Chemir Analytical Services

ANALYSIS REPORT

Prepared for:

Mr. Adam Genei
I-Rock Industries
Chemir Job Number 42723

Friday, February 07, 2003

MATERIAL PROPERTY	VALUE	INFORMATION SUPPLIED BY
Density	1.0435 grams/cm^3	Chemir Analytical
Young's Modulus	141,141 psi	Chemir Analytical
Poisson's Ratio	0.2428	Chemir Analytical
Loss Factor	0.024	HGC Engineering

The complete report that was submitted by HGC Engineering describing the sound insulation performance and a chart detailing the Sound Transmission Loss as a function of frequency is shown in CHART 4. The STC value of the material in its application was determined to be 40. This value is typically accurate to about 2 to 3 points.

INSTRUMENTATION

SCIENTIFIC INSTRUMENT	MANUFACTURER/MODEL	PURPOSE
Gas Chromatograph/Mass Spectrometer (GC/MS)	HP/6890 Series GC/HP 5973 Mass Selective Detector	Identification of Sample Components

CHARTS

Enclosed please find the following CHARTS generated during the analysis.

ENCLOSURE	DESCRIPTION
CHART 1	SPME GC/MS Total Ion Chromatogram fiber blank generated prior to the volatiles analysis.
CHART 2	SPME GC/MS Total Ion Chromatogram from the volatiles analysis.
CHART 3	Collection of Mass Spectra from the SPME GC/MS Chromatogram.
CHART 4	Report Submitted by HGC Engineering detailing the computer modeled Acoustical Testing.

An invoice is being sent to your accounts payable department. Samples are disposed of on the first Monday of every month after being retained a maximum of 30 days unless you direct us otherwise in writing. Please review the Terms & Conditions that govern this analysis work. Thank you for consulting Chemir Analytical Services. If you have any questions regarding this work, or if we can be of any further assistance, please call us at (314) 291-6620.

Sincerely,
Chemir Analytical Services

Shri Thanedar, Ph.D.
Chief Scientist

Project Analyst:

Matthew A. Goode, B.S.
Project Leader

WKW:das/Irock0203.doc/d1
Enclosures

CHEMIR
Analytical Services

07 February 2003

Mr. Adam Genei
I-Rock Industries
702 Advance Street
Brighton, MI 48116

Re: Physical Property Testing

P.O. #: Verbal

Chemir Analytical Services Job #: 43723

Dear Mr. Genei:

Per your request, the volatiles examination, extractable weight loss analysis and acoustic transmission loss was completed. The results of the analyses are detailed below.

SAMPLE LOG-IN

The samples were logged as follows:

SAMPLE DESCRIPTION	CHEMIR ANALYTICAL SERVICES SAMPLE NUMBER
Plastic Lumber	522698
Road Wall	522699

ANALYSIS CONCLUSIONS

The goals of these analyses were to determine the volatile chemicals found in your material, the weight percent of water extractables and the acoustic transmission loss of the material based on computer assisted simulation methods.

The volatile chemicals detected were: Acetophenone; Acetohydroxamic Acid; Cyclopentasiloxane, decamethyl-; Pentadecanoic acid, dimethyl ester; Acetic anhydride; Hexanedioic acid, dimethyl ester; DL-3,4-Dimethyl-3,4-Hexanediol; Dimethyl phthalate; Phenol, 2,5-bis(1,1-dimethylethyl)-; Diethyl Phthalate.

The weight percent of water extractables was completed in triplicate and the results are: 0.45%, 0.50%, 0.36% for an average amount of extractables on a weight percent basis of 0.44%

The predictive model acoustic transmission loss was determined to be: STC-40

ANALYSIS RESULTS

Volatiles Analysis by SPME GC/MS

In Gas Chromatography/Mass Spectrometry (GC/MS) GC resolves the sample components based on volatility, and MS detects and identifies the components. Sample components that interact less with the stationary phase spend less time in the chromatographic column. In MS, the resolved sample components are ionized and separated in a mass analyzer. The fragmentation pattern of a sample component and its computer library match enables sample identification.

The volatile organic compounds from the sample "Plastic Lumber" (Chemir #522698) were detected using a Solid Phase Microextraction (SPME) GC/MS analysis technique. A small specimen of the sample was placed into a 10mL headspace vial, capped, and heated to 80°C for 10 minutes. The SPME device was removed and allowed to desorb into a mass spectrometer. A SPME fiber blank was completed and is shown in CHART 1. CHART 2 shows the Total Ion Chromatogram (TIC) from the sample analysis. The peaks on the TIC represent the major compounds that were detected from the analysis. Mass spectra of each of the major peaks are in CHART 3 and identify the chemicals that were detected in the TIC. The chemicals detected are shown in the table below.

CHEMICALS DETECTED	RETENTION TIME
Acetophenone	6.054
Acetohydroxamic Acid	6.269
Cyclopentasiloxane, decamethyl-	6.551
Pentadecanoic acid, dimethyl ester	6.604
Acetic anhydride	7.035
Hexanedioic acid, dimethyl ester	7.603
DL-3,4-Dimethyl-3,4-Hexanediol	7.825
Dimethyl phthalate	9.703
Phenol, 2,5-bis(1,1-dimethylethyl)-	10.212
Diethyl Phthalate	11.001

Extractables

Three specimens of the sample "Plastic Lumber" (Chemir #522698) were analyzed gravimetrically for weight loss due to water extractables. The specimens were placed in approximately 200 ml of de-ionized water and allowed to set at room temperature for 5 and 2/ days. The water solutions were then dried for 24 hours giving a total weight loss due to water extractables of 0.36%, 0.45% and 0.50%. Averaging these values gives a mean total water extractable weight loss of 0.44%.

Acoustic Testing

Sound Transmission Loss and Sound Transmission Class (STC) were modeled for the submitted sample "Road Wall" (Chemir #522699). A computer assisted modeling program that used multiple material properties for determination completed this calculation. The program inputs consist of the parameters detailed in the table below.

File : C:\HPCHEM\1\DATA\011003\A003.D
Operator : CLS
Acquired : 10 Jan 2003 10:44 am using AcqMethod CHEMSPME
Instrument : GC/MS SVO
Sample Name: Vial Blank
Misc Info : 80C for 10 minutes
Vial Number: 3

