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MATERIALS CHARACTERIZATION REPORT

Report No.: 1608.29 Rev. 1 **Date:** October 4, 2016

Customer: [redacted]
LPI, Inc.
304 Hudson Street
New York, NY 10013

Customer P.O.: LPI Project F16108

Sample: Black Particles Labeled "F16108, S"

Objective: Determine if Thread-Locking or Anti-Seize Formulation Components are Present in the Sample Using Fourier Transform Infrared Spectroscopy, Thermogravimetric Analysis and Pyrolysis/Gas Chromatography-Mass Spectroscopy

318 South Bracken Lane • Chandler, Arizona 85224

SUMMARY

The 'as received' sample was extracted with dichloromethane (DCM) and dried in a fume hood at room temperature. The solvent extract was allowed to evaporate and left a residue accounting for ca. 19 wt-% of the original sample mass. The extracted solid was analyzed by FTIR, TGA, and Pyr/GC-MS. The extract residue remaining after solvent evaporation was analyzed by FTIR.

1. An exact spectral match for the FTIR spectrum acquired from the DCM extracted particles was not obtained. The FTIR spectrum acquired from the dried solid particles contains absorbance bands which can be assigned to long chain aliphatic hydrocarbon, hydroxyl, carboxylate salt and silica/silicates. Elemental analysis would be required to confirm the presence of inorganic material.

2. The FTIR spectrum acquired from the DCM extract residue left after evaporation contains absorbance bands associated with a long chain hydrocarbon material (e.g., mineral oil) and/or various other petroleum distillate fractions and a lower level of poly(dimethylsiloxane) (e.g., silicone oil). There is no evidence for cyanoacrylate compounds.

3. In the TGA analysis, the DCM extracted and dried particles lost all organic material (72 weight %) by 650 °C. This temperature was chosen for the subsequent Pyr/GC-MS analysis. The inorganic ash constitutes 28 wt-% of the DCM washed particulate sample.

4. The Pyr/GC-MS results acquired from the DCM extracted particles are listed in Table I. The most abundant single compound detected is phthalic anhydride (8.6 area-%). The phthalide (2.3 area-%, a lactone of similar structure), phthalimide (2.2 area-%, nitrogen analog) and benzoic acid (2.2 area-%) may also be related to the phthalic anhydride as decomposition or reaction products.

   The major pyrolysis components are admixtures of linear alkanes and alkenes (alkenes C5-C17, alkanes C5-C33), methyl substituted aromatic compounds and nitrogen containing aromatic compounds. Possible sources include processed petroleum distillate fractions.

   Octadecanoic acid (3.9 area-%) was detected.

   Phenol and various substituted phenols are present possibly indicating the presence of a phenolic or an aromatic epoxy resin.

   No reactive cyanoacrylate compounds were detected.

Potential Additional Analyses

The presence of calcium dihydroxide, copper, graphite and quartz possibly relating to the Loctite LB 8008 C5-A anti-seize product could determined by scanning electron microscopy (SEM)/energy dispersive spectroscopy (EDS). Elemental analysis of the DCM washed particles and the particle TGA ash.

The DCM extract residue can be reconstituted and analyzed by direct injection GC-MS in order to determine what organic materials were extracted by the DCM from the "as received" particles.

If a list of other potential Loctite adhesives and anti-seize products could be obtained, the analytical results could be compared to the potential source material formulation.

Background Added on October 4th

Amongst other companies, Loctite makes both thread locking adhesive containing formulations and anti-sieze formulations.

As one sub-class of adhesives, the cyanoacrylate family of materials tend to be associated with the Loctite brand as Loctite was one of the foremost promoters of this technology for thread locking applications. By far and away, cyanoacrylates are the most used adhesive class for thread locking applications. Hence, the concern with cyanoacrylates.

'Anti-seize' is the opposite of thread locking. An 'anti-sieze' formulation provides a barrier between the metal surfaces of the bolt and the threaded hole to prevent sticking (intermingling of metal atoms across the interface when under high pressure), corrosion and galling (pulling out of materials from the opposite surface). Generally, anti-sieze formulations contain very fine particulate materials in a grease base. Depending upon the application, such particulates include copper, aluminum, zinc, nickel, graphite, molybdenum disulfide, calcium fluoride, calcium oxide. Greases are high boiling oils combined with a smaller amount of a thickener. For instance, hydrocarbon based greases use a high boiling hydrocarbon oil thickened with a fatty acid metal carboxylate; e.g., lithium stearate. Silicone and halogen based greases are also known.

The FTIR and Pyr/GC-MS results are consistent with the presence of a hydrocarbon based grease. There is also the suggestion of some silicone oil (e.g., secondary lubricant used to aid removal of bolt ?) in the IR spectrum.

The suggestion of doing SEM/EDS analyses of the DCM insoluble portion on the debris is to look for the particulate materials that might be associated with the anti-sieze formulation. It would also be useful to know the metal alloys used in the bolt/threaded hole (to distinguish wear particles from anti-sieze particles) and the application conditions (e.g., temperature, atmosphere, chemicals in contact with bolt) to better understand the results and potential products which might have been used.

INTRODUCTION

One sample, black particles identified as "F16108, S", was received from B Kaiser on August 22nd.

The objective is to determine if thread locking and/or anti-sieze formulation compounds are present in the sample using Fourier transform infrared spectroscopy, thermogravimetric analysis and pyrolysis/gas chromatography-mass spectroscopy.

ANALYSIS

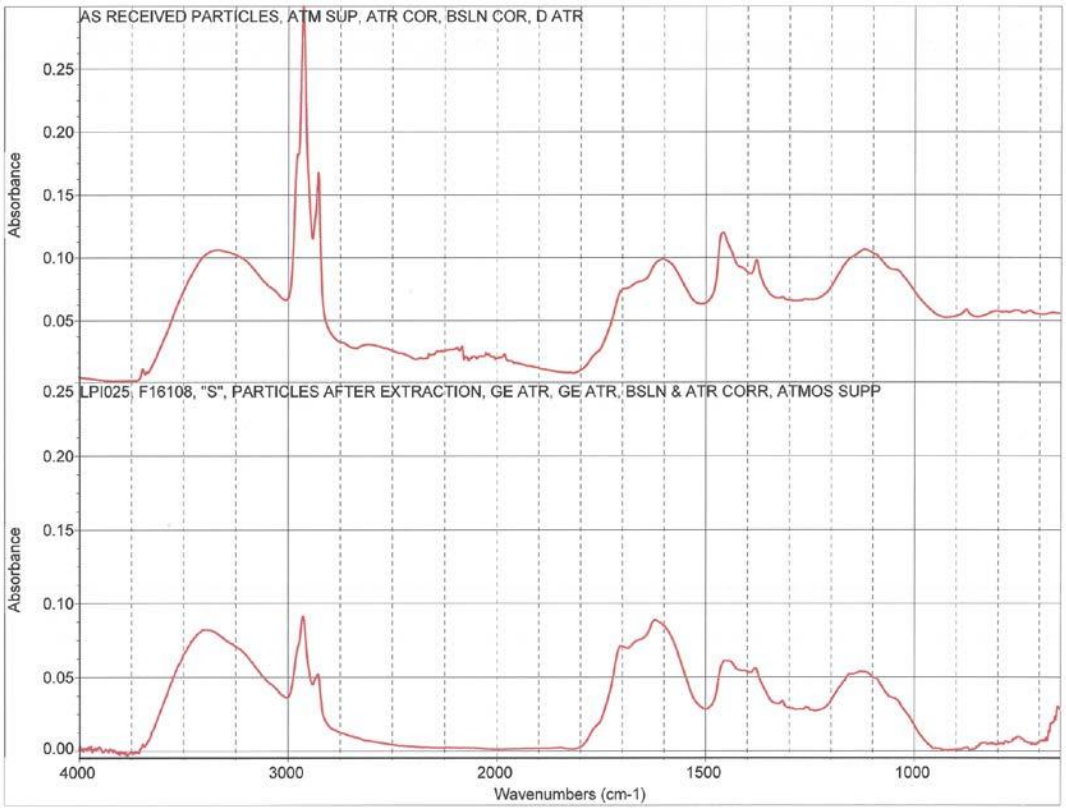
Sample Preparation. 50.8 mg of the sample was extracted with dichloromethane (DCM) and dried in a fume hood at room temperature. The solvent extract was also allowed to evaporate, resulting in a residue that weighed 9.5 mg, and therefore approximately 18.7 % of the original mass was extracted with the DCM. The extracted solid was analyzed by FTIR, TGA, and Pyr/GC-MS. The extracted residue was analyzed by FTIR.

Fourier Transform Infrared Spectroscopy (FTIR). FTIR is an excellent technique for the identification of unknown organic based materials. In FTIR spectra, deflections ("IR absorbance bands") from the baseline can be assigned to specific groupings of atoms; e.g., C-H, C=O. In many cases, identification of a material can be made based on the presence of a number of these bands. The availability of reference spectra of known compounds increases the probability of making a positive identification.

The FTIR spectra were obtained by attenuated total reflectance (ATR) on a Nicolet iS10 Fourier Transform Infrared Spectrometer with a Smart iTR ATR Accessory and DTGS MID-IR Detector. The spectra were acquired using a diamond or germanium crystal in reflectance mode with 4 cm^{-1} resolution (64 scans) and plotted in absorbance versus frequency (cm^{-1}) format. The original wavenumber annotated spectra are included in the FTIR Appendix.

The IR spectra of the "as received" sample, extracted particle sample and selected references are shown in Figures 1-2.

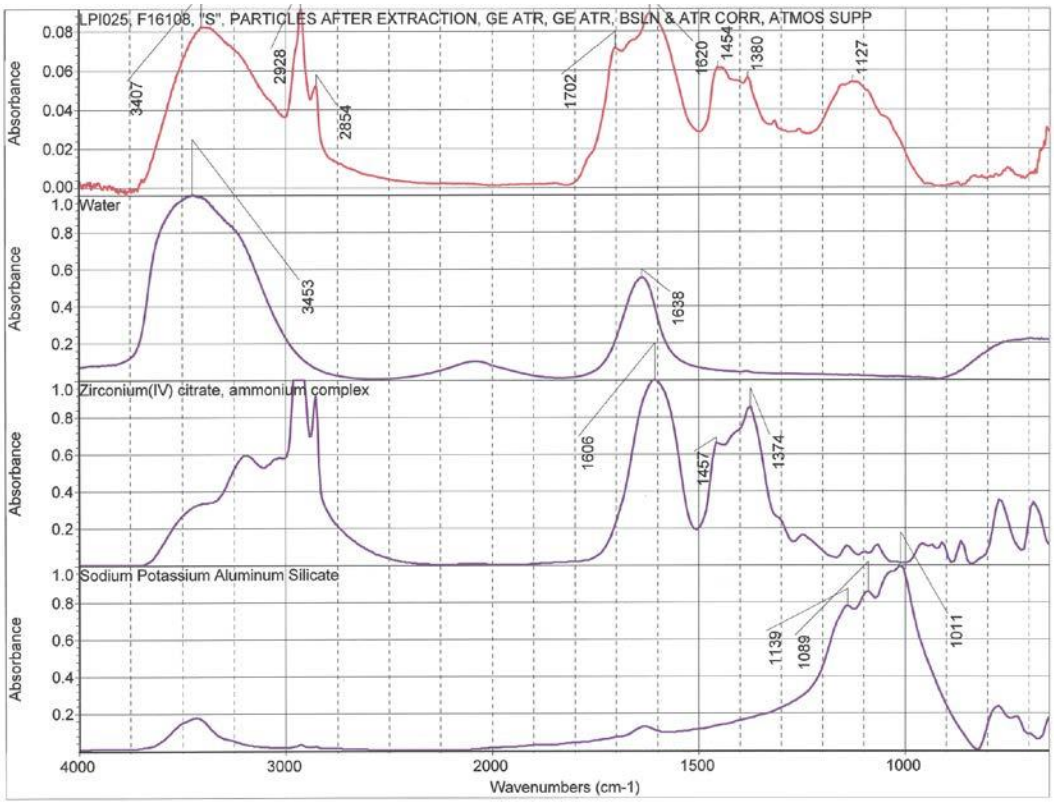
Figure 1 – IR Spectra of the 'As Received' and DCM Extracted Particles



Analysis of the particles sample 'as received' and after extraction with dichloromethane (DCM) and subsequent drying of the particles result in similar IR spectra, with the latter having a lower absorbance in the C-H stretch region (3000-2800 cm^{-1}) as a significant amount of DCM soluble hydrocarbon based material was extracted from the sample.

Figure 2 displays the IR spectrum acquired from the DCM extracted particles along with selected reference spectra.

Figure 2 – IR Spectra of DCM Extracted Particles and Selected References



An exact spectral match for the FTIR spectrum acquired from the DCM extracted particles was not obtained. The FTIR spectrum acquired from the dried solid particles contains functionality relating to long chain aliphatic hydrocarbon (3000-2800 cm^{-1}), O-H functionality (3600-3000 cm^{-1}), absorbance from a possible carboxylate salt (ca 1700-1600 cm^{-1}) and functionality in the region of Si-O absorbance (1200-1000 cm^{-1}) from silica/silicates. Elemental analysis would be required to confirm the presence of inorganic material.

Figure 3a-b displays the IR spectrum acquired from the DCM extract residue along with selected reference spectra.

Figure 3a – IR Spectra of DCM Extract Residue and Selected References

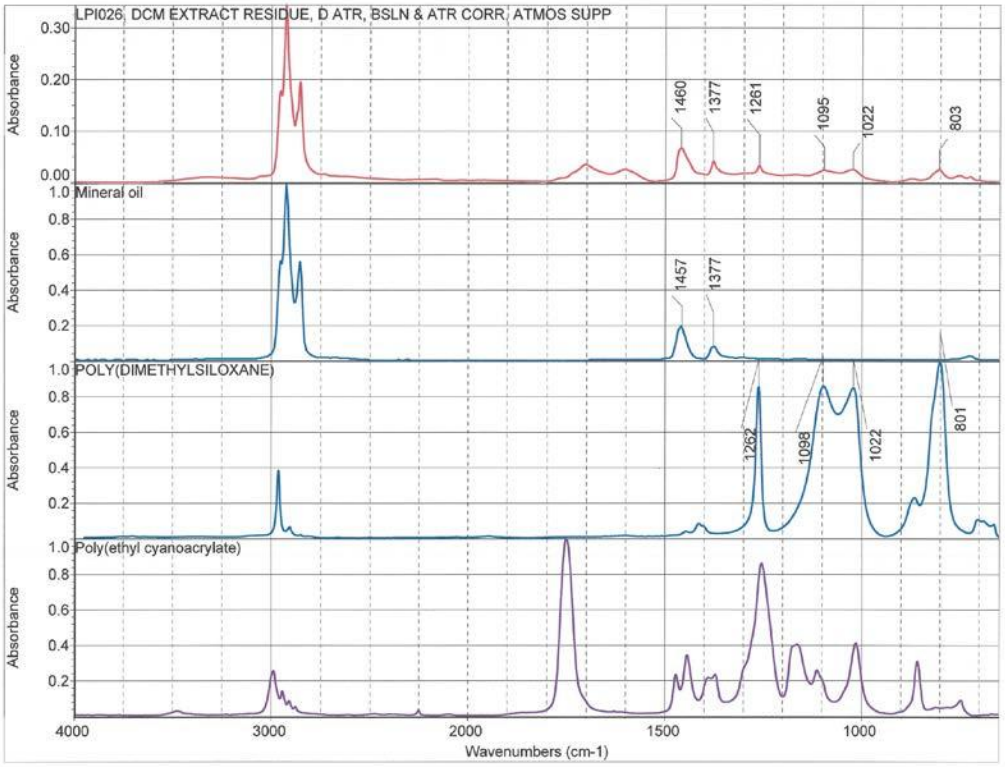
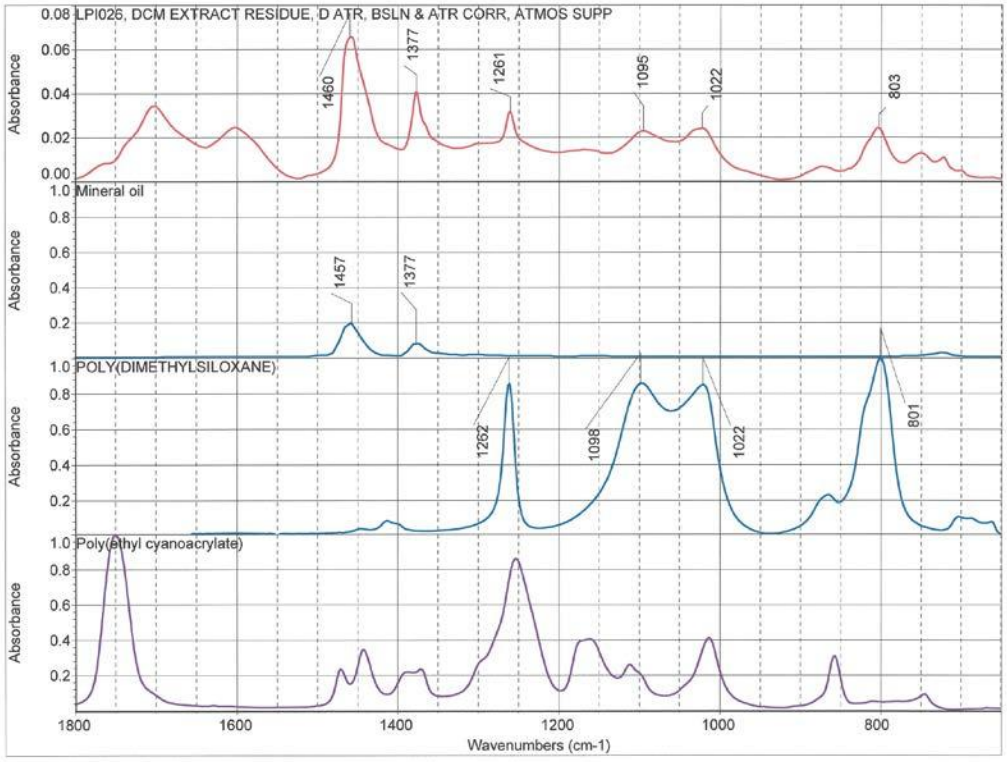


Figure 3b – IR Spectra of DCM Extract Residue and Selected References (Expanded)



The FTIR spectrum acquired from the extract residue (displayed on top in red) contains functionality that can be assigned to a long chain hydrocarbon material (e.g., mineral oil) and a poly(dimethylsiloxane) (e.g., silicone oil).

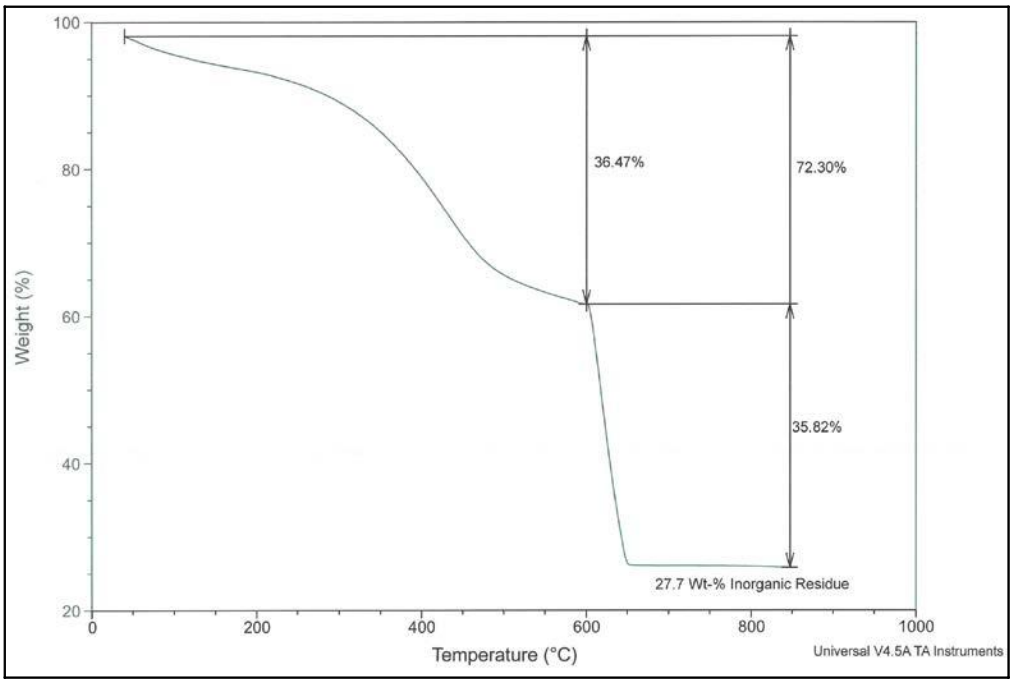
A reference spectrum for poly(ethyl cyanoacrylate) (displayed in purple) is shown for comparison. The large, characteristic carbonyl ester (C=O) band at ca. 1740 cm^{-1} is not present in the acquired sample spectrum and thus is not believed to be present in the sample.

Thermal Gravimetric Analysis (TGA). TGA measures the change in weight of a material as it is heated. Typically, organic based materials (e.g., polymers and additives) thermally degrade at moderate temperatures (300-500 °C) with loss of weight while inorganic materials do not exhibit weight loss in this temperature range. With carbon black filled formulations or aromatic polymers, further weight loss can be observed when oxygen or air is introduced as purge gas to complete the oxidation of the organic materials and carbon black.

A TA Q500 TGA analysis module equipped with auto-sampler and Thermal Advantage release 5.4.0 software for Windows were used for these analyses. Approximately 17 mg of the sample were heated from 40 °C to 600 °C in a nitrogen atmosphere at a rate of 10 °C/min then heated from 650 °C to 850 °C (ramped at 10 °C/min) in an air atmosphere.

The TGA trace of the extracted dried particle sample is displayed in Figure 4.

Figure 4 – TGA Heating Trace of Extracted Dried Particles



The extracted dried particles lost all organic material (72 weight %) by 650 °C, and thus this temperature was chosen for the subsequent Pyr/GC-MS analysis. The inorganic ash constituted 28 wt-% after heating to 850 ºC in air.

Pyrolysis/Gas Chromatography – Mass Spectroscopy (PYR/GC-MS). GC-MS is a valuable analytical technique for the separation and identification of volatile organic compounds. The pyrolysis admixture of compounds are separated on the GC column and identified by matching their electron impact ionization mass spectra to those of the reference spectra contained in the NIST/Wiley digital library.

Thermal desorption/pyrolysis is a sampling technique in which a small amount of a solid sample is heated below its thermal decomposition temperature. Volatile compounds are entrained in a flowing stream of helium gas and trapped by a cryo-focusing sample inlet system located at the head of the GC column. Subsequent flash vaporization of the material from the cold trap ensures that the entire sample enters the GC column at one time leading to a proper separation of the various components by interaction with the column's stationary phase. The separated compounds enter the mass electron impact spectrometer source where they are ionized and fragmented. The resulting ions are separated on the basis of mass per charge in the quadruple mass spectrometer and the ion abundance measured by the detector.

As the temperature exceeds the thermal decomposition temperature of a particular compound, the volatile pyrolysis products are evolved and entrained in the helium gas flow. Hence, the pyrolysis sampling method combines thermal desorption and pyrolysis.

Instrumentation and Conditions. Thermal desorption analysis was performed using an Agilent 6890N Gas Chromatograph (GC) equipped with an Agilent 5975B Quadrupole Mass Selective Detector and Gerstel Thermal Desorption System, which included a Gerstel Cooled Injection System split/splitless injection port that supplied the cryo-focusing capability. An Agilent J&W VF-5MS UI capillary GC column (30 m x 0.25 mm with 0.25 μm film thickness) was used for chromatography under the following conditions:

<u>Pyrolysis Conditions:</u>

TD System:	Splitless
Sample Oven Temperature:	30 °C to 400 °C at 60 °C/min, hold at 400 °C for 4 min Ramp to 650 °C, hold for 1 min
TD Transfer line temp:	300 °C
Cryotrap temperature:	-150 °C
Injector Temp.:	-150 °C to 280 °C at 12 °C/sec, hold at 280 °C for 3 min
He Flow Rate:	1.0 ml/min
Column Oven:	40 °C for 6 min, 40 °C to 300 °C at 15 °C/min, hold at 300 °C for 10 min
MS Transfer Line Temp.:	280 °C
MSD:	m/z 29-550

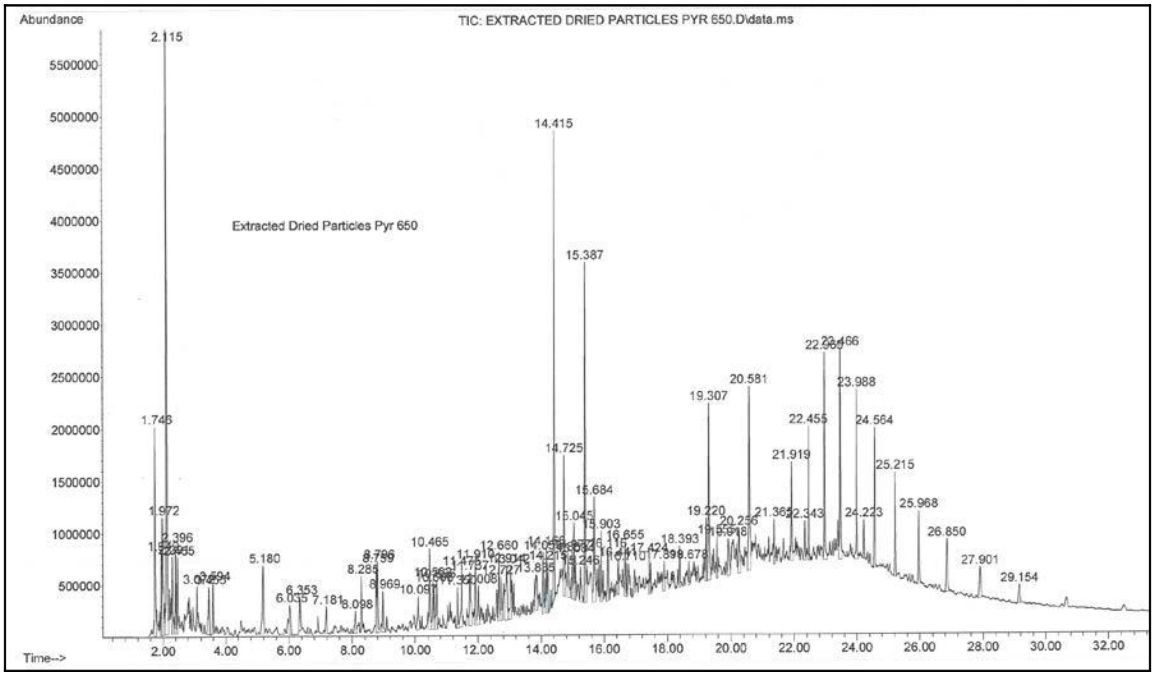
The mass spectrometer was tuned prior to analysis. The tune reports, chromatograms and mass spectral comparisons are included in the Pyr/GC-MS Appendix.

The pyrolysis system (unit, transfer line) and the GC column were baked out to remove any contaminants prior to sample analysis. A blank was run immediately prior to the sample.

The sample (fraction of a mg) was inserted into the pyrolysis system and equilibrated in flowing helium. The cryo-focusing chamber was held at -150 °C during the heating of the sample and then rapidly ramped to 280 °C to start the GC analysis. During cryo-trapping, the MSD was turned off.

Figure 5 displays the total ion chromatogram (TIC) of the extracted dried particles sample. The detector response (ion abundance) on the y-axis is plotted against the retention time (minutes) on the x-axis.

Figure 5 – Pyrolysis TIC of Extracted Dried Particles



The PYR/GC-MS results are listed in Table I. The compounds are identified based on their matches with reference spectra. The major ions of the mass spectra (most abundant mass underlined) are listed where a good match was not obtained. The area-% is defined as the integrated area of an individual peak divided by total integrated area of all detected peaks x 100. As the detector responses are not corrected, these area-% values are relative and not quantitative.

Table I – Pyr/GC-MS Results

Retention Time (min)	Compound Identification or Mass Spectrum (m/z)	Relative Area-%
1.75	2-Methyl-1-propene	3.1
1.95	2-Pentene	0.8
1.97	Pentane	2.4
2.29	2-Methyl-2-propenal	1.1
2.40	1-Hexene	1.1
2.46	Hexane	1.0
3.07	Benzene	0.5
3.46	1-Heptene	1.1
3.59	Heptane	0.8
5.18	Toluene	1.8
6.04	1-Butyl-2-methylcyclopropane	0.9
6.35	Octane	0.8
7.18	Hexamethylcyclotrisiloxane	0.6
8.10	Ethylbenzene	0.6
8.29	p-Xylene	1.1
8.76	Styrene	1.0
8.80	1-Methyl-2-pentylcyclopropane	1.3
8.97	Nonane	0.7
10.10	1-Ethyl-3-methylbenzene	0.9
10.47	Phenol	1.6
10.56	1-Decene	0.9
10.61	1,2,4-Trimethylbenzene	0.8
10.69	Decane	0.9
11.35	Indene	0.7
11.48	2-Methylphenol	1.4
11.74	4-Methylphenol	1.6
11.91	41, 43, 55, 56, 69, 70, 83, 84, 97, 113, 154	1.0
12.01	Undecane	0.8
12.66	1-Methyl-2-cyclopropen-1-ylbenzene	1.1
12.73	2-Methylindene	1.0
12.91	Benzoic acid	2.2
13.04	1-Dodecene	1.0
13.84	41, 55, 57, 60, 73, 98, 115, 128, 129, 144, 225, 240	1.0
14.05	1-Tridecene	0.9
14.17	Indole (plus m/z 129, 144, 253, 269 ?)	1.1
14.22	1-Methylnapthalene	0.7
14.42	Phthalic anhydride	8.6
14.73	Phthalide	2.3
14.86	5-Methyl-1H-indole	1.1
14.98	1-Tetradecene	0.6
15.05	Methylindole isomer	1.2
15.08	Methylindole isomer	0.6
15.25	2,7-Dimethylnaphthalene	0.8
15.39	2-Methyl-1H-isoindole-1,3(2H)-dione	4.8
15.68	Phthalimide	2.2
15.90	2,8-Dimethylindolizine	1.3
16.12	39, 51, 63, 77, 89, 91, 115, 116, 118, 144, 146, 147, 175	1.1
16.66	41, 43, 55, 57, 69, 83, 97, 118, 119, 147, 161, 182, 224	0.9
17.42	3-Heptadecene	0.6
18.39	Phenanthrene	0.5
19.22	2-Methylphenanthrene	0.9
19.31	2-Methylanthracene	3.0
19.56	2-Methyl-9H-carbazole	0.8
19.92	3-Methyl-1-phenyl-1H-indene	1.0
20.26	41/43, 57/58, 97, 110, 124, 152, 166, 180, 194/195, 226, ...	1.1
20.58	Ocadecanoic acid	3.9
21.37	Tricosane	0.7
21.92	Tetracosane	1.6
22.34	Hexadecylphenol isomer	0.6
22.46	Pentacosane	1.7
22.97	Hexacosane	2.8
23.47	Heptacosane	3.1
23.99	Octacosane	2.6
24.22	Squalene	0.5
24.56	Nonacosane	2.2
25.22	Triacontane	1.9
25.97	Hentriacontane	1.7
26.85	Dotriacontane	1.4
27.90	Tritriacontane	0.9
29.15	41/43, 55/57, 69, 71, 83/85, 97/99, 111/113, ...	0.6

The most abundant single compound detected is phthalic anhydride (8.6 area-%). The phthalide (2.3 area-%, a lactone of similar structure), phthalimide (2.2 area-%, nitrogen analog) and benzoic acid (2.2 area-%) may also be related to the phthalic anhydride as decomposition or reaction products.

The major pyrolysis components are linear alkanes and alkenes (alkenes C5-C17, alkanes C5-C33), methyl substituted aromatic compounds and nitrogen containing aromatic compounds.

Octadecanoic acid (3.9 area-%) was detected.

Phenol and various substituted phenols are present possibly indicating the presence of a phenolic or an aromatic epoxy resin.

No reactive cyanoacrylate compounds were detected.

As questions arise during your review of this report, please do not hesitate to call us.

ANALYZE Inc.

[redacted]
Consulting Chemist
Laboratory Supervisor

[redacted]
Consulting Chemist
Director of Operations

FTIR APPENDIX

Performance Verification

Operator: Lab
Date: Mon, Aug 29 2016, 07:01 AM (GMT-07:00)
Instrument: Nicolet iS10 Serial number: AKX0800770

Test Description	High Limit	Low Limit	Measured	Result
Energy ratio (Single-beam)				
Energy ratio 4000 / 2000	1.0	0.2	0.31	Pass
Energy ratio 2000 / 1000	4.0	0.9	1.301	Pass
Noise level (100 %T)				
Peak to peak noise 4050 - 3950 (%T)	0.3	0.0	0.015	Pass
Peak to peak noise 2050 - 1950 (%T)	0.3	0.0	0.014	Pass
Peak to peak noise 1050 - 950 (%T)	0.3	0.0	0.021	Pass
Peak to peak noise 550 - 450 (%T)	3.0	0.0	0.499	Pass
RMS noise 4050 - 3950	0.05	0.0	0.004	Pass
RMS noise 2050 - 1950	0.05	0.0	0.003	Pass
RMS noise 1050 - 950	0.05	0.0	0.004	Pass
RMS noise 550 - 450	0.6	0.0	0.078	Pass
Wavenumber accuracy (1.5 mil Polystyrene)				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.637	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.056	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.375	Pass
Intensity repeatability (NG11 glass)				
Intensity (%T) at 3990.0	85.86	65.86	75.683	Pass
Intensity (%T) at 3031.0	51.83	31.83	42.012	Pass
Intensity (%T) at 2598.0	25.38	5.38	15.421	Pass
Intensity (%T) at 2010.0	10.01	-9.99	0.009	Pass

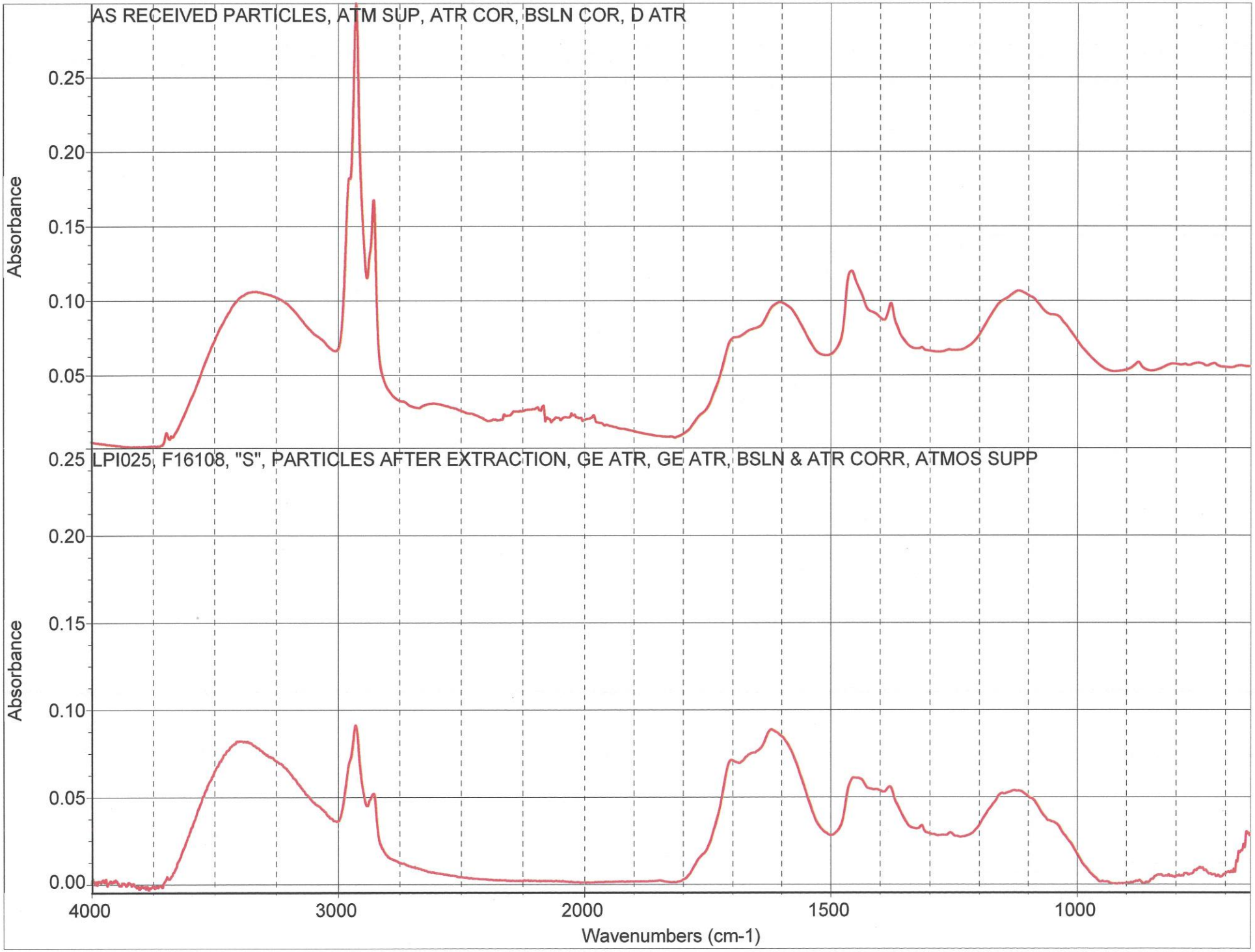
Performed by: [signature] Title: Consulting Chemist Date: 08.29.16
Approved by: [signature] Title: Consulting Chemist Date: 08.29.16
Comments:

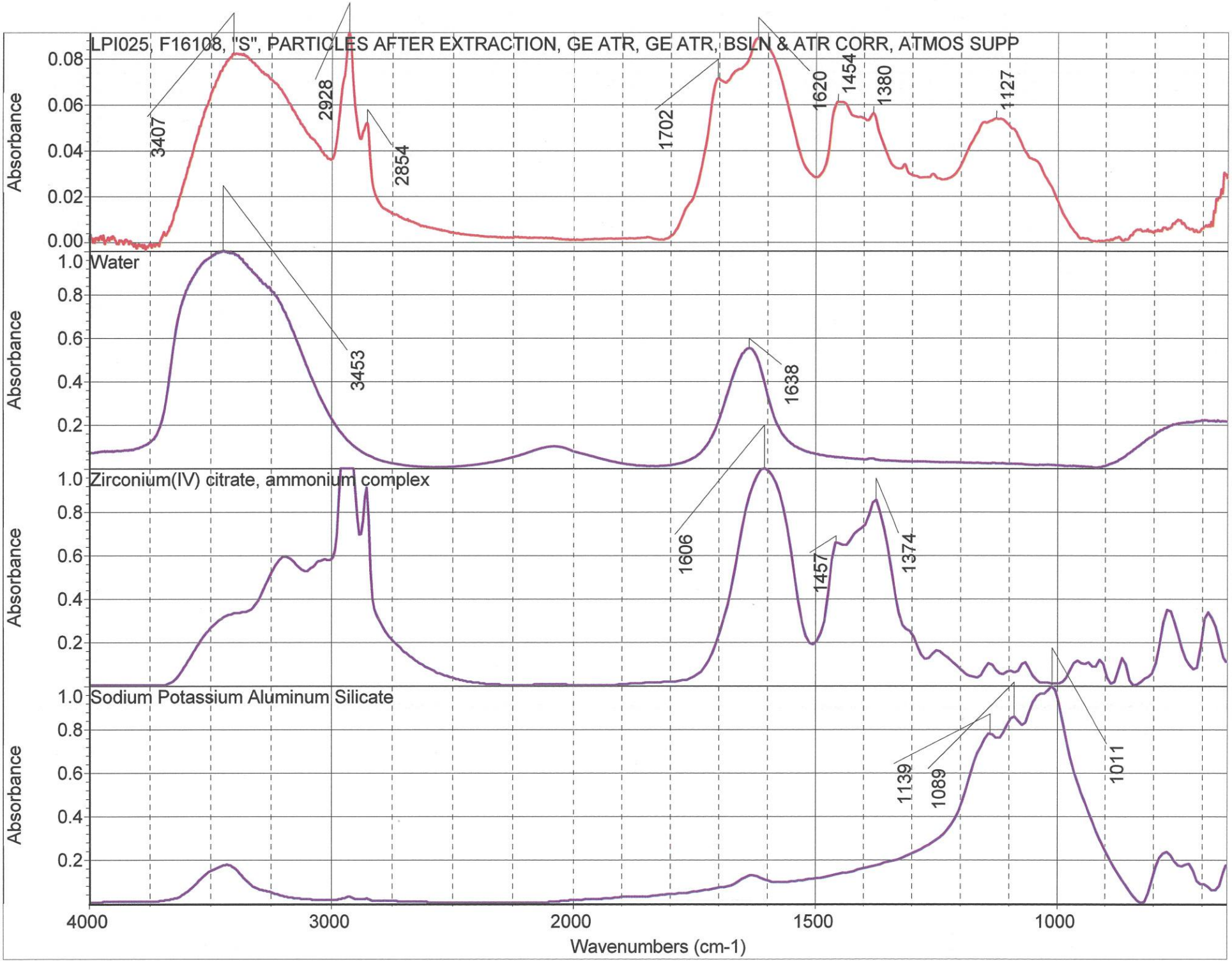
Performance Verification

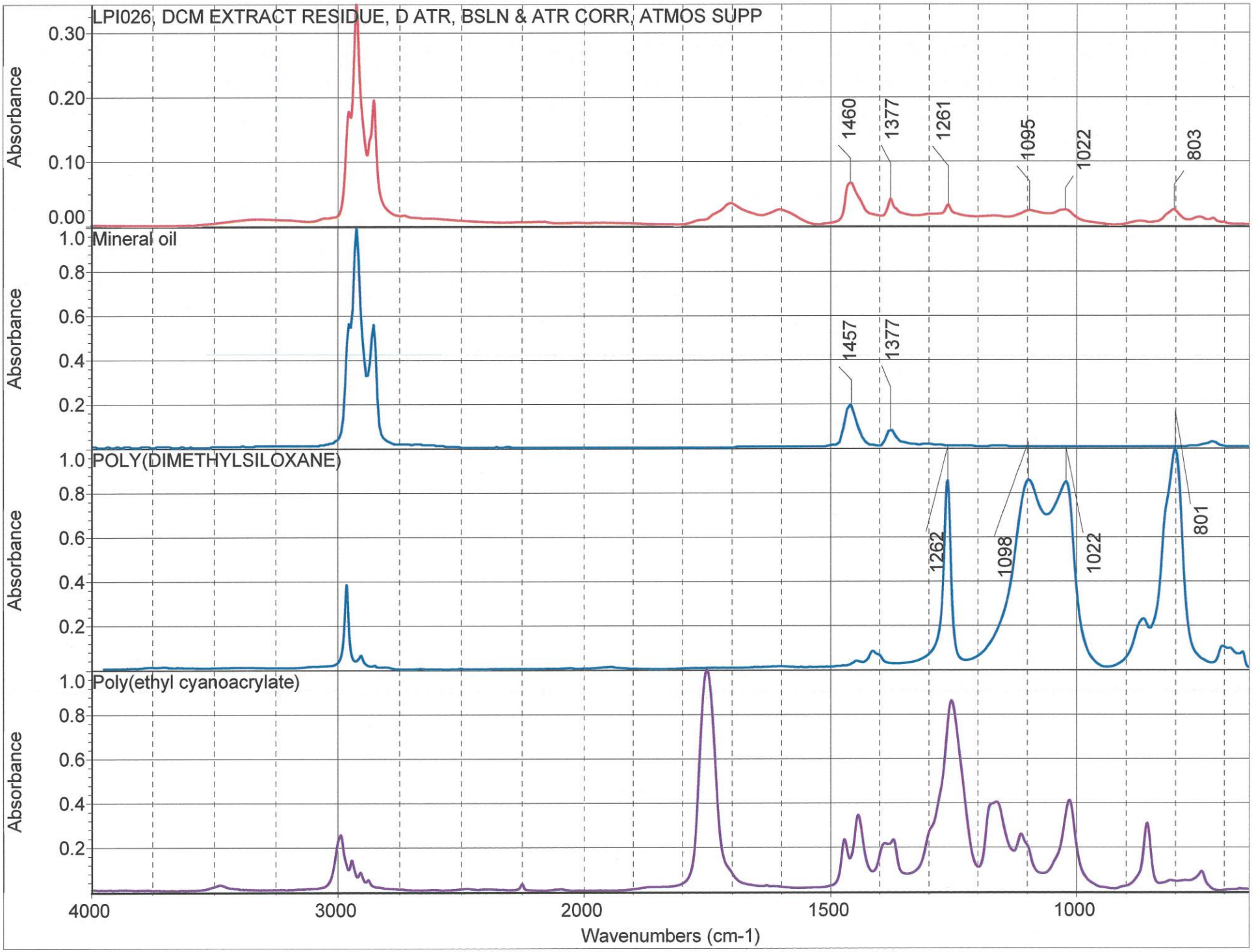
Operator: Lab
Date: Fri, Aug 26 2016, 01:25 PM (GMT-07:00)
Instrument: Nicolet iS10 Serial number: AKX0800770

