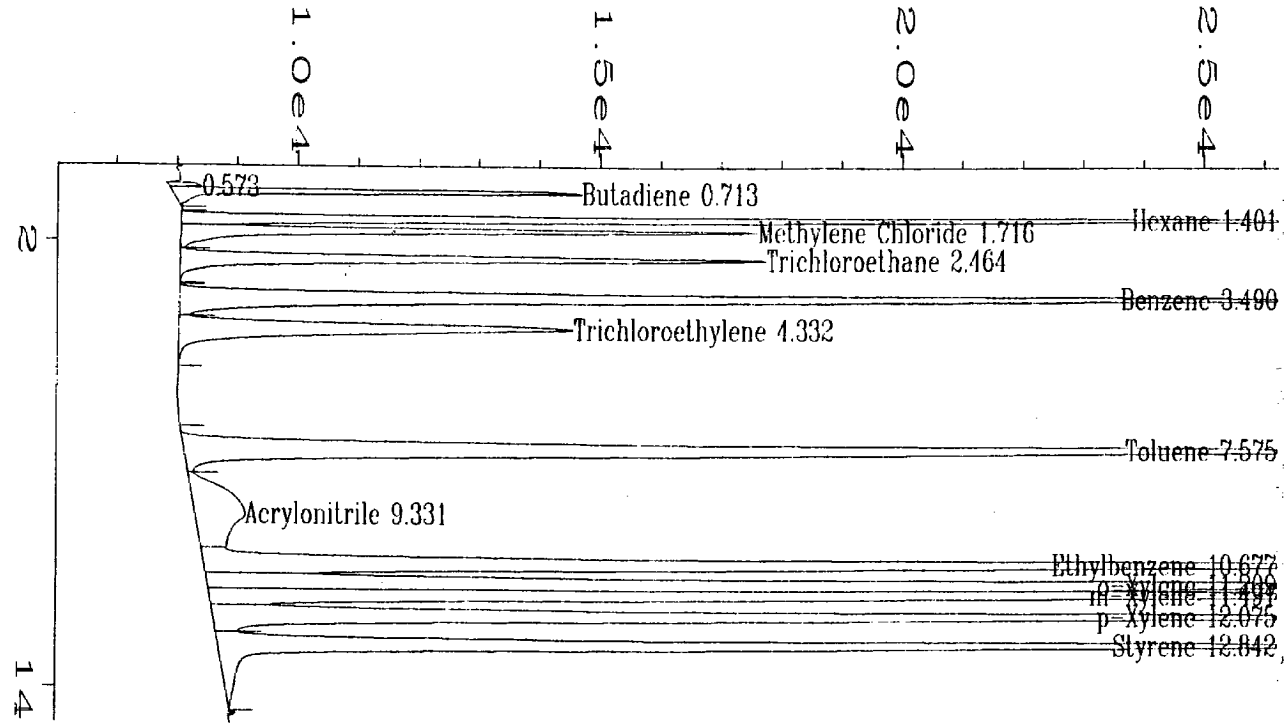
Data File Name : D:\HP\SOLVAY\10-27\BAG1_002.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag1
Run Time Bar Code:
Acquired on : 27 Oct 95 02:16 PM
Report Created on: 16 Dec 95 04:04 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-27\BAG1_002.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.576	3115	534	PV	0.078	0.1064
2	0.715	51727	6755	VB	0.124	1.7664
3	1.405	182989	22740	BV	0.130	6.2488
4	1.719	92304	9522	VV	0.148	3.1520
5	2.471	112342	9598	VV	0.183	3.8363
6	3.501	296345	20141	PV	0.225	10.1197
7	4.345	124021	6515	VB	0.277	4.2351
8	7.590	363420	21091	BV	0.268	12.4102
9	9.052	24968	634	VV	0.478	0.8526
10	9.150	13213	605	VB	0.279	0.4512
11	10.690	354482	23943	BV	0.231	12.1050
12	11.221	338888	23880	VV	0.216	11.5724
13	11.505	341140	23890	VV	0.217	11.6494
14	12.087	331752	23181	VV	0.223	11.3288
15	12.855	297693	21420	VV	0.214	10.1657

Total area = 2928400



Area Percent Report

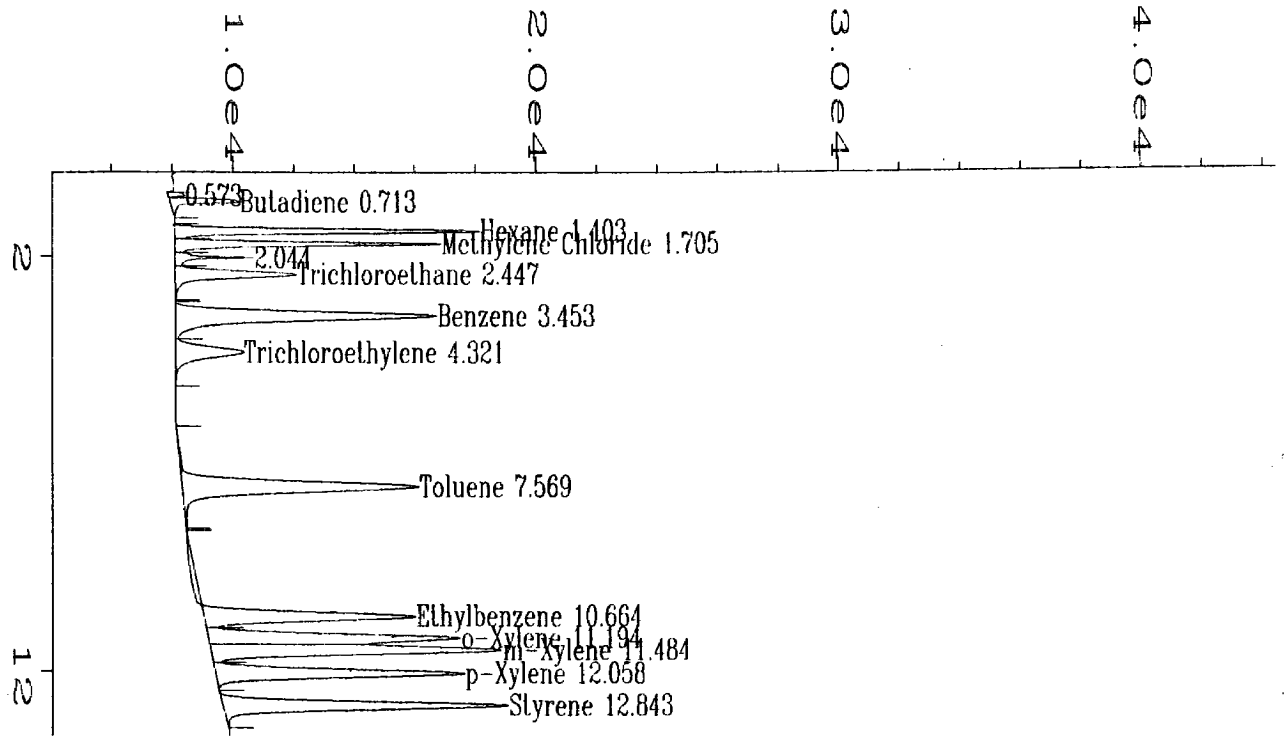
Data File Name : D:\HP\SOLVAY\10-27\BAG1_003.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag1
Run Time Bar Code:
Acquired on : 27 Oct 95 02:36 PM
Report Created on: 16 Dec 95 04:05 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-27\BAG1_003.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.573	3114	537	PV	0.075	0.1032
2	0.713	51930	6770	VB	0.104	1.7209
3	1.401	183366	22818	BV	0.129	6.0766
4	1.716	92367	9545	VV	0.148	3.0610
5	2.464	113011	9687	VB	0.180	3.7451
6	3.490	296613	20210	BV	0.224	9.8295
7	4.332	122631	6531	VB	0.287	4.0639
8	7.575	368965	21100	BV	0.271	12.2272
9	9.331	69691	831	VV	1.043	2.3095
10	10.677	370480	24259	VV	0.238	12.2774
11	11.209	346661	24159	VV	0.218	11.4881
12	11.491	348466	24156	VV	0.219	11.5479
13	12.075	341422	23341	VV	0.228	11.3145
14	12.842	308849	21603	VV	0.220	10.2350

Total area = 3017564



Area Percent Report

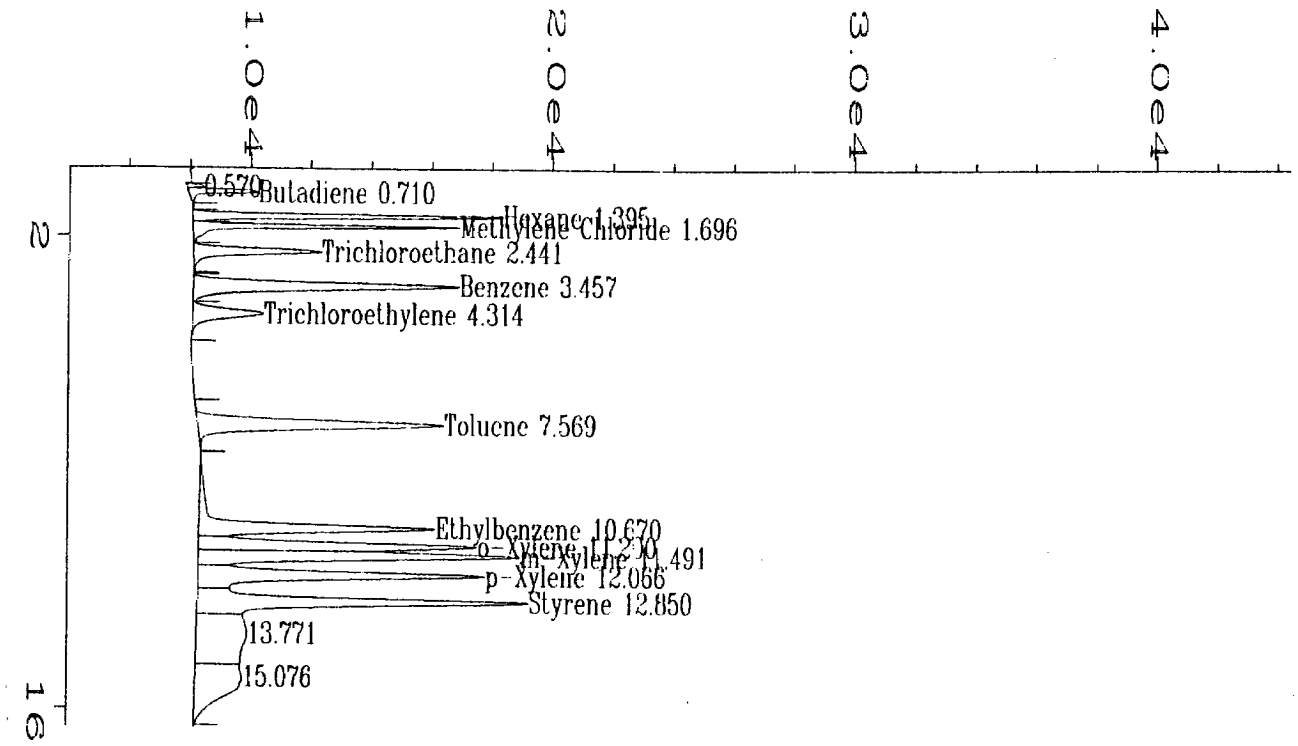
Data File Name : D:\HP\SOLVAY\10-27\BAG4_001.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag4
Run Time Bar Code:
Acquired on : 27 Oct 95 07:08 PM
Report Created on: 16 Dec 95 04:07 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-27\BAG4_001.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.573	3154	541	PV	0.077	0.2781
2	0.713	18613	2283	VB	0.107	1.6412
3	1.403	78814	10084	BV	0.127	6.9497
4	1.705	62747	8797	VV	0.108	5.5330
5	2.044	12633	2583	VV	0.065	1.1139
6	2.447	50025	4018	VB	0.189	4.4111
7	3.453	134602	8630	BV	0.234	11.8690
8	4.321	42433	2265	VB	0.285	3.7417
9	7.569	142815	7817	BB	0.282	12.5932
10	10.664	88826	6987	BV	0.208	7.8325
11	11.194	116236	8323	VV	0.213	10.2495
12	11.484	139593	9623	VV	0.220	12.3091
13	12.058	116938	8228	VV	0.222	10.3114
14	12.843	126636	9426	PB	0.210	11.1665

Total area = 1134064



Area Percent Report

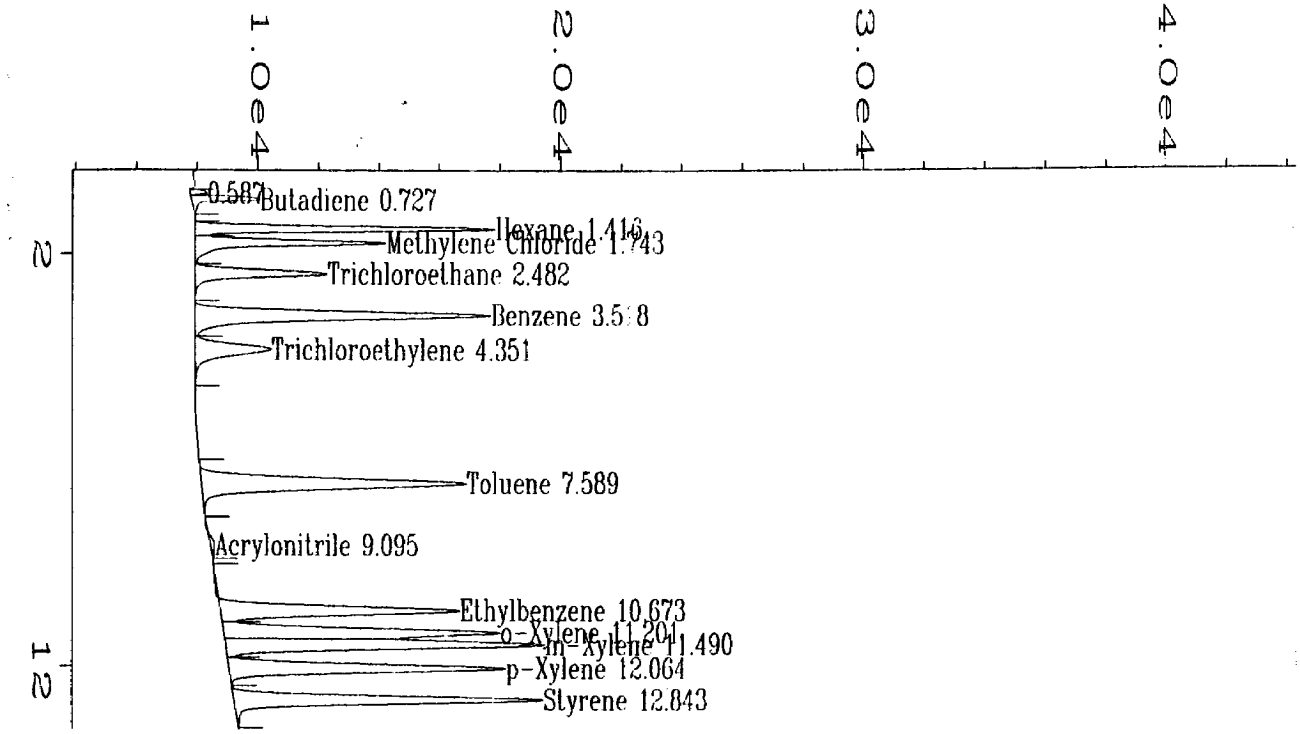
Data File Name : D:\HP\SOLVAY\10-27\BAG4_002.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag4
Run Time Bar Code:
Acquired on : 27 Oct 95 07:27 PM
Report Created on: 16 Dec 95 04:07 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-27\BAG4_002.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.570	3359	560	PV	0.080	0.2134
2	0.710	18662	2302	VB	0.109	1.1857
3	1.395	81509	10264	BV	0.130	5.1784
4	1.696	64654	8848	VV	0.110	4.1075
5	2.441	55628	4222	VB	0.203	3.5341
6	3.457	138905	8777	BV	0.240	8.8248
7	4.314	44579	2349	VB	0.288	2.8321
8	7.569	145304	8149	BB	0.277	9.2314
9	10.670	139174	7817	BV	0.267	8.8419
10	11.200	134941	9193	VV	0.221	8.5730
11	11.491	163459	10632	VV	0.231	10.3848
12	12.066	159828	9490	VV	0.253	10.1541
13	12.850	185026	10949	VV	0.250	11.7550
14	13.771	138900	1672	VV	1.023	8.8245
15	15.076	100098	1541	VBA	0.794	6.3594

Total area = 1574025



Area Percent Report

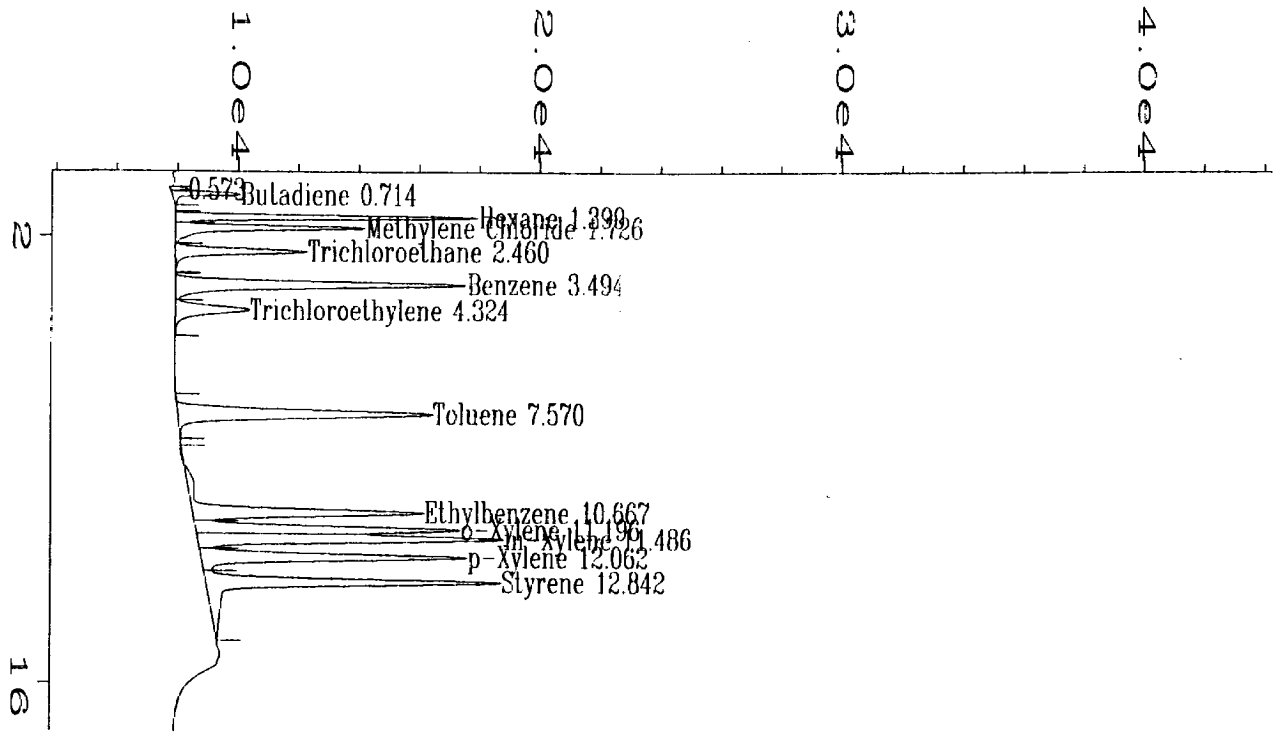
Data File Name : D:\HP\SOLVAY\10-27\BAG4_003.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag4
Run Time Bar Code:
Acquired on : 27 Oct 95 08:09 PM
Report Created on: 16 Dec 95 04:07 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-27\BAG4_003.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.587	3615	553	PV	0.084	0.2923
2	0.727	19140	2243	VB	0.112	1.5477
3	1.416	86336	9925	BV	0.141	6.9815
4	1.743	66474	6296	VV	0.161	5.3754
5	2.482	52513	4361	VB	0.185	4.2465
6	3.518	146754	9762	BV	0.226	11.8673
7	4.351	47984	2518	VB	0.289	3.8802
8	7.589	153543	8746	BB	0.272	12.4162
9	9.095	2449	141	BB	0.252	0.1981
10	10.673	113627	7880	BV	0.227	9.1884
11	11.201	126953	9094	VV	0.213	10.2661
12	11.490	151163	10518	VV	0.219	12.2238
13	12.064	128407	9108	VV	0.220	10.3836
14	12.843	137670	10189	PBA	0.210	11.1327

Total area = 1236628



Area Percent Report

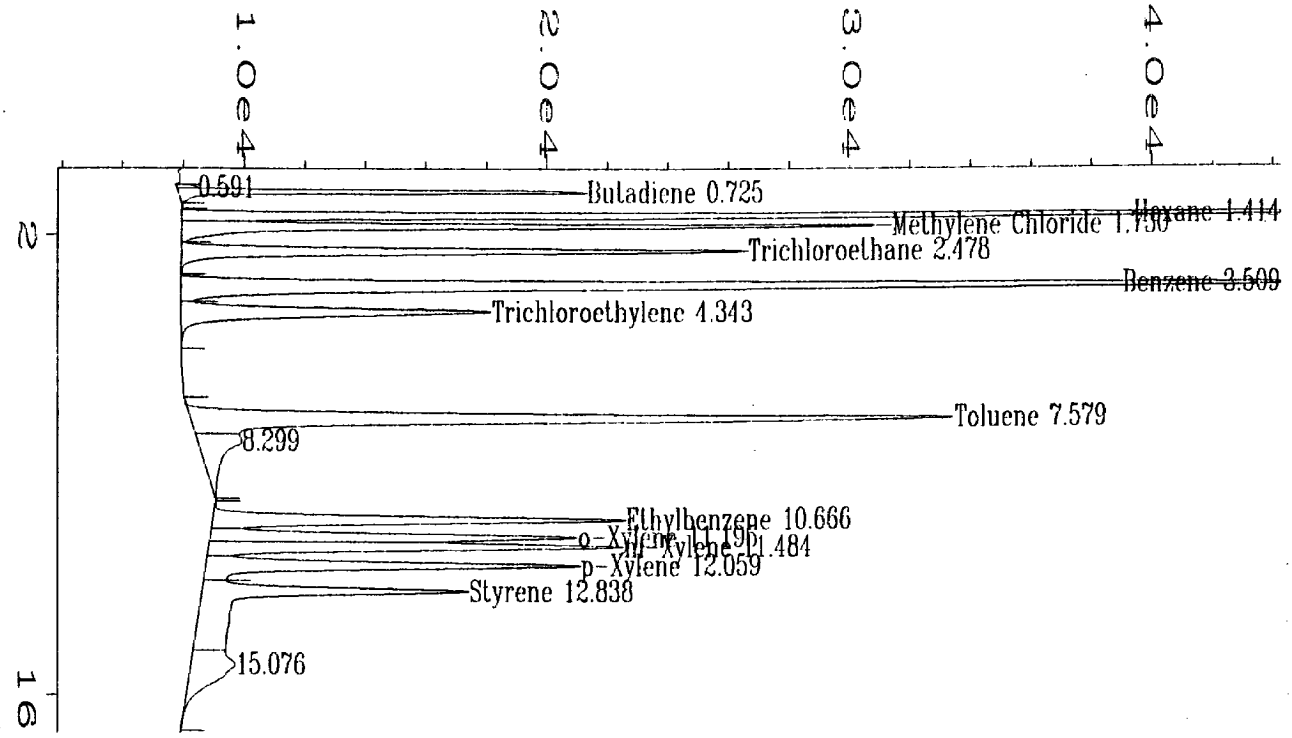
Data File Name : D:\HP\SOLVAY\10-27\BAG4_004.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag4
Run Time Bar Code:
Acquired on : 27 Oct 95 08:28 PM
Report Created on: 16 Dec 95 04:07 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-27\BAG4_004.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.573	3757	580	PV	0.085	0.2980
2	0.714	18890	2258	VB	0.111	1.4985
3	1.399	86108	10035	BV	0.140	6.8307
4	1.726	66771	6314	VV	0.160	5.2967
5	2.460	52818	4371	VB	0.185	4.1899
6	3.494	145424	9653	BV	0.225	11.5361
7	4.324	46901	2462	VB	0.289	3.7205
8	7.570	148938	8446	BB	0.275	11.8148
9	10.667	126663	7646	BV	0.253	10.0478
10	11.196	124431	8751	VV	0.216	9.8707
11	11.486	148844	10119	VV	0.222	11.8074
12	12.062	131431	8789	VV	0.230	10.4261
13	12.842	159626	9748	VB	0.243	12.6627

Total area = 1260601



Area Percent Report

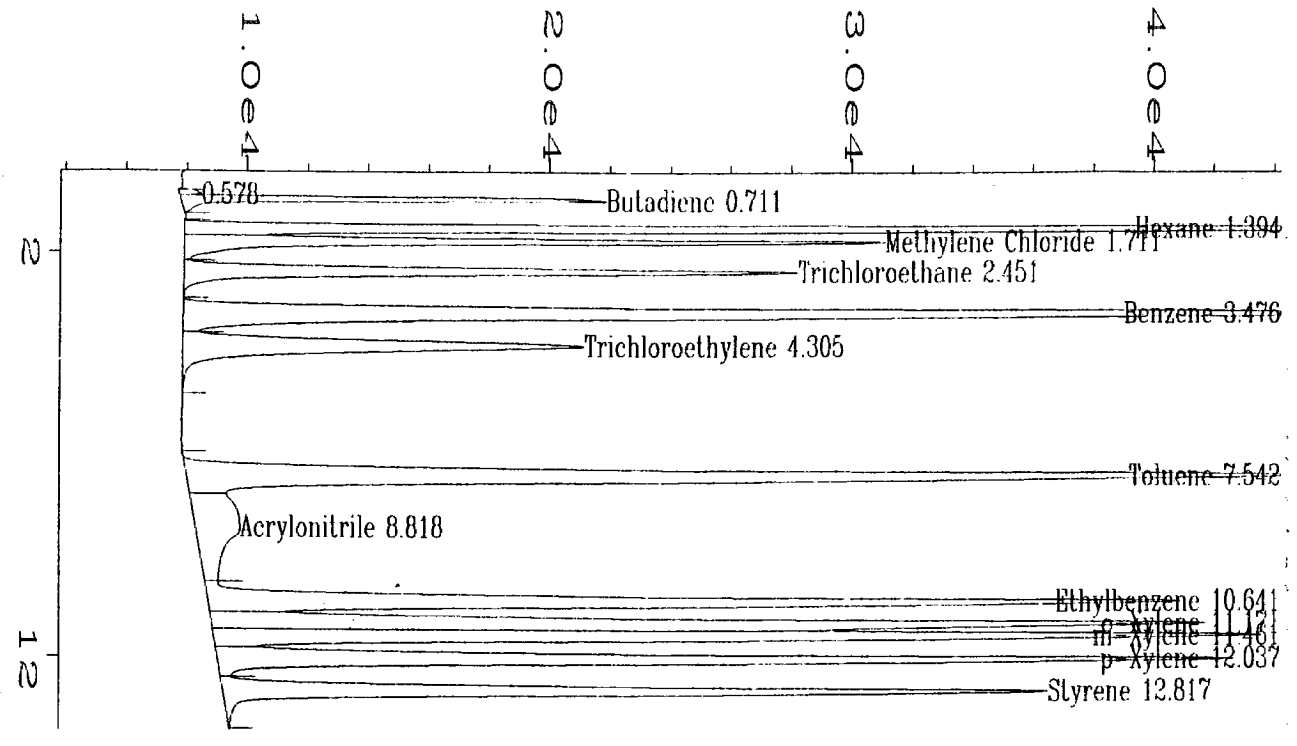
Data File Name : D:\HP\SOLVAY\10-27\BAG3_001.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag3
Run Time Bar Code:
Acquired on : 27 Oct 95 08:57 PM
Report Created on: 16 Dec 95 04:06 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-27\BAG3_001.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.591	4307	693	PV	0.077	0.1234
2	0.725	108943	13503	VV	0.133	3.1211
3	1.414	498980	58256	BV	0.139	14.2955
4	1.730	229450	23462	VV	0.149	6.5736
5	2.478	224303	18729	VV	0.186	6.4261
6	3.509	603674	40557	PV	0.229	17.2949
7	4.343	193775	10258	VB	0.288	5.5515
8	7.579	458680	25231	BV	0.279	13.1409
9	8.299	70377	1452	VB	0.637	2.0163
10	10.666	206029	13648	BV	0.235	5.9026
11	11.195	173436	12140	VV	0.217	4.9688
12	11.484	202924	13704	VV	0.224	5.8136
13	12.059	194026	12357	VV	0.239	5.5587
14	12.838	233661	8831	VV	0.361	6.6942
15	15.076	87914	1482	VBA	0.774	2.5187

Total area = 3490480



Area Percent Report

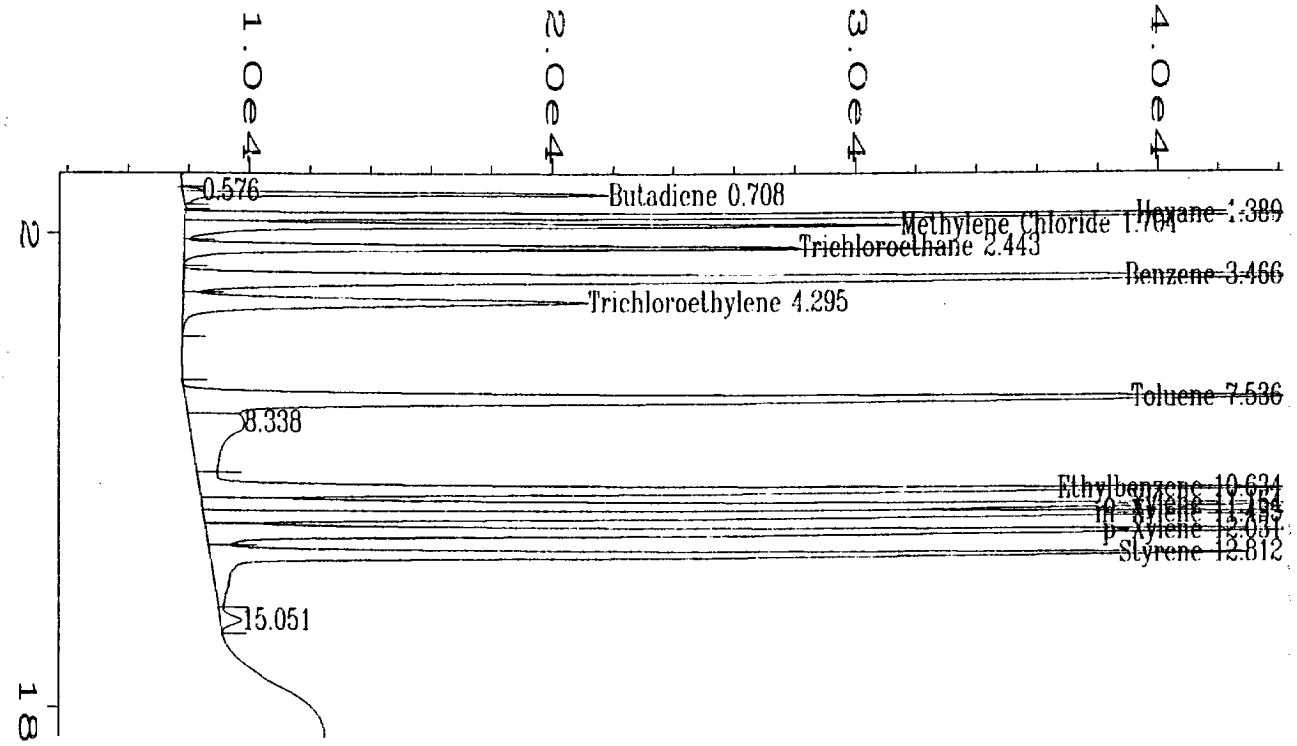
Data File Name : D:\HP\SOLVAY\10-27\BAG3_002.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag3
Run Time Bar Code:
Acquired on : 27 Oct 95 09:17 PM
Report Created on: 16 Dec 95 04:06 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Fig. 1 in D:\HP\SOLVAY\10-27\BAG3_002.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.578	4393	719	PV	0.076	0.0842
2	0.711	112082	14064	VV	0.111	2.1486
3	1.394	529538	62286	BV	0.138	10.1513
4	1.711	229661	23180	VV	0.150	4.4026
5	2.451	243656	20329	VV	0.185	4.6709
6	3.476	700419	46743	PV	0.230	13.4270
7	4.305	254260	13260	VB	0.291	4.8742
8	7.542	665130	37528	BV	0.274	12.7506
9	8.818	137466	1480	VV	1.124	2.6352
10	10.641	494274	32223	VV	0.238	9.4752
11	11.171	474152	32866	VV	0.219	9.0895
12	11.461	503820	34661	VV	0.221	9.6582
13	12.037	490870	33643	VV	0.226	9.4100
14	12.817	376756	27278	VBA	0.214	7.2224

