Frontier Analysis, Ltd

**TECHNICAL SERVICE RESPONSE NO.: UT023**

**Subject:** Analysis of Samples from a Cow Mutilated in the Fall of 2001 (Logan, Utah)

**Date:** May 13, 2002

**Requested By:** Colm Kelleher
NIDS
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**Reported By:** P. A. Budinger
Analytical Scientist

## Background/Objective:

A cow was found mutilated in northern Utah (near Logan) in the fall of 2001. The object is to look for any components that should not be normally present in the animal. To accomplish this, samples of liver tissue, blood, and vitreous fluid from the mutilated animal were submitted for analysis. Additionally, the analytical results of the vitreous fluid from the mutilated animal are compared to that from a control animal as an aid to achieve this objective.

## Conclusions:

1.) Comparison of the analytical results from the vitreous fluids from a control heifer and the mutilated animal reveals differences in phenolic type materials. The vitreous fluid contains higher amounts of as well as additional phenolic types. It is speculated that these could originate from decomposition products of drugs and/or controlled substances. Many of these substances have similar phenolic functionalities as part of their structures. See Table IV.

2.) A trace amount of oxindole (ca. 0.6 pm) was also found in the vitreous fluid of the mutilated animal. The low amount indicates it is a byproduct of natural biological compounds found in the animal such as low levels of tryptophan.[1]

3.) A specific drug structure is not identified by this analysis for the possible following three reasons: 1) it is totally deteriorated, that is, only the byproducts exist; 2) the chemical

[1] Oxindole was found in very high concentration in the vitreous fluid and tissues from a mutilated animal found June 2001 in Montana. Its concentrations were too high (50-100 ppm in the vitreous fluid) to be from a natural origin. This indicated the animal was sedated before death. See T. S. R. Nos. UT016 and UT022.

nature of the drug is not amenable to detection by the analytical procedure employed[2], 3) a foreign material (drug) was not administered to the animal before euthanasia. (This analyst feels the reasons are a combination of the 1 and 2 speculations. The 3 speculation is least likely because of the presence of high concentrations of phenolics.)

**Procedure:**

**Samples:** The following samples were submitted in plastic vials surrounded by cold packs. All samples were from the mutilated Utah animal and received 2/27/2002.

- Liver tissue
- Blood
- Vitreous fluid

The liver tissue and blood were extracted with HPLC grade methylene chloride. Solvent was added to the "as received" sample, and it was allowed to soak for 8 days in the refrigerator. The sample was subjected to ultrasonic agitation for approximately one hour a day. The solvent was not completely removed and reduced to 2 mls. Both GC/MS and infrared analyses were then performed on all the extracts to characterize their chemical nature. The vitreous fluid was examined "as received" by GC/MS using the same conditions reported in T.S.R. Nos.: 016 and 022. The GC/MS results of the vitreous fluid were compared to vitreous fluid from a control animal. The control animal had been obtained from a slaughterhouse. It was exposed to environmental conditions expected for mutilated animal carcass. It was laid out for 4 days, and protected from predators and scavengers.

Detailed information regarding the instrumental data acquisition conditions can be found in the appendix.

**Results:**

The results of the individual tests performed on the blood, liver tissue and vitreous fluid follow. All tables and figures referenced in this report can be found in an appendix.

## LIVER TISSUE

**GC/MS Analysis:** Significant amounts of liver tissue were methylene chloride extractable. GC/MS analysis shows mostly natural products dominated by fatty acids and esters. No unexpected foreign materials are detected. The GC chromatogram of the extract is shown in figure 1. The MS identifications presented in Table I.

**Infrared Analysis:** This analysis supports the GC/MS results. The spectrum shows a predominance of fatty acids and some ester (specifically suggested is a glycerol fatty acid ester derivative). Additionally, a minor amount of possibly a phosphorus or sulfonated component is indicated. Some of these materials were not detected by GC/MS because they would not pass through the GC column. The spectrum with pertinent peaks labeled is shown in figure 2.

[2] The chemical structure may have not been amenable to GC (gas chromatography) separation because of high molecular weight and boiling point, or possibly it was in salt form such as a hydrochloride salt, sulfate etc. Also, it is possible that the drug may not have been soluble in methylene chloride used in extracting the liver tissue and the blood.

## BLOOD

**GC/MS Analysis**: Only a small amount of material was extracted by methylene chloride from the blood. The GC/MS analysis of the extract detects components that appear to be natural. No oxindole or other unusual materials are detected. Figure 3 shows the GC chromatogram. Table II displays the MS identifications.

**Infrared Analysis:** An infrared spectrum of the methylene chloride extract shows the extract is primarily long chain fatty acid esters which are probably attached to glycerol. Must of this high molecular weight material will not pass through a GC column, and therefore would not be detected by GC/MS analysis. The spectrum is displayed in figure 4.

## VITREOUS FLUID

**GC/MS Analysis:** Comparison of the analytical results of the vitreous fluids from the mutilated animal and the control heifer expectedly show mostly natural products and putrefaction products. Additionally, the data suggest small, but significant, differences in phenolic type materials. The mutilated cow vitreous fluid contains higher amounts as well as additional phenolic types. Phenol in the mutilated cow amounts to 80 ppm, which is significantly higher than the 15 ppm observed in the control fluid. The GC chromatogram is shown in figure 5. The chromatogram of the control fluid can be found in figure 6. The MS identifications of the GC peaks of the vitreous fluids from both animals are presented in Table III. It is speculated that the excess phenolics could originate from decomposition products of drugs and/or controlled substances. Many of these substances have similar phenolic functionalities as part of their structures. The phenolic structures suggested by the MS analysis are singled out and shown along with a few drugs and controlled substances having structural similarities in Table IV.

**Acknowledgments:** I wish to thank and acknowledge Richard L. Wilson for the GC/MS analysis.

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Phyllis A. Budinger

Distribution:

R. L. Wilson

# APPENDIX

## Instrumental Data Acquisitions Conditions

**Infrared:** Both transmittance and reflectance infrared spectra were obtained from the samples using a Nicolet Avatar 360 spectrometer. Transmittance spectra were obtained from smears on KBr crystals. Reflectance spectra were acquired using the Harrick SplitPea® sampling accessory.

