

118 / AMINO

A61 Factory Grid


Atmospheric Emissions from the Scrubber

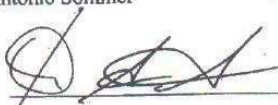
ATMOSPHERIC EMISSIONS FROM THE SCRUBBER

TETRAHYDROFURAN/ETHYL ACETATE/ACETONE

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| | |
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1.1 Introduction

The method used for the analysis of the atmospheric emissions are the one stated by the NIOSH guidelines (National Institute for Occupational Safety and Health), issued on the 15th August 2004.

The exposure limits for the solvents under investigation are:

| | ppm | |
|---------------|-----|----------------------------------|
| Acetone | 250 | 1ppm=2.37mg/m ³ @ NTP |
| Ethyl Acetate | 400 | 1ppm=360mg/m ³ @ NTP |
| THF | 200 | 1ppm=2.95mg/m ³ @ NTP |

The sampling was taken from scrubber Tower AB203 and a diagram of the latter can be seen in Appendix A. The flow of exhaust from the chimney is 2000m³/hr

The sampling was carried out using Drager Sampling Tube 67 28831 (Activated Charcoal Tube Type G). The sampling tube contains two layers: one sampling layer and one following layer. During sampling, the substances to be measured are adsorbed by the sampling layer. The following layer verifies whether the adsorption capacity of the sampling layer is adequate.

2.1 Sampling

Sampler: Drager Sampling Tube (Activated Charcoal Tube Type G)

Flow Rate: 0.2L/min

Volume: 5 litres

Samples: 2 samples are taken for each scrubber under investigation.

Both tips of the sample tube are broken immediately prior to sampling. The sample tube is inserted tightly into the pump; with arrow on sample tube pointing towards the pump showing the direction of the flow. 5 litres of air are sucked through the sample tube maintaining a flow of the pump of 0.2litres/min, thus enabling the activated carbon to adsorb well any solvents present in the air being analysed. Following the sampling the tubes are immediately sealed using polyethylene caps.

3.1 Measurement

The analysis of the samples are carried out using a GC instrument using the following method:

| | |
|-----------------------|---------------------|
| GC Instrument: | Varian 3900 |
| Injector Temperature: | 250°C |
| Detector temperature: | 250°C |
| Column Flow: | 2.0ml/min |
| Column Program: | 40°C for 10 minutes |
| Makeup Flow (Helium): | 25ml/min |
| Hydrogen Flow: | 30ml/min |
| Air Flow: | 300ml/min |
| Solvent Used: | CS ₂ |

3.1.1 Calibration Curve:

The calibration curve is performed by preparing standards of the solvents under investigation (THF, Ethyl Acetate, Acetone) of the following concentrations; 0.13mg/ml, 0.52mg/ml, 2.6mg/ml, 5.2mg/ml, 13mg/ml and 26mg/ml.

The above solutions are performed using the following dilutions:

Solution 1

650mg of each solvent in 25ml flask and brought to volume with CS2 (Sol 1). (26mg/ml)

Solution 2

5ml of Sol 1 in 10ml flask and brought to volume with CS2 (Sol 2). (13mg/ml)

Solution 3

2ml of Sol 1 in 10ml flask and brought to volume with CS2 (Sol 3). (5.2mg/ml)

Solution 4

1ml of Sol 1 in 10ml flask and brought to volume with CS2 (Sol 4). (2.6mg/ml)

Solution 5

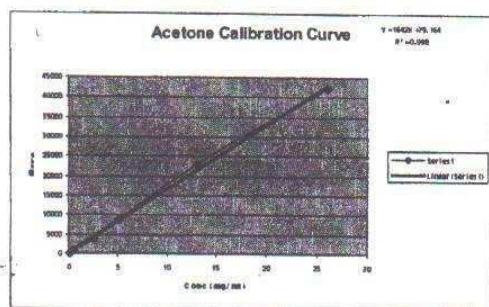
0.2ml of Sol 1 in 10ml flask and brought to volume with CS2 (Sol 5). (0.52mg/ml)

Solution 6

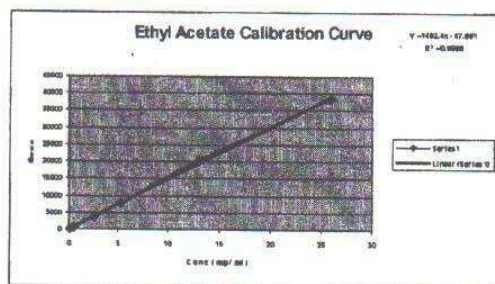
0.05ml of Sol 1 in 10ml flask and brought to volume with CS2 (Sol 6). (0.13mg/ml)

Acetone

| Conc mg/ml | Standard 1 | Standard 2 | Standard 3 | Sum | Average | STD | RSD |
|------------|------------|------------|------------|--------|---------|-----|-----|
| 0.13 | 140 | 138 | 131 | 409 | 136 | 5 | 3.5 |
| 0.52 | 687 | 701 | 676 | 2064 | 688 | 13 | 1.8 |
| 2.6 | 3945 | 4138 | 3845 | 11928 | 3976 | 149 | 3.7 |
| 5.2 | 8740 | 8642 | 8514 | 25896 | 8632 | 113 | 1.3 |
| 13 | 23229 | 23069 | 22294 | 68592 | 22864 | 500 | 2.2 |
| 26 | 41473 | 42823 | 41981 | 126277 | 42092 | 682 | 1.6 |

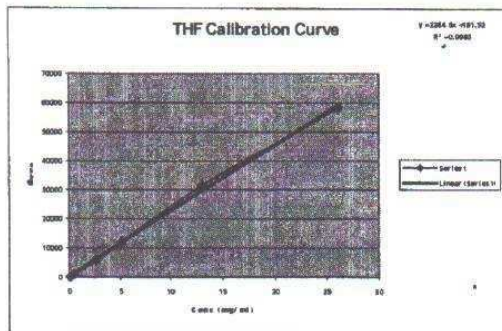
**Ethyl Acetate**

| Conc mg/ml | Standard 1 | Standard 2 | Standard 3 | Sum | Average | STD | RSD |
|------------|------------|------------|------------|--------|---------|-----|-----|
| 0.13 | 99 | 102 | 107 | 308 | 103 | 4 | 3.9 |
| 0.52 | 592 | 599 | 596 | 1787 | 596 | 4 | 0.6 |
| 2.6 | 3505 | 3683 | 3468 | 10656 | 3552 | 115 | 3.2 |
| 5.2 | 7733 | 7571 | 7517 | 22821 | 7607 | 112 | 1.5 |
| 13 | 20649 | 20632 | 19842 | 61123 | 20374 | 461 | 2.3 |
| 26 | 38048 | 38697 | 38142 | 114887 | 38296 | 351 | 0.9 |



Tetrahydrofuran

| Conc mg/ml | Standard 1 | Standard 2 | Standard 3 | Sum | Average | STD | RSD |
|------------|------------|------------|------------|--------|---------|-----|-----|
| 0.13 | 231 | 225 | 225 | 681 | 227 | 3 | 1.5 |
| 0.52 | 1043 | 1049 | 1026 | 3118 | 1039 | 12 | 1.1 |
| 2.6 | 5640 | 5873 | 5583 | 17096 | 5699 | 154 | 2.7 |
| 5.2 | 12153 | 11847 | 11806 | 35806 | 11935 | 190 | 1.6 |
| 13 | 31914 | 31822 | 30597 | 94333 | 31444 | 735 | 2.3 |
| 26 | 57959 | 58720 | 57910 | 174589 | 58196 | 454 | 0.8 |



3.1.2 Recovery of the Solvents on the Activated Carbon

Known quantities of every solvent were spiked onto the front part of the sampling tube. The tubes were sealed by the polyethylene caps and left to stand for one night. The back part of the sampling tube was discarded, while the front part was placed in a vial and sealed. 3ml of CS₂ were added to the carbon and left to stand for 30 minutes with occasional stirring. The solution was then placed in a GC vial and injected.

| Acetone | Standard 1 | Standard 2 | Standard 3 | Sum | Average | STD | RSD |
|-----------|------------|------------|------------|-------|---------|--------|-----|
| 0.52mg/ml | 571 | 561 | 568 | 1700 | 567 | 5.13 | 0.9 |
| 13mg/ml | 18334 | 18735 | 18993 | 56062 | 18687 | 332.08 | 1.8 |

| Ethyl Acetate | Standard 1 | Standard 2 | Standard 3 | Sum | Average | STD | RSD |
|---------------|------------|------------|------------|-------|---------|--------|-----|
| 0.52mg/ml | 555 | 536 | 546 | 1637 | 546 | 9.50 | 1.7 |
| 13mg/ml | 18393 | 18904 | 18783 | 56080 | 18693 | 267.04 | 1.4 |

| THF | Standard 1 | Standard 2 | Standard 3 | Sum | Average | STD | RSD |
|-----------|------------|------------|------------|-------|---------|--------|-----|
| 0.52mg/ml | 1049 | 1009 | 1035 | 3093 | 1031 | 20.30 | 2.0 |
| 13mg/ml | 30453 | 31210 | 30924 | 92587 | 30862 | 382.25 | 1.2 |

The recovery of the solvents were calculated using the area of their respective standard concentration.

| | mg of solvent spiked | mg of solvent recovered | Desorption efficiency |
|---------------|----------------------|-------------------------|-----------------------|
| Acetone | 1.56 | 1.28 | 82.4% |
| | 39 | 31.88 | 81.7% |
| Ethyl Acetate | 1.56 | 1.43 | 91.6% |
| | 39 | 35.78 | 91.8% |
| THF | 1.56 | 1.55 | 99.2% |
| | 39 | 38.28 | 98.2% |

3.1.3 Analysis of sampling tubes from the scrubbers

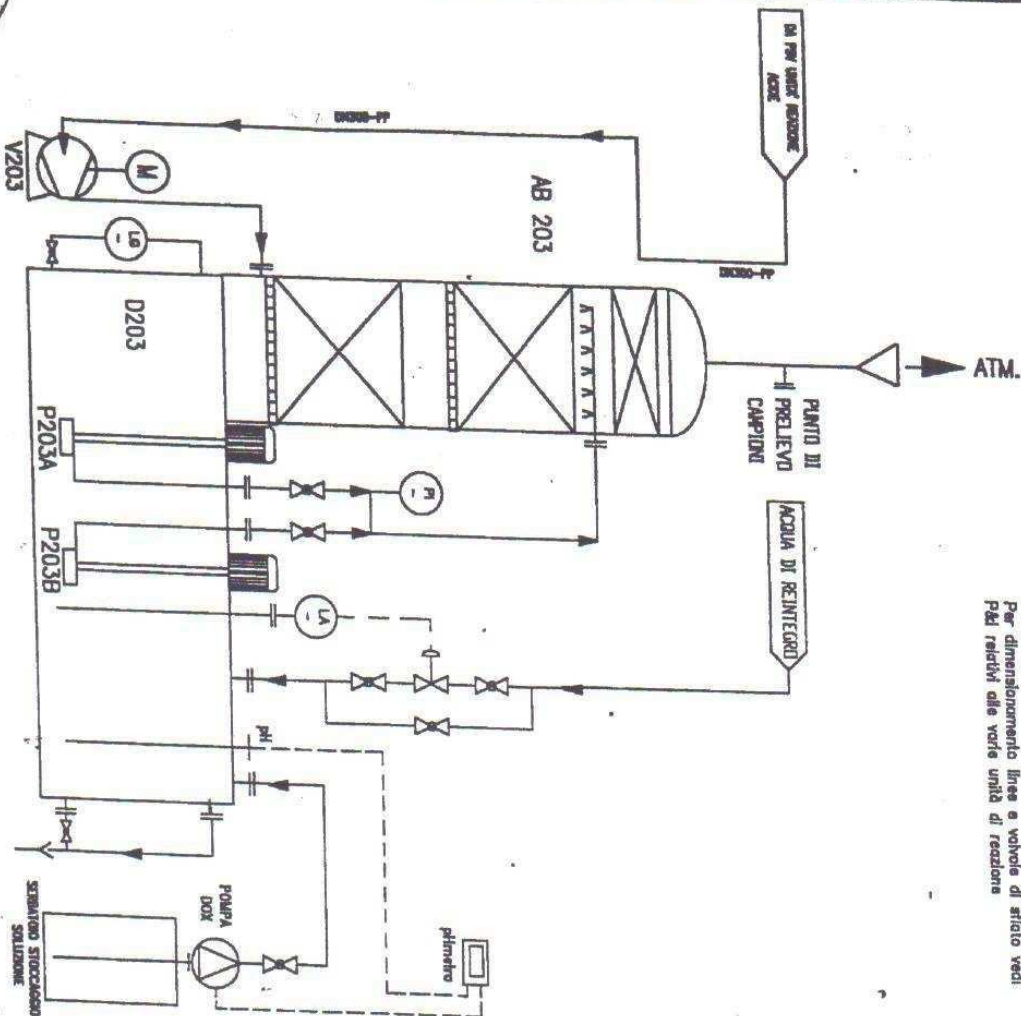
| | Acetone | Ethyl Acetate | THF |
|---------------------------|---------|---------------|------|
| Front Sorbent Sample 1 | N.D. | N.D. | N.D. |
| Back Sorbent Sample 1 | N.D. | N.D. | N.D. |
| Front Sorbent Sample 2 | N.D. | N.D. | N.D. |
| Back Sorbent Sample 2 | N.D. | N.D. | N.D. |

Comments

No traces of any solvent were detected from the emissions of the scrubber.