Total area = 5216476



Area Percent Report

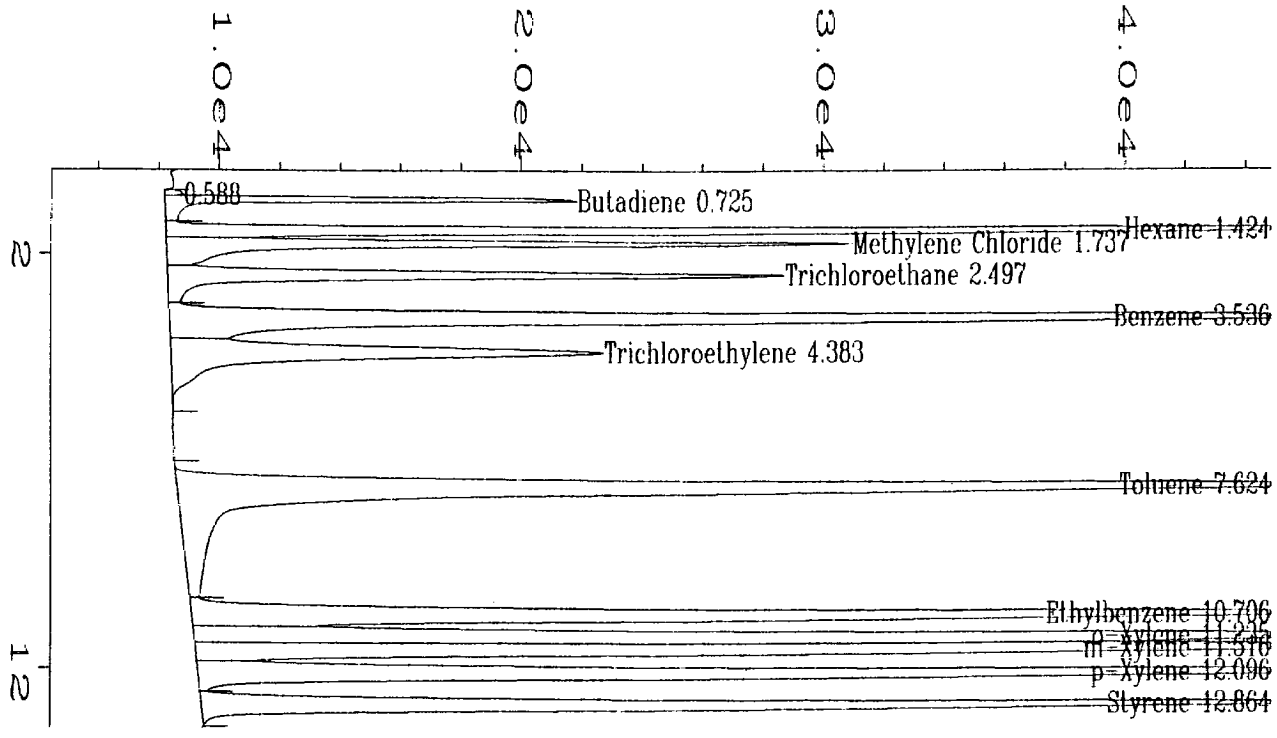
Data File Name : D:\HP\SOLVAY\10-27\BAG3_003.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag3
Run Time Bar Code:
Acquired on : 27 Oct 95 09:35 PM
Report Created on: 16 Dec 95 04:06 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-27\BAG3_003.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.576	3710	653	BV	0.071	0.0643
2	0.708	111044	14047	VV	0.130	1.9259
3	1.389	528739	62264	BV	0.138	9.1702
4	1.704	232729	23631	VV	0.150	4.0363
5	2.443	243829	20302	VV	0.172	4.2289
6	3.466	700162	46646	VV	0.230	12.1433
7	4.295	256670	13366	VB	0.292	4.4516
8	7.536	703771	38566	BV	0.280	12.2059
9	8.338	144451	1820	VV	1.037	2.5053
10	10.634	567571	36394	VV	0.242	9.8437
11	11.164	558189	38751	VV	0.219	9.6810
12	11.455	590661	40501	VV	0.221	10.2441
13	12.031	593165	40099	VV	0.229	10.2876
14	12.812	514373	34356	VV	0.227	8.9210
15	15.051	16779	696	VV	0.360	0.2910

Total area = 5765842



Area Percent Report

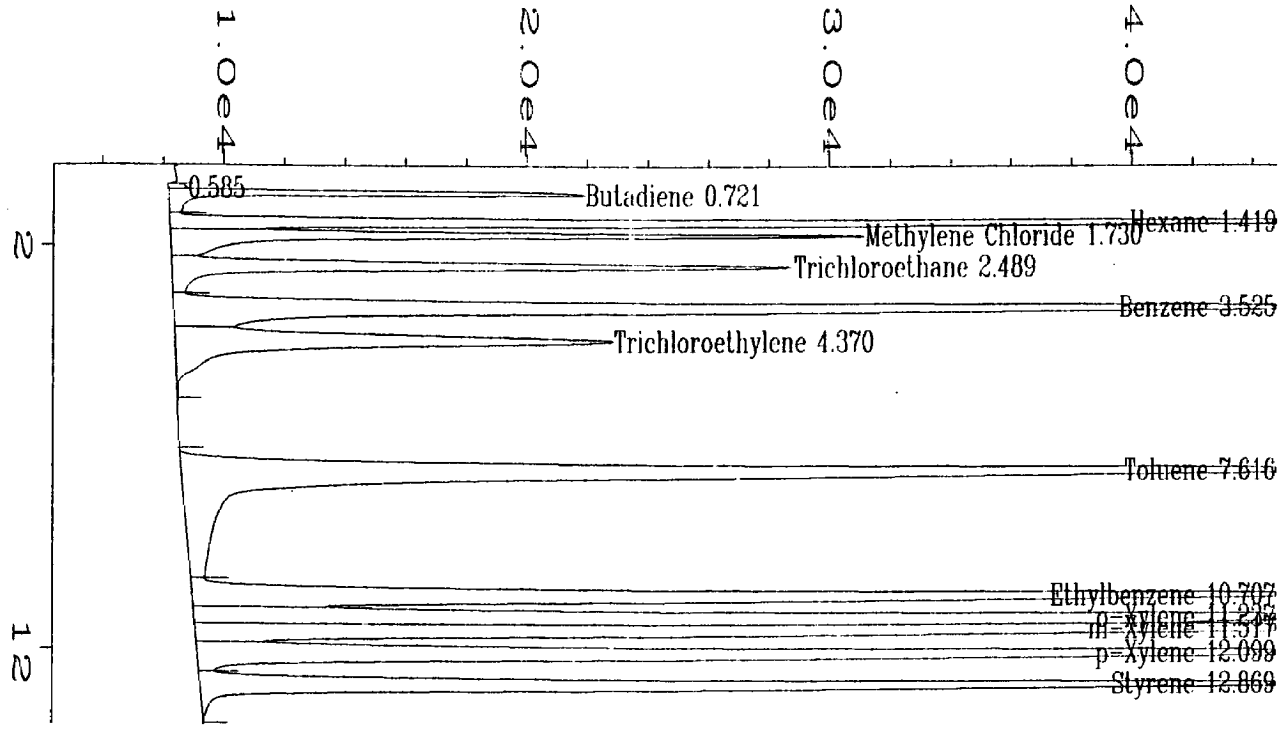
Data File Name : D:\HP\SOLVAY\10-28\BAG3_001.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag3
Run Time Bar Code:
Acquired on : 28 Oct 95 08:17 PM
Report Created on: 16 Dec 95 04:04 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-28\BAG3_001.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.588	3817	633	PV	0.076	0.0589
2	0.725	120230	13653	VV	0.141	1.8555
3	1.424	531768	61972	VV	0.139	8.2066
4	1.737	248750	22734	VV	0.163	3.8389
5	2.497	263576	20441	VV	0.196	4.0677
6	3.536	732196	46766	VV	0.239	11.2998
7	4.383	314530	14332	VB	0.324	4.8541
8	7.624	933255	42711	BV	0.321	14.4027
9	10.706	660556	42337	VV	0.242	10.1942
10	11.235	678103	46591	VV	0.221	10.4650
11	11.516	717687	48019	VV	0.226	11.0759
12	12.096	712608	48520	VV	0.228	10.9975
13	12.864	562652	41301	VBA	0.213	8.6833

Total area = 6479730



Area Percent Report

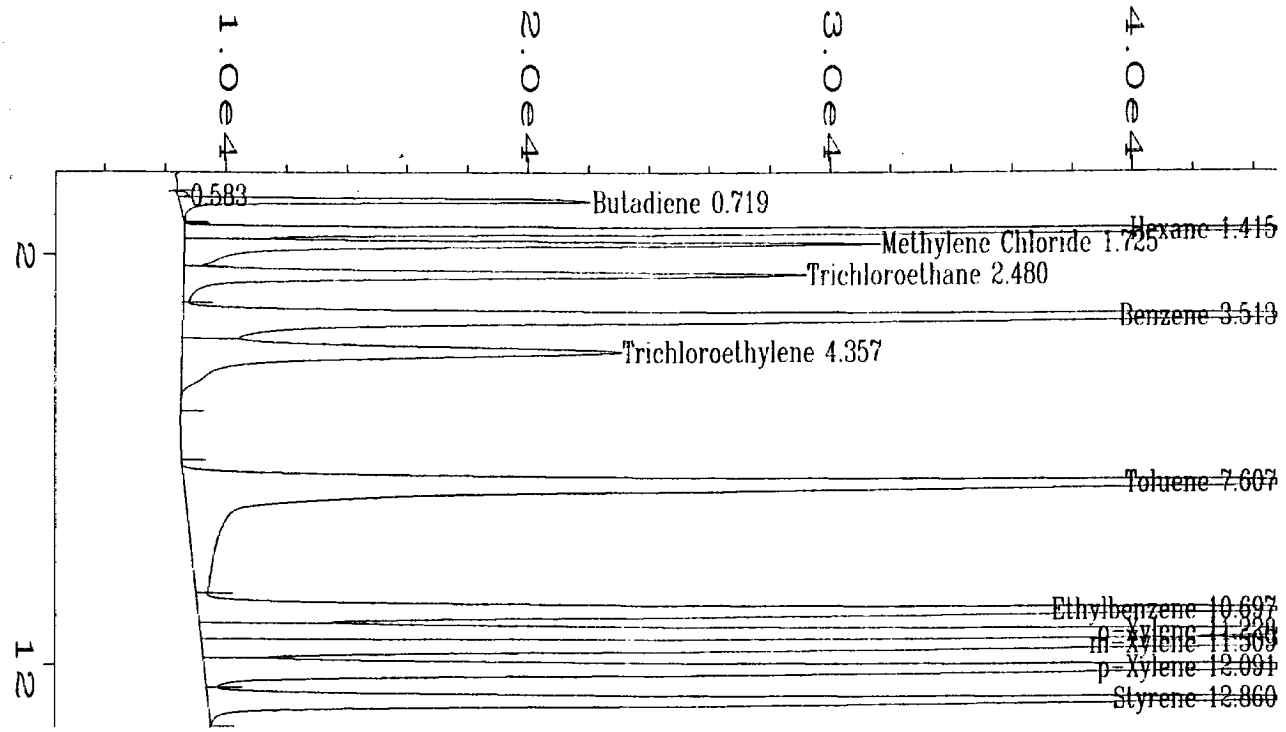
Data File Name : D:\HP\SOLVAY\10-28\BAG3_002.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag3
Run Time Bar Code:
Acquired on : 28 Oct 95 08:36 PM
Report Created on: 16 Dec 95 04:04 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-28\BAG3_002.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.585	3856	644	PV	0.076	0.0579
2	0.721	120614	13747	VV	0.141	1.8105
3	1.419	533488	62346	VV	0.138	8.0078
4	1.730	250387	22931	VV	0.162	3.7584
5	2.489	265101	20552	VV	0.197	3.9792
6	3.525	736217	47079	VV	0.238	11.0509
7	4.370	318478	14483	VB	0.325	4.7805
8	7.616	970099	43310	BV	0.328	14.5615
9	10.707	681447	43184	VV	0.245	10.2287
10	11.237	699672	47814	VV	0.222	10.5023
11	11.517	741723	49303	VV	0.227	11.1335
12	12.099	741756	49800	VV	0.231	11.1340
13	12.869	599243	43138	VBA	0.216	8.9948

Total area = 6662080



Area Percent Report

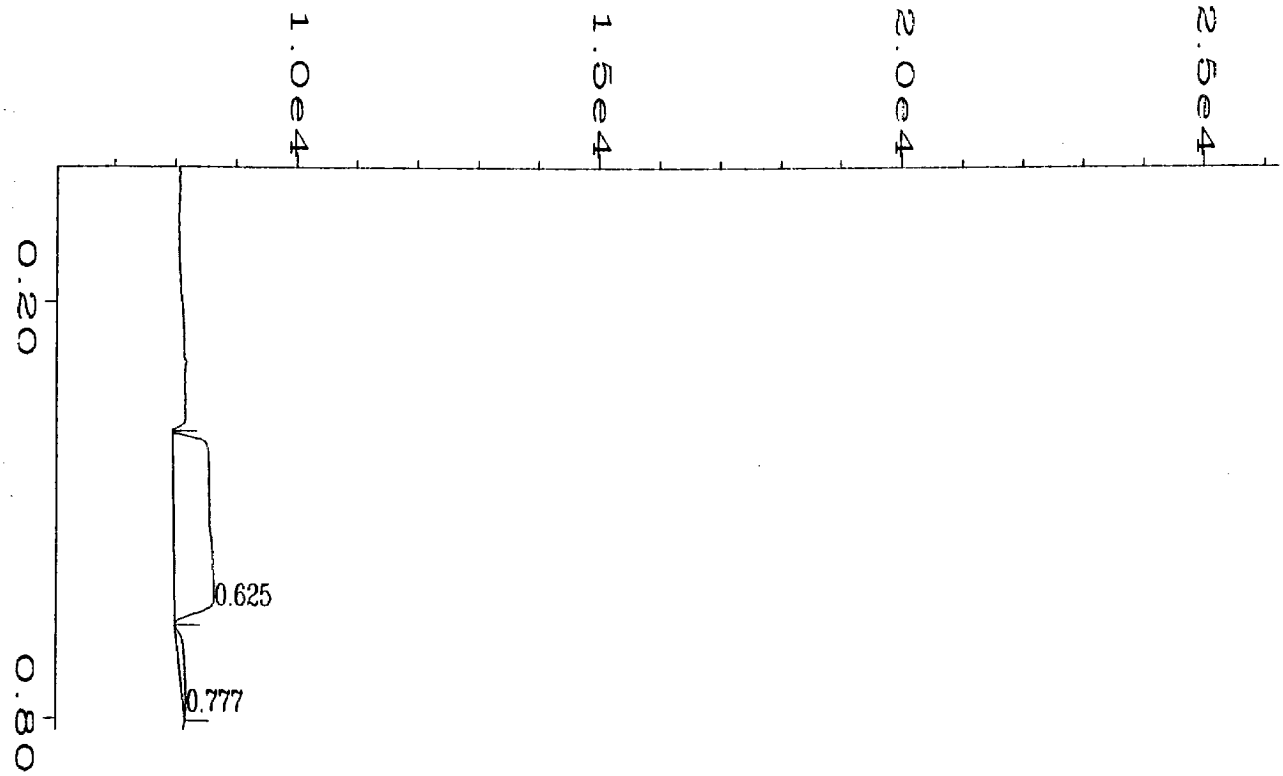
Data File Name : D:\HP\SOLVAY\10-28\BAG3_003.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag3
Run Time Bar Code:
Acquired on : 28 Oct 95 08:54 PM
Report Created on: 16 Dec 95 04:04 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-28\BAG3_003.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.583	1971	400	BV	0.062	0.0296
2	0.719	109503	13647	VB	0.109	1.6448
3	1.415	531962	63240	BV	0.136	7.9904
4	1.725	242553	23085	VV	0.157	3.6433
5	2.480	255804	20638	VV	0.190	3.8424
6	3.513	737126	47517	VV	0.237	11.0721
7	4.357	315120	14561	VB	0.321	4.7333
8	7.607	974713	43674	BV	0.327	14.6408
9	10.697	687187	43670	VV	0.244	10.3220
10	11.228	706614	48305	VV	0.221	10.6138
11	11.509	748767	49789	VV	0.227	11.2470
12	12.091	747089	50349	VV	0.231	11.2218
13	12.860	599080	43577	VBA	0.214	8.9986

Total area = 6657488



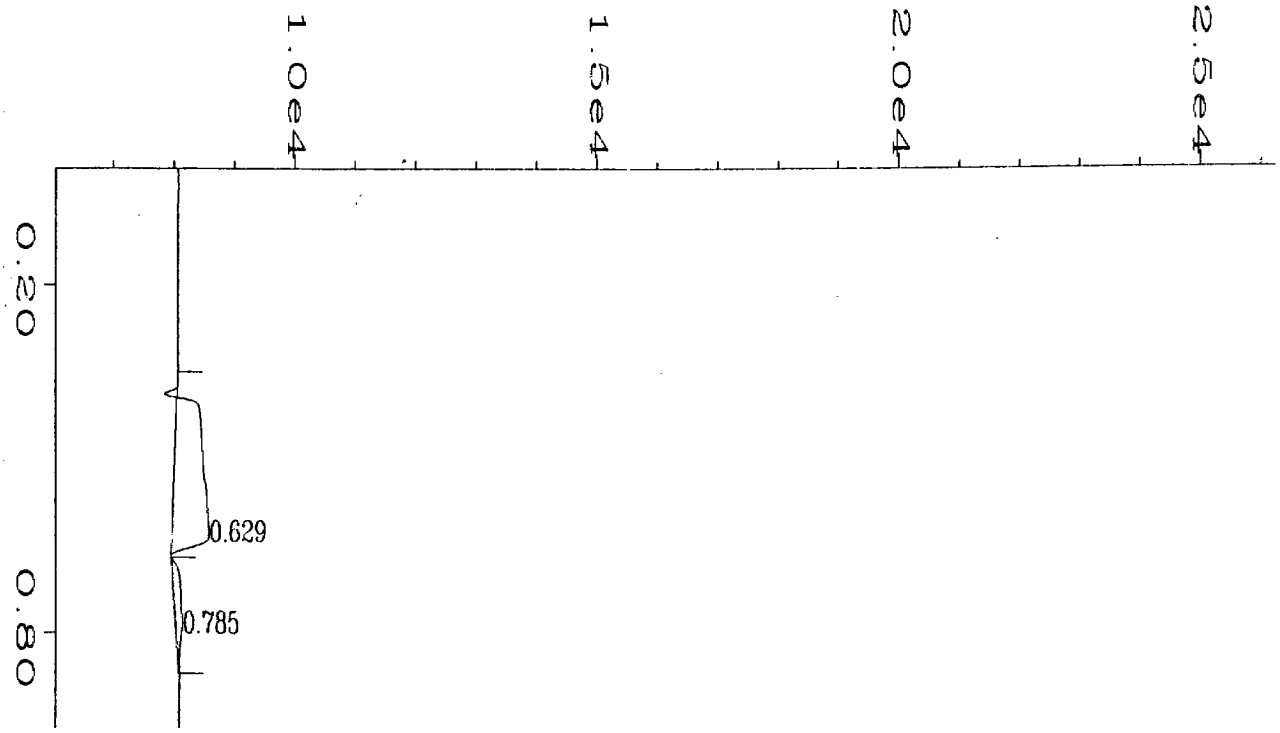
External Standard Report

Data File Name	: D:\HP\SOLVAY\10-28\AIR_0002.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: zero air	Injection Number	:
Run Time Bar Code:		Sequence Line	:
Acquired on	: 28 Oct 95 01:32 PM	Instrument Method:	SOLVAY.MTH
Report Created on:	16 Dec 95 06:35 PM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HP\SOLVAY\10-28\AIR_0002.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.409	* not found *			1		Hexane
1.722	* not found *			1		Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.514	* not found *			1		Benzene
4.364	* not found *			1		Trichloroethylene
7.608	* not found *			1		Toluene
8.934	* not found *			1		Acrylonitrile
10.705	* not found *			1		Ethylbenzene
11.235	* not found *			1		o-Xylene
11.519	* not found *			1		m-Xylene
12.102	* not found *			1		p-Xylene
12.868	* not found *			1		Styrene

Not all calibrated peaks were found



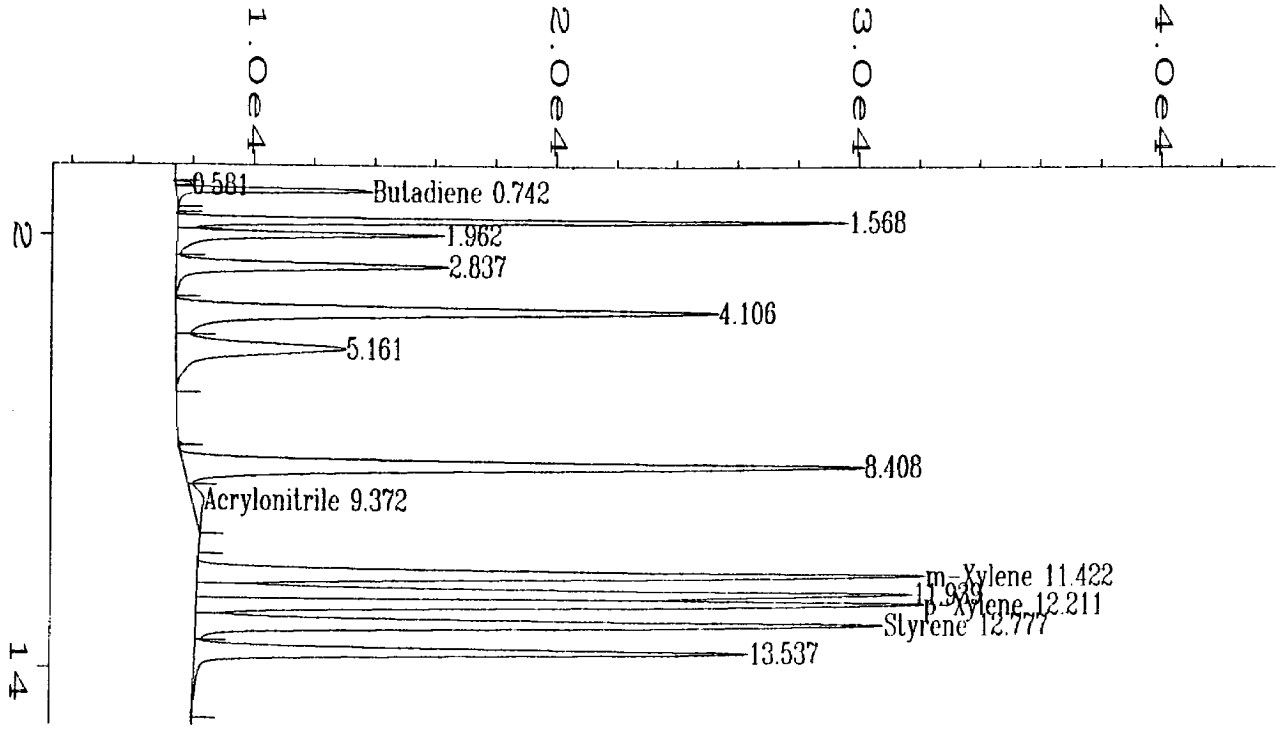
External Standard Report

Data File Name	: D:\HP\SOLVAY\10-28\AIR_0001.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: zero air	Injection Number	:
Run Time Bar Code:		Sequence Line	:
Acquired on	: 28 Oct 95 01:30 PM	Instrument Method	: SOLVAY.MTH
Report Created on	: 16 Dec 95 06:35 PM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Fig. 1 in D:\HP\SOLVAY\10-28\AIR_0001.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.409	* not found *			1		Hexane
1.722	* not found *			1		Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.514	* not found *			1		Benzene
4.364	* not found *			1		Trichloroethylene
7.608	* not found *			1		Toluene
8.934	* not found *			1		Acrylonitrile
10.705	* not found *			1		Ethylbenzene
11.235	* not found *			1		o-Xylene
11.519	* not found *			1		m-Xylene
12.102	* not found *			1		p-Xylene
12.868	* not found *			1		Styrene

Not all calibrated peaks were found



Area Percent Report

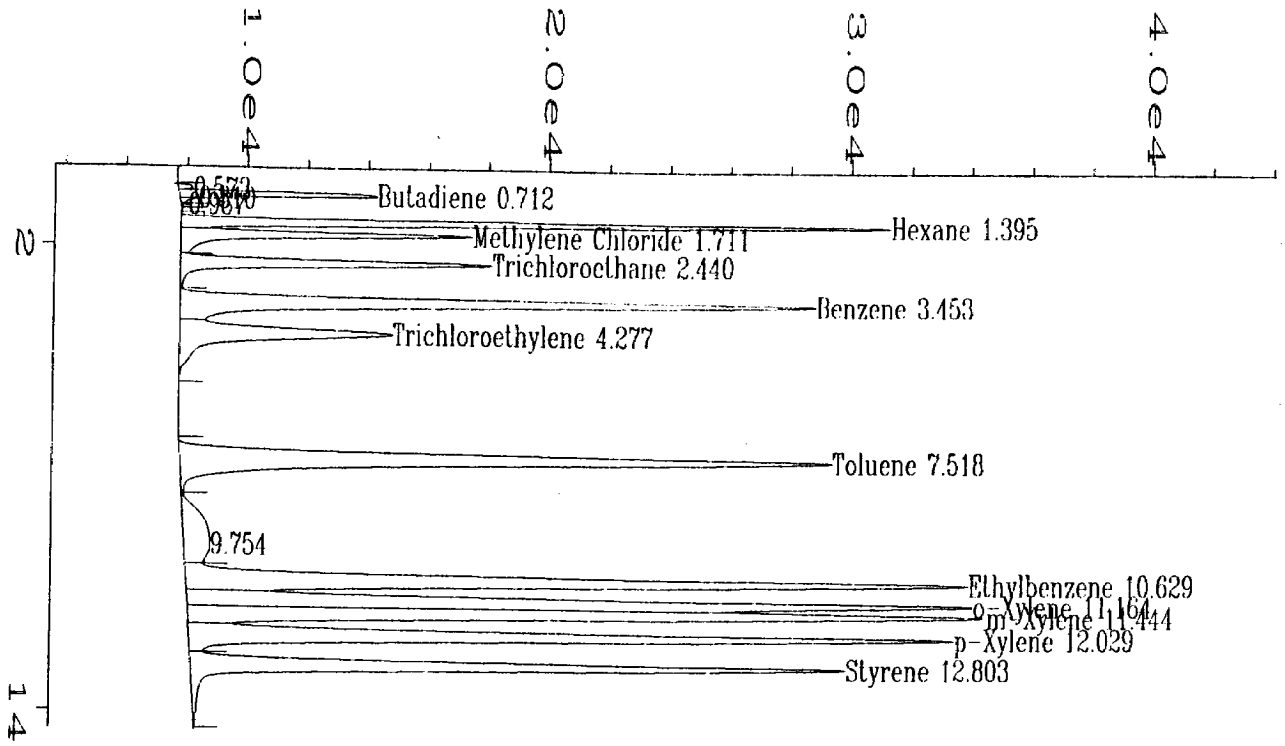
Data File Name : D:\HP\SOLVAY\10-29\BAG1_001.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag1
Run Time Bar Code:
Acquired on : 29 Oct 95 08:48 AM
Report Created on: 16 Dec 95 04:01 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-29\BAG1_001.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.581	3425	538	BV	0.085	0.1163
2	0.742	52642	6486	VB	0.111	1.7882
3	1.568	195907	22192	BV	0.142	6.6549
4	1.962	99210	8827	VV	0.168	3.3701
5	2.837	121931	8999	VV	0.206	4.1420
6	4.106	315512	17933	PV	0.269	10.7178
7	5.161	133911	5617	VB	0.358	4.5489
8	8.408	383810	22493	PV	0.262	13.0378
9	9.372	17978	394	VB	0.604	0.6107
10	11.422	358168	24045	BV	0.234	12.1668
11	11.939	333228	23622	VV	0.215	11.3196
12	12.211	343174	24021	VV	0.217	11.6575
13	12.777	327666	22727	VV	0.225	11.1307
14	13.537	257251	18290	VV	0.219	8.7387