**GC/MS:** A Hewlett-Packard GC/MS (DOS-MSD/ChemStation) employing a 6890 gas chromatography, 5973 Mass selective detector and capillary injection system was used for analysis. Chromatographic separation was accomplished by using a 60m x 0.32mm i.d., 1.0 mm film thickness DB-1 capillary column from J&W Scientific (sn 0433924; Cat # 123-1063). The following GC/MS conditions were used:

| | |
|---|---|
| Instrument: | GC/MS-4 |
| Injector Temp: Inj. 300°C | |
| GC Oven Program: | 50°C (0.0 min.) to 290°C @ 10.0°C/min. (36.0 min.) |
| Injection Volume: | 1.0 μl, splitless |
| Run Time: | 60.6 min. |
| MS Run Type: Scan | |
| Mass Range: | 25-600 Da; Scan threshold: 100 |
| Scan Start Time: | 0 min. |
| Sampling: | No.=5 |
| Multiplier Volt.: Emv offset=200; | resulting volt.=1490 |
| Method File: | RWSVM.M |
| Tune File: | ATUNE.U |

**Table I**

**GC/MS Data from Methylene Chloride Extraction of Liver Tissue from a Mutilated Cow**

| Compound | Match | GC Retention Time (min.) |
|---|---|---|
| •Propanoic acid, ethyl ester | 94 | 5.794 |
| •C5 Amine | | 5.993 |
| (1-Butanamine, 3-methyl-) | 72 | |
| •Butanoic acid | 87 | 6.690 |
| •Butanoic acid, ethyl ester (<20 ppm) | 96 | 7.237 |
| •Butanoic acid, propyl ester | 74 | 8.930 |
| •Benzeneethanamine (<80 ppm) | 72 | 12.714 |
| •M/Z 56 Nitrogen Compound | | 13.809 |
| (Aziridine, 1-(2-phenylethyl)-) | 64 | |
| •Benzeneacetaldehyde, .alpha.-ethylidene- | 96 | 15.153 |
| •1H-Indole | 95 | 15.402 |
| •5-Methyl-2-phenyl-2-hexenal | 94 | 18.240 |
| •MW= 195 | | 19.186 |
| (9H-Carbazole, 9-ethyl-) | 35 | |
| •C13-C15 Fatty Acid | | 21.277 |
| (Pentadecanoic acid) | 90 | |
| •~C16 Fatty Acid | | 23.417 |
| (Hexadecanoic acid) | 99 | |
| •~C18 Fatty Acid | | 25.259 |
| (9-Octadecenoic acid (Z)-) | 80 | |
| •~C18 Fatty Acid | | 25.508 |
| (Octadecanoic acid) | 99 | |
| •M/Z 85 Nitrogen Compound | | 27.848 |
| Decanamide, H-(2-hydroxyethyl)- | 72 | |
| •Cholesterol | 99 | 53.736 |

**Table II**

**GC/MS Data from Methylene Chloride Extraction* of Blood from a Mutilated Cow**

| Compound | Match | GC Retention Time (min.) |
|---|---|---|
| •Butanoic acid, ethyl ester | 80 | 7.234 |
| •2-Piperidinone (<10 ppm) | 86 | 13.358 |
| •Indole (<2 ppm) | 64 | 15.449 |
| •M/Z 171, 152 (Hydrazinecarbothioamide, 2-cyclohexylidene-) | 38 | 22.120 |
| •Cholesterol | 70 | 53.684 |

*Very small amounts of components were extracted from blood.

## TABLE III
## GC/MS Data from the Vitreous Fluid of the Mutilated Cow and the Control Heifer

| Mutilated Utah Cow | | | Control Heifer | | |
|---|---|---|---|---|---|
| **Compound** | **Match** | **GC Retention Time (min.)** | **Compound** | **Match** | **GC Retention Time (min.)** |
| •Acetaldehyde | 39 | 3.231 | •Acetaldehyde | 39 | 3.191 |
| •Methanamine, N,N-dimethyl- (Trimethylamine) | 59 | 3.480 | •Methanamine, N,N-dimethyl- (Trimethylamine) | 72 | 3.480 |
| •M/Z 44, 28 Amine | | 3.829 | - | - | - |
| 2-Butanamine, 3-methyl- | 42 | | | | |
| •M/Z 43 Urea Derivative | | 4.077 | - | - | - |
| Urea | 9 | | | | |
| •Acetic Acid (~ 53 ppm) | 72 | 4.725 | - | - | - |
| •Propanoic Acid | 23 | 5.820 | - | - | - |
| •M/Z 56 Possible C6 Nitrile or Protein Fragment | | 7.861 | - | - | - |
| Pentanenitrile, 4-methyl- | 37 | | | | |
| •Methane, sulfonylbis- (Dimethyl Sulfone) | 78 | 8.757 | - | - | - |
| - | - | - | •MW=97 C4H3NO3 | | 10.039 |
| | | | 1H-Pyrrole-2.5-dione (Maleimide) | 78 | |
| •2(5H)-Furanone, 3-methyl- | 81 | 10.151 | - | - | - |
| •Phenol (~80 ppm) | 90 | 10.350 | •Phenol (~15 ppm) | 64 | 10.369 |
| •Urea | 72 | 10.699 | - | - | - |
| •MW=94 | | 10.998 | - | - | - |
| 2-Pyridinamine or Derivative | 9 | | | | |
| Pyrimidine, 2-methyl- | 9 | | | | |
| •2,5-Pyrrolidinedione (Succinimide) (~80 ppm) | 83 | 12.093 | •MW=99 C4H4NO2 | | 12.143 |
| | | | Succinimide (~21 ppm) | 80 | |
| •Pentanamide | 10 | 12.392 | - | - | - |
| - | - | - | •M/Z 44, 98 Nitrogen Compound | | 12.597 |
| - | - | - | •M/Z 112, 56 (MW=112) | | 13.793 |
| | | | 1,4-Cyclohexanedione | 38 | |
| •W=98 Ketone | | 14.134 | - | - | - |
| 2(5H)-Furanone, 5-methyl- | 59 | | | | |
| •Benzenepropanenitrile | 87 | 14.532 | - | - | - |
| - | - | - | •M/Z 70 | | 14.742 |
| | | | L-Proline | 35 | |
| •MW=98 | | 14.931 | | | |
| 1,3-Cyclopentanedione | 78 | | | | |
| •MW=114 | | 15.130 | | | |
| Methylthiofuran | 37 | | | | |