Appendix A – Diagram of the Scrubber

Nota:
Per dimensionamento linee e volume di sfogo vedi
P&I relativi alle varie unità di reazione



ELENCO APPARECCHIATURE

| SIGLA | TP | DESCRIZIONE | CONFERMA | ALTEZZA | SPAZIO | AVVIA | MODALITÀ | PRO |
|---------|----|-------------|----------|---------|--------|-------|----------|-----|
| AB 203 | / | / | / | / | / | / | / | / |
| SP03 | / | / | / | / | / | / | / | / |
| V203 | / | / | / | / | / | / | / | / |
| P203A-B | / | / | / | / | / | / | / | / |

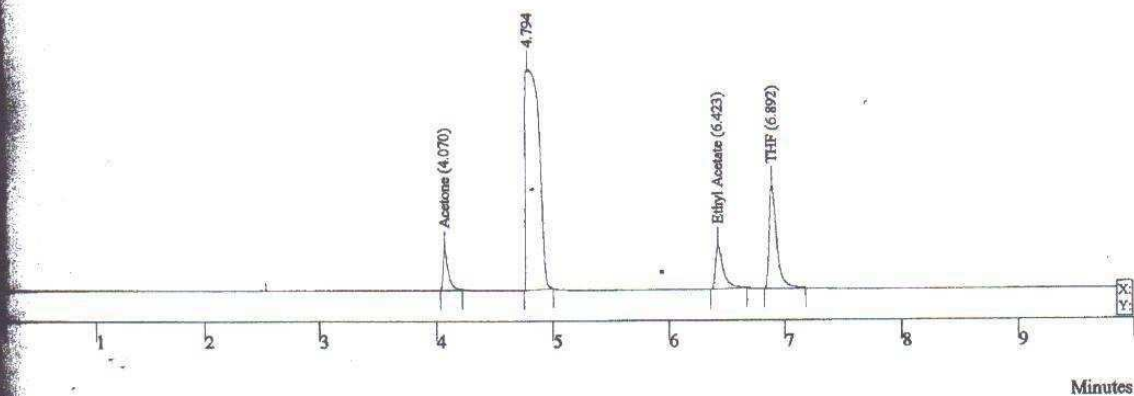
| | | | | |
|---------------------|----------|------------------------|-----------|----------|
| 1 | 02-07-03 | SITUAZIONE AL 02-07-03 | R.A. | R.S. |
| 2 | 27-06-03 | PRIMA DESCRIZIONE | V.D. | |
| REV. | DATA | DESCRIZIONE | DIREZIONE | COMPLET. |
| AMINO CHEMICALS Ltd | | | | |
| AB-203 | | | | |
| SCHEMA DI IMPIANTO | | | | |

IMPIANTO DI ASPRAZIONE E ABBATTIMENTO EFFLUENTI GAS

Appendix B – Chromatograms for Calibration Curve

File: c:\star\data\thf in atmospher\thf-ea-acetone in
 atmosphere 2005\calibration curve\ rec
 0.52mg-ml inj 1 10-4-05.run
 Method: Front = FID RESULTS
 File ID: REC 0.52mg-ml Inj 1
 Operator (Inj): Anthony
 Injection Date: 10/04/05 01:59:53 PM
 Injection Method: c:\star\analysis of thf in atmosphere.mth
 Retention Time (min): 9.998
 Station:
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 10/04/05 03:24:01 PM
 Times Calculated: 2
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



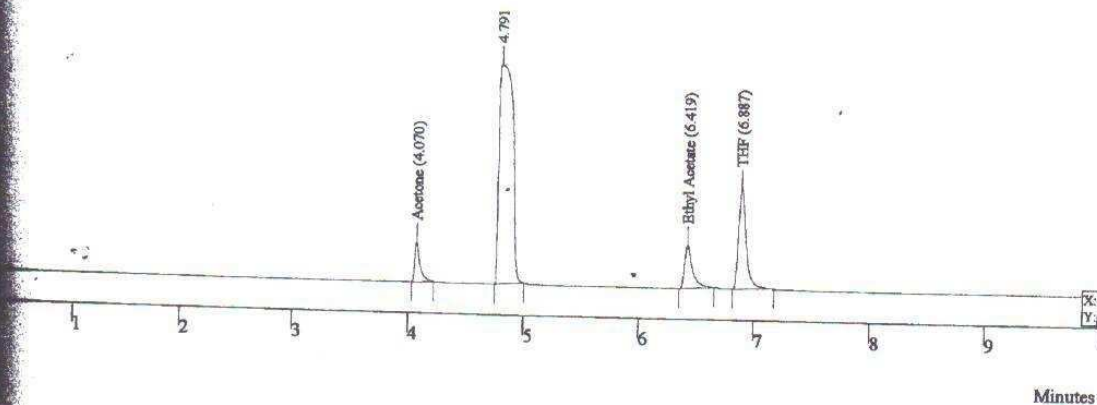
Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 4.8702 | 4.070 | 144 | 0.00 | BB |
| | 69.4294 | 4.794 | 2056 | 0.00 | BB |
| Ethyl Acetate | 7.7649 | 6.423 | 230 | 0.00 | BB |
| THF | 17.9354 | 6.892 | 531 | 0.00 | BB |
| Totals | 99.9999 | | 2961 | | |

c:\star\data\thf in atmosphere\thf-ea-acetone in
 atmosphere 2005\calibration curve\ rec
 0.52mg-ml inj 2 10-4-05.run
 Front = FID RESULTS
 REC 0.52mg-ml Inj 2
 Operator (Inj): Anthony
 Date: 10/04/05 02:13:21 PM
 Method: c:\star\analysis of thf in atmosphere.mth
 Time (min): 9.994
 Injection: 1
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 10/04/05 03:24:01 PM
 Times Calculated: 2
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



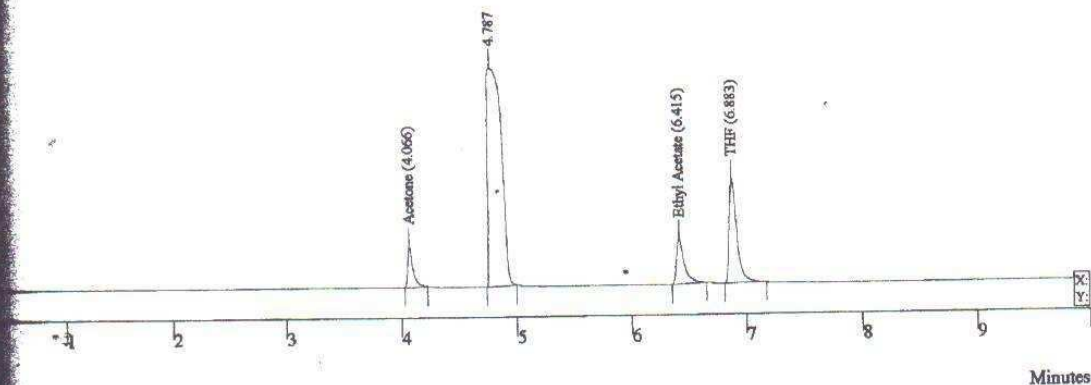
Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 5.0491 | 4.070 | 149 | 0.00 | BB |
| | 69.5807 | 4.791 | 2047 | 0.00 | BB |
| Ethyl Acetate | 7.8576 | 6.419 | 231 | 0.00 | BB |
| | 17.5126 | 6.887 | 515 | 0.00 | BB |
| | 100.0000 | | 2942 | | |

c:\star\data\thf in atmosphere\thf-ea-acetone in
atmosphere 2005\calibration curve\ rec
0.52mg-ml inj 3 10-4-05.run

ID: Front = FID RESULTS
Inj: REC 0.52mg-ml Inj 3
Date: Anthony
10/04/05 02:26:50 PM
Method: c:\star\analysis of thf in atmosphere.mth
Time (min): 9.995
Injection: 1
Inj: Varian Star #2

Operator (Calc): Anthony
Calc Date: 10/04/05 03:24:01 PM
Times Calculated: 2
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



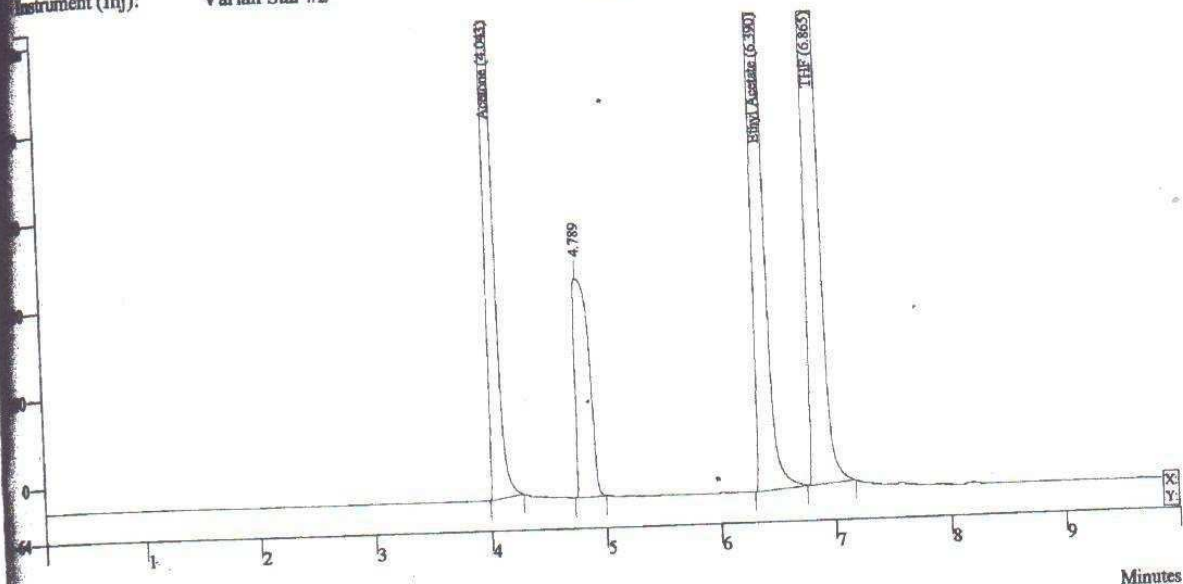
Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 5.1218 | 4.066 | 156 | 0.00 | BB |
| | 68.8903 | 4.787 | 2099 | 0.00 | BB |
| Ethyl Acetate | 8.0512 | 6.415 | 245 | 0.00 | BB |
| THF | 17.9367 | 6.883 | 547 | 0.00 | BB |
| Totals | 100.0000 | | 3047 | | |

Data File: c:\star\data\thf in atmosphere\thf-ea-acetone in
 atmosphere 2005\calibration curve\ rec
 13mg-ml inj 1 10-4-05.run
 Channel: Front = FID RESULTS
 Sample ID: REC 13mg-ml Inj 1
 Operator (Inj): Anthony
 Injection Date: 10/04/05 02:40:20 PM
 Injection Method: c:\star\analysis of thf in atmosphere.mth
 Run Time (min): 9.999
 Workstation:
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 10/04/05 03:24:01 PM
 Times Calculated: 2
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



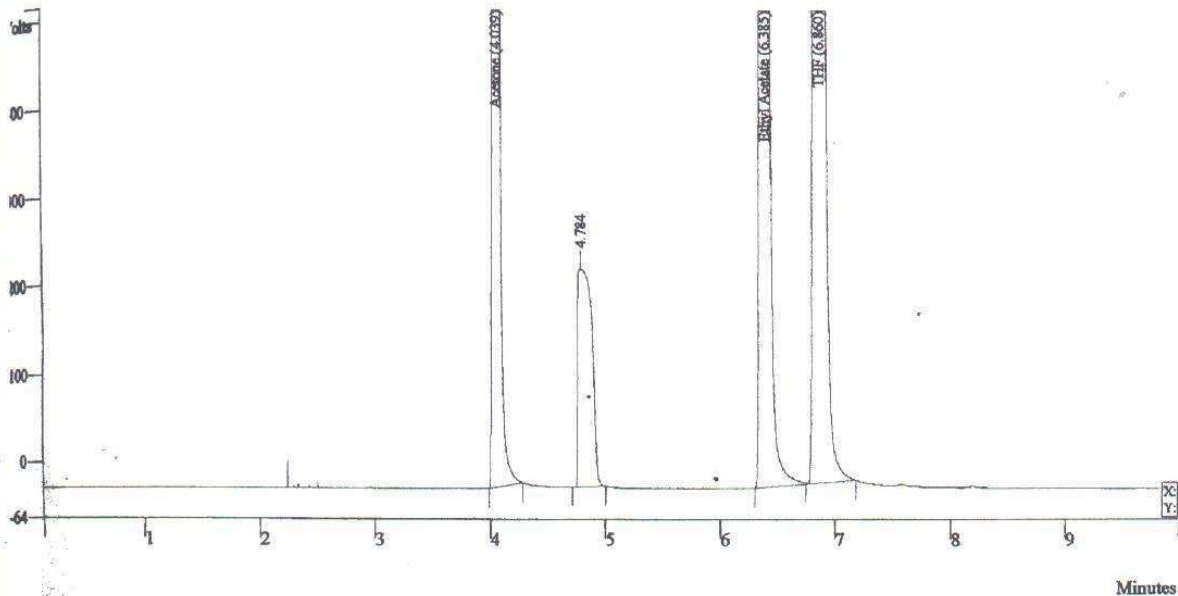
Sample Prep Info

Vial: 21 Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak No. | Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|----------|---------------|-----------|----------------|--------------------|--------------|-----------|
| 1 | Acetone | 23.7818 | 4.043 | 13416 | 0.00 | BB |
| 2 | | 3.6766 | 4.789 | 2074 | 0.00 | BB |
| 3 | Ethyl Acetate | 25.8326 | 6.390 | 14572 | 0.00 | BV |
| 4 | THF | 46.7090 | 6.865 | 26349 | 0.00 | VB |
| 5 | Totals | 100.0000 | | 56411 | | |

Data File: c:\star\data\thf in atmosphere\thf-ea-acetone in
atmosphere 2005\calibration curve\ rec
13mg-ml inj 2 10-4-05.run
Channel: Front = FID RESULTS
Sample ID: REC 13mg-ml Inj 2
Operator (Inj): Anthony
Injection Date: 10/04/05 02:53:48 PM
Injection Method: c:\star\analysis of thf in atmosphere.mth
Run Time (min): 9.999
Workstation:
Instrument (Inj): Varian Star #2

Operator (Calc): Anmomy
Calc Date: 10/04/05 03:24:01 PM
Times Calculated: 2
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



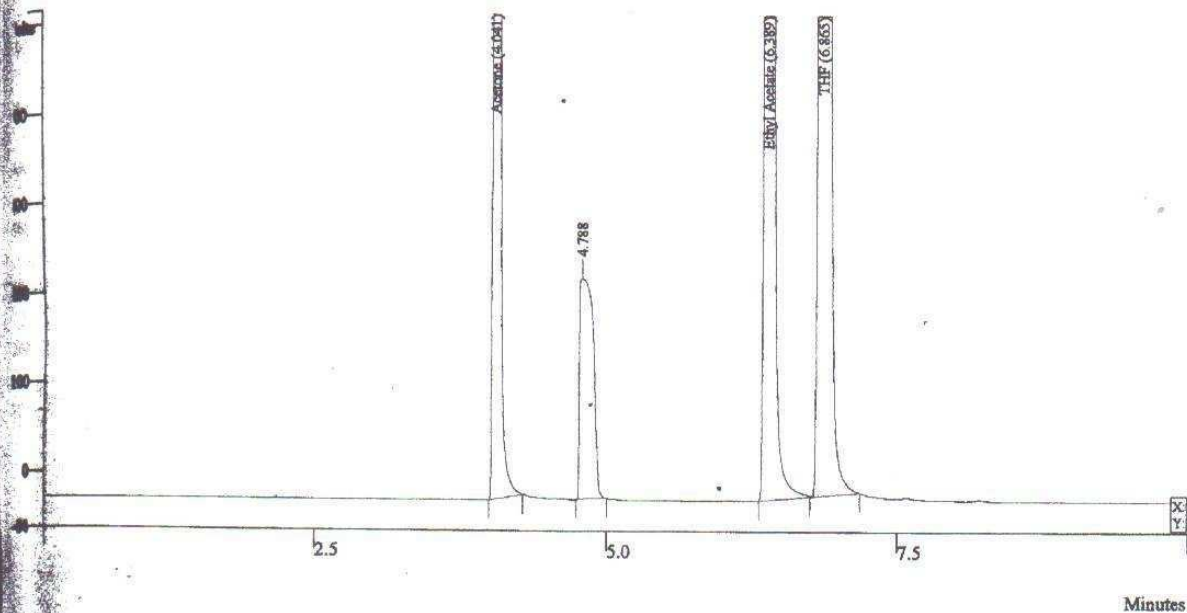
Sample Prep Info

Vial 21 Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 24.0908 | 4.039 | 14121 | 0.00 | BB |
| Ethyl Acetate | 3.5690 | 4.784 | 2092 | 0.00 | BB |
| Ethyl Acetate | 25.8719 | 6.385 | 15165 | 0.00 | BV |
| THF | 46.4682 | 6.860 | 27238 | 0.00 | VB |
| Totals | 99.9999 | | 58616 | | |

Data File: c:\star\data\thf in atmosphere\thf-ea-acetone in
atmosphere 2005\calibration curve\ rec
13mg-ml inj 3 10-4-05.run
Channel: Front = FID RESULTS
Sample ID: REC 13mg-ml Inj 3
Operator (Inj): Anthony
Injection Date: 10/04/05 03:07:15 PM
Injection Method: c:\star\analysis of thf in atmosphere.mth
Run Time (min): 10.000
Workstation:
Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 10/04/05 03:24:01 PM
Times Calculated: 2
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