Total area = 2943813



Area Percent Report

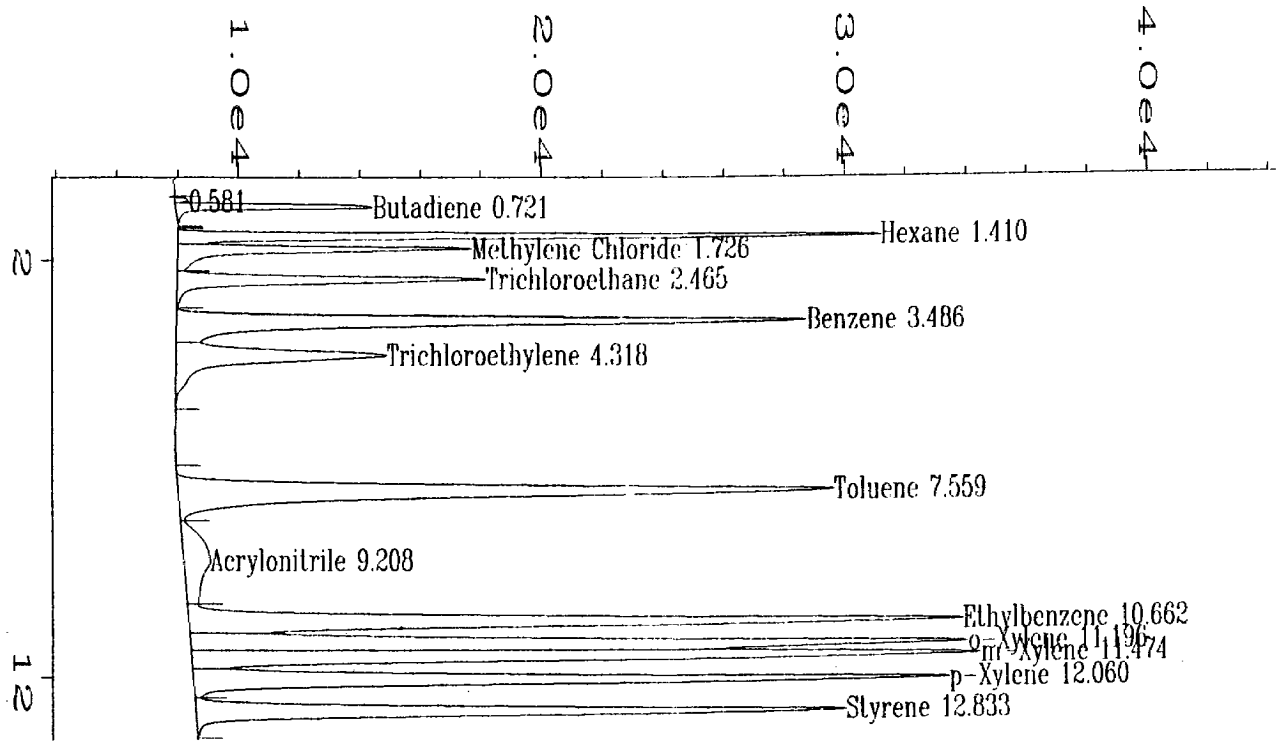
Data File Name : D:\HP\SOLVAY\10-29\BAG1_002.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag1
Run Time Bar Code:
Acquired on : 29 Oct 95 09:10 AM
Report Created on: 16 Dec 95 04:01 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-29\BAG1_002.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.573	2869	482	BV	0.076	0.0857
2	0.712	49953	6546	VV	0.102	1.4921
3	0.810	2571	606	VV	0.071	0.0768
4	0.967	352	294	VB	0.021	0.0105
5	1.395	195676	23507	BV	0.135	5.8450
6	1.711	102324	9670	VV	0.160	3.0565
7	2.440	122915	10316	VV	0.186	3.6716
8	3.453	319136	21066	VV	0.231	9.5328
9	4.277	149163	7049	VB	0.314	4.4556
10	7.518	417666	21593	BV	0.293	12.4760
11	9.754	67757	856	VV	0.965	2.0240
12	10.629	419930	25872	VV	0.252	12.5436
13	11.164	387492	25976	VV	0.226	11.5747
14	11.444	404311	26402	VV	0.231	12.0771
15	12.029	386792	25305	VV	0.237	11.5538
16	12.803	318849	21677	VBA	0.227	9.5243

Total area = 3347755



Area Percent Report

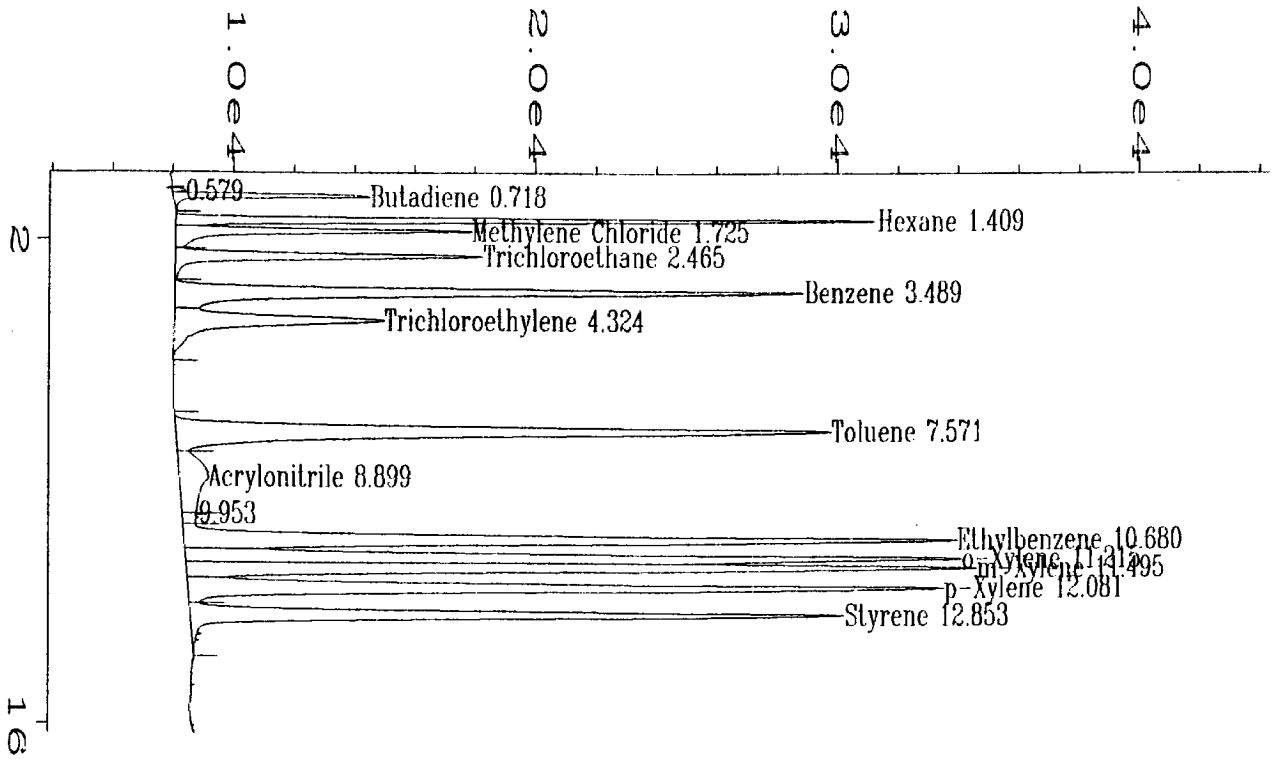
Data File Name : D:\HP\SOLVAY\10-29\BAG1_003.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag1
Run Time Bar Code:
Acquired on : 29 Oct 95 09:32 AM
Report Created on: 16 Dec 95 04:01 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-29\BAG1_003.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.581	2641	450	BV	0.074	0.0805
2	0.721	51992	6482	VB	0.113	1.5857
3	1.410	194730	23199	BV	0.136	5.9391
4	1.726	102254	9698	VV	0.160	3.1187
5	2.465	121895	10170	VV	0.185	3.7177
6	3.486	317584	20788	VV	0.233	9.6861
7	4.318	147466	6938	VB	0.317	4.4976
8	7.559	413126	21649	BV	0.289	12.6001
9	9.208	70073	870	VV	1.019	2.1372
10	10.662	409096	25542	VV	0.249	12.4772
11	11.196	379622	25628	VV	0.224	11.5782
12	11.474	395172	26051	VV	0.229	12.0525
13	12.060	374505	24922	VV	0.234	11.4222
14	12.833	298600	21442	VBA	0.218	9.1071

Total area = 3278754



Area Percent Report

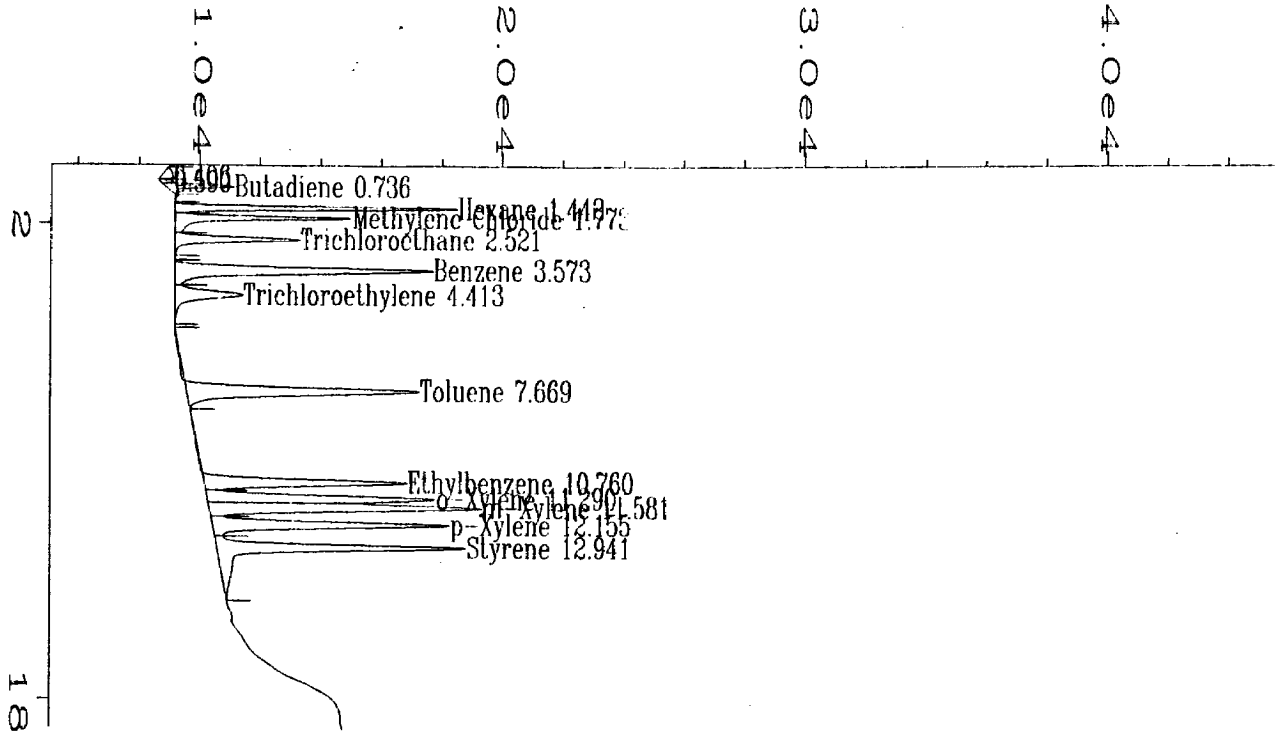
ata File Name : D:\HP\SOLVAY\10-29\BAG1_004.D
perator : K. WEPPRECHT
Instrument : HP 5890
ample Name : bag1
un Time Bar Code:
Acquired on : 29 Oct 95 09:51 AM
eport Created on: 16 Dec 95 04:02 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

ig. 1 in D:\HP\SOLVAY\10-29\BAG1_004.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.579	2598	451	BV	0.073	0.0781
2	0.718	52254	6518	VB	0.109	1.5712
3	1.409	196029	23246	BV	0.133	5.8945
4	1.725	103787	9807	VV	0.159	3.1208
5	2.465	123272	10193	VV	0.185	3.7067
6	3.489	319709	20843	VV	0.234	9.6135
7	4.324	149135	6962	VB	0.318	4.4844
8	7.571	416168	21719	BV	0.290	12.5140
9	8.899	72403	964	VV	0.963	2.1771
10	9.953	8646	569	VV	0.253	0.2600
11	10.680	412563	25583	VV	0.251	12.4056
12	11.215	381611	25655	VV	0.226	11.4749
13	11.495	398571	26176	VV	0.230	11.9848
14	12.081	379534	25018	VV	0.236	11.4124
15	12.853	309345	21672	VV	0.222	9.3019

otal area = 3325624



Area Percent Report

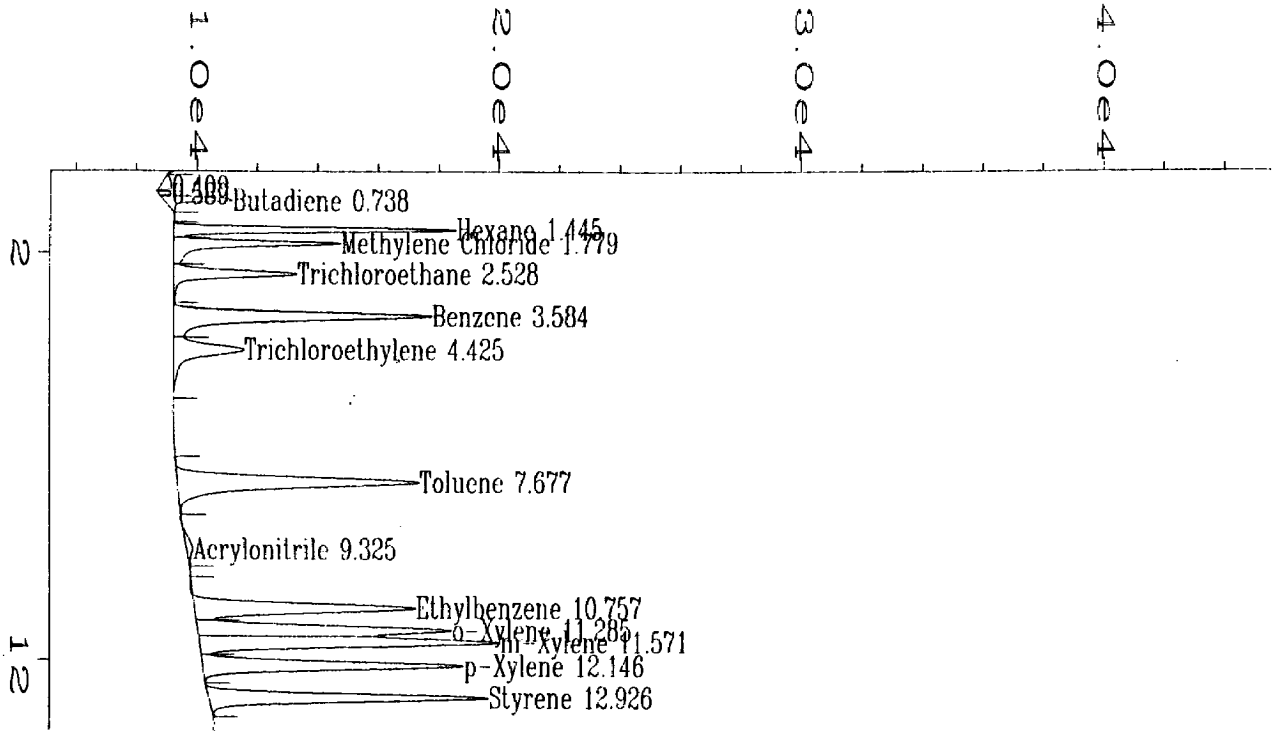
Data File Name : D:\HP\SOLVAY\10-29\BAG4_001.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag4
Run Time Bar Code:
Acquired on : 29 Oct 95 01:53 PM
Report Created on: 16 Dec 95 04:03 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-29\BAG4_001.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.406	6244	418	BV	0.191	0.5532
2	0.590	2541	408	PV	0.080	0.2251
3	0.736	19541	2248	PB	0.115	1.7314
4	1.442	78391	9348	BV	0.134	6.9455
5	1.773	61393	5846	VV	0.156	5.4395
6	2.521	50087	4148	VB	0.185	4.4378
7	3.573	129490	8531	BV	0.230	11.4729
8	4.413	45502	2261	VB	0.302	4.0315
9	7.669	132762	7696	BV	0.266	11.7629
10	10.760	98618	6701	VV	0.231	8.7377
11	11.290	107400	7546	VV	0.216	9.5157
12	11.581	135574	9023	VV	0.227	12.0120
13	12.155	118708	7844	VV	0.234	10.5176
14	12.941	142406	8253	VV	0.255	12.6173

Total area = 1128658



Area Percent Report

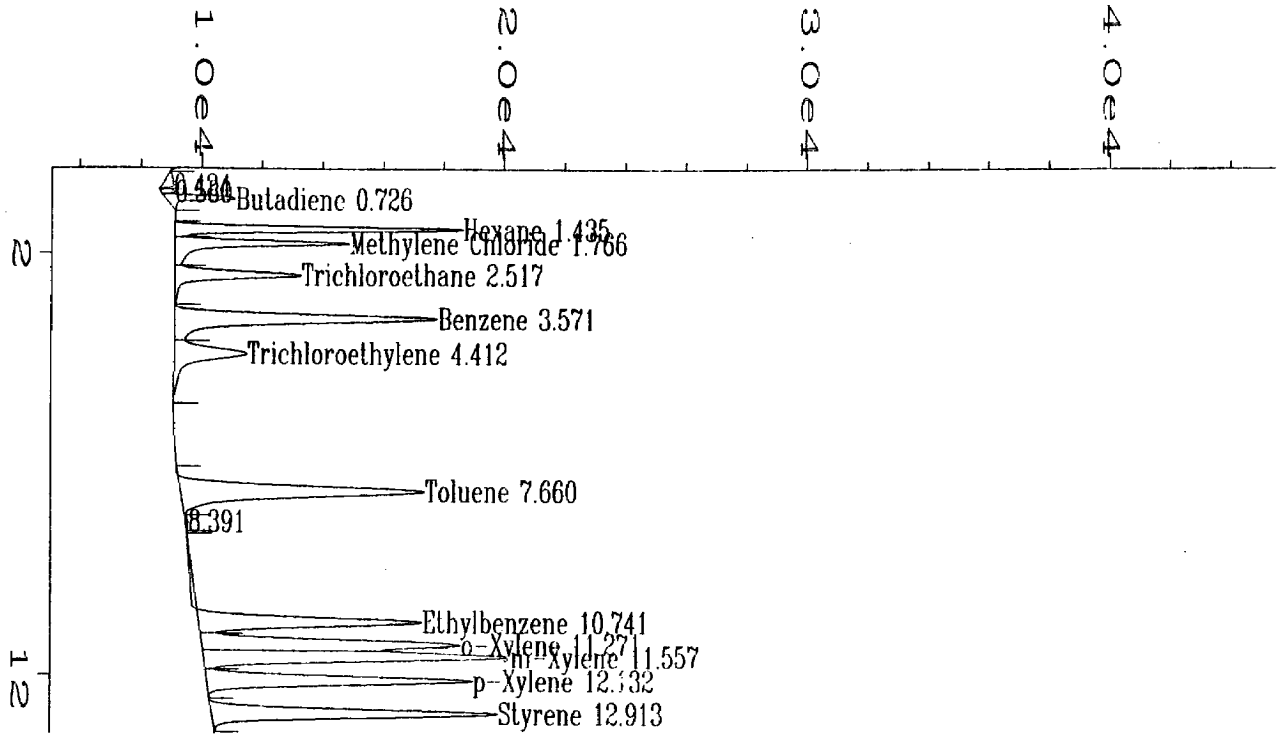
Data File Name : D:\HP\SOLVAY\10-29\BAG4_002.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag4
Run Time Bar Code:
Acquired on : 29 Oct 95 02:20 PM
Report Created on: 16 Dec 95 04:03 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-29\BAG4_002.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.409	6274	424	BV	0.186	0.5303
2	0.589	2480	408	PV	0.079	0.2096
3	0.738	19710	2252	PB	0.119	1.6661
4	1.445	78009	9337	BV	0.133	6.5942
5	1.779	59470	5529	VV	0.159	5.0270
6	2.528	50779	4096	VV	0.188	4.2924
7	3.584	132963	8545	VV	0.235	11.2394
8	4.425	51078	2346	VB	0.325	4.3177
9	7.677	149190	8003	BV	0.282	12.6111
10	9.325	5444	202	PB	0.349	0.4602
11	10.757	110763	7299	BV	0.237	9.3628
12	11.285	119092	8392	VV	0.216	10.0669
13	11.571	149010	9943	VV	0.227	12.5959
14	12.146	124096	8619	VV	0.225	10.4899
15	12.926	124644	9230	PV	0.211	10.5363

Total area = 1183003



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Area Percent Report

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Data File Name : D:\HP\SOLVAY\10-29\BAG4_003.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag4
Run Time Bar Code:
Acquired on : 29 Oct 95 02:38 PM
Report Created on: 16 Dec 95 04:03 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-29\BAG4_003.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.424	5815	425	BV	0.175	0.4878
2	0.580	2683	441	PV	0.079	0.2251
3	0.726	19471	2283	PB	0.115	1.6333
4	1.435	79332	9517	BV	0.132	6.6548
5	1.766	61043	5744	VV	0.157	5.1207
6	2.517	52410	4168	VV	0.190	4.3964
7	3.571	136012	8704	VV	0.236	11.4094
8	4.412	52179	2403	VB	0.322	4.3770
9	7.660	147831	8084	BV	0.278	12.4009
10	8.391	1032	82	VB	0.175	0.0866
11	10.741	102643	7374	BV	0.222	8.6102
12	11.271	124990	8535	VV	0.225	10.4848
13	11.557	151792	10137	VV	0.227	12.7331
14	12.132	126996	8786	VV	0.226	10.6531
15	12.913	127872	9453	PBA	0.211	10.7266

Total area = 1192102

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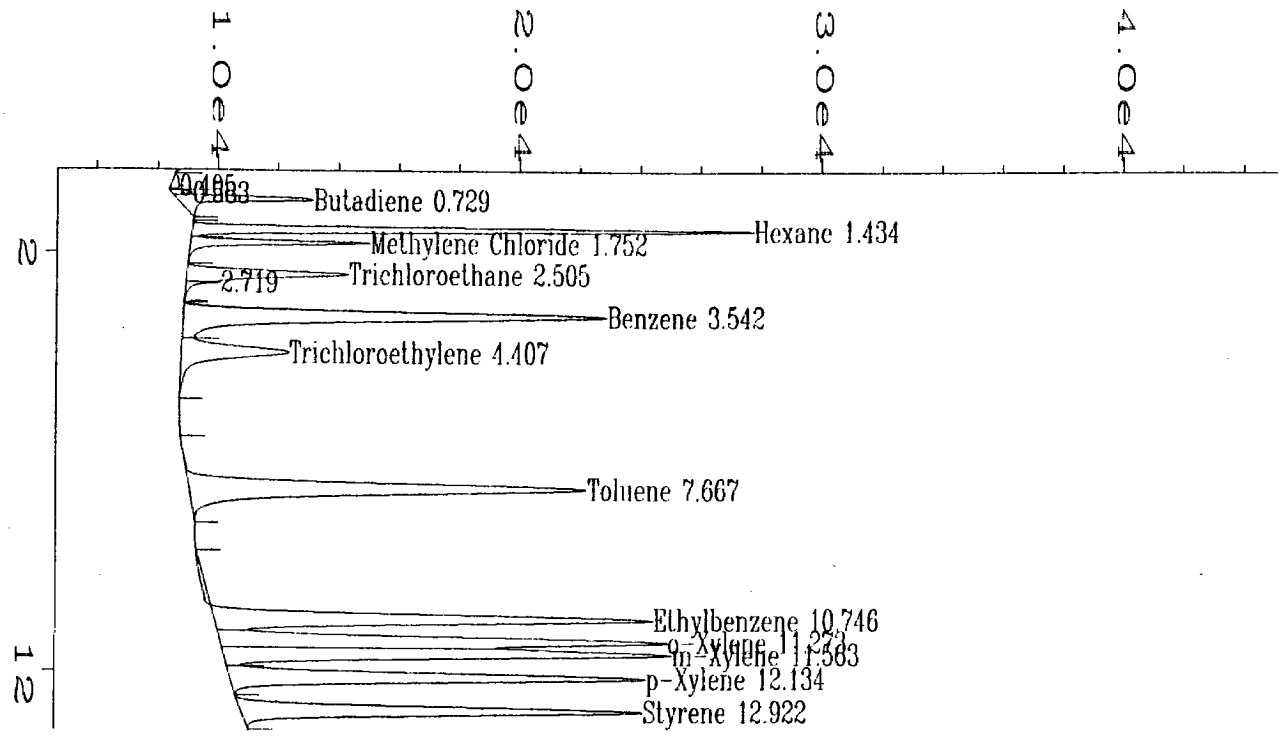


Area Percent Report

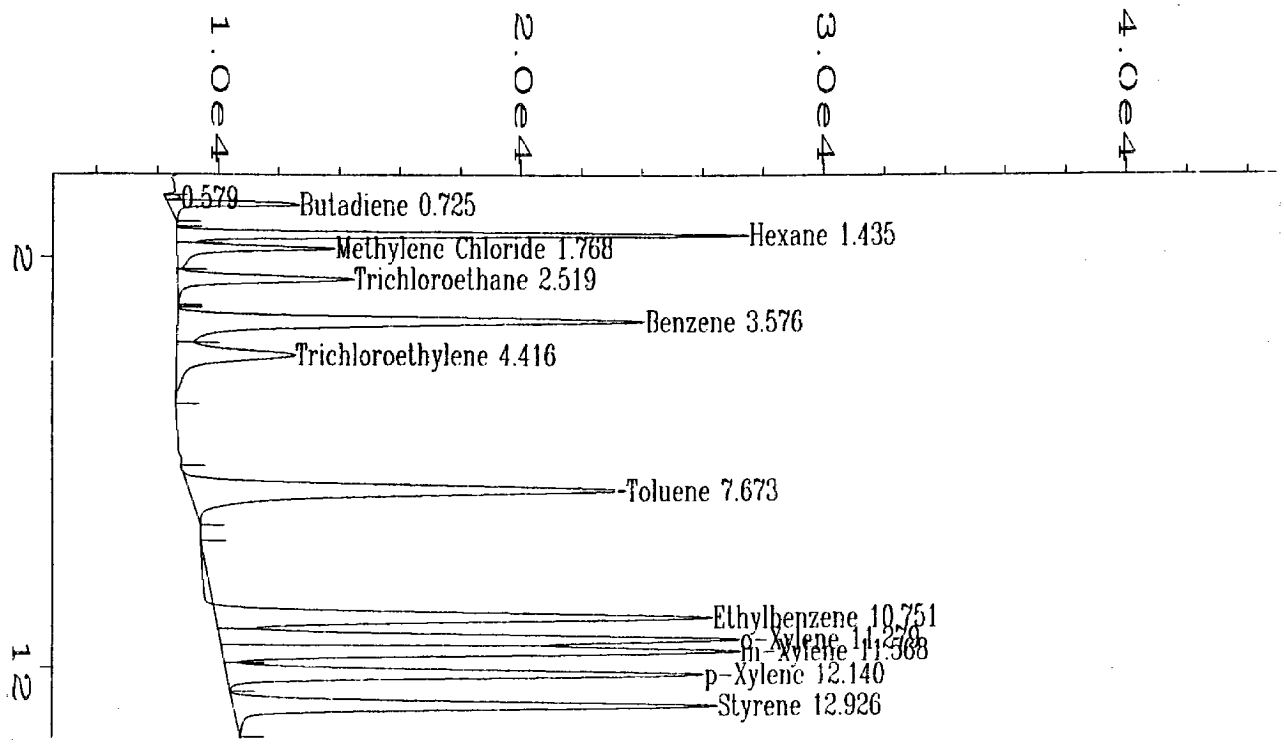
Data File Name : D:\HP\SOLVAY\10-29\BAG2_001.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag2
Run Time Bar Code:
Acquired on : 29 Oct 95 07:16 PM
Report Created on: 16 Dec 95 04:02 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-29\BAG2_001.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.405	4541	306	BV	0.186	0.2442
2	0.583	3759	656	PV	0.074	0.2022
3	0.729	40534	4493	VB	0.124	2.1803
4	1.434	145638	18610	BV	0.127	7.8338
5	1.752	42863	5951	VV	0.110	2.3056
6	2.505	64654	5360	PV	0.180	3.4777
7	2.719	5883	1139	VV	0.086	0.3165
8	3.542	222926	14034	PV	0.243	11.9911
9	4.407	72841	3571	VV	0.296	3.9181
10	7.667	242064	13174	BB	0.280	13.0205
11	10.746	209916	14527	BV	0.228	11.2913
12	11.273	212138	14781	VV	0.219	11.4108
13	11.563	215692	14812	VV	0.221	11.6019
14	12.134	196819	13731	VV	0.224	10.5868
15	12.922	178834	13274	PBA	0.211	9.6194

Total area = 1859102



Area Percent Report

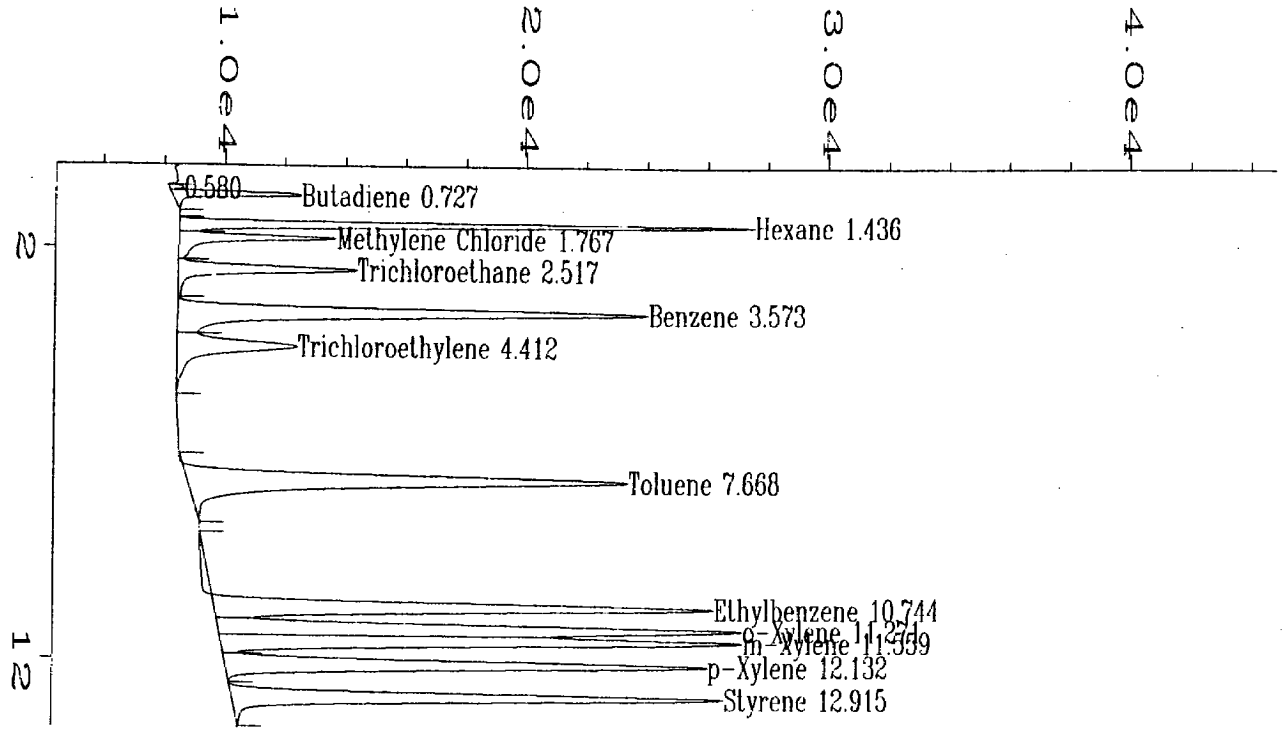
Data File Name : D:\HP\SOLVAY\10-29\BAG2_002.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag2
Run Time Bar Code:
Acquired on : 29 Oct 95 07:35 PM
Report Created on: 16 Dec 95 04:02 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-29\BAG2_002.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.579	2854	467	PV	0.079	0.1357
2	0.725	35848	4286	VB	0.112	1.7038
3	1.435	158226	18882	BV	0.136	7.5202
4	1.768	55605	5213	VV	0.157	2.6428
5	2.519	70171	5825	VB	0.183	3.3351
6	3.576	239866	15430	BV	0.238	11.4004
7	4.416	84850	3921	VB	0.323	4.0328
8	7.673	273072	14430	BB	0.287	12.9786
9	10.751	234909	16385	BV	0.227	11.1648
10	11.279	248522	17151	VV	0.220	11.8118
11	11.568	251205	17073	VV	0.223	11.9393
12	12.140	226880	15746	VV	0.225	10.7832
13	12.926	222006	15970	PBA	0.215	10.5515