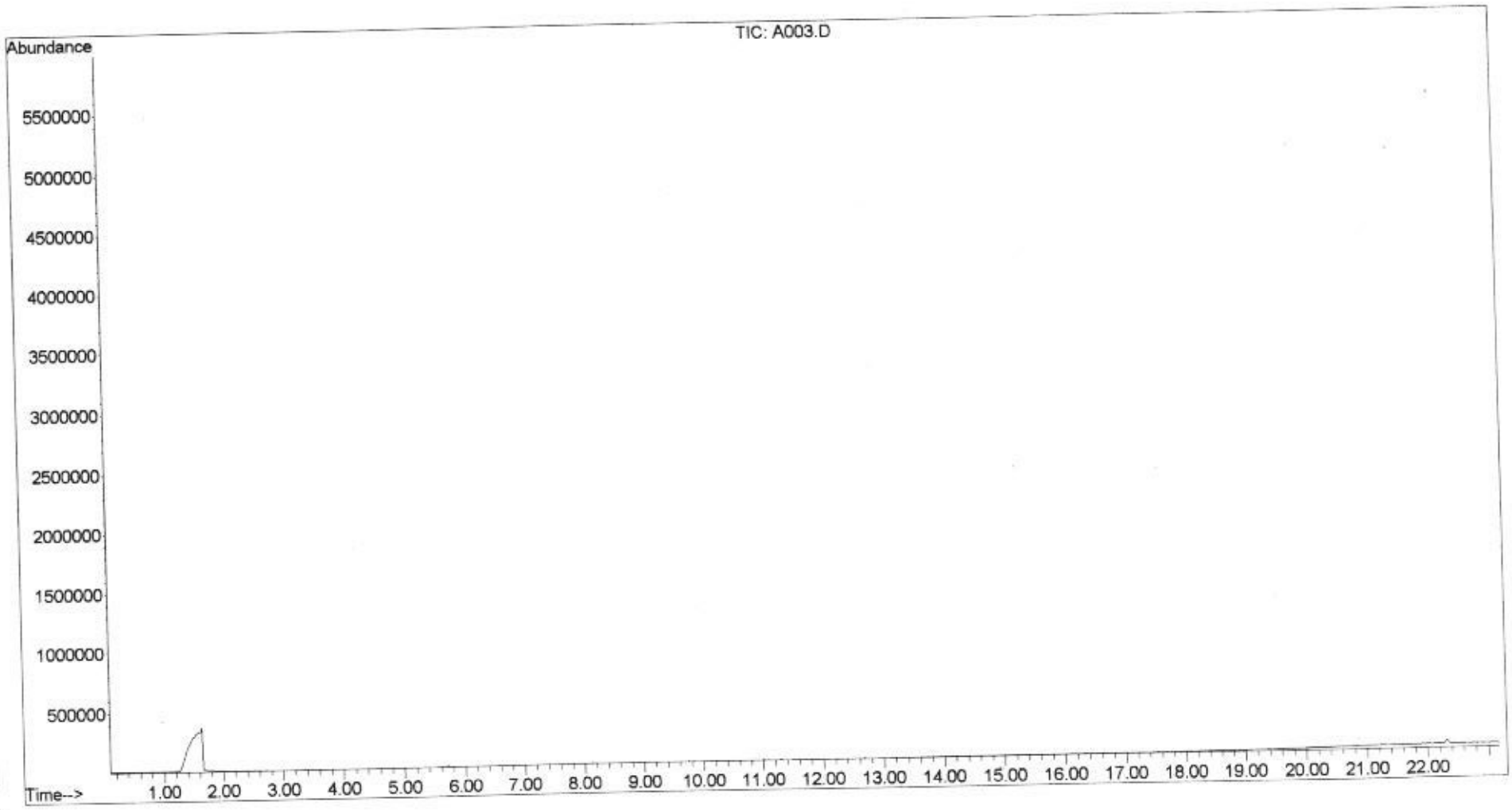


CHART 1

File : C:\HPCHEM\1\DATA\011003\A004.D
Operator : CLS
Acquired : 10 Jan 2003 11:20 am using AcqMethod CHEMSPME
Instrument : GC/MS SVO
Sample Name: 522698A
Misc Info : 80C for 10 minutes
Vial Number: 4

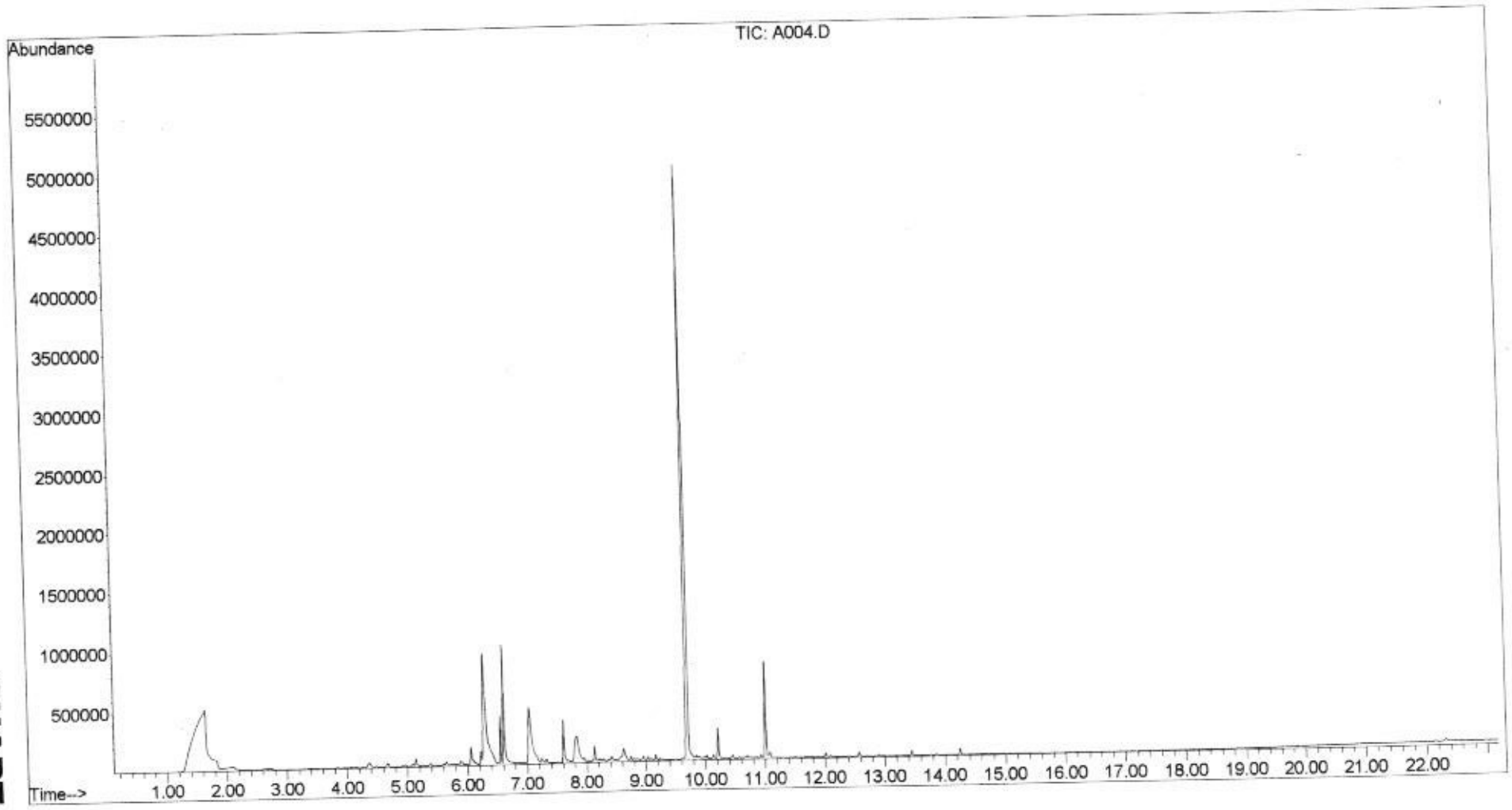
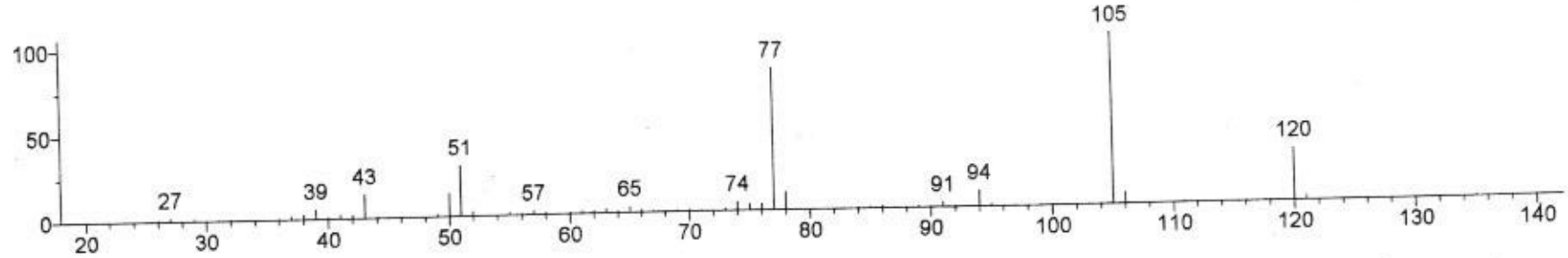
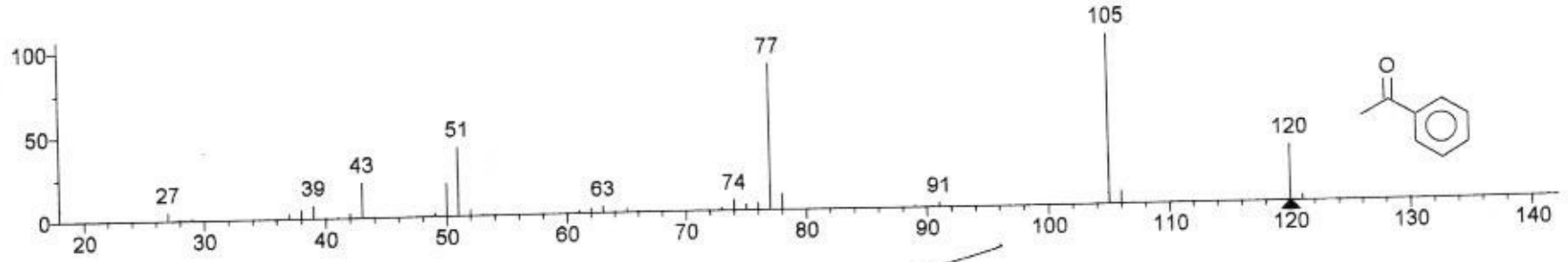