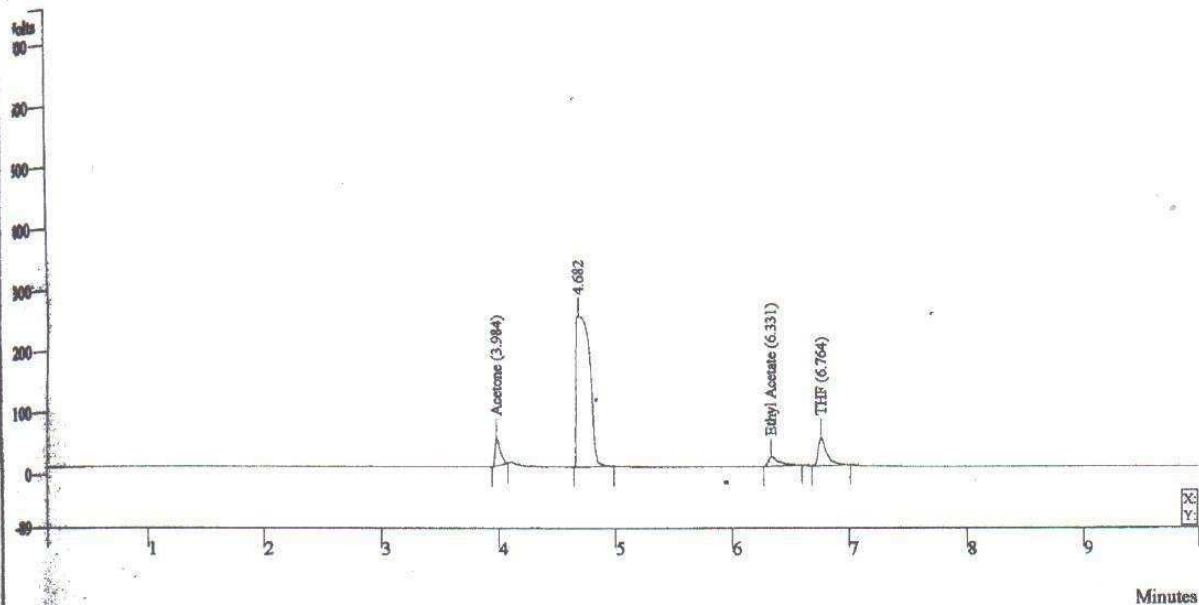
Prep Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 23.3263 | 4.041 | 12584 | 0.00 | BB |
| | 3.7648 | 4.788 | 2031 | 0.00 | BB |
| Ethyl Acetate | 25.8000 | 6.389 | 13918 | 0.00 | BV |
| THF | 47.1090 | 6.865 | 25413 | 0.00 | VB |
| Totals | 100.0001 | | 53946 | | |

Data File: c:\star\data\thf in atmospher\thf-ea-acetone in
atmosphere 2005\calibration curve\ std
0.13mg-ml inj 1 9-29-05.run
Channel: Front = FID RESULTS
Sample ID: Std 0.13mg-ml Inj 1
Operator (Inj): Anthony
Injection Date: 09/29/05 04:28:02 PM
Injection Method: c:\star\analysis of thf in atmosphere.mth
Run Time (min): 9.991
Workstation:
Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 09/30/05 10:43:30 AM
Times Calculated: 3
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



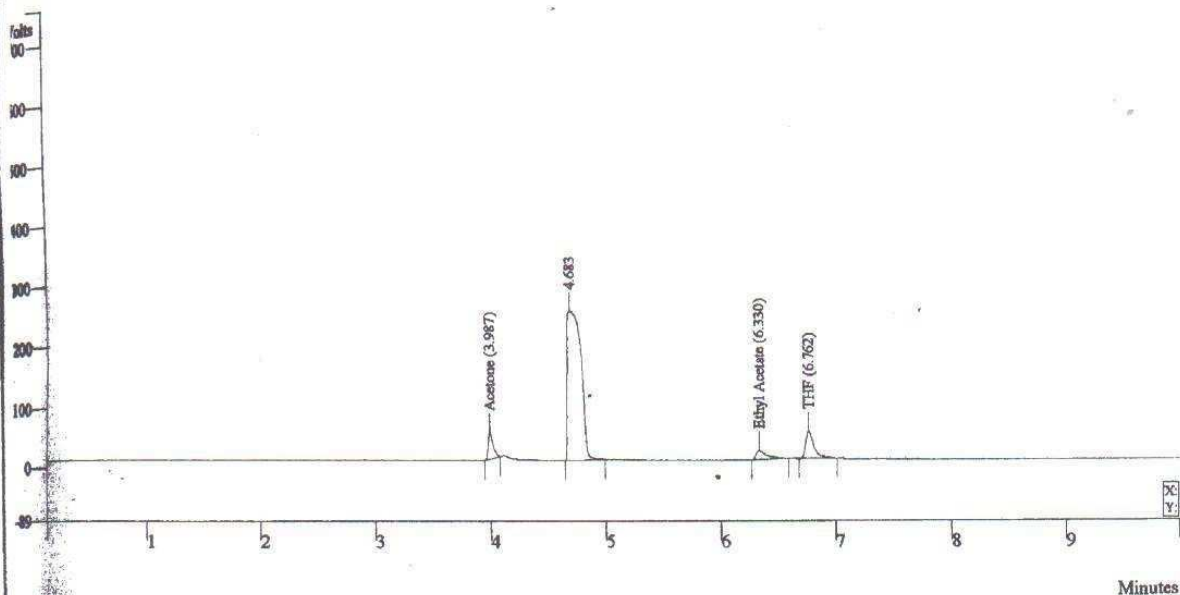
Sample Prep Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 5.5769 | 3.984 | 140 | 0.00 | BB |
| | 81.2618 | 4.682 | 2034 | 0.00 | BB |
| Ethyl Acetate | 3.9507 | 6.331 | 99 | 0.00 | BB |
| THF | 9.2105 | 6.764 | 231 | 0.00 | BB |
| Totals | 99.9999 | | 2504 | | |

Data File: c:\star\data\thf in atmosphere\thf-ea-acetone in atmosphere 2005\calibration curve\ std 0.13mg-ml inj 2 9-29-05.run
 Channel: Front = FID RESULTS
 Sample ID: Std 0.13mg-ml Inj 2
 Operator (Inj): Anthony
 Injection Date: 09/29/05 04:41:30 PM
 Injection Method: c:\star\analysis of thf in atmosphere.mth
 Run Time (min): 9.998
 Workstation:
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 09/30/05 10:43:30 AM
 Times Calculated: 3
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



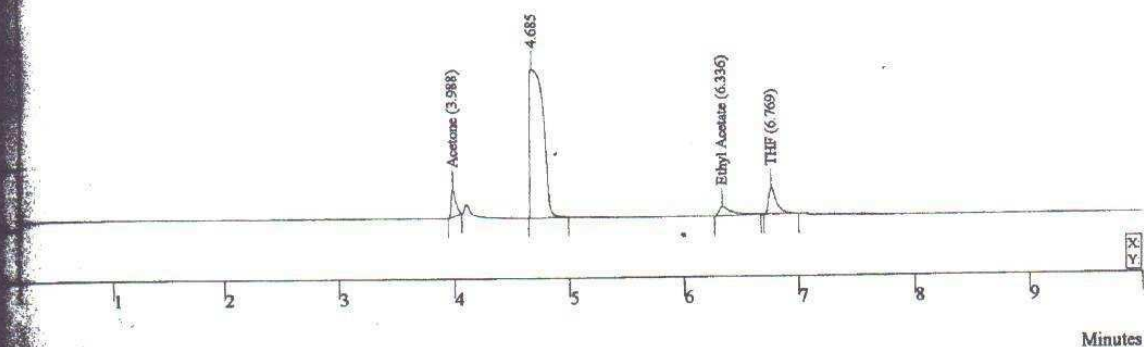
Sample Prep Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 5.4988 | 3.987 | 138 | 0.00 | BB |
| | 81.4732 | 4.683 | 2044 | 0.00 | BB |
| Ethyl Acetate | 4.0781 | 6.330 | 102 | 0.00 | BB |
| THF | 8.9499 | 6.762 | 225 | 0.00 | BB |
| Totals | 100.0000 | | 2509 | | |

File: c:\star\data\thf in atmospher\thf-ea-acetone in
 atmosphere 2005\calibration curve\ std
 0.13mg-ml inj 3 9-29-05.run
 Channel: Front = FID RESULTS
 Sample ID: Std 0.13mg-ml Inj 3
 Operator (Inj): Anthony
 Injection Date: 09/29/05 04:54:59 PM
 Injection Method: c:\star\analysis of thf in atmosphere.mth
 Run Time (min): 9.997
 Workstation:
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 09/30/05 10:43:30 AM
 Times Calculated: 3
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



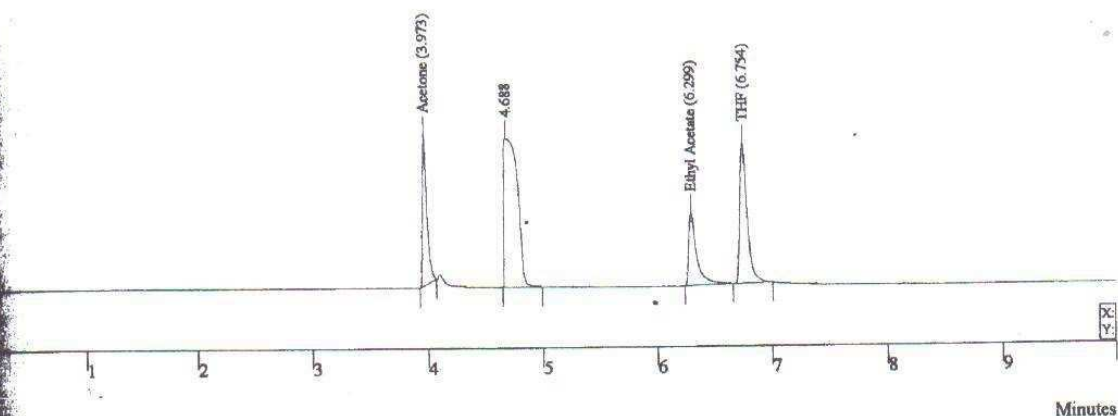
Rep Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 5.2212 | 3.988 | 131 | 0.00 | BB |
| | 81.5267 | 4.685 | 2044 | 0.00 | BB |
| Ethyl Acetate | 4.2737 | 6.336 | 107 | 0.00 | BB |
| THF | 8.9783 | 6.769 | 225 | 0.00 | BB |
| Totals | 99.9999 | | 2507 | | |

File: c:\star\data\thf in atmosphere\thf-ea-acetone in
 atmosphere 2005\calibration curve\ std
 0.52mg-ml inj 1 9-29-05.run
 Sample ID: Front = FID RESULTS
 Std 0.52mg-ml Inj 1
 Operator (Inj): Anthony
 Injection Date: 09/29/05 05:08:29 PM
 Injection Method: c:\star\analysis of thf in atmosphere.mth
 Run Time (min): 9.998
 Workstation:
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 09/30/05 10:44:10 AM
 Times Calculated: 3
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



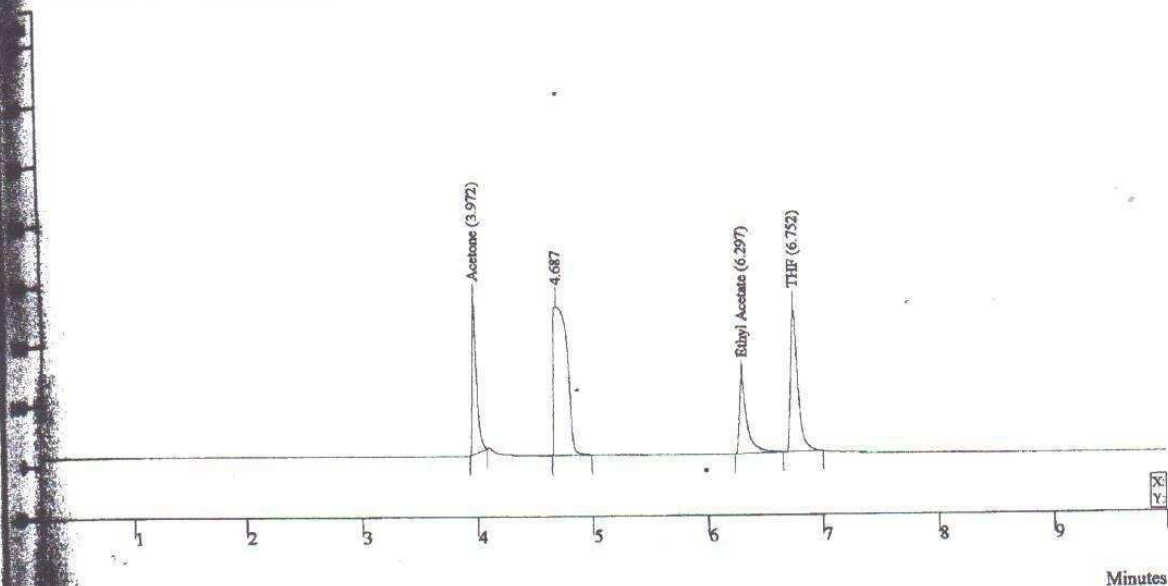
Step Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 15.6922 | 3.973 | 687 | 0.00 | BB |
| | 46.9646 | 4.688 | 2057 | 0.00 | BB |
| Ethyl Acetate | 13.5239 | 6.299 | 592 | 0.00 | BP |
| | 23.8193 | 6.754 | 1043 | 0.00 | PB |
| THF | 100.0000 | | 4379 | | |

File: c:\star\data\thf in atmosphere\thf-ea-acetone in
 atmosphere 2005\calibration curve\ std
 0.52mg-ml inj 2 9-29-05.run
 Channel: Front = FID RESULTS
 Sample ID: Std 0.52mg-ml Inj 2
 Operator (Inj): Anthony
 Injection Date: 09/29/05 05:21:57 PM
 Injection Method: c:\star\analysis of thf in atmosphere.mth
 Run Time (min): 9.992
 Workstation:
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 09/30/05 10:44:10 AM
 Times Calculated: 3
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



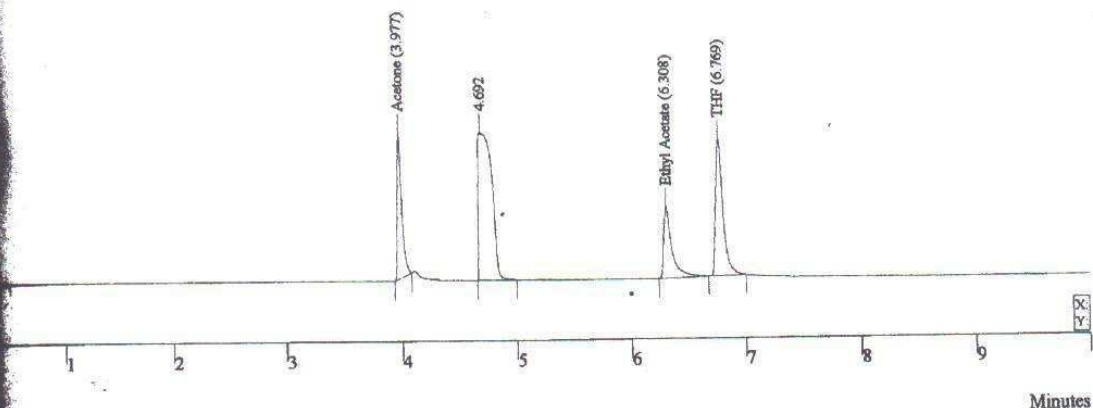
Rep Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 15.9045 | 3.972 | 701 | 0.00 | BB |
| | 46.6923 | 4.687 | 2058 | 0.00 | BB |
| Ethyl Acetate | 13.5965 | 6.297 | 599 | 0.00 | BP |
| | 23.8067 | 6.752 | 1049 | 0.00 | PB |
| THF | 100.0000 | | 4407 | | |