Total area = 2104014



Area Percent Report

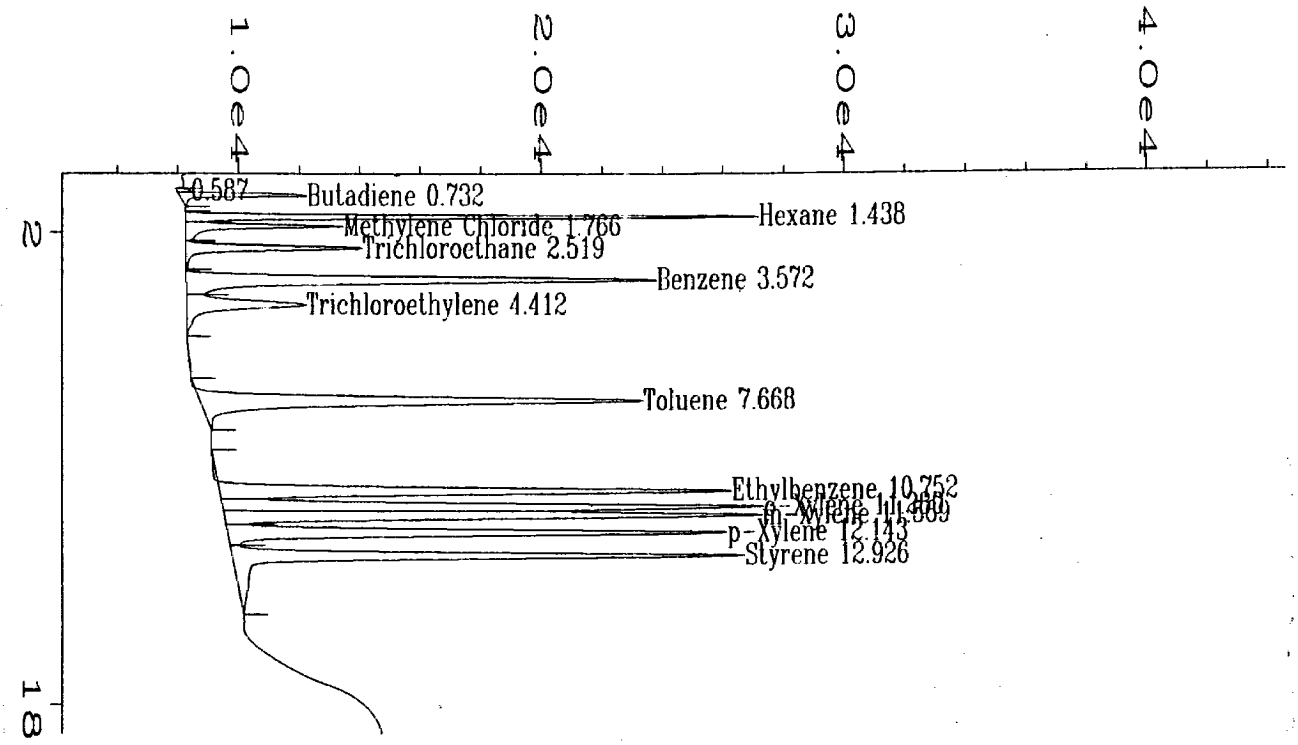
Data File Name : D:\HP\SOLVAY\10-29\BAG2_003.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag2
Run Time Bar Code:
Acquired on : 29 Oct 95 07:54 PM
Report Created on: 16 Dec 95 04:02 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-29\BAG2_003.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.580	2784	453	PV	0.080	0.1306
2	0.727	34917	4253	VB	0.114	1.6376
3	1.436	158885	19066	BV	0.134	7.4517
4	1.767	56706	5225	VV	0.159	2.6595
5	2.517	73285	5901	VV	0.191	3.4371
6	3.573	244329	15587	VV	0.239	11.4591
7	4.412	87323	3984	VB	0.326	4.0955
8	7.668	278507	14583	BB	0.289	13.0620
9	10.744	235895	16515	BV	0.227	11.0635
10	11.271	250873	17308	VV	0.220	11.7660
11	11.559	253933	17259	VV	0.223	11.9095
12	12.132	229787	15944	VV	0.225	10.7771
13	12.915	224960	16262	PBA	0.215	10.5507

Total area = 2132185



Area Percent Report

Data File Name : D:\HP\SOLVAY\10-29\BAG2_004.D
Operator : K. WEPPRECHT
Instrument : HP 5890
Sample Name : bag2
Run Time Bar Code:
Acquired on : 29 Oct 95 08:19 PM
Report Created on: 16 Dec 95 04:03 PM

Page Number : 1
Vial Number :
Injection Number :
Sequence Line :
Instrument Method: SOLVAY.MTH
Analysis Method : SOLVAY.MTH

Sig. 1 in D:\HP\SOLVAY\10-29\BAG2_004.D

Pk#	Ret Time	Area	Height	Type	Width	Area %
1	0.587	2793	444	PV	0.081	0.1257
2	0.732	34511	4187	VB	0.116	1.5533
3	1.438	158336	18913	BV	0.135	7.1264
4	1.766	55213	5203	VV	0.155	2.4850
5	2.519	71077	5830	VV	0.187	3.1990
6	3.572	241162	15518	VV	0.236	10.8542
7	4.412	84975	3952	VB	0.321	3.8246
8	7.668	280388	14638	BB	0.290	12.6197
9	10.752	255312	16893	BV	0.237	11.4911
10	11.280	260208	17836	VV	0.221	11.7115
11	11.569	264262	17738	VV	0.225	11.8939
12	12.143	246270	16478	VV	0.232	11.0841
13	12.926	267319	16916	VV	0.238	12.0315

Total area = 2221827

SOLVAY MINERALS
CAE Job No. 7594
12/11/95

Hewlett Packard 5890 GC

Target Compounds

Compound	Phase	Mol. Wt.	Density
1,3 Butadiene	gas	54.09	na
Hexane	liquid	86.18	0.663
Methylene Chloride	liquid	84.94	1.326
1,1,1-Trichloroethane	liquid	133.41	1.338
Benzene	liquid	78.11	0.879
2-Butanone	liquid	72.10	0.805
Acrylonitrile	liquid	53.06	0.806
Toluene	liquid	92.14	0.866
Ethylbenzene	liquid	106.17	0.867
Xylene	liquid	106.16	0.860
Styrene	liquid	104.14	0.906
Trichloroethene	liquid	131.40	1.465

Calibration Bag Standards

Raw Data

bag #	0 flow (l/min)	time (min)	Pb (in Hg)	T amb (F)	Butadiene (ul)	
1	2.51	15.00	23.78	70	70	All other compounds 1ul
2	2.50	23.00	23.78	70	70	All other compounds 1ul
3	2.50	7.00	23.78	70	70	All other compounds 1ul
4	2.76	21.00	23.78	70	35	All other compounds 0.5ul

SOLVAY MINERALS
CAE Job No. 7594
12/11/95

Hewlett Packard 5890 GC

Calibration Bag Standards
Result Summary

Bag #1	(ppmv)
1,3 Butadiene	1.86
Hexane	6.20
Methylene Chloride	12.59
1,1,1-Trichloroethane	8.09
Benzene	9.07
Acrylonitrile	12.25
Toluene	7.58
Ethylbenzene	6.59
Xylene	6.53
Styrene	7.02
Trichloroethene	8.99

Bag #2	(ppmv)
1,3 Butadiene	1.22
Hexane	4.06
Methylene Chloride	8.24
1,1,1-Trichloroethane	5.30
Benzene	5.94
Acrylonitrile	8.02
Toluene	4.96
Ethylbenzene	4.31
Xylene	4.28
Styrene	4.59
Trichloroethene	5.89

Bag #3	(ppmv)
1,3 Butadiene	4.00
Hexane	13.35
Methylene Chloride	27.08
1,1,1-Trichloroethane	17.40
Benzene	19.52
Acrylonitrile	26.35
Toluene	16.31
Ethylbenzene	14.17
Xylene	14.05
Styrene	15.09
Trichloroethene	19.34

Bag #4	(ppmv)
1,3 Butadiene	0.60
Hexane	2.01
Methylene Chloride	4.09
1,1,1-Trichloroethane	2.63
Benzene	2.95
Acrylonitrile	3.98
Toluene	2.46
Ethylbenzene	2.14
Xylene	2.12
Styrene	2.28
Trichloroethene	2.92

SOLVAY MINERALS
CAE Job No. 7594
12/11/95

Hewlett Packard 5890 GC

Calibration Summary

Bag #1
10/25/95

	area 1	area 2	area 3	area 4	area 5
1,3 Butadiene	52264	52662	52343	53185	51885
Hexane	185614	181265	182043	179677	180660
Methylene Chloride	96923	93264	94295	112286	103380
1,1,1-Trichloroethane	113892	111447	111899	110665	111026
Benzene	302295	298281	297207	294027	295470
Trichloroethene	125218	124218	122904	121097	122249
Toluene	374837	374939	371127	368599	373473
Acrylonitrile		60922	80802		91097
Ethylbenzene	359972	381018	372751	360506	378704
o-Xylene	345072	362094	352983	351602	360197
m-Xylene	346545	361591	353411	360366	360188
p-Xylene	337474	353972	345903	347672	355560
Styrene	314902	328196	324737	364901	346779

Bag #1
10/27/95

	area 1	area 2	area 3
1,3 Butadiene	49844	51727	51930
Hexane	182683	182989	183366
Methylene Chloride	91424	92304	92367
1,1,1-Trichloroethane	112089	112342	113011
Benzene	294429	296345	296613
Trichloroethene	106890	124021	122631
Toluene	360959	363420	368965
Acrylonitrile	40566	24968	69691
Ethylbenzene	350003	354482	370480
o-Xylene	332345	338888	346661
m-Xylene	334858	341140	348466
p-Xylene	323869	331752	341422
Styrene	280778	297693	308849

SOLVAY MINERALS
CAE Job No. 7594
12/11/95

Hewlett Packard 5890 GC

Calibration Summary

Bag #1
10/29/95

	area 1	area 2	area 3
1,3 Butadiene	49953	51992	52254
Hexane	195676	194730	196029
Methylene Chloride	102324	102254	103787
1,1,1-Trichloroethane	122915	121895	123272
Benzene	319136	317584	319709
Trichloroethene	149163	147466	149135
Toluene	417666	413126	416168
Acrylonitrile		70073	72403
Ethylbenzene	419930	409096	412563
o-Xylene	387492	379622	381611
m-Xylene	404311	395172	398571
p-Xylene	386792	374505	379534
Styrene	318849	298600	309345

Bag #2
10/25/95

	area 1	area 2	area 3
1,3 Butadiene	35503	35052	34873
Hexane	154018	153237	155843
Methylene Chloride	49605	49108	50136
1,1,1-Trichloroethane	67799	67432	68909
Benzene	234024	232255	235609
Trichloroethene	72374	71650	72170
Toluene	247146	247044	250665
Acrylonitrile	33777	50629	50841
Ethylbenzene	241780	250975	252645
o-Xylene	240501	242793	245147
m-Xylene	237366	239634	242576
p-Xylene	219602	223185	227469
Styrene	226528	228485	239834

Hewlett Packard 5890 GC

Calibration Summary

Bag #2
10/27/95

	area 1	area 2	area 3	area 4
1,3 Butadiene	33846	33846	33972	33183
Hexane	155999	155999	155627	154713
Methylene Chloride	49533	49533	49417	48882
1,1,1-Trichloroethane	68489	68489	68212	67795
Benzene	235208	235208	235019	233522
Trichloroethene	72783	72783	72730	72215
Toluene	248237	248237	249019	248506
Acrylonitrile	41536	41536	41601	
Ethylbenzene	245814	245814	247344	249799
o-Xylene	239415	239415	240837	241906
m-Xylene	235928	235928	237174	238397
p-Xylene	217935	217935	219192	222006
Styrene	209852	209852	210431	214479

Bag #2
10/29/95

	area 1	area 2	area 3	area 4
1,3 Butadiene	40534	35848	34917	34511
Hexane	145638	158226	158885	158336
Methylene Chloride	42863	55605	56706	55213
1,1,1-Trichloroethane	64654	70171	73285	71077
Benzene	222926	239866	244329	241162
Trichloroethene	72841	84850	87323	84975
Toluene	242064	273072	278507	280388
Acrylonitrile				
Ethylbenzene	209916	234909	235895	255312
o-Xylene	212138	248522	250873	260208
m-Xylene	215692	251205	253933	264262
p-Xylene	196819	226880	229787	246270
Styrene	178834	222006	224960	267319

Hewlett Packard 5890 GC

Calibration Summary

Bag #3
10/25/95

	area 1	area 2	area 3
1,3 Butadiene	108445	106122	107488
Hexane	490964	486250	489541
Methylene Chloride	219118	217925	219076
1,1,1-Trichloroethane	227780	226297	226968
Benzene	705000	701200	705106
Trichloroethene	267507	267540	268335
Toluene	761755	762663	793117
Acrylonitrile	217649	212883	210047
Ethylbenzene	696281	683416	697535
o-Xylene	740984	733102	747801
m-Xylene	748691	735663	751641
p-Xylene	775174	760848	782611
Styrene	816495	791378	818229

Bag #3
10/27/95

	area 1	area 2	area 3
1,3 Butadiene	108943	112082	111044
Hexane	498980	529538	528739
Methylene Chloride	229450	229661	232729
1,1,1-Trichloroethane	224303	243656	243829
Benzene	603674	700419	700162
Trichloroethene	193775	254260	256670
Toluene	458680	665130	703771
Acrylonitrile		137466	
Ethylbenzene	206029	494274	567571
o-Xylene	173436	474152	558189
m-Xylene	202924	503820	590661
p-Xylene	194026	490870	593165
Styrene	233661	376756	514373

Hewlett Packard 5890 GC

Calibration Summary

Bag #3
10/28/95

	area 1	area 2	area 3	area 4
1,3 Butadiene	120230	120614	109503	106023
Hexane	531768	533488	531962	522798
Methylene Chloride	248750	250387	242553	233514
1,1,1-Trichloroethane	263576	265101	255804	240867
Benzene	732196	736217	737126	718695
Trichloroethene	314530	318478	315120	305904
Toluene	933255	970099	974713	851113
Acrylonitrile				
Ethylbenzene	660556	681447	687187	671509
o-Xylene	678103	699672	706614	700485
m-Xylene	717687	741723	748767	741133
p-Xylene	712608	741756	747089	742035
Styrene	562652	599243	599080	602679

Bag #4
10/27/95

	area 1	area 2	area 3	area 4
1,3 Butadiene	18613	18662	19140	18890
Hexane	78814	81509	86336	86108
Methylene Chloride	62747	64654	66474	66771
1,1,1-Trichloroethane	50025	55628	52513	52818
Benzene	134602	138905	146754	145424
Trichloroethene	42433	44579	47984	46901
Toluene	142815	145304	153543	148938
Acrylonitrile			2449	
Ethylbenzene	88826	139174	113627	126663
o-Xylene	116236	134941	126953	124431
m-Xylene	139593	163459	151163	148844
p-Xylene	116938	159828	128407	131431
Styrene	126636	185026	137670	159626

Hewlett Packard 5890 GC

Calibration Summary

Bag #4
10/29/95

	area 1	area 2	area 3
1,3 Butadiene	19541	19710	19471
Hexane	78391	78009	79332
Methylene Chloride	61393	59470	61043
1,1,1-Trichloroethane	50087	50779	52410
Benzene	129490	132963	136012
Trichloroethene	45502	51078	52179
Toluene	132762	149190	147831
Acrylonitrile		5444	
Ethylbenzene	98618	110763	102643
o-Xylene	107400	119092	124990
m-Xylene	135574	149010	151792
p-Xylene	118708	124096	126996
Styrene	142406	124644	127872

SOLVAY MINERALS
CAE Job No. 7594
12/11/95

Hewlett Packard 5890 GC

Calibration Summary

Summary

	Bag 1		Bag 2		Bag 3		Bag 4	
	avg area	% rsd	avg area	% rsd	avg area	% rsd	avg area	% rsd
1,3 Butadiene	51822	1.99	35099	5.61	111049	4.77	19147	2.30
Hexane	185885	3.42	155138	2.34	514403	3.93	81214	4.43
Methylene Chloride	98601	6.76	50600	7.74	232316	5.12	63222	4.46
1,1,1-Trichloroethane	114950	4.40	68756	3.21	241818	6.44	52037	3.79
Benzene	302827	3.47	235375	2.34	703980	5.45	137736	4.64
Trichloroethene	128636	10.68	76063	8.20	276212	14.03	47237	7.38
Toluene	382116	5.76	255717	5.53	787430	20.08	145769	4.56
Acrylonitrile	63815	33.70	43320	14.97	194511	19.62	3947	53.66
Ethylbenzene	379046	6.45	242746	5.21	604581	25.62	111473	15.36
o-Xylene	358052	5.07	241978	4.84	621254	28.99	122006	7.19
m-Xylene	364056	6.65	241100	5.15	648271	27.36	148491	6.08
p-Xylene	352587	5.72	222462	5.29	654018	28.47	129486	11.08
Styrene	317603	7.40	221144	9.89	591455	32.04	143411	15.34

SOLVAY2016_6_001047

Detection Limits
At 99% Probability

1,3 Butadiene	0.10
Hexane	0.46
Methylene Chloride	2.24
Trichloroethane	1.03
Benzene	0.83
Trichloroethene	2.67
Toluene	2.09
Acrylonitrile	8.29
Ethylbenzene	1.59
o-Xylene	1.15
m-Xylene	1.49
p-Xylene	1.21
Styrene	1.72

By Calibration Curve x Intercepts
for Equation y=mx+b where:
y= instrument response (area counts)
m= slope
x= concentration (ppm)
b= constant

	equation	Detection limit
Butadiene	y=2.75e4+1.21e3	0.05
Hexane	y=3.79e4-6.96e3	0.18
Methylene Chloride	y=8.22e3+3.44e3	0.42
Trichloroethane	y=1.36e4+4.61e3	0.34
Benzene	y=3.51e4+1.27e4	0.36
Trichloroethylene	y=1.42e4-31	0.00
Toluene	y=2.91e4+5.76e4	1.98
Acrylonitrile	y=7.17e3-4.37e3	0.61
Ethylbenzene	y=4.25e4+3.63e4	0.85
p-Xylene	y=4.59e4+2.38e4	0.52
m-Xylene	y=4.49e4+3.8e4	0.85
o-Xylene	y=4.36e4+3.34e4	0.77
Styrene	y=3.78e4+3.56e4	0.94

SOLVAY MINERALS
CAE Job No. 7594
12/11/95

Hewlett Packard 5890 GC

Detection Limit Summary

Reportable Limits of Detection based on the greater of the two Detection Limit Determinations.

	(ppmwv)
1,3 Butadiene	0.10
Hexane	0.46
Methylene Chloride	2.24
Trichloroethane	1.03
Benzene	0.83
Trichloroethene	2.67
Toluene	2.09
Acrylonitrile	8.29
Ethylbenzene	1.59
o-Xylene	1.15
m-Xylene	1.49
p-Xylene	1.21
Styrene	1.72

SOLVAY MINERALS
CAE Job No. 7594
12/11/95

Hewlett Packard 5890 GC

Methane Bag Standards

Raw Data

bag #	0 Air flow (cc/min)	time (min)	0.95% meth. inj (ml)
cal #3	152	10	2
cal #4	152	10	1
cal #5	153	10	4

Result Summary

bag #	conc. Meth. (ppm)
cal #3	12.50
cal #4	6.25
cal #5	24.84

Calibration Summary

cal #3	Methane Area	cal #4	Methane Area	cal #5	Methane Area
	81143		35715		166113
	77212		35544		167962
	76369		35554		164341
	76856		35131		165387
	77279		34908		167806
	82849				
	87455				
	86183				
	85653				
	80882				
avg	81188	avg	35370	avg	166322
%rsd	5.19	%rsd	0.95	%rsd	0.94
RF	1.540E-04	RF	1.767E-04	RF	1.493E-04

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FIELD DATA

D

Location: TACE Run: 1

Moisture Determination Field Data Sheet

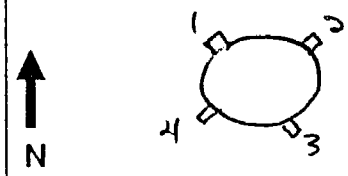
Page 1 of 1

Client SOLVAY	Project Number 7594
Plant GREENRIVERWY	Unit EP5
Date 10/29/95	Inlet/outlet/stack
Meter Operator RON M. LUIKAART	
Probe Operator N/A	

Sample Box Number N/A	
Pyrometer Number 66-12	
Meter Box Number 66-12	
Meter ΔH@ 1.8909	Meter Y_d 0.9963

Leak Rate Before:	.001	cc/m cf/m @	15	"Hg
Leak Rate After:	.001	cc/m cf/m @	14	"Hg

Schematic of Testing Location



First point all the way IN OUT	Method 4	
Area (ft^2) 85.93	Port Len. (in.) 5, 12.5	Gas Flow IN OUT
Filter Material N/A		

Ambient Temp. (°F) 50	Bar. Press. (in. Hg) 23.69
Assumed Moisture (%)	

Heater Box Setting N/A	Probe Heater Setting N/A
Probe Length 8'	Probe Number N/A
Probe Material METAL	

IGS Bag ID Number R1	
% O_2 9.0	% CO_2 13.7
H_2O (ml) 298	Silica Gel (gm) 20.5
Total V_{lc} 318.5	
Start Time: ~~1020~~ 920 AM / PM	Stop Time: 1005 AM PM

RML

STATIC ~~30~~ 5P -0.3

Traverse Point Number	Min/pt 5 Clock Time	Pump Vacuum (in. Hg)	Stack Temp, Ts (°F)	Bath Temp, (°F)	Orifice Setting ΔH (in. H_2O)	Initial Volume 392.70 Gas Sample Volume V_m Circle one: (L) (ft^3)	Gas Sample Temperature at Dry Gas Meter Inlet $T_{m\,in}$ (°F)	Outlet $T_{m\,out}$ (°F)	Probe Temp. T_p (°F)			Notes
SINGLE	5	3	SEE	42	1.8	396.65	64	60	N/A			
PT.	10	3	TRAVERSE DATA	40		400.46	66	61				
	15	3		40		404.34	69	63				
	20	3		41		408.19	73	65				%Bwo: 35.4
	25	3		43		412.02	75	67				DSCFM = 57,700
	30	3		43		415.85	77	68				~~Cp = 0.4043~~
	35	3		44		419.69	78	70				~~Ts = 31~~
	40	3		45		423.54	80	71				Cp = 0.3986
	45	3		47		427.37	80	72				Ts: 311 °F
Average							70					
Total					1.8	34.67						

SOLVAY2016_6_001053

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Location: JACK Run: 2

Moisture Determination Field Data Sheet

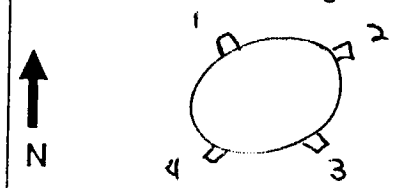
Page 1 of

Client SOLVAY	Project Number 7594
Plant GREEN RIVER WY.	Unit EP5
Date 10/29/95	Inlet/outlet/stack
Meter Operator RON M. LUIKAART	
Probe Operator N/A	

Sample Box Number ~~66-12~~ N/A RML	
Pyrometer Number 66-12	
Meter Box Number 66-12	
Meter ΔH@ 1.8909	Meter Y_d 0.9963

Leak Rate Before:	.001	cc/m cf/m @	15	"Hg
Leak Rate After:	.001	cc/m cf/m @	13	"Hg

Schematic of Testing Location



First point all the way IN OUT	Method 4	
Area (ft^2) 85.93	Port Len. (in.) 5, 10.5	Gas Flow IN OUT
Filter Material N/A		

Ambient Temp. (°F) 55	Bar. Press. (in. Hg) 23.69
Assumed Moisture (%)	

Heater Box Setting N/A	Probe Heater Setting N/A
Probe Length 8	Probe Number N/A
Probe Material METAL	

IGS Bag ID Number R2	
% O_2 9.0	% CO_2 13.8
H_2O (ml) 329	Silica Gel (gm) 9.5
Total V_{lc} 338.5	

Start Time: 1049 AM / PM	Stop Time: 1134 AM / PM

Traverse Point Number	Min/pt 5 / Clock Time	Pump Vacuum (in. Hg)	Stack Temp, Ts (°F)	Bath Temp, (°F)	Orifice Setting ΔH (in. H_2O)	Initial Volume 427.50 / Gas Sample Volume V_m Circle one: (L) (ft^3)	Gas Sample Temperature at Dry Gas Meter: Inlet $T_{m\,in}$ (°F)	Outlet $T_{m\,out}$ (°F)	Probe Temp. T_p (°F)			Notes
SINGLE	5	3	SEE	35	1.8	431.33	74	73	N/A			%BWO = 36.8
PT.	10	3	TRAVERSE	37		435.26	75	73				DSCFM = 57,294
	15	3	DATA	37		439.17	77	73				√ΔP = 0.4043
	20	3		38		443.07	80	74				Ts = 315°F
	25	3		40		447.01	81	74				
	30	3		42		450.93	83	75				
	35	3		42		454.84	84	76				
	40	3		43		458.76	84	76				
	45	3		44		462.67	84	76				
Average							77					
Total					1.8	35.17						

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SOLVAY2016_6_0010054

Location: [redacted] Run: 3 [redacted] Page 1 of [redacted]

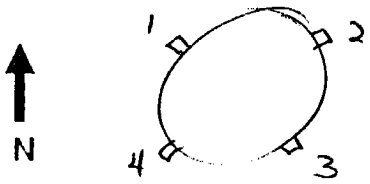
Moisture Determination Field Data Sheet

Client SOLVAY	Project Number 7594
Plant GREENRIVER, WY	Unit EP5
Date 10/29/95	Inlet/outlet/stack
Meter Operator RON M. LUIKAART	
Probe Operator N/A	

Sample Box Number N/A	
Pyrometer Number 66-12	
Meter Box Number 66-12	
Meter ΔH@ 1.8909	Meter Y_d 0.9963

Leak Rate Before:	.001	cc/m cf/m @	15	"Hg
Leak Rate After:	.001	cc/m cf/m @	12	"Hg

Schematic of Testing Location



First point all the way IN OUT	Method 4	
Area (ft^2) 85.93	Port Len. (in.) 5, 12.5	Gas Flow IN OUT
Filter Material N/A		

Ambient Temp. (°F) 55	Bar. Press. (in. Hg) 23.69
Assumed Moisture (%)	

Heater Box Setting N/A	Probe Heater Setting N/A
Probe Length 8	Probe Number N/A
Probe Material METAL	

IGS Bag ID Number R3			
% O_2	9.0	% CO_2	13.8
H_2O (ml)	332	Silica Gel (gm)	16.5
Total V_{lc}	348.5		

Start Time: 1215 AM PM Stop Time: 1300 AM PM

Traverse Point Number	Min/pt 5 / Clock Time	Pump Vacuum (in. Hg)	Stack Temp, Ts (°F)	Bath Temp, (°F)	Orifice Setting ΔH (in. H_2O)	Initial Volume 462.90 / Gas Sample Volume V_m Circle one: (L) (ft^3)	Gas Sample Temperature at Dry Gas Meter: Inlet $T_{m\,in}$ (°F)	Outlet $T_{m\,out}$ (°F)	Probe Temp, T_p (°F)			Notes
SINGLE	5	3	SEE	38	1.8	466.84	78	77	N/A			$\bar{T}_{dp}$: 0.4029
PT.	10	3	TRAVERSE	37		470.81	80	77				$\bar{T}_s$: 315
	15	3	DATA	37		474.80	85	79				%Bwo = 37.2
	20	3		39		478.79	86	79				DSCFm = 56,766
	25	3		39		482.78	87	80				
	30	3		40		486.75	89	81				
	35	3		41		490.73	90	81				
	40	3		41		494.80	87	80				
	45	3		42		498.76	86	80				
Average					1.8	35.86	82					
Total												

SOLVAY2016_6_001055

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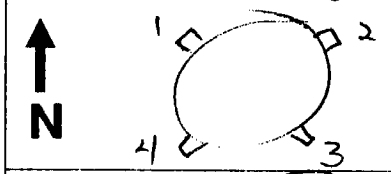
Location: STACK Run: 1-3

Velocity Determination Field Data Sheet

Client SOLVAY	Project Number 7594
Plant GREENRIVER, WY	Unit EP5
Date 10/29/95	Inlet/Outlet/Stack
Data Recorder RON M. LUIKAART	
Probe Operator ED McGAFFICK	

Pyrometer Number 66-12	Pitot Cp .84
Pitot Leak Check: ✓ Before	✓ After
Static Pressure (inches H_2O) (+/-) 0, 3, 0.2, 0.2	

Schematic of Testing Location



First point all the way	IN	OUT
Area (ft^2) 85.93	Port Len (in) 5, 12.5	Gas Flow IN OUT

Ambient Temp. (°F) 50	Bar. Press. (in. Hg) 23.69
IGS Bag ID Number R1-3	
% O_2	% CO_2
% Moisture:	Assumed/Measured
Start Time AM/PM	Stop Time AM/PM

12 8 94 2
PITOT #

R1 9:46 - 9:53 R2 11:10 - 11:17 R3 12:41 - 12:48

Traverse Point Number	Veocity Head ΔPs	Stack Temp (°F)		Traverse Point Number	Velocity Head ΔPs	Stack Temp (°F)		Traverse Point Number	Velocity Head ΔPs	Stack Temp (°F)		Traverse Point Number	Velocity Head ΔPs	Stack Temp (°F)		Notes
1-1	.16 RML ~~.19~~	~~316~~ RML	311	1-1	.18	318		1-1	.17 RML ~~.14~~	~~318~~	316					
2	.18 ~~.20~~	~~316~~	311	2	.19	319		2	.18 ~~.15~~	~~318~~	316					
3	.17 ~~.20~~	~~316~~	311	3	.18	319		3	.18 ~~.15~~	~~318~~	316					
2-1	.19	316		2-1	.19	314		2-1	.19	314						
2	.20	316		2	.21	315		2	.20	314						
3	.20	316		3	.21	316		3	.20	314						
3-1	.12	306		3-1	.13	311		3-1	.14	313						
2	.14	307		2	.13	312		2	.13	314						
3	.13	306		3	.12	312		3	.13	313						
4-1	.14	310		4-1	.13	314		4-1	.14	318						
2	.14	311		2	.15	315		2	.15	318						
3	.15	310		3	.16	315		3	.15	318						
Total																
Average	.3980	311			.4043	315			.4029		315					

SOLVAY2016_6_00109

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Orsat Readings

Client Solvay Minerals, Inc.	Project Number 7594
Plant Green River WY	Unit EP-5, EP-1,2
Date 10-29-95	Fuel Type Natural Gas (Calciner)
Orsat ID 65-2	Leak Check? ✓

$$F_o = \frac{20.9 - \%O_2}{\%CO_2}$$

F_o = 1.083 to 1.230 (for bituminous coal)

Run Number	Location	Bag ID	Trial	Percent CO_2	Percent $CO_2 + O_2$	Percent O_2	F_o	Sample Time	Analysis Time	Analyst
1	EP-5 Stack	1	1	13.6	22.6	9.0			1014	SR
			2	13.7	22.7	9.0				
			3	13.8	22.8	9.0				
			Avg	13.7		9.0				
2	EP-5 Stack	2	1	13.8	22.8	9.0			1150	SR
			2	13.8	22.8	9.0				
			3	13.8	22.8	9.0				
			Avg.	13.8		9.0				
3	EP-5 Stack	3	1	13.9	22.8	8.9			1310	SR
			2	13.8	22.8	9.0				
			3	13.8	22.8	9.0				
			Avg.	13.8		9.0				
			1							
			2							
			3							
			Avg.							
1	EP-1,2 Stack	1	1	8.5	22.1	13.6			1610	SR
			2	8.5	22.1	13.6				
			3	8.5	22.1	13.6				
			Avg.	8.5		13.6				
2	EP-1,2 Stack	2	1	8.4	22.1	13.7			1740	SR
			2	8.4	22.1	13.7				
			3	8.4	22.1	13.7				
			Avg.	8.4		13.7				
3	EP-1,2 Stack	3	1	8.4	22.1	13.7			1907	SR
			2	8.4	22.1	13.7				
			3	8.4	22.1	13.7				
			Avg.	8.4		13.7				
			1							
			2							
			3							
			Avg.							