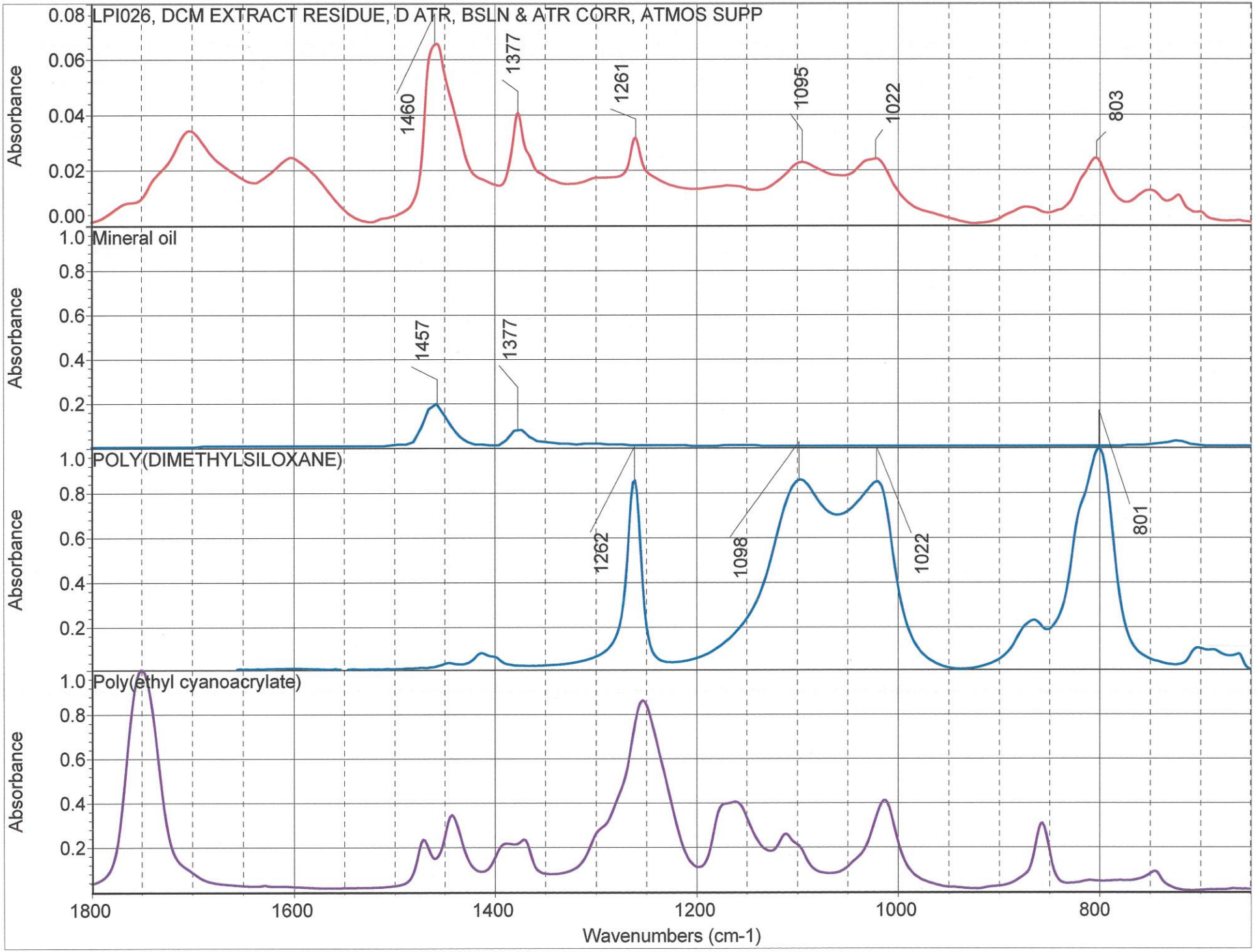
Test Description	High Limit	Low Limit	Measured	Result
Energy ratio (Single-beam)				
Energy ratio 4000 / 2000	1.0	0.2	0.311	Pass
Energy ratio 2000 / 1000	4.0	0.9	1.303	Pass
Noise level (100 %T)				
Peak to peak noise 4050 - 3950 (%T)	0.3	0.0	0.082	Pass
Peak to peak noise 2050 - 1950 (%T)	0.3	0.0	0.082	Pass
Peak to peak noise 1050 - 950 (%T)	0.3	0.0	0.033	Pass
Peak to peak noise 550 - 450 (%T)	3.0	0.0	0.389	Pass
RMS noise 4050 - 3950	0.05	0.0	0.011	Pass
RMS noise 2050 - 1950	0.05	0.0	0.017	Pass
RMS noise 1050 - 950	0.05	0.0	0.01	Pass
RMS noise 550 - 450	0.6	0.0	0.068	Pass
Wavenumber accuracy (1.5 mil Polystyrene)				
Peak at 3060.0 (cm-1)	3061.0	3059.0	3059.638	Pass
Peak at 1601.2 (cm-1)	1602.2	1600.2	1601.051	Pass
Peak at 1028.3 (cm-1)	1029.3	1027.3	1028.374	Pass
Intensity repeatability (NG11 glass)				
Intensity (%T) at 3990.0	85.86	65.86	75.823	Pass
Intensity (%T) at 3031.0	51.83	31.83	42.151	Pass
Intensity (%T) at 2598.0	25.38	5.38	15.459	Pass
Intensity (%T) at 2010.0	10.01	-9.99	0.009	Pass

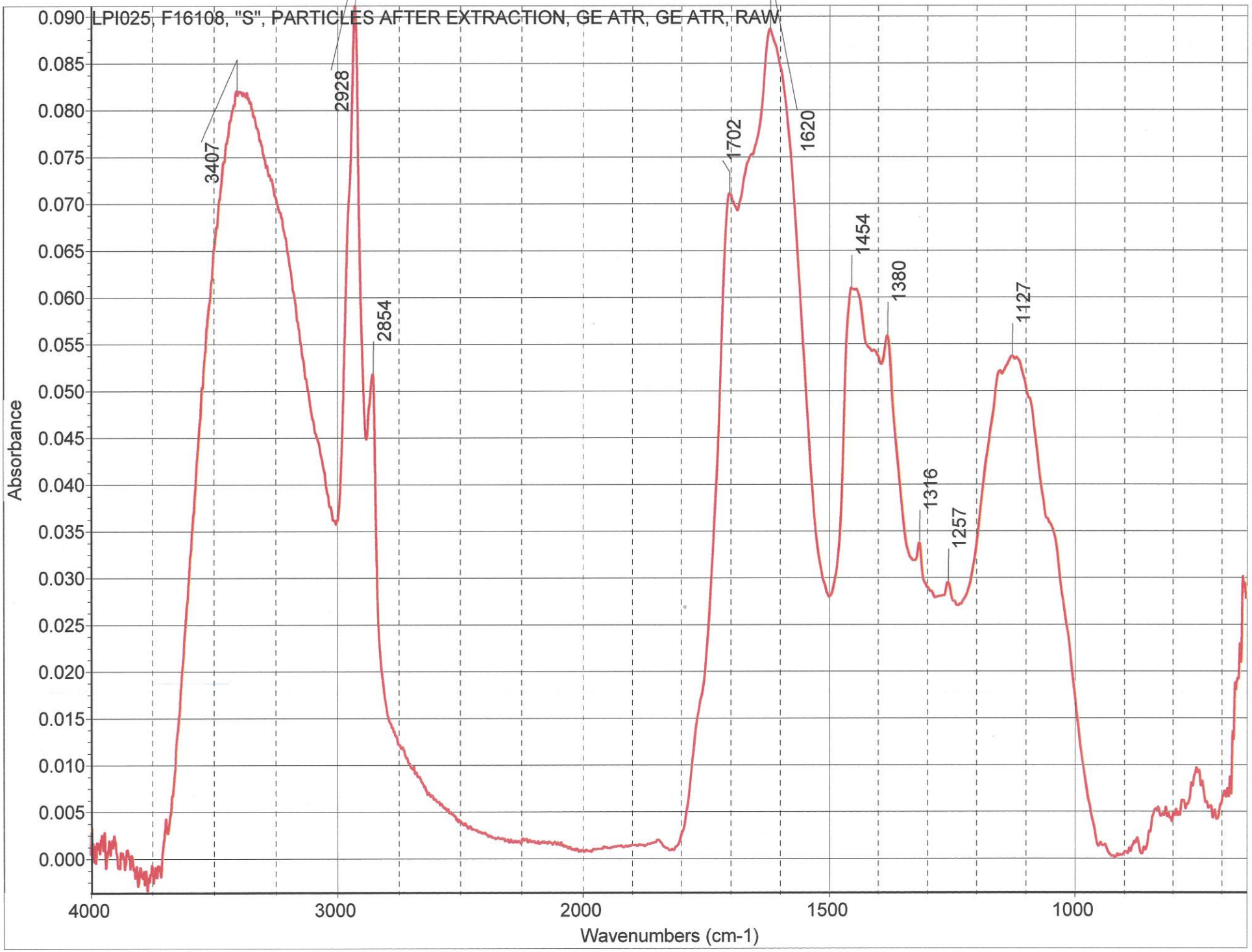
Performed by: _____ Title: Consulting Chemist Date: 08.26.16
Approved by: _____ Title: Consulting Chemist Date: 08.26.16
Comments: _____

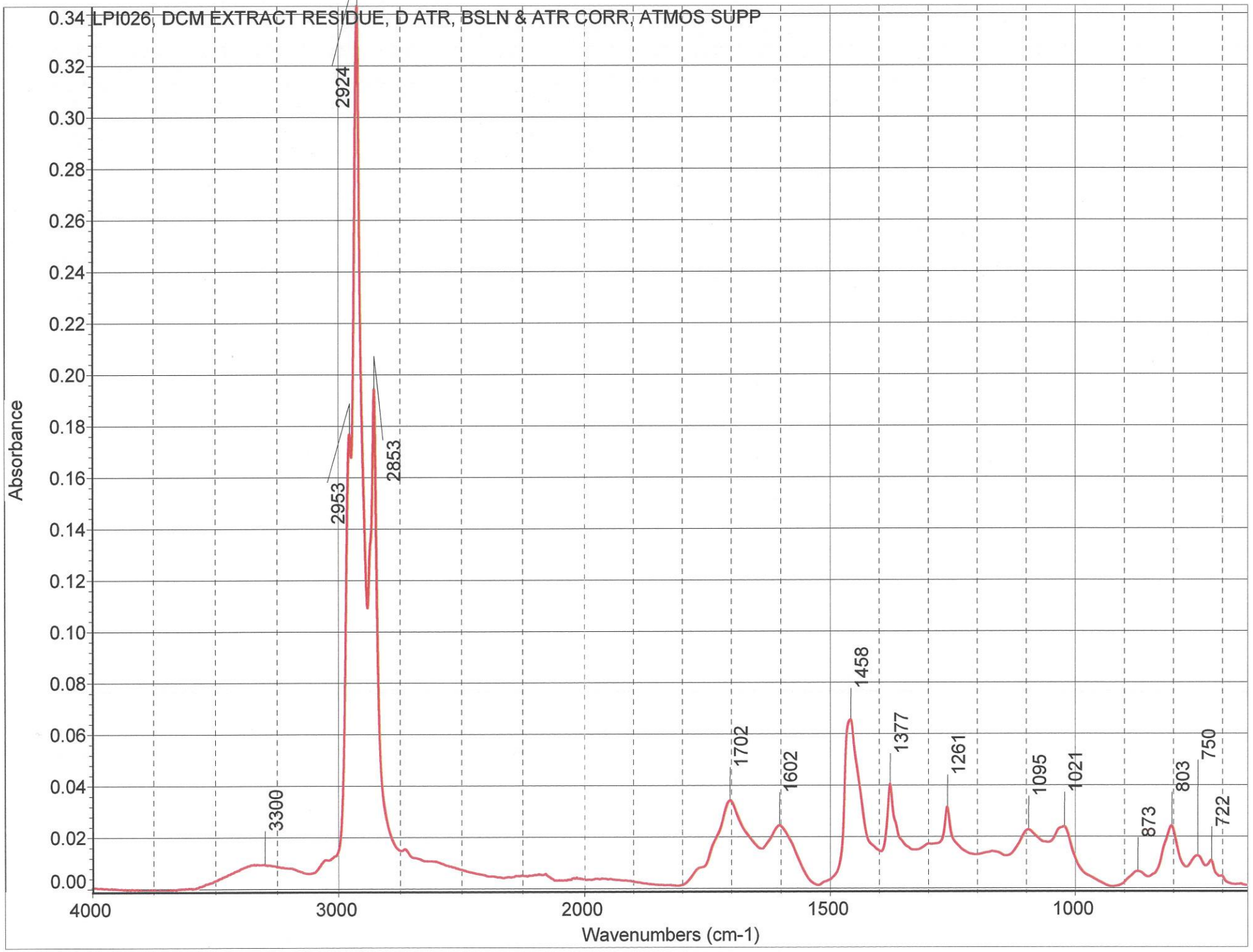

AS RECEIVED PARTICLES, ATM SUP, ATR COR, BSLN COR, D ATR
Absorbance
0.25
0.20
0.15
0.10
0.05
LPI025, F16108, "S", PARTICLES AFTER EXTRACTION, GE ATR, GE ATR, BSLN & ATR CORR, ATMOS SUPP
Absorbance
0.25
0.20
0.15
0.10
0.05
0.00
4000
3000
2000
1500
1000
Wavenumbers (cm-1)


LPI025, F16108, "S", PARTICLES AFTER EXTRACTION, GE ATR, GE ATR, BSLN & ATR CORR, ATMOS SUPP
Absorbance
0.08
0.06
0.04
0.02
0.00
3407
2928
2854
1702
1620
1454
1380
1127
Water
1.0
0.8
0.6
0.4
0.2
3453
1638
Zirconium(IV) citrate, ammonium complex
1606
1457
1374
Sodium Potassium Aluminum Silicate
1139
1089
1011
4000
3000
2000
1500
1000
Wavenumbers (cm-1)


LPI026, DCM EXTRACT RESIDUE, D ATR, BSLN & ATR CORR, ATMOS SUPP
Absorbance
0.30
0.20
0.10
0.00
1460
1377
1261
1095
1022
803
Mineral oil
1.0
0.8
0.6
0.4
0.2
1457
1377
POLY(DIMETHYLSILOXANE)
1262
1098
1022
801
Poly(ethyl cyanoacrylate)
4000
3000
2000
1500
1000
Wavenumbers (cm-1)


LPI026, DCM EXTRACT RESIDUE, D ATR, BSLN & ATR CORR, ATMOS SUPP
Absorbance
0.08
0.06
0.04
0.02
0.00
1460
1377
1261
1095
1022
803
Mineral oil
1.0
0.8
0.6
0.4
0.2
1457
1377
POLY(DIMETHYLSILOXANE)
1262
1098
1022
801
Poly(ethyl cyanoacrylate)
1800
1600
1400
1200
1000
800
Wavenumbers (cm-1)


LPI025, F16108, "S", PARTICLES AFTER EXTRACTION, GE ATR, GE ATR, RAW
Absorbance
0.090
0.085
0.080
0.075
0.070
0.065
0.060
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
3407
2928
2854
1702
1620
1454
1380
1316
1257
1127
4000
3000
2000
1500
1000
Wavenumbers (cm-1)

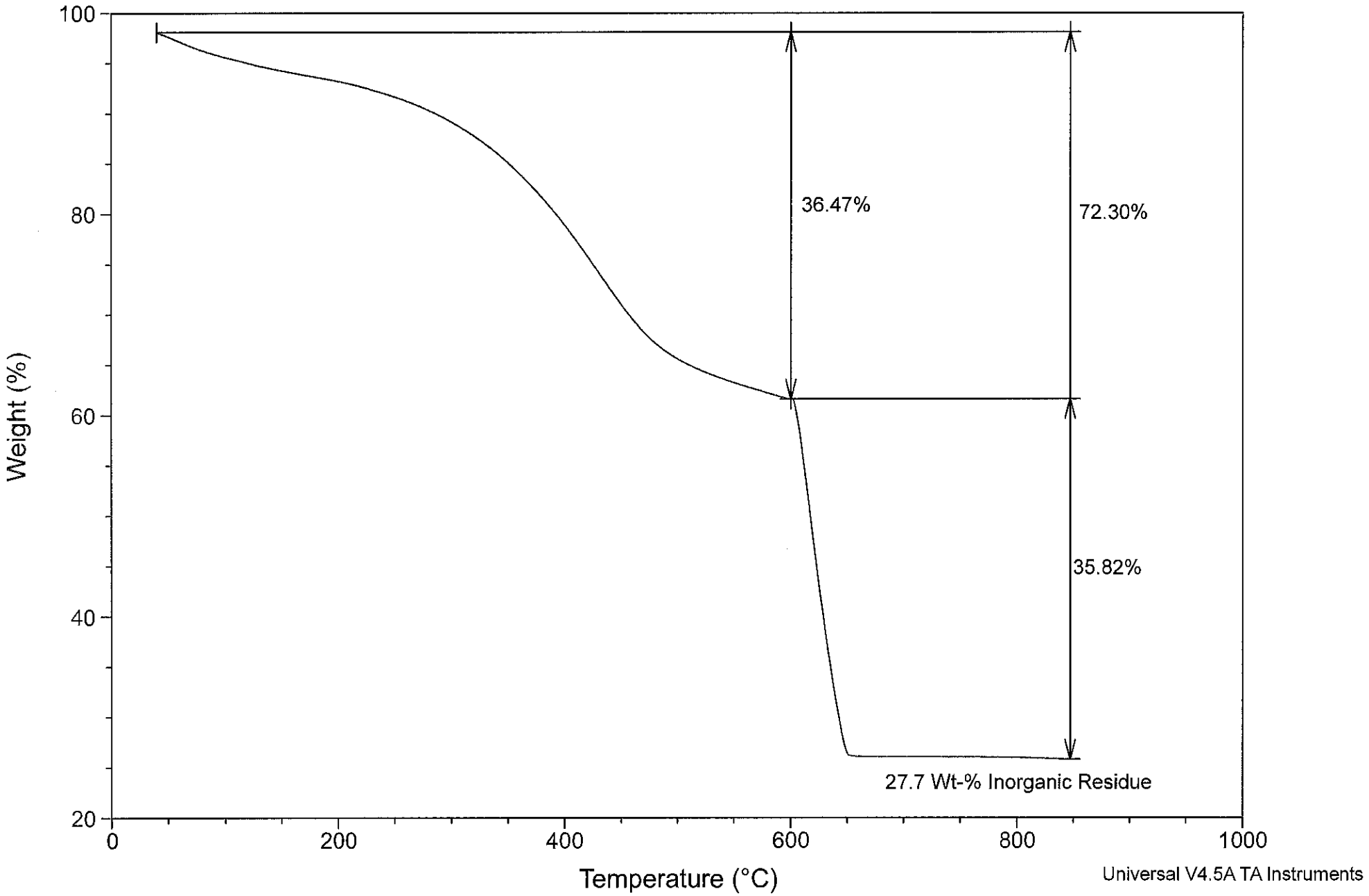

LPI026, DCM EXTRACT RESIDUE, D ATR, BSLN & ATR CORR, ATMOS SUPP
Absorbance
0.34
0.32
0.30
0.28
0.26
0.24
0.22
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
2924
2953
2853
3300
1702
1602
1458
1377
1261
1095
1021
873
803
750
722
4000
3000
2000
1500
1000
Wavenumbers (cm-1)

TGA APPENDIX

Sample: Extracted and Dried Particles
Size: 17.4240 mg
Method: Ramp

TGA

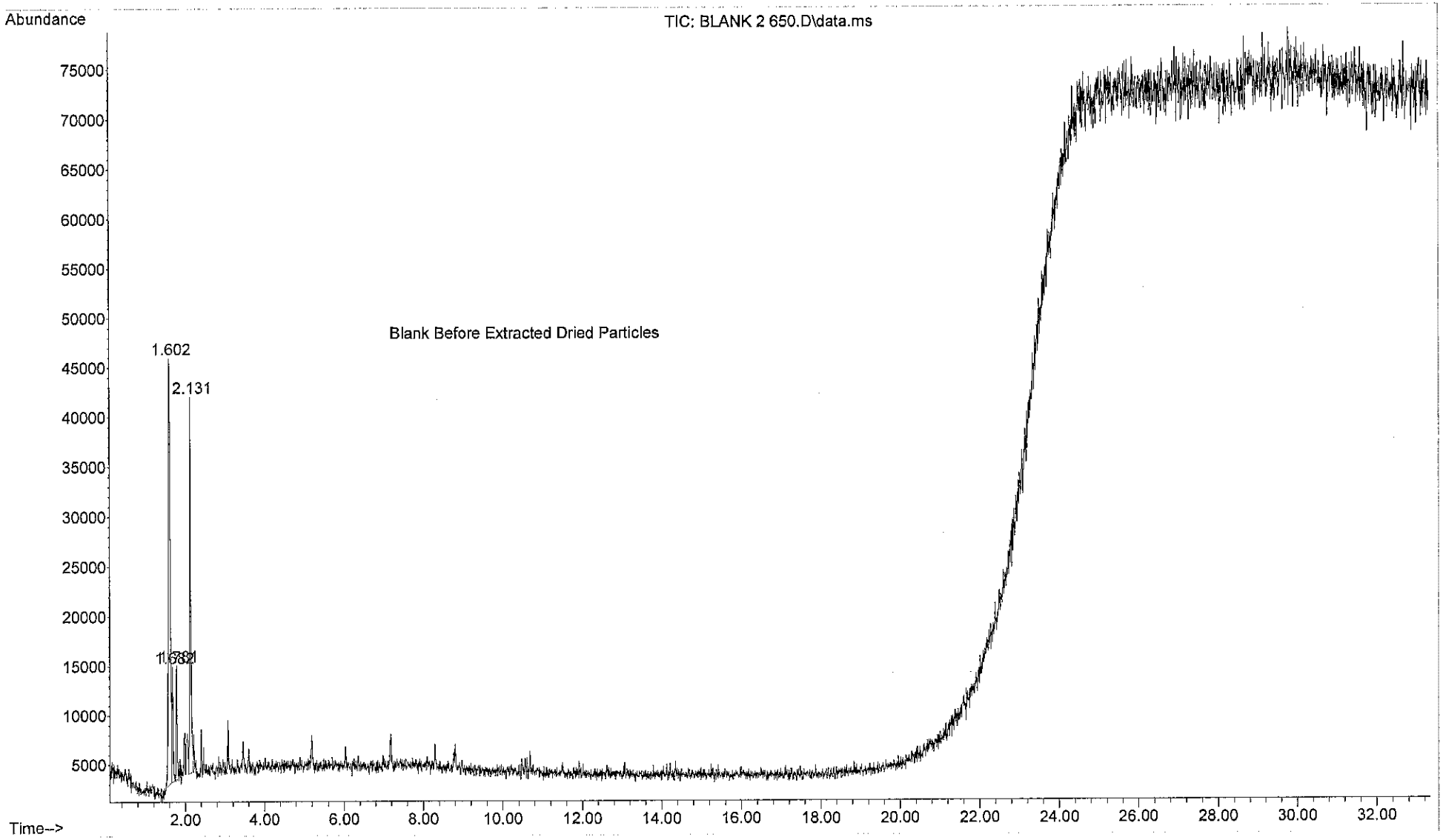
File: C:...\Extracted and Dried Particles.001
Operator: CG
Run Date: 29-Aug-2016 11:36
Instrument: TGA Q500 V20.13 Build 39



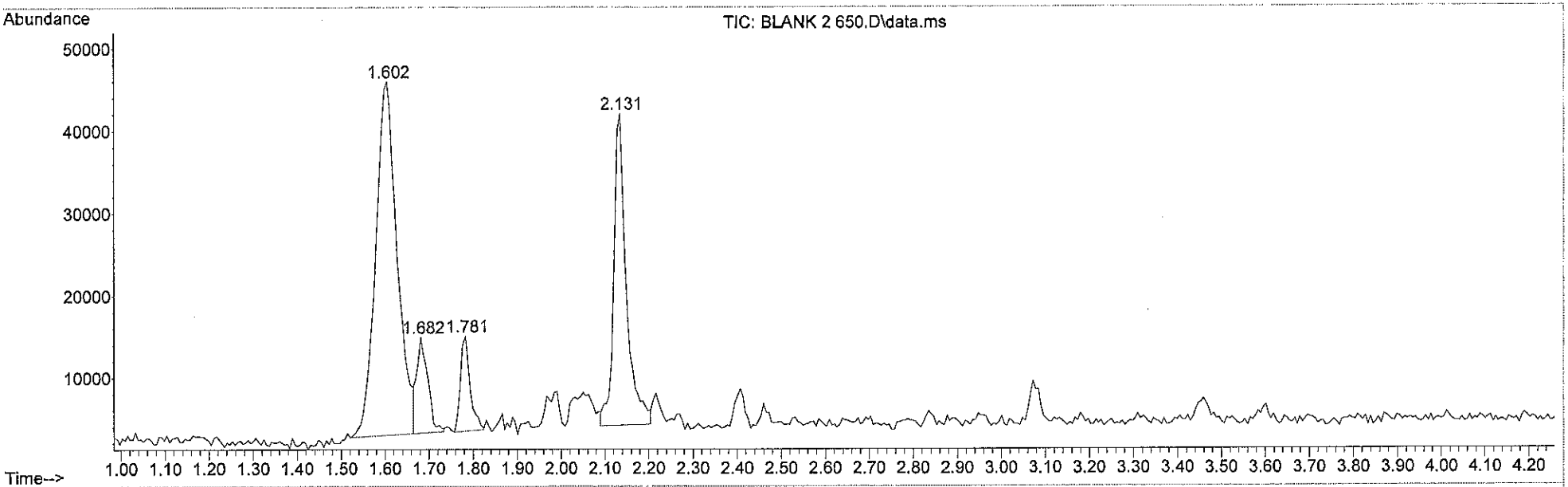
Universal V4.5A TA Instruments

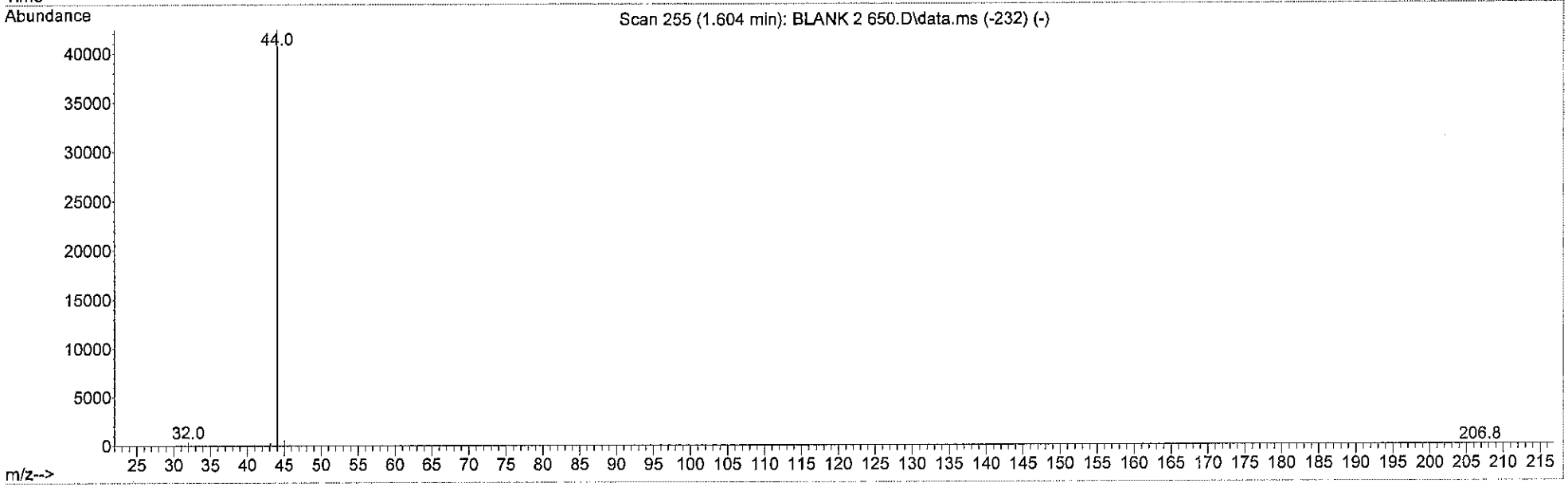
Pyr/GC-MS APPENDIX

File :D:\Data 2016\LPI\Job 8029\BLANK 2 650.D
Operator : CG
Acquired : 30 Aug 2016 6:55 using AcqMethod PYR 650 SPLIT30.M
Instrument : Instrument #1
Sample Name: blank
Misc Info :
Vial Number: 1

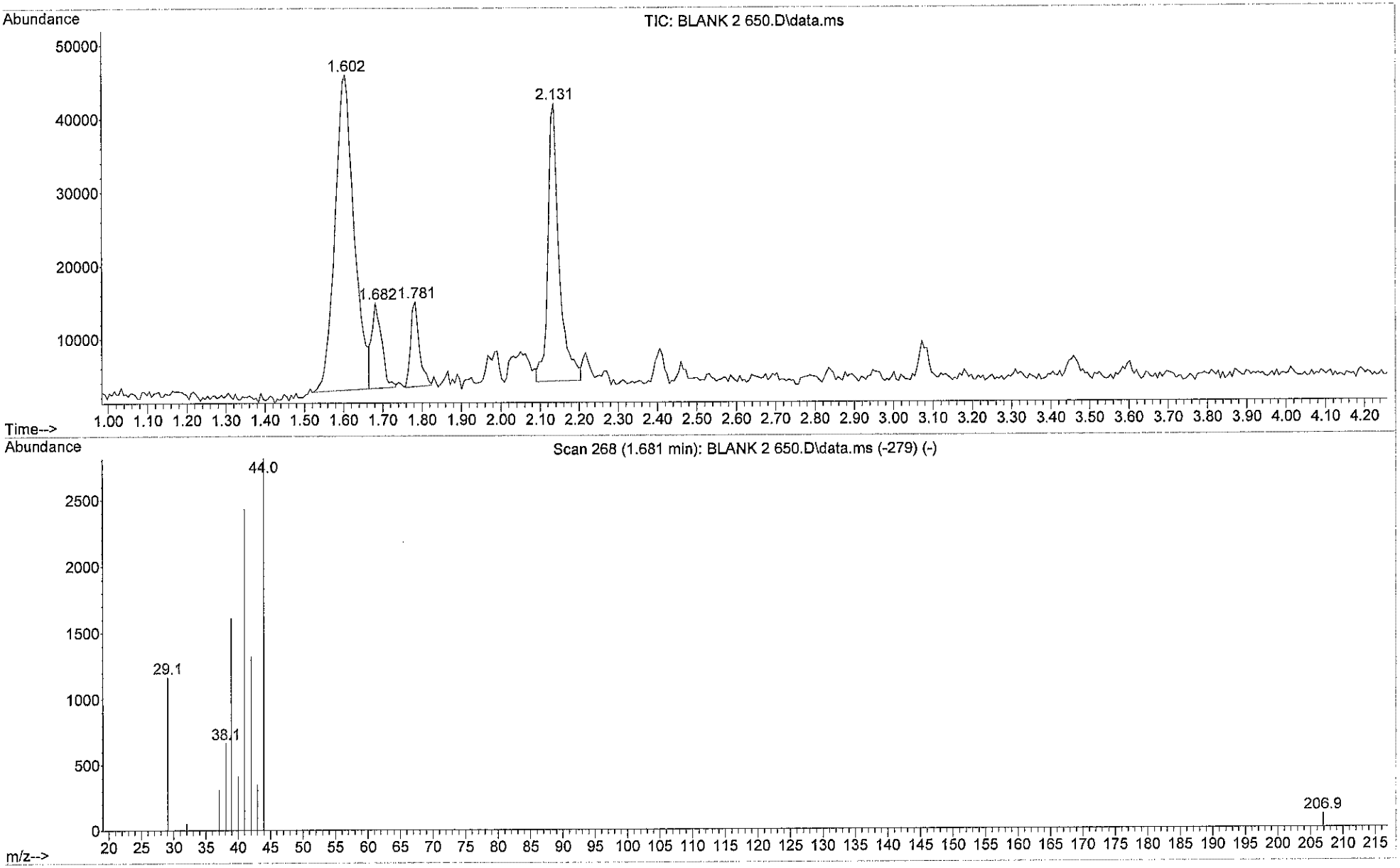


File :D:\Data 2016\LPI\Job 8029\BLANK 2 650.D
Operator : CG
Acquired : 30 Aug 2016 6:55 using AcqMethod PYR 650 SPLIT30.M
Instrument : Instrument #1
Sample Name: blank
Misc Info :
Vial Number: 1

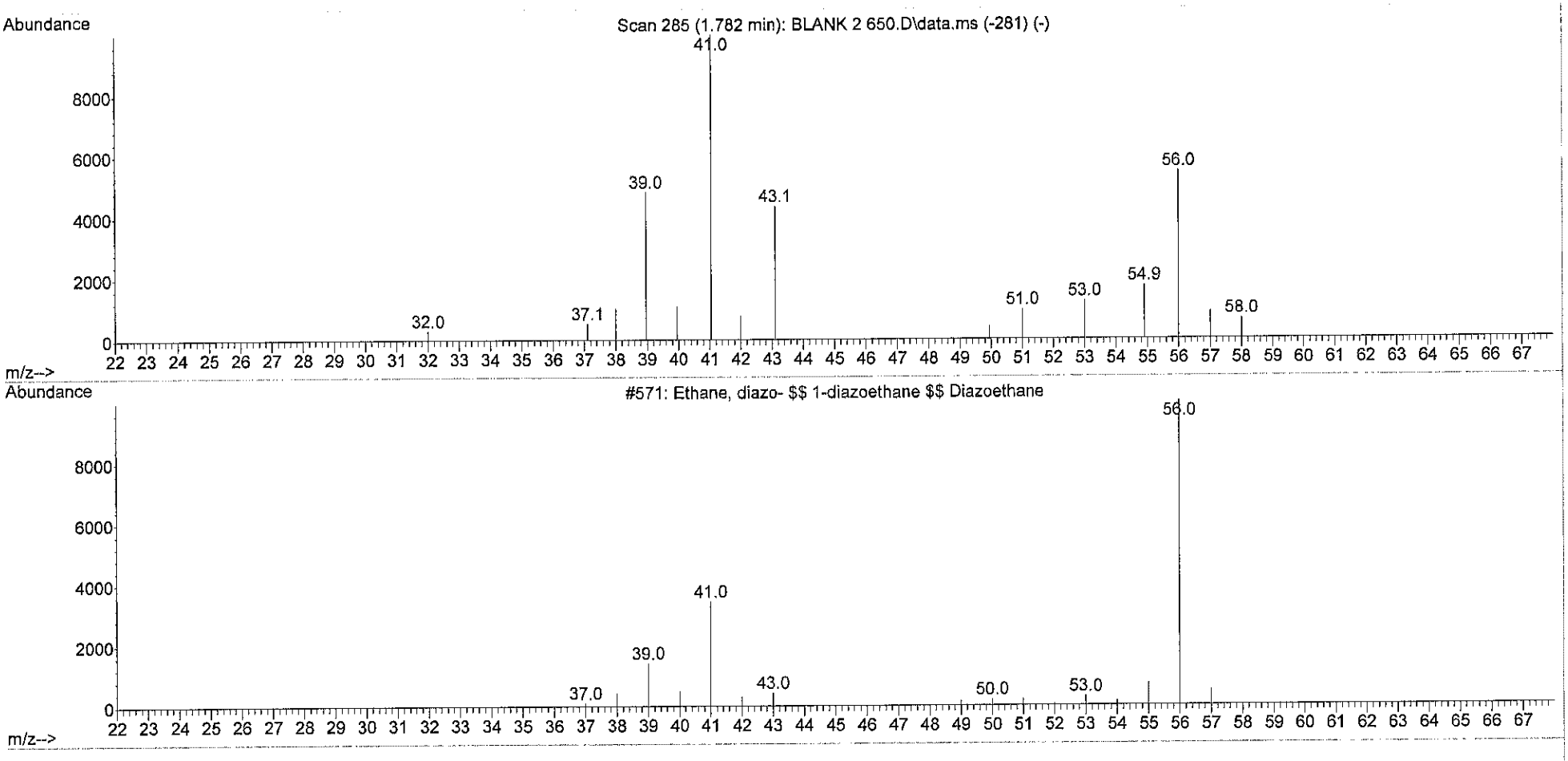




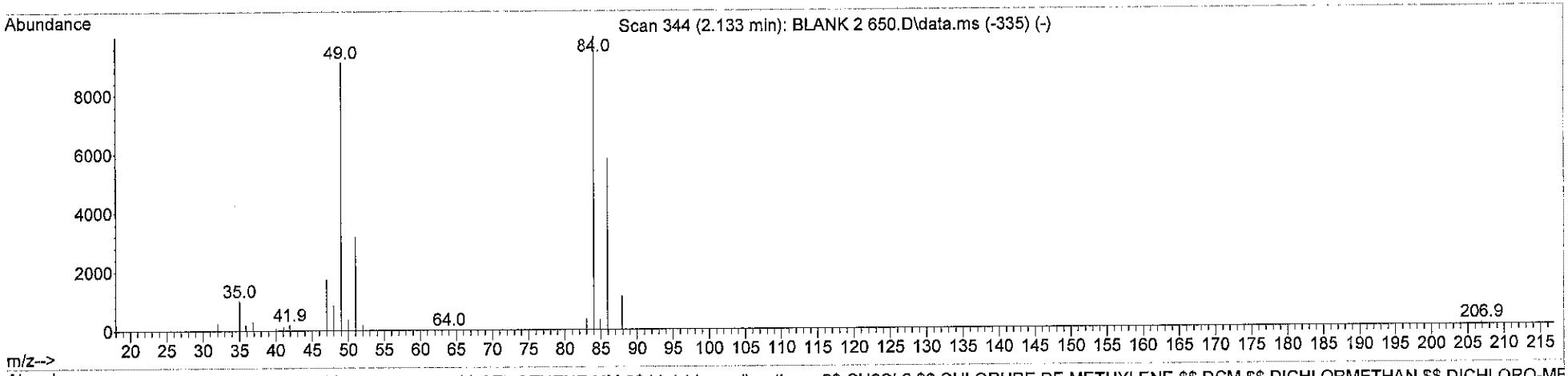
File :D:\Data 2016\LPI\Job 8029\BLANK 2 650.D
Operator : CG
Acquired : 30 Aug 2016 6:55 using AcqMethod PYR 650 SPLIT30.M
Instrument : Instrument #1
Sample Name: blank
Misc Info :
Vial Number: 1

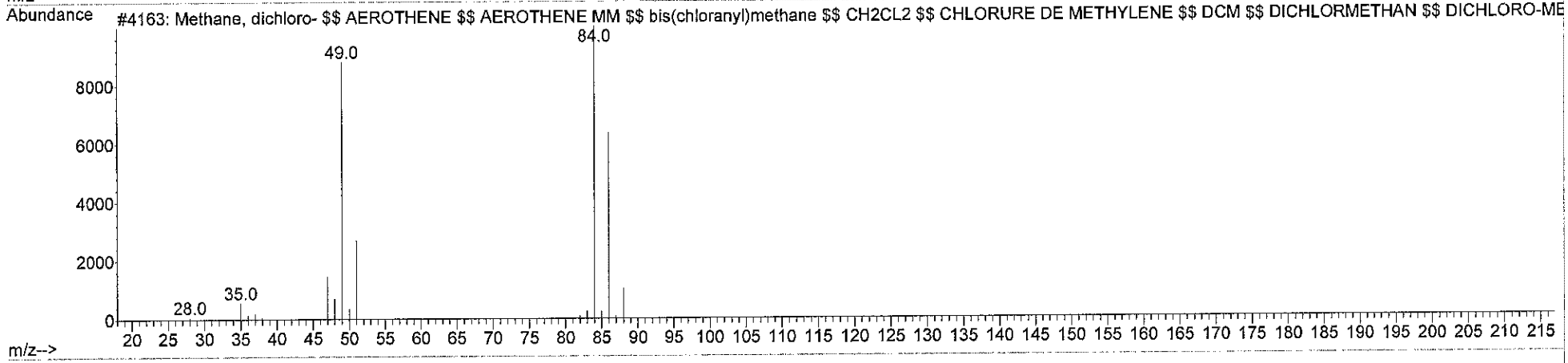


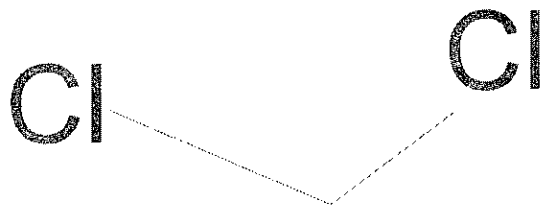
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 72
ID : Ethane, diazo- $$ 1-diazoethane $$ Diazoethane



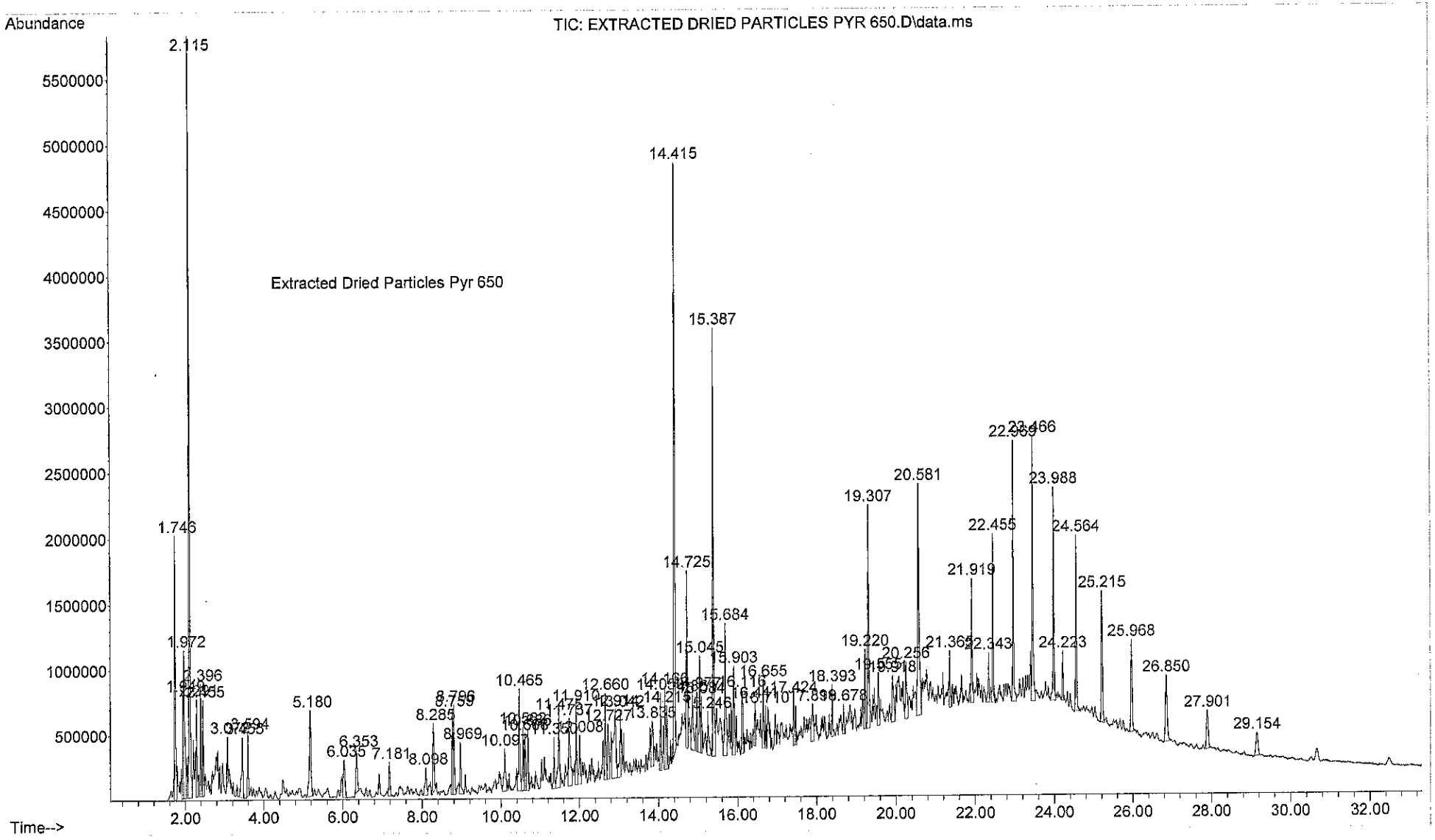
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 96
ID : Methane, dichloro- $$ AEROTHENE $$ AEROTHENE MM $$ bis(chloranyl)methane $$ CH2CL2 $$ CHLORURE DE METHYLENE $$ DCM $$ DICHLOR METHAN $$ DICHLORO-METHANE $$ DICHLOROMETHANE CATION RADICAL $$ DICHLOROMETHANE ION $$ DISTILLEX DS3 $$ DRIVERIT $$ F 30







File :D:\Data 2016\LPI\Job 8029\EXTRACTED DRIED PARTICLES PYR 650.D
Operator : CG
Acquired : 30 Aug 2016 8:11 using AcqMethod PYR 650 SPLIT30.M
Instrument : Instrument #1
Sample Name: EXTRACTED DRIED PARTICLES PYR 650
Misc Info :
Vial Number: 1



Area Percent Report

Data Path : D:\Data 2016\LPI\Job 8029\
Data File : EXTRACTED DRIED PARTICLES PYR 650.D
Acq On : 30 Aug 2016 8:11
Operator : CG
Sample : EXTRACTED DRIED PARTICLES PYR 650
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration Parameters: events.e
Integrator: ChemStation

Method : D:\MassHunter\GCMS\1\methods\mps front - Wax Column.M
Title :

Signal : TIC: EXTRACTED DRIED PARTICLES PYR 650.D\data.ms

peak #	R.T. min	first scan	max scan	last scan	PK TY	peak height	corr. area	corr. % max.	% of total
1	1.746	275	279	286	VV 2	2005533	31603072	31.67%	2.797%
2	1.949	309	313	315	VV	792221	8736650	8.76%	0.773%
3	1.972	315	317	326	VV 4	1141267	25235928	25.29%	2.234%
4	2.115	333	341	351	VV 2	5860328	99782606	100.00%	8.832%
5	2.291	367	371	376	VV	726559	11181739	11.21%	0.990%
6	2.396	384	388	393	VV	821966	11302991	11.33%	1.000%
7	2.455	393	398	403	VV 3	714984	10554157	10.58%	0.934%
8	3.072	495	502	506	PV	357149	5127960	5.14%	0.454%
9	3.455	550	566	575	BV 2	452881	11194542	11.22%	0.991%
10	3.594	575	590	596	PV	484718	8207434	8.23%	0.726%
11	5.180	841	856	867	PV	650490	18581798	18.62%	1.645%
12	6.035	994	1000	1014	VB 2	282054	8824413	8.84%	0.781%
13	6.353	1039	1054	1066	BB 2	327384	7895481	7.91%	0.699%
14	7.181	1186	1193	1203	VV	256936	5692688	5.71%	0.504%
15	8.098	1335	1347	1355	PV 2	207896	5785962	5.80%	0.512%
16	8.285	1372	1379	1387	PV	523100	10966732	10.99%	0.971%
17	8.759	1453	1458	1461	VV	632531	10489365	10.51%	0.928%
18	8.796	1461	1465	1475	VV 2	684043	13558162	13.59%	1.200%
19	8.969	1489	1494	1509	VV	389964	7302354	7.32%	0.646%
20	10.097	1672	1684	1691	VV 2	317855	9019212	9.04%	0.798%
21	10.465	1737	1745	1754	VV	759464	16001580	16.04%	1.416%
22	10.562	1754	1762	1766	VV 3	472502	8763051	8.78%	0.776%
23	10.608	1766	1769	1774	VV 2	429553	8096476	8.11%	0.717%
24	10.686	1774	1783	1788	VV 4	462072	9294099	9.31%	0.823%
25	11.350	1885	1894	1901	PV	377230	6755459	6.77%	0.598%
26	11.475	1901	1915	1921	VV 4	556233	14244813	14.28%	1.261%