File: c:\star\data\thf in atmosphere\thf-ea-acetone in
 atmosphere 2005\calibration curve\ std
 0.52mg-ml inj 3 9-29-05.run
 ID: Front = FID RESULTS
 Std 0.52mg-ml Inj 3
 Operator (Inj): Anthony
 Date: 09/29/05 05:35:24 PM
 Method: c:\star\analysis of thf in atmosphere.mth
 Time (min): 9.999
 Location:
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 09/30/05 10:44:10 AM
 Times Calculated: 3
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



Info

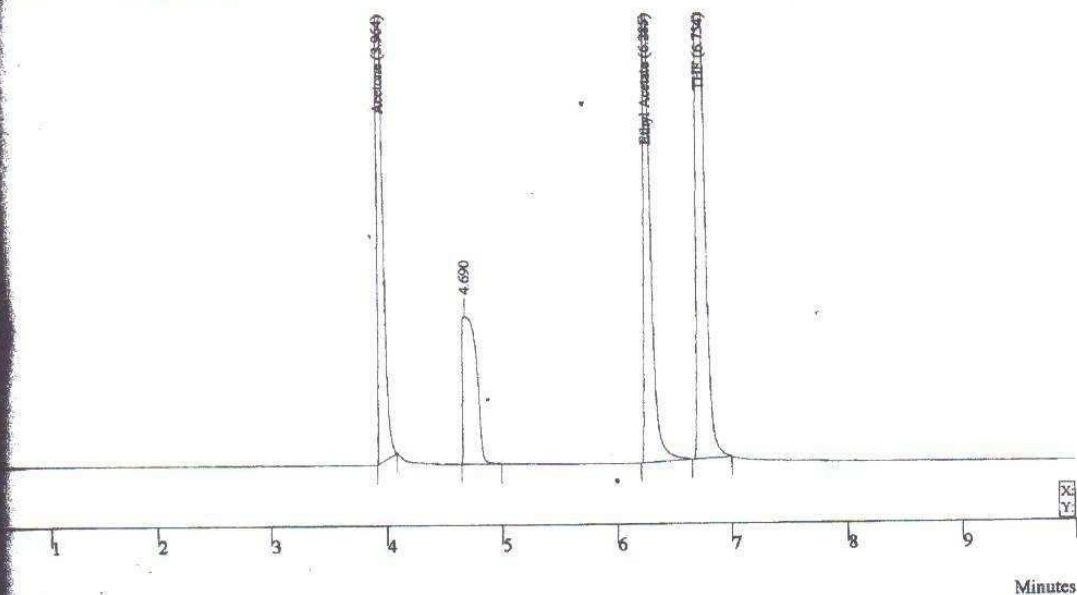
Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 15.5878 | 3.977 | 676 | 0.00 | BB |
| | 46.9775 | 4.692 | 2036 | 0.00 | BB |
| Ethyl Acetate | 13.7547 | 6.308 | 596 | 0.00 | BV |
| | 23.6800 | 6.769 | 1026 | 0.00 | VB |
| | 100.0000 | | 4334 | | |

c:\star\data\thf in atmosphere\thf-ea-acetone in
atmosphere 2005\calibration curve\ std
2.6mg-ml inj 1 9-29-05.run

Front = FID RESULTS
Std 2.6mg-ml Inj 1
Date: 09/29/05 05:48:53 PM
Method: c:\star\analysis of thf in atmosphere.mth
Time (min): 9.991
Injection (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 09/30/05 10:44:10 AM
Times Calculated: 3
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



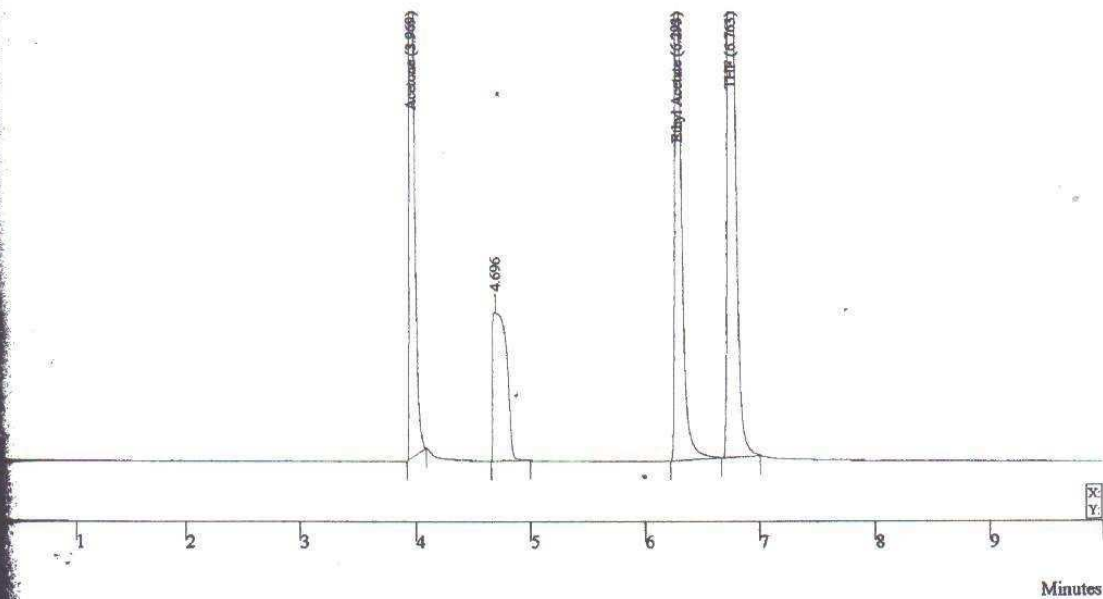
Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 26.0835 | 3.964 | 3945 | 0.00 | BB |
| | 13.4483 | 4.690 | 2034 | 0.00 | BB |
| Ethyl Acetate | 23.1784 | 6.285 | 3505 | 0.00 | BP |
| | 37.2898 | 6.754 | 5640 | 0.00 | PB |
| | 100.0000 | | 15124 | | |

File: c:\star\data\thf in atmosphere\thf-ea-acetone in
atmosphere 2005\calibration curve\std 2.6
mg-ml inj 2 9-29-05.run
Panel: Front = FID RESULTS
Sample ID: Std 2.6 mg-ml Inj 2
Operator (Inj): Anthony
Injection Date: 09/29/05 06:02:21 PM
Injection Method: c:\star\analysis of thf in atmosphere.mth
Retention Time (min): 9.994
Injection Station:
Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 09/30/05 10:44:10 AM
Times Calculated: 3
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



Run Info

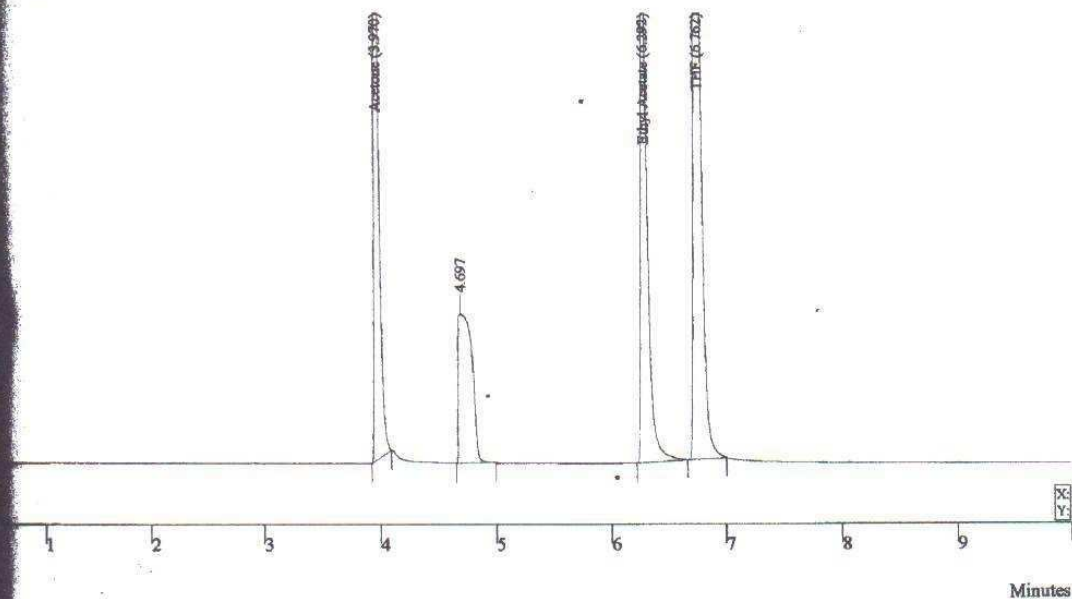
Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result (%) | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|------------|----------------|--------------------|--------------|-----------|
| Acetone | 26.2708 | 3.969 | 4138 | 0.00 | BB |
| | 13.0622 | 4.696 | 2058 | 0.00 | BB |
| Ethyl Acetate | 23.3799 | 6.293 | 3683 | 0.00 | BP |
| | 37.2871 | 6.763 | 5873 | 0.00 | PB |
| THF | 100.0000 | | 15752 | | |

c:\star\data\thf in atmosphere\thf-ea-acetone in
atmosphere 2005\calibration curve\ std 2.6
mg-ml inj 3 9-29-05.run

Front = FID RESULTS
Std 2.6 mg-ml Inj 3
Inj): Anthony
Date: 09/29/05 06:15:49 PM
Method: c:\star\analysis of thf in atmosphere.mth
(min): 9.995
Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 09/30/05 10:44:10 AM
Times Calculated: 3
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



Info

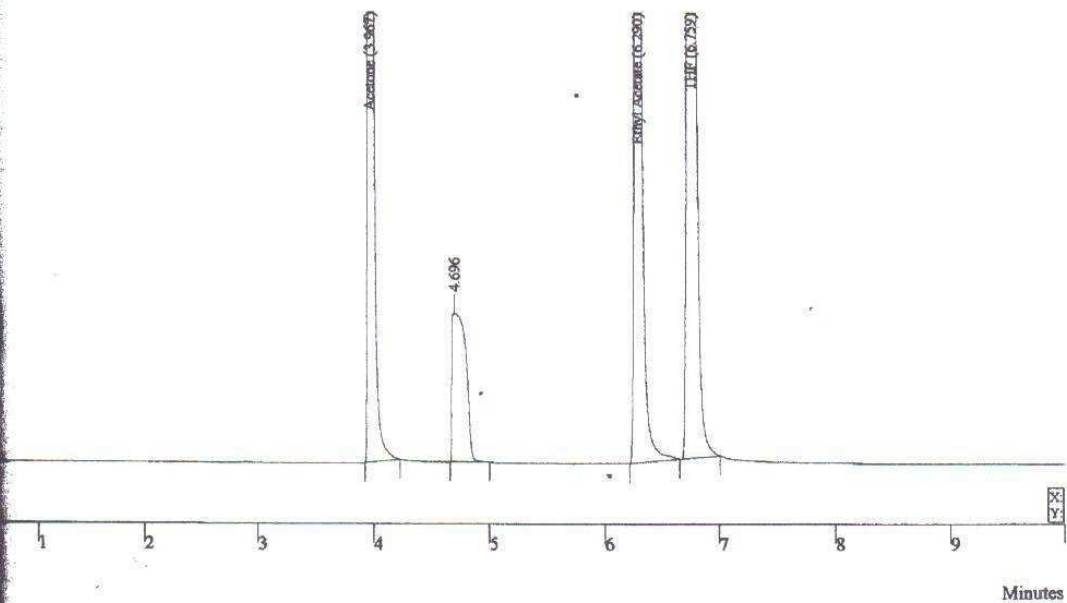
Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|-----------|-----------|----------------|--------------------|--------------|-----------|
| | 25.7849 | 3.970 | 3845 | 0.00 | BB |
| | 13.5212 | 4.697 | 2016 | 0.00 | BB |
| acetate | 23.2566 | 6.292 | 3468 | 0.00 | BP |
| | 37.4373 | 6.762 | 5583 | 0.00 | PB |
| | 100.0000 | | 14912 | | |

c:\star\data\thf in atmosphere\thf-ea-acetone in
atmosphere 2005\calibration curve\ std
5.2mg-ml inj 1 9-29-05.run

Front = FID RESULTS
Std 5.2mg-ml Inj 1
Operator: Anthony
Date: 09/29/05 06:29:19 PM
Method: c:\star\analysis of thf in atmosphere.mth
Injection (min): 9.996
Injection (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 09/30/05 10:45:24 AM
Times Calculated: 3
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



Info

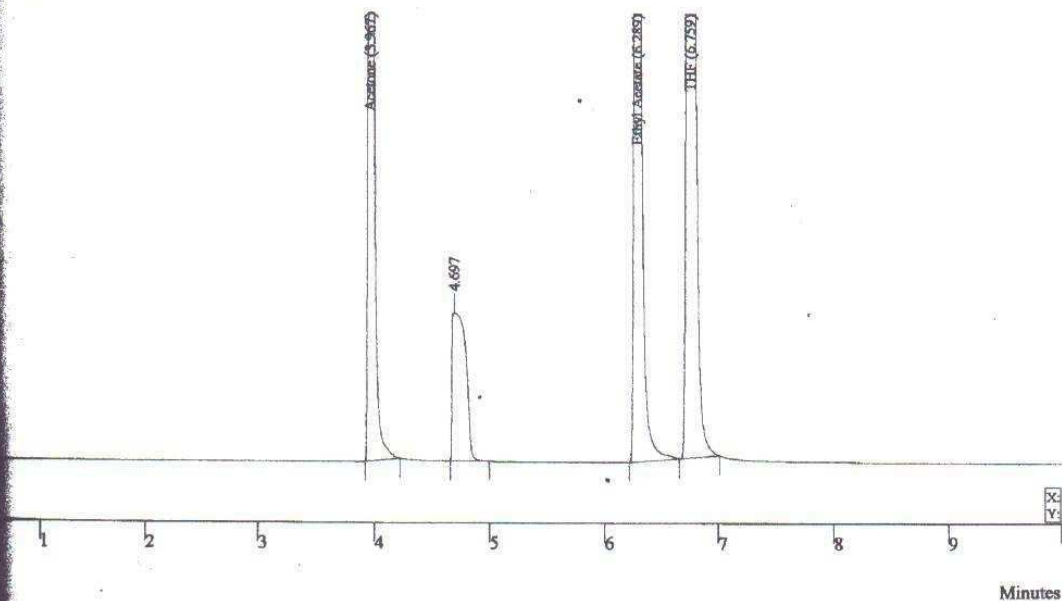
Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| | 28.5010 | 3.967 | 8740 | 0.00 | BB |
| | 6.6494 | 4.696 | 2039 | 0.00 | BB |
| Ethyl Acetate | 25.2179 | 6.290 | 7733 | 0.00 | BV |
| | 39.6316 | 6.759 | 12153 | 0.00 | VB |
| | 99.9999 | | 30665 | | |

c:\star\data\thf in atmosphere\thf-ea-acetone in
atmosphere 2005\calibration curve\ std
5.2mg-ml inj 2 9-29-05.run