CAE P3 ver 1.0
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CAE

SOLVAY MINERALS, INC.
CAE Project No: 7594
EP-5 Calciner Stack
October 29, 1995

CALIBRATION BIAS 0

Time	NO_x (ppm)	SO_2 (ppm)	THC (ppm)	O_2 (%)	CO_2 (%)	CO (ppm)	SO_2 In (ppm)	O_2 In (%)	CO_2 In (%)
08:33:44	0.0	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0
08:33:59	0.0	0.0	6.8	0.0	0.0	0.0	0.0	0.0	0.0
08:34:14	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0
08:34:29	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
08:34:44	0.0	0.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0
08:34:59	0.0	0.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0
08:35:14	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0
08:35:29	0.0	0.0	532.0	0.0	0.0	0.0	0.0	0.0	0.0
08:35:44	0.0	0.0	799.9	0.0	0.0	0.0	0.0	0.0	0.0
08:35:59	0.0	0.0	811.6	0.0	0.0	0.0	0.0	0.0	0.0
08:36:14	0.0	0.0	817.5	0.0	0.0	0.0	0.0	0.0	0.0
08:36:29	0.0	0.0	816.4	0.0	0.0	0.0	0.0	0.0	0.0
08:36:44	0.0	0.0	815.8	0.0	0.0	0.0	0.0	0.0	0.0
08:36:59	0.0	0.0	814.8	0.0	0.0	0.0	0.0	0.0	0.0
08:37:14	0.0	0.0	814.7	0.0	0.0	0.0	0.0	0.0	0.0
08:37:29	0.0	0.0	813.8	0.0	0.0	0.0	0.0	0.0	0.0
08:37:44	0.0	0.0	817.0	0.0	0.0	0.0	0.0	0.0	0.0
08:37:59	0.0	0.0	751.6	0.0	0.0	0.0	0.0	0.0	0.0
08:38:14	0.0	0.0	551.3	0.0	0.0	0.0	0.0	0.0	0.0
08:38:29	0.0	0.0	546.3	0.0	0.0	0.0	0.0	0.0	0.0
08:38:44	0.0	0.0	546.7	0.0	0.0	0.0	0.0	0.0	0.0
08:38:59	0.0	0.0	546.7	0.0	0.0	0.0	0.0	0.0	0.0
08:39:14	0.0	0.0	548.6	0.0	0.0	0.0	0.0	0.0	0.0
08:39:29	0.0	0.0	545.9	0.0	0.0	0.0	0.0	0.0	0.0
08:39:44	0.0	0.0	545.5	0.0	0.0	0.0	0.0	0.0	0.0
08:39:59	0.0	0.0	547.3	0.0	0.0	0.0	0.0	0.0	0.0
08:40:14	0.0	0.0	545.8	0.0	0.0	0.0	0.0	0.0	0.0
08:40:29	0.0	0.0	545.6	0.0	0.0	0.0	0.0	0.0	0.0
08:40:44	0.0	0.0	379.6	0.0	0.0	0.0	0.0	0.0	0.0
08:40:59	0.0	0.0	251.2	0.0	0.0	0.0	0.0	0.0	0.0
08:41:14	0.0	0.0	249.8	0.0	0.0	0.0	0.0	0.0	0.0
08:41:29	0.0	0.0	248.4	0.0	0.0	0.0	0.0	0.0	0.0
08:41:44	0.0	0.0	248.7	0.0	0.0	0.0	0.0	0.0	0.0
08:41:59	0.0	0.0	247.1	0.0	0.0	0.0	0.0	0.0	0.0
08:42:14	0.0	0.0	246.8	0.0	0.0	0.0	0.0	0.0	0.0
08:42:29	0.0	0.0	246.8	0.0	0.0	0.0	0.0	0.0	0.0
08:42:44	0.0	0.0	246.4	0.0	0.0	0.0	0.0	0.0	0.0
08:42:59	0.0	0.0	246.2	0.0	0.0	0.0	0.0	0.0	0.0
08:43:14	0.0	0.0	246.2	0.0	0.0	0.0	0.0	0.0	0.0
08:43:29	0.0	0.0	49.5	0.0	0.0	0.0	0.0	0.0	0.0
08:43:44	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0
08:43:59	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0
08:44:14	0.0	0.0	6.6	0.0	0.0	0.0	0.0	0.0	0.0
08:44:29	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0
08:44:44	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0
08:44:59	0.0	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0
08:45:14	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0
08:45:29	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0
Zero Gas			6.1						
Cal Gas			246.5						

SOLVAY MINERALS, INC.
CAE Project No: 7594
EP-5 Calciner Stack
October 29, 1995

REFERENCE METHOD RUN 1

Time	NO_x (ppm)	SO_2 (ppm)	THC (ppm)	O_2 (%)	CO_2 (%)	CO (ppm)	SO_2 In (ppm)	O_2 In (%)	CO_2 In (%)
09:20	0.0	0.0	118.3	0.0	0.0	0.0	0.0	0.0	0.0
09:21	0.0	0.0	122.2	0.0	0.0	0.0	0.0	0.0	0.0
09:22	0.0	0.0	120.4	0.0	0.0	0.0	0.0	0.0	0.0
09:23	0.0	0.0	107.1	0.0	0.0	0.0	0.0	0.0	0.0
09:24	0.0	0.0	120.8	0.0	0.0	0.0	0.0	0.0	0.0
09:25	0.0	0.0	120.0	0.0	0.0	0.0	0.0	0.0	0.0
09:26	0.0	0.0	87.8	0.0	0.0	0.0	0.0	0.0	0.0
09:27	0.0	0.0	110.7	0.0	0.0	0.0	0.0	0.0	0.0
09:28	0.0	0.0	117.8	0.0	0.0	0.0	0.0	0.0	0.0
09:29	0.0	0.0	114.1	0.0	0.0	0.0	0.0	0.0	0.0
09:30	0.0	0.0	115.1	0.0	0.0	0.0	0.0	0.0	0.0
09:31	0.0	0.0	114.4	0.0	0.0	0.0	0.0	0.0	0.0
09:32	0.0	0.0	100.2	0.0	0.0	0.0	0.0	0.0	0.0
09:33	0.0	0.0	108.0	0.0	0.0	0.0	0.0	0.0	0.0
09:34	0.0	0.0	108.1	0.0	0.0	0.0	0.0	0.0	0.0
09:35	0.0	0.0	112.1	0.0	0.0	0.0	0.0	0.0	0.0
09:36	0.0	0.0	114.3	0.0	0.0	0.0	0.0	0.0	0.0
09:37	0.0	0.0	114.9	0.0	0.0	0.0	0.0	0.0	0.0
09:38	0.0	0.0	113.3	0.0	0.0	0.0	0.0	0.0	0.0
09:39	0.0	0.0	82.5	0.0	0.0	0.0	0.0	0.0	0.0
09:40	0.0	0.0	111.2	0.0	0.0	0.0	0.0	0.0	0.0
09:41	0.0	0.0	107.4	0.0	0.0	0.0	0.0	0.0	0.0
09:42	0.0	0.0	112.2	0.0	0.0	0.0	0.0	0.0	0.0
09:43	0.0	0.0	113.2	0.0	0.0	0.0	0.0	0.0	0.0
09:44	0.0	0.0	105.9	0.0	0.0	0.0	0.0	0.0	0.0
09:45	0.0	0.0	97.0	0.0	0.0	0.0	0.0	0.0	0.0
09:46	0.0	0.0	104.4	0.0	0.0	0.0	0.0	0.0	0.0
09:47	0.0	0.0	114.0	0.0	0.0	0.0	0.0	0.0	0.0
09:48	0.0	0.0	114.0	0.0	0.0	0.0	0.0	0.0	0.0
09:49	0.0	0.0	98.2	0.0	0.0	0.0	0.0	0.0	0.0
09:50	0.0	0.0	101.8	0.0	0.0	0.0	0.0	0.0	0.0
09:51	0.0	0.0	110.0	0.0	0.0	0.0	0.0	0.0	0.0
09:52	0.0	0.0	111.1	0.0	0.0	0.0	0.0	0.0	0.0
09:53	0.0	0.0	99.9	0.0	0.0	0.0	0.0	0.0	0.0
09:54	0.0	0.0	100.1	0.0	0.0	0.0	0.0	0.0	0.0
09:55	0.0	0.0	102.4	0.0	0.0	0.0	0.0	0.0	0.0
09:56	0.0	0.0	106.0	0.0	0.0	0.0	0.0	0.0	0.0
09:57	0.0	0.0	108.4	0.0	0.0	0.0	0.0	0.0	0.0
09:58	0.0	0.0	106.2	0.0	0.0	0.0	0.0	0.0	0.0
09:59	0.0	0.0	106.9	0.0	0.0	0.0	0.0	0.0	0.0
10:00	0.0	0.0	97.4	0.0	0.0	0.0	0.0	0.0	0.0
10:01	0.0	0.0	104.0	0.0	0.0	0.0	0.0	0.0	0.0
10:02	0.0	0.0	106.2	0.0	0.0	0.0	0.0	0.0	0.0
10:03	0.0	0.0	107.0	0.0	0.0	0.0	0.0	0.0	0.0
10:04	0.0	0.0	104.8	0.0	0.0	0.0	0.0	0.0	0.0
10:05	0.0	0.0	92.9	0.0	0.0	0.0	0.0	0.0	0.0
10:06	0.0	0.0	102.0	0.0	0.0	0.0	0.0	0.0	0.0
10:07	0.0	0.0	100.8	0.0	0.0	0.0	0.0	0.0	0.0
10:08	0.0	0.0	104.1	0.0	0.0	0.0	0.0	0.0	0.0
10:09	0.0	0.0	104.0	0.0	0.0	0.0	0.0	0.0	0.0
10:10	0.0	0.0	90.7	0.0	0.0	0.0	0.0	0.0	0.0
10:11	0.0	0.0	92.8	0.0	0.0	0.0	0.0	0.0	0.0
10:12	0.0	0.0	97.7	0.0	0.0	0.0	0.0	0.0	0.0
10:13	0.0	0.0	98.5	0.0	0.0	0.0	0.0	0.0	0.0
10:14	0.0	0.0	99.8	0.0	0.0	0.0	0.0	0.0	0.0
10:15	0.0	0.0	99.7	0.0	0.0	0.0	0.0	0.0	0.0
10:16	0.0	0.0	83.1	0.0	0.0	0.0	0.0	0.0	0.0
10:17	0.0	0.0	103.1	0.0	0.0	0.0	0.0	0.0	0.0
10:18	0.0	0.0	102.7	0.0	0.0	0.0	0.0	0.0	0.0
10:19	0.0	0.0	99.9	0.0	0.0	0.0	0.0	0.0	0.0
Average			105.7						

SOLVAY MINERALS, INC.
CAE Project No: 7594
EP-5 Calciner Stack
October 29, 1995

CALIBRATION BIAS 1

Time	NO_x (ppm)	SO_2 (ppm)	THC (ppm)	O_2 (%)	CO_2 (%)	CO (ppm)	SO_2 In (ppm)	O_2 In (%)	CO_2 In (%)
10:25:09	0.0	0.0	17.7	0.0	0.0	-0.1	0.0	0.0	0.0
10:26:09	0.0	0.0	15.4	0.0	0.0	-0.1	0.0	0.0	0.0
10:27:09	0.0	0.0	14.3	0.0	0.0	-0.2	0.0	0.0	0.0
10:28:09	0.0	0.0	26.7	0.0	0.0	-0.2	0.0	0.0	0.0
10:29:09	0.0	0.0	231.1	0.0	0.0	-0.2	0.0	0.0	0.0
10:30:09	0.0	0.0	238.2	0.0	0.0	-0.2	0.0	0.0	0.0
10:31:09	0.0	0.0	243.1	0.0	0.0	-0.1	0.0	0.0	0.0
10:32:09	0.0	0.0	123.2	0.0	0.0	-0.2	0.0	0.0	0.0
10:33:09	0.0	0.0	12.2	0.0	0.0	-0.2	0.0	0.0	0.0
10:34:09	0.0	0.0	10.8	0.0	0.0	-0.2	0.0	0.0	0.0
10:35:09	0.0	0.0	10.1	0.0	0.0	-0.2	0.0	0.0	0.0
Zero Gas			10.5						
Cal Gas			240.7						

SOLVAY MINERALS, INC.
CAE Project No: 7594
EP-5 Calciner Stack
October 29, 1995

REFERENCE METHOD RUN 2

Time	NO_x (ppm)	SO_2 (ppm)	THC (ppm)	O_2 (%)	CO_2 (%)	CO (ppm)	SO_2 In (ppm)	O_2 In (%)	CO_2 In (%)
10:49	0.0	0.0	107.9	0.0	0.0	0.0	0.0	0.0	0.0
10:50	0.0	0.0	101.5	0.0	0.0	0.0	0.0	0.0	0.0
10:51	0.0	0.0	102.9	0.0	0.0	0.0	0.0	0.0	0.0
10:52	0.0	0.0	101.8	0.0	0.0	0.0	0.0	0.0	0.0
10:53	0.0	0.0	91.8	0.0	0.0	0.0	0.0	0.0	0.0
10:54	0.0	0.0	105.0	0.0	0.0	0.0	0.0	0.0	0.0
10:55	0.0	0.0	105.0	0.0	0.0	0.0	0.0	0.0	0.0
10:56	0.0	0.0	106.3	0.0	0.0	0.0	0.0	0.0	0.0
10:57	0.0	0.0	109.0	0.0	0.0	0.0	0.0	0.0	0.0
10:58	0.0	0.0	95.8	0.0	0.0	0.0	0.0	0.0	0.0
10:59	0.0	0.0	103.4	0.0	0.0	0.0	0.0	0.0	0.0
11:00	0.0	0.0	104.4	0.0	0.0	0.0	0.0	0.0	0.0
11:01	0.0	0.0	108.2	0.0	0.0	0.0	0.0	0.0	0.0
11:02	0.0	0.0	99.1	0.0	0.0	0.0	0.0	0.0	0.0
11:03	0.0	0.0	108.9	0.0	0.0	0.0	0.0	0.0	0.0
11:04	0.0	0.0	111.1	0.0	0.0	0.0	0.0	0.0	0.0
11:05	0.0	0.0	93.8	0.0	0.0	0.0	0.0	0.0	0.0
11:06	0.0	0.0	101.3	0.0	0.0	0.0	0.0	0.0	0.0
11:07	0.0	0.0	110.3	0.0	0.0	0.0	0.0	0.0	0.0
11:08	0.0	0.0	108.4	0.0	0.0	0.0	0.0	0.0	0.0
11:09	0.0	0.0	104.3	0.0	0.0	0.0	0.0	0.0	0.0
11:10	0.0	0.0	111.2	0.0	0.0	0.0	0.0	0.0	0.0
11:11	0.0	0.0	88.6	0.0	0.0	0.0	0.0	0.0	0.0
11:12	0.0	0.0	106.7	0.0	0.0	0.0	0.0	0.0	0.0
11:13	0.0	0.0	114.3	0.0	0.0	0.0	0.0	0.0	0.0
11:14	0.0	0.0	107.1	0.0	0.0	0.0	0.0	0.0	0.0
11:15	0.0	0.0	112.9	0.0	0.0	0.0	0.0	0.0	0.0
11:16	0.0	0.0	108.3	0.0	0.0	0.0	0.0	0.0	0.0
11:17	0.0	0.0	89.4	0.0	0.0	0.0	0.0	0.0	0.0
11:18	0.0	0.0	106.9	0.0	0.0	0.0	0.0	0.0	0.0
11:19	0.0	0.0	106.8	0.0	0.0	0.0	0.0	0.0	0.0
11:20	0.0	0.0	111.8	0.0	0.0	0.0	0.0	0.0	0.0
11:21	0.0	0.0	105.4	0.0	0.0	0.0	0.0	0.0	0.0
11:22	0.0	0.0	111.2	0.0	0.0	0.0	0.0	0.0	0.0
11:23	0.0	0.0	93.3	0.0	0.0	0.0	0.0	0.0	0.0
11:24	0.0	0.0	108.3	0.0	0.0	0.0	0.0	0.0	0.0
11:25	0.0	0.0	109.1	0.0	0.0	0.0	0.0	0.0	0.0
11:26	0.0	0.0	96.8	0.0	0.0	0.0	0.0	0.0	0.0
11:27	0.0	0.0	112.7	0.0	0.0	0.0	0.0	0.0	0.0
11:28	0.0	0.0	105.2	0.0	0.0	0.0	0.0	0.0	0.0
11:29	0.0	0.0	105.8	0.0	0.0	0.0	0.0	0.0	0.0
11:30	0.0	0.0	113.0	0.0	0.0	0.0	0.0	0.0	0.0
11:31	0.0	0.0	113.6	0.0	0.0	0.0	0.0	0.0	0.0
11:32	0.0	0.0	107.8	0.0	0.0	0.0	0.0	0.0	0.0
11:33	0.0	0.0	98.3	0.0	0.0	0.0	0.0	0.0	0.0
11:34	0.0	0.0	93.5	0.0	0.0	0.0	0.0	0.0	0.0
11:35	0.0	0.0	109.0	0.0	0.0	0.0	0.0	0.0	0.0
11:36	0.0	0.0	109.3	0.0	0.0	0.0	0.0	0.0	0.0
11:37	0.0	0.0	108.6	0.0	0.0	0.0	0.0	0.0	0.0
11:38	0.0	0.0	108.0	0.0	0.0	0.0	0.0	0.0	0.0
11:39	0.0	0.0	92.3	0.0	0.0	0.0	0.0	0.0	0.0
11:40	0.0	0.0	103.2	0.0	0.0	0.0	0.0	0.0	0.0
11:41	0.0	0.0	107.0	0.0	0.0	0.0	0.0	0.0	0.0
11:42	0.0	0.0	110.1	0.0	0.0	0.0	0.0	0.0	0.0
11:43	0.0	0.0	109.7	0.0	0.0	0.0	0.0	0.0	0.0
11:44	0.0	0.0	89.7	0.0	0.0	0.0	0.0	0.0	0.0
11:45	0.0	0.0	95.0	0.0	0.0	0.0	0.0	0.0	0.0
11:46	0.0	0.0	109.0	0.0	0.0	0.0	0.0	0.0	0.0
11:47	0.0	0.0	104.6	0.0	0.0	0.0	0.0	0.0	0.0
11:48	0.0	0.0	106.5	0.0	0.0	0.0	0.0	0.0	0.0
Average			104.7						

SOLVAY MINERALS, INC.
CAE Project No: 7594
EP-5 Calciner Stack
October 29, 1995

CALIBRATION BIAS 2

Time	NO_x (ppm)	SO_2 (ppm)	THC (ppm)	O_2 (%)	CO_2 (%)	CO (ppm)	SO_2 In (ppm)	O_2 In (%)	CO_2 In (%)
11:54:27	0.0	0.0	18.0	0.0	0.0	-0.4	0.0	0.0	0.0
11:54:42	0.0	0.0	17.0	0.0	0.0	-0.1	0.0	0.0	0.0
11:54:57	0.0	0.0	18.0	0.0	0.0	-0.5	0.0	0.0	0.0
11:55:12	0.0	0.0	15.8	0.0	0.0	-0.1	0.0	0.0	0.0
11:55:27	0.0	0.0	15.4	0.0	0.0	-0.2	0.0	0.0	0.0
11:55:42	0.0	0.0	14.5	0.0	0.0	-0.3	0.0	0.0	0.0
11:55:57	0.0	0.0	13.9	0.0	0.0	-0.3	0.0	0.0	0.0
11:56:12	0.0	0.0	13.3	0.0	0.0	-0.3	0.0	0.0	0.0
11:56:27	0.0	0.0	12.6	0.0	0.0	-0.2	0.0	0.0	0.0
11:56:42	0.0	0.0	12.2	0.0	0.0	-0.5	0.0	0.0	0.0
11:56:57	0.0	0.0	11.8	0.0	0.0	-0.1	0.0	0.0	0.0
11:57:12	0.0	0.0	11.3	0.0	0.0	-0.4	0.0	0.0	0.0
11:57:27	0.0	0.0	11.3	0.0	0.0	-0.4	0.0	0.0	0.0
11:57:42	0.0	0.0	11.3	0.0	0.0	-0.1	0.0	0.0	0.0
11:57:57	0.0	0.0	11.0	0.0	0.0	-0.4	0.0	0.0	0.0
11:58:12	0.0	0.0	10.8	0.0	0.0	-0.2	0.0	0.0	0.0
11:58:27	0.0	0.0	162.7	0.0	0.0	-0.4	0.0	0.0	0.0
11:58:42	0.0	0.0	211.3	0.0	0.0	-0.2	0.0	0.0	0.0
11:58:57	0.0	0.0	210.0	0.0	0.0	-0.4	0.0	0.0	0.0
11:59:12	0.0	0.0	212.1	0.0	0.0	-0.1	0.0	0.0	0.0
11:59:27	0.0	0.0	216.3	0.0	0.0	-0.3	0.0	0.0	0.0
11:59:42	0.0	0.0	220.1	0.0	0.0	-0.4	0.0	0.0	0.0
11:59:57	0.0	0.0	222.9	0.0	0.0	-0.2	0.0	0.0	0.0
12:00:12	-0.2	0.0	236.9	0.0	0.0	-0.4	0.0	0.0	0.0
12:00:27	0.0	0.0	224.7	0.0	0.0	-0.1	0.0	0.0	0.0
12:00:42	0.0	0.0	226.1	0.0	0.0	-0.4	0.0	0.0	0.0
12:00:57	0.0	0.0	226.8	0.0	0.0	-0.1	0.0	0.0	0.0
12:01:12	0.0	0.0	228.3	0.0	0.0	-0.4	0.0	0.0	0.0
12:01:27	0.0	0.0	232.3	0.0	0.0	-0.1	0.0	0.0	0.0
12:01:42	0.0	0.0	234.8	0.0	0.0	-0.4	0.0	0.0	0.0
12:01:57	0.0	0.0	235.8	0.0	0.0	-0.2	0.0	0.0	0.0
12:02:12	0.0	0.0	237.5	0.0	0.0	-0.3	0.0	0.0	0.0
12:02:27	0.0	0.0	238.5	0.0	0.0	-0.2	0.0	0.0	0.0
12:02:42	0.0	0.0	239.9	0.0	0.0	-0.4	0.0	0.0	0.0
12:02:57	0.0	0.0	241.2	0.0	0.0	-0.2	0.0	0.0	0.0
12:03:12	0.0	0.0	242.1	0.0	0.0	-0.3	0.0	0.0	0.0
12:03:27	0.0	0.0	243.0	0.0	0.0	-0.2	0.0	0.0	0.0
12:03:42	0.0	0.0	244.3	0.0	0.0	-0.2	0.0	0.0	0.0
12:03:57	0.0	0.0	246.7	0.0	0.0	-0.2	0.0	0.0	0.0
12:04:12	0.0	0.0	248.5	0.0	0.0	-0.4	0.0	0.0	0.0
12:04:27	0.0	0.0	249.4	0.0	0.0	-0.2	0.0	0.0	0.0
12:04:42	0.0	0.0	178.4	0.0	0.0	-0.3	0.0	0.0	0.0
12:04:57	0.0	0.0	11.8	0.0	0.0	-0.2	0.0	0.0	0.0
12:05:12	0.0	0.0	8.6	0.0	0.0	-0.3	0.0	0.0	0.0
12:05:27	0.0	0.0	7.6	0.0	0.0	-0.2	0.0	0.0	0.0
12:05:42	0.0	0.0	7.1	0.0	0.0	-0.3	0.0	0.0	0.0
12:05:57	0.0	0.0	6.7	0.0	0.0	-0.2	0.0	0.0	0.0
12:06:12	0.0	0.0	6.4	0.0	0.0	-0.4	0.0	0.0	0.0
12:06:27	0.0	0.0	6.2	0.0	0.0	-0.3	0.0	0.0	0.0
12:06:42	0.0	0.0	6.0	0.0	0.0	-0.4	0.0	0.0	0.0
12:06:57	0.0	0.0	5.9	0.0	0.0	-0.1	0.0	0.0	0.0
Zero Gas			6.2						
Cal Gas			246.5						

SOLVAY MINERALS, INC.
CAE Project No: 7594
EP-5 Calciner Stack
October 29, 1995

REFERENCE METHOD RUN 3

Time	NO_x (ppm)	SO_2 (ppm)	THC (ppm)	O_2 (%)	CO_2 (%)	CO (ppm)	SO_2 In (ppm)	O_2 In (%)	CO_2 In (%)
12:15	0.0	0.0	101.0	0.0	0.0	0.0	0.0	0.0	0.0
12:16	0.0	0.0	104.3	0.0	0.0	0.0	0.0	0.0	0.0
12:17	0.0	0.0	91.5	0.0	0.0	0.0	0.0	0.0	0.0
12:18	0.0	0.0	98.8	0.0	0.0	0.0	0.0	0.0	0.0
12:19	0.0	0.0	103.7	0.0	0.0	0.0	0.0	0.0	0.0
12:20	0.0	0.0	104.2	0.0	0.0	0.0	0.0	0.0	0.0
12:21	0.0	0.0	108.7	0.0	0.0	0.0	0.0	0.0	0.0
12:22	0.0	0.0	107.5	0.0	0.0	0.0	0.0	0.0	0.0
12:23	0.0	0.0	101.5	0.0	0.0	0.0	0.0	0.0	0.0
12:24	0.0	0.0	105.3	0.0	0.0	0.0	0.0	0.0	0.0
12:25	0.0	0.0	110.1	0.0	0.0	0.0	0.0	0.0	0.0
12:26	0.0	0.0	111.2	0.0	0.0	0.0	0.0	0.0	0.0
12:27	0.0	0.0	109.2	0.0	0.0	0.0	0.0	0.0	0.0
12:28	0.0	0.0	106.2	0.0	0.0	0.0	0.0	0.0	0.0
12:29	0.0	0.0	115.1	0.0	0.0	0.0	0.0	0.0	0.0
12:30	0.0	0.0	101.0	0.0	0.0	0.0	0.0	0.0	0.0
12:31	0.0	0.0	106.6	0.0	0.0	0.0	0.0	0.0	0.0
12:32	0.0	0.0	116.6	0.0	0.0	0.0	0.0	0.0	0.0
12:33	0.0	0.0	116.2	0.0	0.0	0.0	0.0	0.0	0.0
12:34	0.0	0.0	125.2	0.0	0.0	0.0	0.0	0.0	0.0
12:35	0.0	0.0	107.6	0.0	0.0	0.0	0.0	0.0	0.0
12:36	0.0	0.0	108.5	0.0	0.0	0.0	0.0	0.0	0.0
12:37	0.0	0.0	118.6	0.0	0.0	0.0	0.0	0.0	0.0
12:38	0.0	0.0	121.0	0.0	0.0	0.0	0.0	0.0	0.0
12:39	0.0	0.0	126.3	0.0	0.0	0.0	0.0	0.0	0.0
12:40	0.0	0.0	127.7	0.0	0.0	0.0	0.0	0.0	0.0
12:41	0.0	0.0	124.8	0.0	0.0	0.0	0.0	0.0	0.0
12:42	0.0	0.0	120.4	0.0	0.0	0.0	0.0	0.0	0.0
12:43	0.0	0.0	121.0	0.0	0.0	0.0	0.0	0.0	0.0
12:44	0.0	0.0	121.4	0.0	0.0	0.0	0.0	0.0	0.0
12:45	0.0	0.0	128.5	0.0	0.0	0.0	0.0	0.0	0.0
12:46	0.0	0.0	132.5	0.0	0.0	0.0	0.0	0.0	0.0
12:47	0.0	0.0	136.2	0.0	0.0	0.0	0.0	0.0	0.0
12:48	0.0	0.0	124.0	0.0	0.0	0.0	0.0	0.0	0.0
12:49	0.0	0.0	132.5	0.0	0.0	0.0	0.0	0.0	0.0
12:50	0.0	0.0	112.7	0.0	0.0	0.0	0.0	0.0	0.0
12:51	0.0	0.0	134.8	0.0	0.0	0.0	0.0	0.0	0.0
12:52	0.0	0.0	142.1	0.0	0.0	0.0	0.0	0.0	0.0
12:53	0.0	0.0	136.3	0.0	0.0	0.0	0.0	0.0	0.0
12:54	0.0	0.0	137.8	0.0	0.0	0.0	0.0	0.0	0.0
12:55	0.0	0.0	142.5	0.0	0.0	0.0	0.0	0.0	0.0
12:56	0.0	0.0	139.5	0.0	0.0	0.0	0.0	0.0	0.0
12:57	0.0	0.0	133.7	0.0	0.0	0.0	0.0	0.0	0.0
12:58	0.0	0.0	130.5	0.0	0.0	0.0	0.0	0.0	0.0
12:59	0.0	0.0	128.2	0.0	0.0	0.0	0.0	0.0	0.0
13:00	0.0	0.0	150.0	0.0	0.0	0.0	0.0	0.0	0.0
13:01	0.0	0.0	149.0	0.0	0.0	0.0	0.0	0.0	0.0
13:02	0.0	0.0	135.8	0.0	0.0	0.0	0.0	0.0	0.0
13:03	0.0	0.0	144.2	0.0	0.0	0.0	0.0	0.0	0.0
13:04	0.0	0.0	138.8	0.0	0.0	0.0	0.0	0.0	0.0
13:05	0.0	0.0	144.2	0.0	0.0	0.0	0.0	0.0	0.0
13:06	0.0	0.0	145.3	0.0	0.0	0.0	0.0	0.0	0.0
13:07	0.0	0.0	145.3	0.0	0.0	0.0	0.0	0.0	0.0
13:08	0.0	0.0	143.3	0.0	0.0	0.0	0.0	0.0	0.0
13:09	0.0	0.0	147.7	0.0	0.0	0.0	0.0	0.0	0.0
13:10	0.0	0.0	133.8	0.0	0.0	0.0	0.0	0.0	0.0
13:11	0.0	0.0	140.1	0.0	0.0	0.0	0.0	0.0	0.0
13:12	0.0	0.0	155.3	0.0	0.0	0.0	0.0	0.0	0.0
13:13	0.0	0.0	144.0	0.0	0.0	0.0	0.0	0.0	0.0
13:14	0.0	0.0	133.0	0.0	0.0	0.0	0.0	0.0	0.0
Average			124.7						