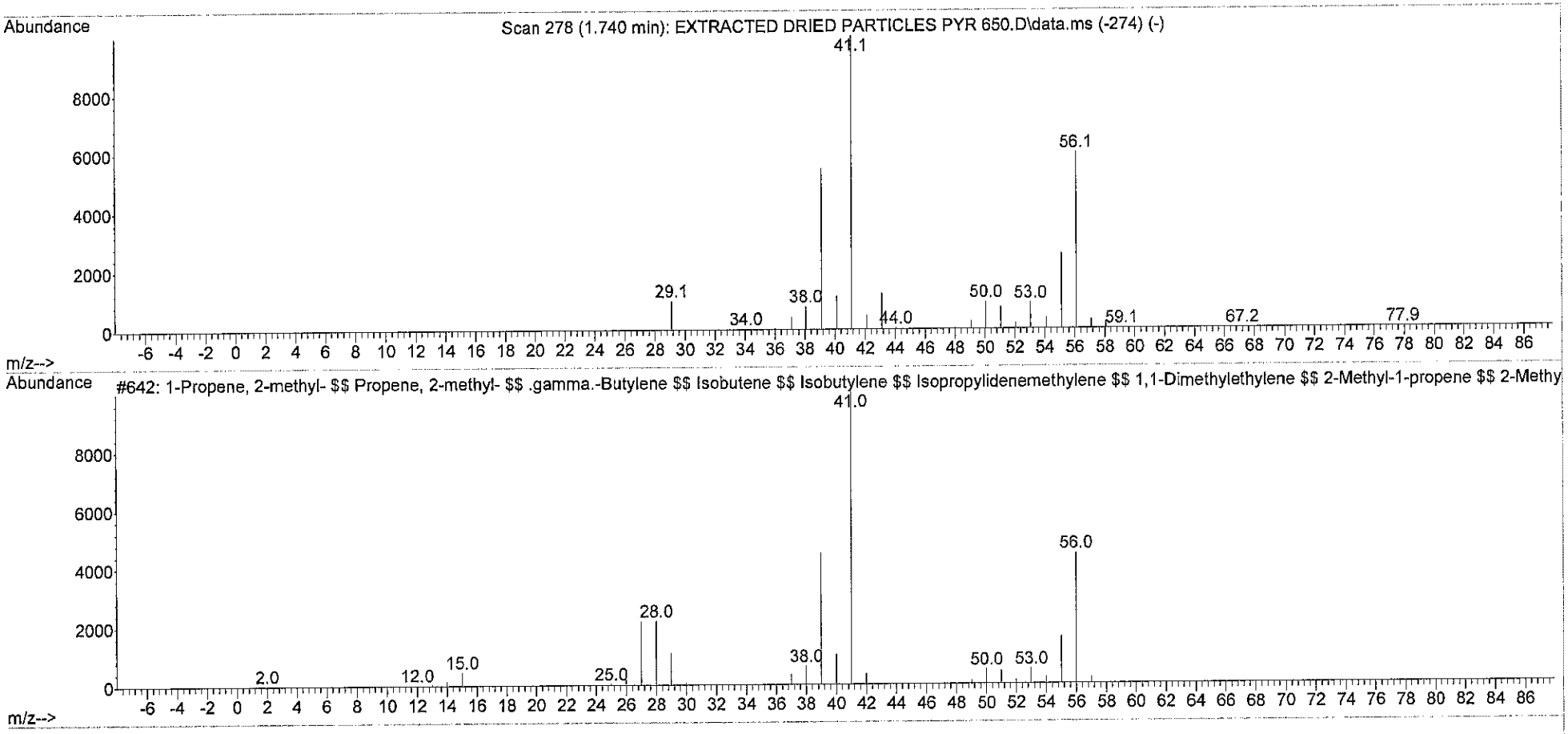
27	11.737	1954	1959	1973	VV	3	512893	16719491	16.76%	1.480%
28	11.910	1984	1988	1996	VV	3	595019	10498416	10.52%	0.929%
29	12.008	1996	2005	2012	VV	3	375243	8429270	8.45%	0.746%
30	12.660	2109	2114	2121	VV	3	643212	11110147	11.13%	0.983%
31	12.727	2121	2126	2133	VV	4	419829	10384807	10.41%	0.919%
32	12.914	2143	2157	2165	VV	5	521121	23100366	23.15%	2.045%
33	13.042	2165	2179	2181	VV	6	497842	10503430	10.53%	0.930%
34	13.835	2307	2312	2320		M6	349197	10683024	10.71%	0.946%
35	14.053	2343	2349	2353	VV	3	591126	9390993	9.41%	0.831%
36	14.166	2364	2368	2372	VV		616575	10894990	10.92%	0.964%
37	14.215	2372	2376	2382	VV	2	485918	7595657	7.61%	0.672%
38	14.415	2395	2410	2415	PV		4466246	88533099	88.73%	7.836%
39	14.725	2456	2462	2467	VV	2	1352759	23427404	23.48%	2.074%
40	14.861	2478	2485	2495	VV	5	419909	11523394	11.55%	1.020%
41	14.977	2501	2504	2508	VV		442383	6249869	6.26%	0.553%
42	15.045	2508	2516	2519	VV	2	716918	12218503	12.25%	1.081%
43	15.084	2519	2522	2525	VV		415449	6111497	6.12%	0.541%
44	15.246	2545	2549	2561	VV	6	324467	7991744	8.01%	0.707%
45	15.387	2567	2573	2581	PV		3199735	49869651	49.98%	4.414%
46	15.684	2615	2623	2632	VV	3	1006672	22708968	22.76%	2.010%
47	15.903	2653	2660	2667	VV	4	679393	13006433	13.03%	1.151%
48	16.116	2687	2696	2703	PV	4	483506	11454609	11.48%	1.014%
49	16.655	2780	2786	2792	VV	7	506972	9064806	9.08%	0.802%
50	17.424	2912	2916	2921	VV	6	376776	6475155	6.49%	0.573%
51	18.393	3074	3079	3083	VV		386446	5615265	5.63%	0.497%
52	19.220	3213	3218	3223	VV	2	612153	9569460	9.59%	0.847%
53	19.307	3223	3232	3241	PV		1648050	30686853	30.75%	2.716%
54	19.555	3270	3274	3280	VV	2	404073	7949639	7.97%	0.704%
55	19.918	3328	3335	3345	VV	7	351475	10229022	10.25%	0.905%
56	20.256	3386	3392	3401	VV	6	435467	11467551	11.49%	1.015%
57	20.581	3438	3447	3457	VV	3	1724246	40425573	40.51%	3.578%
58	21.365	3575	3579	3586	VV	5	419235	7288499	7.30%	0.645%
59	21.919	3666	3672	3681	VV	2	927880	16012175	16.05%	1.417%
60	22.343	3732	3743	3748	VV		379408	6441176	6.46%	0.570%
61	22.455	3757	3762	3767	VV		1297778	17448264	17.49%	1.544%
62	22.969	3841	3848	3862	VV		1885637	29153935	29.22%	2.580%
63	23.466	3926	3932	3941	VV		2025565	32159643	32.23%	2.846%
64	23.988	4005	4020	4029	VV		1609572	26987358	27.05%	2.389%
65	24.223	4053	4059	4065	VB	2	370110	5661622	5.67%	0.501%
66	24.564	4104	4116	4134	BV		1293451	22703509	22.75%	2.009%
67	25.215	4213	4226	4236	BV		1004275	20024809	20.07%	1.772%
68	25.968	4340	4353	4369	PV		703133	17176680	17.21%	1.520%
69	26.850	4487	4501	4518	BV	2	514922	14554504	14.59%	1.288%
70	27.901	4666	4678	4689	PV	4	293848	9632400	9.65%	0.853%

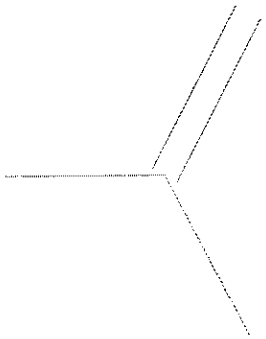
71	29.154	4867	4888	4905	BV 4	178117	6499846	6.51%	0.575%

Sum of corrected areas: 1129832229

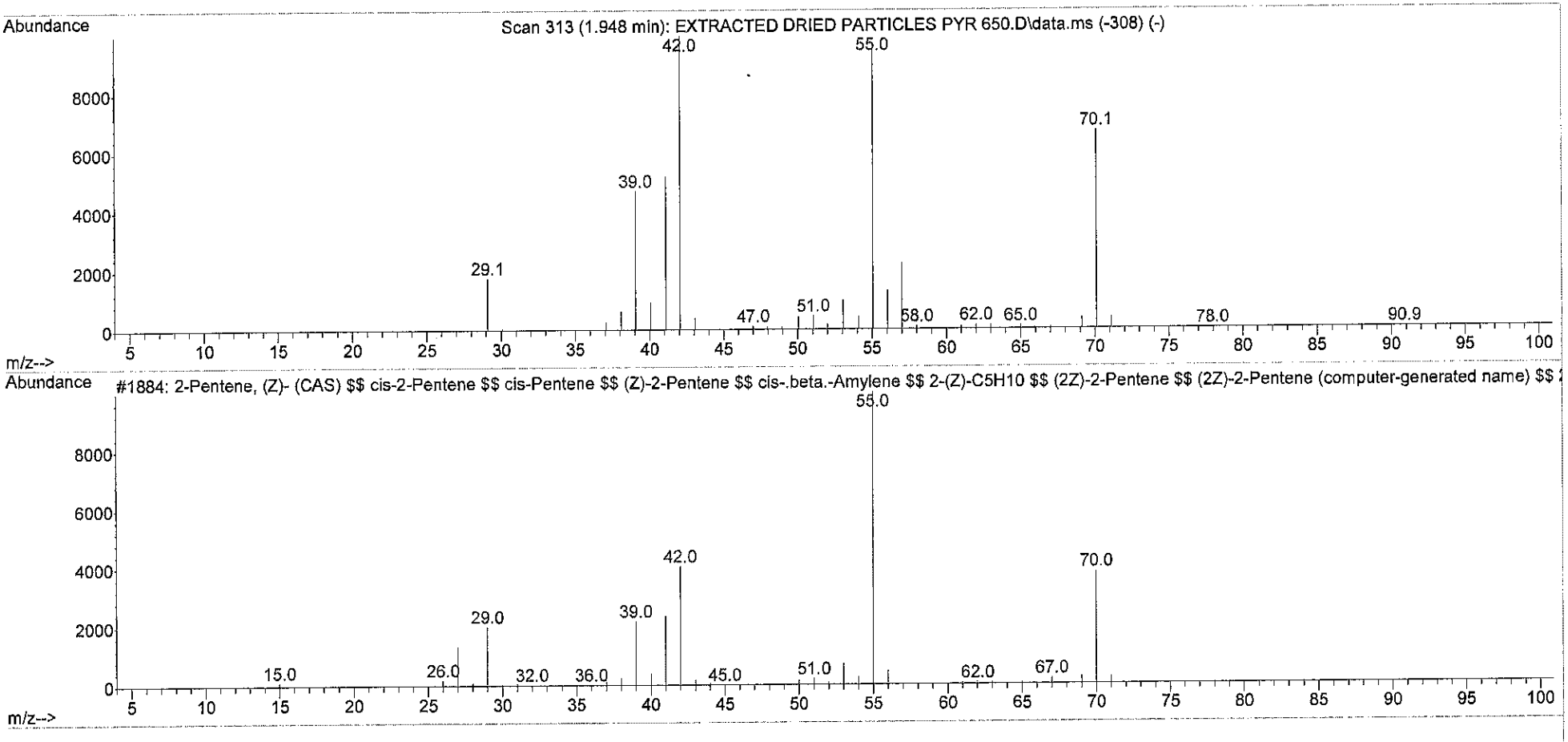
mps front - Wax Column.M Tue Aug 30 09:58:28 2016

Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 87
ID : 1-Propene, 2-methyl- $$ Propene, 2-methyl- $$ .gamma.-Butylene $$ Isobutene $$ Isobutylene $$ Isopropylidenemethylene $$ 1,1-Dimethylethylene $$ 2-Methyl-1-propene $$ 2-Methylpropene $$ iso-C4H8 $$ Methylpropene $$ UN 1055 $$ 1,1-Dimethylethene

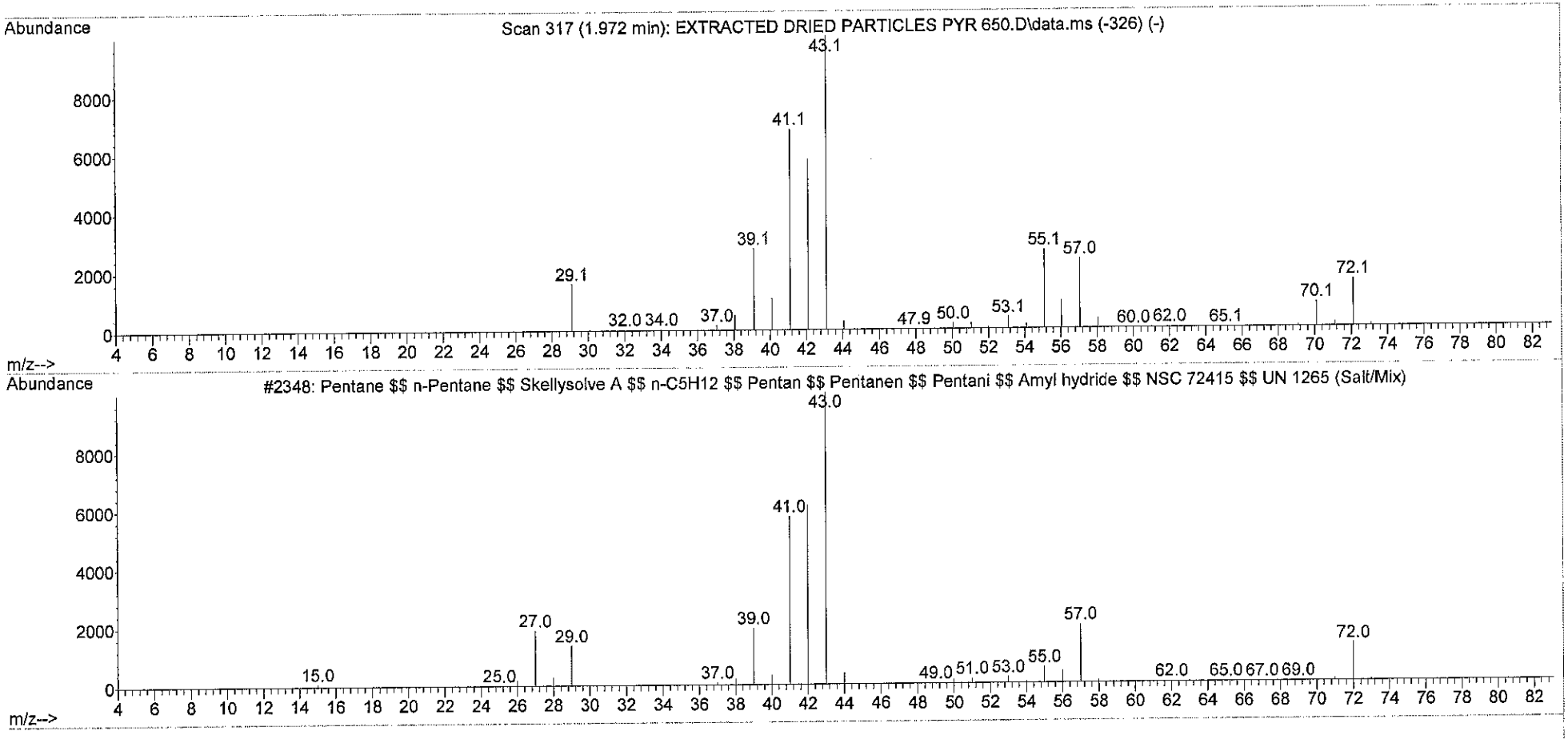




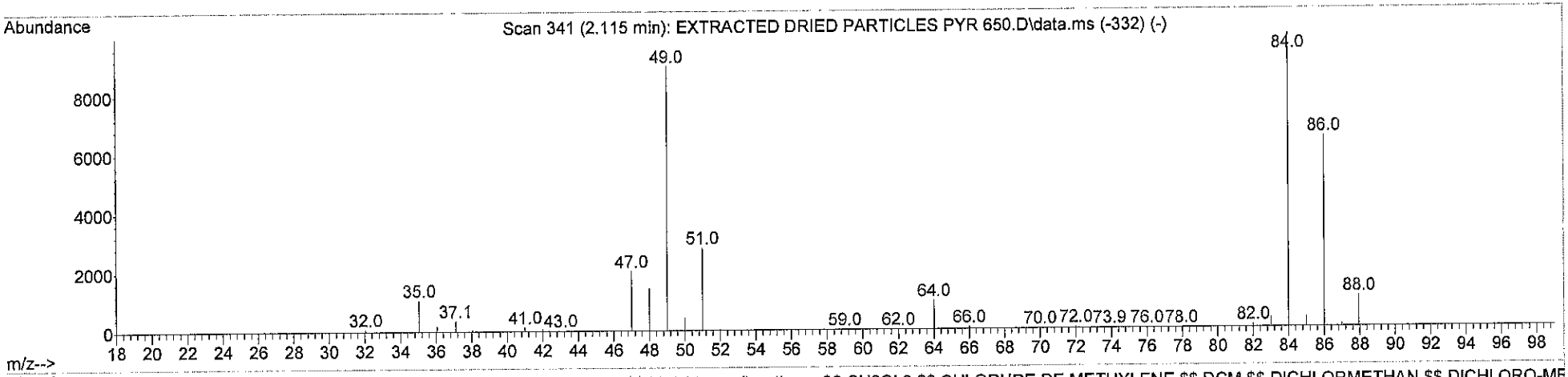
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 80
ID : 2-Pentene, (Z)- (CAS) $$ cis-2-Pentene $$ cis-Pentene $$ (Z)-2-Pentene $$ cis-.beta.-Amylene $$ 2-(Z)-C5H10 $$ (2Z)-2-Pentene $$ (2Z)-2-Pentene (computer-generated name) $$ 2-PENTENE $$ (2Z)-2-PENTENE # $$ (Z)-PENT-2-ENE $$ 2-PENTENE, (2Z)-

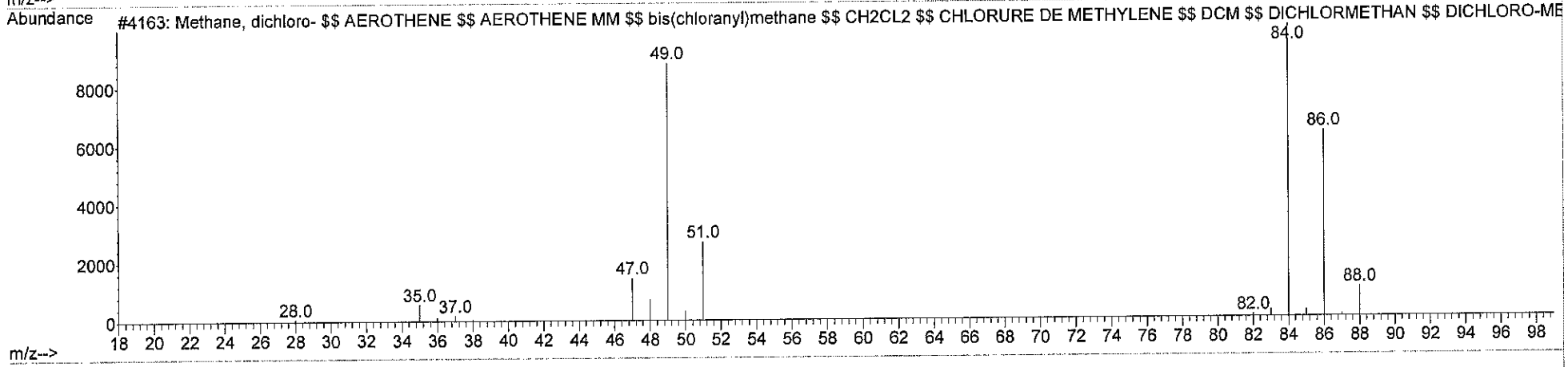


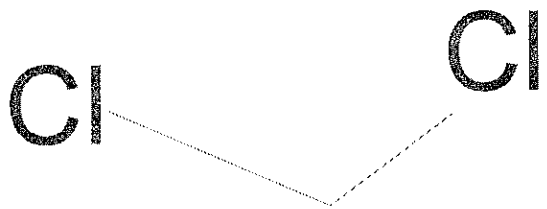
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 86
ID : Pentane $$ n-Pentane $$ Skellysolve A $$ n-C5H12 $$ Pentan $$ Pentanen $$ Pentani $$ Amyl hydride $$ N5C 72415 $$ UN 1265 (Salt/Mix)



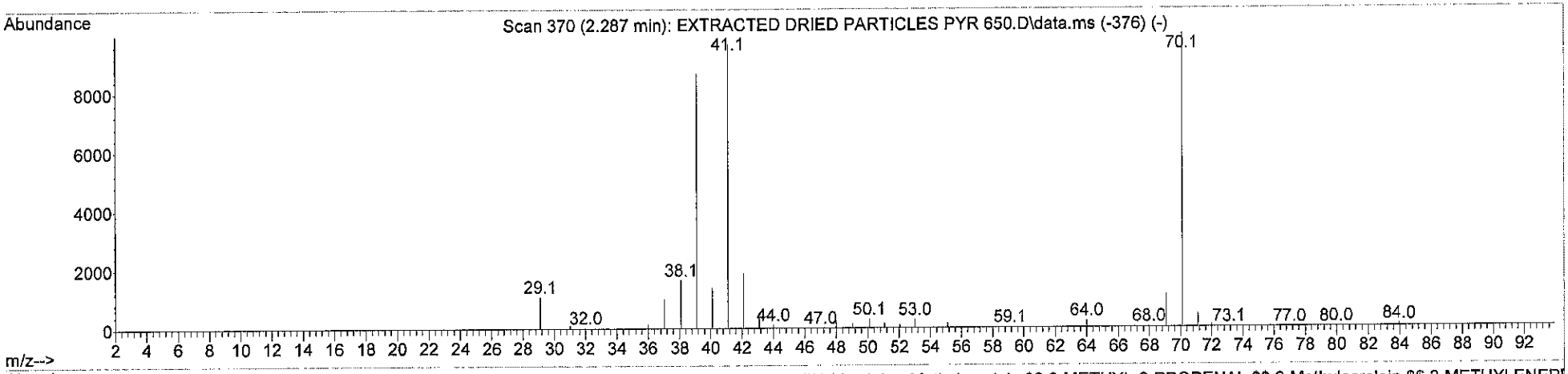
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 96
ID : Methane, dichloro- $$ AEROTHENE $$ AEROTHENE MM $$ bis(chloranyl)methane $$ CH2CL2 $$ CHLORURE DE METHYLENE $$ DCM $$ DICHLOR METHAN $$ DICHLORO-METHANE $$ DICHLOROMETHANE CATION RADICAL $$ DICHLOROMETHANE ION $$ DISTILLEX DS3 $$ DRIVERIT $$ F 30

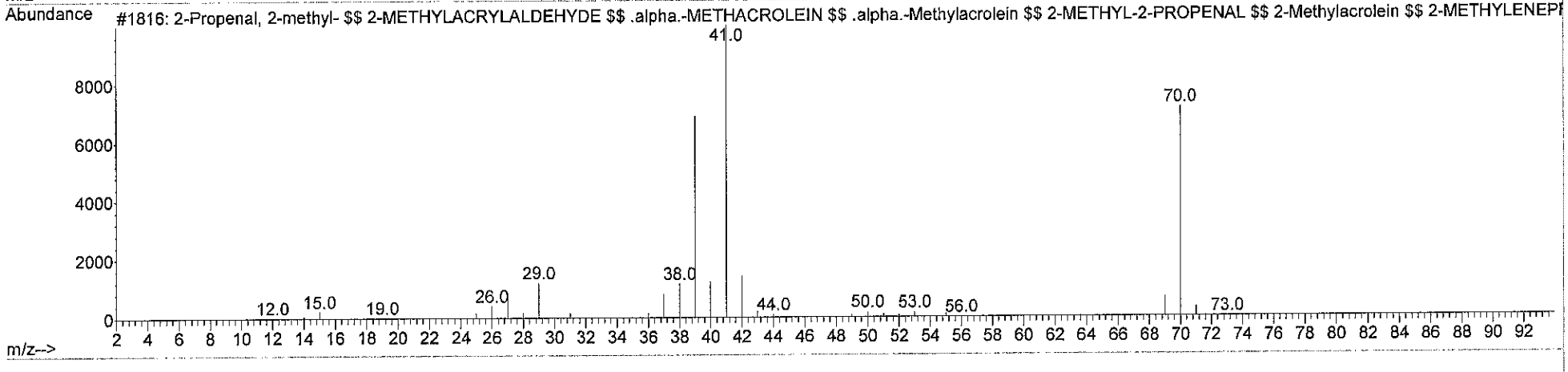


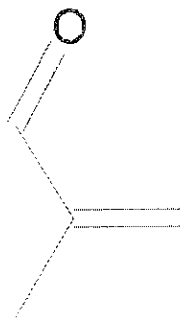




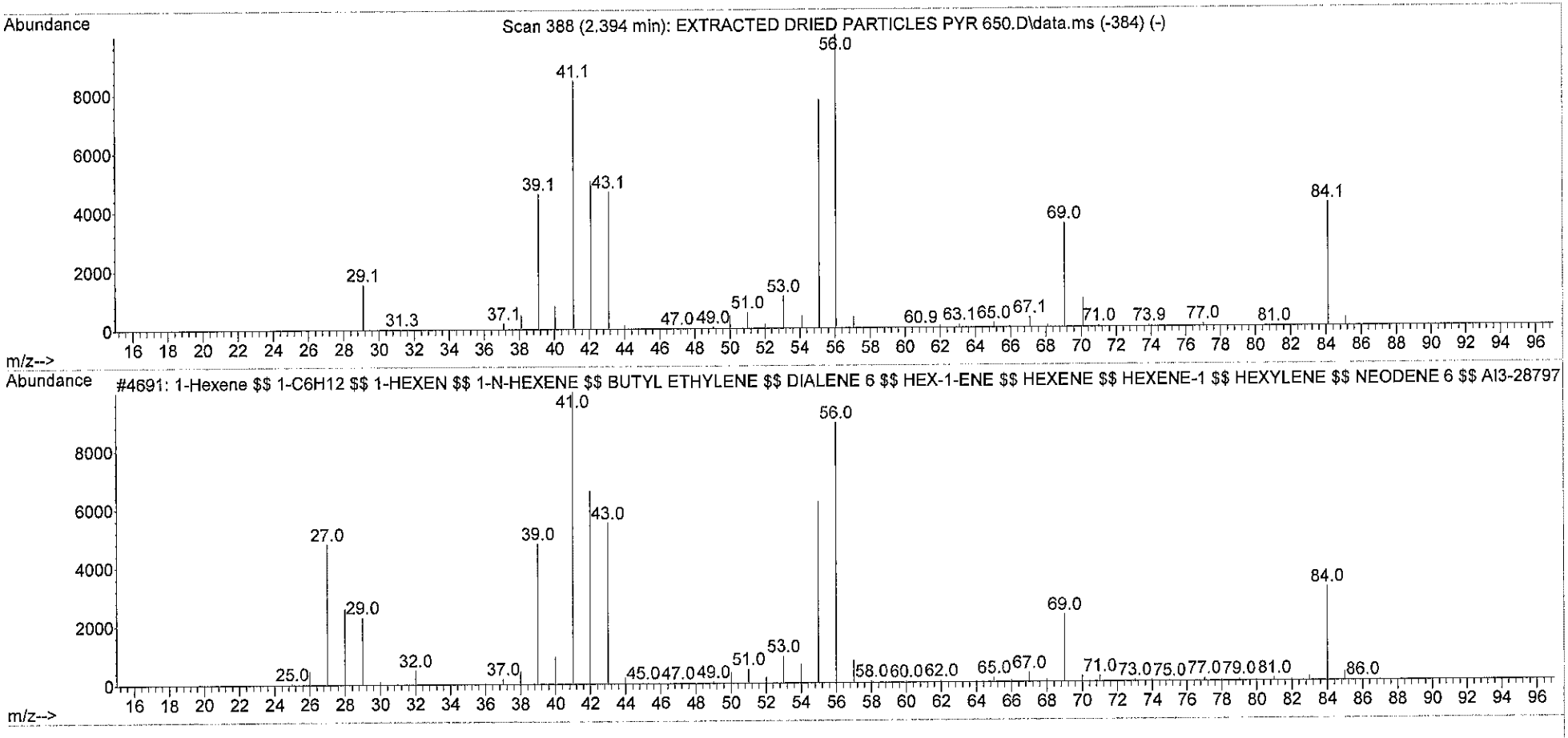
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 91
ID : 2-Propenal, 2-methyl- $$ 2-METHYLACRYLALDEHYDE $$ .alpha.-METHACROLEIN $$ .alpha.-Methylacrolein $$ 2-METHYL-2-PROPENAL $$ 2-Methylacrolein $$ 2-METHYLENEPROPANAL $$ 2-METHYLPROP-2-ENAL $$ 2-Methylpropenal $$ ACROLEIN, 2-METHYL- $$ CH2=C(CH3)CHO



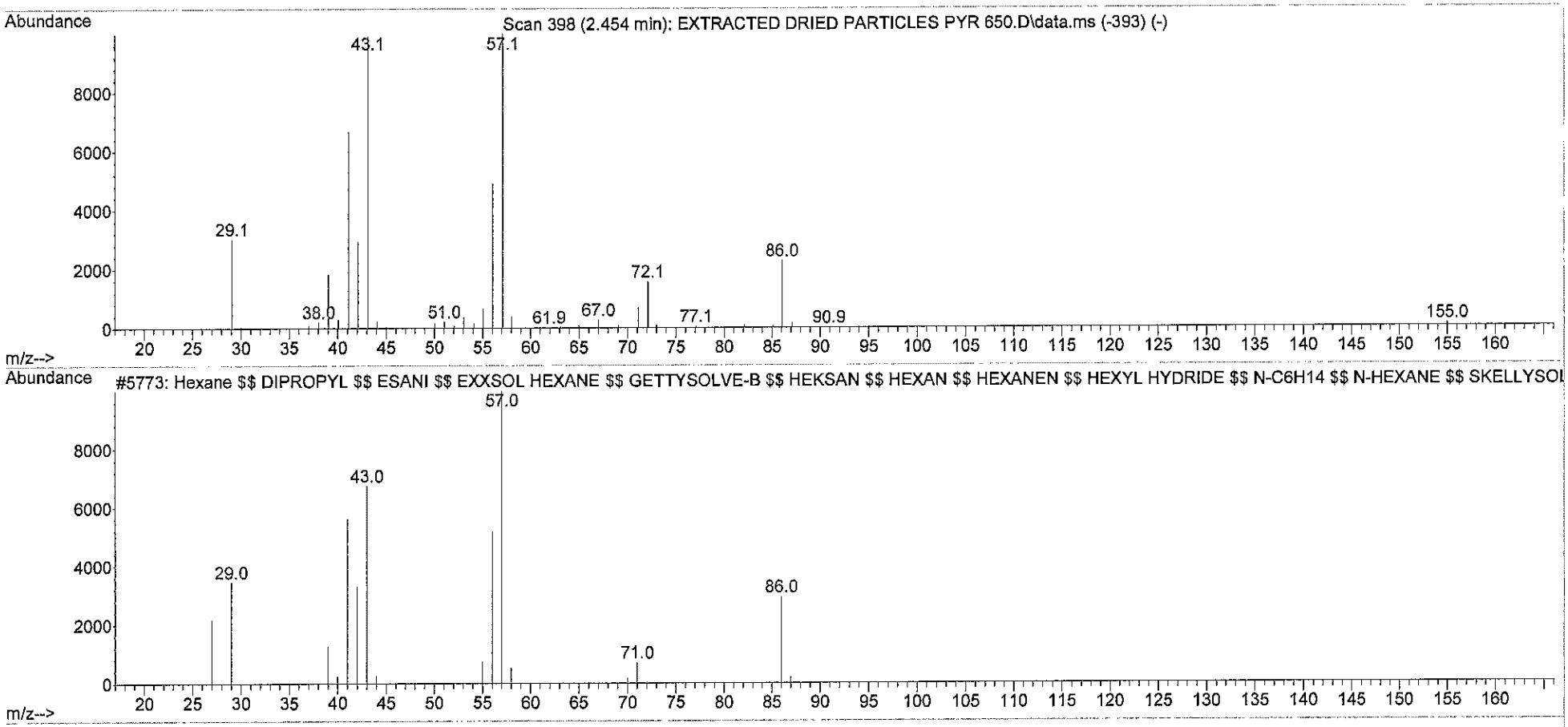




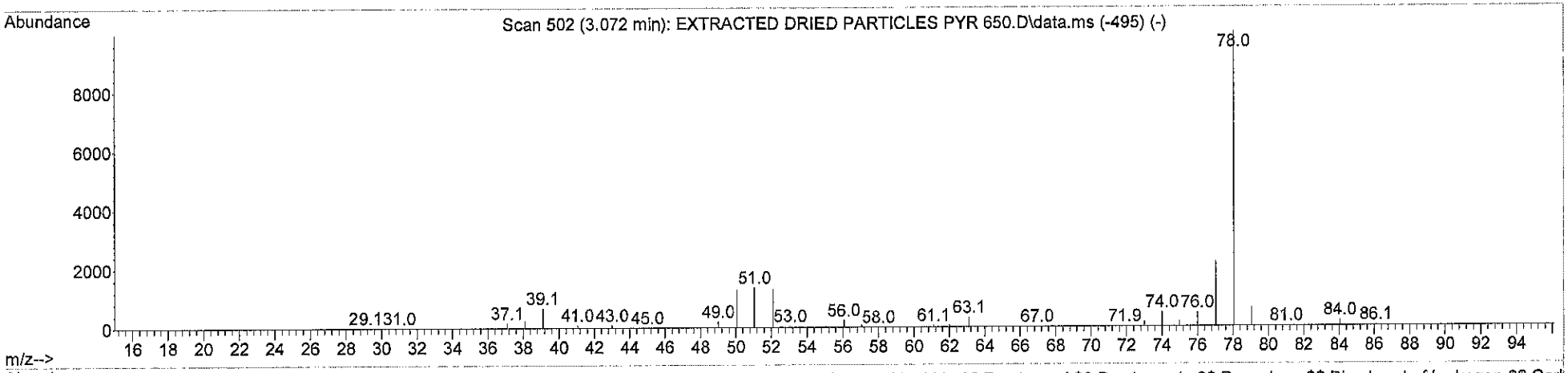
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 91
ID : 1-Hexene $$ 1-C6H12 $$ 1-HEXEN $$ 1-N-HEXENE $$ BUTYL ETHYLENE $$ DIALENE 6 $$ HEX-1-ENE $$ HEXENE $$ HEXENE-1 $$ HEXYLENE $$ NEODENE 6 $$ AI3-28797 $$ EINECS 209-753-1 $$ HSDB 1079 $$ NSC 74121 $$ UN2370

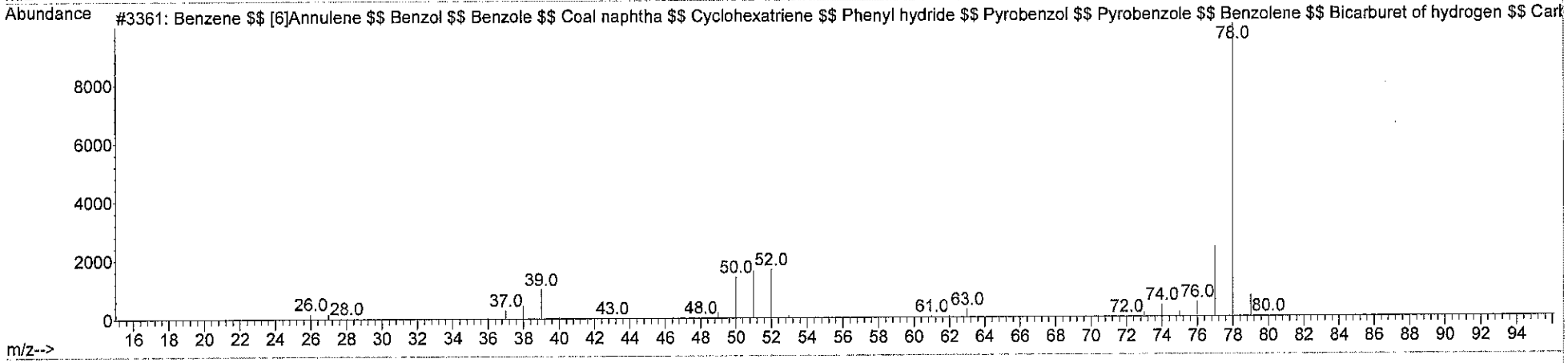


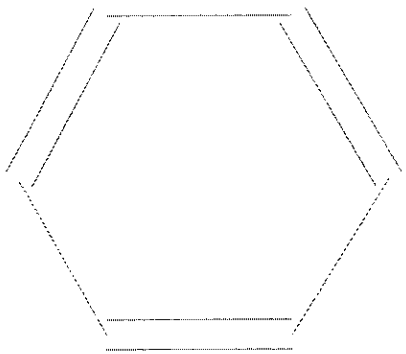
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 83
ID : Hexane $$ DIPROPYL $$ ESANI $$ EXXSOL HEXANE $$ GETTYSOLVE-B $$ HEKSAN $$ HEXAN $$ HEXANEN $$ HEXYL HYDRIDE $$ N-C6H14 $$ N-HEXANE $$ SKELLYSOLVE B $$ AI3-24253 $$ CCRIS 6247 $$ EINECS 203-777-6 $$ HEXANES $$ HSDB 91 $$ NCI-C60571 $$ NSC 68472



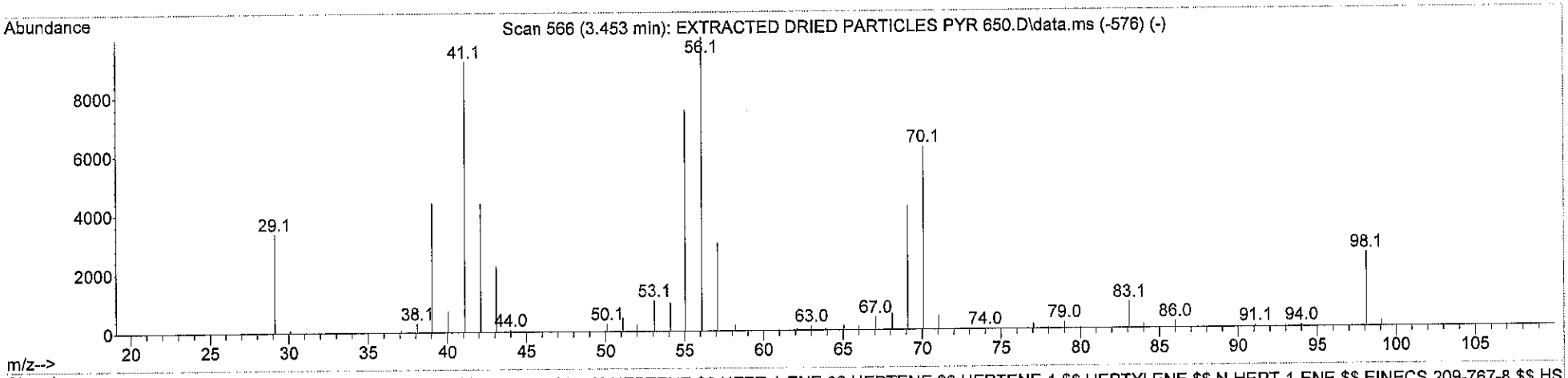
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 91
ID : Benzene $$ [6]Annulene $$ Benzol $$ Benzole $$ Coal naphtha $$ Cyclohexatriene $$ Phenyl hydride $$ Pyrobenzol $$ Pyrobenzole $$ Benzolene $$ Bicarburet of hydrogen $$ Carbon oil $$ Mineral naphtha $$ Motor benzol $$ Benzeen $$ Benzen $$ Benzin

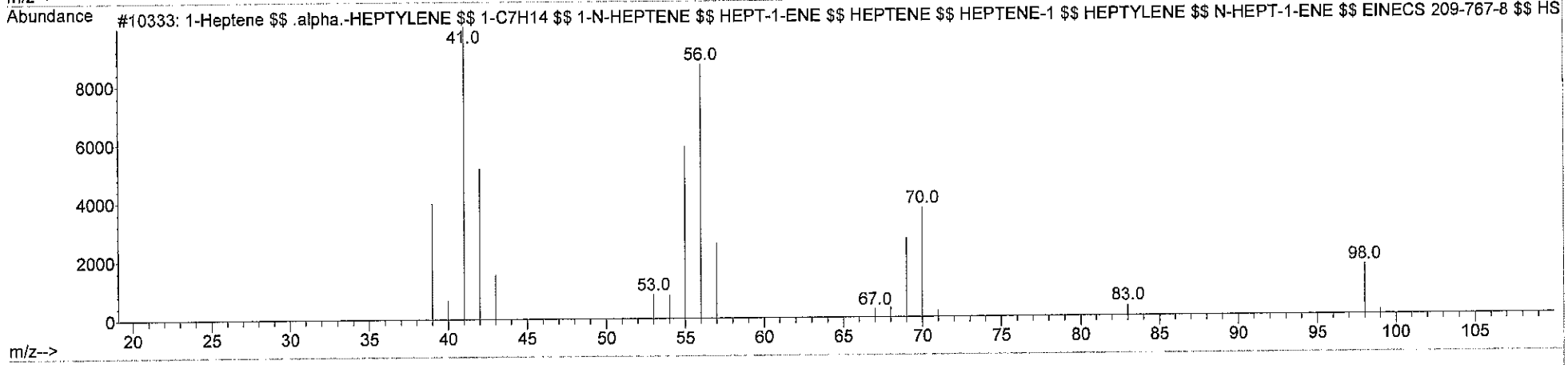




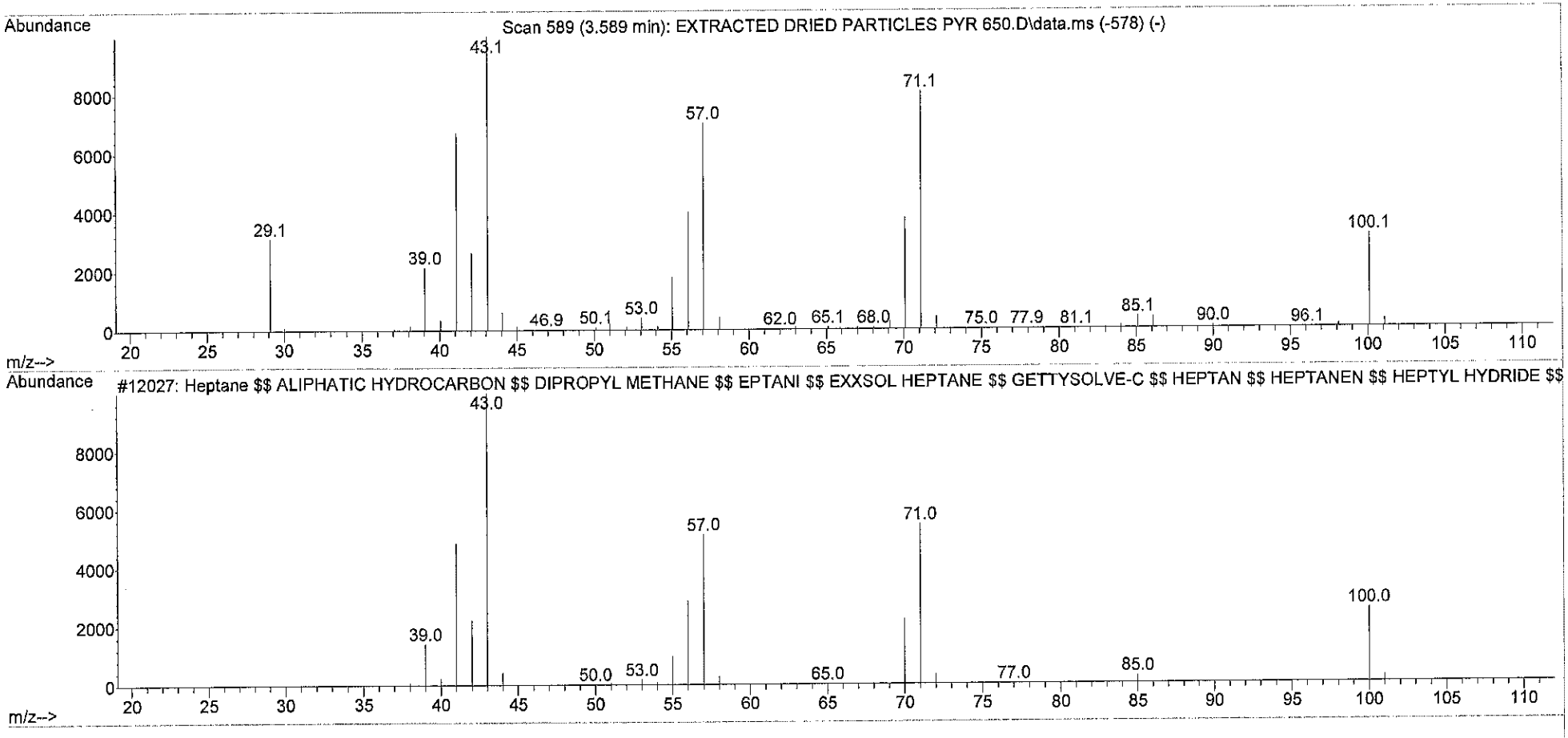


Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 95
ID : 1-Heptene $$ .alpha.-HEPTYLENE $$ 1-C7H14 $$ 1-N-HEPTENE $$ HEPT-1-ENE $$ HEPTENE $$ HEPTENE-1 $$ HEPTYLENE $$ N-HEPT-1-ENE $ $ EINECS 209-767-8 $$ HSDB 1078 $$ N-HEPTENE $$ NSC 74130 $$ UN2278

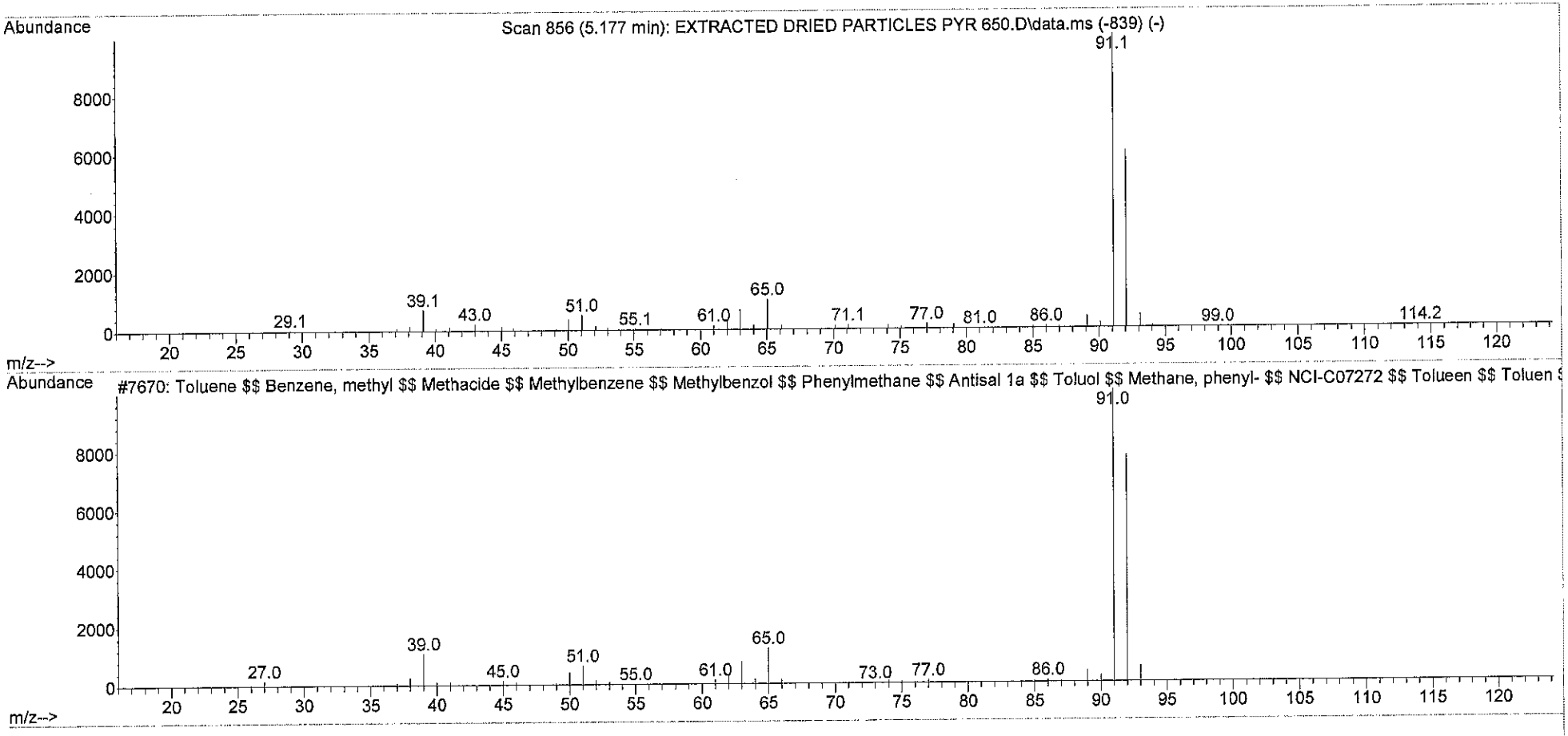


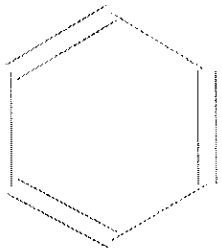


Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 95
ID : Heptane $$ ALIPHATIC HYDROCARBON $$ DIPROPYL METHANE $$ EPTANI $$ EXXSOL HEPTANE $$ GETTYSOLVE-C $$ HEPTAN $$ HEPTANEN $$ HEPTYL HYDRIDE $$ N-C7H16 $$ N-HEPTANE $$ n-Heptane from 1-Heptene $$ n-Heptane from 2-Heptene $$ n-Heptane from 3-Heptene



Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 95
ID : Toluene $$ Benzene, methyl $$ Methacide $$ Methylbenzene $$ Methylbenzol $$ Phenylmethane $$ Antisal 1a $$ Toluol $$ Methane, phenyl- $$ NCI-C07272 $$ Tolueen $$ Toluen $$ Toluolo $$ Rcra waste number U220 $$ Tolu-sol $$ UN 1294 $$ Dracyl $$ CP 25





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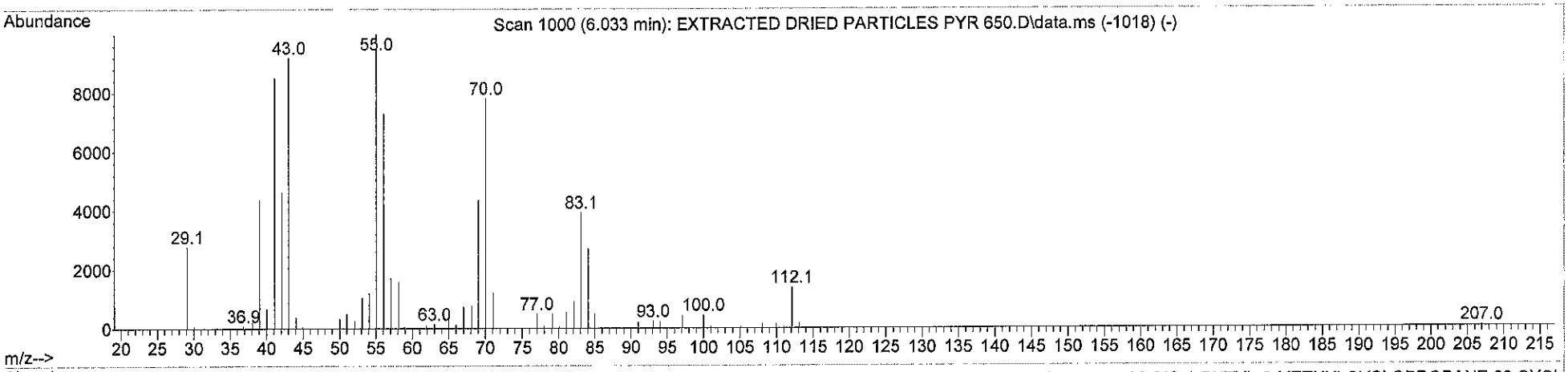
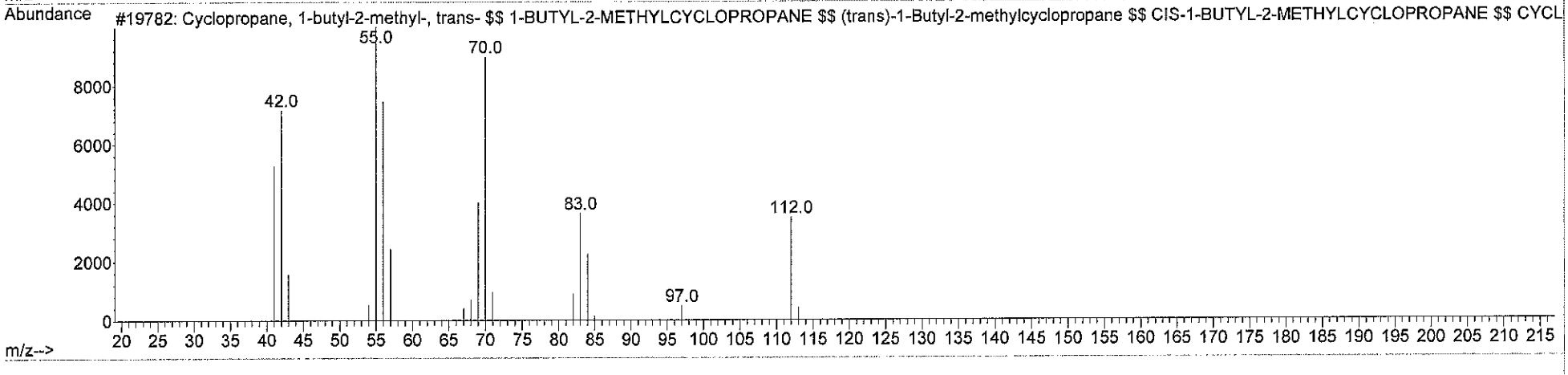
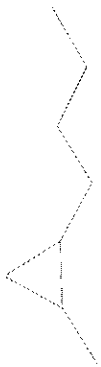
Quality : 95
ID : Cyclopropane, 1-butyl-2-methyl-, trans- $$ 1-BUTYL-2-METHYLCYCLOPROPANE $$ (trans)-1-Butyl-2-methylcyclopropane $$ CIS-1-BUTYL-2-METHYLCYCLOPROPANE $$ CYCLOPROPANE, 1-BUTYL-2-METHYL-, CIS-







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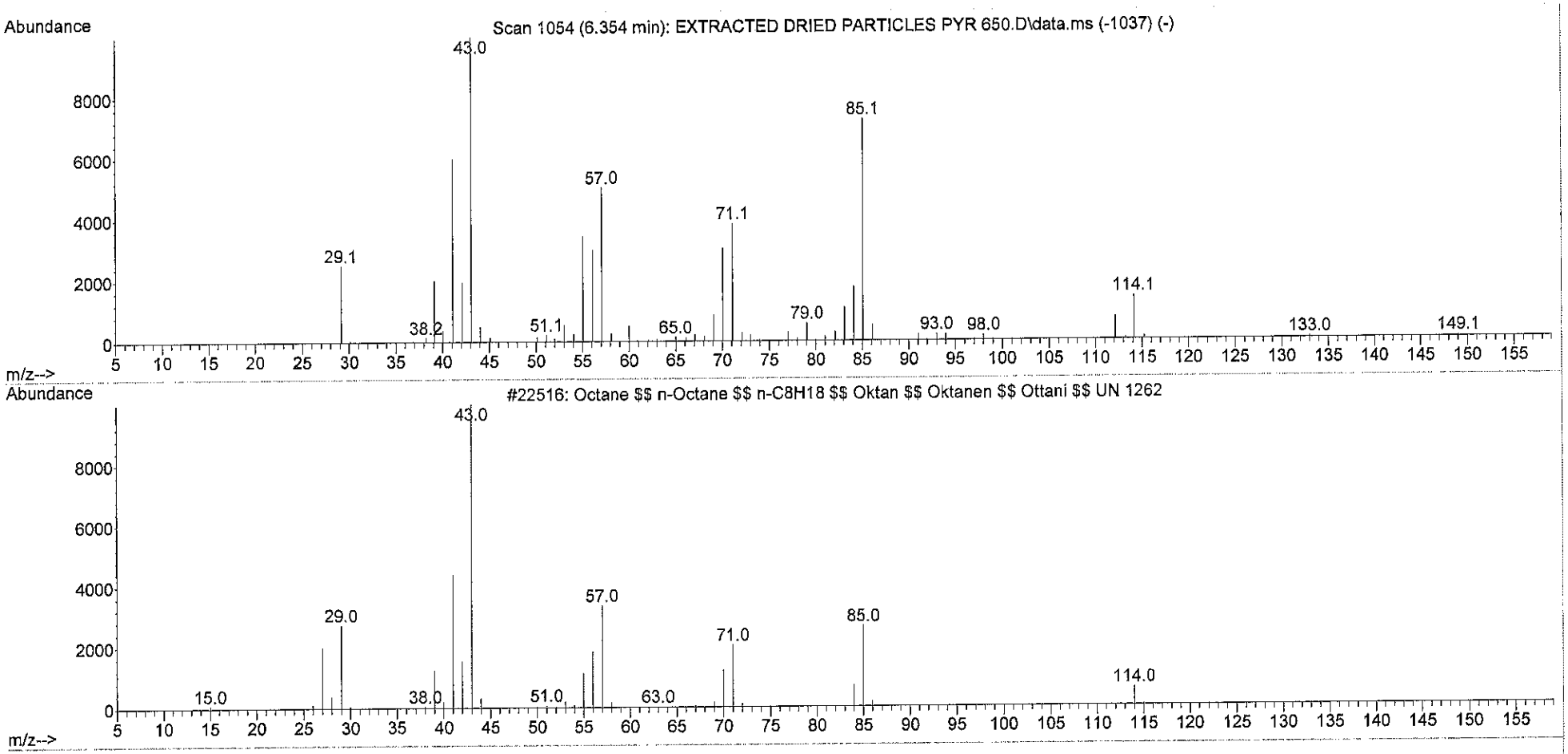
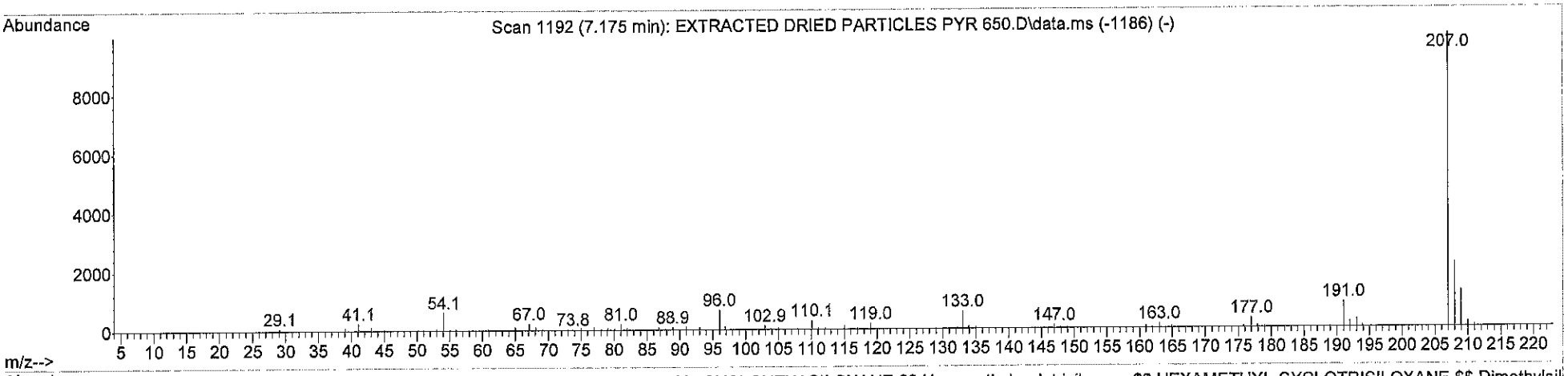
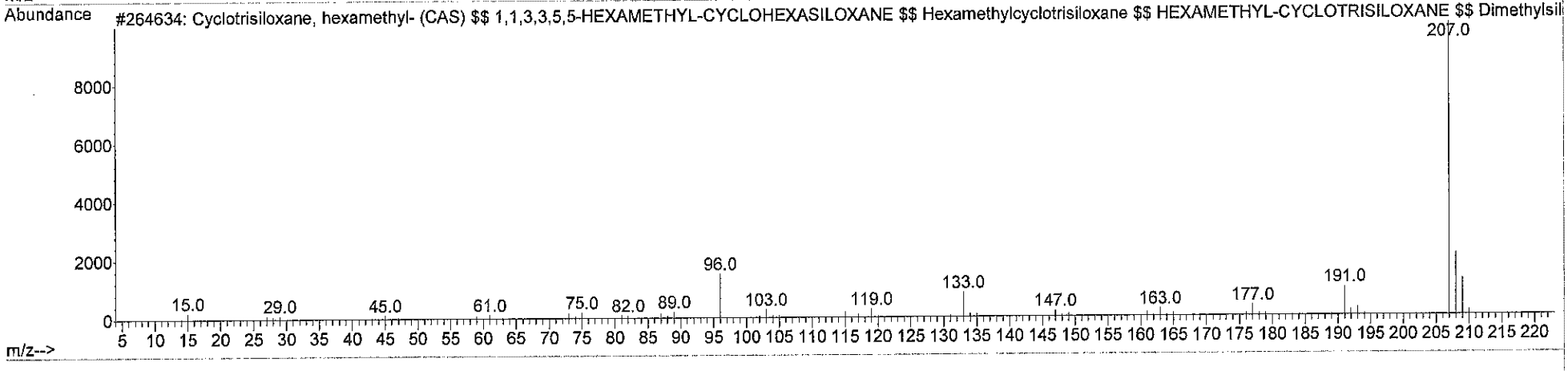
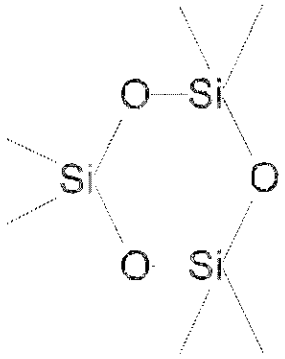
ID : Octane $$ n-Octane $$ n-C8H18 $$ Oktan $$ Oktanen $$ Ottani $$ UN 1262



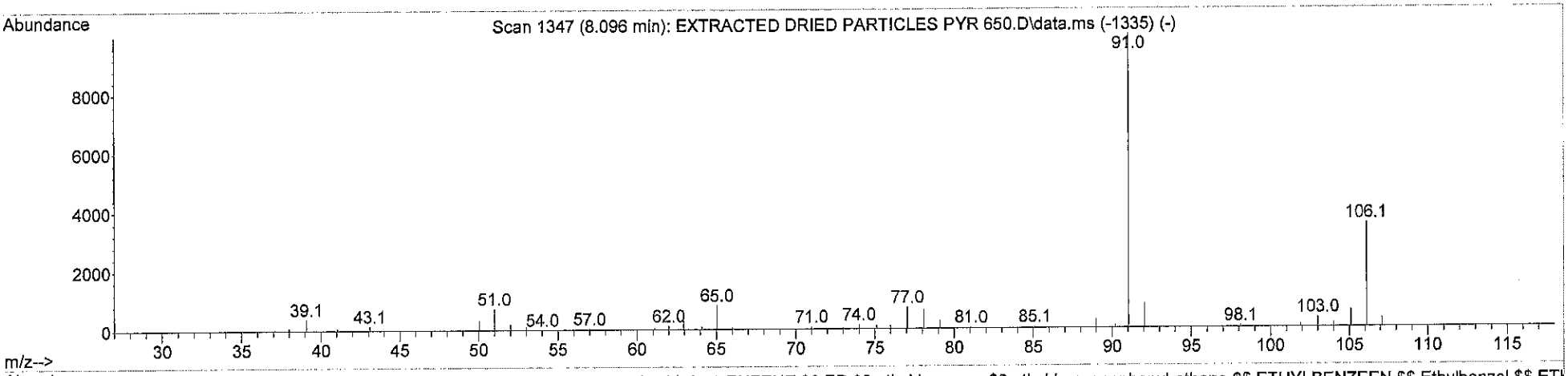
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 90
ID : Cyclotrisiloxane, hexamethyl- (CAS) $$ 1,1,3,3,5,5-HEXAMETHYL-CYCLOHEXASILOXANE $$ Hexamethylcyclotrisiloxane $$ HEXAMETHYL-CYCLOTRISILOXANE $$ Dimethylsiloxane cyclic trimer $$ CH7260 $$ 2,2,4,4,6,6-Hexamethyl-1,3,5,2,4,6-trioxatrisilinane

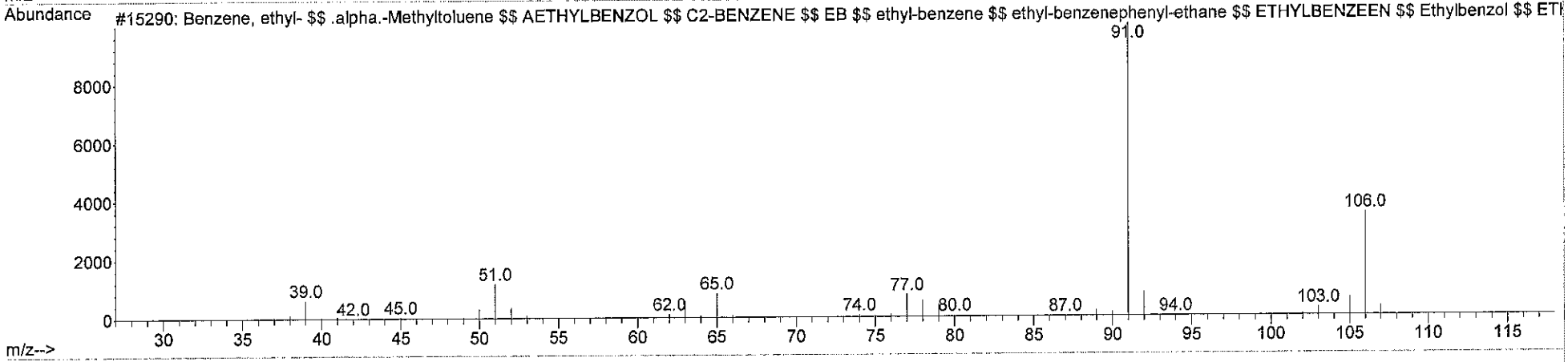


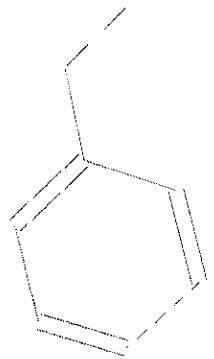




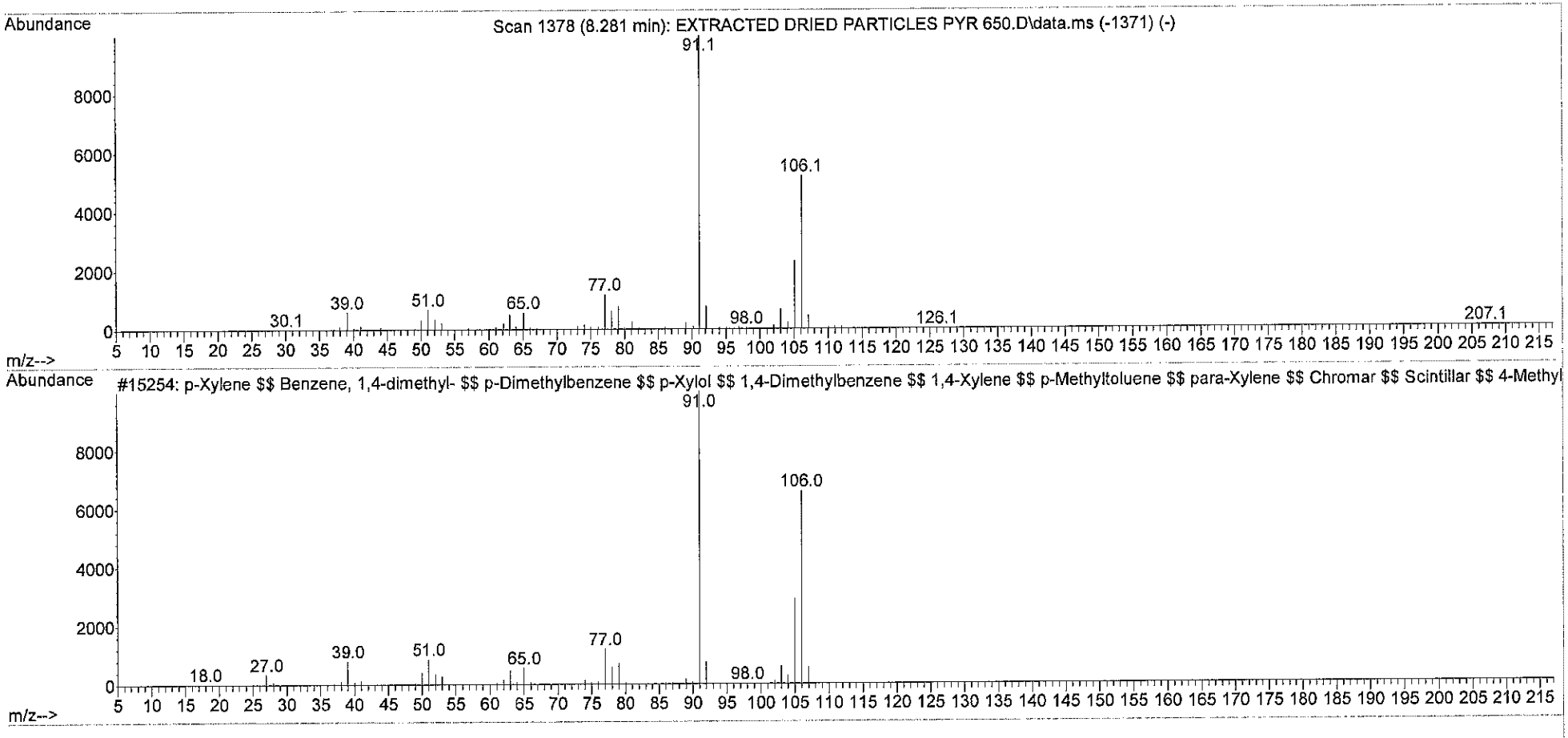
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 91
ID : Benzene, ethyl- $$ .alpha.-Methyltoluene $$ AETHYLBENZOL $$ C2-BENZENE $$ EB $$ ethyl-benzene $$ ethyl-benzenephenyl-ethane $$ ETHYLBENZEEN $$ Ethylbenzol $$ ETHYLENZENE $$ ETILBENZENE $$ ETYLOBENZEN $$ phenyl-ethane $$ AI3-09057 $$ CCRIS 916

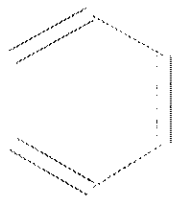






Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 97
ID : p-Xylene $$ Benzene, 1,4-dimethyl- $$ p-Dimethylbenzene $$ p-Xylol $$ 1,4-Dimethylbenzene $$ 1,4-Xylene $$ p-Methyltoluene $$ para-Xylene $$ Chromar $$ Scintillar $$ 4-Methyltoluene $$ 1,4-Dimethyl benzene $$ NSC 72419 $$ UN 1307 (Related)





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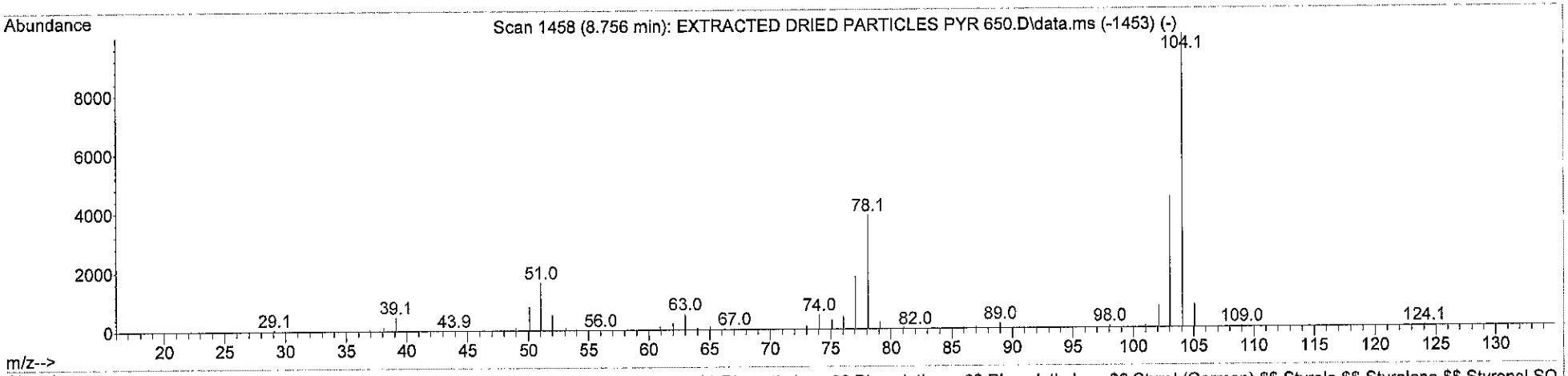
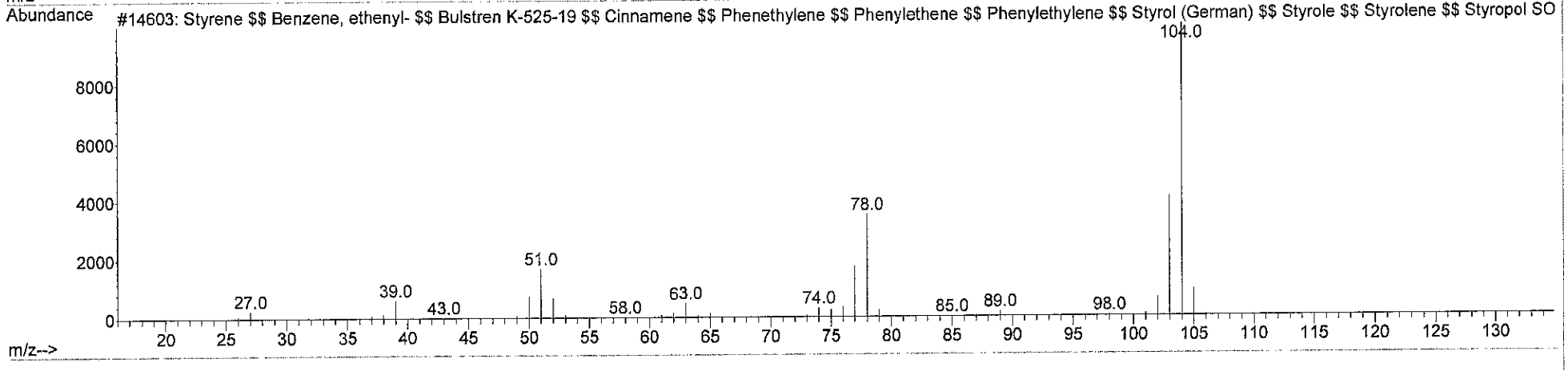
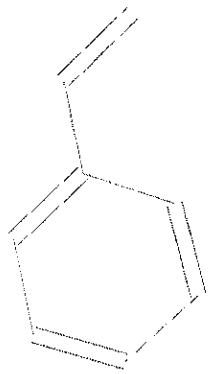
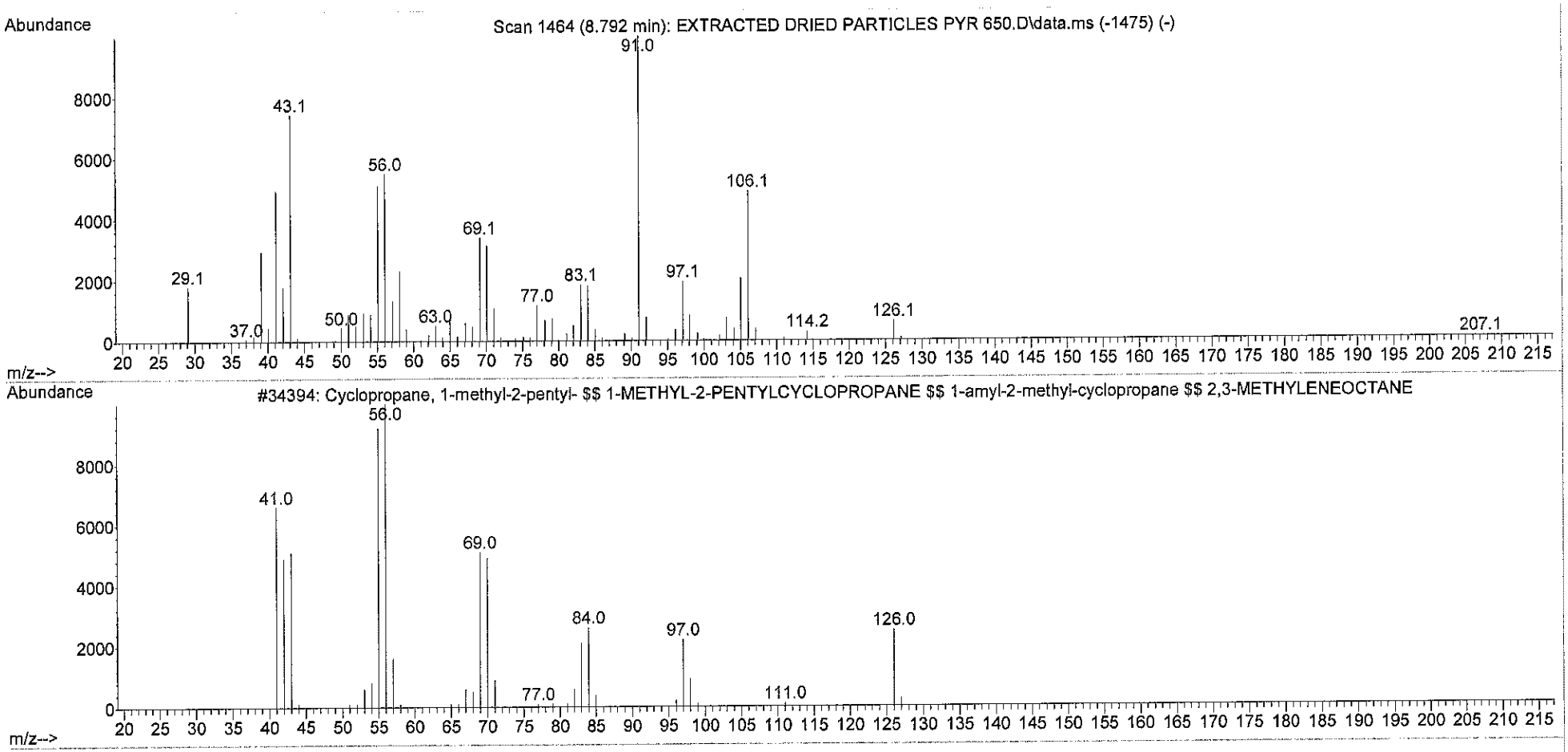
Quality : 97
ID : Styrene $$ Benzene, ethenyl- $$ Bulstren K-525-19 $$ Cinnamene $$ Phenethylene $$ Phenylethene $$ Phenylethylene $$ Styrol (German) $$ Styrole $$ Styrolene $$ Styropol SO $$ Vinylbenzene $$ Vinylbenzol $$ Ethenylbenzene $$ Cinnaminol $$ Cinnamol

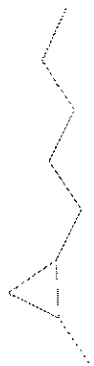




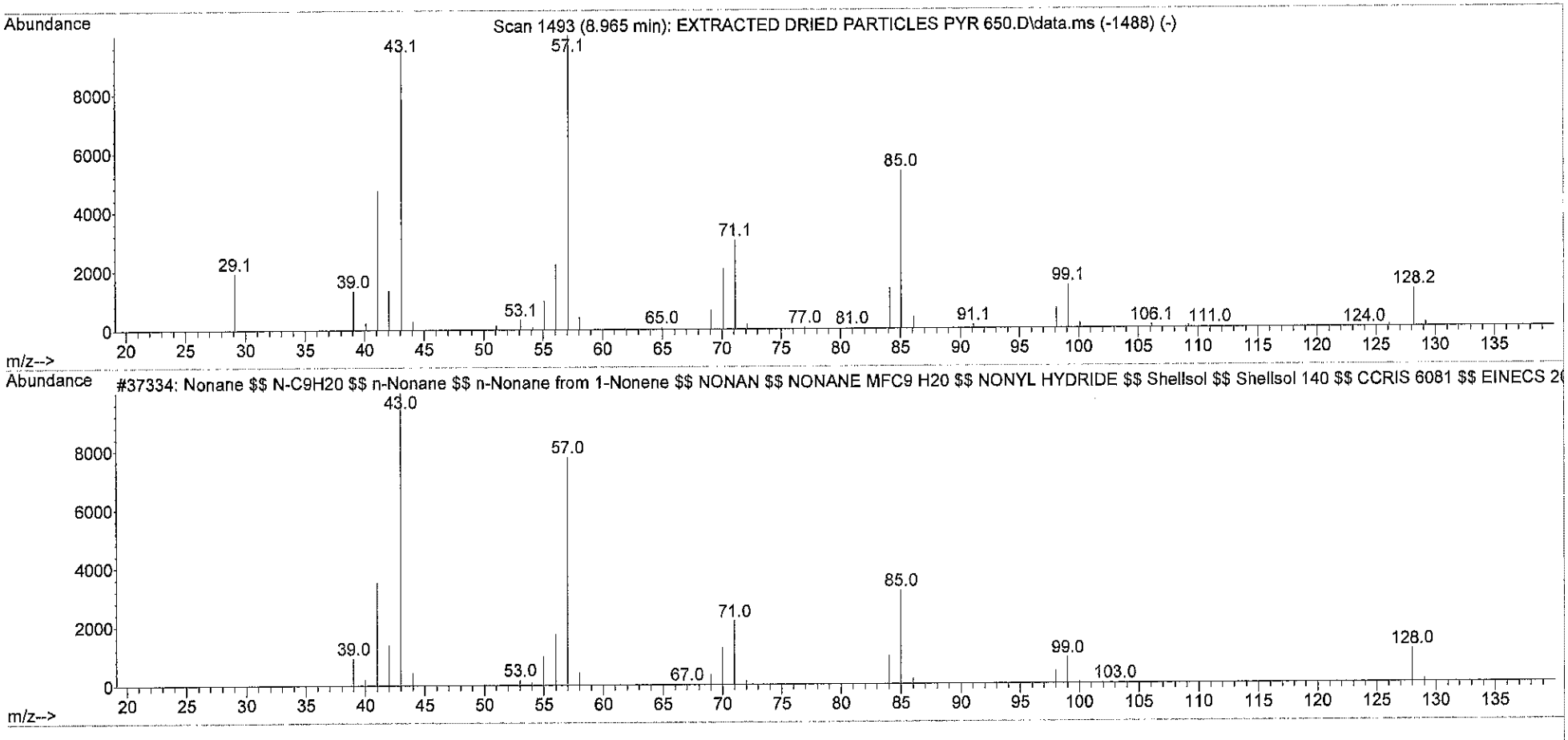


Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 86
ID : Cyclopropane, 1-methyl-2-pentyl- $$ 1-METHYL-2-PENTYLCYCLOPROPANE $$ 1-amyl-2-methyl-cyclopropane $$ 2,3-METHYLENEOCTANE

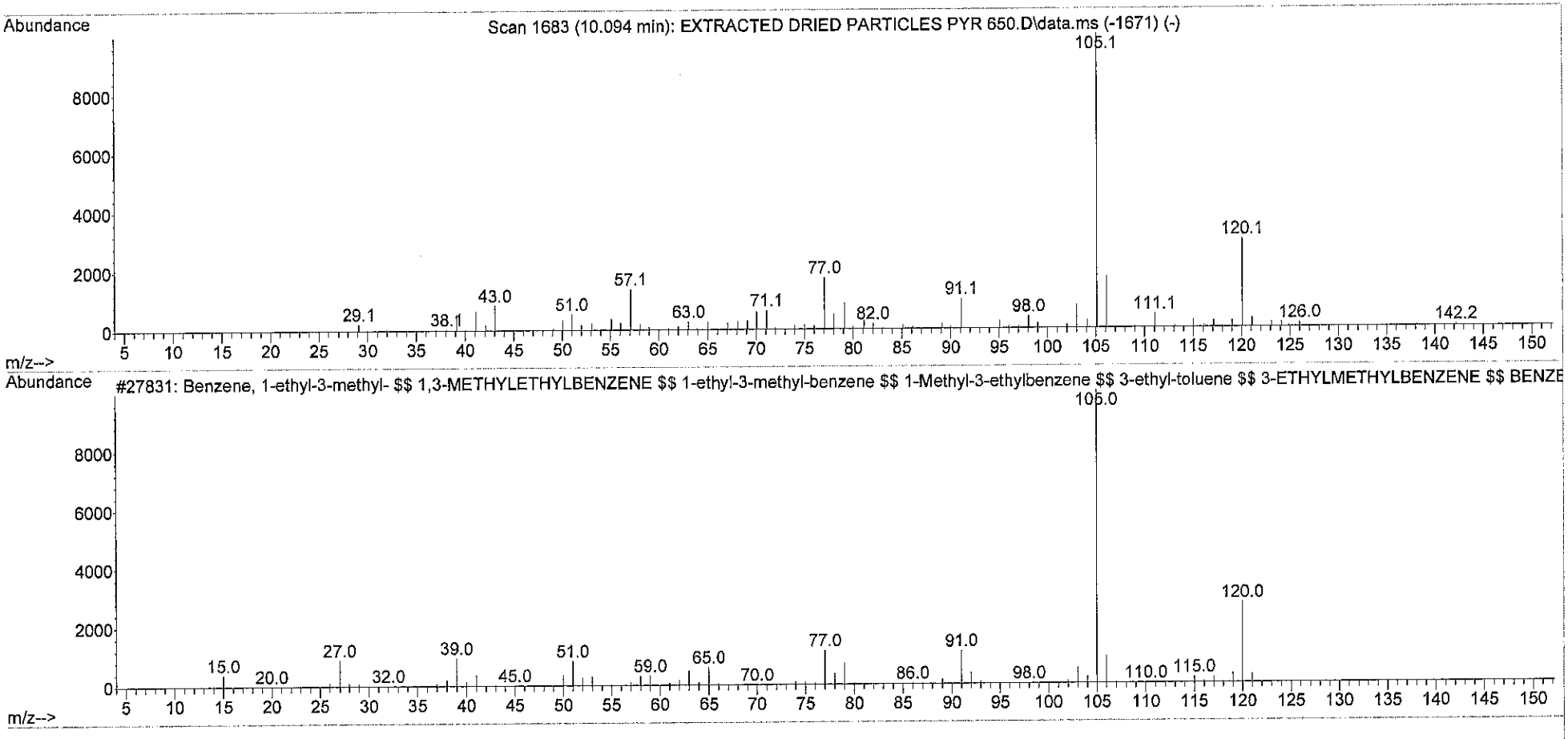


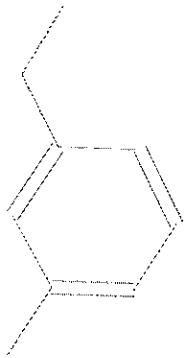


Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 97
ID : Nonane $$ N-C9H20 $$ n-Nonane $$ n-Nonane from 1-Nonene $$ NONAN $$ NONANE MFC9 H20 $$ NONYL HYDRIDE $$ Shellsol $$ Shellsol 140 $$ CCRIS 6081 $$ EINECS 203-913-4 $$ HSDB 107 $$ nonaneTrade Name: Shellsol 140Aldrich No. N2,940-6: $6.20/2mLn-ALKANE

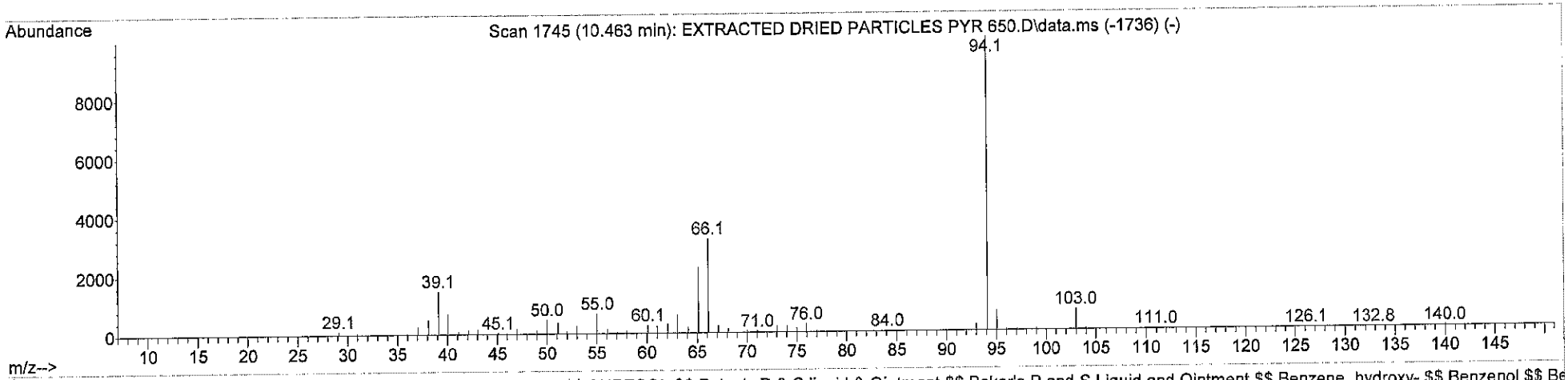


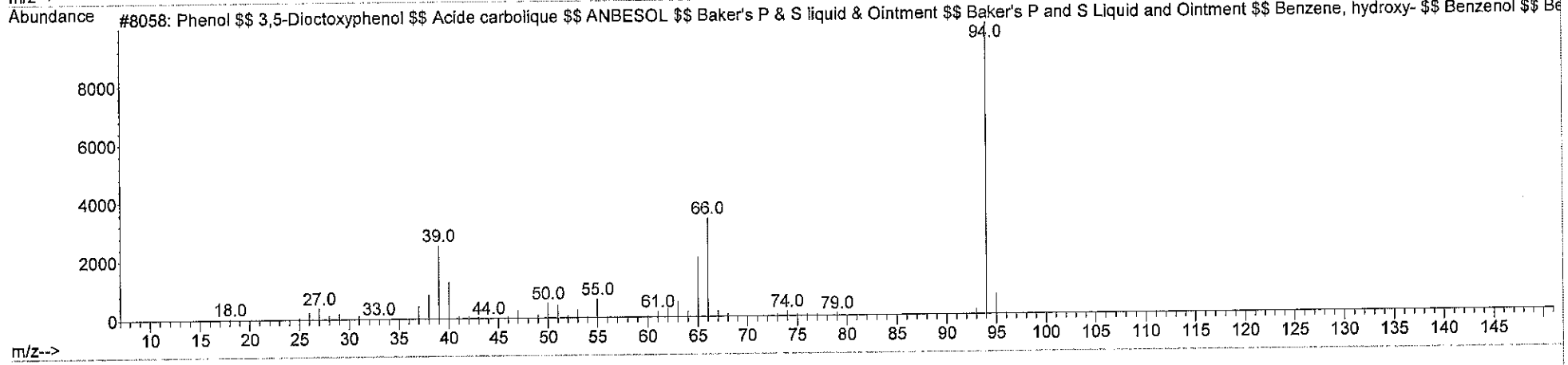
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 76
ID : Benzene, 1-ethyl-3-methyl- $$ 1,3-METHYLETHYLBENZENE $$ 1-ethyl-3-methyl-benzene $$ 1-Methyl-3-ethylbenzene $$ 3-ethyl-toluen
e $$ 3-ETHYLMETHYLBENZENE $$ BENZENE, 3-ETHYL-1-METHYL- $$ m-ethyl-toluene $$ m-Ethylmethylbenzene $$ m-Methylethylbenzene

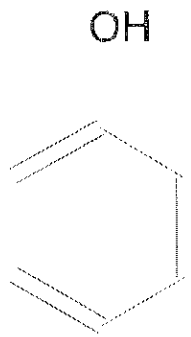




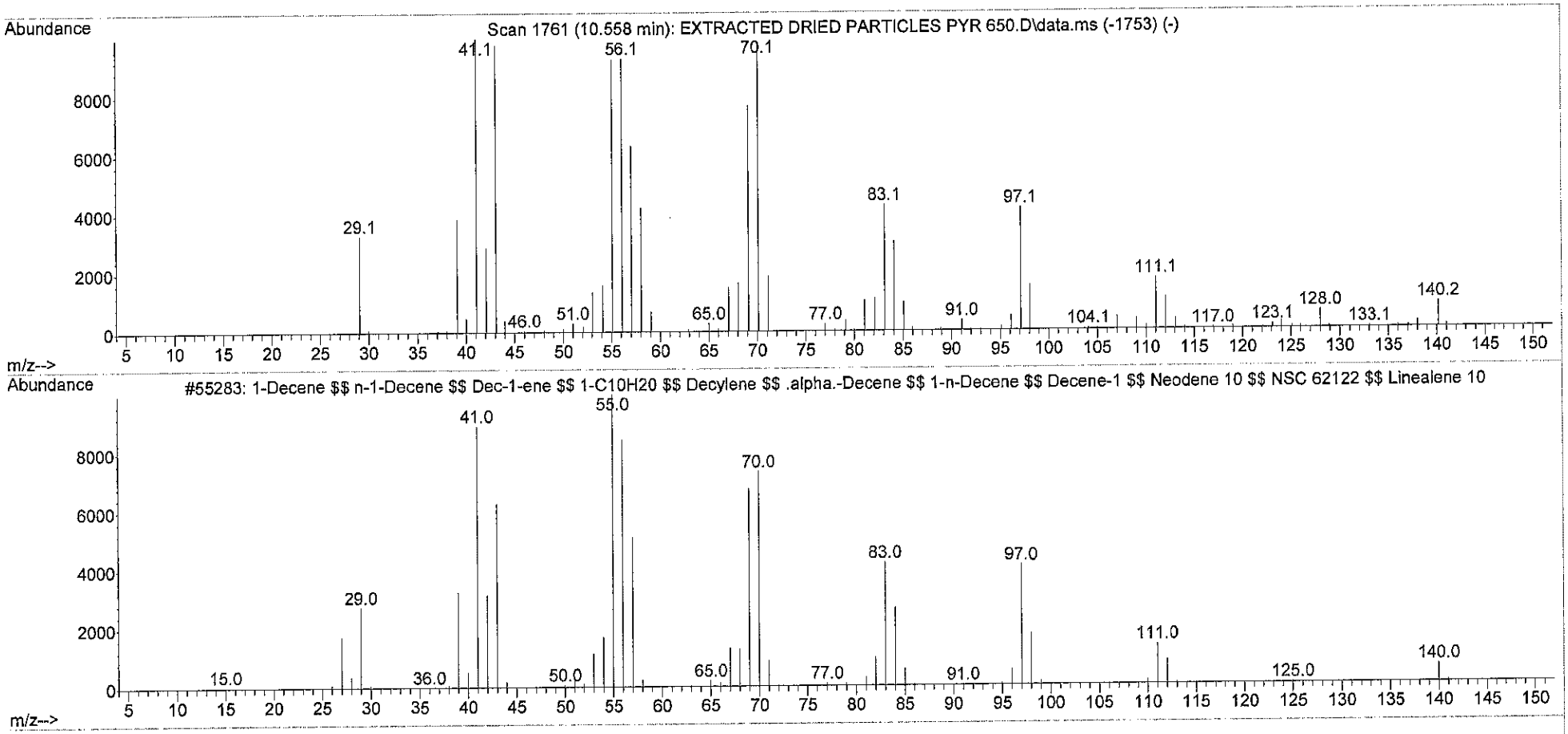
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 94
ID : Phenol $$ 3,5-Dioctoxyphenol $$ Acide carbolique $$ ANBESOL $$ Baker's P & S liquid & Ointment $$ Baker's P and S Liquid and Ointment $$ Benzene, hydroxy- $$ Benzenol $$ Benzophenol $$ CAMPHO-PHENIQUE COLD SORE GEL $$ CAMPHO-PHENIQUE GEL $$ Fenol