## TABLE III (Continued)
## GC/MS Data from the Vitreous Fluid of the Mutilated Cow and the Control Heifer

| Mutilated Utah Cow | | | Control Heifer | | |
|---|---|---|---|---|---|
| **Compound** | **Match** | **GC Retention Time (min.)** | **Compound** | **Match** | **GC Retention Time (min.)** |
| - | - | - | •MW=114 | | 15.154 |
| | | | Parabanic acid | 47 | |
| •1H-Indole (~375 ppm) | 97 | 15.528 | •1H-Indole | 94 | 15.608 |
| - | - | - | •M/Z 98 | | 15.732 |
| | | | Mepivacaine | 43 | |
| •MW=112 | | 15.976 | | | |
| 1,4-Cyclohexanedione | 43 | | | | |
| | | | •MW=138 | | 16.474 |
| •MW=138 Aromatic Compound | | 16.623 | - | - | - |
| 3-Methoxy-2-methylphenol | 12 | | | | |
| 2,5-diamino-p-benzoquinone | 25 | | | | |
| Benzene, 1-methyl-2-(methylthio)- | 12 | | | | |
| •MW=152 | | 16.673 | | | |
| Benzaldehyde, 2-hydroxy-5-methoxy- | 43 | | | | |
| - | - | - | •MW=152 | | 16.763 |
| | | | 4(3H)-Pyrimidinone, 2-ethyl-3,6-dimethyl- | 38 | |
| | | | 2-Methyl-3-(2-thienyl)-2-propenal | 64 | |
| •MW=131 | | 16.922 | - | - | - |
| 1H-Indole, 3-methyl- | 90 | | | | |
| •MW=100 | | 17.022 | - | - | - |
| 2,4-Imidazolidinedione (Hydantoin) | 45 | | | | |
| - | - | - | •M/Z 100 | | 17.052 |
| | | | 4-Morpholinebutyric acid, .beta.-methyl.alpha.,. alpha.-diphenyl | 42 | |
| | | | 4,9-Decadien-2-amine, N-butyl- | 42 | |
| •M/Z 69, 56, 152 Very Poor Matches (Fragments suggest material with long chain olefinic hydrocarbons.) | | 17.420 | - | - | - |
| - | - | - | •M/Z 98 Ketone | | 17.423 |
| | | | 3-n-Butylcyclohexanone | 32 | |
| •MW=152 Aromatic | | 17.569 | - | - | - |
| Phenol, 5-methoxy-2,3-dimethyl- | 22 | | | | |
| •Oxindole (~0.6 ppm) | * | 17.82 | - | - | - |
| •MW=166 | | 17.918 | - | - | - |
| 2-Methoxy-4-dimethylaminoaniline | 43 | | | | |

## TABLE III (Continued)
## GC/MS Data from the Vitreous Fluid of the Mutilated Cow and the Control Heifer

| Mutilated Utah Cow | | | Control Heifer | | |
|---|---|---|---|---|---|
| **Compound** | **Match** | **GC Retention Time (min.)** | **Compound** | **Match** | **GC Retention Time (min.)** |
| - | - | - | •MW=166 | | 17.959 |
| | | | Phenol, 3-methoxy-2,4,6-trimethyl- | 30 | |
| •MW=166 | | 18.216 | - | - | - |
| 2,6-Dimethyl-4-oxa-endo-tricyclo(5.2.1.0**2,6)decane | 64 | | | | |
| •2,4-Imidazolidinedione (Hydantoin) | 47 | 18.366 | | | |
| •MW=166 | | 18.465 | | | |
| 2-Cyclopenten-1-one, 2-(2-butenyl)-4-hydro- | 27 | | | | |
| - | - | - | •M/Z 100, 166 | | 18.496 |
| | | | Hexahydropyrimidin-2-one | 40 | |
| •MW=107 Phenol or Pyridine Derivative | | 18.764 | - | - | - |
| Phenol, 4-(2-phenylethyl)- | 53 | | | | |
| Pyridine, 2,5-dimethyl- | 53 | | | | |
| •M/Z 138 Aromatic Compound | | 18.963 | - | - | - |
| 2-Methoxy-4-methylphenol | 38 | | | | |
| 2-Methoxy-1,4-benzenediamine | 43 | | | | |
| 2,5-Diamino-p-benzoquinone | 43 | | | | |
| - | - | - | •M/Z 138, 180 | | 19.032 |
| | | | Acetamide, N-(2-nitrophenyl)- | 38 | |
| | | | 3-Methoxy-2-methylphenol | 38 | |
| •L-Glutamic Acid | 64 | 19.361 | •M/Z 84 Glutamic Acid or Derivative | | 19.321 |
| | | | L-Glutamic Acid | 72 | |
| •M/Z 138 | | 20.258 | - | - | - |
| 4,5,6-Trimethyl-2-pyrimidone | 52 | | | | |
| 1,3,7,7-Tetramethyl-2-oxa-bicyclo(4.4.0)dec-5-ene | 9 | | | | |
| •M/Z 138 | | 20.506 | - | - | - |
| | - | - | •M/Z 138, 70 | | 20.558 |
| - | | | Bicyclo [2.2.1]heptane-2-one, 3,3-dimethyl- | 53 | |
| | | | Endo-6-methylbicyclo[2.2.2]octan-2-one | 47 | |
| •M/Z 70 Hydrocarbon | | 20.755 | | | |
| Nonane, 3-methylene- | 43 | | | | |
| Octane, 3-methyl-6-methylene- | 43 | | | | |
| •M/Z 41, 114, 70 Nitrogen Compound | | 20.905 | | | |
| 1H-Imidazole, 4,5-dihydro-2,4-dimethyl- | 27 | | | | |