SOLVAY MINERALS, INC.
CAE Project No: 7594
EP-5 Calciner Stack
October 29, 1995

CALIBRATION BIAS 3

Time	NO_x (ppm)	SO_2 (ppm)	THC (ppm)	O_2 (%)	CO_2 (%)	CO (ppm)	SO_2 In (ppm)	O_2 In (%)	CO_2 In (%)
13:19:18	0.0	0.0	18.3	0.0	0.0	-0.2	0.0	0.0	0.0
13:19:33	0.0	0.0	16.3	0.0	0.0	-0.3	0.0	0.0	0.0
13:19:48	0.0	0.0	15.7	0.0	0.0	-0.2	0.0	0.0	0.0
13:20:03	0.0	0.0	15.0	0.0	0.0	-0.2	0.0	0.0	0.0
13:20:18	0.0	0.0	14.1	0.0	0.0	-0.3	0.0	0.0	0.0
13:20:33	0.0	0.0	13.4	0.0	0.0	-0.3	0.0	0.0	0.0
13:20:48	0.0	0.0	12.8	0.0	0.0	-0.5	0.0	0.0	0.0
13:21:03	0.0	0.0	12.0	0.0	0.0	-0.1	0.0	0.0	0.0
13:21:18	0.0	0.0	11.6	0.0	0.0	-0.5	0.0	0.0	0.0
13:21:33	0.0	0.0	11.6	0.0	0.0	-0.4	0.0	0.0	0.0
13:21:48	0.0	0.0	10.7	0.0	0.0	-0.2	0.0	0.0	0.0
13:22:03	0.0	0.0	10.4	0.0	0.0	-0.4	0.0	0.0	0.0
13:22:18	0.0	0.0	9.9	0.0	0.0	-0.2	0.0	0.0	0.0
13:22:33	0.0	0.0	9.5	0.0	0.0	-0.2	0.0	0.0	0.0
13:22:48	0.0	0.0	9.2	0.0	0.0	-0.5	0.0	0.0	0.0
13:23:03	0.0	0.0	9.0	0.0	0.0	-0.1	0.0	0.0	0.0
13:23:18	0.0	0.0	8.7	0.0	0.0	-0.3	0.0	0.0	0.0
13:23:33	0.0	0.0	8.6	0.0	0.0	-0.5	0.0	0.0	0.0
13:23:48	0.0	0.0	8.3	0.0	0.0	-0.1	0.0	0.0	0.0
13:24:03	0.0	0.0	7.9	0.0	0.0	-0.2	0.0	0.0	0.0
13:24:18	0.0	0.0	7.9	0.0	0.0	-0.6	0.0	0.0	0.0
13:24:33	0.0	0.0	7.8	0.0	0.0	-0.2	0.0	0.0	0.0
13:24:48	0.0	0.0	7.7	0.0	0.0	-0.3	0.0	0.0	0.0
13:25:03	0.0	0.0	7.5	0.0	0.0	-0.3	0.0	0.0	0.0
13:25:18	0.0	0.0	7.3	0.0	0.0	-0.1	0.0	0.0	0.0
13:25:33	0.0	0.0	7.2	0.0	0.0	-0.5	0.0	0.0	0.0
13:25:48	0.0	0.0	7.1	0.0	0.0	-0.5	0.0	0.0	0.0
13:26:03	0.0	0.0	6.7	0.0	0.0	-0.1	0.0	0.0	0.0
13:26:18	0.0	0.0	6.4	0.0	0.0	-0.6	0.0	0.0	0.0
13:26:33	0.0	0.0	6.3	0.0	0.0	-0.2	0.0	0.0	0.0
13:26:48	0.0	0.0	6.0	0.0	0.0	-0.3	0.0	0.0	0.0
13:27:03	0.0	0.0	5.7	0.0	0.0	-0.4	0.0	0.0	0.0
13:27:18	0.0	0.0	5.5	0.0	0.0	-0.2	0.0	0.0	0.0
13:27:33	0.0	0.0	5.2	0.0	0.0	-0.4	0.0	0.0	0.0
13:27:48	0.0	0.0	4.8	0.0	0.0	-0.2	0.0	0.0	0.0
13:28:03	0.0	0.0	4.7	0.0	0.0	-0.5	0.0	0.0	0.0
13:28:18	0.0	0.0	4.5	0.0	0.0	-0.1	0.0	0.0	0.0
13:28:33	0.0	0.0	4.4	0.0	0.0	-0.5	0.0	0.0	0.0
13:28:48	0.0	0.0	4.3	0.0	0.0	-0.4	0.0	0.0	0.0
13:29:03	0.0	0.0	4.3	0.0	0.0	-0.1	0.0	0.0	0.0
13:29:18	0.0	0.0	4.2	0.0	0.0	-0.4	0.0	0.0	0.0
13:29:33	0.0	0.0	4.1	0.0	0.0	-0.4	0.0	0.0	0.0
13:29:48	0.0	0.0	4.0	0.0	0.0	-0.1	0.0	0.0	0.0
13:30:03	0.0	0.0	4.0	0.0	0.0	-0.5	0.0	0.0	0.0
13:30:18	0.0	0.0	4.1	0.0	0.0	-0.3	0.0	0.0	0.0
13:30:33	0.0	0.0	158.7	0.0	0.0	-0.1	0.0	0.0	0.0
13:30:48	0.0	0.0	250.3	0.0	0.0	-0.6	0.0	0.0	0.0
13:31:03	0.0	0.0	251.1	0.0	0.0	-0.5	0.0	0.0	0.0
13:31:18	0.0	0.0	251.9	0.0	0.0	-0.1	0.0	0.0	0.0
13:31:33	0.0	0.0	252.7	0.0	0.0	-0.4	0.0	0.0	0.0
13:31:48	0.0	0.0	253.2	0.0	0.0	-0.6	0.0	0.0	0.0
13:32:03	0.0	0.0	253.6	0.0	0.0	-0.1	0.0	0.0	0.0
13:32:18	0.0	0.0	254.0	0.0	0.0	-0.1	0.0	0.0	0.0
13:32:33	0.0	0.0	254.7	0.0	0.0	-0.5	0.0	0.0	0.0
13:32:48	0.0	0.0	255.6	0.0	0.0	-0.1	0.0	0.0	0.0
Zero Gas			4.0						
Cal Gas			254.8						

Solvay Minerals,Inc.
CAE Project No: 7594
10/29/95

Run 1

Field Data

Solvay Minerals

EP-5 Calciner Stack

	Run #	Methane AMT	Ethane AMT
10/29/95 9:17	1	157.6	BDL
10/29/95 9:18	2	156.9	BDL
10/29/95 9:19	3	149.3	BDL
10/29/95 9:20	4	140.9	BDL
10/29/95 9:21	5	151.6	BDL
10/29/95 9:22	6	145.3	BDL
10/29/95 9:23	7	141.7	BDL
10/29/95 9:24	8	135.9	BDL
10/29/95 9:25	9	119.3	BDL
10/29/95 9:26	10	140.7	BDL
10/29/95 9:26	11	115.7	BDL
10/29/95 9:27	12	144.2	BDL
10/29/95 9:28	13	118.9	BDL
10/29/95 9:29	14	118.5	BDL
10/29/95 9:30	15	139.0	BDL
10/29/95 9:31	16	139.4	BDL
10/29/95 9:32	17	124.3	BDL
10/29/95 9:33	18	120.9	BDL
10/29/95 9:34	19	151.5	BDL
10/29/95 9:35	20	150.1	BDL
10/29/95 9:36	21	128.2	BDL
10/29/95 9:37	22	149.6	BDL
10/29/95 9:38	23	154.7	BDL
10/29/95 9:39	24	130.5	BDL
10/29/95 9:39	25	148.4	BDL
10/29/95 9:40	26	150.3	BDL
10/29/95 9:41	27	104.3	BDL
10/29/95 9:42	28	102.6	BDL
10/29/95 9:43	29	108.3	BDL
10/29/95 9:44	30	115.4	BDL
10/29/95 9:45	31	108.7	BDL
10/29/95 9:46	32	146.1	BDL
10/29/95 9:47	33	116.2	BDL
10/29/95 9:48	34	113.4	BDL
10/29/95 9:49	35	107.5	BDL
10/29/95 9:50	36	110.6	BDL
10/29/95 9:51	37	147.9	BDL
10/29/95 9:52	38	Bad injection	BDL
10/29/95 9:53	39	117.9	BDL
10/29/95 9:53	40	118.2	BDL
10/29/95 9:54	41	121.1	BDL
10/29/95 9:55	42	118.3	BDL
10/29/95 9:56	43	120.5	BDL
10/29/95 9:57	44	131.8	BDL
10/29/95 9:58	45	128.9	BDL
10/29/95 9:59	46	120.3	BDL
10/29/95 10:00	47	121.1	BDL
10/29/95 10:01	48	116.4	BDL
10/29/95 10:02	49	121.6	BDL
10/29/95 10:03	50	127.1	BDL
10/29/95 10:04	51	106.1	BDL
10/29/95 10:05	52	129.3	BDL
10/29/95 10:06	53	129.2	BDL
10/29/95 10:07	54	115.5	BDL
10/29/95 10:07	55	118.5	BDL
10/29/95 10:08	56	111.8	BDL
10/29/95 10:09	57	Bad injection	BDL
10/29/95 10:10	58	Bad injection	BDL
10/29/95 10:11	59	109.9	BDL
10/29/95 10:12	60	Bad injection	BDL
Average	**(ppmdv)**	**128.4**	

Solvay Minerals,Inc.
CAE Project No: 7594
10/29/95

Run 2

Field Data

Solvay Minerals

EP-5 Calciner Stack

		Run #	Methane AMT	Ethane RT
10/29/95	10:47	1	130.3	BDL
10/29/95	10:48	2	157.5	BDL
10/29/95	10:49	3	152.9	BDL
10/29/95	10:49	4	158.9	BDL
10/29/95	10:50	5	155.9	BDL
10/29/95	10:51	6	132.8	BDL
10/29/95	10:52	7	137.8	BDL
10/29/95	10:53	8	143.0	BDL
10/29/95	10:54	9	141.1	BDL
10/29/95	10:55	10	163.2	BDL
10/29/95	10:56	11	163.3	BDL
10/29/95	10:57	12	133.4	BDL
10/29/95	10:58	13	166.4	BDL
10/29/95	10:59	14	165.1	BDL
10/29/95	11:00	15	184.7	BDL
10/29/95	11:01	16	161.5	BDL
10/29/95	11:02	17	168.2	BDL
10/29/95	11:03	18	169.9	BDL
10/29/95	11:03	19	171.3	BDL
10/29/95	11:04	20	165.6	BDL
10/29/95	11:05	21	158.2	BDL
10/29/95	11:06	22	165.9	BDL
10/29/95	11:07	23	178.0	BDL
10/29/95	11:08	24	163.6	BDL
10/29/95	11:09	25	175.7	BDL
10/29/95	11:10	26	158.1	BDL
10/29/95	11:11	27	158.6	BDL
10/29/95	11:12	28	158.7	BDL
10/29/95	11:13	29	137.9	BDL
10/29/95	11:14	30	125.4	BDL
10/29/95	11:15	31	120.7	BDL
10/29/95	11:16	32	149.2	BDL
10/29/95	11:17	33	142.3	BDL
10/29/95	11:18	34	141.6	BDL
10/29/95	11:18	35	139.4	BDL
10/29/95	11:19	36	128.7	BDL
10/29/95	11:20	37	140.5	BDL
10/29/95	11:21	38	145.6	BDL
10/29/95	11:22	39	130.4	BDL
10/29/95	11:23	40	137.3	BDL
10/29/95	11:24	41	131.4	BDL
10/29/95	11:25	42	128.5	BDL
10/29/95	11:26	43	132.3	BDL
10/29/95	11:27	44	125.5	BDL
10/29/95	11:28	45	130.1	BDL
10/29/95	11:29	46	155.4	BDL
10/29/95	11:30	47	144.1	BDL
10/29/95	11:31	48	152.6	BDL
10/29/95	11:32	49	157.2	BDL
10/29/95	11:32	50	135.1	BDL
10/29/95	11:33	51	138.8	BDL
10/29/95	11:34	52	135.1	BDL
10/29/95	11:35	53	133.9	BDL
10/29/95	11:36	54	135.7	BDL
10/29/95	11:37	55	144.1	BDL
10/29/95	11:38	56	156.3	BDL
10/29/95	11:39	57	139.9	BDL
10/29/95	11:40	58	155.6	BDL
10/29/95	11:41	59	145.4	BDL
10/29/95	11:42	60	139.1	BDL
	Average	**(ppmdv)**	**148.2**	

Solvay Minerals,Inc.
CAE Project No: 7594
10/29/95

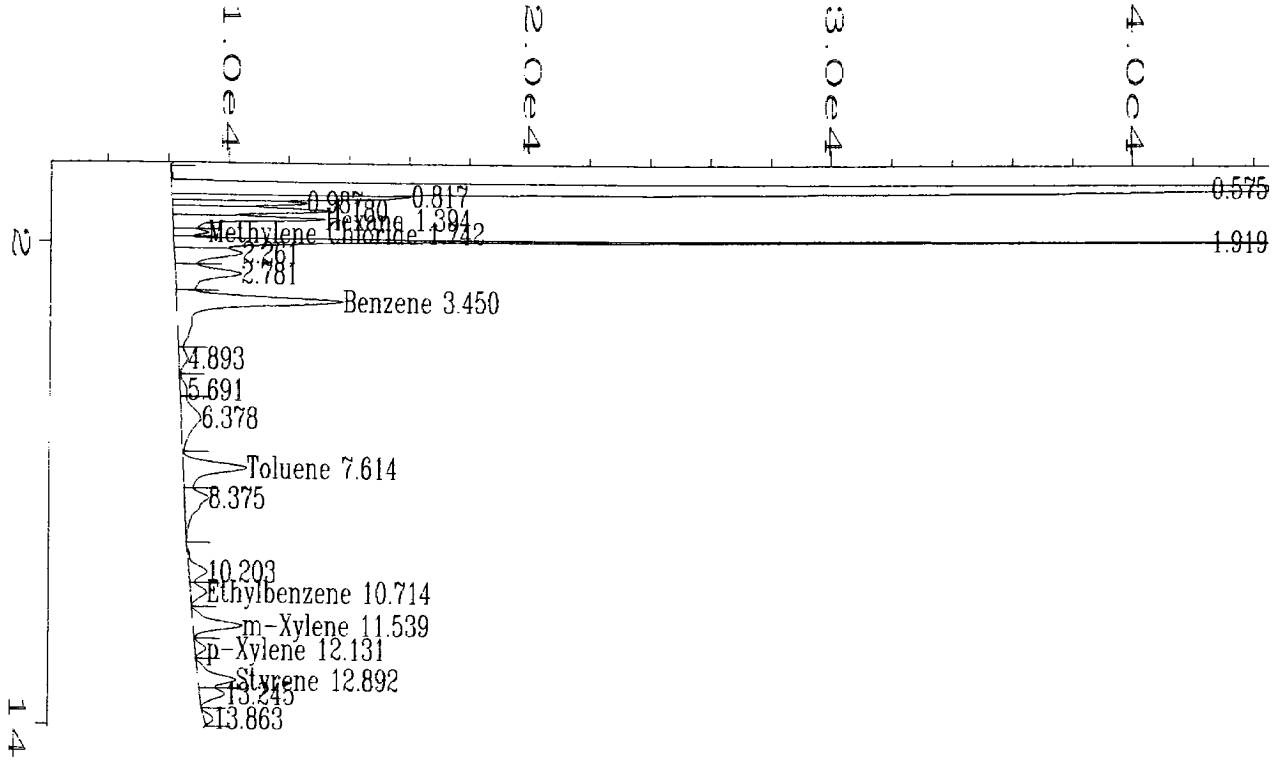
Run 3

Field Data

Solvay Minerals

EP-5 Calciner Stack

		Run #	Methane AMT	Ethane RT
10/29/95	12:15	1	116.4	BDL
10/29/95	12:16	2	125.4	BDL
10/29/95	12:17	3	128.2	BDL
10/29/95	12:17	4	147.8	BDL
10/29/95	12:18	5	147.1	BDL
10/29/95	12:19	6	149.2	BDL
10/29/95	12:20	7	131.5	BDL
10/29/95	12:21	8	149.7	BDL
10/29/95	12:22	9	125.8	BDL
10/29/95	12:23	10	149.9	BDL
10/29/95	12:24	11	134.0	BDL
10/29/95	12:25	12	156.0	BDL
10/29/95	12:26	13	151.2	BDL
10/29/95	12:27	14	154.0	BDL
10/29/95	12:28	15	166.6	BDL
10/29/95	12:29	16	162.7	BDL
10/29/95	12:30	17	153.0	BDL
10/29/95	12:31	18	123.4	BDL
10/29/95	12:32	19	146.8	BDL
10/29/95	12:32	20	140.5	BDL
10/29/95	12:33	21	166.8	BDL
10/29/95	12:34	22	165.9	BDL
10/29/95	12:35	23	169.3	BDL
10/29/95	12:36	24	139.7	BDL
10/29/95	12:37	25	166.3	BDL
10/29/95	12:38	26	164.5	BDL
10/29/95	12:39	27	165.2	BDL
10/29/95	12:40	28	163.3	BDL
10/29/95	12:41	29	180.1	BDL
10/29/95	12:42	30	170.0	BDL
10/29/95	12:43	31	152.3	BDL
10/29/95	12:44	32	171.4	BDL
10/29/95	12:45	33	159.0	BDL
10/29/95	12:46	34	183.1	BDL
10/29/95	12:47	35	164.1	BDL
10/29/95	12:47	36	172.5	BDL
10/29/95	12:48	37	166.3	BDL
10/29/95	12:49	38	177.7	BDL
10/29/95	12:50	39	189.2	BDL
10/29/95	12:51	40	190.8	BDL
10/29/95	12:52	41	197.0	BDL
10/29/95	12:53	42	195.9	BDL
10/29/95	12:54	43	185.9	BDL
10/29/95	12:55	44	190.9	BDL
10/29/95	12:56	45	192.9	BDL
10/29/95	12:57	46	193.0	BDL
10/29/95	12:58	47	201.2	BDL
10/29/95	12:59	48	178.6	BDL
10/29/95	13:00	49	202.3	BDL
10/29/95	13:01	50	196.9	BDL
10/29/95	13:02	51	203.4	BDL
10/29/95	13:03	52	213.6	BDL
10/29/95	13:03	53	192.0	BDL
10/29/95	13:04	54	210.0	BDL
10/29/95	13:05	55	179.2	BDL
10/29/95	13:06	56	178.6	BDL
10/29/95	13:07	57	177.2	BDL
10/29/95	13:08	58	212.7	BDL
10/29/95	13:09	59	181.0	BDL
10/29/95	13:10	60	193.7	BDL
	Average	**(ppmdv)**	**168.5**	



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External Standard Report

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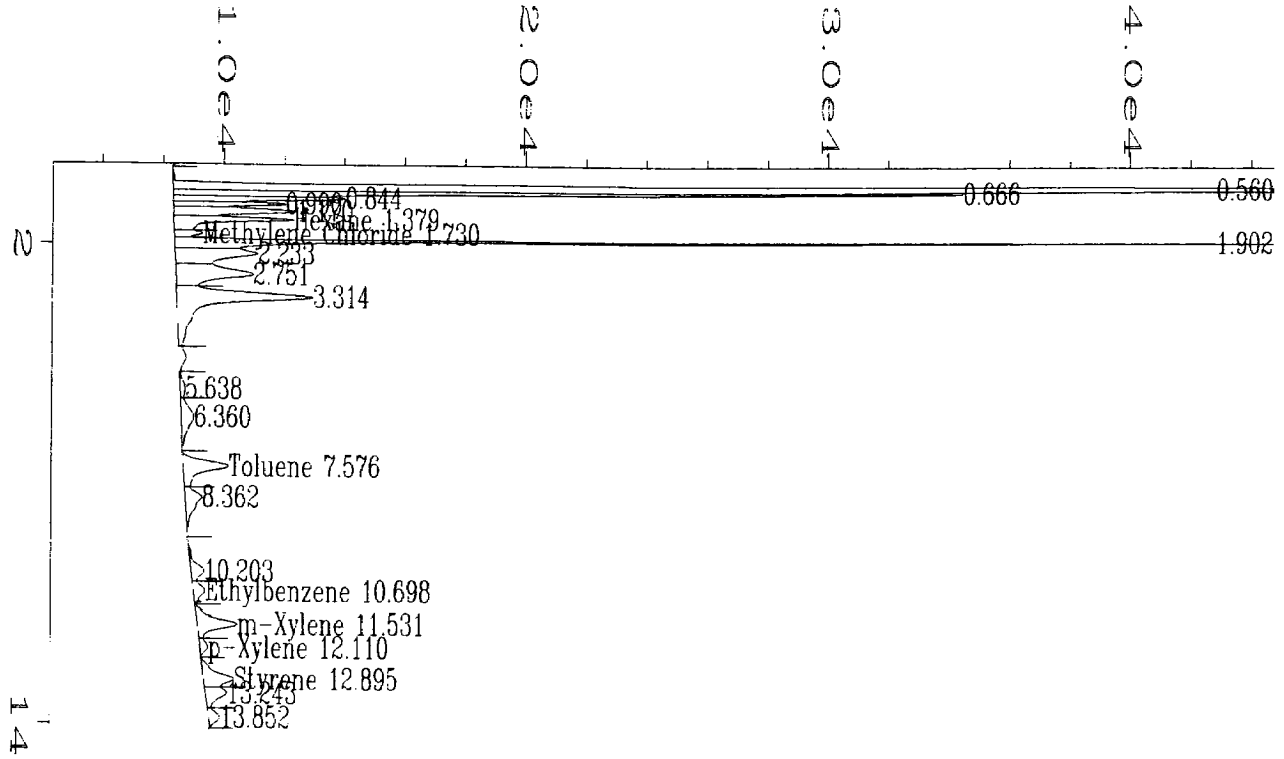
Data File Name	: D:\HP\SOLVAY\10-29\EP5R1_01.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: ep5 run1	Injection Number	:
Run Time Bar Code:		Sequence Line	:
Acquired on	: 29 Oct 95 09:18 AM	Instrument Method	: SOLVAY.MTH
Report Created on	: 16 Dec 95 06:44 PM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HP\SOLVAY\10-29\EP5R1_01.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.394	49022	VV	0.143	1	1.477	Hexane
1.742	11220	VV	0.141	1	0.947	Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.450	110981	VV	0.291	1	2.798	Benzene
4.364	* not found *			1		Trichloroethylene
7.614	43620	VV	0.310	1	-0.480	Toluene
8.934	* not found *			1		Acrylonitrile
10.714	10082	VV	0.295	1	-0.618	Ethylbenzene
11.235	* not found *			1		o-Xylene
11.539	27487	VV	0.257	1	-0.235	m-Xylene
12.131	5296	VV	0.232	1	-0.403	p-Xylene
12.892	23785	PV	0.280	1	-0.314	Styrene

Not all calibrated peaks were found



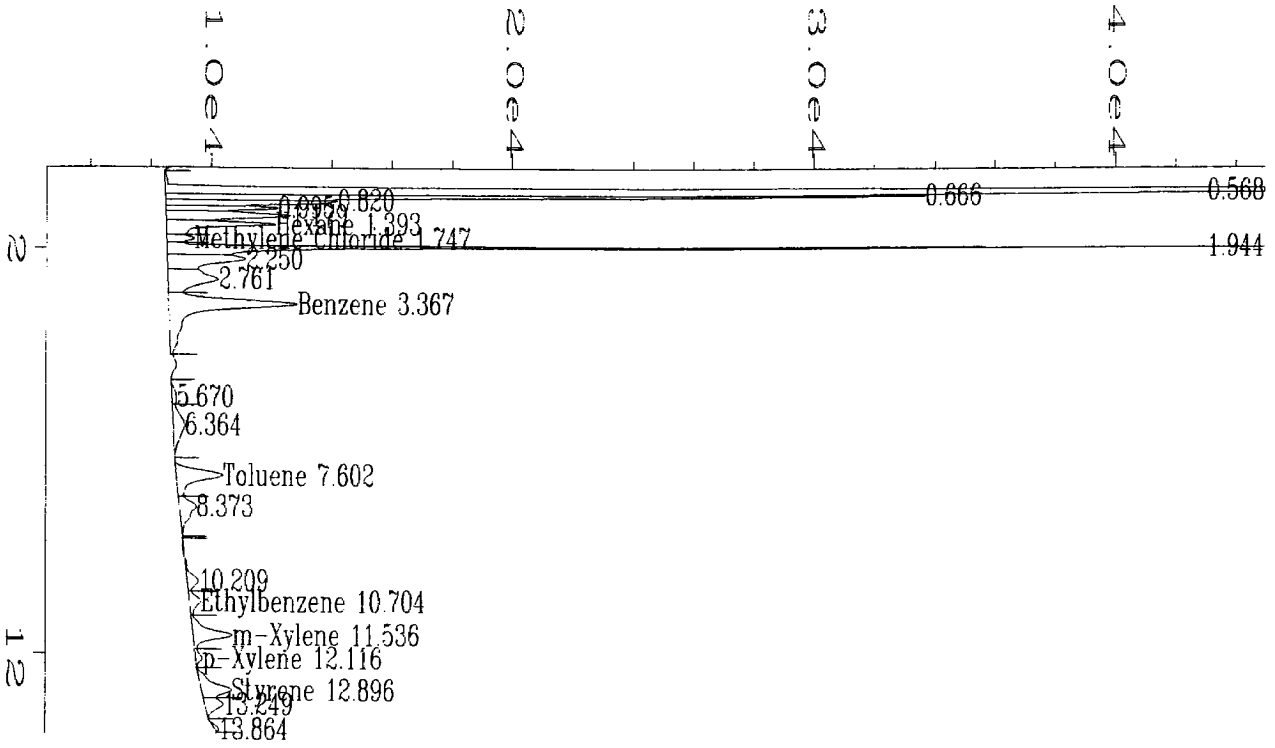
External Standard Report

Data File Name	: D:\HP\SOLVAY\10-29\EP5R1_02.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: ep5 run1	Injection Number	:
Run Time Bar Code:		Sequence Line	:
Acquired on	: 29 Oct 95 09:37 AM	Instrument Method	: SOLVAY.MTH
Report Created on	: 16 Dec 95 06:44 PM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HP\SOLVAY\10-29\EP5R1_02.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.379	36432	VV	0.133	1	1.145	Hexane
1.730	8358	VV	0.129	1	0.599	Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.514	* not found *			1		Benzene
4.364	* not found *			1		Trichloroethylene
7.576	30447	PV	0.302	1	-0.932	Toluene
8.934	* not found *			1		Acrylonitrile
10.698	7842	VV	0.311	1	-0.670	Ethylbenzene
11.235	* not found *			1		o-Xylene
11.531	26000	VV	0.292	1	-0.268	m-Xylene
12.110	4684	VV	0.261	1	-0.417	p-Xylene
12.895	20214	PV	0.292	1	-0.408	Styrene

Not all calibrated peaks were found



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External Standard Report

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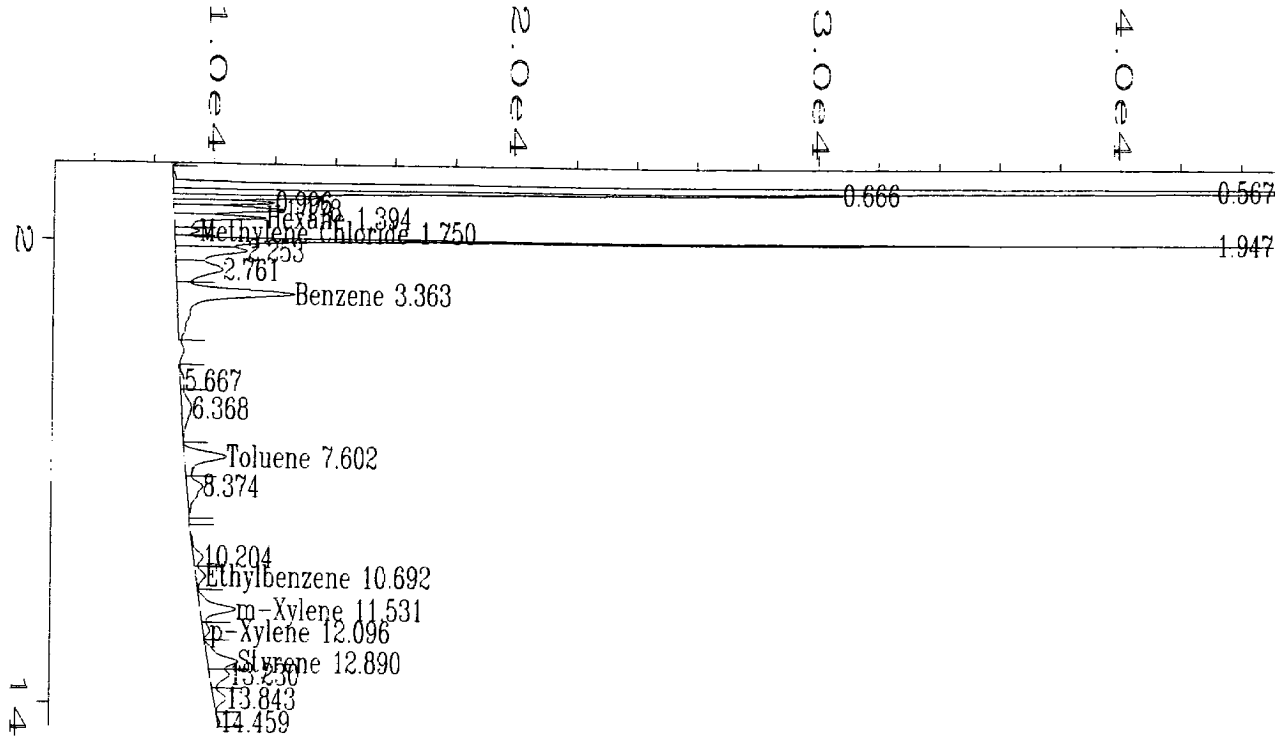
Data File Name	: D:\HP\SOLVAY\10-29\EP5R1_03.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: ep5 run1	Injection Number	:
Run Time Bar Code:		Sequence Line	:
Acquired on	: 29 Oct 95 09:58 AM	Instrument Method	: SOLVAY.MTH
Report Created on	: 16 Dec 95 06:45 PM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HP\SOLVAY\10-29\EP5R1_03.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.393	35465	VV	0.143	1	1.119	Hexane
1.747	8593	VV	0.137	1	0.627	Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.367	86989	VV	0.287	1	2.115	Benzene
4.364	* not found *			1		Trichloroethylene
7.602	30396	PV	0.295	1	-0.934	Toluene
8.934	* not found *			1		Acrylonitrile
10.704	7081	VV	0.297	1	-0.688	Ethylbenzene
11.235	* not found *			1		o-Xylene
11.536	23601	VV	0.269	1	-0.322	m-Xylene
12.116	3260	VV	0.236	1	-0.448	p-Xylene
12.896	19749	PV	0.289	1	-0.420	Styrene