CHART 2

Unknown: Scan 997 (6.054 min): A004.D
Compound in Library Factor = 0



Hit 1 : Acetophenone
C8H8O; MF: 907; RMF: 945; CAS: 98-86-2; Lib: replib; ID: 13720.



Hit 2 : Benzoyl isothiocyanate
C8H5NOS; MF: 798; RMF: 936; CAS: 532-55-8; Lib: replib; ID: 13738.

01-1003

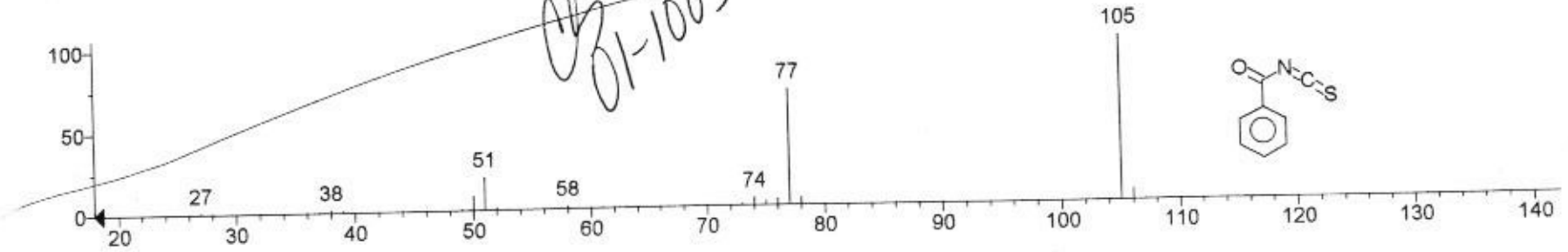


CHART 3

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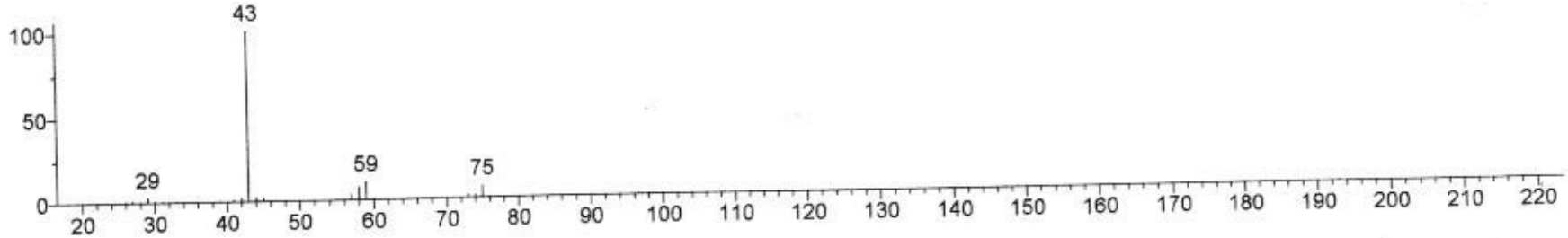
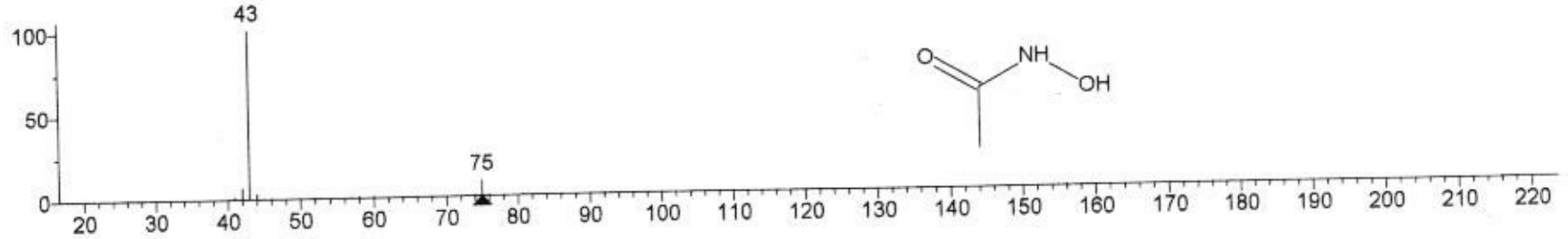
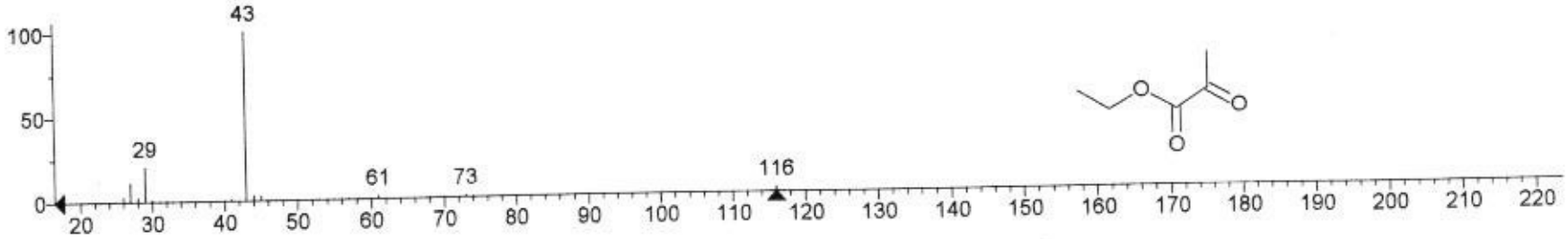