Front = FID RESULTS
Std 5.2mg-ml Inj 2
Operator: Anthony
Date: 09/29/05 06:42:47 PM
Method: c:\star\analysis of thf in atmosphere.mth
Injection (min): 9.993
Injection:
Injection (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 09/30/05 10:45:24 AM
Times Calculated: 3
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



Injection

Injection Number: 1 Volume: 1.0 uL Position: 1

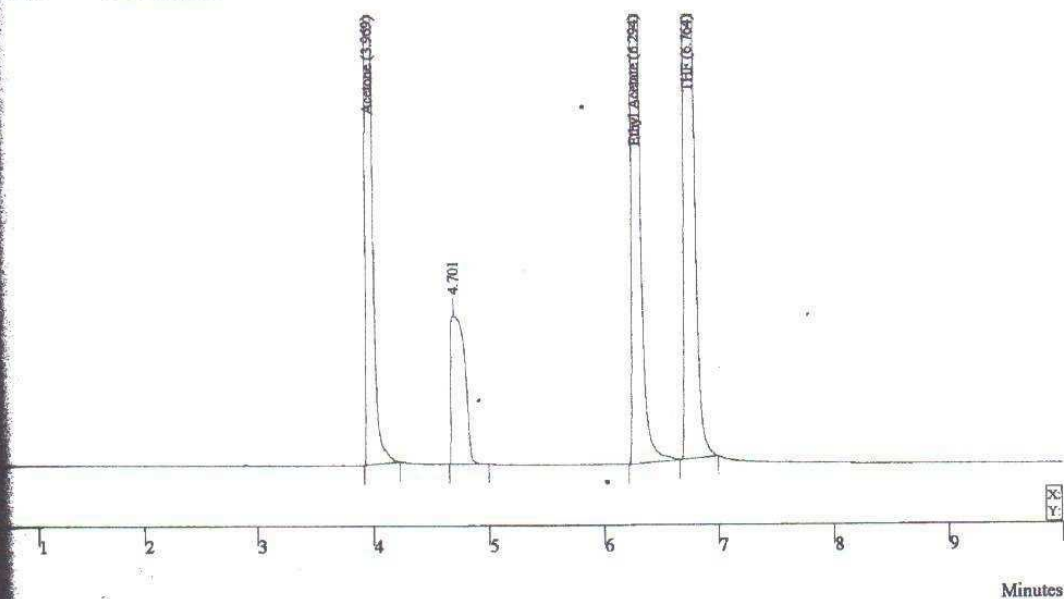
| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|-----------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 28.7303 | 3.967 | 8642 | 0.00 | BB |
| | 6.7133 | 4.697 | 2019 | 0.00 | BB |
| Acetate | 25.1715 | 6.289 | 7571 | 0.00 | BV |
| | 39.3849 | 6.759 | 11847 | 0.00 | VB |
| | 100.0000 | | 30079 | | |

c:\star\data\thf in atmosphere\thf-ea-acetone in
atmosphere 2005\calibration curve\ std
5.2mg-ml inj 3 9-29-05.run

Front = FID RESULTS
Std 5.2mg-ml Inj 3

Inj): Anthony
Date: 09/29/05 06:56:15 PM
Method: c:\star\analysis of thf in atmosphere.mth
(min): 9.995
In:
(Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 09/30/05 10:45:24 AM
Times Calculated: 3
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|-----------|-----------|----------------|--------------------|--------------|-----------|
| | 28.5235 | 3.969 | 8514 | 0.00 | BB |
| | 6.7386 | 4.701 | 2011 | 0.00 | BB |
| Acetate | 25.1829 | 6.294 | 7517 | 0.00 | BP |
| | 39.5550 | 6.764 | 11806 | 0.00 | PB |
| | 100.0000 | | 29848 | | |

c:\star\data\thf in atmospher\thf-ea-acetone in
atmosphere 2005\calibration curve\ std
13mg-ml inj 1 9-29-05.run

Front = FID RESULTS

Std 13mg-ml Inj 1

Anthony

09/29/05 07:09:45 PM

Method: c:\star\analysis of thf in atmosphere.mth

min): 9.994

(Inj): Varian Star #2

Operator (Calc):

Anthony

Calc Date:

09/30/05 10:46:04 AM

Times Calculated:

5

Calculation Method:

c:\star\analysis of thf in atmosphere.mth

Instrument (Calc):

Varian Star #2

Run Mode:

Analysis

Peak Measurement:

Peak Area

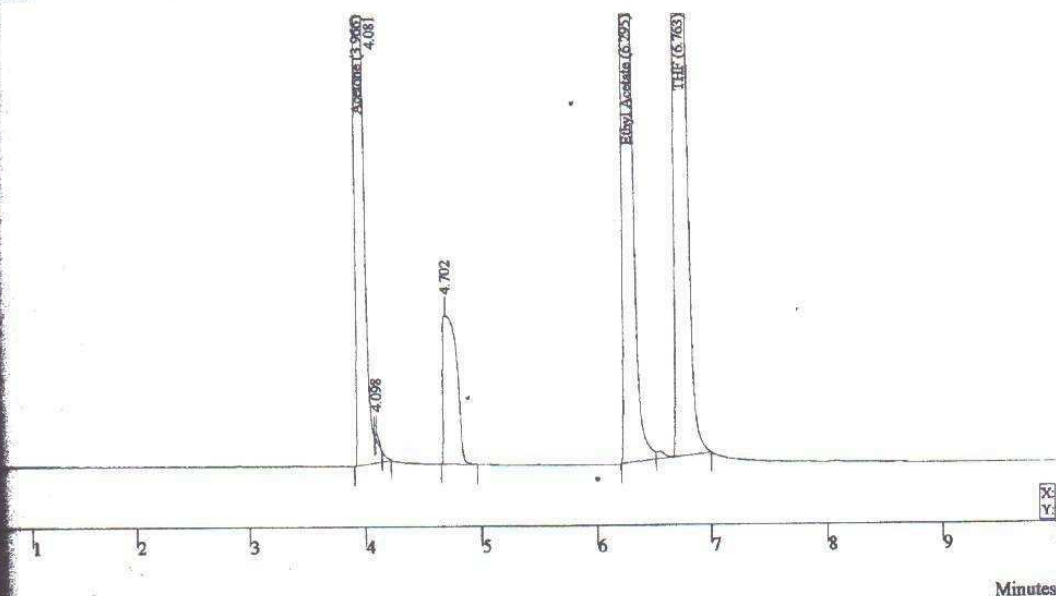
Calculation Type:

Percent

Calibration Level:

N/A

Verification Tolerance: N/A



Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|-----------|-----------|----------------|--------------------|--------------|-----------|
| | 29.8524 | 3.966 | 23229 | 0.00 | BB |
| | 0.0001 | 4.081 | 0 | 0.00 | TF |
| | 0.0272 | 4.098 | 21 | 0.00 | TF |
| | 2.5703 | 4.702 | 2000 | 0.00 | BB |
| Acetone | 26.5368 | 6.295 | 20649 | 0.00 | BV |
| | 41.0131 | 6.763 | 31914 | 0.00 | VB |
| | 99.9999 | | 77813 | | |

data\thf in atmosphere\thf-ca-acetone in
 sphere 2005\calibration curve\ std
 -ml inj 2 9-29-05.run

Front = FID RESULTS

Std 13mg-ml Inj 2

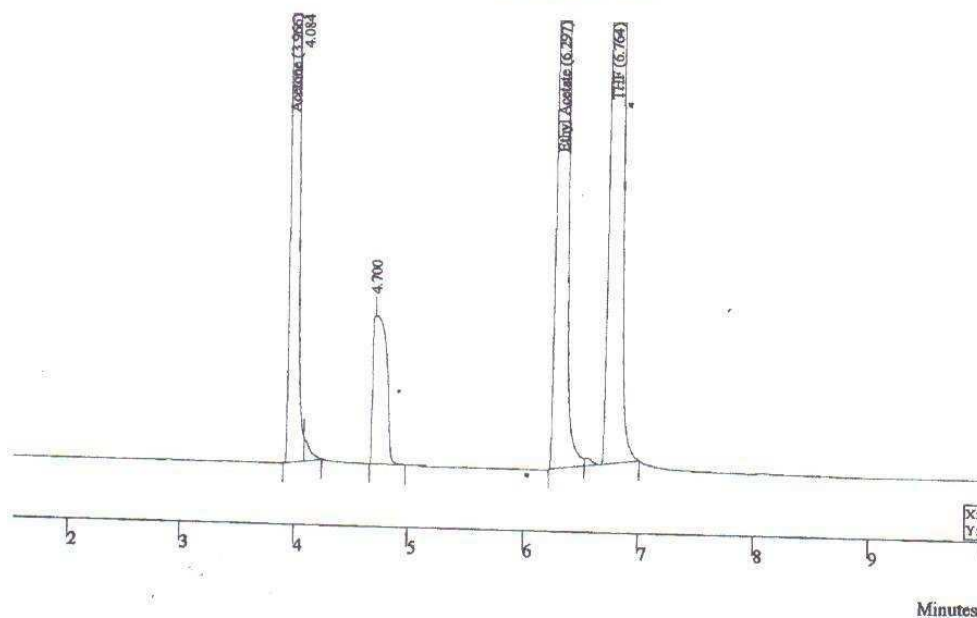
Anthony

09/29/05 07:23:13 PM

c:\star\analysis of thf in atmosphere.mth
 9.991

Varian Star #2

Operator (Calc): Anthony
 Calc Date: 09/30/05 10:46:04 AM
 Times Calculated: 5
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



iber: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result (%) | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|-----------|------------|----------------|--------------------|--------------|-----------|
| | 29.7103 | 3.966 | 23069 | 0.00 | BV |
| | 0.1650 | 4.084 | 128 | 0.00 | VB |
| | 2.5684 | 4.700 | 1994 | 0.00 | BB |
| | 26.5728 | 6.297 | 20632 | 0.00 | BV |
| | 40.9835 | 6.764 | 31822 | 0.00 | VB |
| | 100.0000 | | 77645 | | |

data\thf in atmospher\thf-ea-acetone in
 phre 2005\calibration curve\ std
 ml inj 3 9-29-05.run

Front = FID RESULTS

Std 13mg-ml Inj 3

Anthony

09/29/05 07:36:41 PM

c:\star\analysis of thf in atmosphere.mth
 9.995

Varian Star #2

Operator (Calc):

Anthony

Calc Date:

09/30/05 10:46:04 AM

Times Calculated:

5

Calculation Method:

c:\star\analysis of thf in atmosphere.mth

Instrument (Calc):

Varian Star #2

Run Mode:

Analysis

Peak Measurement:

Peak Area

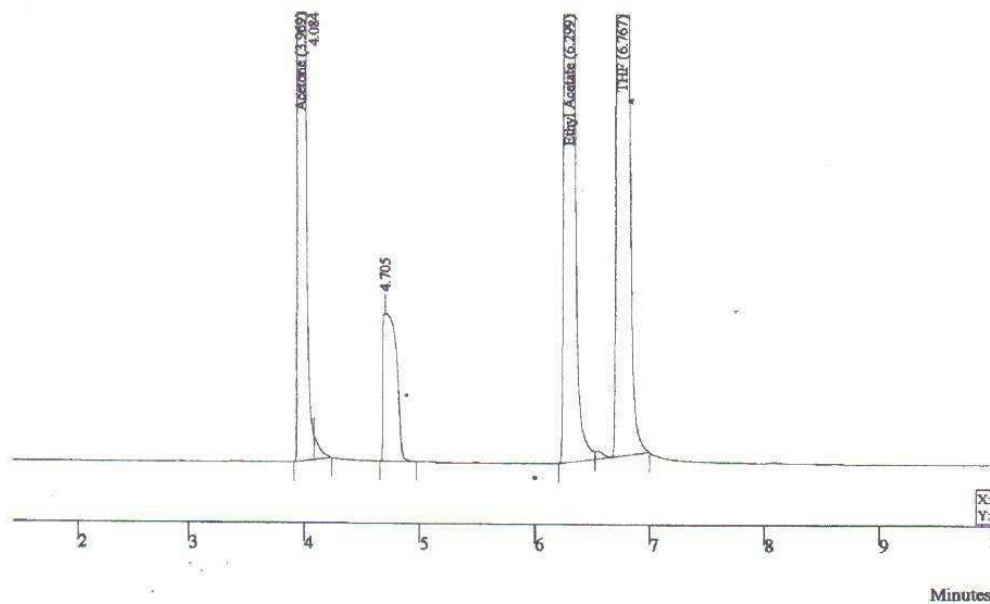
Calculation Type:

Percent

Calibration Level:

N/A

Verification Tolerance: N/A



umber: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|-----------|-----------|----------------|--------------------|--------------|-----------|
| | 29.7937 | 3.969 | 22294 | 0.00 | BV |
| | 0.1616 | 4.084 | 121 | 0.00 | VB |
| | 2.6365 | 4.705 | 1973 | 0.00 | BB |
| | 26.5172 | 6.299 | 19842 | 0.00 | BV |
| | 40.8911 | 6.767 | 30597 | 0.00 | VB |
| | 100.0001 | | 74827 | | |

c:\star\data\thf in atmosphere\thf-ea-acetone in
atmosphere 2005\calibration curve\ std
26mg-ml inj 1 9-29-05.run

Front = FID RESULTS

Std 26mg-ml Inj 1

Operator: Anthony

Date: 09/29/05 07:50:10 PM

Method: c:\star\analysis of thf in atmosphere.mth

Injection: 9.995

Injection: Varian Star #2

Operator (Calc):

Anthony

Calc Date:

09/30/05 10:46:32 AM

Times Calculated:

2

Calculation Method:

c:\star\analysis of thf in atmosphere.mth

Instrument (Calc):

Varian Star #2

Run Mode:

Analysis

Peak Measurement:

Peak Area

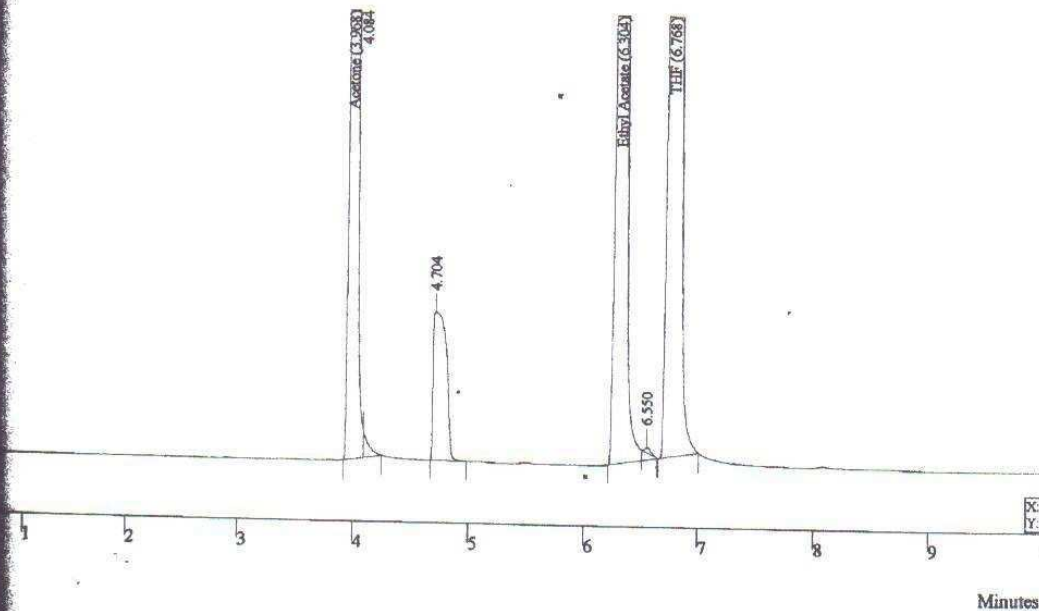
Calculation Type:

Percent

Calibration Level:

N/A

Verification Tolerance: N/A



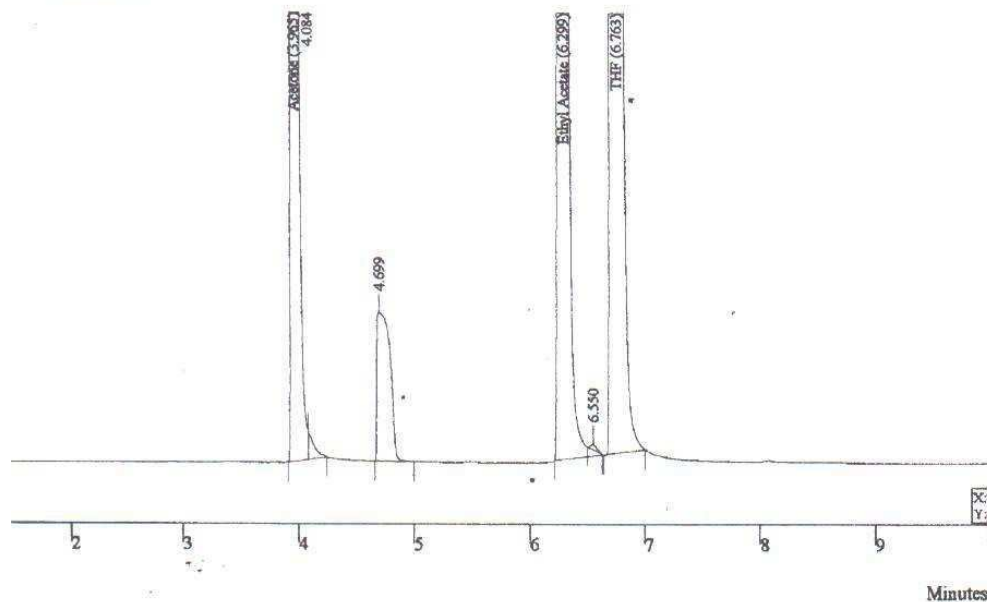
Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|-----------|-----------|----------------|--------------------|--------------|-----------|
| | 29.7126 | 3.968 | 41473 | 0.00 | BV |
| | 0.0952 | 4.084 | 133 | 0.00 | VB |
| | 1.3872 | 4.704 | 1936 | 0.00 | BB |
| Acetone | 27.2591 | 6.304 | 38048 | 0.00 | BP |
| | 0.0220 | 6.550 | 31 | 0.00 | TS |
| | 41.5240 | 6.768 | 57959 | 0.00 | PB |
| | 100.0001 | | 139580 | | |

data\thf in atmospher\thf-ea-acetone in
 here 2005\calibration curve\ std
 nl inj 2 9-29-05.run
 Front = FID RESULTS
 Std 26mg-ml Inj 2
 Anthony
 09/29/05 08:03:38 PM
 c:\star\analysis of thf in atmosphere.mth
 9.991

Operator (Calc): Anthony
 Calc Date: 09/30/05 10:46:33 AM
 Times Calculated: 2
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A

Varian Star #2



umber: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|-----------|-----------|----------------|--------------------|--------------|-----------|
| | 30.0796 | 3.965 | 42823 | 0.00 | BV |
| | 0.1013 | 4.084 | 144 | 0.00 | VB |
| | 1.3695 | 4.699 | 1950 | 0.00 | BB |
| | 27.1812 | 6.299 | 38697 | 0.00 | BB |
| | 0.0227 | 6.550 | 32 | 0.00 | TS |
| | 41.2457 | 6.763 | 58720 | 0.00 | VB |
| | 100.0000 | | 142366 | | |

data\thf in atmospher\thf-ea-acetone in
 here 2005\calibration curve\ std
 ml inj 3 9-29-05.run

Front = FID RESULTS

Std 26mg-ml Inj 3

Anthony

09/29/05 08:17:06 PM

c:\star\analysis of thf in atmosphere.mth

9.997

Varian Star #2

Operator (Calc):

Anthony

Calc Date:

09/30/05 10:46:33 AM

Times Calculated:

2

Calculation Method:

c:\star\analysis of thf in atmosphere.mth

Instrument (Calc):

Varian Star #2

Run Mode:

Analysis

Peak Measurement:

Peak Area

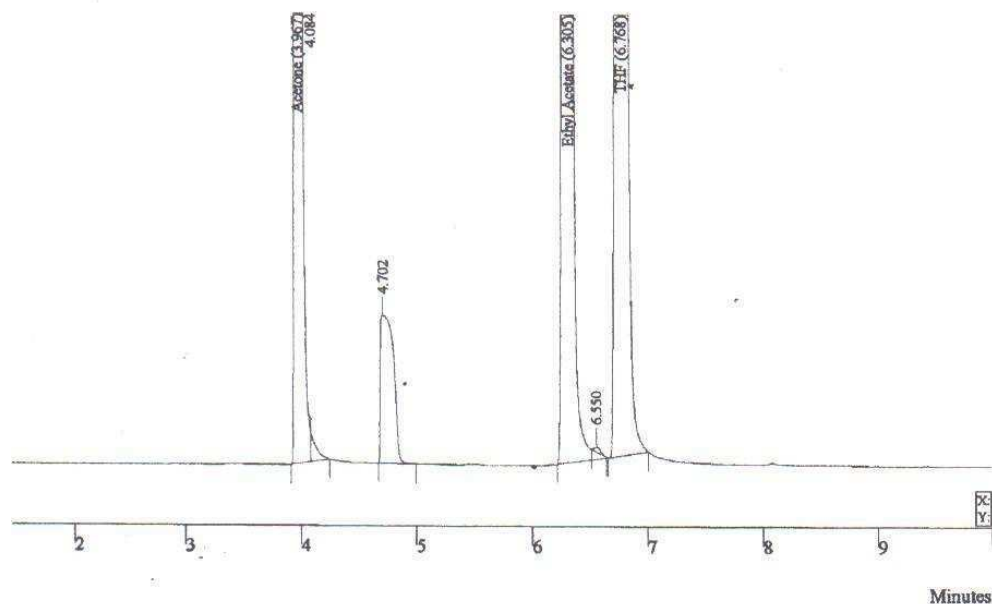
Calculation Type:

Percent

Calibration Level:

N/A

Verification Tolerance: N/A



umber: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|-----------|-----------|----------------|--------------------|--------------|-----------|
| | 29.9560 | 3.967 | 41981 | 0.00 | BV |
| | 0.0926 | 4.084 | 130 | 0.00 | VB |
| | 1.3875 | 4.702 | 1944 | 0.00 | BB |
| | 27.2167 | 6.305 | 38142 | 0.00 | BP |
| | 0.0246 | 6.550 | 35 | 0.00 | TS |
| | 41.3226 | 6.768 | 57910 | 0.00 | PB |
| | 100.0000 | | 140142 | | |

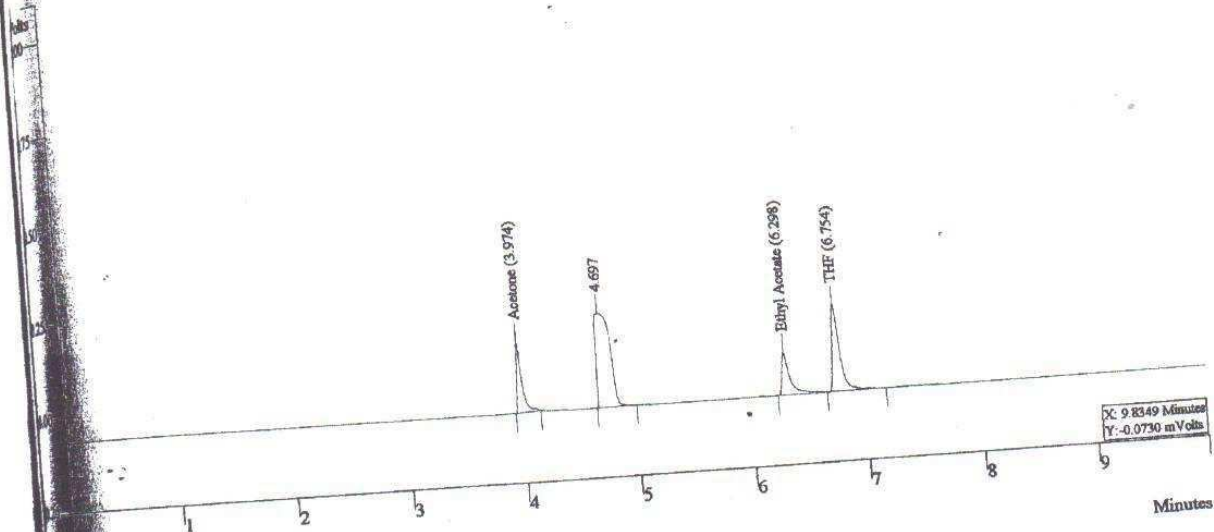
io Chemicals Ltd

Emissions of Solvents from Scrubber

Appendix C – Chromatograms for Recovery

Data File: c:\star\data\thf in atmosphere\thf-ca-acetone in atmosphere 2005\calibration curve\ rec 0.52mg-ml 1 10-5-05.run
 Channel: Front = FID RESULTS
 Sample ID: Rec 0.52mg-ml 1
 Operator (Inj): Anthony
 Injection Date: 10/05/05 10:32:28 AM
 Injection Method: c:\star\analysis of thf in atmosphere.mth
 Run Time (min): 9.995
 Workstation:
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 10/05/05 11:50:58 AM
 Times Calculated: 2
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A

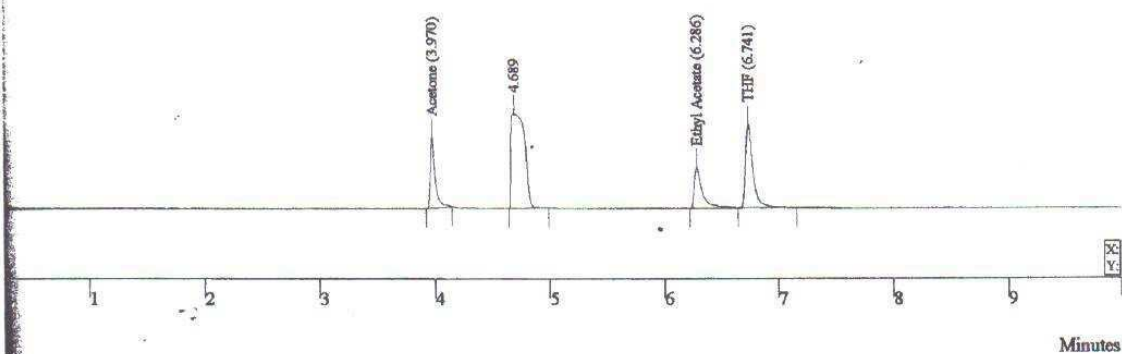


Prep Info
 Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| | 13.2421 | 3.974 | 571 | 0.00 | BB |
| Acetone | 49.5400 | 4.697 | 2135 | 0.00 | BB |
| | 12.8829 | 6.298 | 555 | 0.00 | BV |
| Ethyl Acetate | 24.3350 | 6.754 | 1049 | 0.00 | VB |
| THF | | | 4310 | | |
| Totals | 100.0000 | | | | |

File: c:\star\data\thf in atmospher\thf-ea-acetone in
atmosphere 2005\calibration curve\ rec
0.52mg-ml 2 10-5-05.run
Inlet: Front = FID RESULTS
Sample ID: Rec 0.52mg-ml 2
Operator (Inj): Anthony
Injection Date: 10/05/05 10:45:57 AM
Injection Method: c:\star\analysis of thf in atmosphere.mth
Time (min): 9.991
Injection Station:
Injection Vessel (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 10/05/05 11:50:58 AM
Times Calculated: 2
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



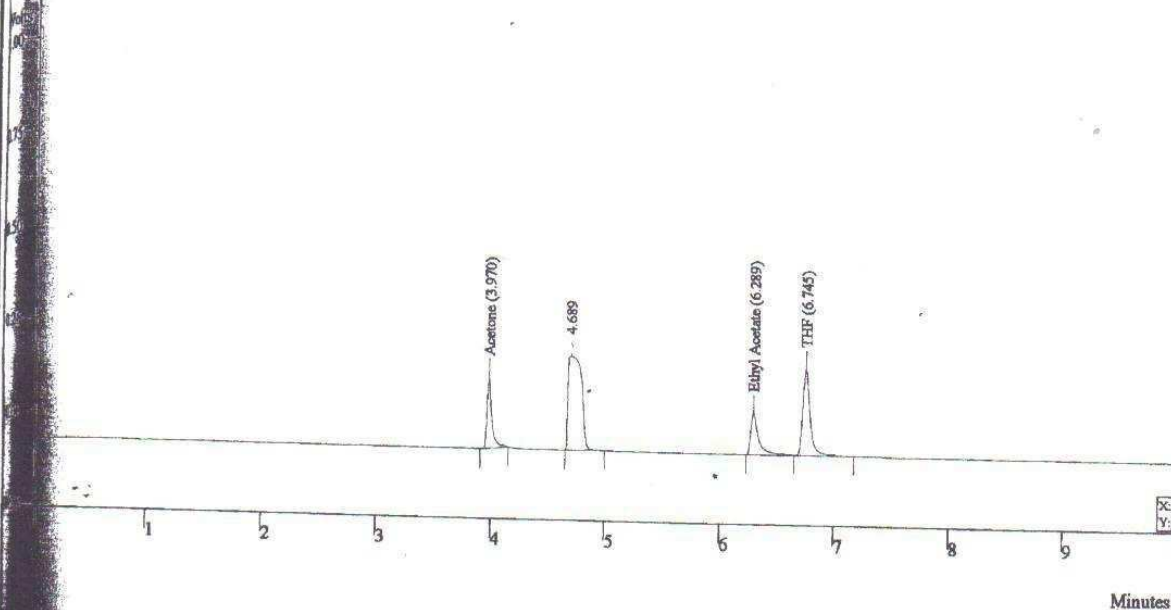
Rep Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result (%) | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|------------|----------------|--------------------|--------------|-----------|
| Acetone | 13.3566 | 3.970 | 561 | 0.00 | BB |
| | 49.8706 | 4.689 | 2095 | 0.00 | BB |
| Ethyl Acetate | 12.7550 | 6.286 | 536 | 0.00 | BV |
| THF | 24.0178 | 6.741 | 1009 | 0.00 | VB |
| Totals | 100.0000 | | 4201 | | |

Data File: c:\star\data\thf in atmosphere\thf-ea-acetone in atmosphere 2005\calibration curve\ rec 0.52mg-ml 3 10-5-05.run
 Channel: Front = FID RESULTS
 Sample ID: Rec 0.52mg-ml 3
 Operator (Inj): Anthony
 Injection Date: 10/05/05 10:59:24 AM
 Injection Method: c:\star\analysis of thf in atmosphere.mth
 Run Time (min): 9.992
 Workstation:
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 10/05/05 11:50:58 AM
 Times Calculated: 2
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