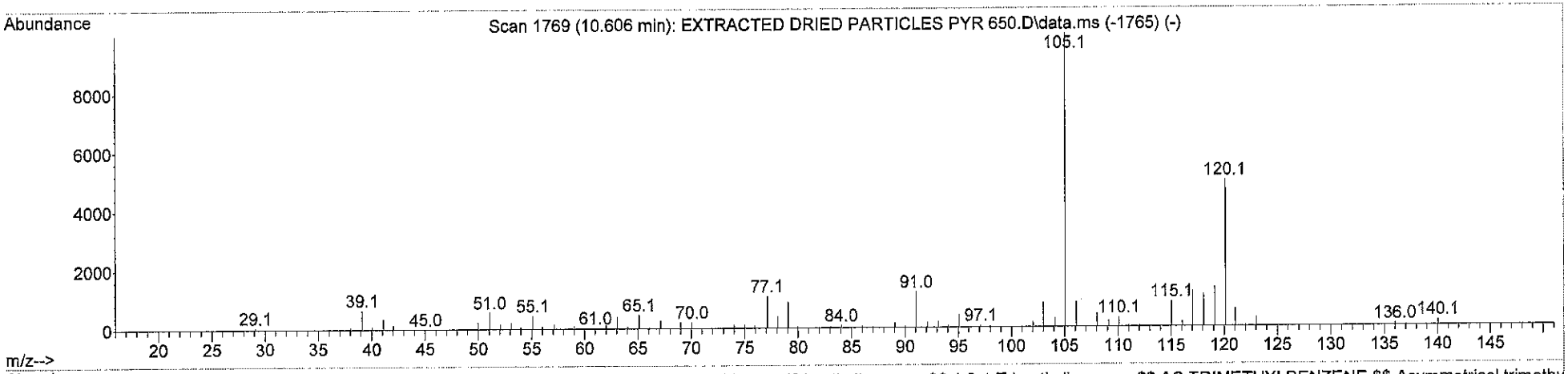


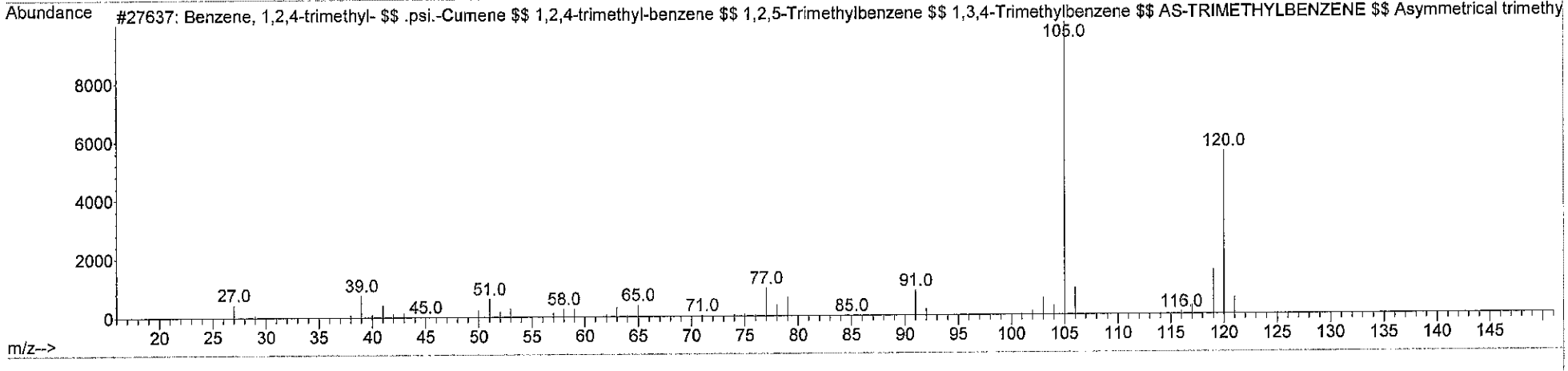


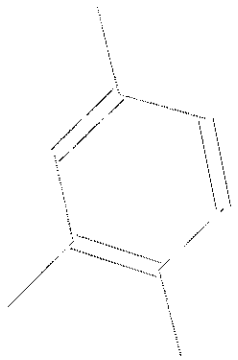
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 97
ID : 1-Decene $$ n-1-Decene $$ Dec-1-ene $$ 1-C10H20 $$ Decylene $$ .alpha.-Decene $$ 1-n-Decene $$ Decene-1 $$ Neodene 10 $$ NSC 62122 $$ Linealene 10



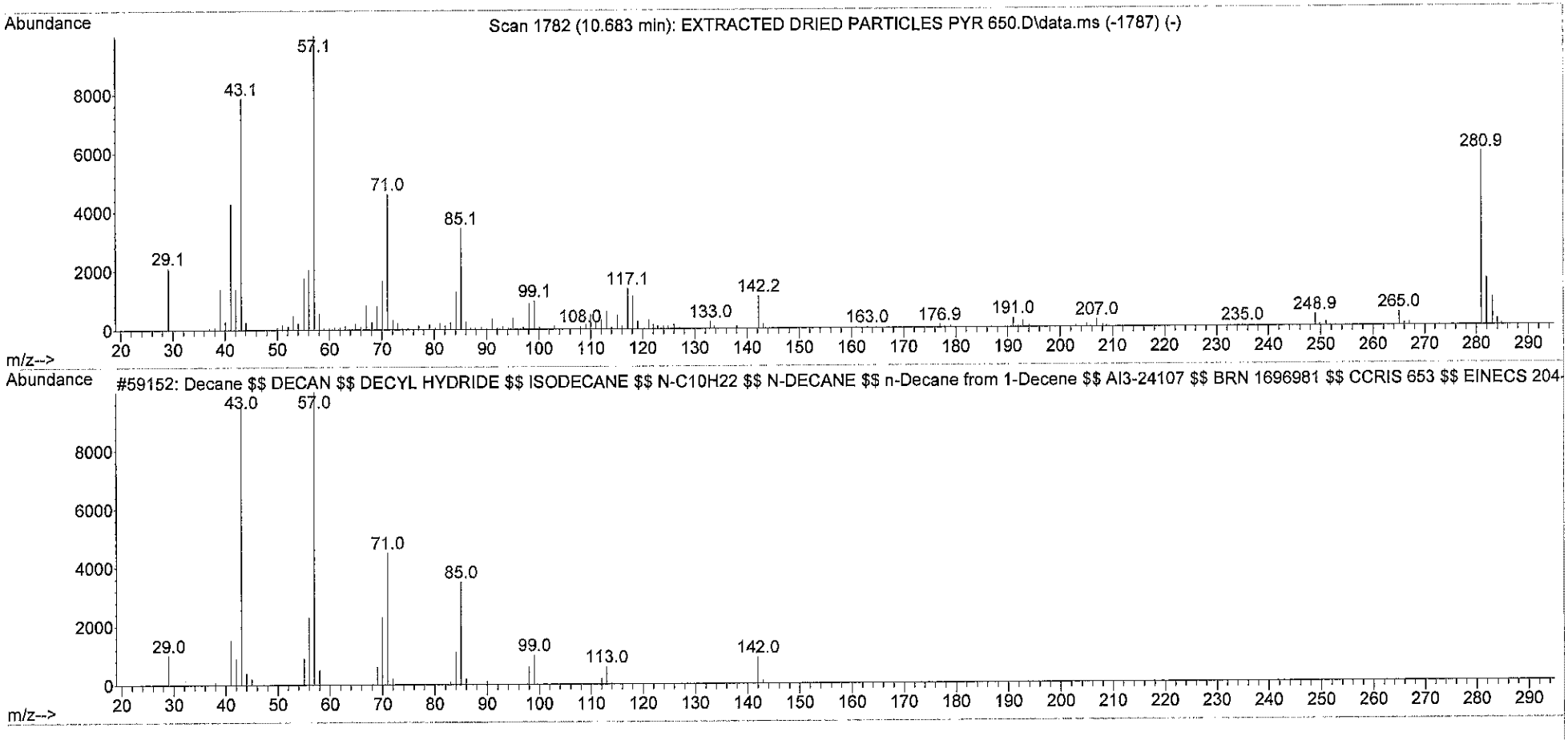
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 94
ID : Benzene, 1,2,4-trimethyl- $$ .psi.-Cumene $$ 1,2,4-trimethyl-benzene $$ 1,2,5-Trimethylbenzene $$ 1,3,4-Trimethylbenzene $$ A
S-TRIMETHYLBENZENE $$ Asymmetrical trimethylbenzene $$ BENZENE, 1,2,5-TRIMETHYL- $$ pseudo-cumene $$ Pseudocumol



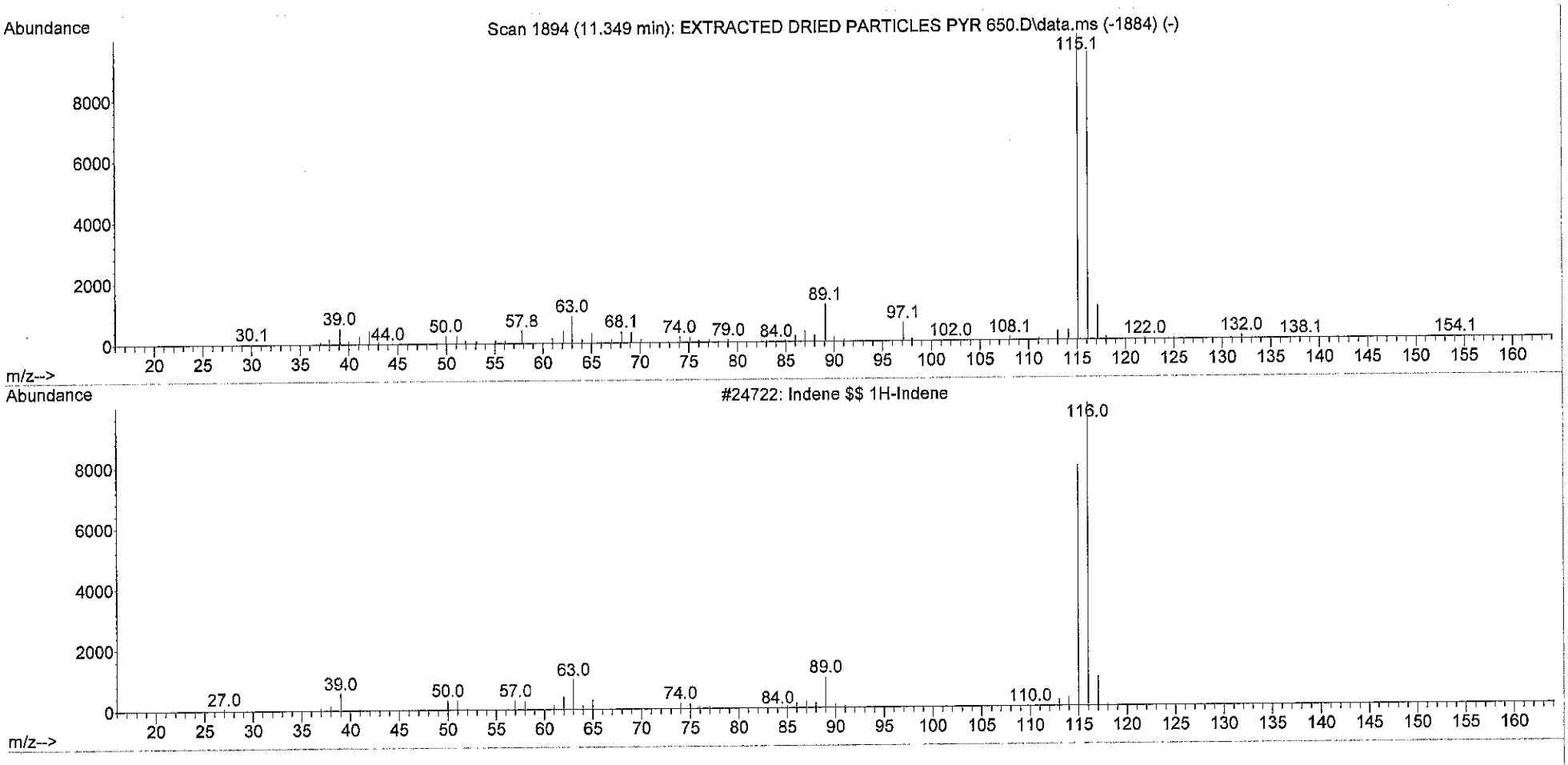


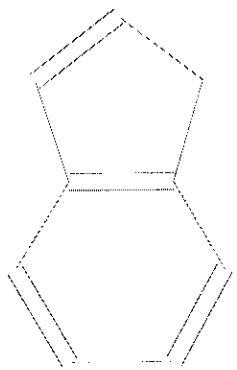


Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 86
ID : Decane $$ DECAN $$ DECYL HYDRIDE $$ ISODECANE $$ N-C10H22 $$ N-DECANE $$ n-Decane from 1-Decene $$ AI3-24107 $$ BRN 1696981 $ $ CCRIS 653 $$ EINECS 204-686-4 $$ HSDB 63 $$ NSC 8781 $$ UN2247

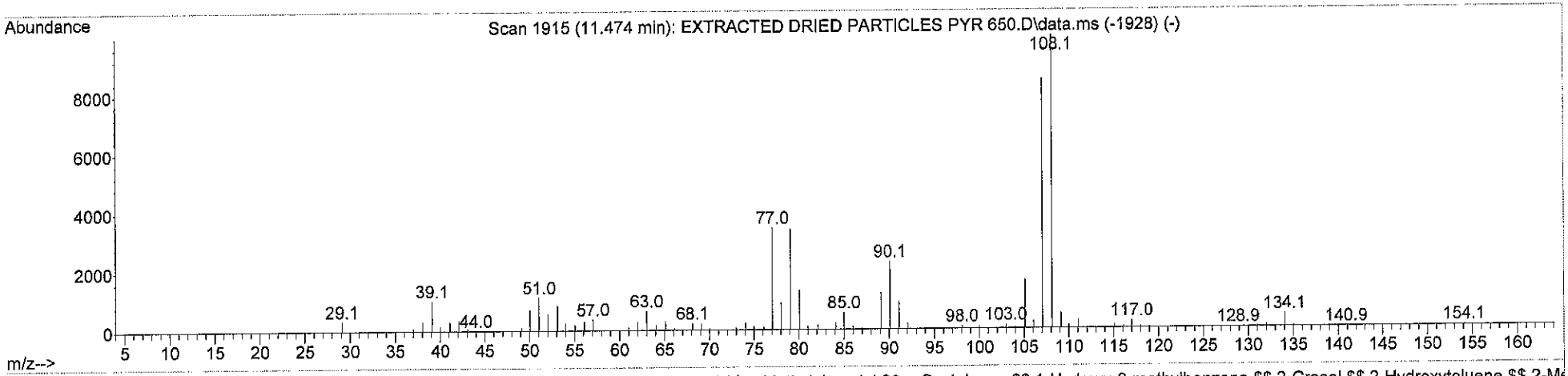


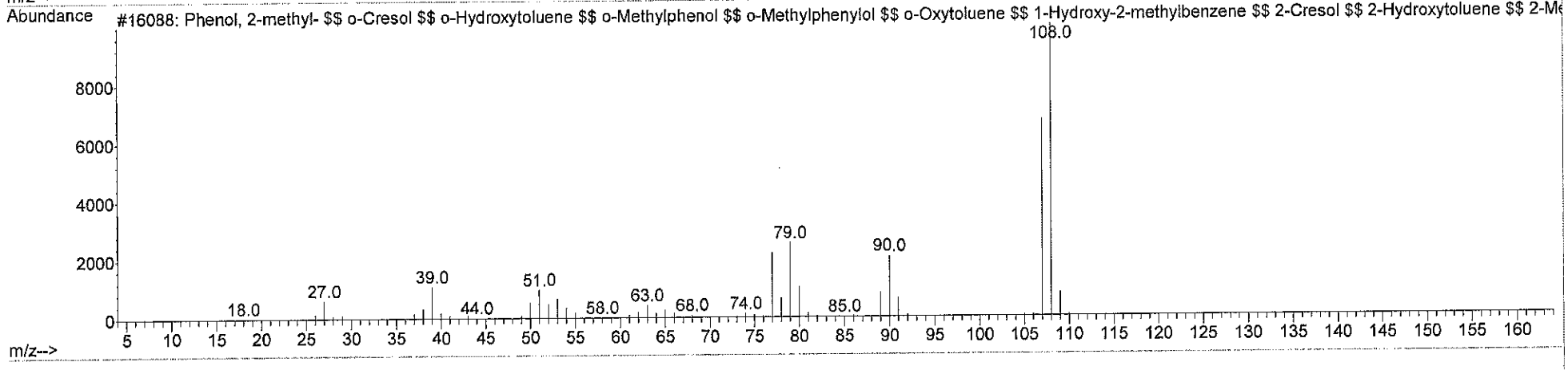
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 97
ID : Indene $$ 1H-Indene

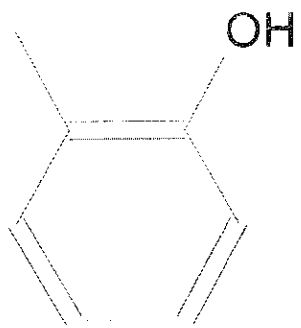




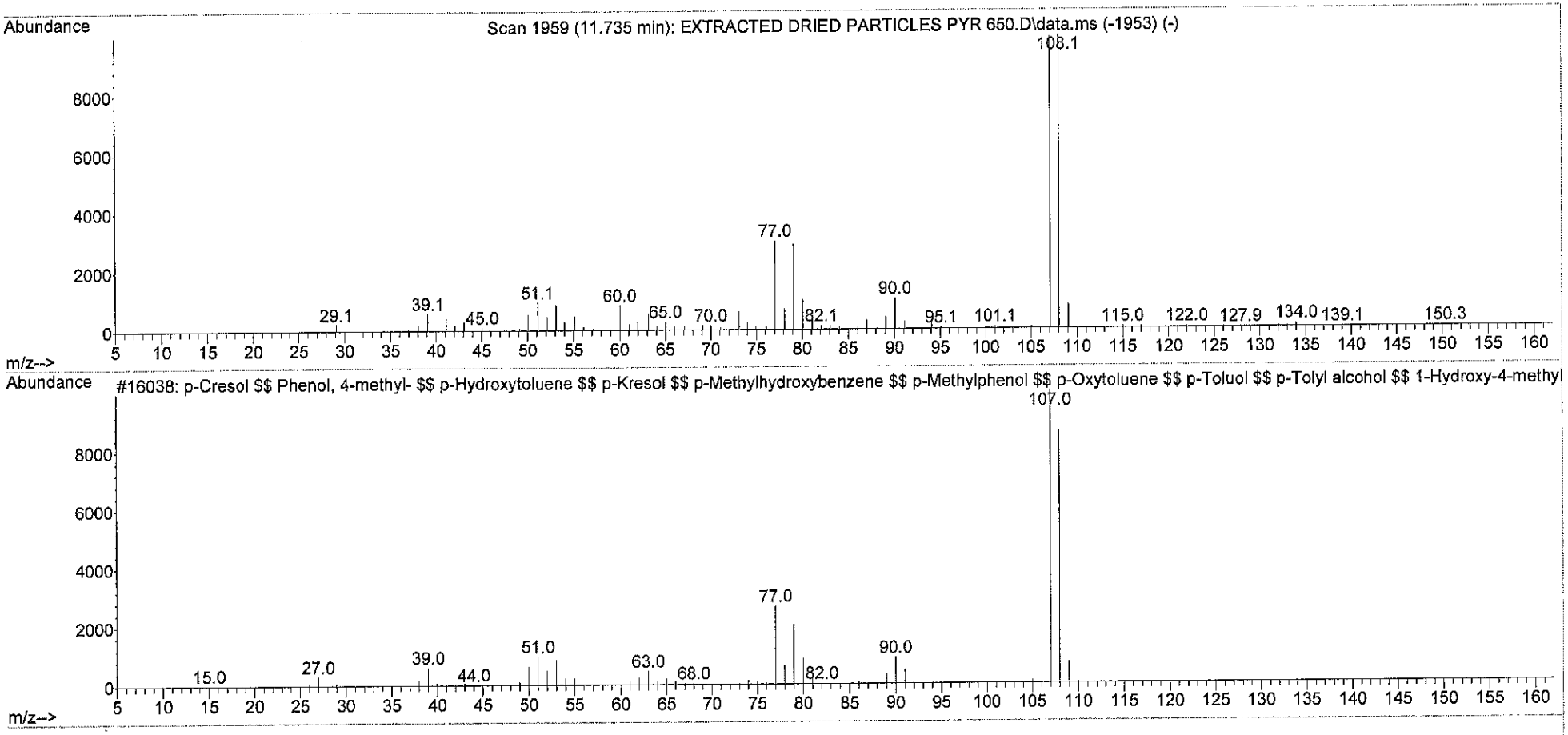
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 93
ID : Phenol, 2-methyl- $$ o-Cresol $$ o-Hydroxytoluene $$ o-Methylphenol $$ o-Methylphenylol $$ o-Oxytoluene $$ 1-Hydroxy-2-methyl benzene $$ 2-Cresol $$ 2-Hydroxytoluene $$ 2-Methylphenol $$ Orthocresol $$ o-Kresol $$ Rcra waste number U052 $$ NSC 23076

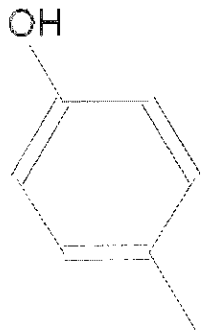




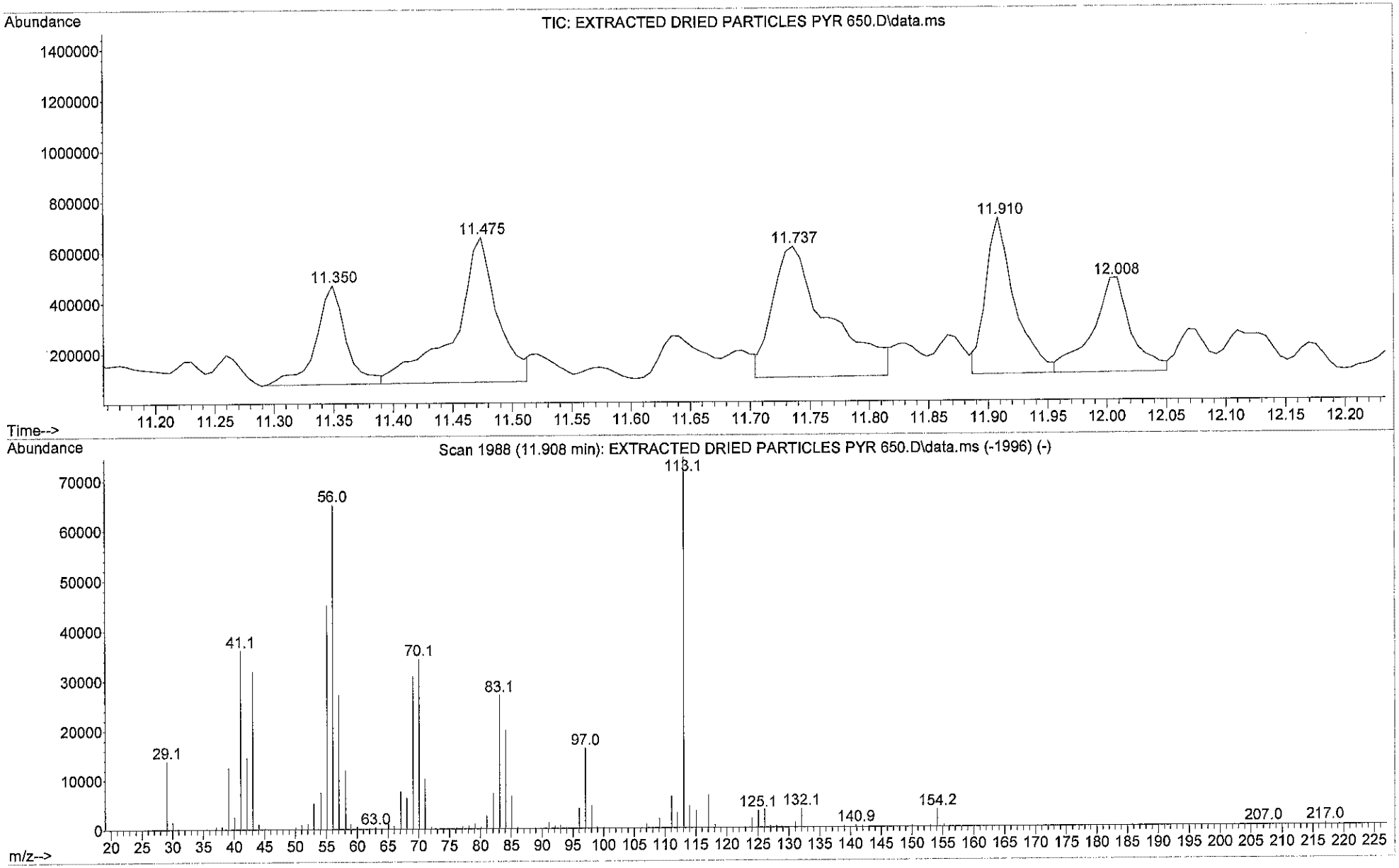


Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 97
ID : p-Cresol $$ Phenol, 4-methyl- $$ p-Hydroxytoluene $$ p-Kresol $$ p-Methylhydroxybenzene $$ p-Methylphenol $$ p-Oxytoluene $$ p-Toluol $$ p-Tolyl alcohol $$ 1-Hydroxy-4-methylbenzene $$ 4-Cresol $$ 4-Hydroxytoluene $$ 4-Methylphenol $$ Paracresol

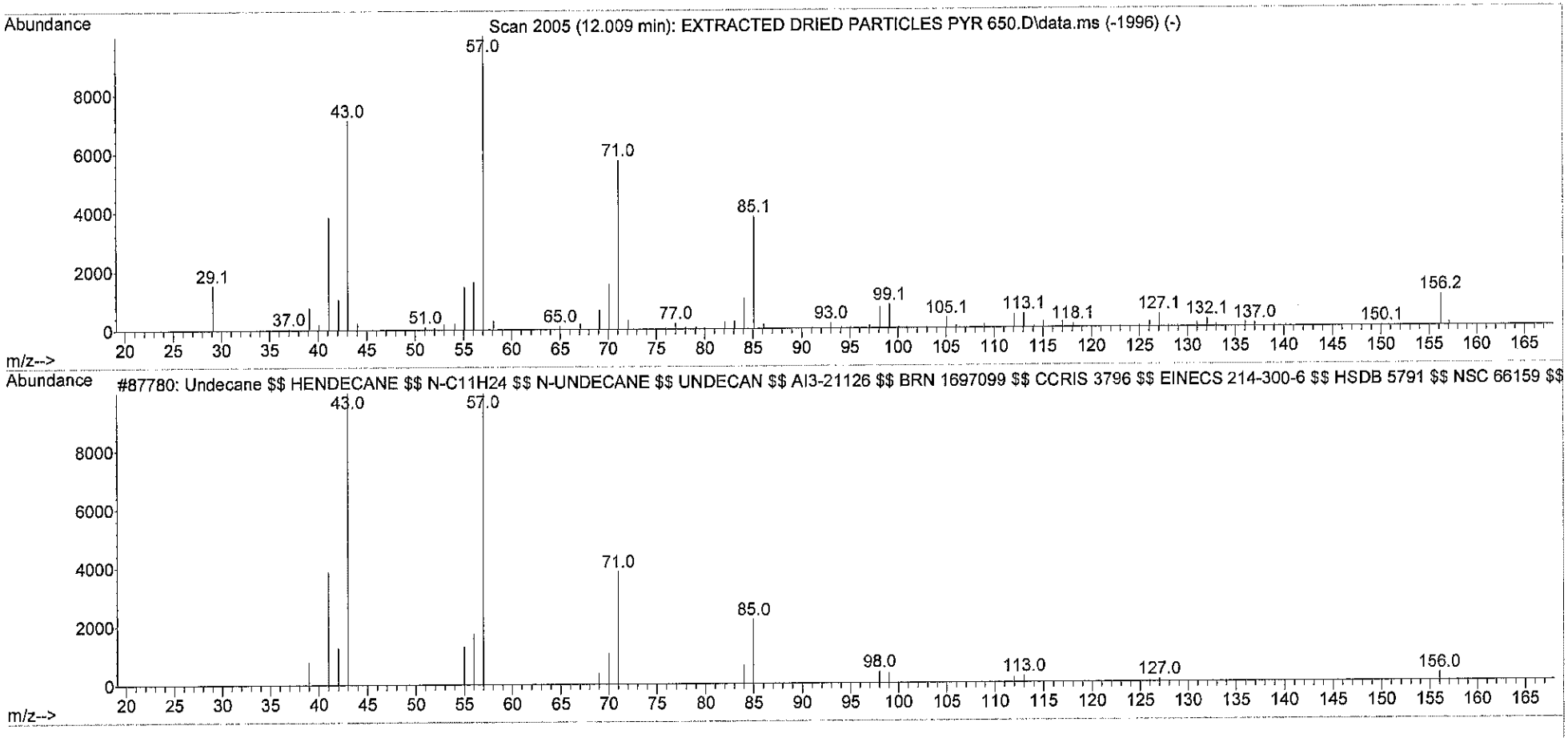




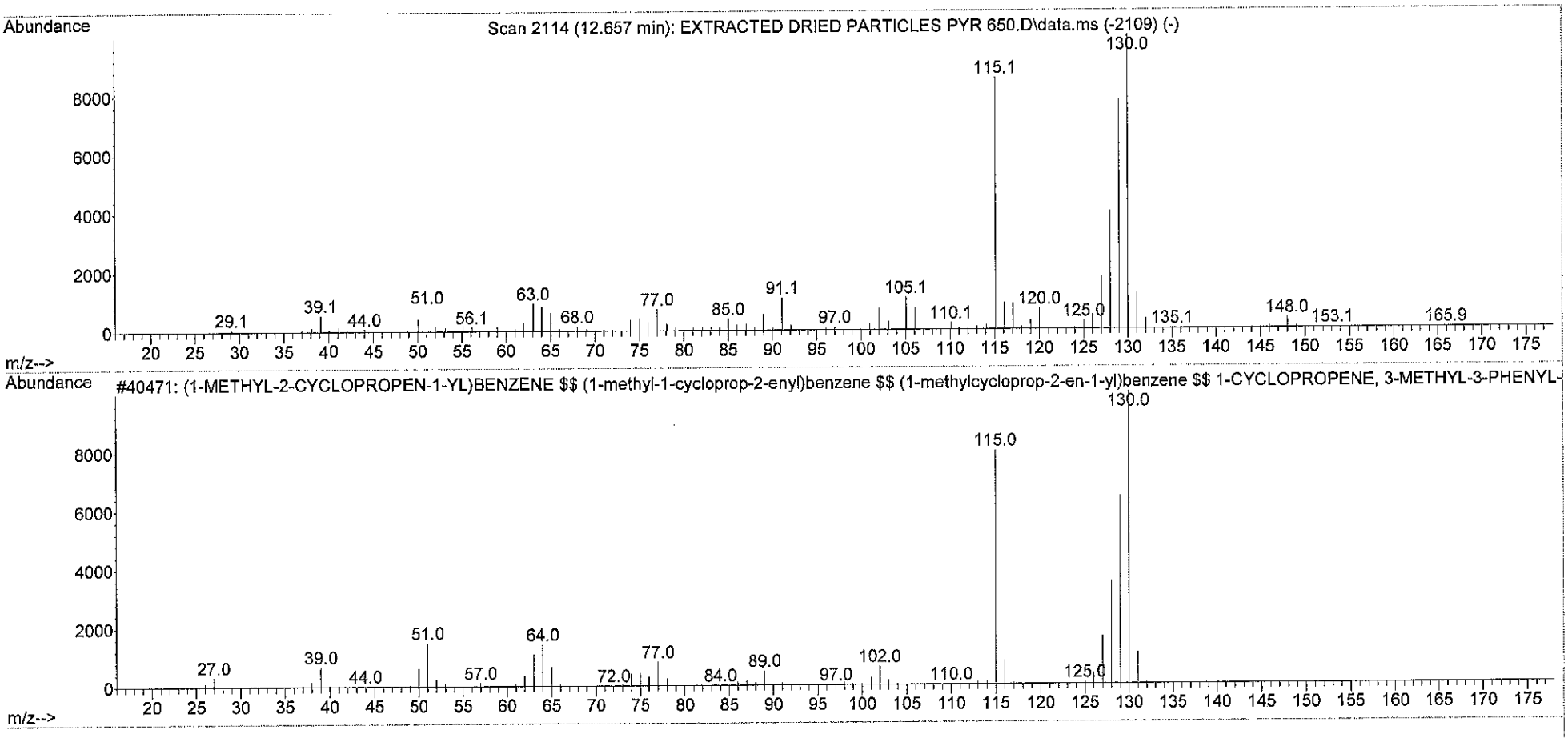
File :D:\Data 2016\LPI\Job 8029\EXTRACTED DRIED PARTICLES PYR 650.D
Operator : CG
Acquired : 30 Aug 2016 8:11 using AcqMethod PYR 650 SPLIT30.M
Instrument : Instrument #1
Sample Name: EXTRACTED DRIED PARTICLES PYR 650
Misc Info :
Vial Number: 1

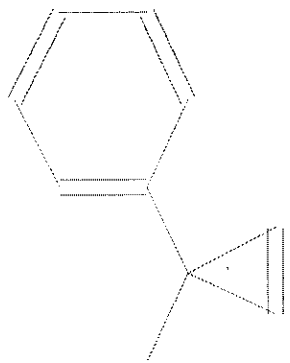


Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 95
ID : Undecane $$ HENDECANE $$ N-C11H24 $$ N-UNDECANE $$ UNDECAN $$ AI3-21126 $$ BRN 1697099 $$ CCRIS 3796 $$ EINECS 214-300-6 $$ H
SDB 5791 $$ NSC 66159 $$ UN2330

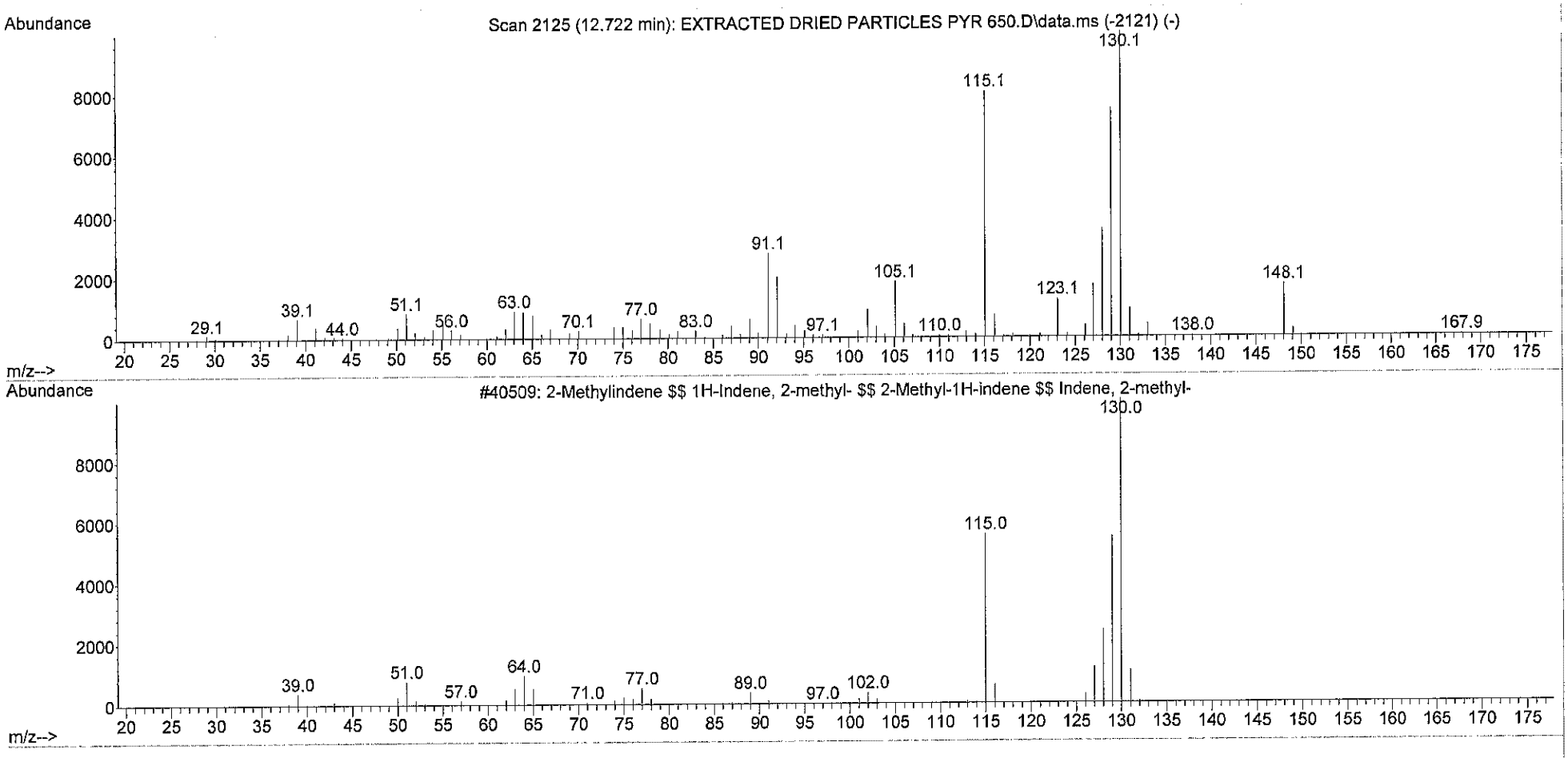


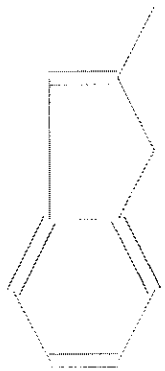
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 94
ID : (1-METHYL-2-CYCLOPROPEN-1-YL)BENZENE $$ (1-methyl-1-cycloprop-2-enyl)benzene $$ (1-methylcycloprop-2-en-1-yl)benzene $$ 1-CYCLOPROPENE, 3-METHYL-3-PHENYL- $$ 3-METHYL-3-PHENYLCYCLOPROPENE $$ BENZENE, (1-METHYL-2-CYCLOPROPEN-1-YL)-



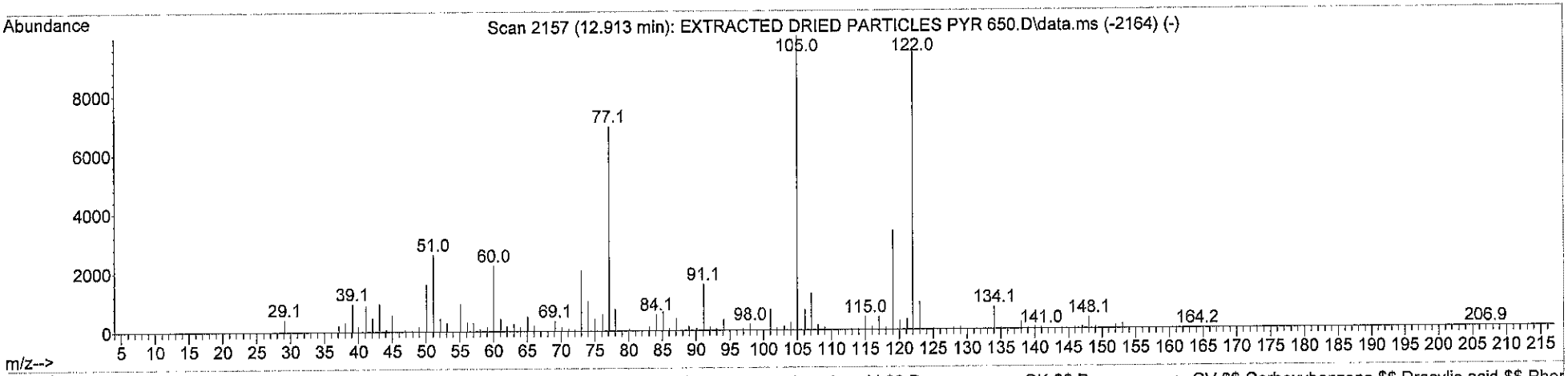


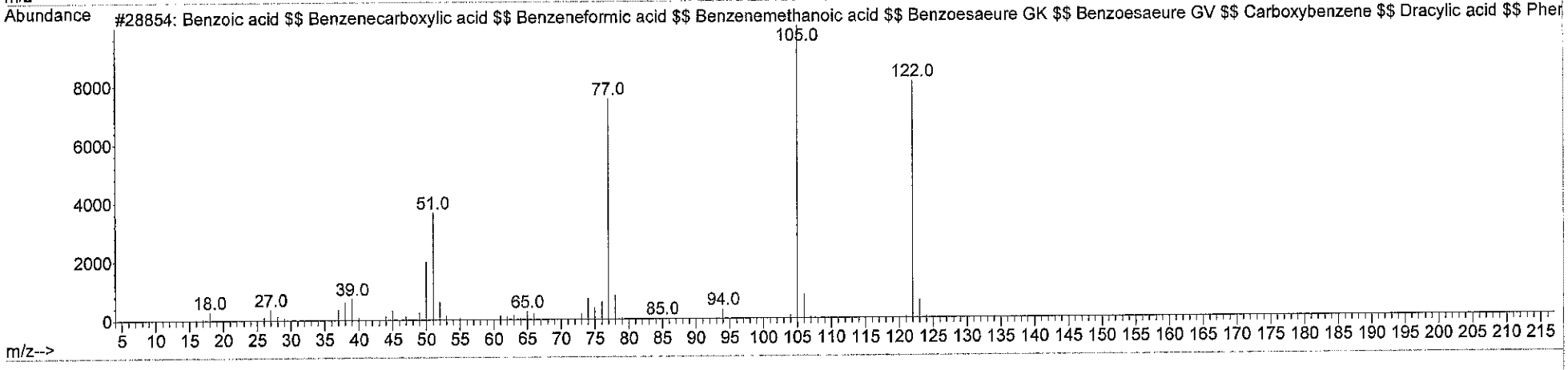
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 94
ID : 2-Methylindene $$ 1H-Indene, 2-methyl- $$ 2-Methyl-1H-indene $$ Indene, 2-methyl-

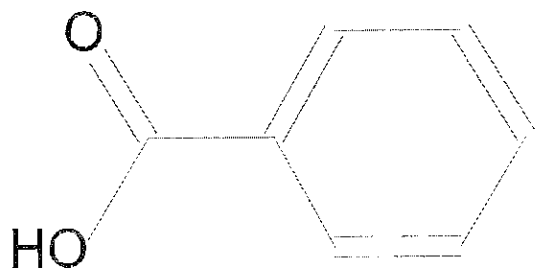




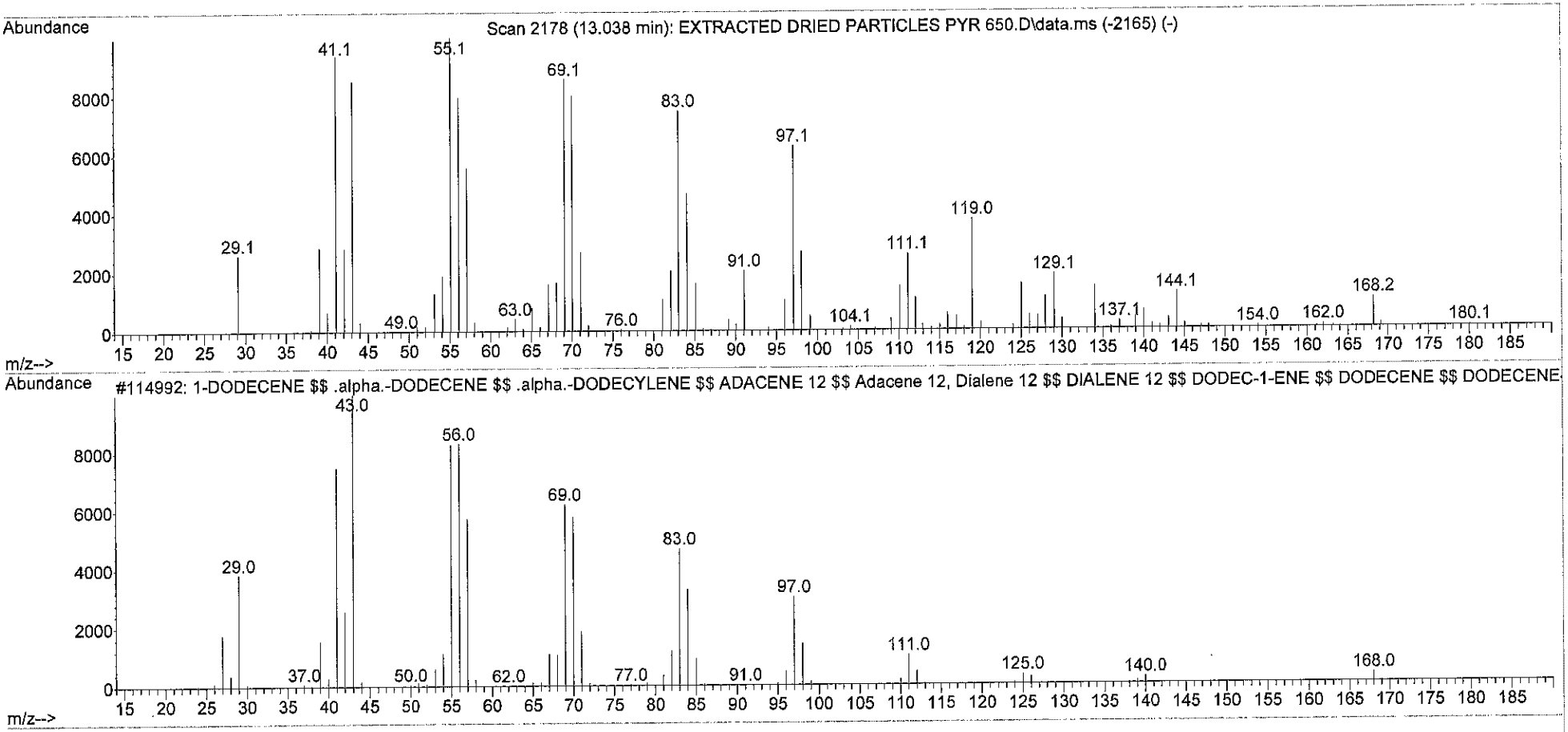
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 93
ID : Benzoic acid $$ Benzenecarboxylic acid $$ Benzeneformic acid $$ Benzenemethanoic acid $$ Benzoesaeure GK $$ Benzoesaeure GV $$ Carboxybenzene $$ Dracylic acid $$ Phenylcarboxylic acid $$ Phenylformic acid $$ Retarder BA $$ Retardex $$ Salvo, liquid