## TABLE III (Continued)
## GC/MS Data from the Vitreous Fluid of the Mutilated Cow and the Control Heifer

| Mutilated Utah Cow | | | Control Heifer | | |
|---|---|---|---|---|---|
| **Compound** | **Match** | **GC Retention Time (min.)** | **Compound** | **Match** | **GC Retention Time (min.)** |
| - | - | - | •MW=154 | | 20.971 |
| | | | 6,8-Diazabicyclo[3.2.2]nonane-7,9-dione | 35 | |
| | | | 2,4(1H,3H)-Pyrimidinedione, 1,3,5-trimethyl- | 14 | |
| | | | •M/Z 116, 61 | | 21.177 |
| | | | Hexanoic, 2-methylpropyl ester | 12 | |
| •M/Z 116, 61, 99 Glutaminic Acid Derivative | | 21.254 | - | - | - |
| Glutaminic acid dimethyl ester | 35 | | | | |
| •M/Z 152 Benzaldehyde Derivative | | 21.303 | - | - | - |
| Benzaldehyde, 2-hydroxy-5-methoxy- | 64 | | | | |
| •MW=154 | | 21.900 | - | - | - |
| Benzene, 2-chloro-1,3,5-trimehyl- | 64 | | | | |
| •M/Z 154 Possible Phenol Derivative | | 22.149 | - | - | - |
| Phenol, 3,5-dimethoxy-, acetate | 53 | | | | |
| •M/Z 130 Indole Derivative (~15 ppm) | | 22.697 | - | - | - |
| Tryptophane | 80 | | | | |
| 1H-Indole-3-acetic acid, ethyl ester | 80 | | | | |
| •MW=154 | | 23.095 | - | - | - |
| Phenol, 3,5-dimethoxy- | 25 | | | | |
| 1,2-Cyclopentanedione, 3,3,5,5-tetramethyl- | 36 | | | | |
| - | - | - | •MW=154 | | 23.157 |
| | | | 2,4(1H,3H)-Pyrimidinedione, 1,3,6-trimethyl- | 38 | |
| •MW=154 | | 23.245 | | | |
| 1,2-Cyclopentanedione, 3,3,5,5-tetramethyl- | 42 | | | | |
| - | - | - | •MW=154 | | 23.322 |
| | | | 2,4(1H,3H)-Pyrimidinedione, 1,3,5-trimethyl- | 17 | |
| | | | Phenol, 3,4-dimethoxy- | 27 | |
| •M/Z 186, 117 Indole Derivative Most Probable | | 24.141 | - | - | - |
| 4-Fluroro-2', methyldiphenyl | 83 | | | | |
| 1H-Indole | 43 | | | | |
| - | - | - | •M/Z 186, 117 Indole Derivative Probable | | 24.188 |
| | | | 1H-Indole | 50 | |
| | | | 4-fluoro-2', methylbiphenyl | 83 | |
| •M/Z 91 Aromatic | | 24.340 | - | - | - |
| Benzene, 1,1'-[thiobis(methylene)]bis- | 38 | | | | |
| Benzoic acid, 2-hydroxy-, phenylmethyl ester, ion(1-) | 14 | | | | |

## TABLE III (Continued)
## GC/MS Data from the Vitreous Fluid of the Mutilated Cow and the Control Heifer

| Mutilated Utah Cow | | | Control Heifer | | |
|---|---|---|---|---|---|
| **Compound** | **Match** | **GC Retention Time (min.)** | **Compound** | **Match** | **GC Retention Time (min.)** |
| •M/Z 91 Aromatic | | 24.589 | - | - | - |
| 1-(p-Tolyl)-3-methyl-pyrazol-5-one | 35 | | | | |
| •M/Z 117, 200 Indole Derivative Most Probable | | 24.838 | - | - | - |
| 1H-Indole | 35 | | | | |
| Benzenemethanol, 3-phenoxy- | 25 | | | | |
| - | - | - | •M/Z 200, 117 Indole Derivative | | 24.890 |
| | | | 1H-Indole | 43 | |
| •MW=228 | | 25.087 | - | - | - |
| 3 (paramethoxyphenyl) 4,5,6,7 tetrahydro indazole | 43 | | | | |
| •M/Z 91 | | 25.435 | | | |
| .Delta.2-1,3,4-oxadiazolin-5-one, 4-phenyl-2-propyl- | 50 | | | | |
| - | - | - | •M/Z 91 Aromatic (Phenyl Group) | | 25.467 |
| | | | Benzene, 1-nitro-4-(2-phenylethyl)- | 35 | |
| | | | Benzaldehyde, 2-hydroxy-6-methyl-4-(phenol?) | 35 | |
| •M/Z 186 | | 26.033 | - | - | - |
| Phenol, 4-phenoxy- | 46 | | | | |
| Imidazolo (4,5-B) quinoxaline | 43 | | | | |
| •M/Z 70 Amine | | 26.282 | - | - | - |
| Isomenthylamine | 46 | | | | |
| Menthylamine | 43 | | | | |
| - | - | - | •M/Z 70 | | 26.334 |
| | | | Tetramethyl-1,2-cyclopentanedione | 50 | |
| •M/Z 70 | | 26.431 | - | - | - |
| L-Alanine, N-methyl-N-(trifluroacetyl)-,butyl ester | 32 | | | | |
| •M/Z 186 Aromatic | | 27.377 | | | |
| Phenol, 3-phenoxy- | 36 | | | | |
| •M/Z 186 Aromatic Phenoxy | | 27.675 | | | |
| Phenol, 4-phenoxy- | 53 | | | | |
| - | - | - | •M/Z 186 Phenoxy Group | | 27.736 |
| | | | Phenol, 3-phenoxy- | 59 | |
| •MW=244 Phenylalanine Derivative | | 27.775 | | | |
| Phenylalanine-proline diketopiperazine | 50 | | | | |
| - | - | - | •Phenylalanine Derivative | | 27.860 |
| | | | Phenylalanine-proline diketopiperazine | 39 | |

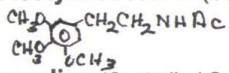
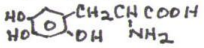
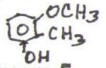
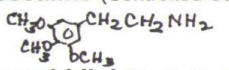
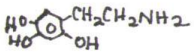
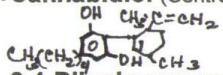
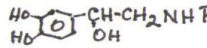
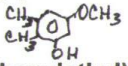
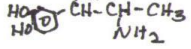
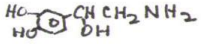
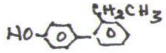
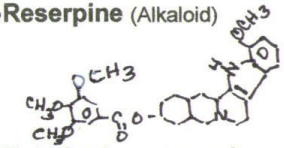
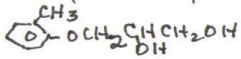
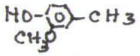
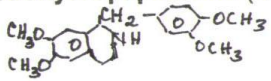
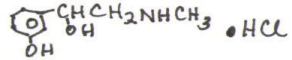
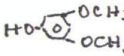
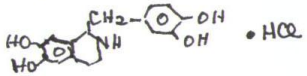
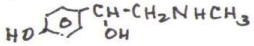
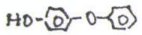
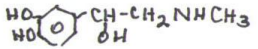
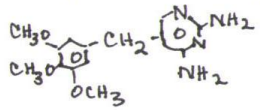
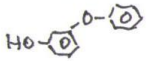
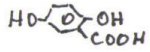
**TABLE III (Continued)**
**GC/MS Data from the Vitreous Fluid of the Mutilated Cow and the Control Heifer**

| Mutilated Utah Cow | | | Control Heifer | | |
|---|---|---|---|---|---|
| **Compound** | **Match** | **GC Retention Time (min.)** | **Compound** | **Match** | **GC Retention Time (min.)** |
| •MW=244 Phenylalanine Derivative<br>Phenylalanine-proline diketopiperazine | 38 | 28.372 | - | - | - |
| •M/Z 226<br>2-Cinnamylidene-6-methylcyclohexanone | 22 | 29.020 | - | - | - |
| •M/Z 97 Possible Amide<br>1H-Pyrazole-1-carboxamide, 4,5-dihydro-3,5,5-trimethyl- | 40 | 29.269 | - | - | - |

*Oxindole was detected in ion chromatogram scans of ions 104 and 133 between GC retention times of 16.00 – 18.40 minutes.