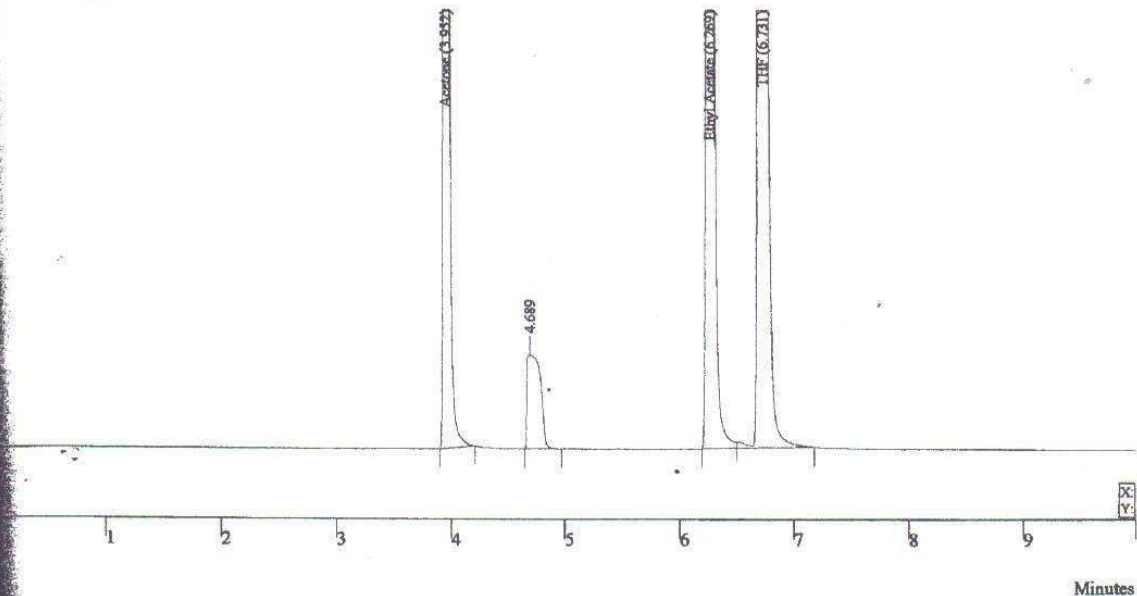
Prep Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 13.3346 | 3.970 | 568 | 0.00 | BB |
| | 49.5308 | 4.689 | 2109 | 0.00 | BB |
| Ethyl Acetate | 12.8277 | 6.289 | 546 | 0.00 | BV |
| THF | 24.3069 | 6.745 | 1035 | 0.00 | VB |
| Totals | 100.0000 | | 4258 | | |

Data File: c:\star\data\thf in atmospher\thf-ea-acetone in
atmosphere 2005\calibration curve\rec
13mg-ml 1 10-5-05.run
Channel: Front = FID RESULTS
Sample ID: Rec 13mg-ml 1
Operator (Inj): Anthony
Injection Date: 10/05/05 11:12:53 AM
Injection Method: c:\star\analysis of thf in atmosphere.mth
Run Time (min): 9.997
Workstation:
Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 10/05/05 11:50:58 AM
Times Calculated: 2
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



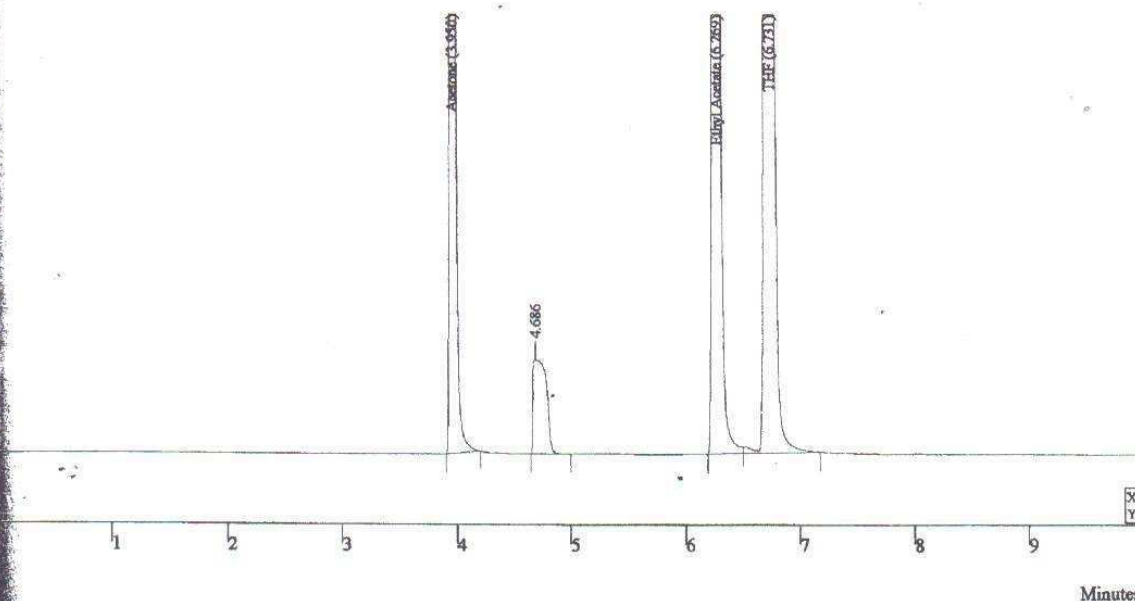
Prep Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 26.4813 | 3.952 | 18334 | 0.00 | BB |
| | 2.9660 | 4.689 | 2053 | 0.00 | BB |
| Ethyl Acetate | 26.5668 | 6.269 | 18393 | 0.00 | BV |
| THF | 43.9860 | 6.731 | 30453 | 0.00 | VB |
| Totals | 100.0001 | | 69233 | | |

Data File: c:\star\data\thf in atmospher\thf-ca-acetone in
atmosphere 2005\calibration curve\ rec
13mg-ml 2 10-5-05.run
Channel: Front = FID RESULTS
Sample ID: Rec 13mg-ml 2
Operator (Inj): Anthony
Injection Date: 10/05/05 11:26:21 AM
Injection Method: c:\star\analysis of thf in atmosphere.mth
Run Time (min): 9.993
Workstation:
Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 10/05/05 11:50:59 AM
Times Calculated: 2
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



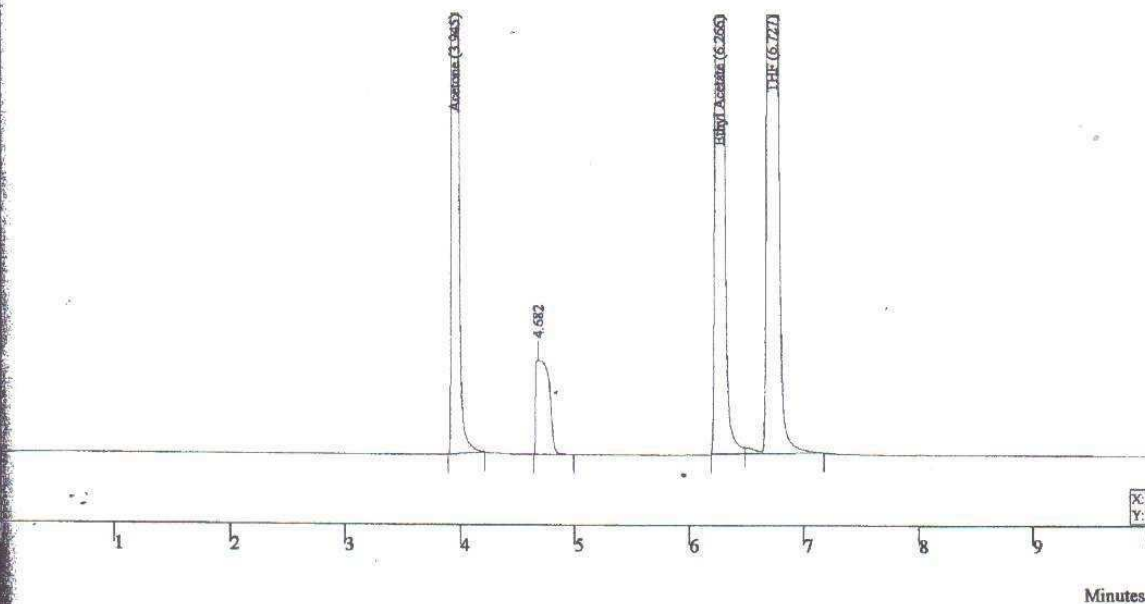
Prep Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 26.4196 | 3.950 | 18735 | 0.00 | BB |
| | 2.9107 | 4.686 | 2064 | 0.00 | BB |
| Ethyl Acetate | 26.6576 | 6.269 | 18904 | 0.00 | BV |
| THF | 44.0121 | 6.731 | 31210 | 0.00 | VB |
| Totals | 100.0000 | | 70913 | | |

Data File: c:\star\data\thf in atmosphere\thf-ea-acetone in atmosphere 2005\calibration curve\ rec 13mg-ml 3 10-5-05.run
 Channel: Front = FID RESULTS
 Sample ID: Rec 13mg-ml 3
 Operator (Inj): Anthony
 Injection Date: 10/05/05 11:39:49 AM
 Injection Method: c:\star\analysis of thf in atmosphere.mth
 Run Time (min): 9.998
 Workstation:
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 10/05/05 11:50:59 AM
 Times Calculated: 2
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



File Prep Info

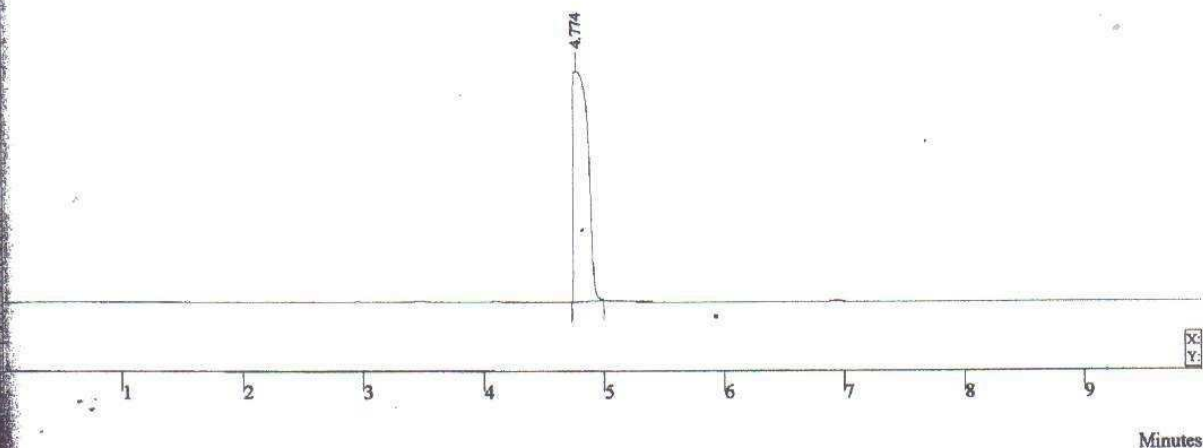
Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|----------------|--------------------|--------------|-----------|
| Acetone | 26.8380 | 3.945 | 18993 | 0.00 | BB |
| | 2.9248 | 4.682 | 2070 | 0.00 | BB |
| Ethyl Acetate | 26.5407 | 6.266 | 18783 | 0.00 | BV |
| THF | 43.6965 | 6.727 | 30924 | 0.00 | VB |
| Totals | 100.0000 | | 70770 | | |

Appendix D – Chromatograms of Samples

Data File: c:\star\data\thf in atmosphere\thf-ca-acetone in
atmosphere 2005\sample\ sample front 1
10-3-05.run
Channel: Front = FID RESULTS
Sample ID: Sample Front 1
Operator (Inj): Anthony
Injection Date: 10/03/05 06:09:56 PM
Injection Method: c:\star\analysis of thf in atmosphere.mth
Run Time (min): 9.994
Workstation:
Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 10/03/05 06:20:01 PM
Times Calculated: 1
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



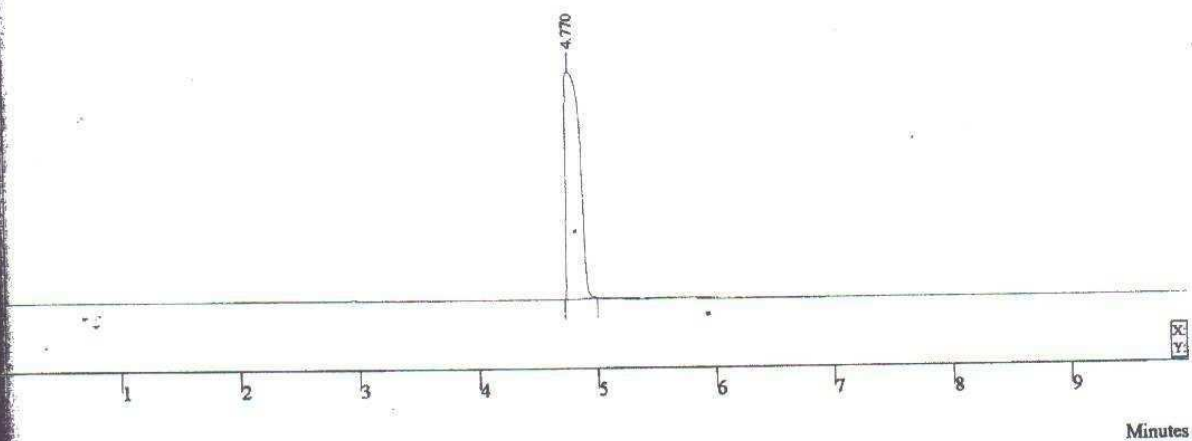
Sample Prep Info

15 Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak | Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|------|---------------|-----------------|----------------|--------------------|--------------|-----------|
| | | 100.0000 | 4.774 | 2136 | 0.00 | BB |
| | Totals | 100.0000 | | 2136 | | |

Data File: c:\star\data\thf in atmosphere\thf-ea-acetone in
atmosphere 2005\sample\ sample back 1
10-3-05.run
Channel: Front = FID RESULTS
Sample ID: Sample Back 1
Operator (Inj): Anthony
Injection Date: 10/03/05 06:23:27 PM
Injection Method: c:\star\analysis of thf in atmosphere.mth
Run Time (min): 9.993
Workstation:
Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 10/03/05 06:33:33 PM
Times Calculated: 1
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



Sample Prep Info

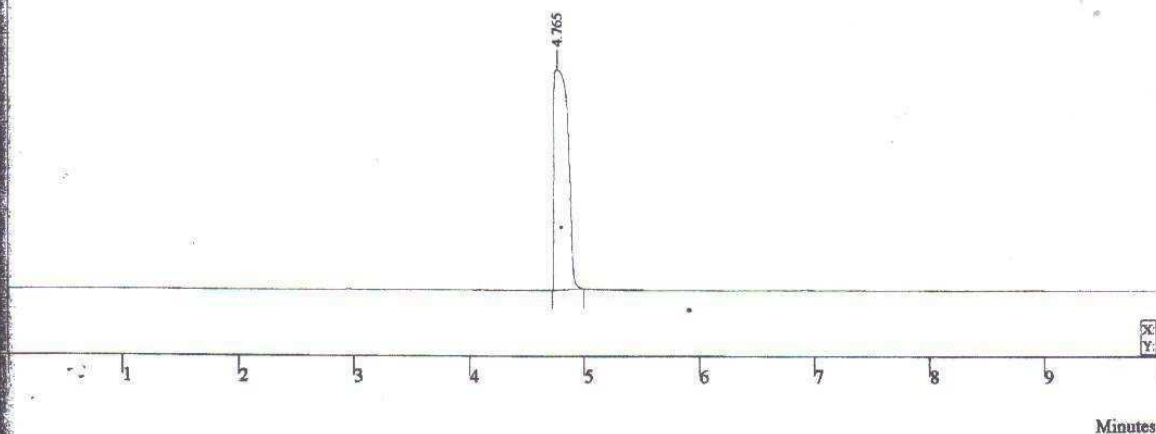
16 Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak | Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|------|---------------|-----------------|----------------|--------------------|--------------|-----------|
| 1 | | 100.0000 | 4.770 | 2109 | 0.00 | BB |
| | Totals | 100.0000 | | 2109 | | |