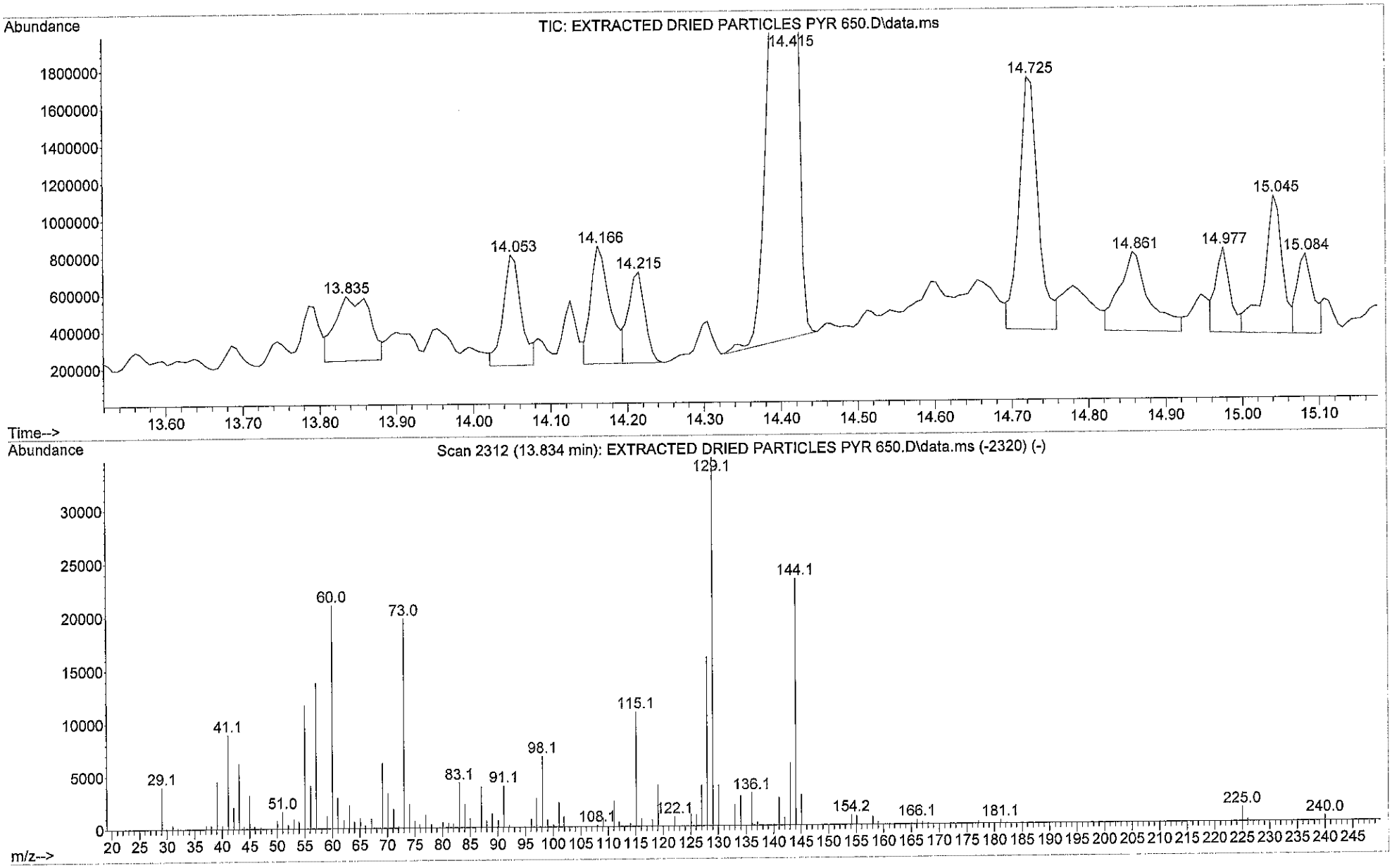




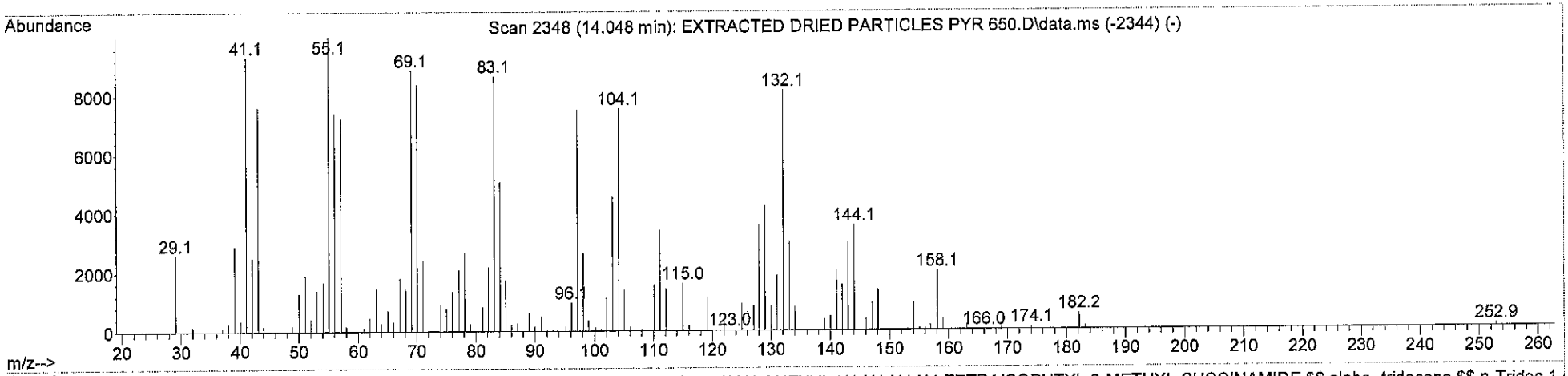
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 97
ID : 1-DODECENE $$ .alpha.-DODECENE $$ .alpha.-DODECYLENE $$ ADACENE 12 $$ Adacene 12, Dialene 12 $$ DIALENE 12 $$ DODEC-1-ENE $$ DODECENE $$ DODECENE-1 $$ DODECYLENE .alpha.- $$ N-DODEC-1-ENE $$ N-UNDECANE. 1-DODECENE $$ NEODENE 12 $$ NEODENE 6/12

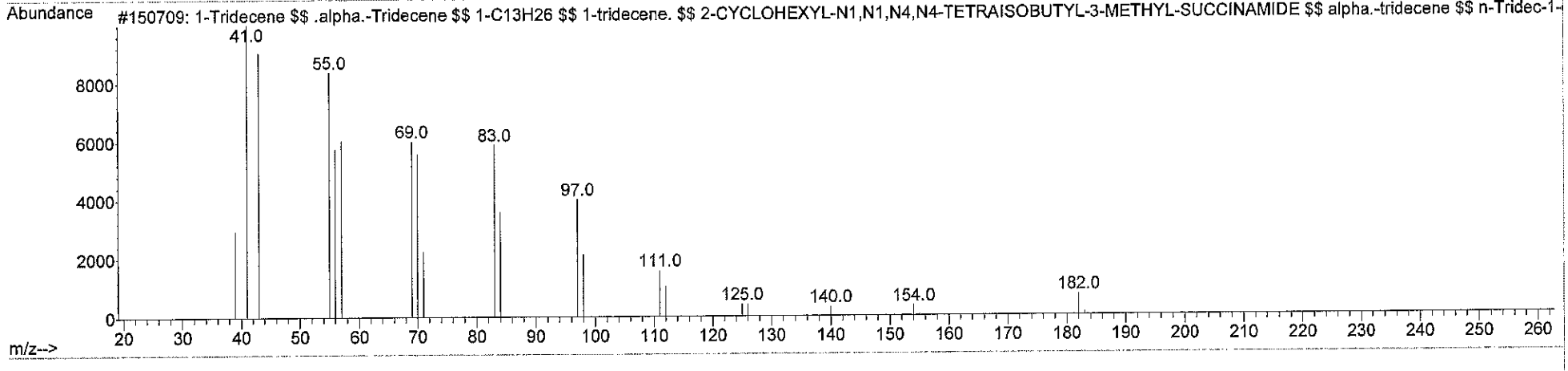


File :D:\Data 2016\LPI\Job 8029\EXTRACTED DRIED PARTICLES PYR 650.D
Operator : CG
Acquired : 30 Aug 2016 8:11 using AcqMethod PYR 650 SPLIT30.M
Instrument : Instrument #1
Sample Name: EXTRACTED DRIED PARTICLES PYR 650
Misc Info :
Vial Number: 1

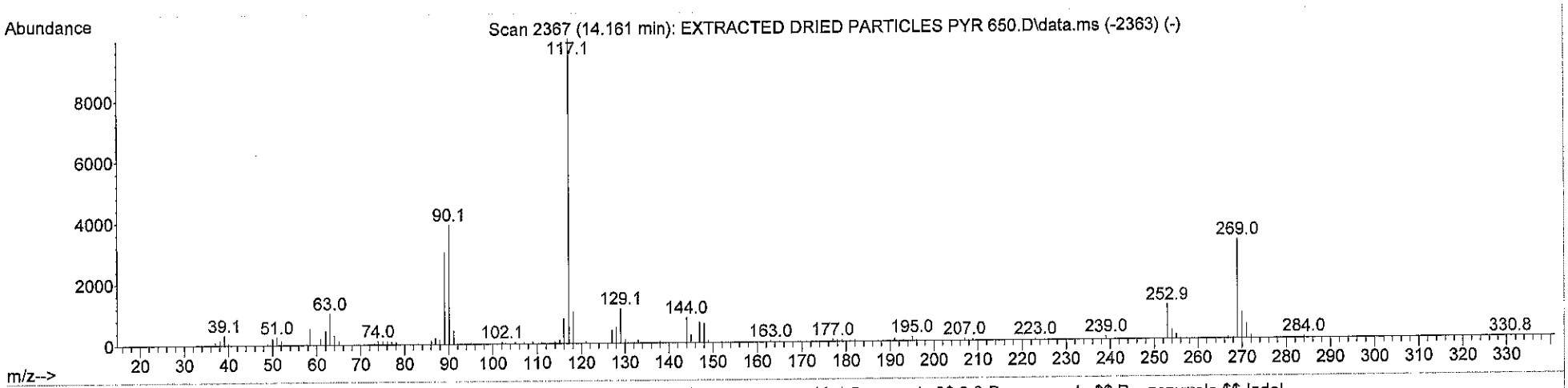


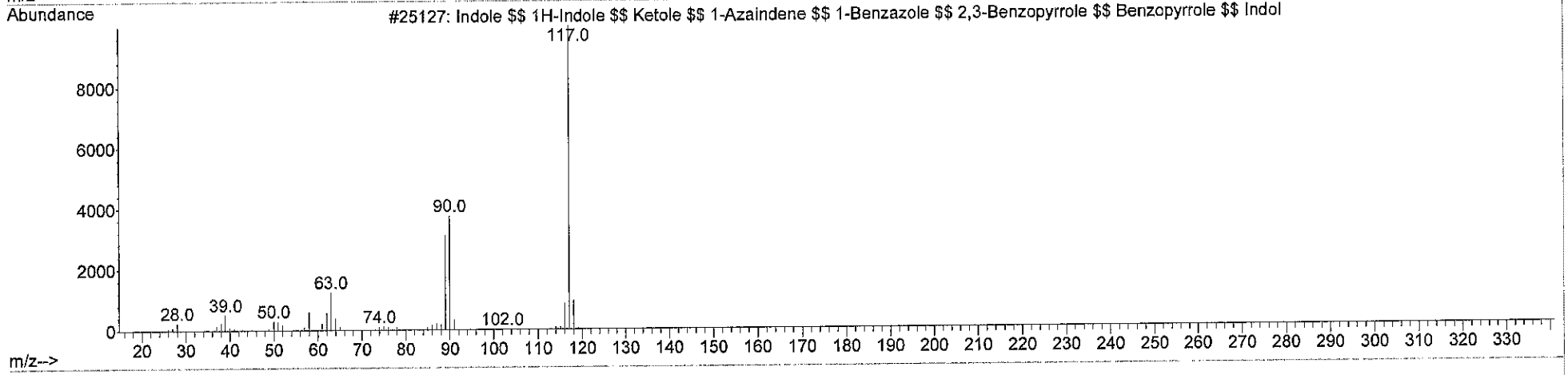
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 97
ID : 1-Tridecene $$ .alpha.-Tridecene $$ 1-C13H26 $$ 1-tridecene. $$ 2-CYCLOHEXYL-N1,N1,N4,N4-TETRAISOBUTYL-3-METHYL-SUCCINAMIDE $ $ alpha.-tridecene $$ n-Tridec-1-ene $$ tridec-1-ene $$ TRIDECENE-1 $$ TRIDECYLENE $$ UNDECYLETHYLENE $$ BRN 1744660

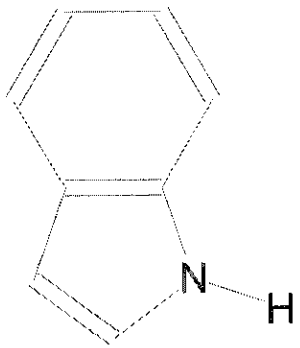




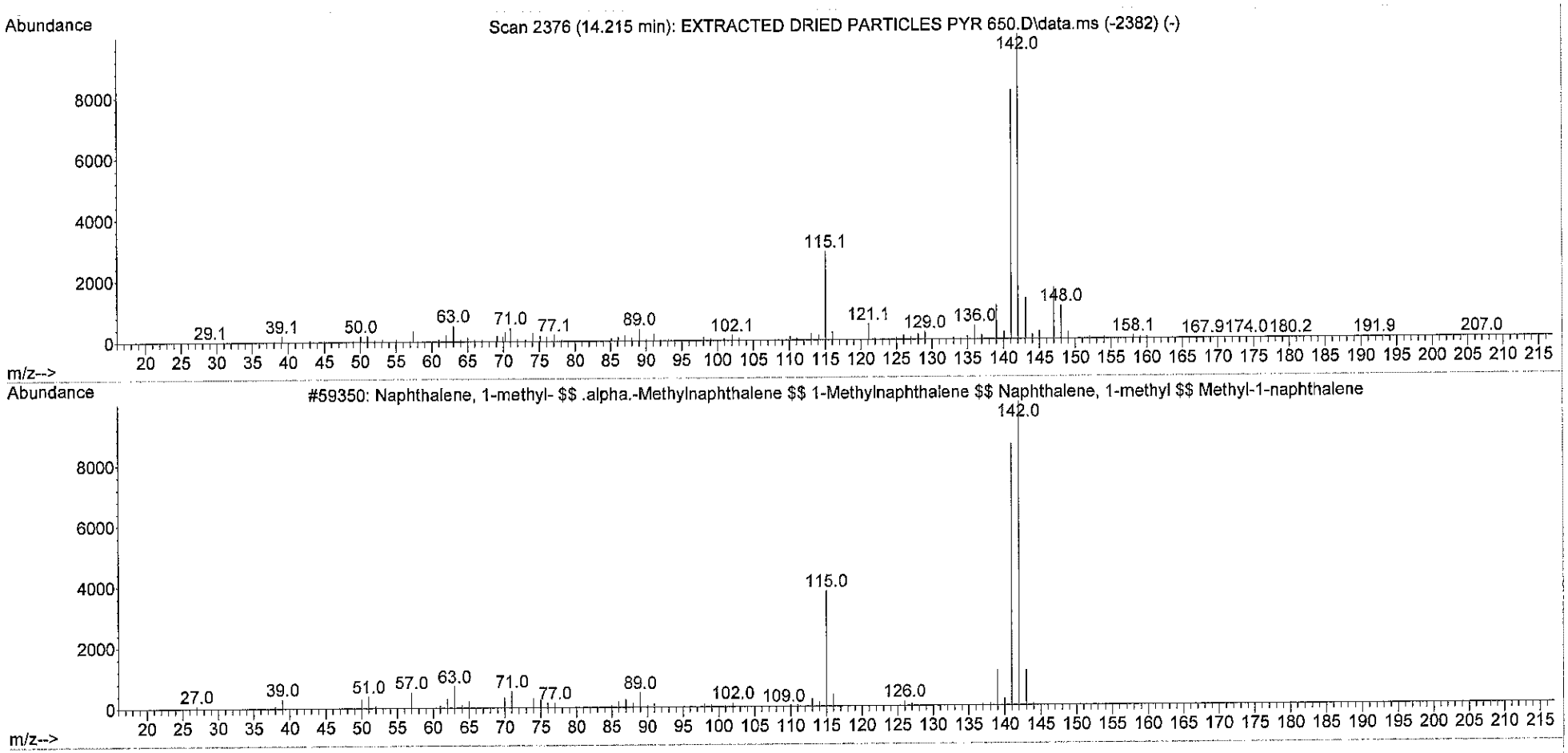
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 89
ID : Indole $$ 1H-Indole $$ Ketole $$ 1-Azaindene $$ 1-Benzazole $$ 2,3-Benzopyrrole $$ Benzopyrrole $$ Indol

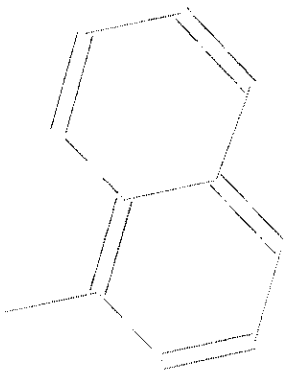




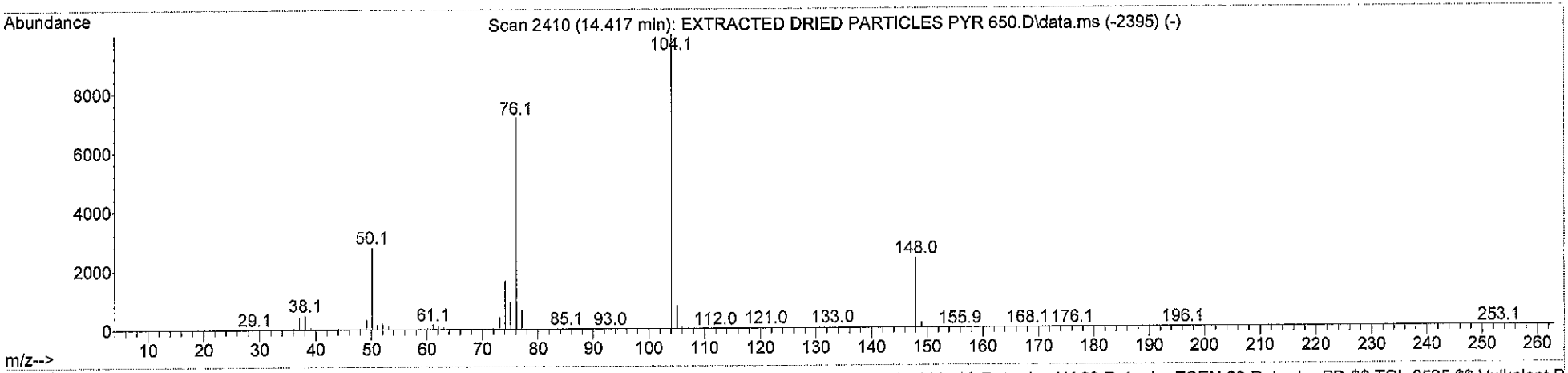


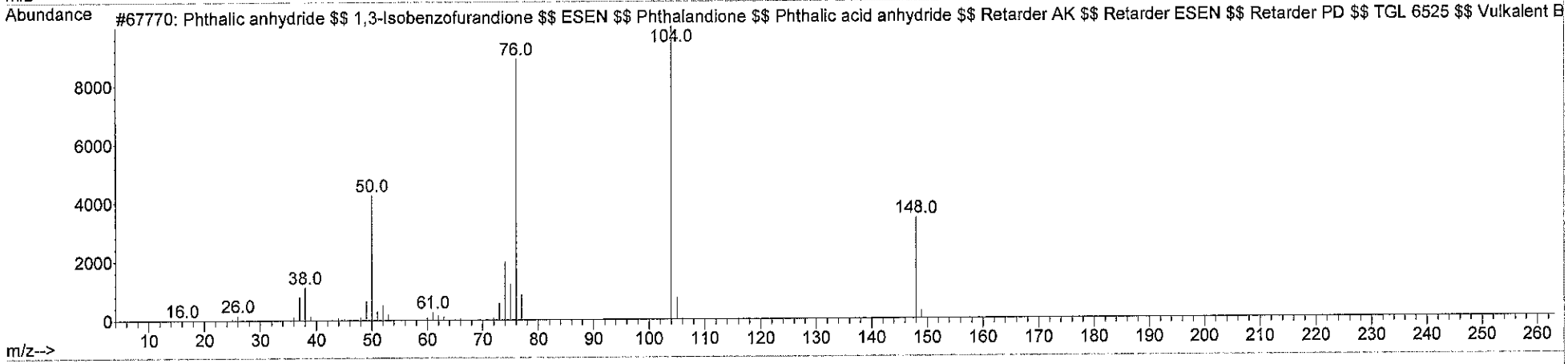
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 96
ID : Naphthalene, 1-methyl- $$ .alpha.-Methylnaphthalene $$ 1-Methylnaphthalene $$ Naphthalene, 1-methyl $$ Methyl-1-naphthalene

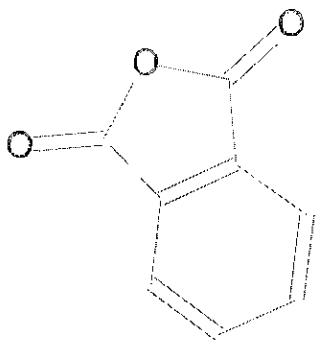




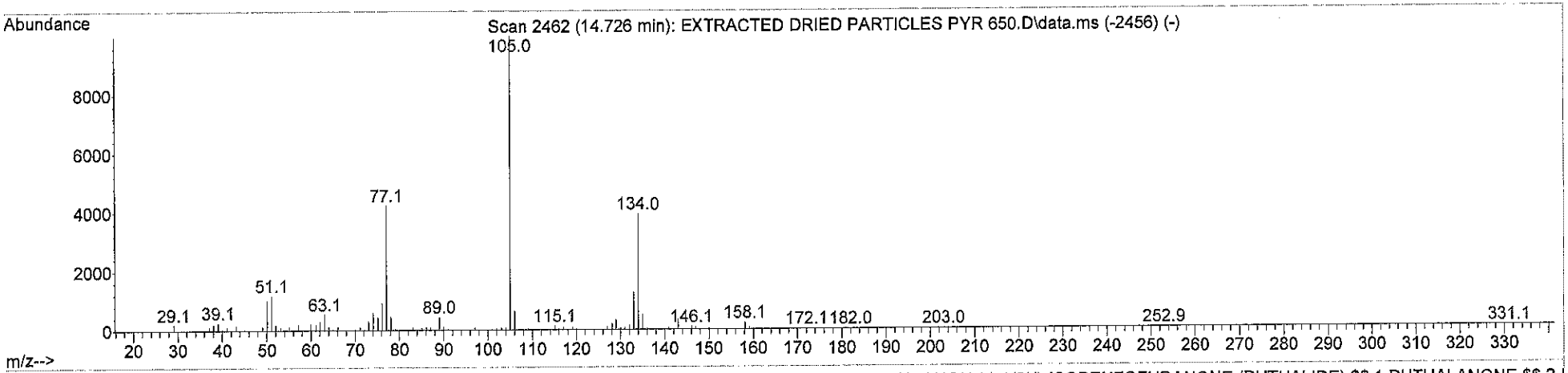
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 95
ID : Phthalic anhydride $$ 1,3-Isobenzofurandione $$ ESEN $$ Phthalandione $$ Phthalic acid anhydride $$ Retarder AK $$ Retarder E
SEN $$ Retarder PD $$ TGL 6525 $$ Vulkalent B/C $$ 1,2-Benzenedicarboxylic anhydride $$ 1,3-Phthalandione $$ NCI-C03601

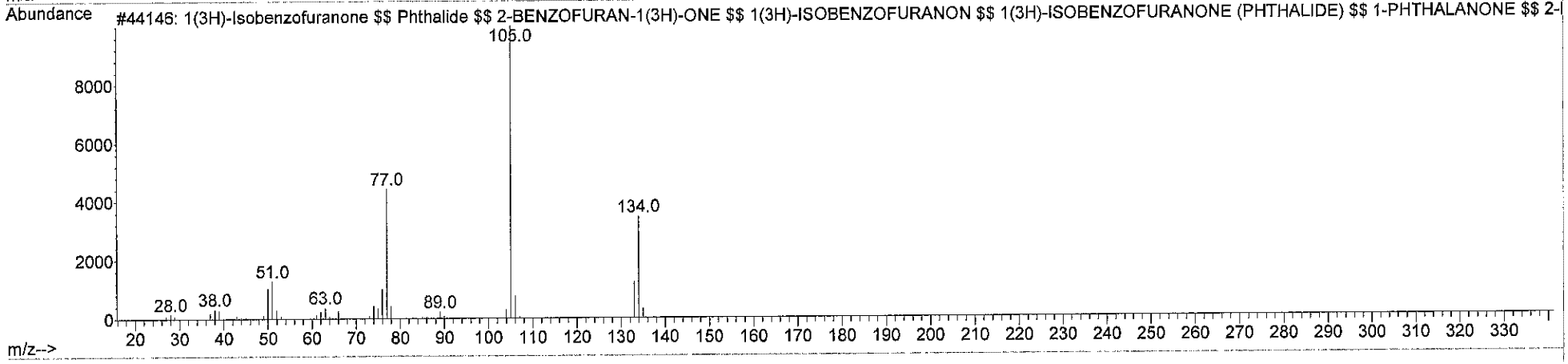


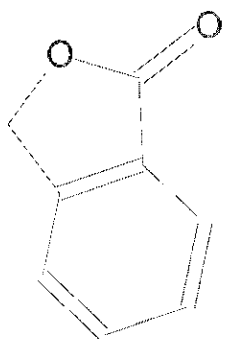




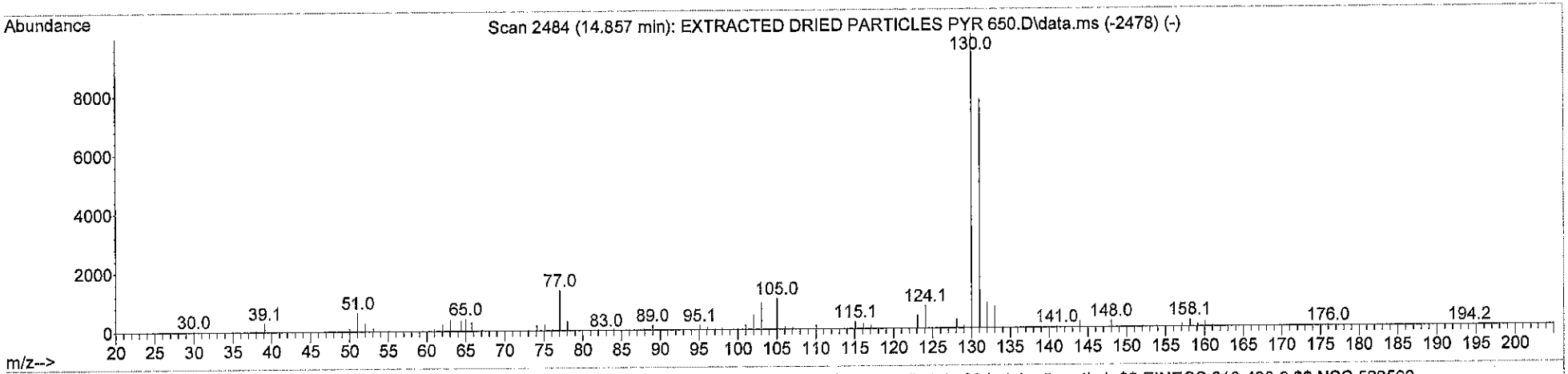
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 94
ID : 1(3H)-Isobenzofuranone $$ Phthalide $$ 2-BENZOFURAN-1(3H)-ONE $$ 1(3H)-ISOBENZOFURANON $$ 1(3H)-ISOBENZOFURANONE (PHTHALIDE) $$ 1-PHTHALANONE $$ 2-HYDROXYMETHYLBENZOIC ACID, .gamma.-LACTONE $$ 2-HYDROXYMETHYLBENZOIC ACID, GAMMA-LACTONE $$ PHTHALID

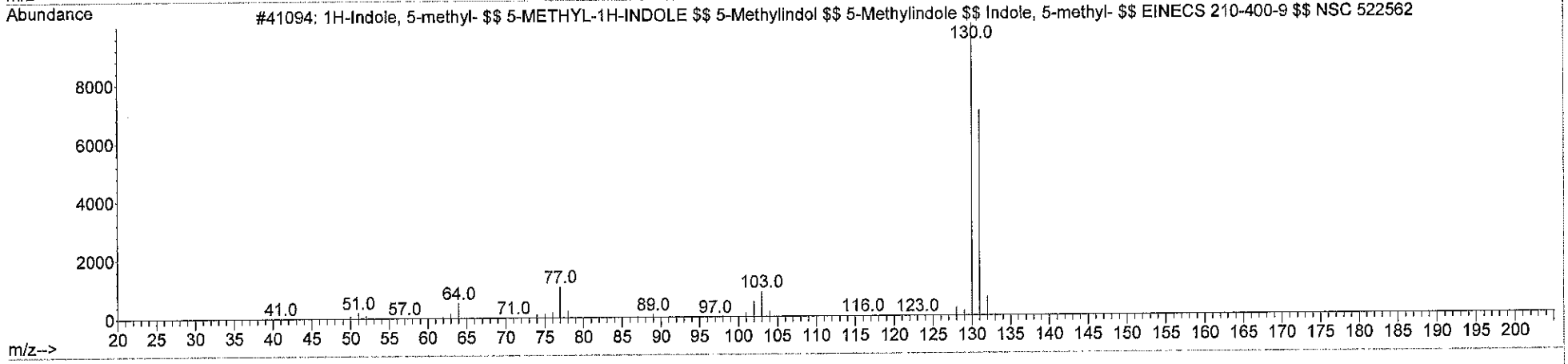


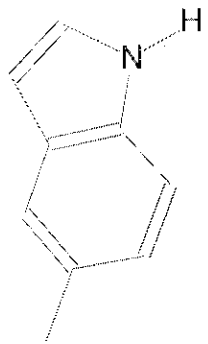




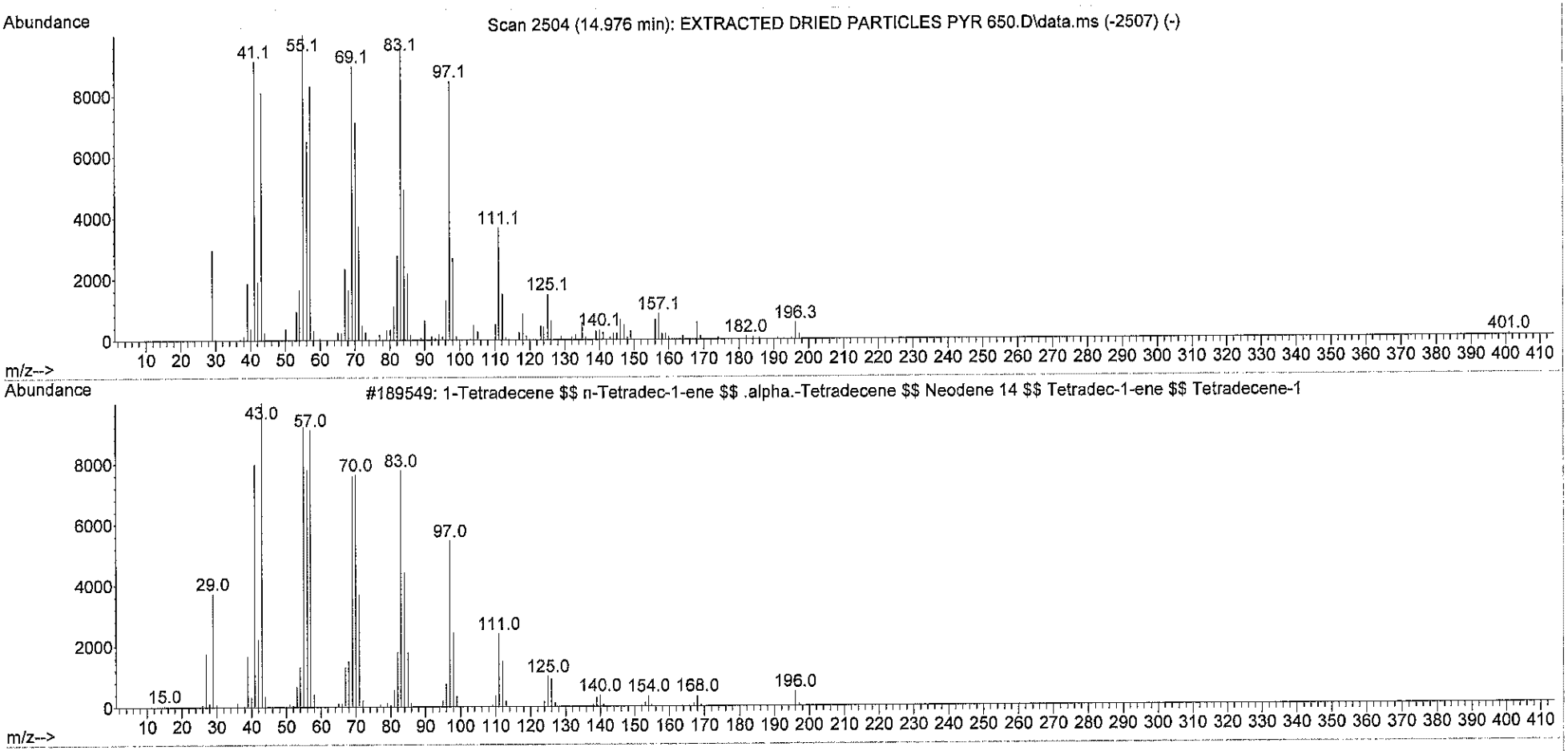
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 87
ID : 1H-Indole, 5-methyl- $$ 5-METHYL-1H-INDOLE $$ 5-Methylindol $$ 5-Methylindole $$ Indole, 5-methyl- $$ EINECS 210-400-9 $$ NSC 522562



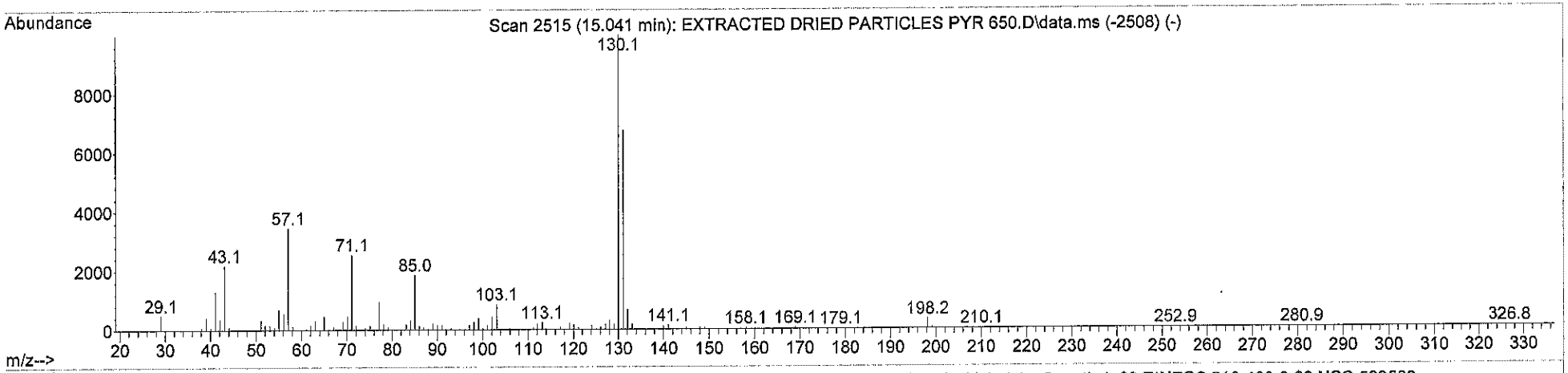


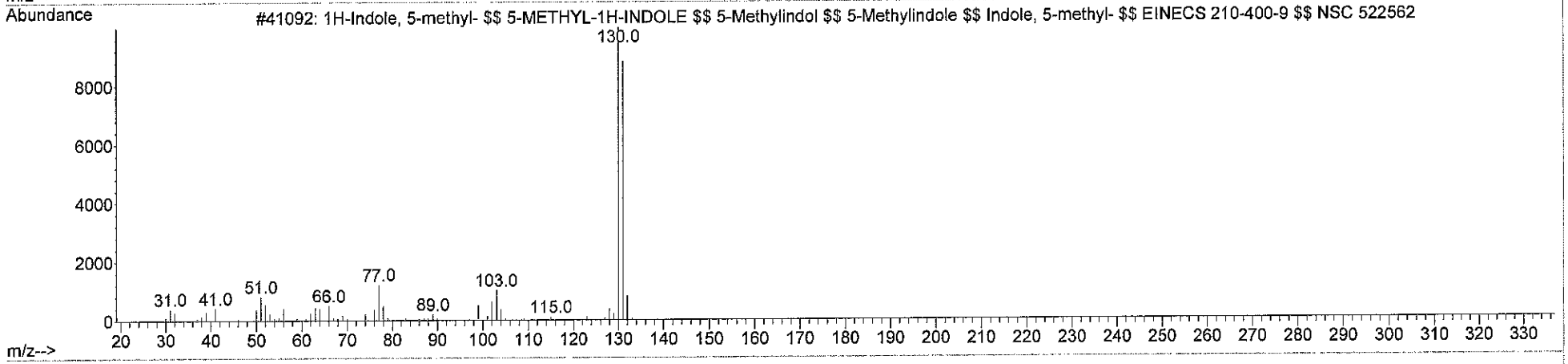


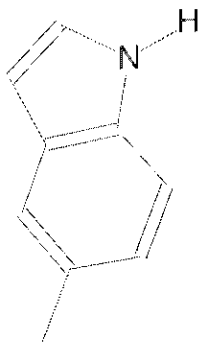
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 98
ID : 1-Tetradecene $$ n-Tetradec-1-ene $$ .alpha.-Tetradecene $$ Neodene 14 $$ Tetradec-1-ene $$ Tetradecene-1



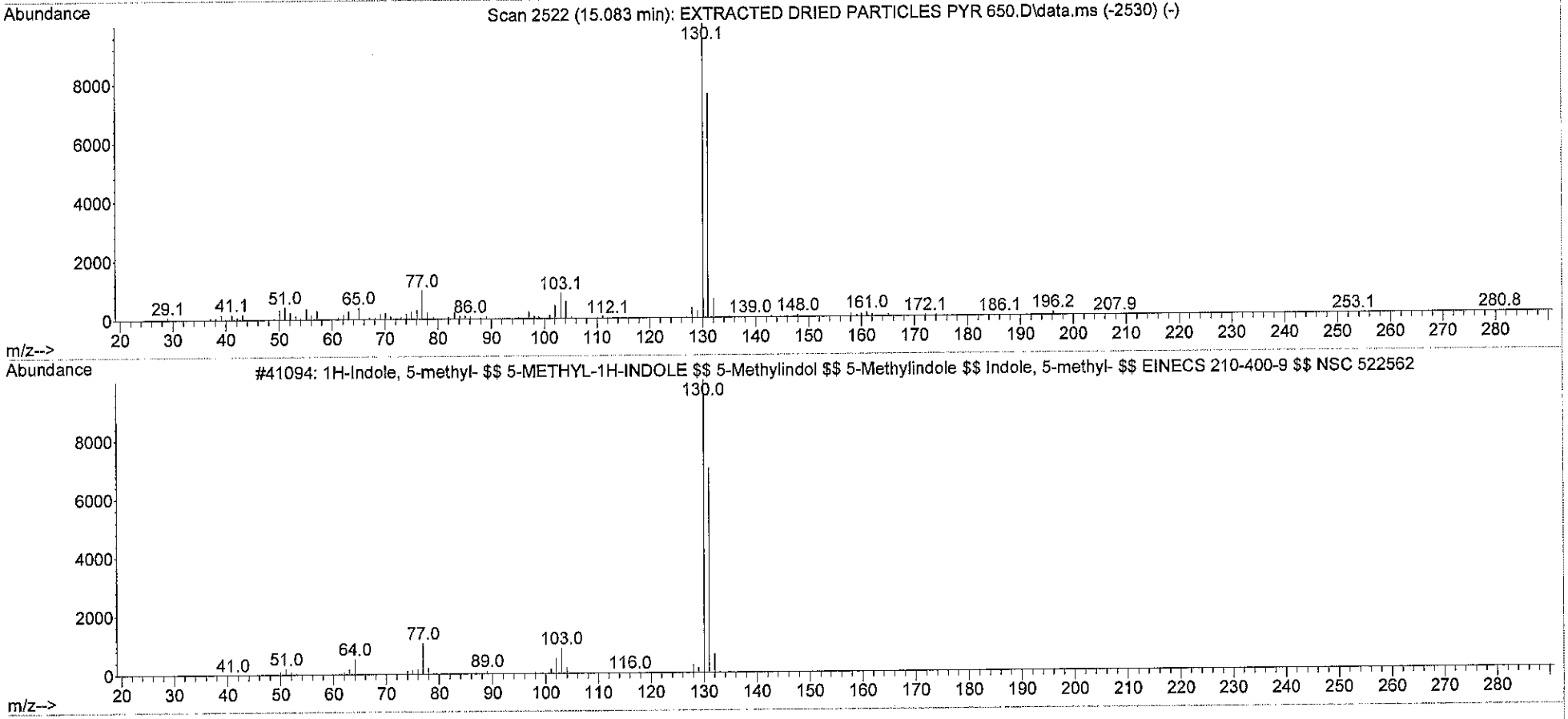
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 81
ID : 1H-Indole, 5-methyl- $$ 5-METHYL-1H-INDOLE $$ 5-Methylindol $$ 5-Methylindole $$ Indole, 5-methyl- $$ EINECS 210-400-9 $$ NSC 522562

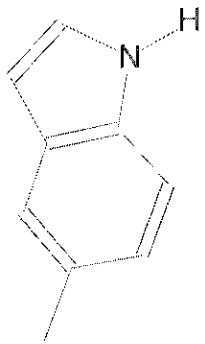




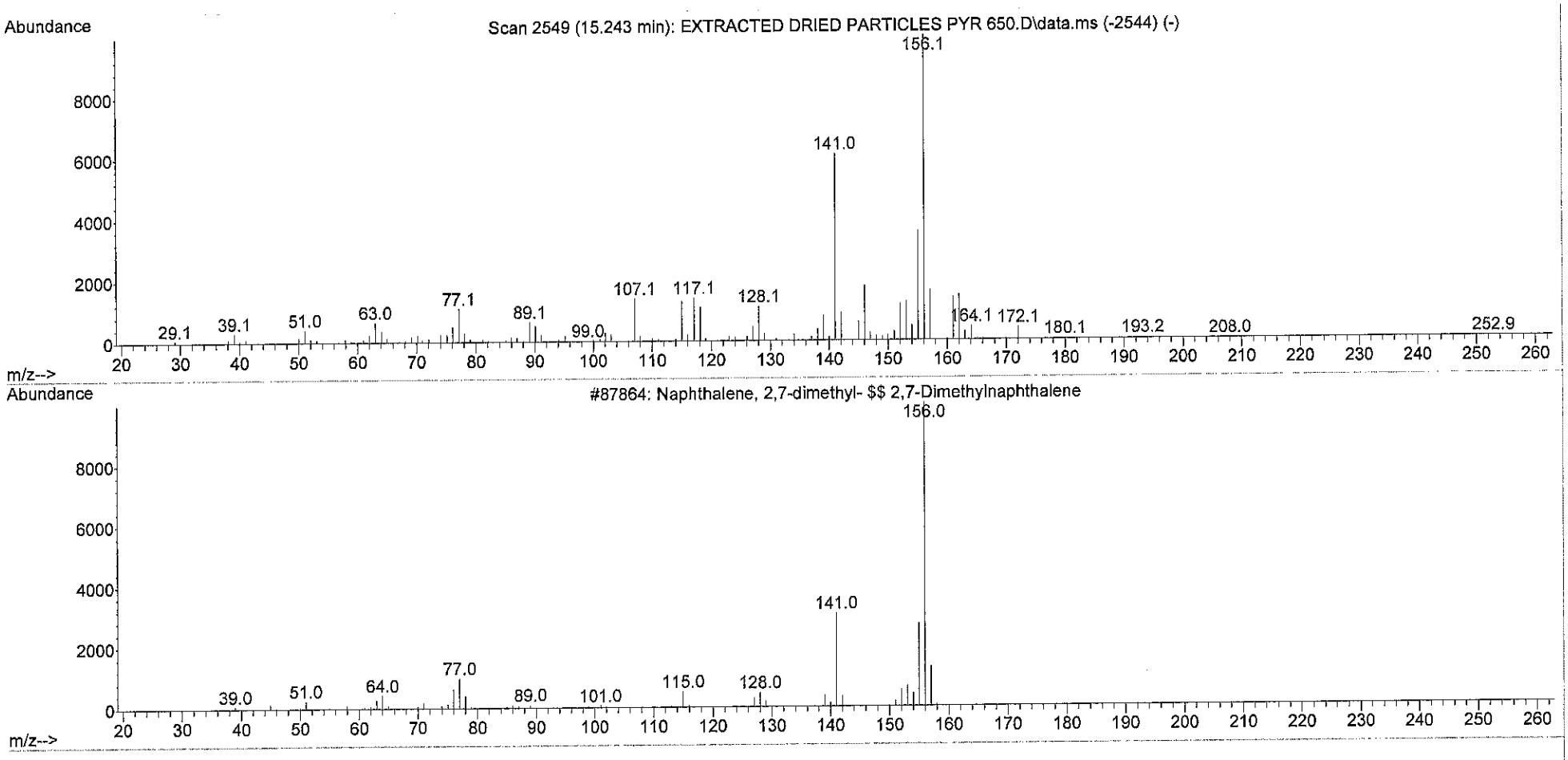


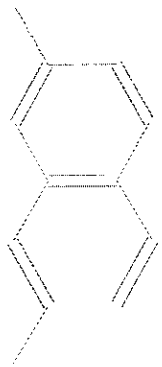
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 91
ID : 1H-Indole, 5-methyl- $$ 5-METHYL-1H-INDOLE $$ 5-Methylindol $$ 5-Methylindole $$ Indole, 5-methyl- $$ EINECS 210-400-9 $$ NSC 522562



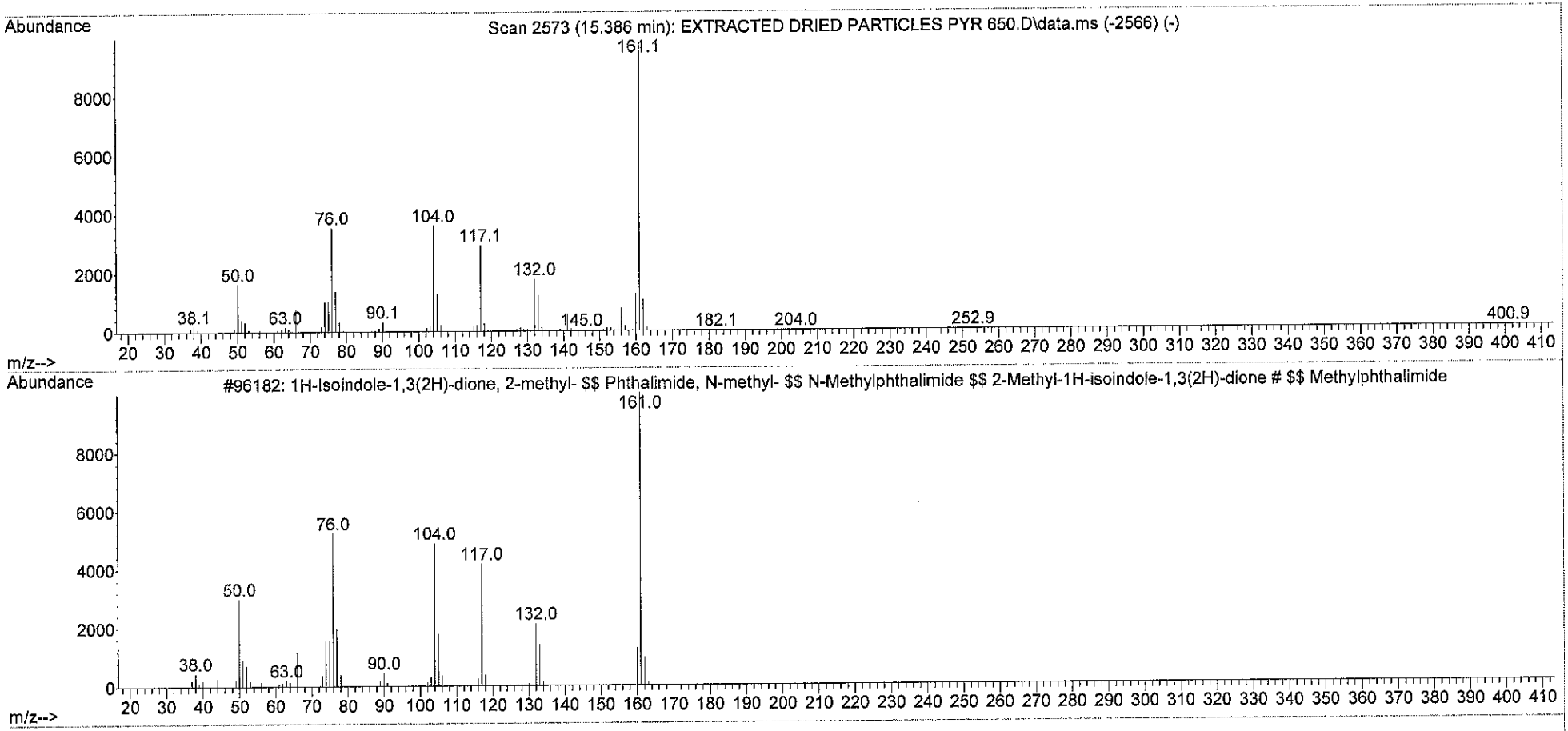


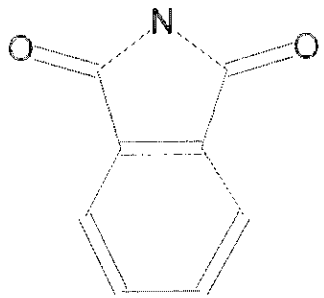
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 94
ID : Naphthalene, 2,7-dimethyl- $$ 2,7-Dimethylnaphthalene