**Table IV**

**Phenolic Material Suggested by GC/MS Analysis of the Mutilated Animal's Vitreous Fluid and Some Drugs/Controlled Substances Containing Phenolic/Phenoxy Functionalities**

| Suggested Phenolics in Vitreous Fluid | Drugs/Controlled Substances with Phenolic/Phenoxy Functional Groups | |
|---|---|---|
| •**Phenol**  | •**N-Acetylmescaline** (Controlled Substance)  | •**6-Hydroxydopa** (Chemotheraputic Agent)  |
| •**3-Methoxy-2-methylphenol**  | •**Mescaline** (Controlled Substance)  | •**6-Hydroxydopamine** (Chemotheraputic Agent)  |
| •**2-Hydroxy-5-methoxybenzaldehyde**  | •**Cannabidiol** (Controlled Substance)  | •**Isoproterenol** (Chemotheraputic Agent)  |
| •**5-Methoxy-2,3-dimethylphenol**  | •**3,4-Dihydroxynorephedrine** (Alkaloid)  | •**Arterenol** (Chemotheraputic Agent)  |
| •**4-(2-Phenylethyl)-phenol**  | •**Reserpine** (Alkaloid)  | •**Mephenesin** (Chemotheraputic Agent)  |
| •**2-Methoxy-4-methylphenol**  | •**Tetrahydropapaverine** (Alkaloid)  | •**Phenylephrine•HCl** (Chemotheraputic Agent)  |
| •**3,5-Dimethoxyphenol**  | •**Tetrahydropapaveroline •HCl** (Alkaloid)  | •**Synephrine** (Chemotheraputic Agent)  |
| •**4-Phenoxyphenol**  | •**Epinephine** (Chemotheraputic Agent)  | •**Trimethoprim** (Chemotheraputic Agent)  |
| •**3-Phenoxyphenol**  | •**Gentisic Acid** (Chemotheraputic Agent)  | |

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Operator : [BSB1]RLW 3/19/02
Acquired : 19 Mar 2002 19:50 using AcqMethod RWSVM
Instrument : GC/MS #4
Sample Name: Lv Extract (Utah) 3/19/02
Misc Info : Semivol Organic Analysis 1ul Splitless EM+2
Vial Number: 7

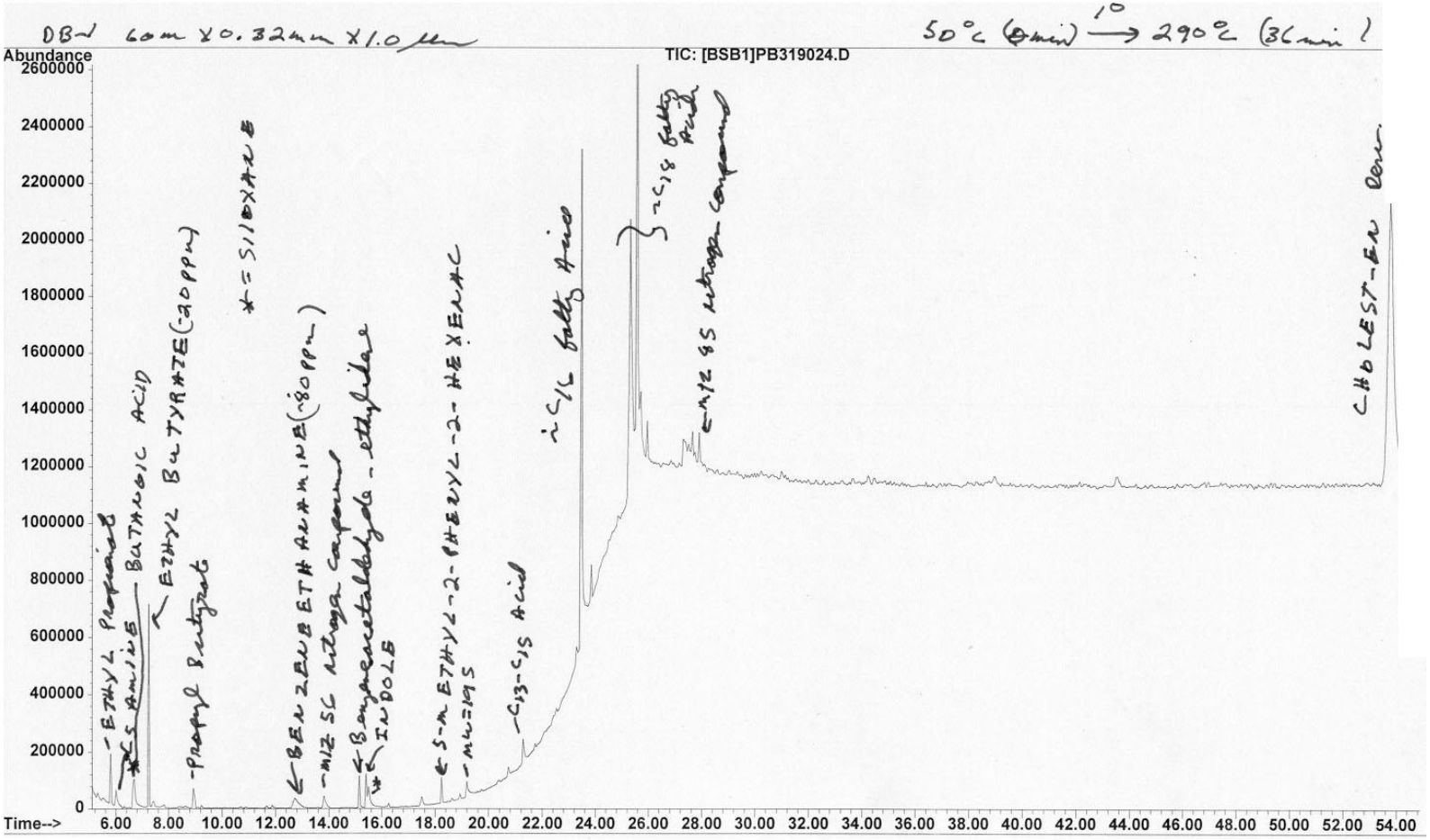



Figure 1. GC chromatogram of the methylene chloride extract from the liver of the mutilated cow.