Not all calibrated peaks were found



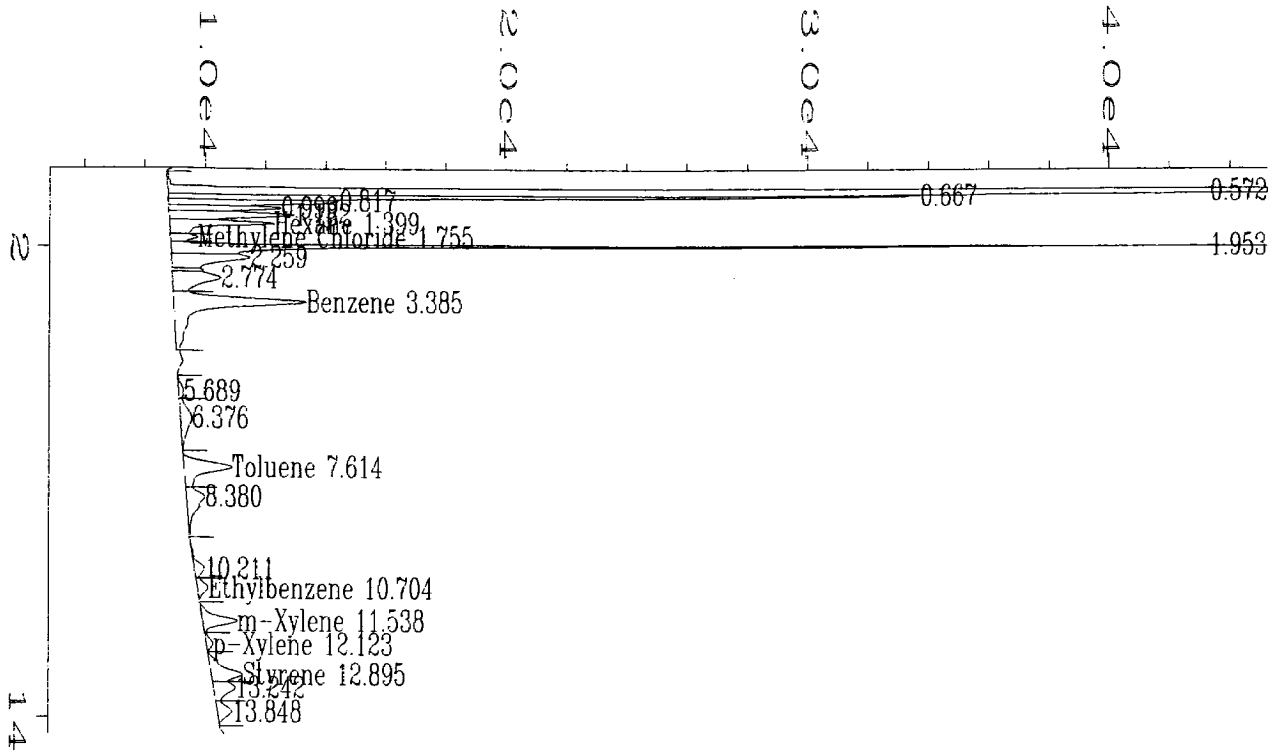
External Standard Report

Data File Name	: D:\HP\SOLVAY\10-29\EP5R1_04.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: ep5 run1	Injection Number	:
Run Time Bar Code:		Sequence Line	:
Acquired on	: 29 Oct 95 10:18 AM	Instrument Method	: SOLVAY.MTH
Report Created on	: 16 Dec 95 06:45 PM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HP\SOLVAY\10-29\EP5R1_04.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.394	30198	VV	0.144	1	0.980	Hexane
1.750	7828	VV	0.141	1	0.534	Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.363	80958	VV	0.294	1	1.943	Benzene
4.364	* not found *			1		Trichloroethylene
7.602	27850	PV	0.301	1	-1.021	Toluene
8.934	* not found *			1		Acrylonitrile
10.692	5827	VV	0.274	1	-0.718	Ethylbenzene
11.235	* not found *			1		o-Xylene
11.531	21600	VV	0.271	1	-0.366	m-Xylene
12.096	3860	VV	0.265	1	-0.435	p-Xylene
12.890	20195	PV	0.297	1	-0.409	Styrene

Not all calibrated peaks were found



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External Standard Report

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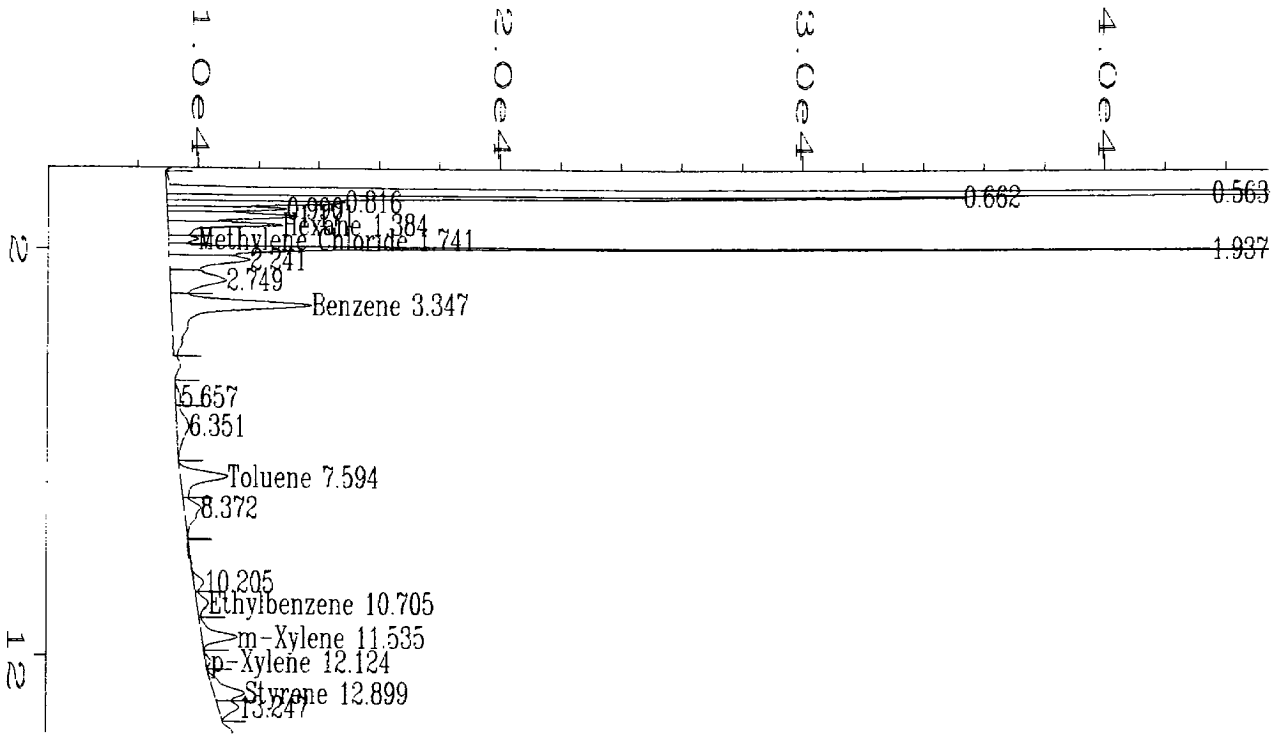
Data File Name	: D:\HP\SOLVAY\10-29\EP5R2_01.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: ep5 run2	Injection Number	:
Run Time Bar Code:		Sequence Line	:
Acquired on	: 29 Oct 95 10:51 AM	Instrument Method	: SOLVAY.MTH
Report Created on	: 16 Dec 95 06:45 PM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HP\SOLVAY\10-29\EP5R2_01.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.399	34561	VV	0.145	1	1.095	Hexane
1.755	8632	VV	0.139	1	0.632	Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.385	90022	VV	0.293	1	2.201	Benzene
4.364	* not found *			1		Trichloroethylene
7.614	32086	PV	0.300	1	-0.876	Toluene
8.934	* not found *			1		Acrylonitrile
10.704	6718	VV	0.281	1	-0.697	Ethylbenzene
11.235	* not found *			1		o-Xylene
11.538	18854	PV	0.251	1	-0.427	m-Xylene
12.123	3776	VV	0.250	1	-0.437	p-Xylene
12.895	21544	VV	0.301	1	-0.373	Styrene

Not all calibrated peaks were found



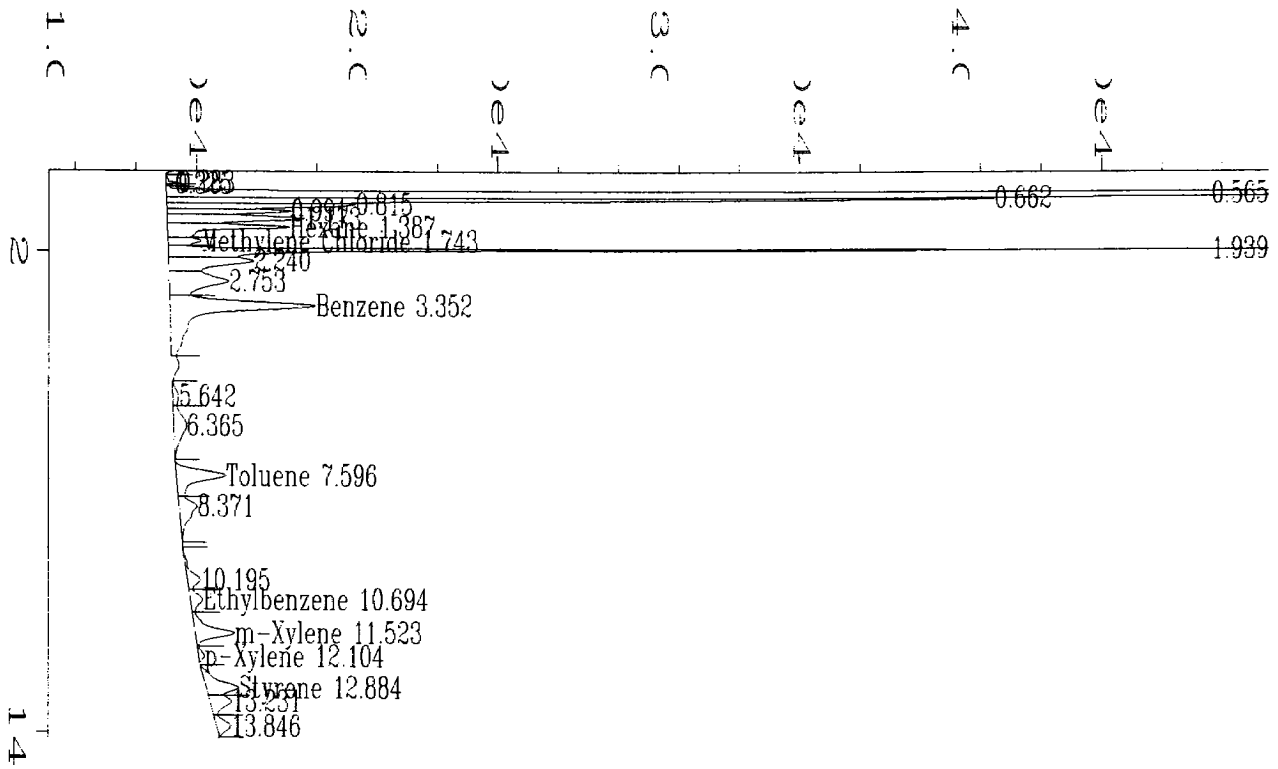
External Standard Report

Data File Name	: D:\HP\SOLVAY\10-29\EP5R2_02.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: ep5 run2	Injection Number	:
Run Time Bar Code:		Sequence Line	:
Acquired on	: 29 Oct 95 11:11 AM	Instrument Method:	SOLVAY.MTH
Report Created on:	16 Dec 95 06:46 PM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HP\SOLVAY\10-29\EP5R2_02.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.384	37569	VV	0.143	1	1.175	Hexane
1.741	9573	VV	0.130	1	0.746	Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.347	97724	VV	0.302	1	2.420	Benzene
4.364	* not found *			1		Trichloroethylene
7.594	31220	PV	0.293	1	-0.905	Toluene
8.934	* not found *			1		Acrylonitrile
10.705	7601	VV	0.299	1	-0.676	Ethylbenzene
11.235	* not found *			1		o-Xylene
11.535	19286	VV	0.255	1	-0.418	m-Xylene
12.124	2018	PV	0.203	1	-0.475	p-Xylene
12.899	20323	PV	0.292	1	-0.405	Styrene

Not all calibrated peaks were found



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External Standard Report

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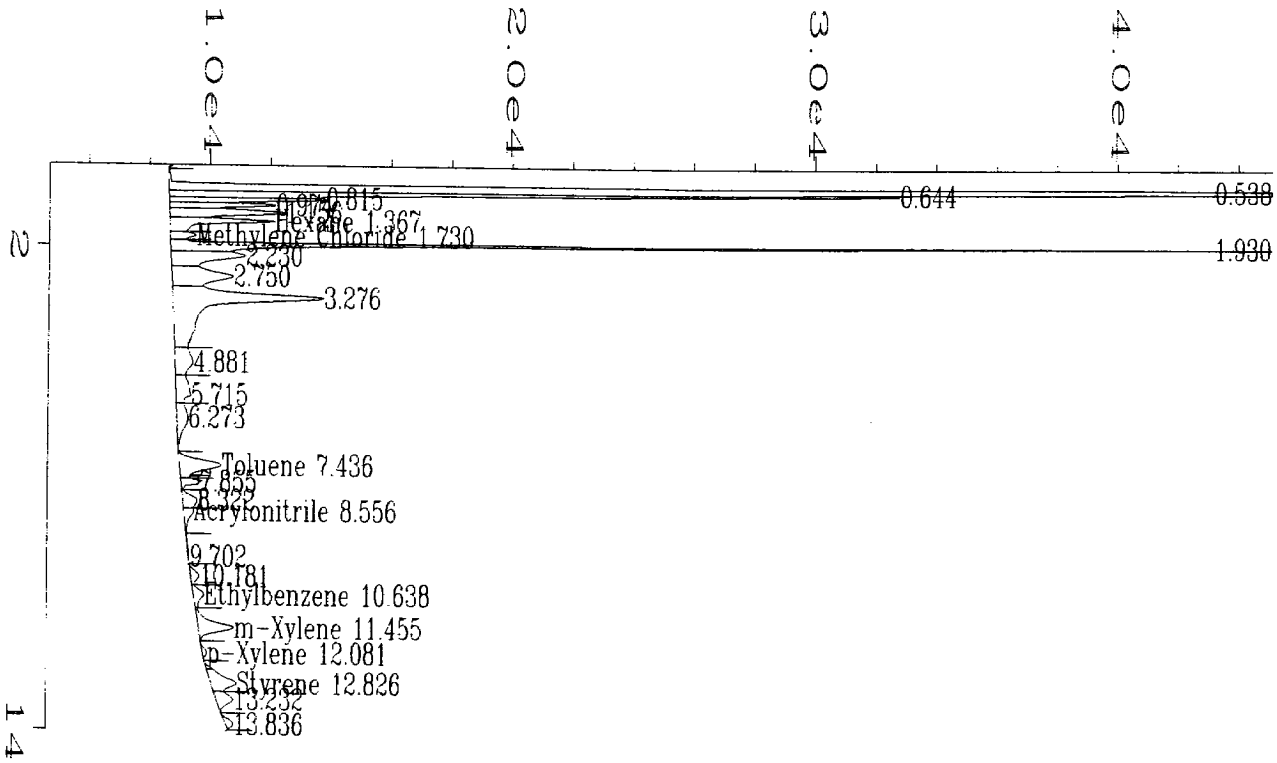
Data File Name	: D:\HP\SOLVAY\10-29\EP5R2_03.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: ep5 run2	Injection Number	:
Run Time Bar Code:		Sequence Line	:
Acquired on	: 29 Oct 95 11:30 AM	Instrument Method	: SOLVAY.MTH
Report Created on	: 19 Dec 95 09:18 AM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HP\SOLVAY\10-29\EP5R2_03.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.387	40844	VV	0.146	1	1.261	Hexane
1.743	10620	VV	0.136	1	0.874	Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.352	105310	VV	0.307	1	2.636	Benzene
4.364	* not found *			1		Trichloroethylene
7.596	32483	PV	0.294	1	-0.862	Toluene
8.934	* not found *			1		Acrylonitrile
10.694	8479	VV	0.308	1	-0.655	Ethylbenzene
11.235	* not found *			1		o-Xylene
11.523	23861	VV	0.276	1	-0.316	m-Xylene
12.104	2806	VV	0.239	1	-0.458	p-Xylene
12.884	21667	PV	0.291	1	-0.370	Styrene

Not all calibrated peaks were found



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External Standard Report

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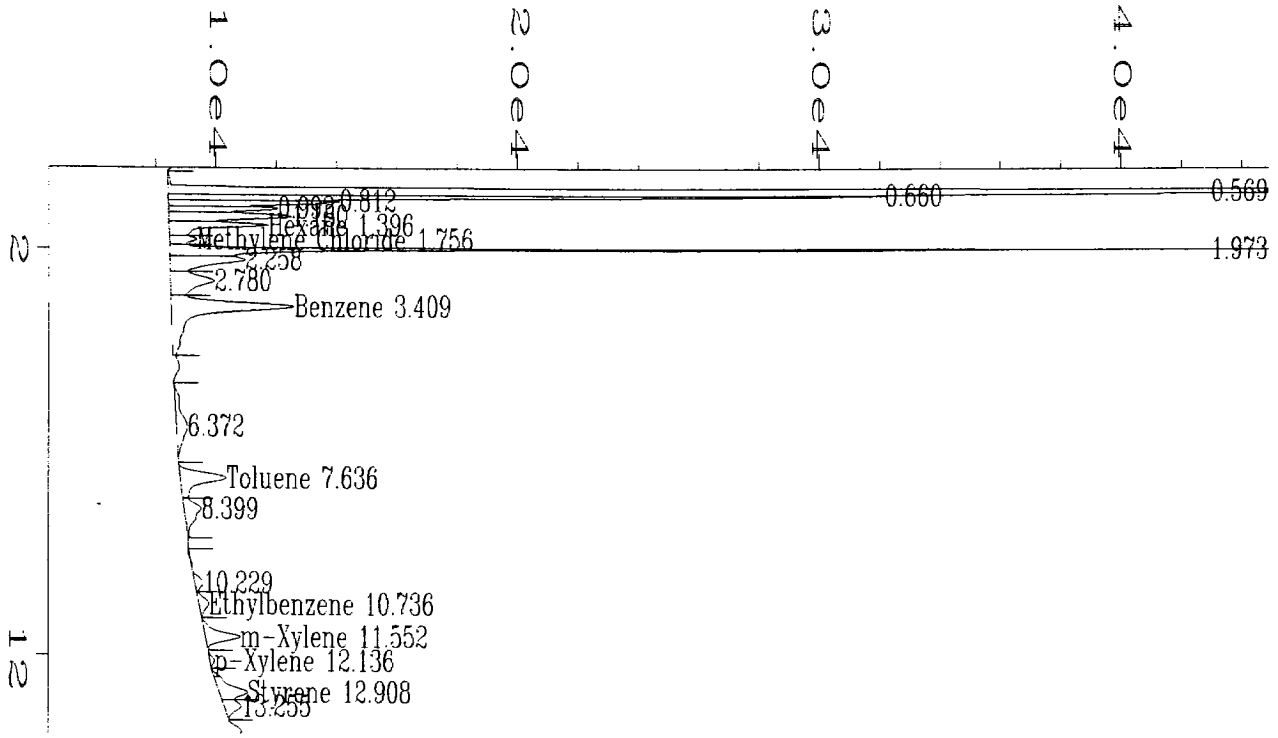
Data File Name	: D:\HP\SOLVAY\10-29\EP5R2_04.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: ep5 run2	Injection Number	:
Run Time Bar Code	:	Sequence Line	:
Acquired on	: 29 Oct 95 11:51 AM	Instrument Method	: SOLVAY.MTH
Report Created on	: 19 Dec 95 09:18 AM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HP\SOLVAY\10-29\EP5R2_04.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.367	31900	VV	0.133	1	1.025	Hexane
1.730	8035	VV	0.134	1	0.559	Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.514	* not found *			1		Benzene
4.364	* not found *			1		Trichloroethylene
7.436	26643	PV	0.297	1	-1.063	Toluene
8.556	5722	VV	0.247	1	1.407	Acrylonitrile
10.638	6286	VV	0.282	1	-0.707	Ethylbenzene
11.235	* not found *			1		o-Xylene
11.455	19876	VV	0.258	1	-0.405	m-Xylene
12.081	1714	PV	0.196	1	-0.481	p-Xylene
12.826	17868	PV	0.312	1	-0.470	Styrene

Not all calibrated peaks were found



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External Standard Report

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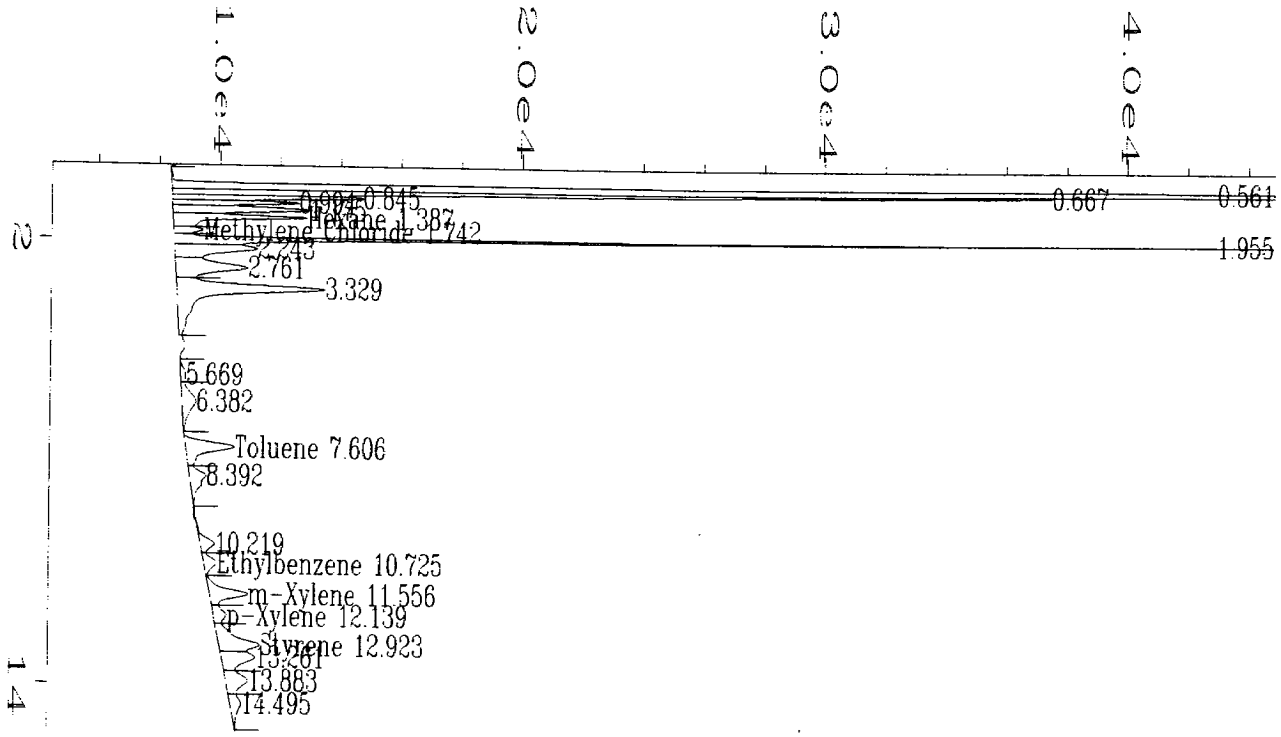
Data File Name	: D:\HP\SOLVAY\10-29\EP5R3_01.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: ep5 run1	Injection Number	:
Run Time Bar Code:		Sequence Line	:
Acquired on	: 29 Oct 95 12:13 PM	Instrument Method	: SOLVAY.MTH
Report Created on:	19 Dec 95 09:18 AM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HP\SOLVAY\10-29\EP5R3_01.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.396	33687	VV	0.150	1	1.072	Hexane
1.756	8931	VV	0.141	1	0.668	Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.409	84301	VV	0.299	1	2.038	Benzene
4.364	* not found *			1		Trichloroethylene
7.636	29937	PV	0.289	1	-0.950	Toluene
8.934	* not found *			1		Acrylonitrile
10.736	6331	VV	0.294	1	-0.706	Ethylbenzene
11.235	* not found *			1		o-Xylene
11.552	18615	VV	0.246	1	-0.433	m-Xylene
12.136	1822	PV	0.195	1	-0.479	p-Xylene
12.908	18766	PV	0.293	1	-0.446	Styrene

Not all calibrated peaks were found



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External Standard Report

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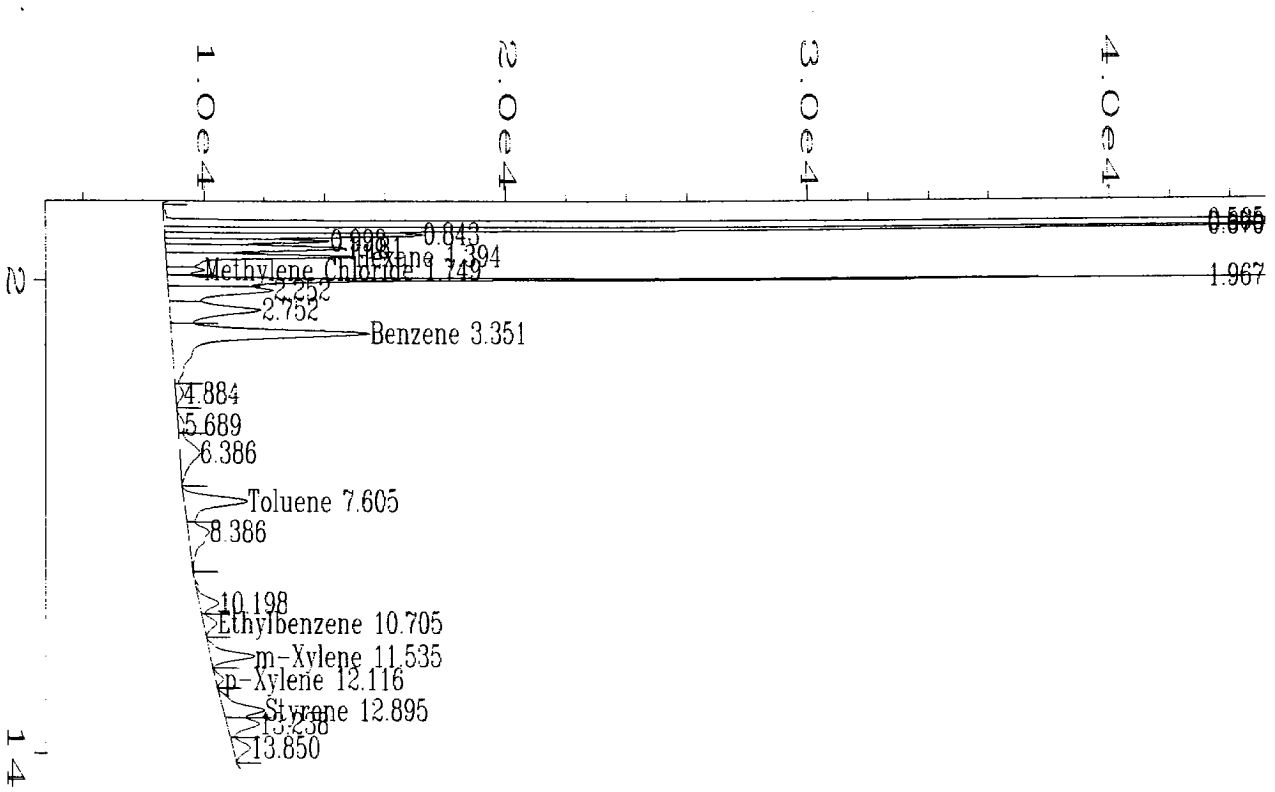
Data File Name	: D:\HP\SOLVAY\10-29\EP5R3_02.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: ep5 run1	Injection Number	:
Run Time Bar Code	:	Sequence Line	:
Acquired on	: 29 Oct 95 12:32 PM	Instrument Method	: SOLVAY.MTH
Report Created on	: 19 Dec 95 09:18 AM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HP\SOLVAY\10-29\EP5R3_02.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.387	41128	VV	0.135	1	1.269	Hexane
1.742	9240	VV	0.137	1	0.706	Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.514	* not found *			1		Benzene
4.364	* not found *			1		Trichloroethylene
7.606	32063	PV	0.302	1	-0.877	Toluene
8.934	* not found *			1		Acrylonitrile
10.725	8713	VV	0.310	1	-0.650	Ethylbenzene
11.235	* not found *			1		o-Xylene
11.556	23452	VV	0.274	1	-0.325	m-Xylene
12.139	9327	VV	0.325	1	-0.316	p-Xylene
12.923	32021	VV	0.338	1	-0.0957	Styrene

Not all calibrated peaks were found



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External Standard Report

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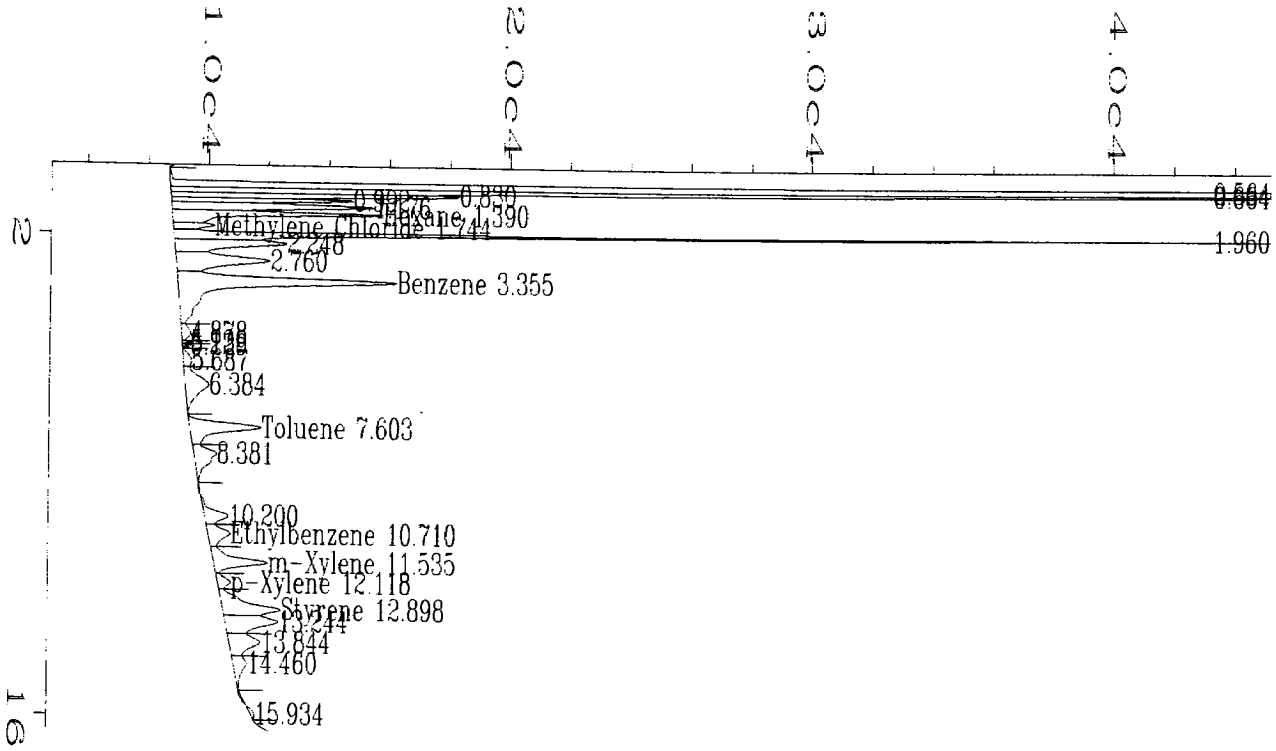
Data File Name	: D:\HP\SOLVAY\10-29\EP5R3_03.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: ep5 run1	Injection Number	:
Run Time Bar Code:		Sequence Line	:
Acquired on	: 29 Oct 95 12:52 PM	Instrument Method	: SOLVAY.MTH
Report Created on:	19 Dec 95 09:19 AM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HP\SOLVAY\10-29\EP5R3_03.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.394	58459	VV	0.136	1	1.726	Hexane
1.749	11465	VV	0.133	1	0.977	Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.351	131649	VV	0.287	1	3.387	Benzene
4.364	* not found *			1		Trichloroethylene
7.605	42535	PV	0.302	1	-0.517	Toluene
8.934	* not found *			1		Acrylonitrile
10.705	8271	VV	0.287	1	-0.660	Ethylbenzene
11.235	* not found *			1		o-Xylene
11.535	23582	PV	0.247	1	-0.322	m-Xylene
12.116	3960	VV	0.235	1	-0.433	p-Xylene
12.895	25984	PV	0.277	1	-0.255	Styrene

Not all calibrated peaks were found



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External Standard Report

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Data File Name	: D:\HP\SOLVAY\10-29\EP5R3_04.D		
Operator	: K. WEPPRECHT	Page Number	: 1
Instrument	: HP 5890	Vial Number	:
Sample Name	: ep5 run1	Injection Number	:
Run Time Bar Code:		Sequence Line	:
Acquired on	: 29 Oct 95 01:12 PM	Instrument Method	: SOLVAY.MTH
Report Created on	: 19 Dec 95 09:19 AM	Analysis Method	: SOLVAY.MTH
Last Recalib on	: 16 DEC 95 02:51 PM	Sample Amount	: 0
Multiplier	: 1	ISTD Amount	:

Sig. 1 in D:\HP\SOLVAY\10-29\EP5R3_04.D

Ret Time	Area	Type	Width	Ref#	ppm	Name
0.718	* not found *			1		Butadiene
1.390	65576	VV	0.137	1	1.914	Hexane
1.744	12783	VV	0.136	1	1.137	Methylene Chloride
2.480	* not found *			1		Trichloroethane
3.355	147567	VV	0.291	1	3.840	Benzene
4.364	* not found *			1		Trichloroethylene
7.603	47253	PV	0.301	1	-0.355	Toluene
8.934	* not found *			1		Acrylonitrile
10.710	17220	VV	0.346	1	-0.450	Ethylbenzene
11.235	* not found *			1		o-Xylene
11.535	33139	VV	0.272	1	-0.109	m-Xylene
12.118	7648	VV	0.275	1	-0.352	p-Xylene
12.898	42722	VV	0.319	1	0.187	Styrene

Not all calibrated peaks were found

FIELD DATA PRINTOUTS

E

Field Data Printout

Location: EP-5 Calciner Stack
Test Run: 1
Client: Solvay Minerals, Inc.
Project No: 7594-1
Test Date: 10/29/95
Meter ΔH@: 1.8909
Meter Y_d: 0.9963
Pitot C_p: 0.84
Static P: -0.3
Leak Rate Before: 0.001 cfm @ 15"Hg
Leak Rate After: 0.001 cfm @ 14"Hg

Method: EPA M 2-4
Testing Type: Moisture/Vel.