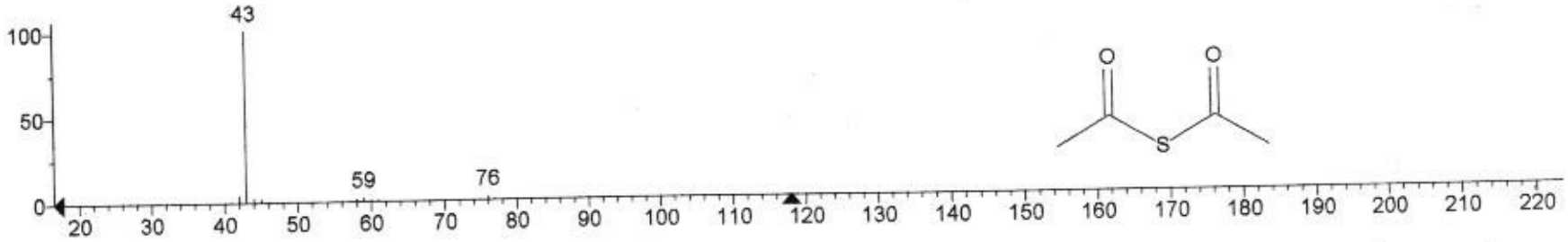
Hit 1 : Acetohydroxamic Acid
C2H5NO2; MF: 772; RMF: 847; CAS: 546-88-3; Lib: replib; ID: 2573.



Hit 2 : Propanoic acid, 2-oxo-, ethyl ester
C5H8O3; MF: 676; RMF: 825; CAS: 617-35-6; Lib: mainlib; ID: 4771.



Hit 3 : Diacetyl sulphide
C4H6O2S; MF: 739; RMF: 818; CAS: 3232-39-1; Lib: mainlib; ID: 4697.



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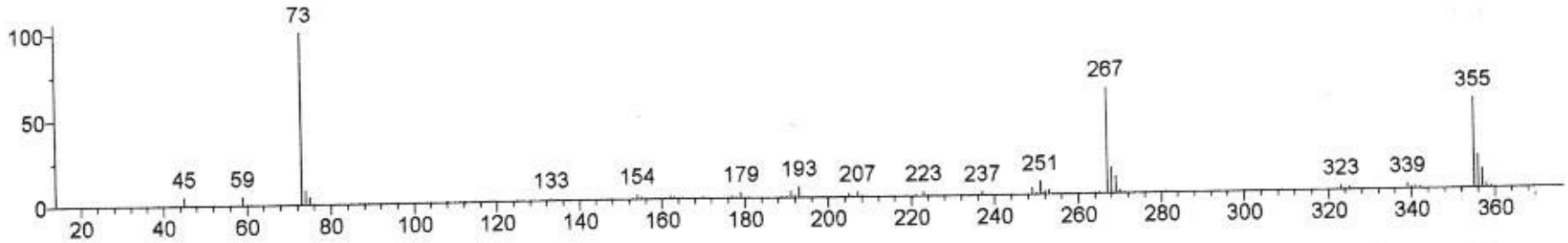
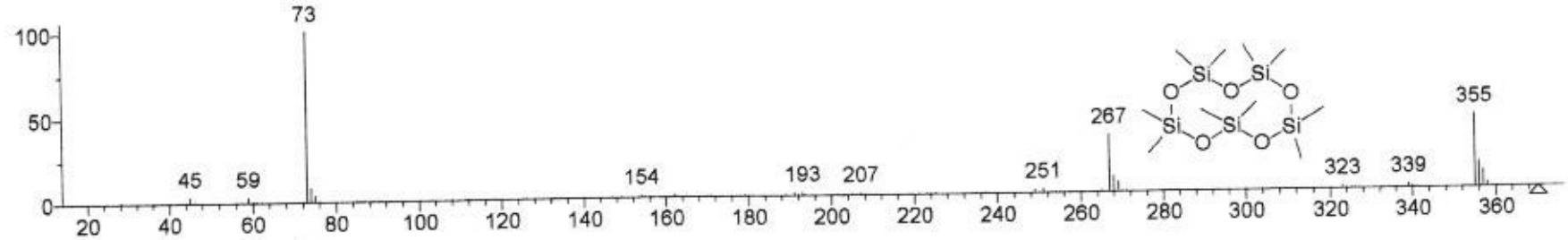
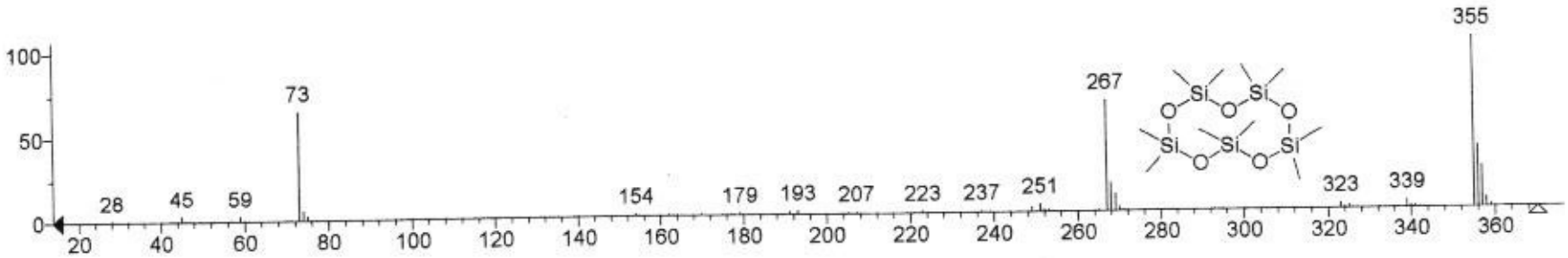
Compound in Library Factor = 0



Hit 1 : Cyclopentasiloxane, decamethyl-
C10H30O5Si5; MF: 922; RMF: 926; CAS: 541-02-6; Lib: replib; ID: 8992.



Hit 2 : Cyclopentasiloxane, decamethyl-
C10H30O5Si5; MF: 895; RMF: 898; CAS: 541-02-6; Lib: mainlib; ID: 141989.