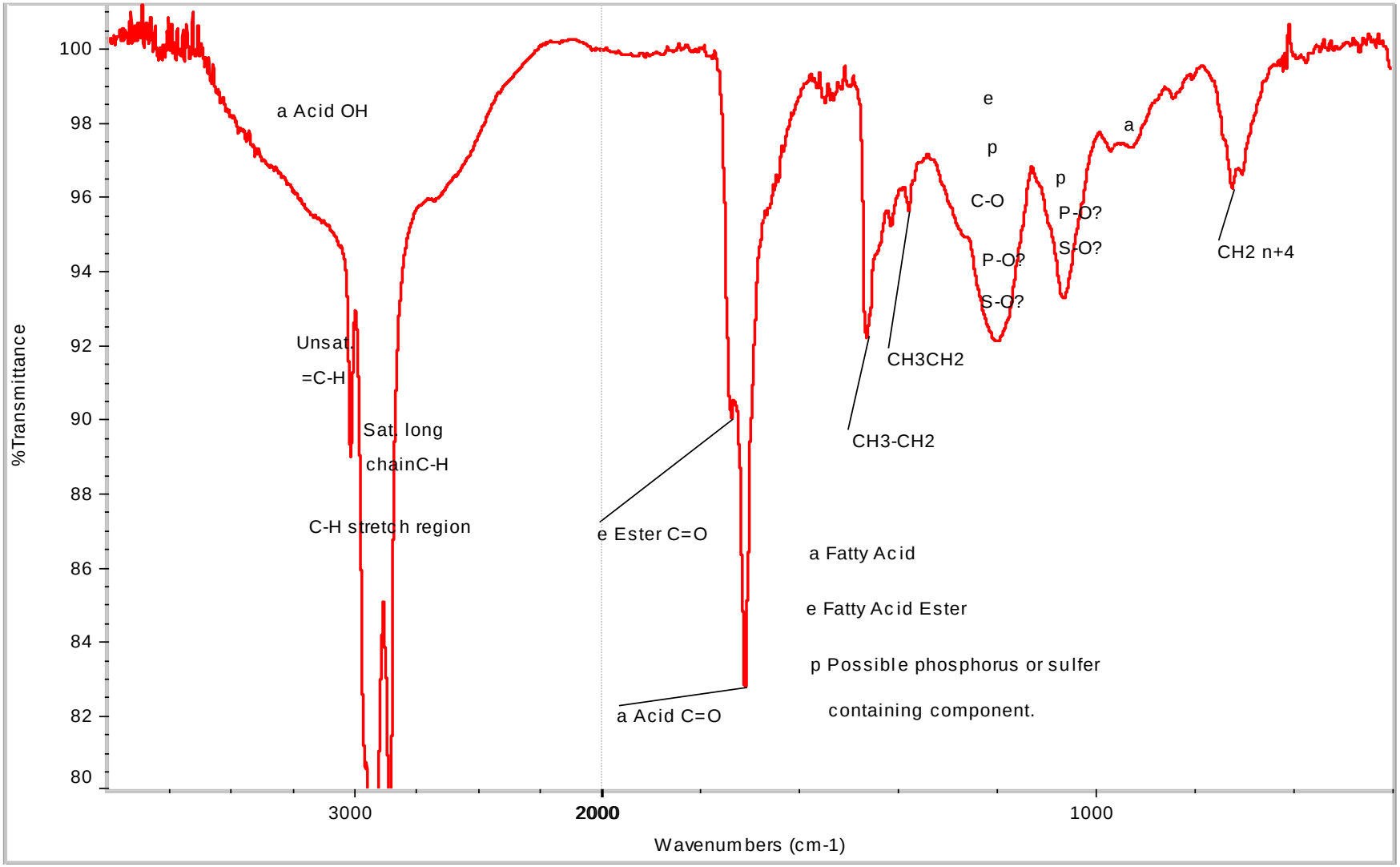



Figure 2. Infrared spectrum of the methylene chloride extract from the liver of the mutilated cow.