Area (ft²): 85.90

Bar. Press. (in. Hg): 23.69
Actual Moisture (%): 35.4

O_2 (dry volume %): 9.0
CO_2 (dry volume %): 13.7
Start Time (approx.): 09:20
Stop Time (approx.): 10:05
H_2O (condensate, ml): 298.0
H_2O (silica, g): 20.5

Traverse Point	Pitot ΔP_s (in. H_2O)	Stack T_s (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.}$ H_2O)	Run Time	Sample ΔH (in. H_2O)	Metered (ft³)	Dry Gas Meter $T_{m\ in}$ (°F)	Dry Gas Meter $T_{m\ out}$ (°F)	Volume (calculated) (ft³)
				0.0		392.70			
1-01	0.16	311	0.40	5.0	1.80	396.65	64	60	3.95
1-02	0.18	311	0.42	10.0	1.80	400.46	66	61	3.81
1-03	0.17	311	0.41	15.0	1.80	404.34	69	63	3.88
2-01	0.19	316	0.44	20.0	1.80	408.19	73	65	3.85
2-02	0.20	316	0.45	25.0	1.80	412.02	75	67	3.83
2-03	0.20	316	0.45	30.0	1.80	415.85	77	68	3.83
3-01	0.12	306	0.35	35.0	1.80	419.69	78	70	3.84
3-02	0.14	307	0.37	40.0	1.80	423.54	80	71	3.85
3-03	0.13	306	0.36	45.0	1.80	427.37	80	72	3.83
4-01	0.14	310	0.37						
4-02	0.14	311	0.37						
4-03	0.15	310	0.39						
Final	0.40	311		45.0	1.80	34.67	70		

Field Data Printout

Location: EP-5 Calciner Stack
Test Run: 2
Client: Solvay Minerals, Inc.
Project No: 7594-1
Test Date: 10/29/95
Meter ΔH@: 1.8909
Meter Y_d: 0.9963
Pitot C_p: 0.84
Static P: -0.2
Leak Rate Before: 0.001 cfm @ 15"Hg
Leak Rate After: 0.001 cfm @ 13"Hg

Method: EPA M 2-4
Testing Type: Moisture/Vel.

Area (ft^2): 85.90

Bar. Press. (in. Hg): 23.69
Actual Moisture (%): 36.8

O_2 (dry volume %): 9.0
CO_2 (dry volume %): 13.8
Start Time (approx.): 10:49
Stop Time (approx.): 11:34
H_2O (condensate, ml): 329.0
H_2O (silica, g): 9.5

Traverse Point	Pitot ΔP_s (in. H_2O)	Stack T_s (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.}$ H_2O)	Run Time	Sample ΔH (in. H_2O)	Metered (ft^3)	Dry Gas Meter $T_{m\ in}$ (°F)	Dry Gas Meter $T_{m\ out}$ (°F)	Volume (calculated) (ft^3)
				0.0		427.50			
1-01	0.18	318	0.42	5.0	1.80	431.33	74	73	3.83
1-02	0.19	319	0.44	10.0	1.80	435.26	75	73	3.93
1-03	0.18	319	0.42	15.0	1.80	439.17	77	73	3.91
2-01	0.19	314	0.44	20.0	1.80	443.07	80	74	3.90
2-02	0.21	315	0.46	25.0	1.80	447.01	81	74	3.94
2-03	0.21	316	0.46	30.0	1.80	450.93	83	75	3.92
3-01	0.13	311	0.36	35.0	1.80	454.84	84	76	3.91
3-02	0.13	312	0.36	40.0	1.80	458.76	84	76	3.92
3-03	0.12	312	0.35	45.0	1.80	462.67	84	76	3.91
4-01	0.13	314	0.36						
4-02	0.15	315	0.39						
4-03	0.16	315	0.40						
Final	0.40	315		45.0	1.80	35.17	77		

Field Data Printout

Location: EP-5 Calciner Stack
Test Run: 3
Client: Solvay Minerals, Inc.
Project No: 7594-1
Test Date: 10/29/95
Meter ΔH@: 1.8909
Meter Y_d: 0.9963
Pitot C_p: 0.84
Static P: -0.2
Leak Rate Before: 0.001 cfm @ 15"Hg
Leak Rate After: 0.001 cfm @ 12"Hg

Method: EPA M 2-4
Testing Type: Moisture/Vel.

Area (ft²): 85.90

Bar. Press. (in. Hg): 23.69
Actual Moisture (%): 37.2

O_2 (dry volume %): 9.0
CO_2 (dry volume %): 13.8
Start Time (approx.): 12:15
Stop Time (approx.): 13:00
H_2O (condensate, ml): 332.0
H_2O (silica, g): 16.5

Traverse Point	Pitot ΔP_s (in. H_2O)	Stack T_s (°F)	$\sqrt{\Delta P_s}$ (calculated) ($\sqrt{in.}$ H_2O)	Run Time	Sample ΔH (in. H_2O)	Metered (ft³)	Dry Gas Meter $T_{m\ in}$ (°F)	Dry Gas Meter $T_{m\ out}$ (°F)	Volume (calculated) (ft³)
				0.0		462.90			
1-01	0.17	316	0.41	5.0	1.80	466.84	78	77	3.94
1-02	0.18	316	0.42	10.0	1.80	470.81	80	77	3.97
1-03	0.18	316	0.42	15.0	1.80	474.80	85	79	3.99
2-01	0.19	314	0.44	20.0	1.80	478.79	86	79	3.99
2-02	0.20	314	0.45	25.0	1.80	482.78	87	80	3.99
2-03	0.20	314	0.45	30.0	1.80	486.75	89	81	3.97
3-01	0.14	313	0.37	35.0	1.80	490.73	90	81	3.98
3-02	0.13	314	0.36	40.0	1.80	494.80	87	80	4.07
3-03	0.13	313	0.36	45.0	1.80	498.76	86	80	3.96
4-01	0.14	318	0.37						
4-02	0.15	318	0.39						
4-03	0.15	318	0.39						
Final	0.40	315		45.0	1.80	35.86	82		

Solvay Minerals, Inc.
CAE Job No. 7594
10/29/95

Chromatagraphic Data Reduction

Limits of Detection

Compound	(ppmwv)
Hexane	0.46
Methylene Chloride	2.24
1,1,1-Trichloroethane	1.03
Benzene	0.83
Toluene	2.09
Ethylbenzene	1.59
Xylene	1.28
1,3 Butadiene	0.10
Styrene	1.72
Acrylonitrile	8.29
Trichloroethene	2.67

EP-5 Calciner Stack - Run 1

Compound	10/29/95 9:18 (ppmwv)	10/29/95 9:37 (ppmwv)	10/29/95 9:58 (ppmwv)	10/29/95 10:18 (ppmwv)	Average
1,3 Butadiene	BDL	BDL	BDL	BDL	BDL
Hexane	1.48	1.15	1.12	0.98	1.18
Methylene Chloride	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	BDL	BDL	BDL	BDL	BDL
Benzene	2.80	BDL	2.12	1.94	1.71
Trichloroethene	BDL	BDL	BDL	BDL	BDL
Toluene	BDL	BDL	BDL	BDL	BDL
Acrylonitrile	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	BDL	BDL	BDL	BDL	BDL
Xylene	BDL	BDL	BDL	BDL	BDL
Styrene	BDL	BDL	BDL	BDL	BDL

BDL indicates the value was below the detection limit. A value of zero was used for BDL in the average calculation.

Solvay Minerals, Inc.
CAE Job No. 7594
10/29/95

Chromatagraphic Data Reduction

EP-5 Calciner Stack - Run 2

Compound	10/29/95 10:51 (ppmwv)	10/29/95 11:11 (ppmwv)	10/29/95 11:30 (ppmwv)	10/29/95 11:51 (ppmwv)	Average
1,3 Butadiene	BDL	BDL	BDL	BDL	BDL
Hexane	1.10	1.18	1.26	1.03	1.14
Methylene Chloride	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	BDL	BDL	BDL	BDL	BDL
Benzene	2.20	2.42	2.64	BDL	1.81
Trichloroethene	BDL	BDL	BDL	BDL	BDL
Toluene	BDL	BDL	BDL	BDL	BDL
Acrylonitrile	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	BDL	BDL	BDL	BDL	BDL
Xylene	BDL	BDL	BDL	BDL	BDL
Styrene	BDL	BDL	BDL	BDL	BDL

EP-5 Calciner Stack - Run 3

Compound	10/29/95 12:13 (ppmwv)	10/29/95 12:32 (ppmwv)	10/29/95 12:52 (ppmwv)	10/29/95 13:12 (ppmwv)	Average
1,3 Butadiene	BDL	BDL	BDL	BDL	BDL
Hexane	1.07	1.27	1.73	1.91	1.50
Methylene Chloride	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	BDL	BDL	BDL	BDL	BDL
Benzene	2.04	BDL	3.39	3.84	2.32
Trichloroethene	BDL	BDL	BDL	BDL	BDL
Toluene	BDL	BDL	BDL	BDL	BDL
Acrylonitrile	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	BDL	BDL	BDL	BDL	BDL
Xylene	BDL	BDL	BDL	BDL	BDL
Styrene	BDL	BDL	BDL	BDL	BDL

BDL indicates the value was below the detection limit. A value of zero was used for BDL in the average calculation.

F

OPERATING DATA

F

Hourly Averages
PVR

PV RETRIEVAL REQUEST

09:45 30 Oct 95
PAGE 3

LEGEND: ' = Calculated time ~ = Time changed " = HG data * = Less than expected # samples

DATE/ TIME	PCCA3A IN WATER VACUUM	FCCA3AA GAS TO CALCINER	FCCA3B	TCDC5 DEG F PRODUCT	CA3_CONTRL_ SWICH	TCCA3B DEG. F OFFGAS	IIDC5 AMPS MOTOR	WCBS8 TONS/hr TRONA
10/28/95								
16:00	-2.0	129.086	2.349	316.7	???????	370.40	31.4	125.1
17:00	-1.9	132.567	2.394	298.6	???????	369.87	31.9	124.8
18:00	-2.0	131.201	2.397	306.9	???????	369.10	31.7	125.0
19:00	-2.0	128.629	2.326	312.4	???????	364.52	31.7	124.9
20:00	-2.0	130.978	2.390	299.7	???????	367.05	32.2	125.0
21:00	-2.0	127.628	2.334	311.5	???????	362.03	32.8	125.4
22:00	-2.0	130.031	2.363	296.2	???????	352.14	33.1	130.1
23:00	2.1	132.911	2.435	282.2	???????	353.43	32.6	130.2
10/29/95								
00:00	1.9	135.021	2.449	276.8	???????	354.14	32.7	130.3
01:00	2.0	136.974	2.488	282.5	???????	360.57	32.7	135.9
02:00	1.9	146.187	2.648	274.9	???????	362.53	34.5	140.0
03:00	2.0	147.086	2.681	297.0	???????	380.55	32.9	140.0
04:00	2.0	146.182	2.661	291.1	???????	375.94	33.3	139.8
05:00	2.0	147.286	2.704	289.9	???????	374.58	33.0	139.9
06:00	2.0	147.042	2.680	294.6	???????	377.82	33.4	139.9
07:00	2.0	147.503	2.691	294.5	???????	377.71	32.9	140.1
08:00	2.0	148.440	2.700	290.8	???????	375.71	33.7	140.1
09:00	2.0	149.387	2.709	298.8	???????	379.31	32.7	139.7
10:00	2.0	148.339	2.680	302.5	???????	382.66	33.8	140.2
11:00	2.0	148.454	2.680	296.5	???????	379.28	33.7	140.1
12:00	[illegible]	148.588	2.707	294.9	???????	380.00	34.3	140.4
13:00	2.1	148.428	2.671	292.8	???????	379.87	34.3	139.8
14:00	[illegible]	148.773	2.712	291.1	???????	379.23	34.1	140.0
15:00	2.1	148.736	2.697	298.4	???????	380.53	33.9	139.7
16:00	[illegible]	147.937	2.684	298.8	???????	381.92	34.3	140.1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

SOLVAY2016_6_0010089

Hourly Averages
PVR

PV RETRIEVAL REQUEST

09:45 30 Oct 95
PAGE 4

LEGEND: = Calculated time ~ = Time changed ^ = HG data * = Less than expected # samples

DATE/ TIME	PCCA3A IN WATER VACUUM	FCCA3AA GAS TO CALCINER	FCCA3B	TCDC5 DEG F PRODUCT	CA3_CONTRL_ SWICH	TCCA3B DEG. F OFFGAS	IIDC5 AMPS MOTOR	WCBS8 TONS/hr TRONA
10/29/95								
[illegible]	1.9	148.842	2.700	287.9	[illegible]	376.80	34.3	140.2
21 [illegible]	-2.1	150.502	2.752	290.8	????????	380.49	34.6	139.5
22 [illegible]	1.9	152.542	2.761	297.4	????????	382.86	34.0	139.9
2[illegible]	[illegible].0	153.341	2.797	301.2	????????	386.29	33.8	139.9

SOLVAY2016_6_001090

Hourly Averages
PVR

PV RETRIEVAL REQUEST

10:08 30 Oct 95
PAGE 3

LEGEND: ' = Calculated time ~ = Time changed " = HG data * = Less than expected # samples

DATE/ TIME	TCCA1_ 0	TCCA2_ 0	WCAF13 TPH TRONA	WCAF14 TPH TRONA	FCBR4A MAIN GAS CALCINER	FCBR5A MAIN GAS CALCINER	AISM3A PERCENT DUST	AICA1A PERCENT O/2
10/28/95								
16:00	352.6	418.1	130.1	130.0	134.363	144.231	0.5	8.44
17:00	361.3	419.2	130.0	130.0	136.897	147.254	2.6	8.30
18:00	354.5	421.4	129.9	130.0	131.158	139.278	0.3	8.55
19:00	342.6	408.5	130.0	130.0	132.076	140.206	0.3	8.50
20:00	355.3	406.9	130.4	130.0	134.097	143.040	0.2	8.52
21:00	364.5	403.4	130.0	130.3	132.469	135.069	0.3	8.63
22:00	359.0	390.0	135.2	135.0	136.665	140.803	0.4	8.37
23:00	356.9	385.5	134.8	135.0	139.080	141.806	0.5	8.33
10/29/95								
00:00	361.2	389.4	135.1	135.0	142.079	145.400	0.4	8.19
01:00	361.0	388.1	138.5	138.4	142.863	146.554	2.8	8.11
02:00	362.2	390.4	139.5	140.0	145.346	147.630	0.6	8.01
03:00	361.6	388.9	140.1	140.0	145.169	148.186	0.9	8.00
04:00	362.3	390.9	139.8	140.0	143.782	147.927	0.8	8.05
05:00	362.4	390.1	140.0	140.0	144.019	147.486	0.7	8.07
06:00	361.7	389.1	140.0	140.0	143.488	148.306	0.7	8.07
07:00	363.2	390.2	139.9	140.0	144.380	149.157	0.8	8.12
08:00	364.8	392.7	139.8	140.0	146.534	151.744	0.8	7.98
09:00	366.9	394.7	140.0	140.0	146.768	151.740	3.1	7.99
10:00	365.7	393.8	140.4	140.0	145.455	150.577	1.0	8.01
11:00	365.8	394.3	140.0	140.0	145.247	149.641	1.1	8.00
12:00	367.2	393.6	140.1	140.0	143.474	151.148	0.9	7.99
13:00	271.5	394.2	34.8	140.0	36.360	150.593	0.8	16.39
14:00	209.6	393.8	12.2	140.0	21.717	148.151	5.3	18.16
15:00	369.8	392.8	136.8	140.0	136.863	145.717	0.8	8.49
16:00	366.1	391.3	140.0	140.0	142.306	145.428	0.1	8.13
17:00	366.4	392.4	139.9	140.0	142.801	146.134	2.3	8.10
18:00	365.9	392.0	139.6	140.0	142.228	144.914	0.1	8.14
19:00	366.0	391.8	140.3	140.0	142.572	146.040	0.2	8.11

SOLVAY2016_6_001091

Hourly Averages
PVR

PV RETRIEVAL REQUEST

10:08 30 Oct 95
PAGE 4

LEGEND: ' = Calculated time ~ = Time changed " = HG data * = Less than expected # samples

DATE/ TIME	TCCA1_ O	TCCA2_ O	WCAF13 TPH TRONA	WCAF14 TPH TRONA	FCBR4A MAIN GAS CALCINER	FCBR5A MAIN GAS CALCINER	AISM3A PERCENT DUST	AICA1A PERCENT O/2
10/29/95 20:00	366.0	391.8	139.9	140.0	142.425	146.632	0.3	8.14
21:00	366.1	391.8	140.4	140.4	143.067	146.925	0.4	8.19
22:00	368.8	392.3	147.7	147.2	149.647	154.099	0.4	7.94
23:00	378.5	393.0	150.0	150.0	157.854	159.308	0.4	7.65

SOLVAY2016_6_001092

PERTINENT CERTIFICATIONS

G

THE STATE OF WYOMING

JIM GERINGER
GOVERNOR

RECEIVED
JUN 16 1995
SOLVAY MINERALS

Department of Environmental Quality

Herschler Building ● 122 West 25th Street ● Cheyenne, Wyoming 82002

ADMINISTRATION	ABANDONED MINES	AIR QUALITY	INDUSTRIAL SITING	LAND QUALITY	SOLID & HAZARDOUS WASTE	WATER QUALITY
(307) 777-7758	(307) 777-6145	(307) 777-7391	(307) 777-7368	(307) 777-7756	(307) 777-7752	(307) 777-7781
FAX 777-7682	FAX 634-0799	FAX 777-5616	FAX 777-6937	FAX 634-0799	FAX 777-5973	FAX 777-5973

June 13, 1995

Mr. Richard Casey
Vice President
Solvey Minerals
P.O. Box 1167
Green River, WY 82935

Permit No. MD-229

Dear Mr. Casey:

The Division of Air Quality of the Wyoming Department of Environmental Quality has completed final review of Solvay Minerals, Incorporated's application to modify the existing coal fired calciners to burn natural gas and to increase production rate in the converted calciners to increase plant production from 2.0 million tons per year to 2.4 million tons per year at the facility located in the NE¼ of Section 31, T18N, R109W, approximately 15 miles west of Green River and 2 miles south of I-80, in Sweetwater County, Wyoming.

Following this agency's proposed approval of the request as published May 12, 1995 and in accordance with Section 21(m) of the Wyoming Air Quality Standards and Regulations, the public was afforded a 30-day period in which to submit comments concerning the proposed new source, and an opportunity for a public hearing. No comments have been received. Therefore, on the basis of the information provided to us, approval to modify operations at the Green River Plant as described in the application is hereby granted pursuant to Section 21 of the regulations with the following conditions:

1. That authorized representatives of the Division of Air Quality be given permission to enter and inspect any property, premise or place on or at which an air pollution source is located or is being constructed or installed for the purpose of investigating actual or potential sources of air pollution, and for determining compliance or non-compliance with any rules, regulations, standards, permits or orders.

2. That all commitments and descriptions set forth in the application for this permit, unless superseded by a specific condition of this permit, are incorporated herein by this reference and are enforceable as conditions of this permit.

3. That for a major source, as defined by Section 30 (c)(i) of the WAQSR, an application for an operating permit is required within 12 months of commencing operations.

4. That written notification of the anticipated date of initial startup, in accordance with Section 21(i) of the WAQSR, is required 60 days prior to such date. Notification of the actual date of initial start-up is required 15 days after start-up.

5. That required performance tests will be conducted, in accordance with Section 21(j) of the WAQS&R, within 30 days of achieving maximum design rate but not later than 90 days after initial start-up, and a written report of the results be submitted. The operator shall provide 15 days prior notice of the test date. If maximum design production rate is not achieved within 90 days of start-up, the Administrator may require testing be done at the rate achieved and again when maximum rate is achieved.

6. That the date of commencement of construction shall be reported to the Administrator within 30 days of commencement. The construction or modification must commence within 24 months of the date of permit issuance, in accordance with Section 21(h) of the WAQSR, or the permit becomes invalid. The Administrator may extend the period based on a satisfactory justification of the requested extension. If the construction is discontinued for a period of 24 months or more then the permit will also become invalid.

7. That Solvay will operate the Green River plant trona calciner and dryers at production rates which do not exceed the rates listed in the following table.

	Calciner Kilns		Trona Ore Feed Rate Capacity @ Full Load	Design Annual Trona Ore Feed Rate
Unit	Trona Ore Feed Rate (TPH)	Calcined Ore Production Rate (TPH)	(MMTPY)	(MMTPY)
#17 "A" Calciner	162	118	1.419	1.277
#17 "B" Calciner	162	118	1.419	1.277
#48 "C"Calciner	162	118	1.419	1.277
Totals	486	354	4.257	3.831

	Dryer Kilns		Soda Ash Production Capacity @ Full Load	Design Annual Soda Ash Production
Unit	Wet Crystal Feed Rate (TPH)	Soda Ash Production Rate (TPH)	(MMTPY)	(MMTPY)
#15 DR-1 Dryer	93	76	0.666	0.599
#15 DR-1 Dryer	93	76	0.666	0.599
#28 DR-4 Dryer	40	32	0.280	0.252
#51 DR-5 Dryer	150	122	1.069	0.962
Totals	376	306	2.681	2.412

8. That maximum soda ash production at the Solvay soda ash plant will be limited to 2.4 million tons per year, from no more than 3.8 million tons per year of trona ore throughput.

9. That the allowable mass emission rates for all Solvay Green River Plant emission sources shall be limited to rates shown in Table I of this permit, as shown for particulate, SO_2, and NO_x, respectively.

10. That the allowable emission rates for the Solvay AQD #17 calciner stack will be set at limits as shown below.

Pollutant	Allowable Emissions
Particulate	22.30 pph
Sulfur Dioxide	0.00 pph
Nitrogen Oxides	0.05 lb/MM Btu, not to exceed 20.00 pph

11. That Solvay will minimize CO emissions from the calciner burner through proper operating procedures as outlined in the operational plan submitted under cover letter dated June 13, 1995. Solvay will revise the plan as necessary to insure minimization of CO emissions.

12. That all compliance stack testing will be accomplished according to standard Reference Method testing, or other methodology specifically approved by the Administrator of the Air Quality Division. For particulate emission tests, the Division will require utilization of Reference Method 5 sampling trains, with the back half impinger catch analyzed by the protocol defined by Reference Method 202. To determine compliance for any particular stack, the Division will compare the sum of the Reference Method 5 front half particulate catch and the **inorganic** (mineral) portion of the Reference Method 202 back half of these Method 5/202 tests, against the particulate emission standards set into this permit.

13. That Solvay will develop through testing and engineering data, an emission inventory for total plant VOC's and then identify, speciate and quantify the portion of these organic compounds which are hazardous air pollutants under Title III of the 1990 U.S. Clean Air Act Amendments, on a schedule approved by the Division. Upon completion of the emission inventory, the Division will require Solvay to complete an ambient impact analysis for HAP emissions. As part of the ambient impact analysis, Solvay will be required to review acceptable ambient levels of HAP's as set in other areas of the country to compare with projected impacts at the Solvay plant.

It must be noted that this approval does not relieve you of your obligation to comply with all applicable county, state, and federal standards, regulations or ordinances. Special attention must be given to Section 21 of the Wyoming Air Quality Standards and Regulations, which details the requirements for compliance with conditions 3, 4, 5, and 6. Any appeal of this permit as a final action of the Department must be made to the Environmental Quality Council within sixty (60) days of permit issuance per Section 16, Chapter I, General Rules of Practice and Procedure, Department of Environmental Quality.

If we may be of further assistance to you, please feel free to contact this office.

Sincerely,

Charles A. Collins
Administrator
Air Quality Division

Dennis Hemmer
Director
Dept. of Environmental Quality

CAC:DH/BJD

TABLE I
Air Quality Permit MD-229
Solvay Minerals Soda Ash Plant Pollutant Emission Rates (pph)

Source Number	Equipment Name		Pollutants: Particulate	Sulfur Dioxide	Nitrogen Oxides
	"Current Plant Emission Sources"				
2a	Ore Crusher Building Baghouse #1		1.60	n.a.	n.a.
2b	Ore Reclaim Baghouse #1		0.20	n.a.	n.a.
6a	Product Silo Top Baghouse #1		0.30	n.a.	n.a.
6b	Product Silo Reclaim Baghouse #1		1.40	n.a.	n.a.
7	Product Loadout Baghouse #1		1.20	n.a.	n.a.
10	Coal Crushing & Storage Baghouse		0.60	n.a.	n.a.
11	Coal Transfer Station Baghouse		0.60	n.a.	n.a.
12	Calciner Coal Bunker Baghouse		0.60	n.a.	n.a.
14	Boiler Coal Bunker Baghouse		1.00	n.a.	n.a.
15	DR-1 & 2 Product Dryers Scrubber		6.80	n.a.	n.a.
16	Dryer Area Housekeeping Baghouse		0.90	n.a.	n.a.
*17	"A" & "B" Ore Calciners Prcptr		30.70	85.60	300.00
*18	#1 Coal Boiler Scrubber & Prcptr		17.00	70.00	245.00
*19	#2 Coal Boiler Scrubber & Prcptr		17.00	70.00	245.00
23	"A" Train Dissolver Scrubber		0.50	n.a.	n.a.
24	Boiler Flyash Silo Vent Baghouse		0.30	n.a.	n.a.
25	Alkaten Crushing Area Baghouse		1.00	n.a.	n.a.
26	DR-3 Alkaten Product Dryer Baghouse		1.10	n.a.	n.a.
27	Alkaten Product Bagging Baghouse		0.50	n.a.	n.a.
28	DR-4 Fld Bed Product Dryer Scrubber		2.90	n.a.	n.a.
29	"B" Train Dissolver Scrubber		0.50	n.a.	n.a.
30	Caustic #1 Lime Bin Baghouse		0.20	n.a.	n.a.
31	Caustic #2 Lime Bin Baghouse		0.20	n.a.	n.a.
32	Caustic Evaporator Brmtrc Condenser		0.00	n.a.	n.a.
33	Sulfite Sulfur Burner Scrubber		n.a.	0.40	1.50
34	Sulfite Crystallizer		0.00	n.a.	n.a.
35	Sulfite Product Dryer Scrubber		1.40	n.a.	n.a.
36	Sulfite #1 Product Bin Baghouse		0.10	n.a.	n.a.
37	Sulfite #2 Product Bin Baghouse		0.10	n.a.	n.a.
38	Sulfite #3 Product Bin Baghouse		0.10	n.a.	n.a.
39	Sulfite #4 Product Bin Baghouse		0.10	n.a.	n.a.
40	Sulfite Product Bagging Baghouse		0.30	n.a.	n.a.
41	Sulfite Product Loadout Baghouse		0.40	n.a.	n.a.
*42	Sulfite HCl Tank Vent		n.a.	n.a.	n.a.
*43	Sulfite Sulfur Tank Storage Vent		n.a.	n.a.	n.a.
44	Caustic Lime Delivery Baghouse		0.90	n.a.	n.a.
45	Alkaten Transloading Baghouse		0.20	n.a.	n.a.
46	#2 Ore Transfer Baghouse		1.20	n.a.	n.a.
47	"C" Train Ore Crusher Baghouse		5.10	n.a.	n.a.
*48	"C" Ore Calciner Precipitator		9.30	n.a.	30.60
*49	"C" Train Train Dissolver Scrubber		0.00	n.a.	n.a.
50	"C" Train Dryer Area Baghouse		2.10	n.a.	n.a.
51	DR-5 Product Dryer Precipitator		4.80	n.a.	18.00
52	Product Silo Top Baghouse #2		0.50	n.a.	n.a.
53	Product Silo Reclaim Baghouse #2		1.10	n.a.	n.a.
54	T-200 Product Storage Baghouse		0.19	n.a.	n.a.
55	Recycle/Reclaim Baghouse		0.40	n.a.	n.a.
56	"D" Ore Calciner Precipitator		18.00	n.a.	38.00
57	"D" Train Transfer Baghouse #2		0.40	n.a.	n.a.
58	"D" Train Transfer Baghouse #1		0.50	n.a.	n.a.
59	"D" Train Transfer Baghouse #3		0.40	n.a.	n.a.
60	Product Silo Reclaim Baghouse #3		0.70	n.a.	n.a.
61	Product Loadout Baghouse #2		1.10	n.a.	n.a.
Total, Current Plant Sources			136.49 (597.8 TPY)	226.00 (989.9 TPY)	878.10 (3846.1 TPY)
	"Calciner Gas Conversion"				
12	Calciner Coal Bunker Baghouse	{rmv}	-0.60	n.a.	n.a.
17	"A" & "B" Ore Calciners-coal	{rmv}	-30.70	-85.60	-300.00
17	"A" & "B" Ore Calciners-gas	{add}	22.30	0.00	20.00
Subtotal, Calciner Changes			-9.00 (-39.4 TPY)	-85.60 (-374.9 TPY)	-280.00 (-1226.4 TPY)
	"Removal of Dissolvers, Relinquishment of CT-946 & Inclusion of Additive Bin Vents"				
23	"A" Train Dissolver Scrubber	{rmv}	-0.50	n.a.	n.a.
29	"B" Train Dissolver Scrubber	{rmv}	-0.50	n.a.	n.a.
56	"D" Ore Calciner	{rmv}	-18.00	n.a.	-38.00
57	"D" Train Transfer	{rmv}	-0.40	n.a.	n.a.
58	"D" Train Transfer	{rmv}	-0.50	n.a.	n.a.
59	"D" Train Transfer	{rmv}	-0.40	n.a.	n.a.
60	Product Silo Reclaim	{rmv}	-0.70	n.a.	n.a.
61	Product Loadout	{rmv}	-1.10	n.a.	n.a.
62	Activated Carbon Bin Vent	{add}	0.13	n.a.	n.a.
63	Perlite Bin Vent Baghouse	{add}	0.17	n.a.	n.a.
Subtotal, Equipment Changes			-21.80 (-95.5 TPY)	0.00 (0.0 TPY)	-38.00 (-166.4 TPY)
Grand Total, Plant Emissions			105.69 (463.0 TPY)	140.40 (615.0 TPY)	560.10 (2453.3 TPY)

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* sources have allowables for other pollutants as well