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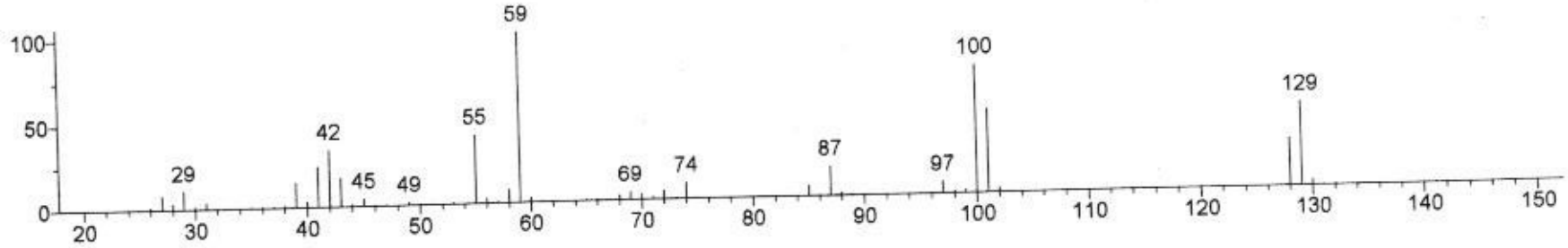
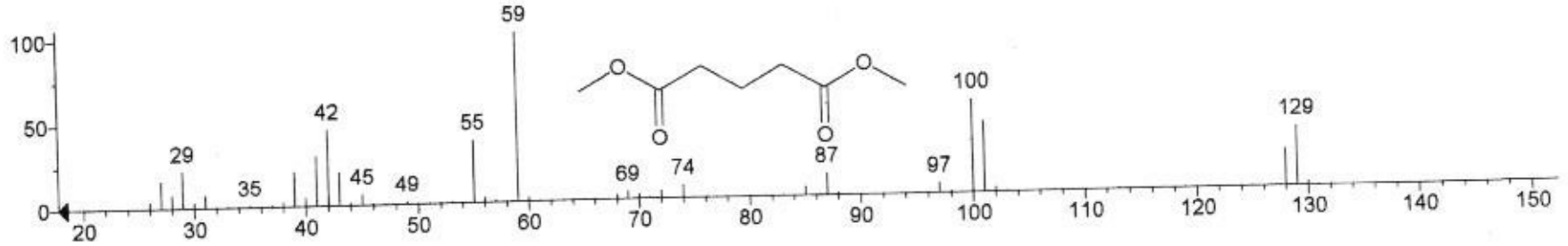
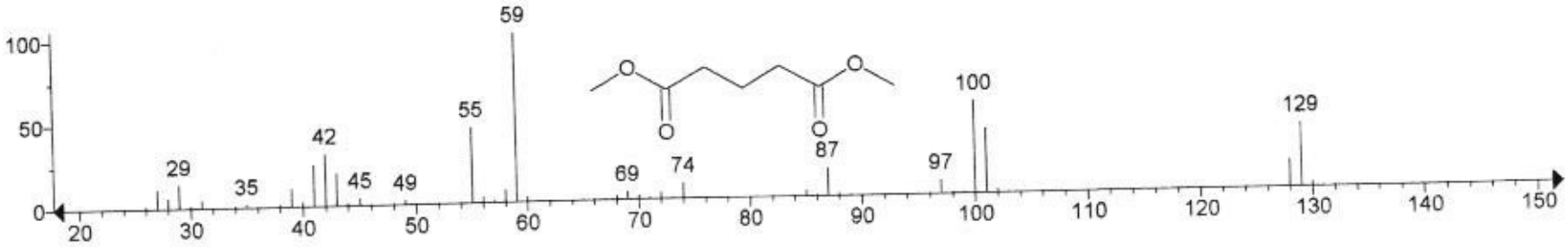
Compound in Library Factor = 0



Hit 1 : Pentanedioic acid, dimethyl ester
C7H12O4; MF: 952; RMF: 961; CAS: 1119-40-0; Lib: replib; ID: 6464.



Hit 2 : Pentanedioic acid, dimethyl ester
C7H12O4; MF: 938; RMF: 938; CAS: 1119-40-0; Lib: mainlib; ID: 23905.



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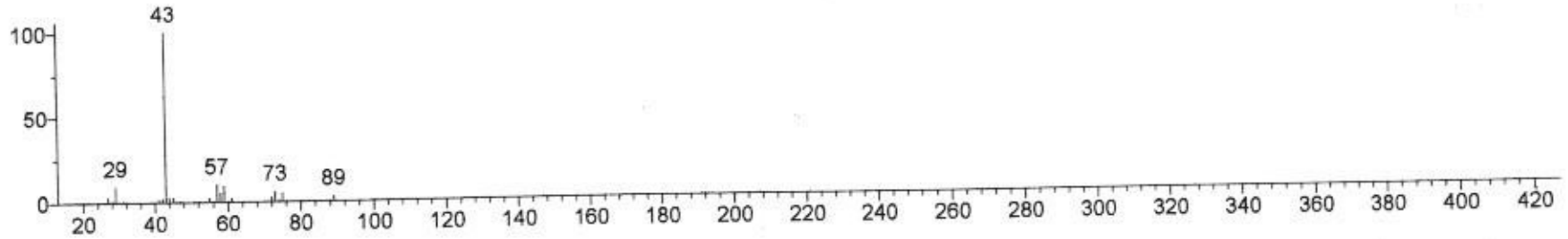
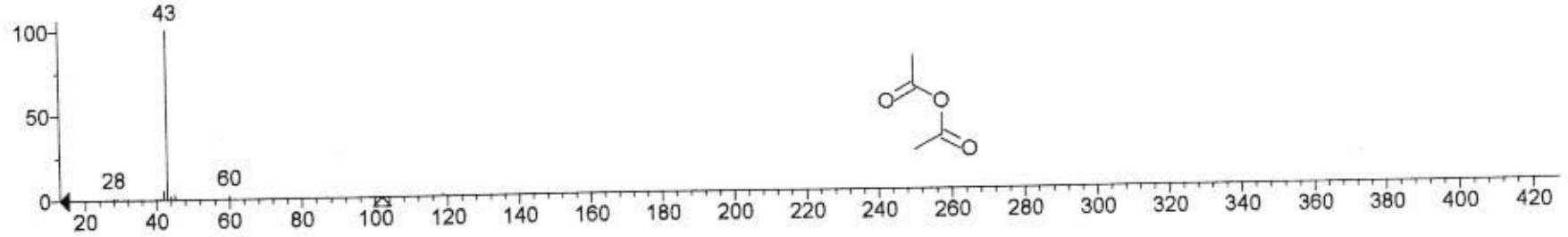
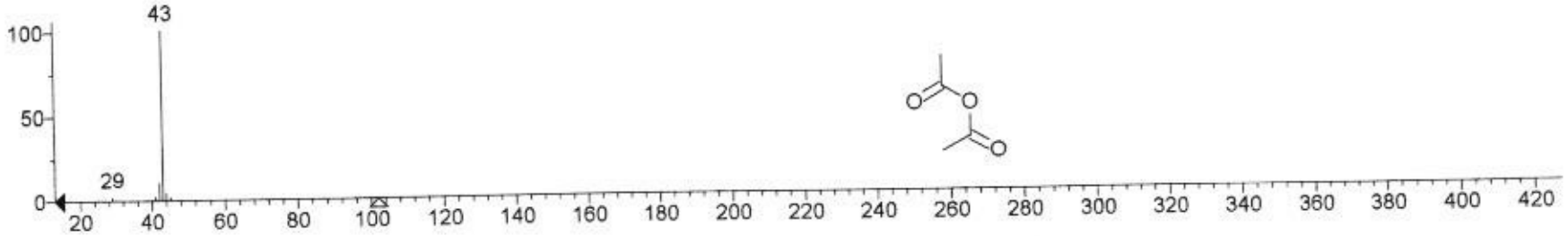
Compound in Library Factor = 0