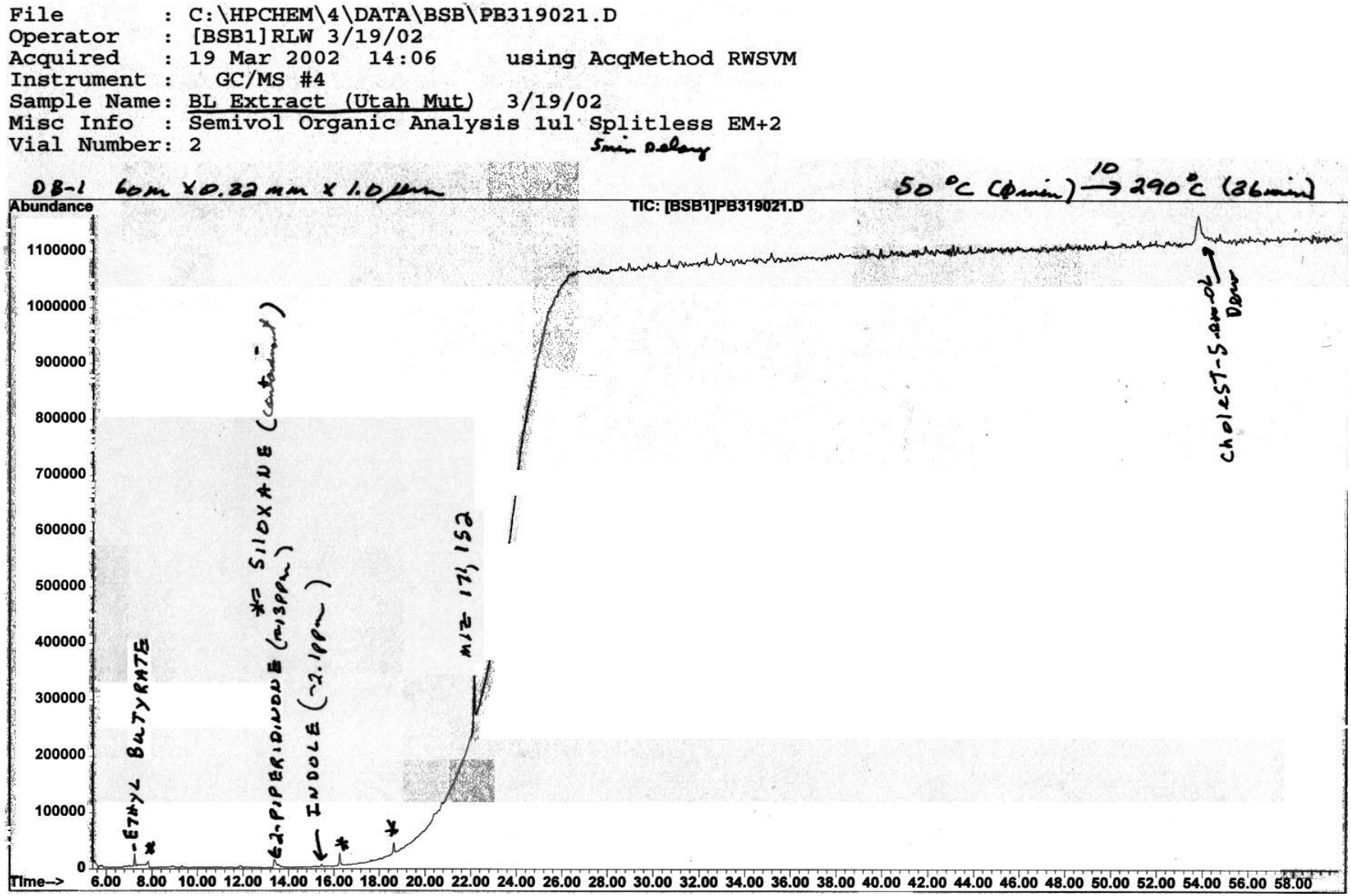



Figure 3. GC chromatogram of the methylene chloride extract from the blood of the mutilated cow.

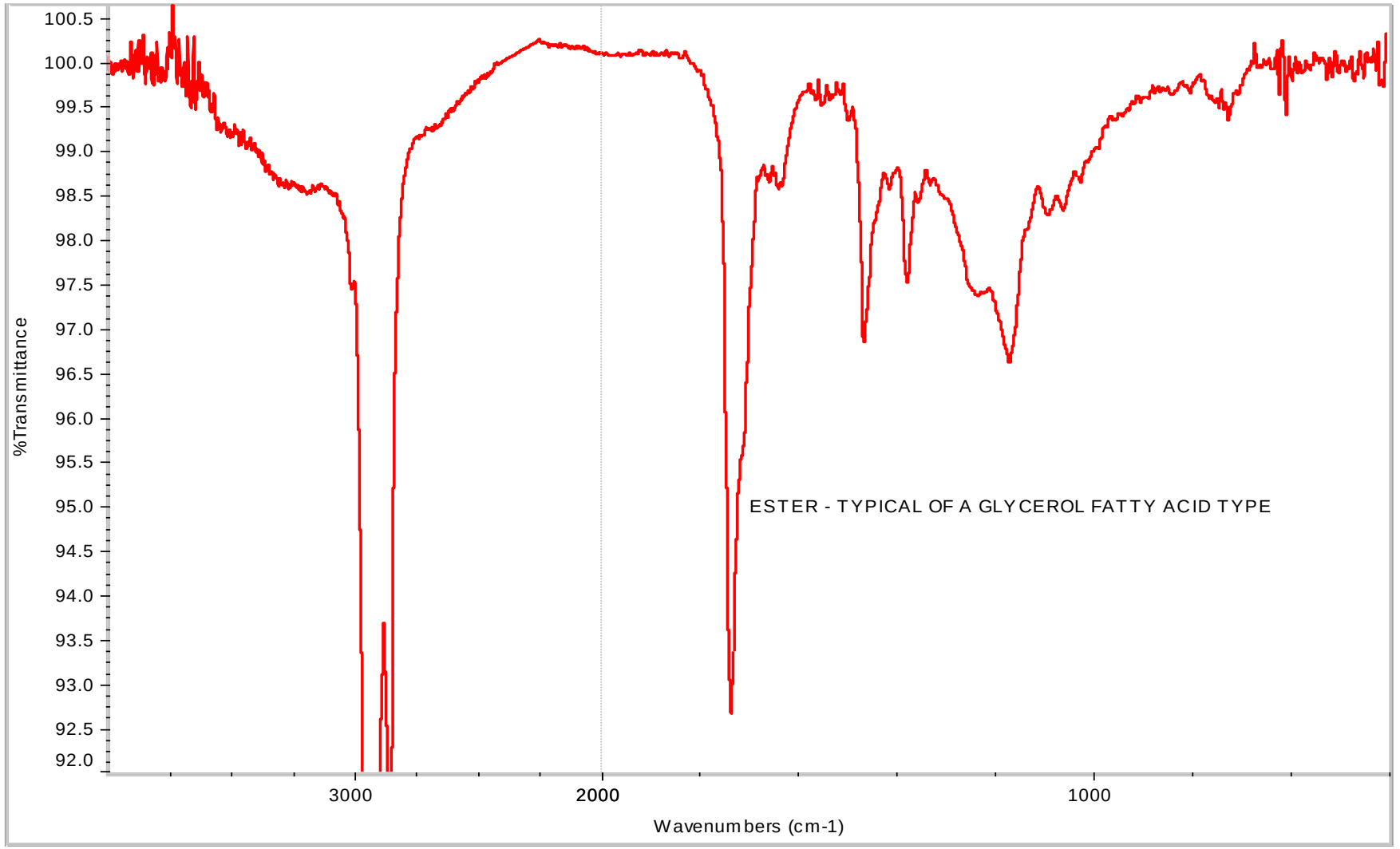



Figure 4. Infrared spectrum of the methylene chloride extract from the blood of the mutilated animal.