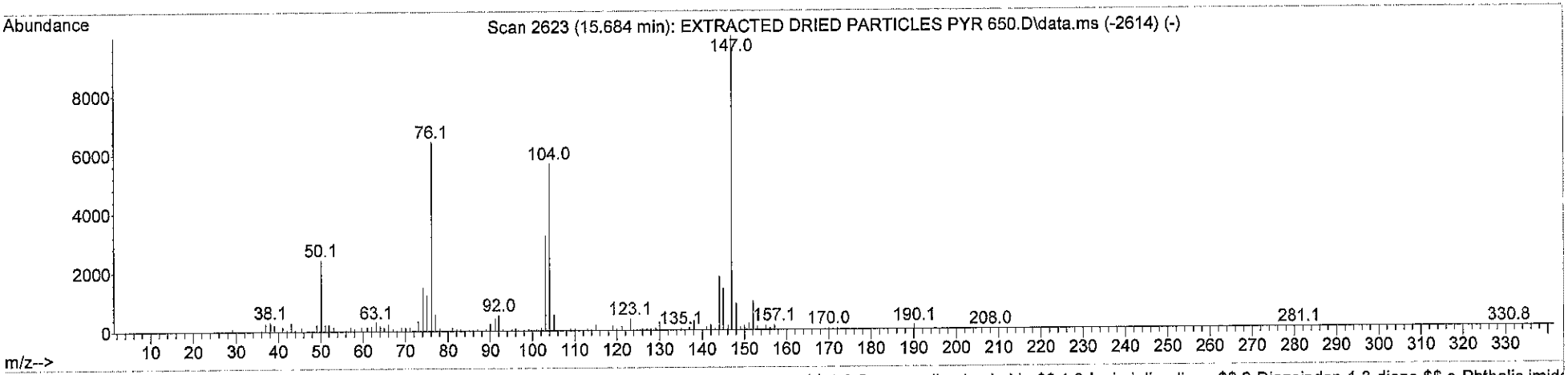


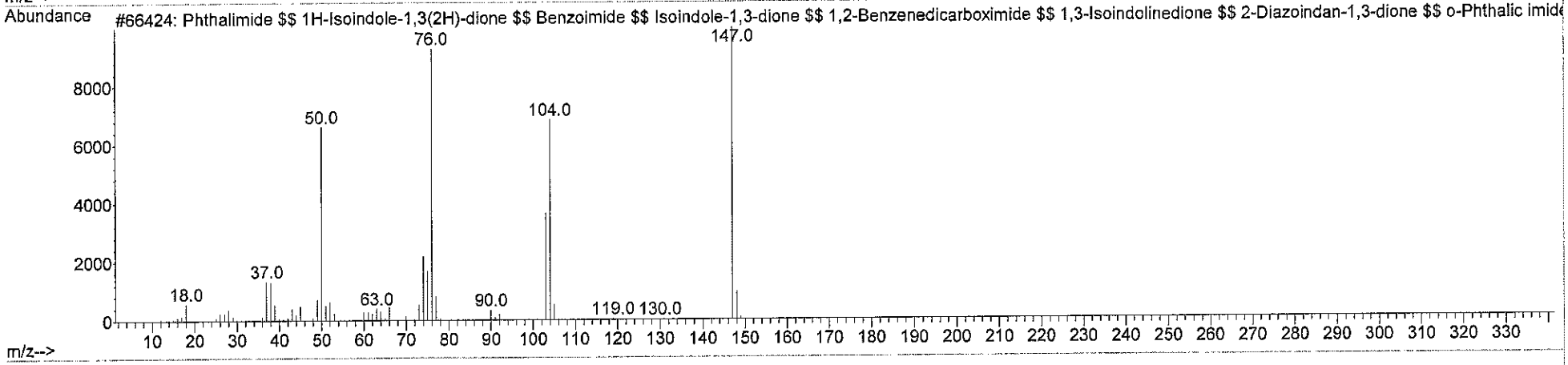
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 96
ID : 1H-Isoindole-1,3(2H)-dione, 2-methyl- $$ Phthalimide, N-methyl- $$ N-Methylphthalimide $$ 2-Methyl-1H-isoindole-1,3(2H)-dione # $$ Methylphthalimide

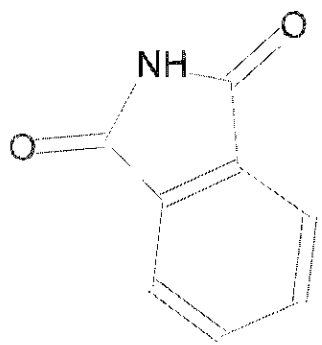




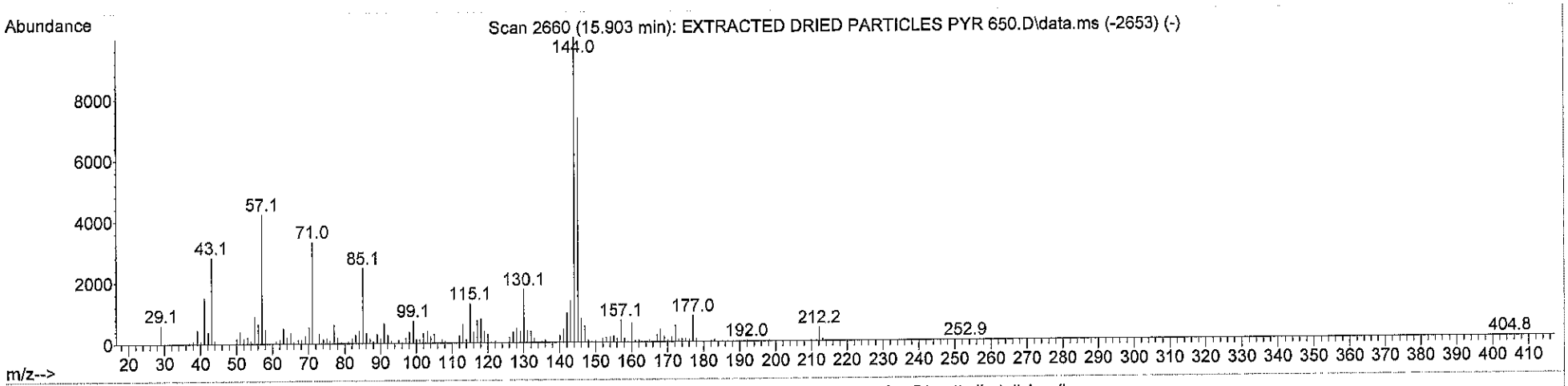
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 95
ID : Phthalimide $$ 1H-Isoindole-1,3(2H)-dione $$ Benzoimide $$ Isoindole-1,3-dione $$ 1,2-Benzenedicarboximide $$ 1,3-Isoindoline dione $$ 2-Diazoindan-1,3-dione $$ o-Phthalic imide $$ 1,3-Isoindoledione $$ Ftalimmide $$ Phthalimid $$ Phenylimide

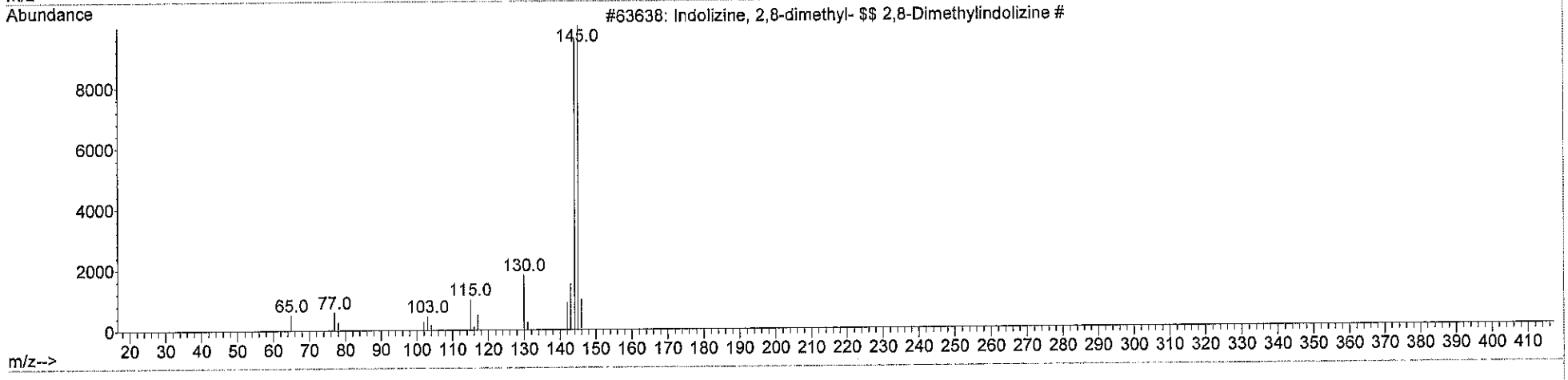


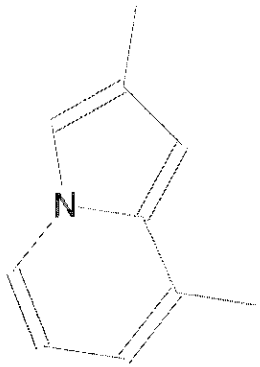




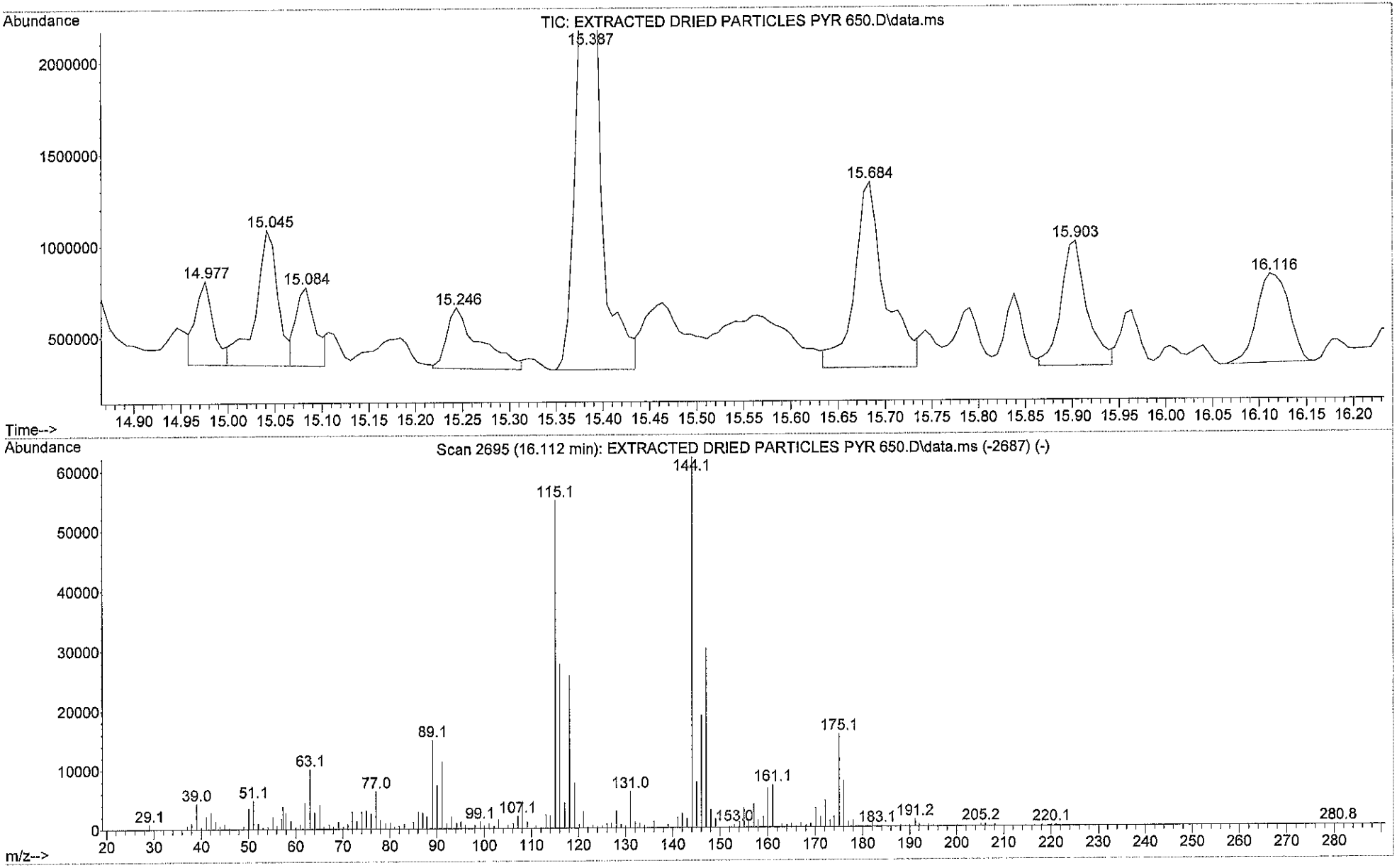
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 96
ID : Indolizine, 2,8-dimethyl- $$ 2,8-Dimethylindolizine #



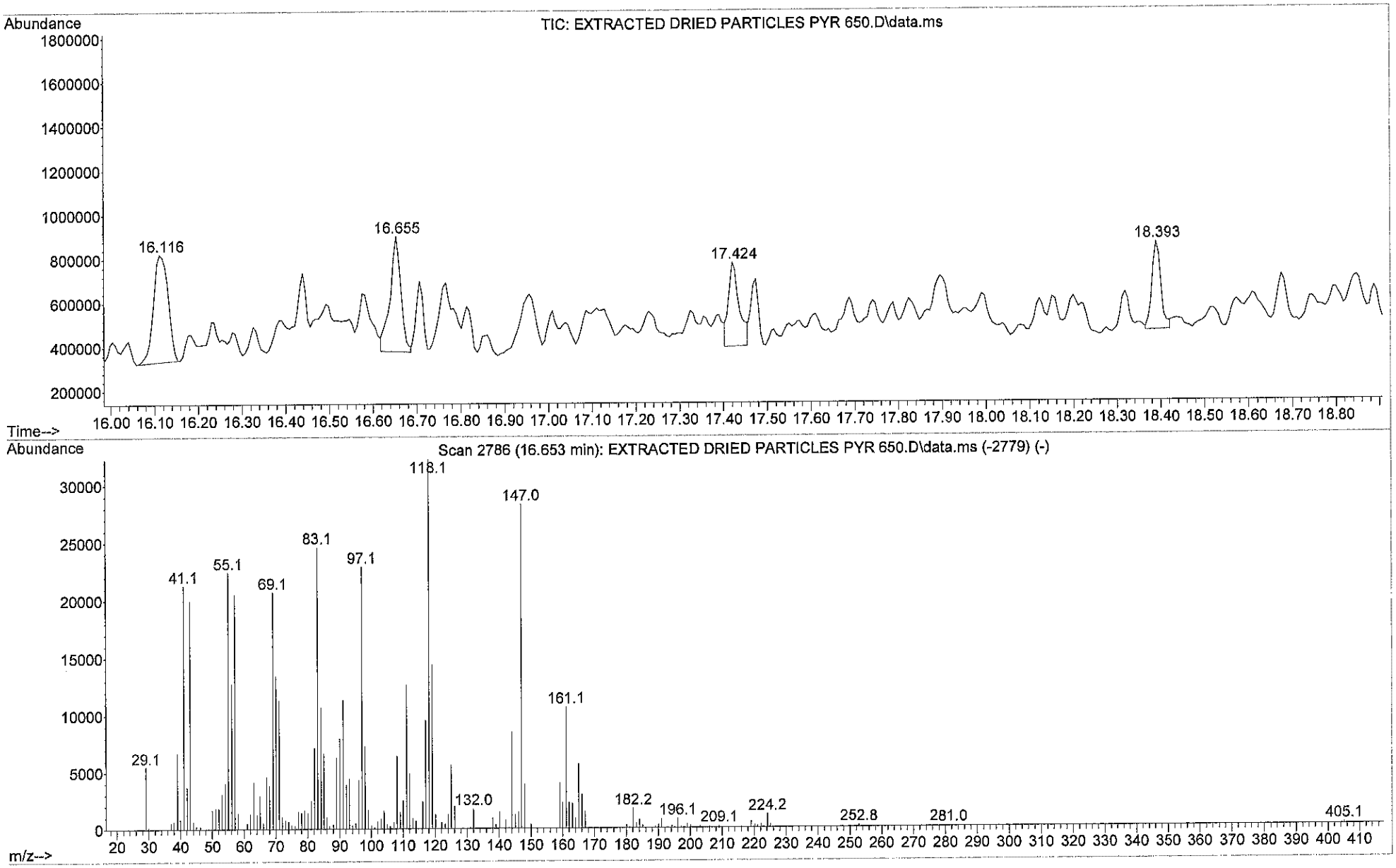




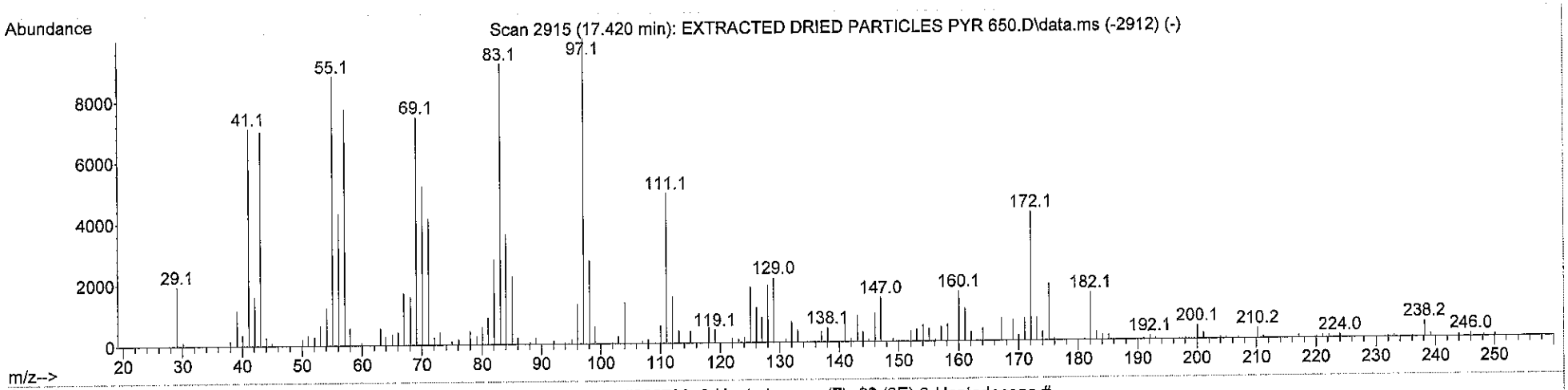
File :D:\Data 2016\LPI\Job 8029\EXTRACTED DRIED PARTICLES PYR 650.D
Operator : CG
Acquired : 30 Aug 2016 8:11 using AcqMethod PYR 650 SPLIT30.M
Instrument : Instrument #1
Sample Name: EXTRACTED DRIED PARTICLES PYR 650
Misc Info :
Vial Number: 1

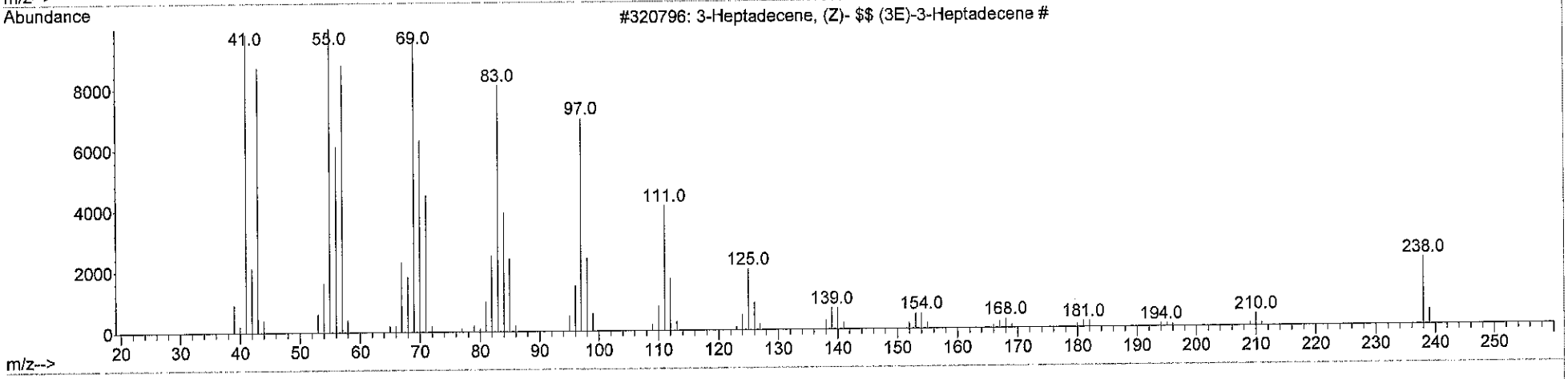


File :D:\Data 2016\LPI\Job 8029\EXTRACTED DRIED PARTICLES PYR 650.D
Operator : CG
Acquired : 30 Aug 2016 8:11 using AcqMethod PYR 650 SPLIT30.M
Instrument : Instrument #1
Sample Name: EXTRACTED DRIED PARTICLES PYR 650
Misc Info :
Vial Number: 1

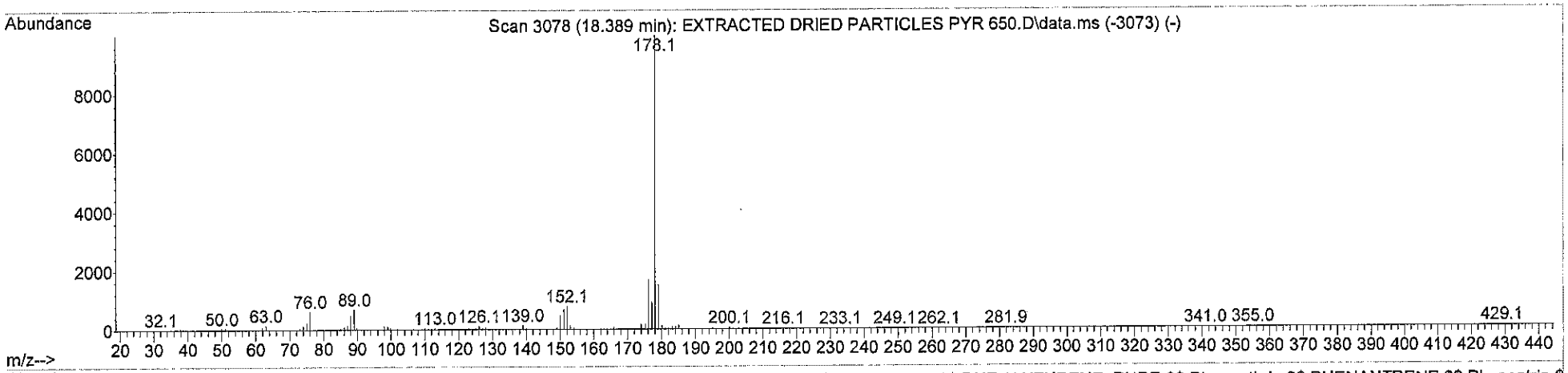


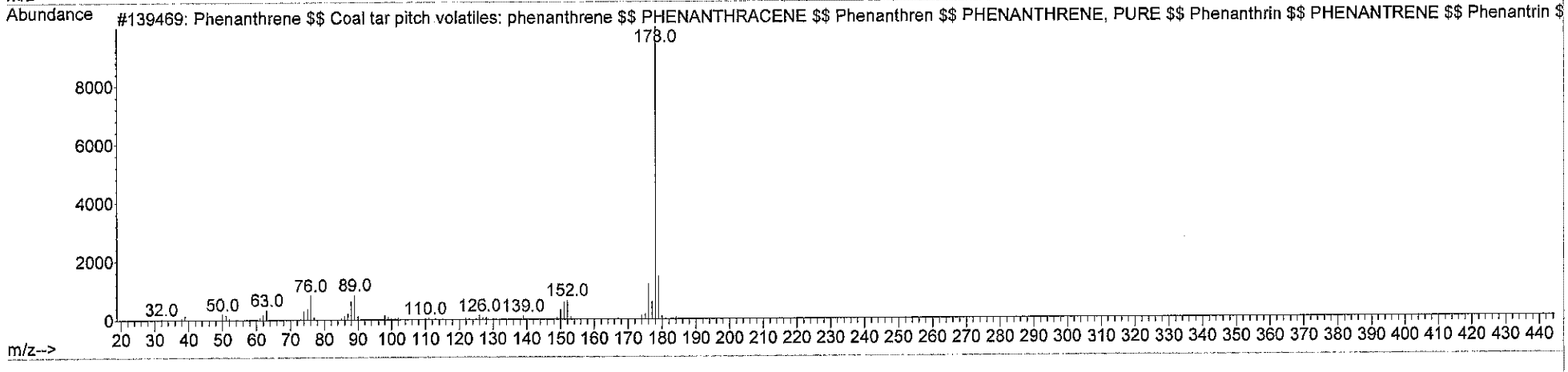
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 99
ID : 3-Heptadecene, (Z)- $$ (3E)-3-Heptadecene #

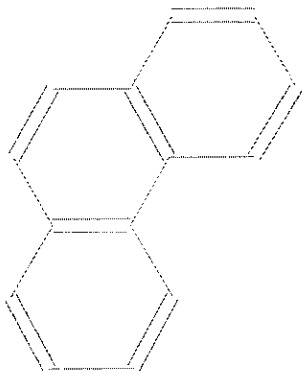




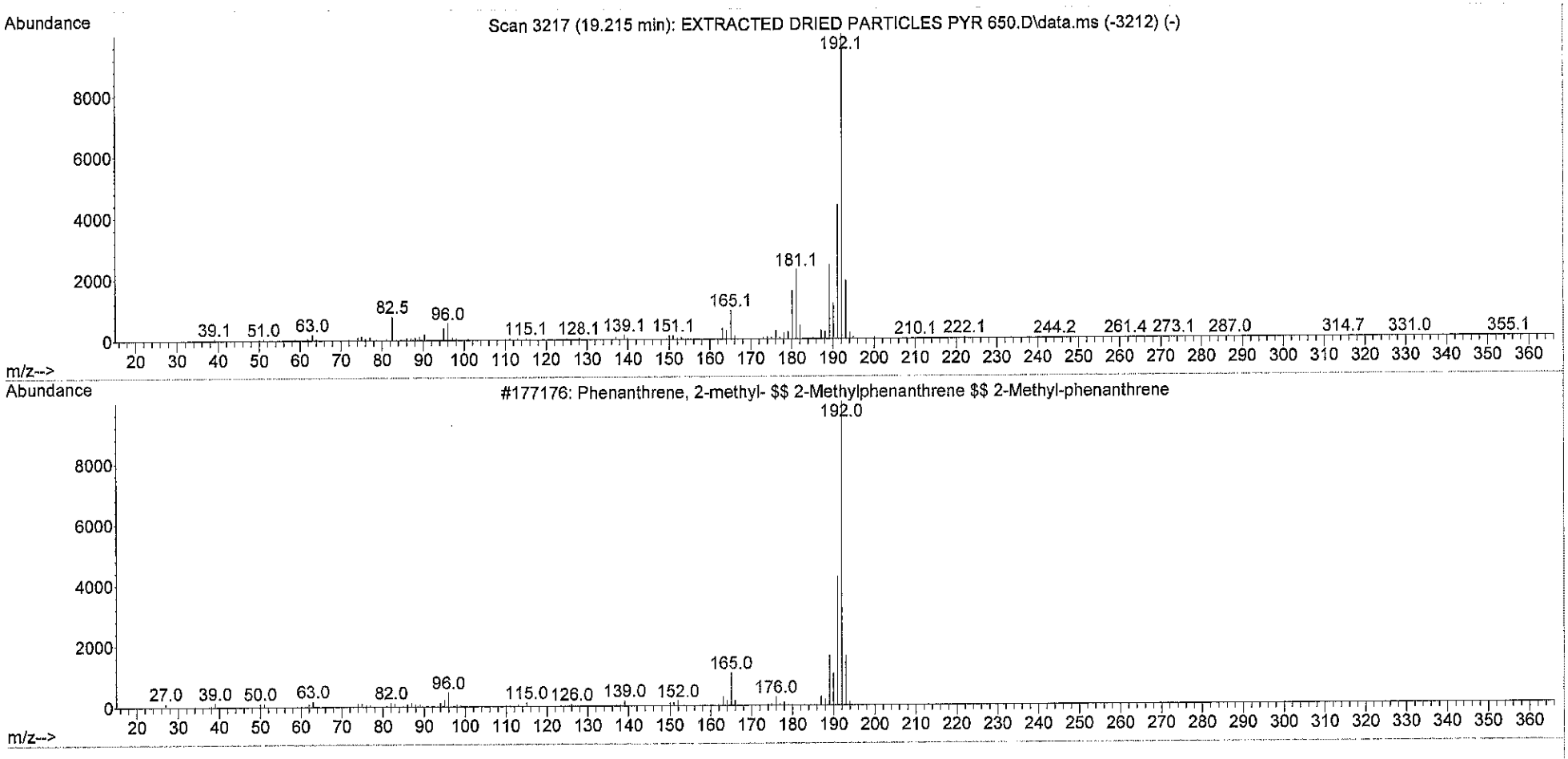
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 95
ID : Phenanthrene $$ Coal tar pitch volatiles: phenanthrene $$ PHENANTHRACENE $$ Phenanthren $$ PHENANTHRENE, PURE $$ Phenanthrin $$ PHENANTRENE $$ Phenantrin $$ RAVATITE $$ AI3-00790 $$ AIDS-017523 $$ CCRIS 1233 $$ EINECS 201-581-5 $$ HSDB 2166

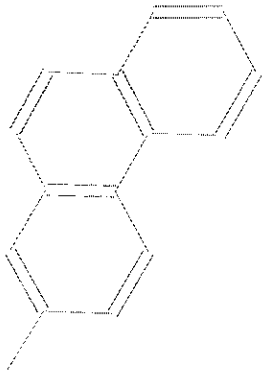




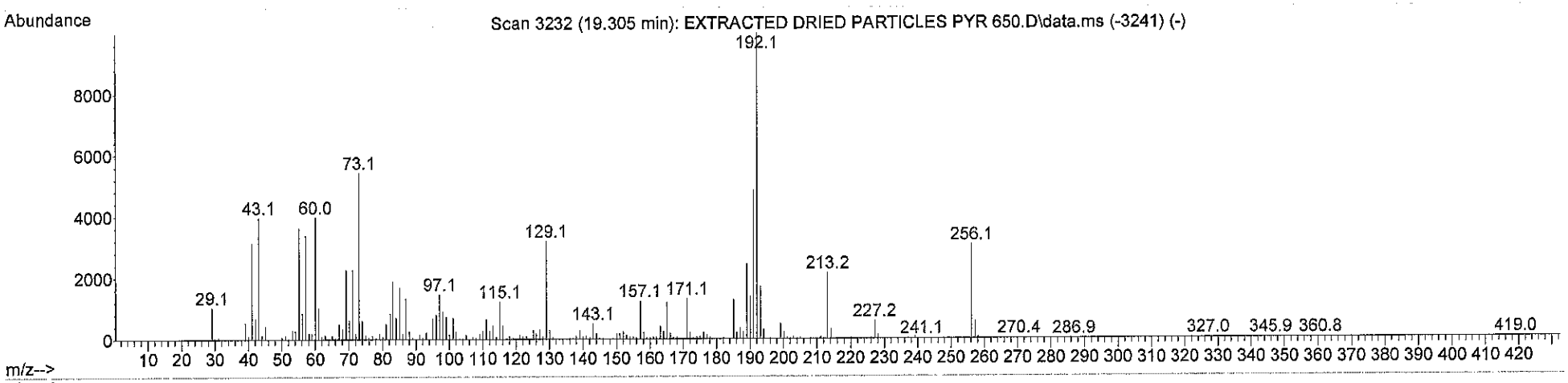


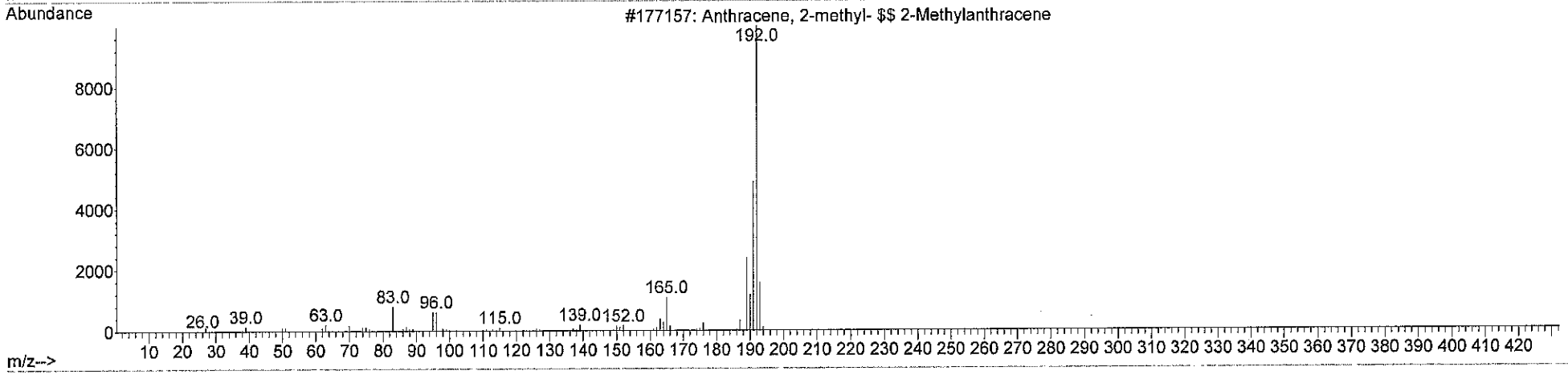
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 96
ID : Phenanthrene, 2-methyl- $$ 2-Methylphenanthrene $$ 2-Methyl-phenanthrene

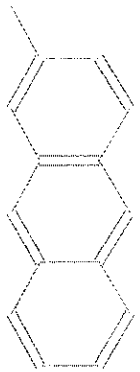




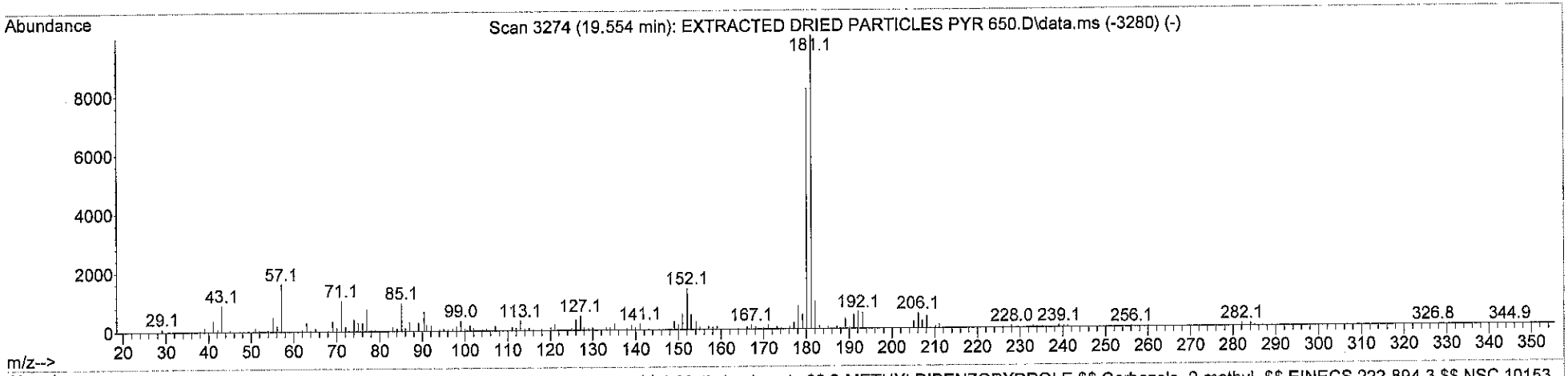
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 95
ID : Anthracene, 2-methyl- $$ 2-Methylanthracene

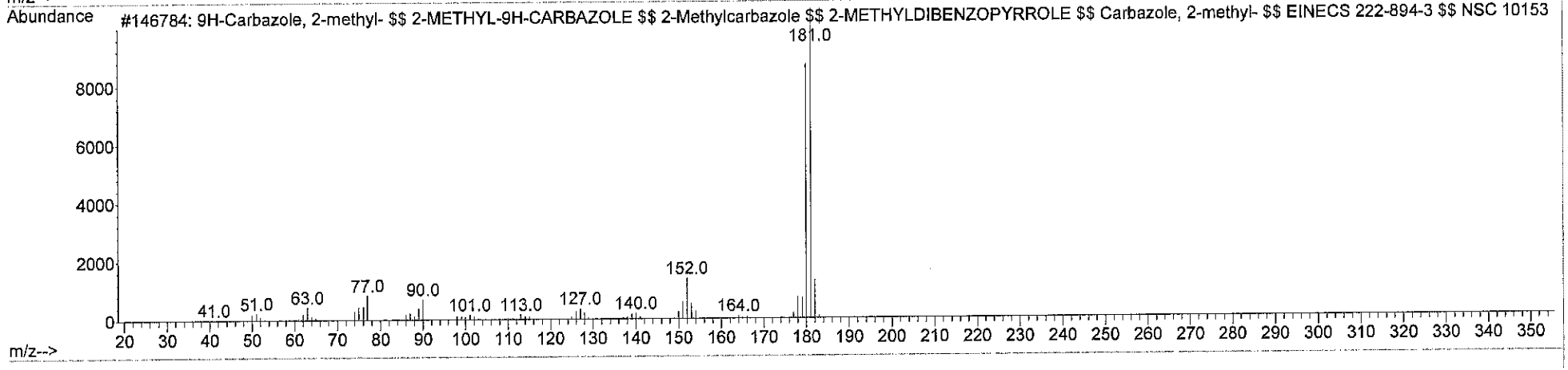


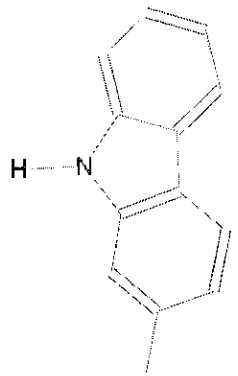




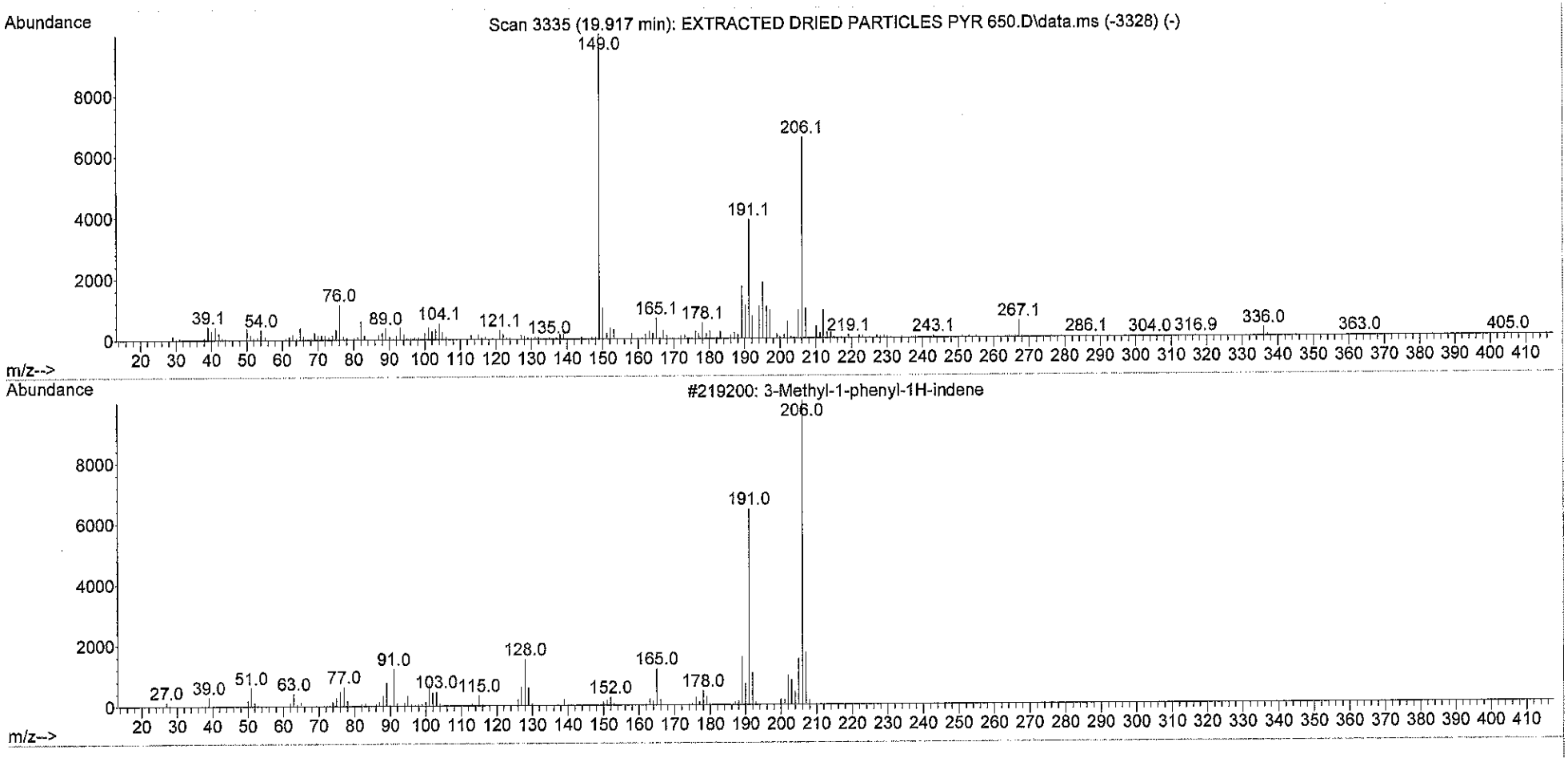
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 94
ID : 9H-Carbazole, 2-methyl- $$ 2-METHYL-9H-CARBAZOLE $$ 2-Methylcarbazole $$ 2-METHYLDIBENZOPYRROLE $$ Carbazole, 2-methyl- $$ EINECS 222-894-3 $$ NSC 10153

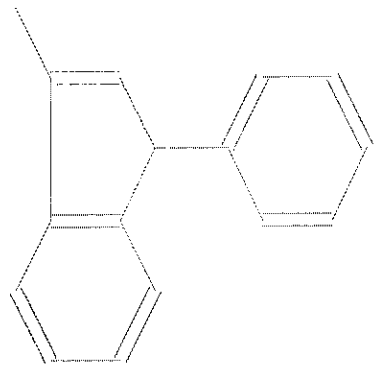




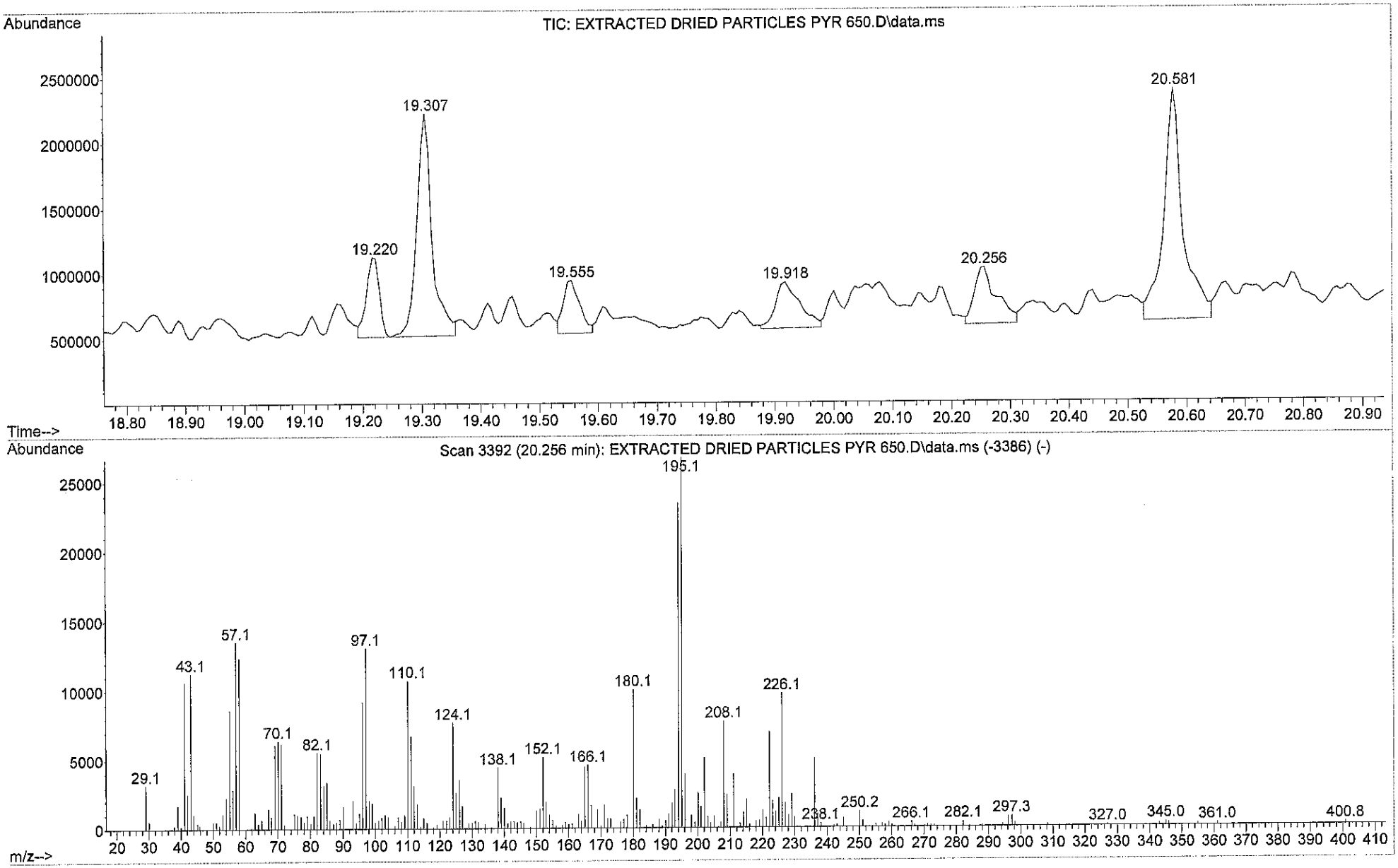


Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 60
ID : 3-Methyl-1-phenyl-1H-indene