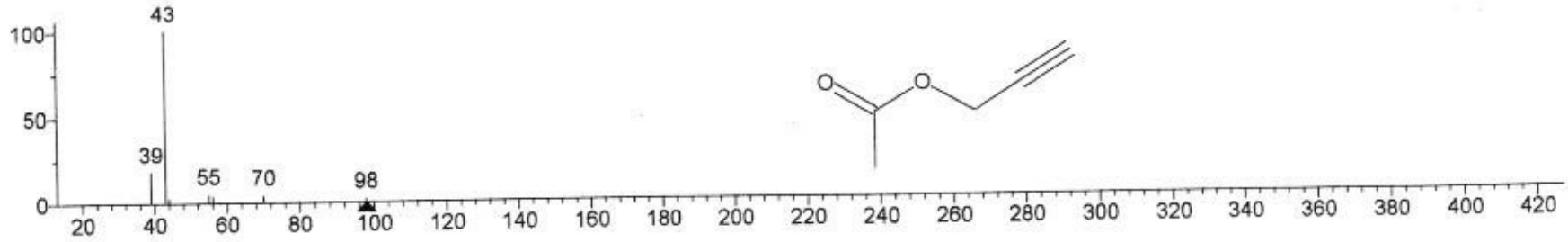
Hit 1 : Acetic anhydride
C4H6O3; MF: 568; RMF: 811; CAS: 108-24-7; Lib: replib; ID: 1532.



Hit 2 : Acetic anhydride
C4H6O3; MF: 569; RMF: 806; CAS: 108-24-7; Lib: mainlib; ID: 5608.



Hit 3 : 2-Propyn-1-ol, acetate
C5H6O2; MF: 527; RMF: 799; CAS: 627-09-8; Lib: replib; ID: 1608.



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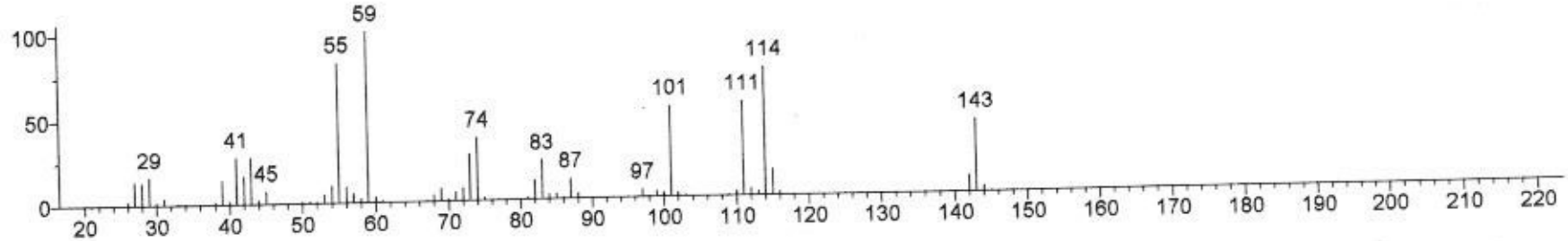
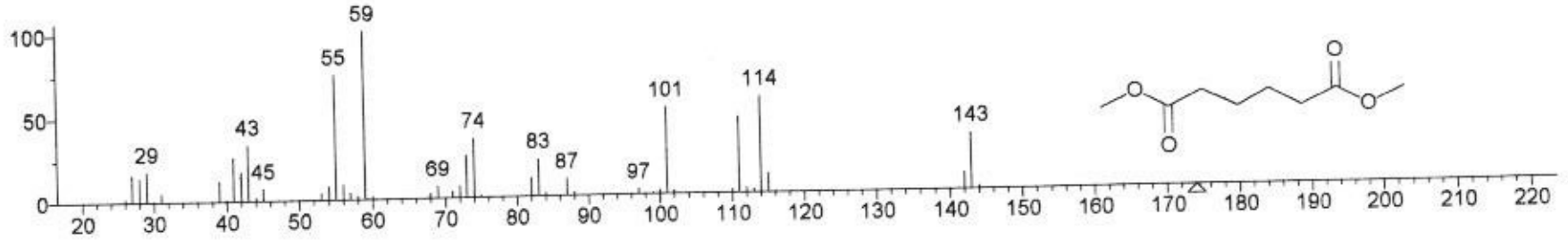
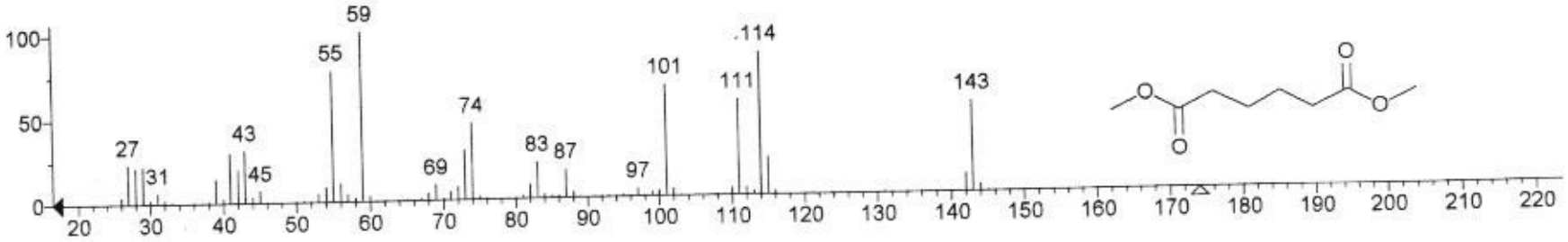
Compound in Library Factor = 0



Hit 1 : Hexanedioic acid, dimethyl ester
C8H14O4; MF: 943; RMF: 958; CAS: 627-93-0; Lib: replib; ID: 6601.



Hit 2 : Hexanedioic acid, dimethyl ester
C8H14O4; MF: 935; RMF: 937; CAS: 627-93-0; Lib: replib; ID: 6703.