Data File: c:\star\data\thf in atmospher\thf-ea-acetone in
atmosphere 2005\sample\ sample front 2
10-3-05.run

Channel: Front = FID RESULTS
Sample ID: Sample Front 2
Operator (Inj): Anthony
Injection Date: 10/03/05 06:36:58 PM
Injection Method: c:\star\analysis of thf in atmosphere.mth
Run Time (min): 9.994
Workstation:
Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 10/03/05 06:47:04 PM
Times Calculated: 1
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



Sample Prep Info

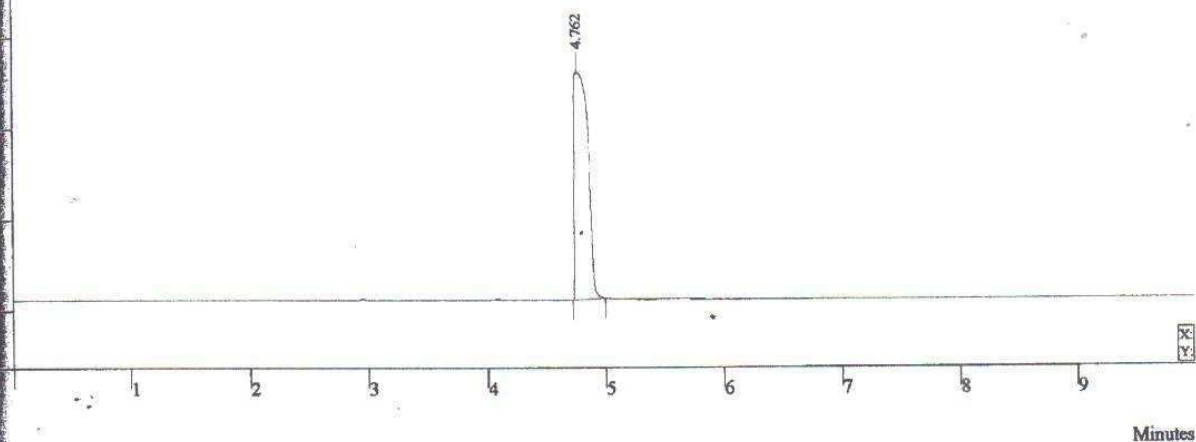
17 Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak No | Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|------------|-----------|-----------|----------------------|--------------------|--------------------|--------------|
| | | 100.0000 | 4.765 | 2147 | 0.00 | BB |
| | Totals | 100.0000 | | 2147 | | |

Data File: c:\star\data\thf in atmospher\thf-ea-acetone in
atmosphere 2005\sample\ sample back 2
10-3-05.run

Channel: Front = FID RESULTS
Sample ID: Sample Back 2
Operator (Inj): Anthony
Injection Date: 10/03/05 06:50:29 PM
Injection Method: c:\star\analysis of thf in atmosphere.mth
Run Time (min): 9.995
Workstation:
Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 10/03/05 07:00:34 PM
Times Calculated: 1
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



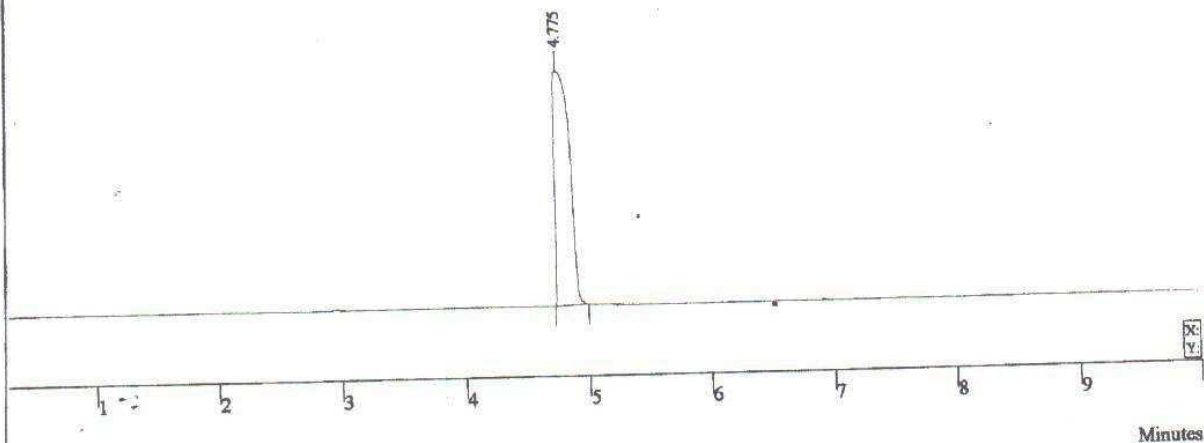
Sample Prep Info

18 Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak No | Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------|-----------|-----------|----------------|--------------------|--------------|-----------|
| 1 | | 100.0000 | 4.762 | 2077 | 0.00 | BB |
| Totals | | 100.0000 | | 2077 | | |

File: c:\star\data\thf in atmosphere\thf-ea-acetone in
atmosphere 2005\sample\ blank front 1
10-3-05.run
Front = FID RESULTS
Blank Front 1
Operator (Inj): Anthony
Injection Date: 10/03/05 05:15:53 PM
Injection Method: c:\star\analysis of thf in atmosphere.mth
Retention Time (min): 9.994
Injection Station:
Injection Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
Calc Date: 10/03/05 05:25:59 PM
Times Calculated: 1
Calculation Method: c:\star\analysis of thf in atmosphere.mth
Instrument (Calc): Varian Star #2
Run Mode: Analysis
Peak Measurement: Peak Area
Calculation Type: Percent
Calibration Level: N/A
Verification Tolerance: N/A



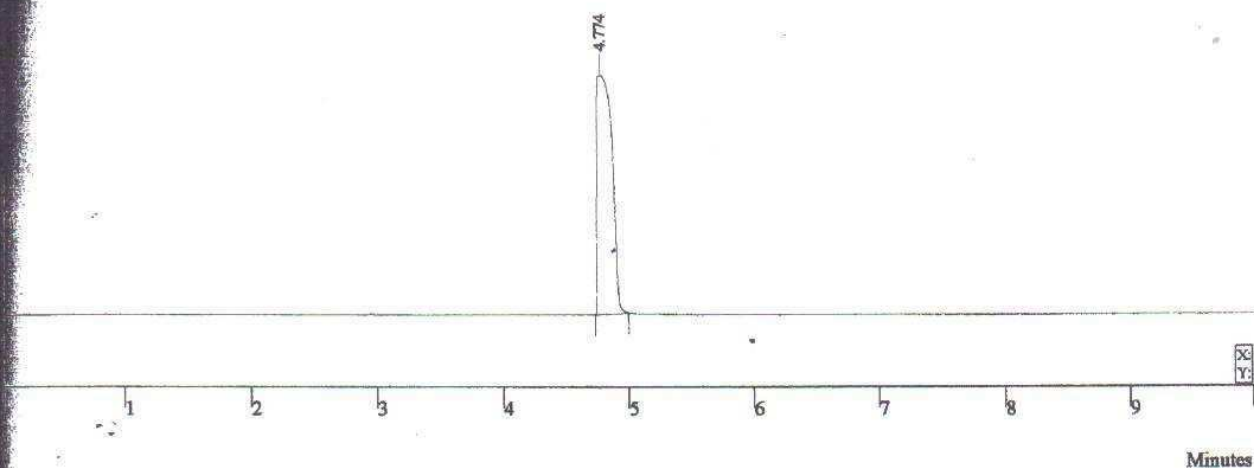
Prep Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|-----------|-----------|----------------|--------------------|--------------|-----------|
| | 100.0000 | 4.775 | 2070 | 0.00 | BB |
| Totals | 100.0000 | | 2070 | | |

File: c:\star\data\thf in atmospher\thf-ea-acetone in
 atmosphere 2005\sample\ blank back 1
 10-3-05.run
 Front = FID RESULTS
 ID: Blank Back 1
 Operator (Inj): Anthony
 Inj Date: 10/03/05 05:29:24 PM
 Inj Method: c:\star\analysis of thf in atmosphere.mth
 Ret Time (min): 9.991
 Station:
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 10/03/05 05:39:28 PM
 Times Calculated: 1
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



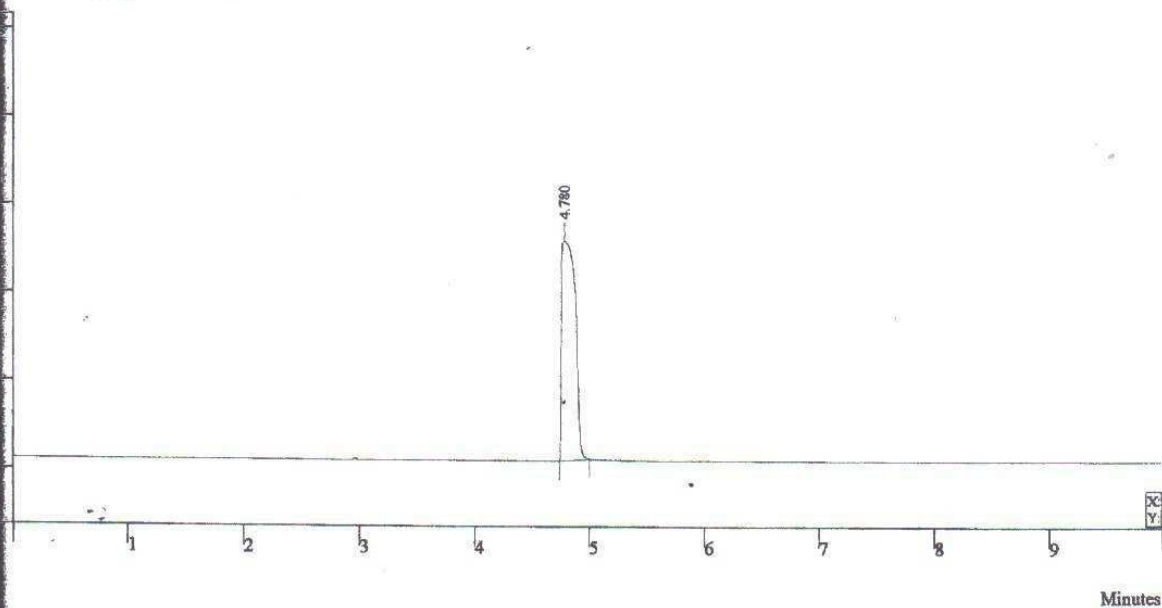
Sample Prep Info

14 Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak No | Peak Name | Result (%) | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|------------|---------------|-----------------|----------------------|--------------------|--------------------|--------------|
| | | 100.0000 | 4.774 | 2122 | 0.00 | BB |
| | Totals | 100.0000 | | 2122 | | |

Data File: c:\star\data\thf in atmosphere\thf-ea-acetone in atmosphere 2005\sample\ blank front 2 10-3-05.run
 Channel: Front = FID RESULTS
 Sample ID: Blank Front 2
 Operator (Inj): Anthony
 Injection Date: 10/03/05 05:42:54 PM
 Injection Method: c:\star\analysis of thf in atmosphere.mth
 Run Time (min): 9.997
 Workstation:
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 10/03/05 05:52:59 PM
 Times Calculated: 1
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



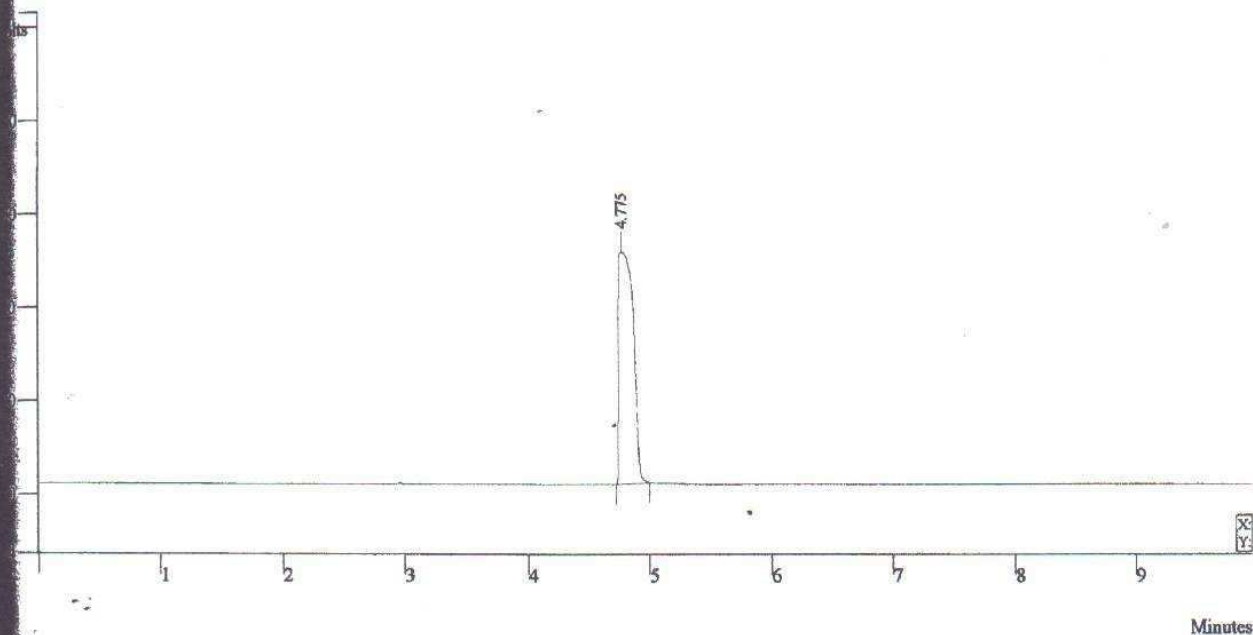
Sample Prep Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak No | Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|-----------------|----------------|--------------------|--------------|-----------|
| 1 | | 100.0000 | 4.780 | 2088 | 0.00 | BB |
| Totals | | 100.0000 | | 2088 | | |

Data File: c:\star\data\thr in atmosphere\thr-ea-acetone in atmosphere 2005\sample\blank back 2 10-3-05.run
 Channel: Front = FID RESULTS
 Sample ID: Blank Back 2
 Operator (Inj): Anthony
 Injection Date: 10/03/05 05:56:25 PM
 Injection Method: c:\star\analysis of thf in atmosphere.mth
 Run Time (min): 9.993
 Workstation:
 Instrument (Inj): Varian Star #2

Operator (Calc): Anthony
 Calc Date: 10/03/05 06:06:30 PM
 Times Calculated: 1
 Calculation Method: c:\star\analysis of thf in atmosphere.mth
 Instrument (Calc): Varian Star #2
 Run Mode: Analysis
 Peak Measurement: Peak Area
 Calculation Type: Percent
 Calibration Level: N/A
 Verification Tolerance: N/A



Sample Prep Info

Injection Number: 1 Volume: 1.0 uL Position: 1

| Peak No | Peak Name | Result () | Ret Time (min) | Peak Area (counts) | Rel Ret Time | Sep. Code |
|---------------|-----------|-----------------|----------------|--------------------|--------------|-----------|
| 1 | | 100.0000 | 4.775 | 2102 | 0.00 | BB |
| Totals | | 100.0000 | | 2102 | | |