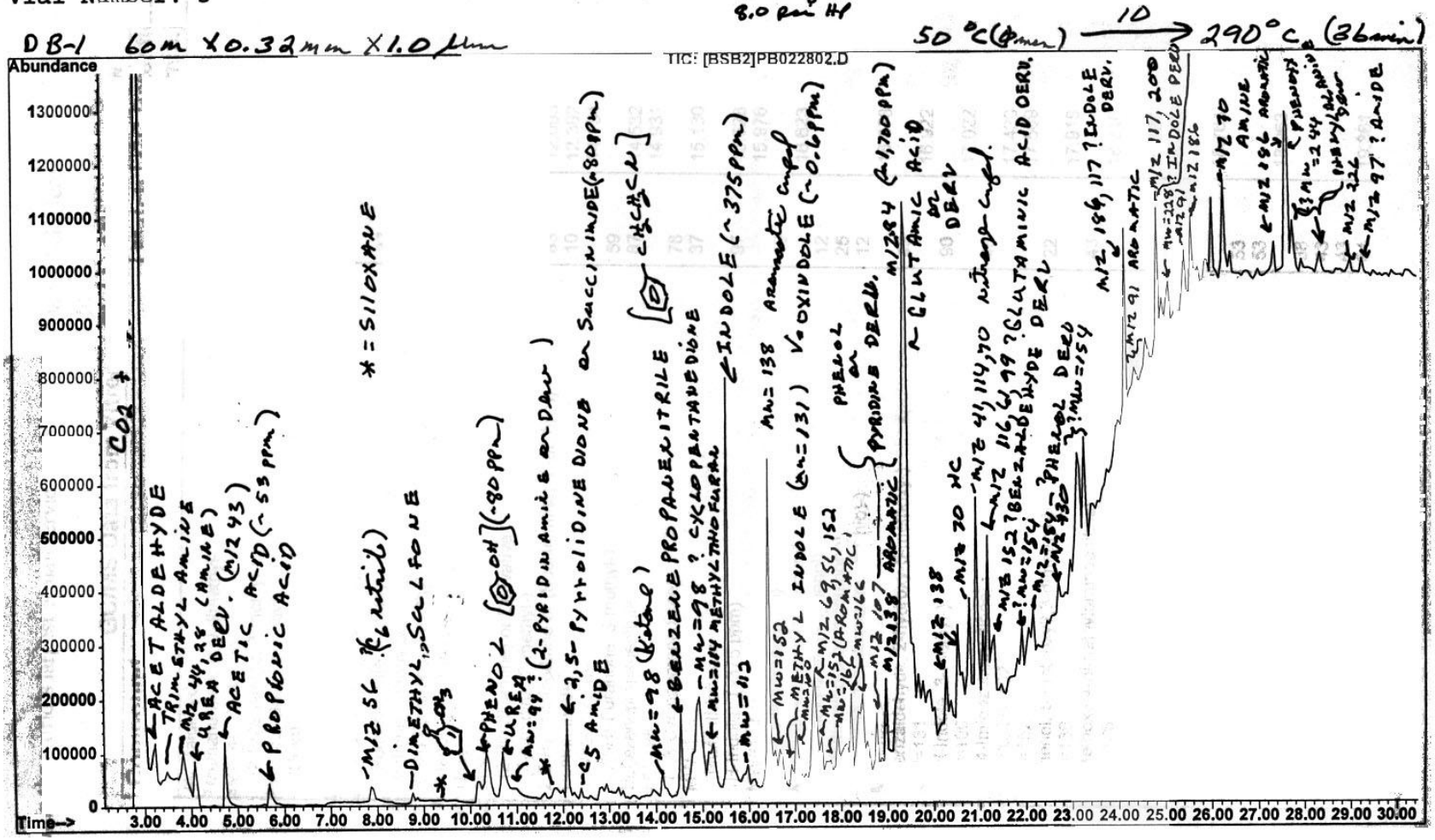
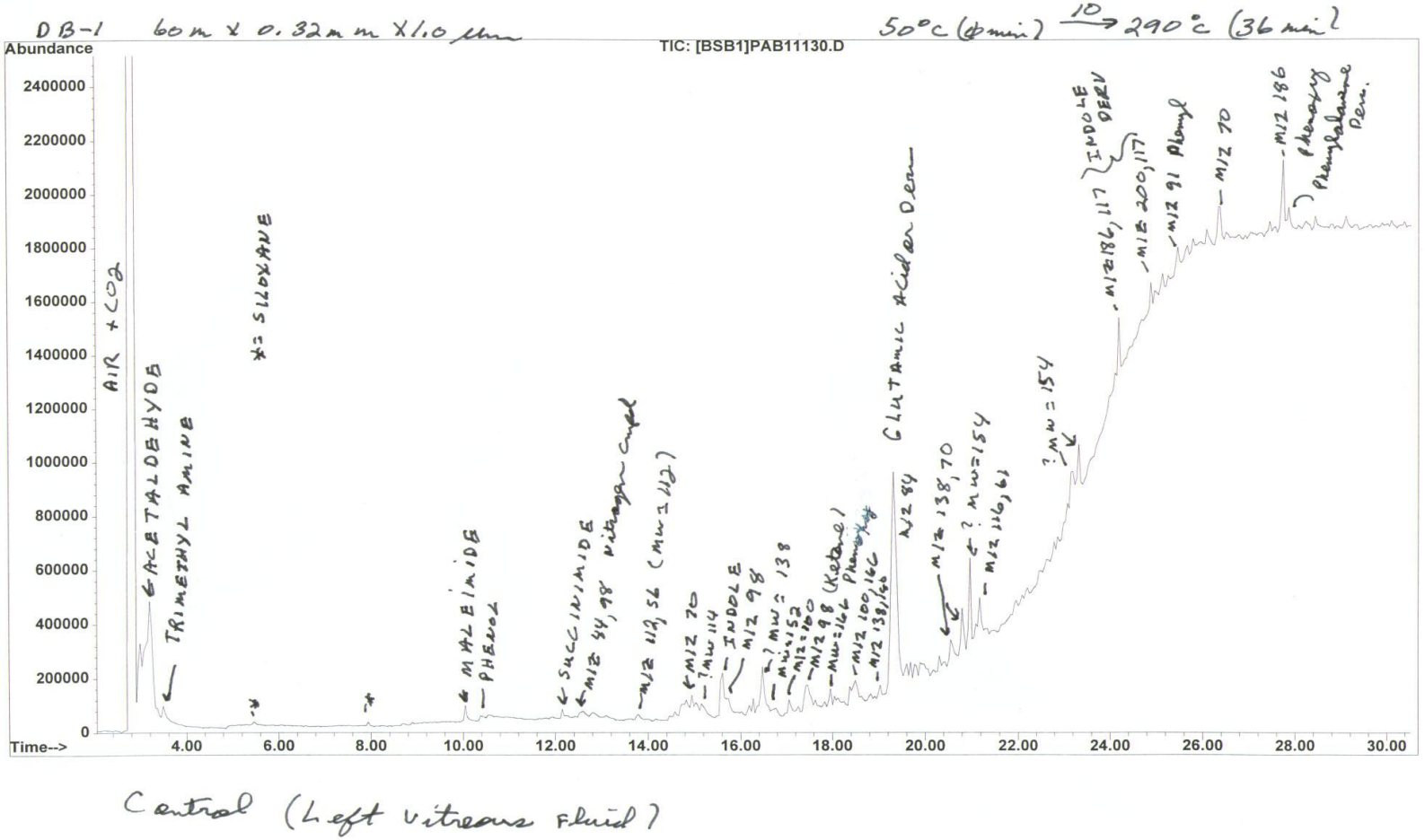



Figure 5. GC chromatogram of the vitreous fluid from the liver of the mutilated cow.

File : C:\HPCHEM\4\DATA\BSB\PAB11130.D
Operator : [BSB1]RLW 11/13/01
Acquired : 13 Nov 2001 13:05 using AcqMethod RWSVM
Instrument : GC/MS #4
Sample Name: Left Eye Fuid 10/18/01 11/13/01
Misc Info : Semivol Organic Analysis 1ul splitless EM+2
Vial Number: 1




Control (Left vitreous fluid)

Figure 6. GC chromatogram of the vitreous fluid from the control heifer.