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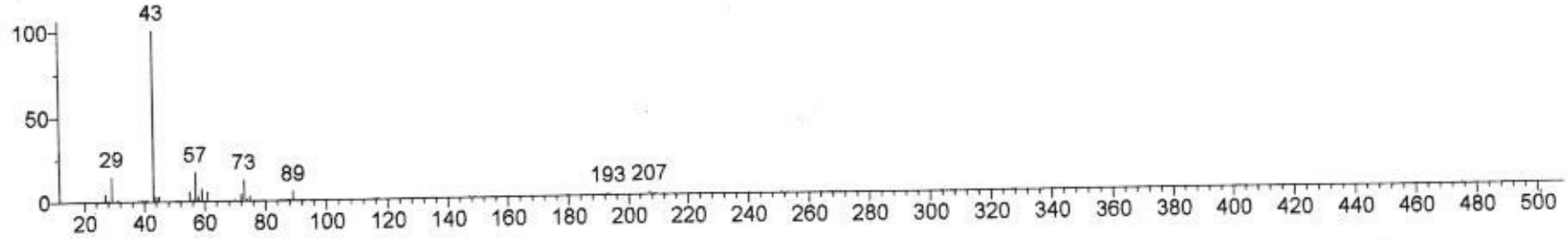
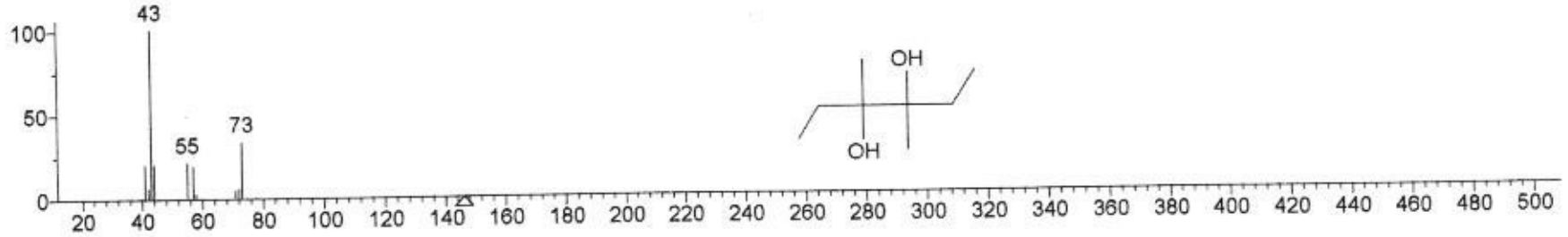
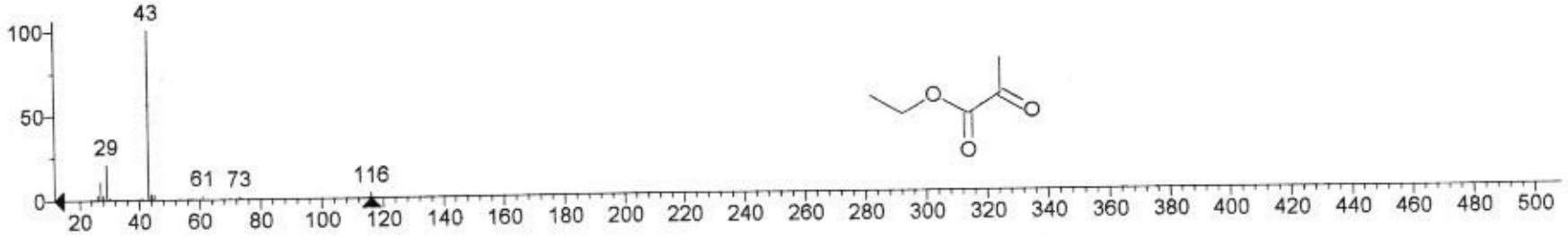
Compound in Library Factor = 0



Hit 1 : DL-3,4-Dimethyl-3,4-hexanediol
C8H18O2; MF: 602; RMF: 817; CAS: 32388-94-6; Lib: mainlib; ID: 7862.



Hit 2 : Propanoic acid, 2-oxo-, ethyl ester
C5H8O3; MF: 597; RMF: 771; CAS: 617-35-6; Lib: mainlib; ID: 4771.



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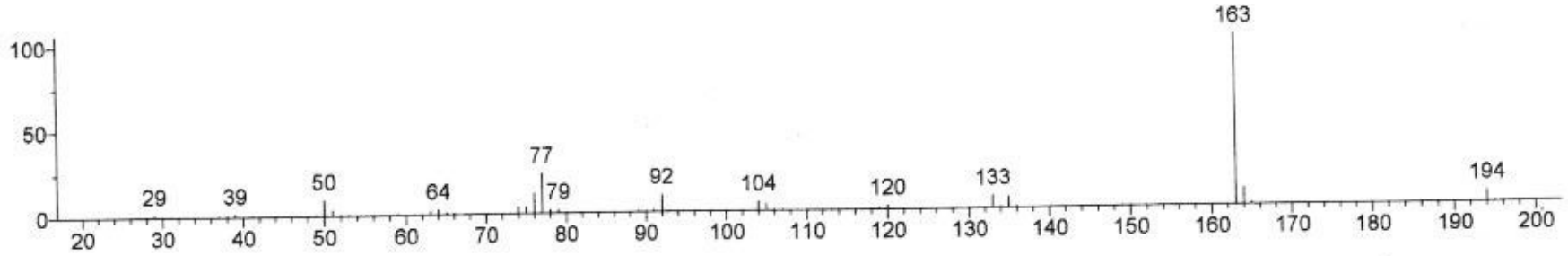
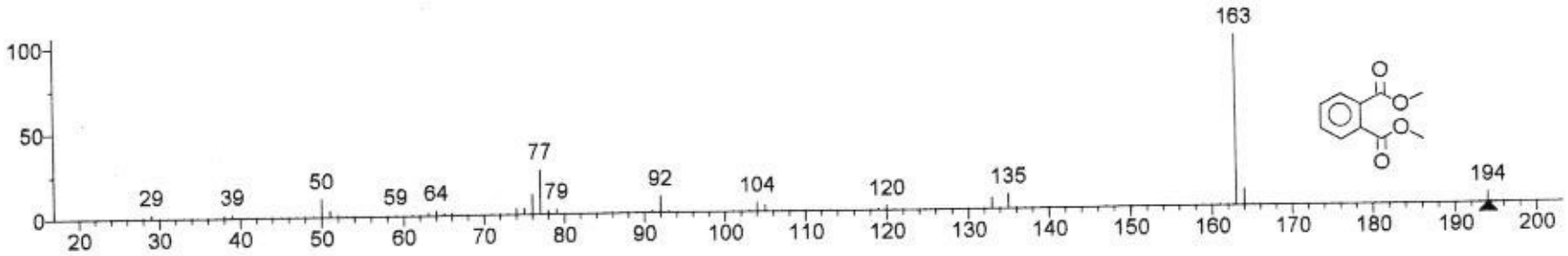
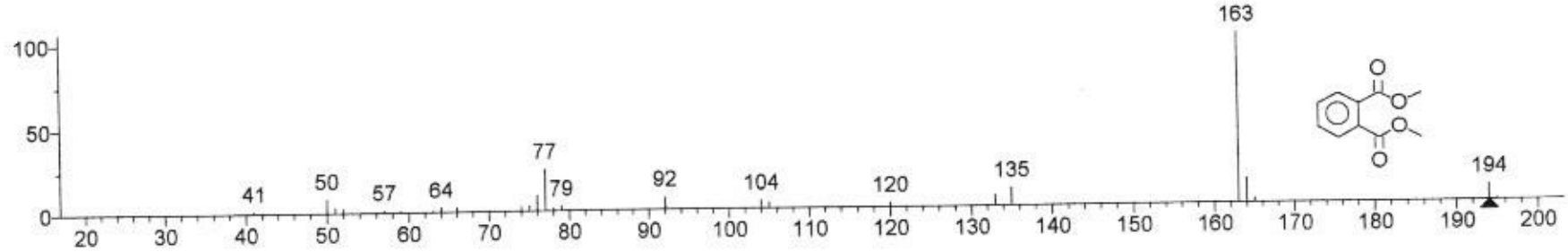
Compound in Library Factor = 0



Hit 1 : Dimethyl phthalate
C10H10O4; MF: 958; RMF: 958; CAS: 131-11-3; Lib: replib; ID: 21202.



Hit 2 : Dimethyl phthalate
C10H10O4; MF: 921; RMF: 941; CAS: 131-11-3; Lib: replib; ID: 21203.



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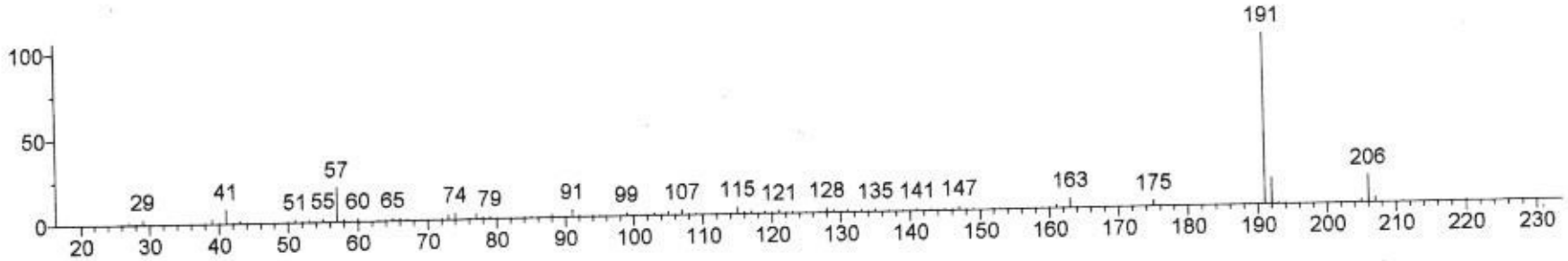
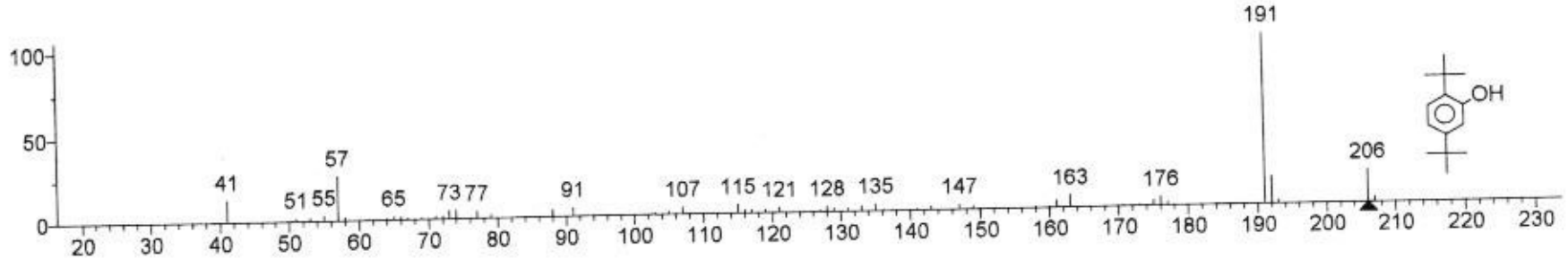
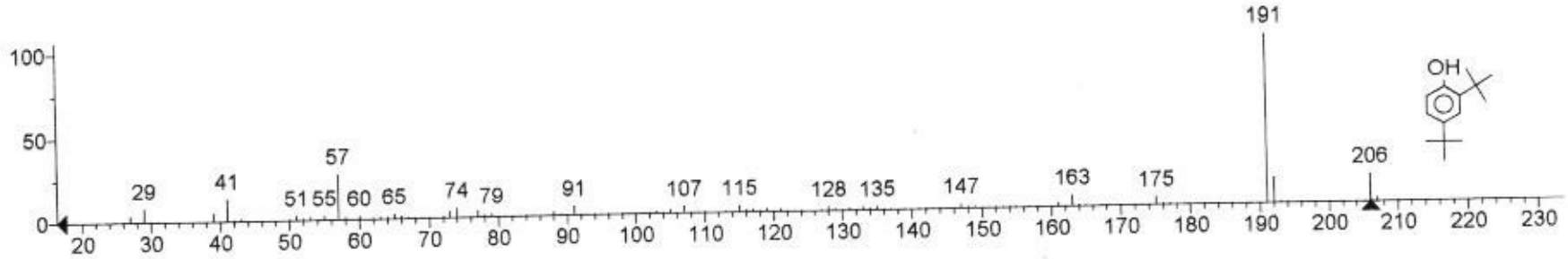
Compound in Library Factor = 0



Hit 1 : Phenol, 2,5-bis(1,1-dimethylethyl)-
C14H22O; MF: 871; RMF: 925; CAS: 5875-45-6; Lib: replib; ID: 23328.



Hit 2 : Phenol, 2,4-bis(1,1-dimethylethyl)-
C14H22O; MF: 894; RMF: 912; CAS: 96-76-4; Lib: replib; ID: 23332.



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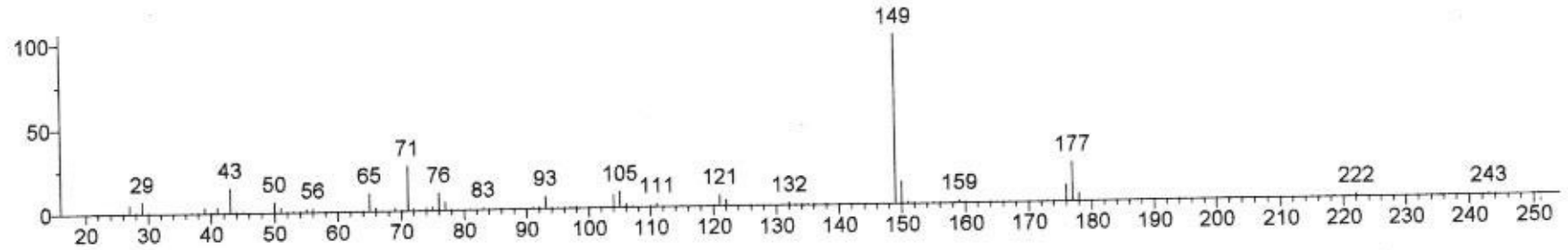
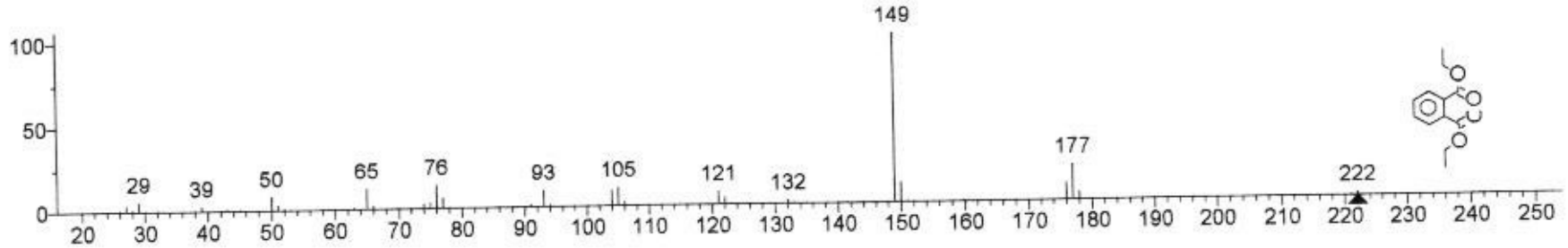
Compound in Library Factor = 0



Hit 1 : Diethyl Phthalate
C12H14O4; MF: 885; RMF: 963; CAS: 84-66-2; Lib: replib; ID: 19915.



Hit 2 : Diethyl Phthalate
C12H14O4; MF: 877; RMF: 930; CAS: 84-66-2; Lib: replib; ID: 19917.