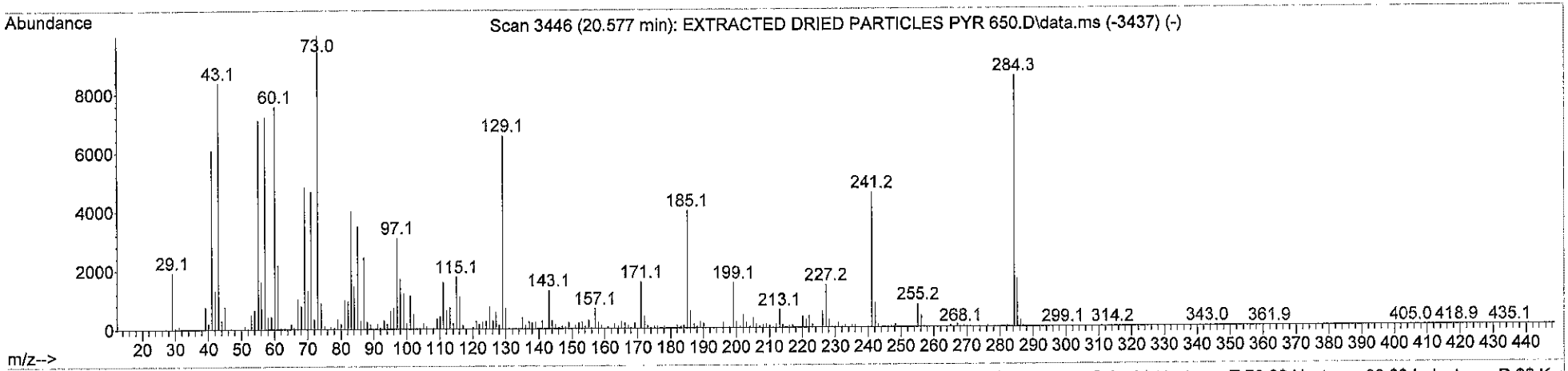


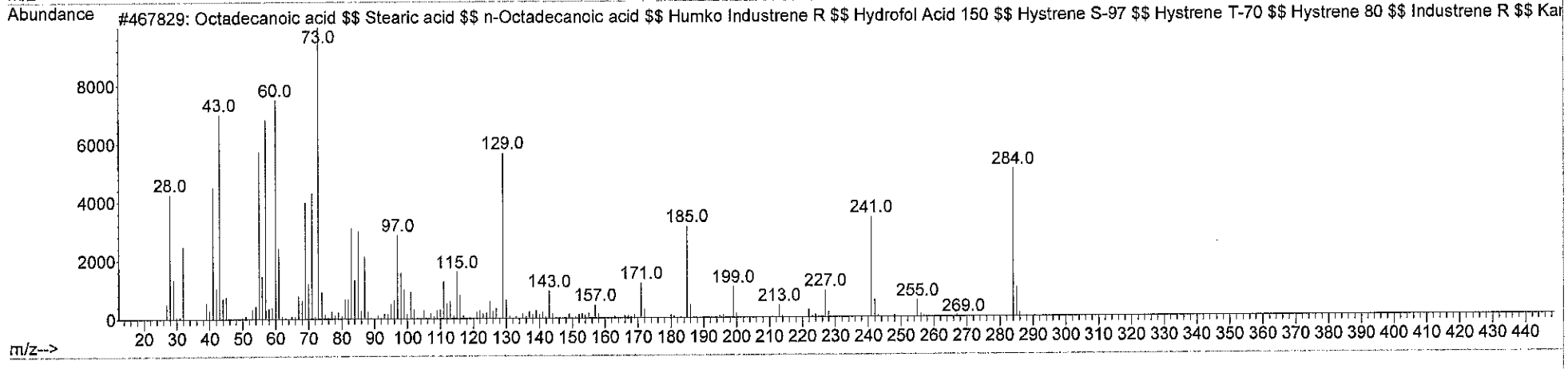


File :D:\Data 2016\LPI\Job 8029\EXTRACTED DRIED PARTICLES PYR 650.D
Operator : CG
Acquired : 30 Aug 2016 8:11 using AcqMethod PYR 650 SPLIT30.M
Instrument : Instrument #1
Sample Name: EXTRACTED DRIED PARTICLES PYR 6S0
Misc Info :
Vial Number: 1

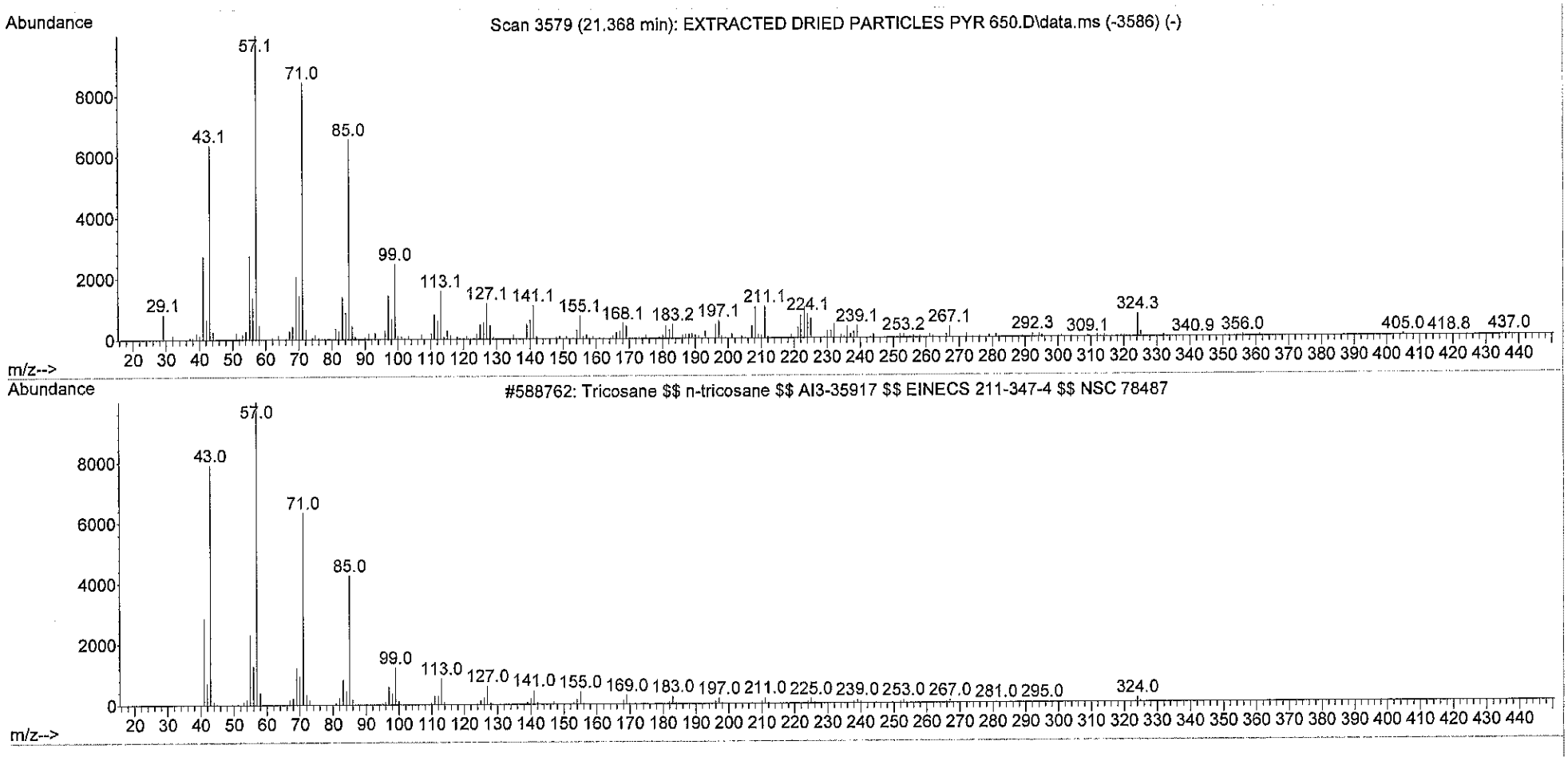


Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 99
ID : Octadecanoic acid $$ Stearic acid $$ n-Octadecanoic acid $$ Humko Industrene R $$ Hydrofol Acid 150 $$ Hystrene S-97 $$ Hystrene T-70 $$ Hystrene 80 $$ Industrene R $$ Kam 1000 $$ Kam 2000 $$ Kam 3000 $$ Neo-Fat 18 $$ Neo-Fat 18-53 $$ Neo-Fat 18-54

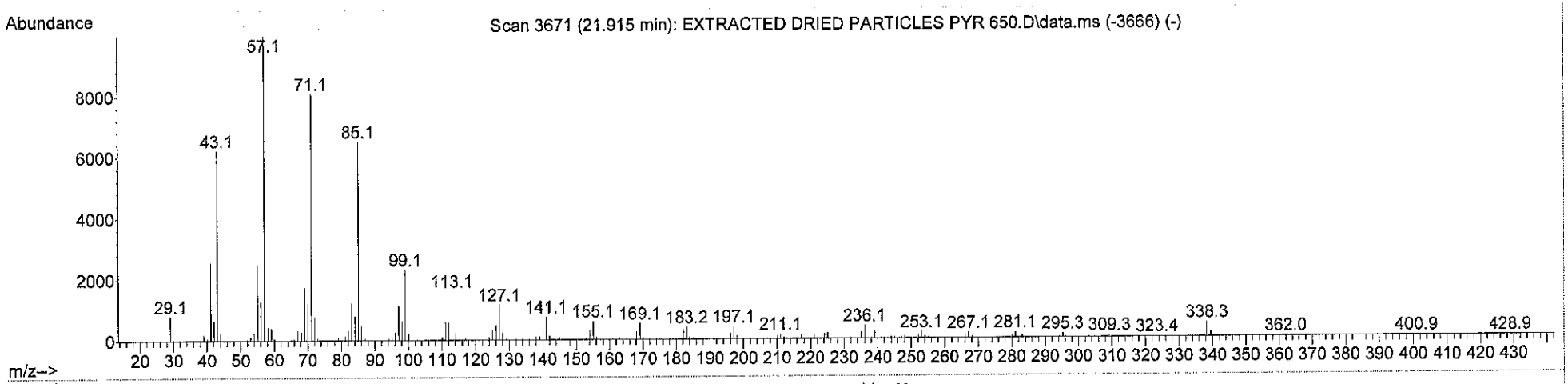


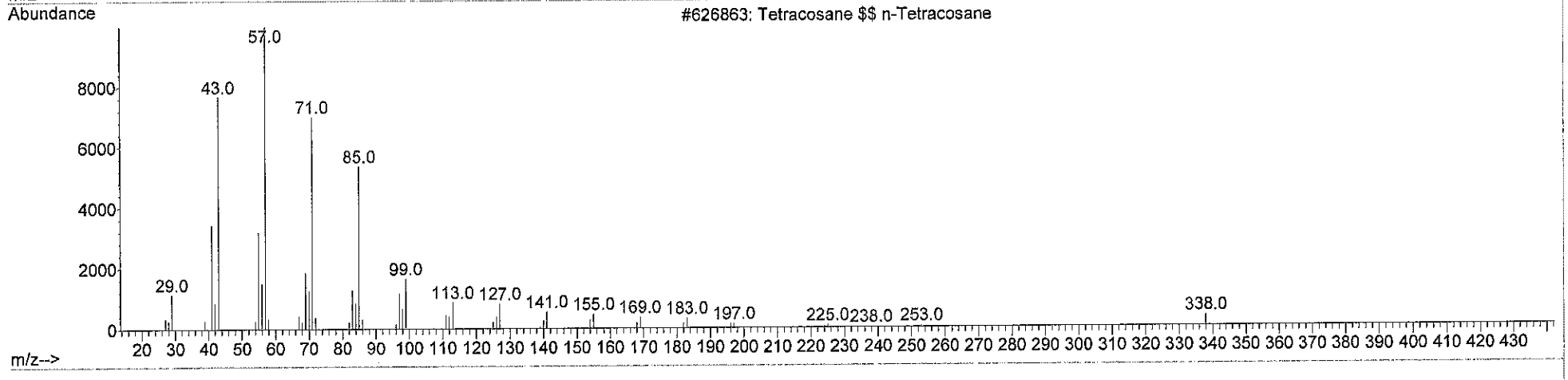


Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 96
ID : Tricosane $$ n-tricosane $$ AI3-35917 $$ EINECS 211-347-4 $$ NSC 78487

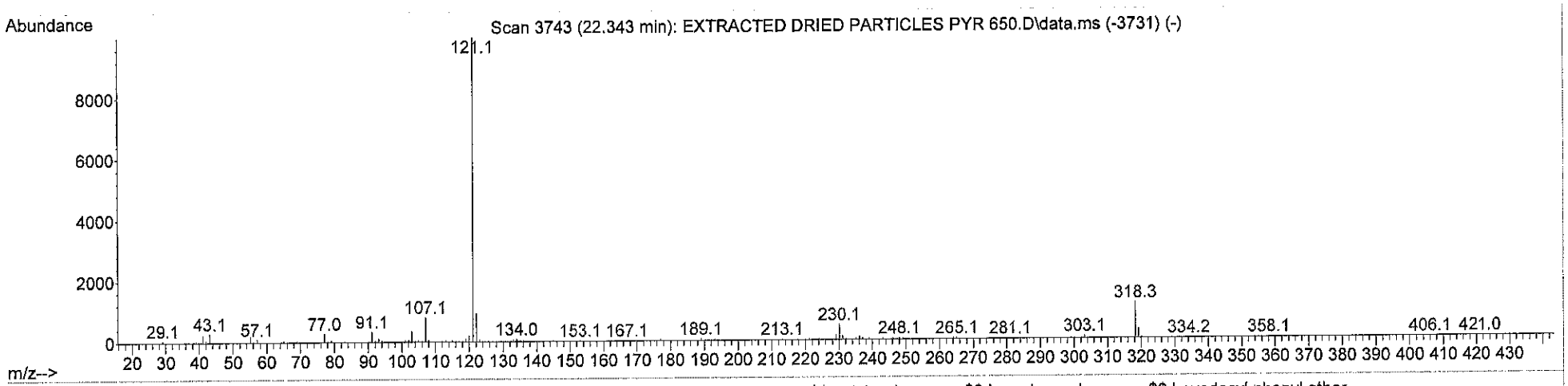


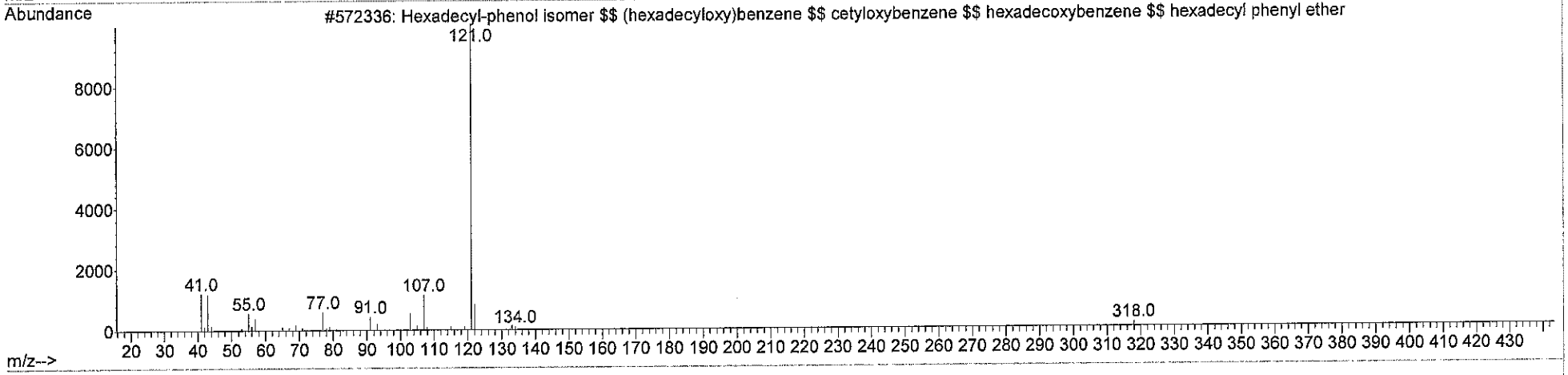
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 99
ID : Tetracosane $$ n-Tetracosane



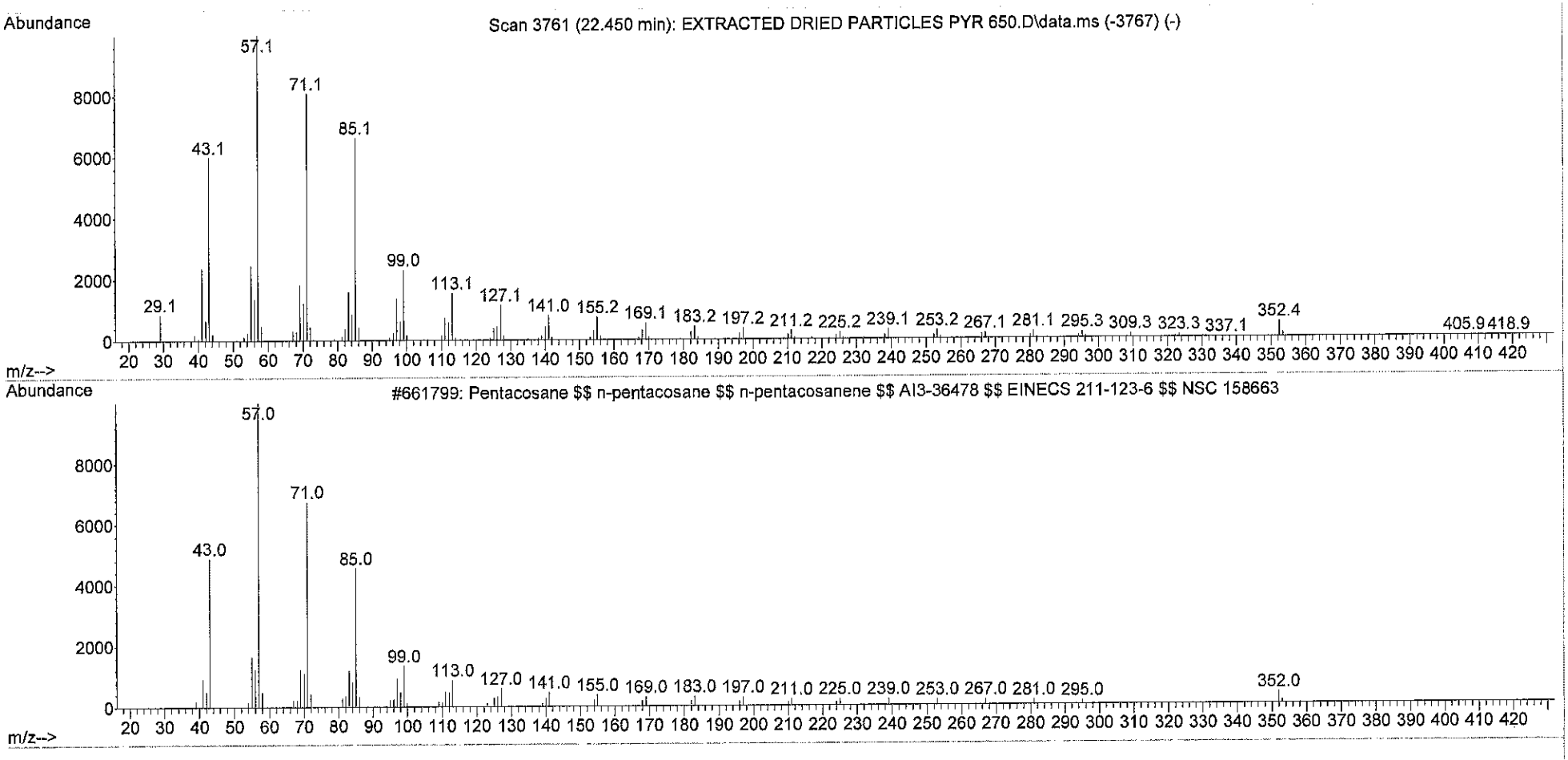


Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 90
ID : Hexadecyl-phenol isomer $$ (hexadecyloxy)benzene $$ cetyloxybenzene $$ hexadecoxybenzene $$ hexadecyl phenyl ether

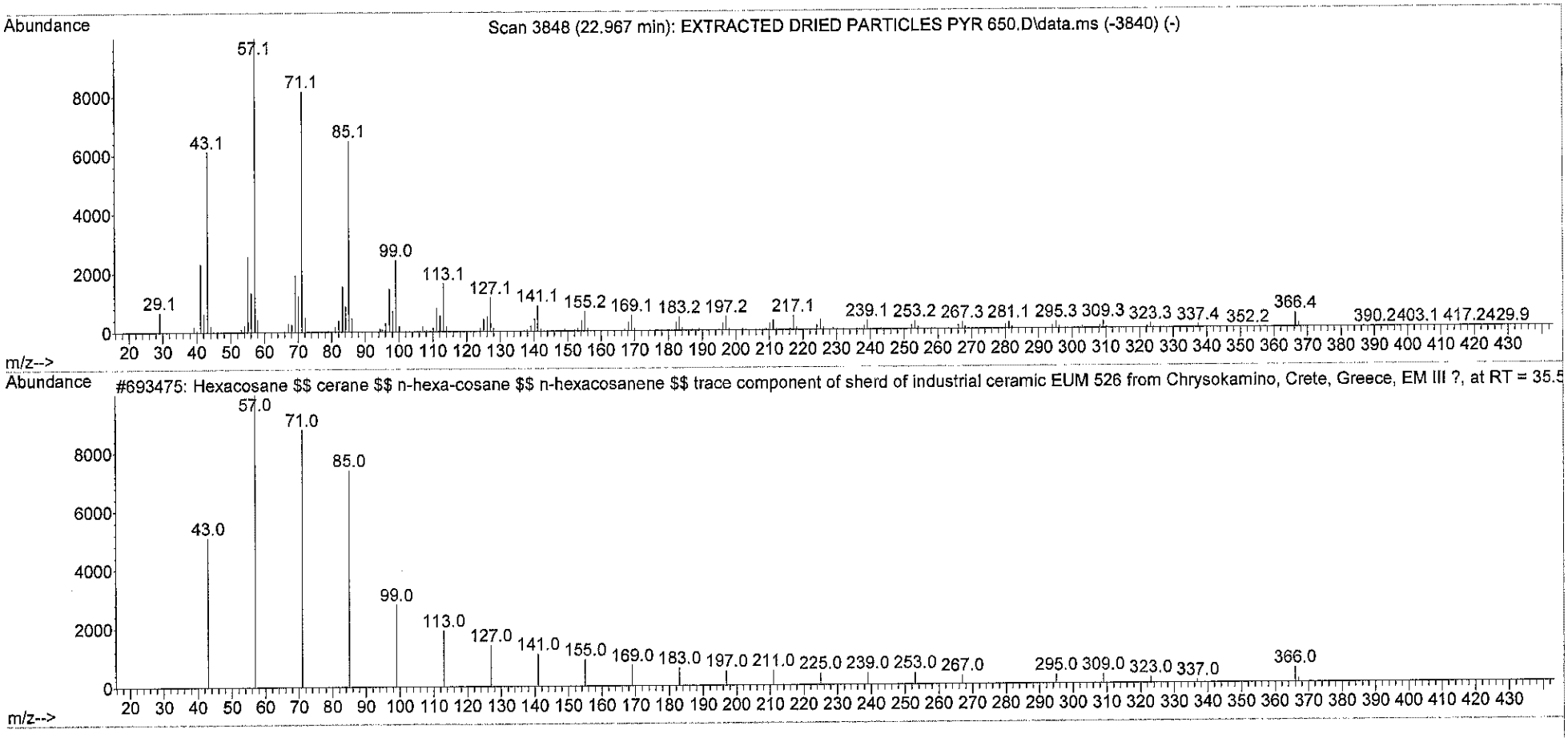




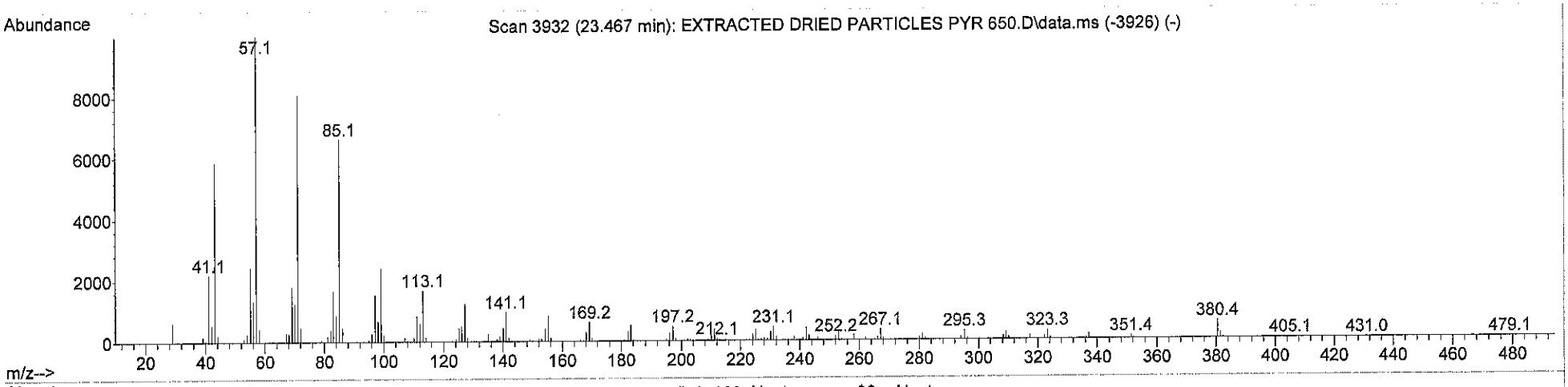
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 99
ID : Pentacosane $$ n-pentacosane $$ n-pentacosanene $$ AI3-36478 $$ EINECS 211-123-6 $$ NSC 158663

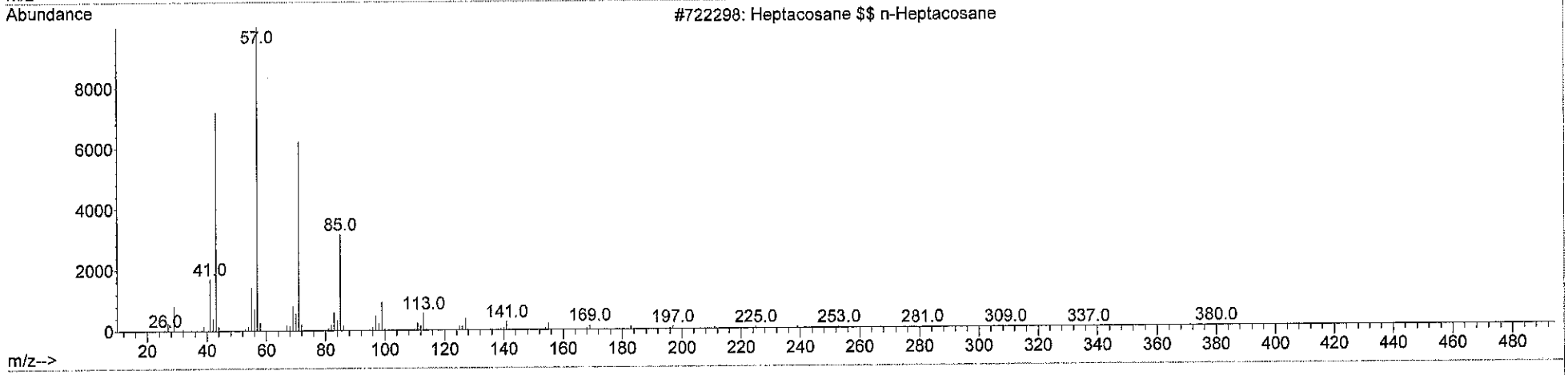


Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 99
ID : Hexacosane $$ cerane $$ n-hexa-cosane $$ n-hexacosanene $$ trace component of sherd of industrial ceramic EUM 526 from Chryso kamino, Crete, Greece, EM III ?, at RT = 35.50n-hexacosanen-ALKANE $$ EINECS 211-124-1 $$ NSC 122457

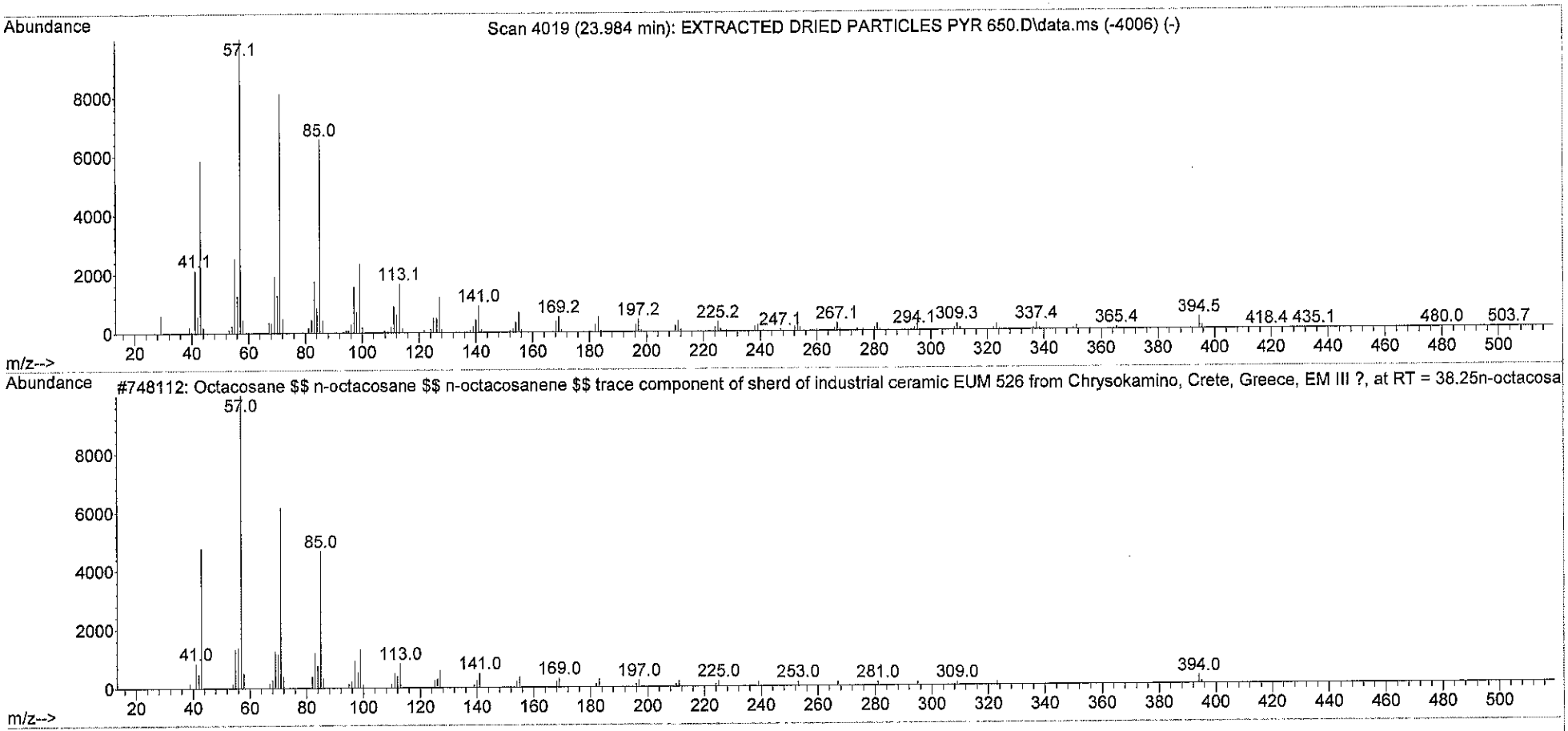


Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 99
ID : Heptacosane $$ n-Heptacosane

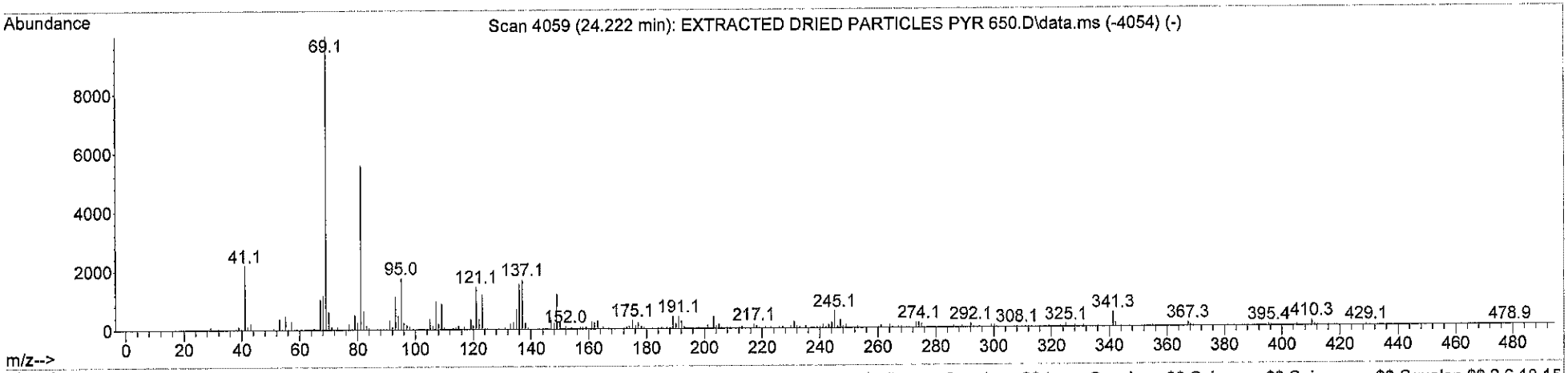


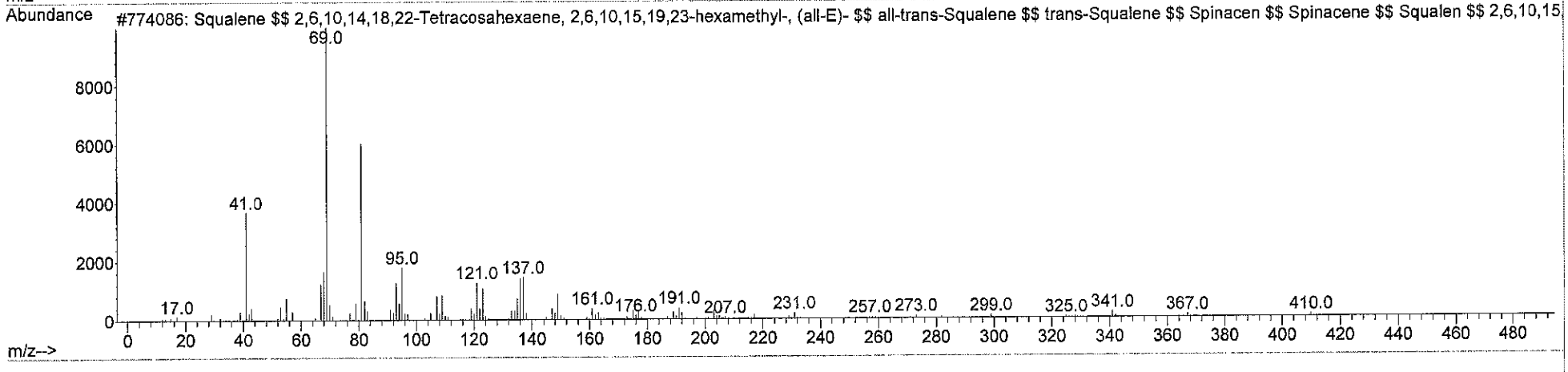


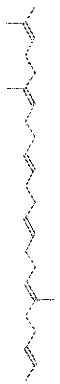
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 99
ID : Octacosane $$ n-octacosane $$ n-octacosanene $$ trace component of sherd of industrial ceramic EUM 526 from Chrysokamino, Crete, Greece, EM III ?, at RT = 38.25n-octacosanen-ALKANE $$ AI3-52615 $$ CCRIS 680 $$ EINECS 211-125-7 $$ NSC 5549



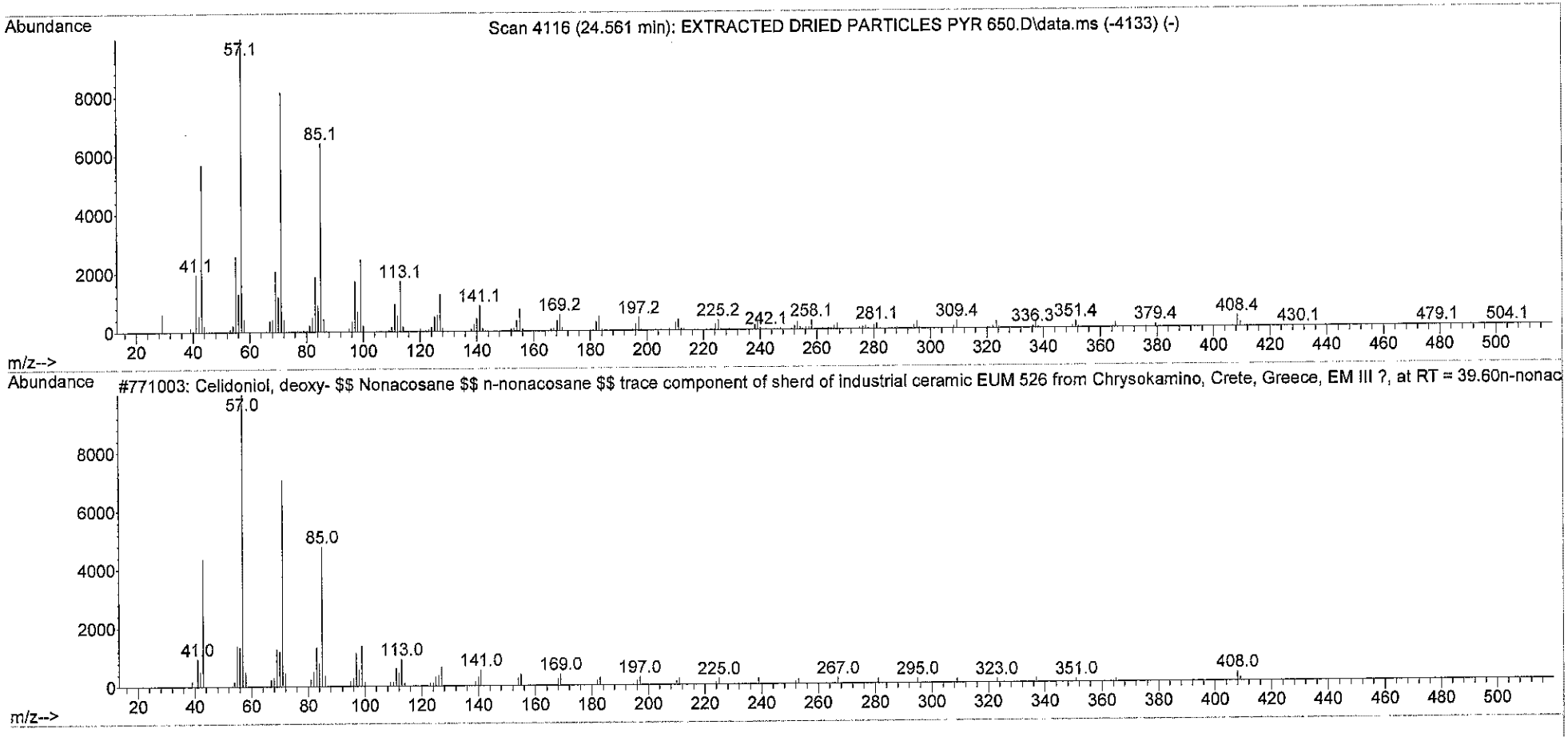
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 95
ID : Squalene $$ 2,6,10,14,18,22-Tetracosahexaene, 2,6,10,15,19,23-hexamethyl-, (all-E)- $$ all-trans-Squalene $$ trans-Squalene $$ Spinacen $$ Spinacene $$ Squalen $$ 2,6,10,15,19,23-Hexamethyl-2,6,10,14,18,22-tetracosahexaene-, (all trans)-



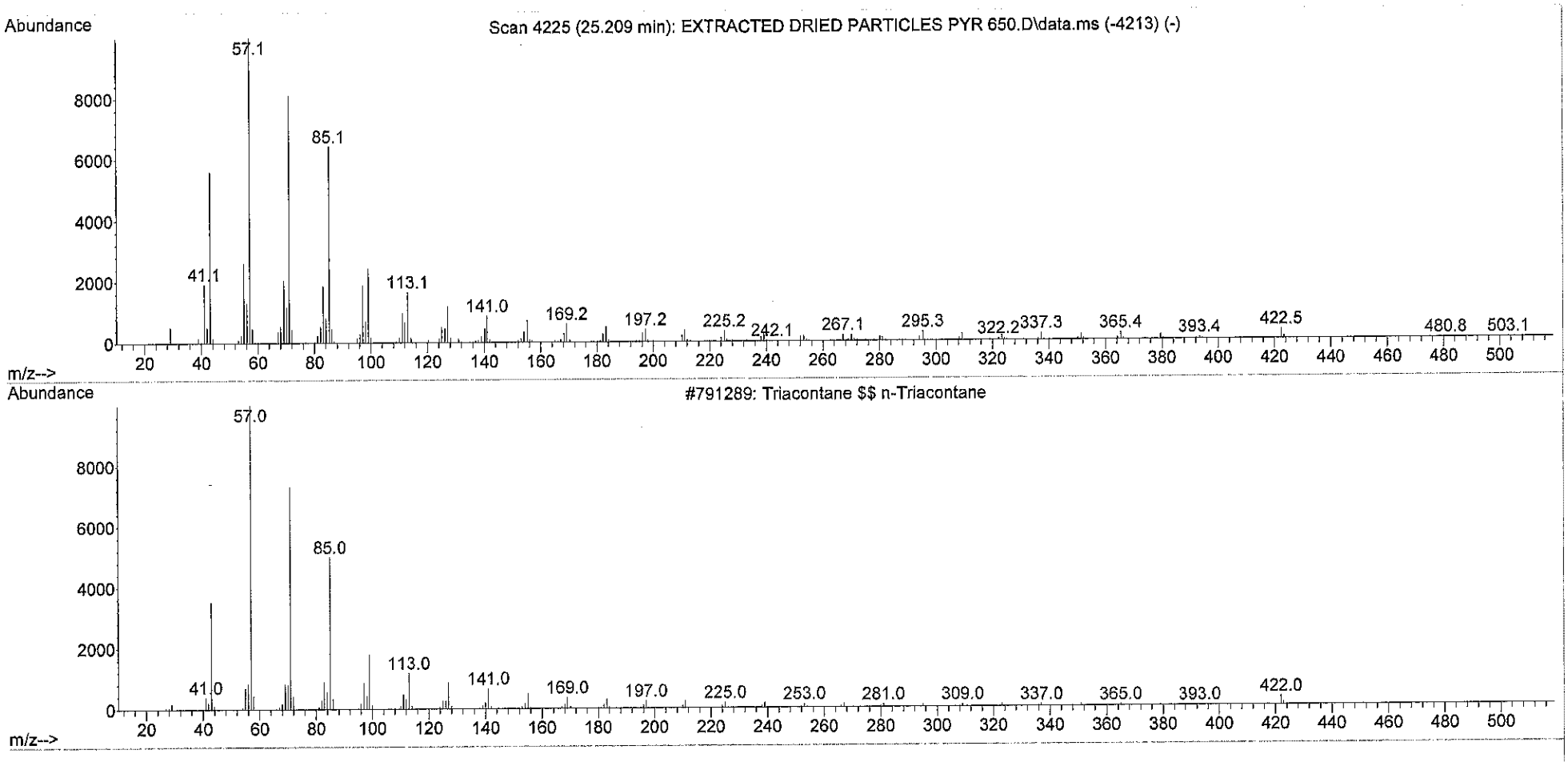




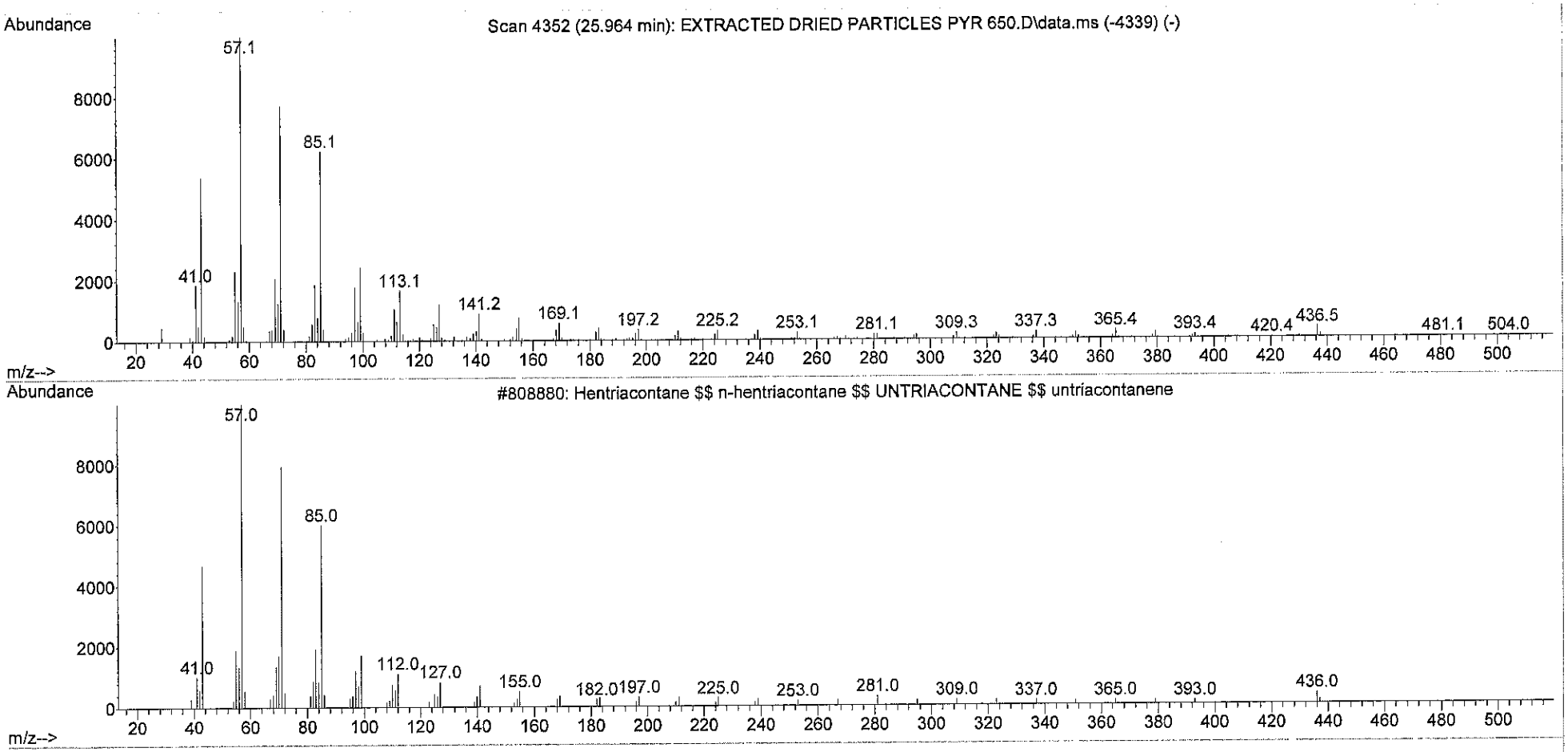
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 99
ID : Celidoniol, deoxy- $$ Nonacosane $$ n-nonacosane $$ trace component of sherd of industrial ceramic EUM 526 from Chrysokamino, Crete, Greece, EM III ?, at RT = 39.60n-nonacosanen-ALKANE $$ AI3-36284 $$ EINECS 211-126-2



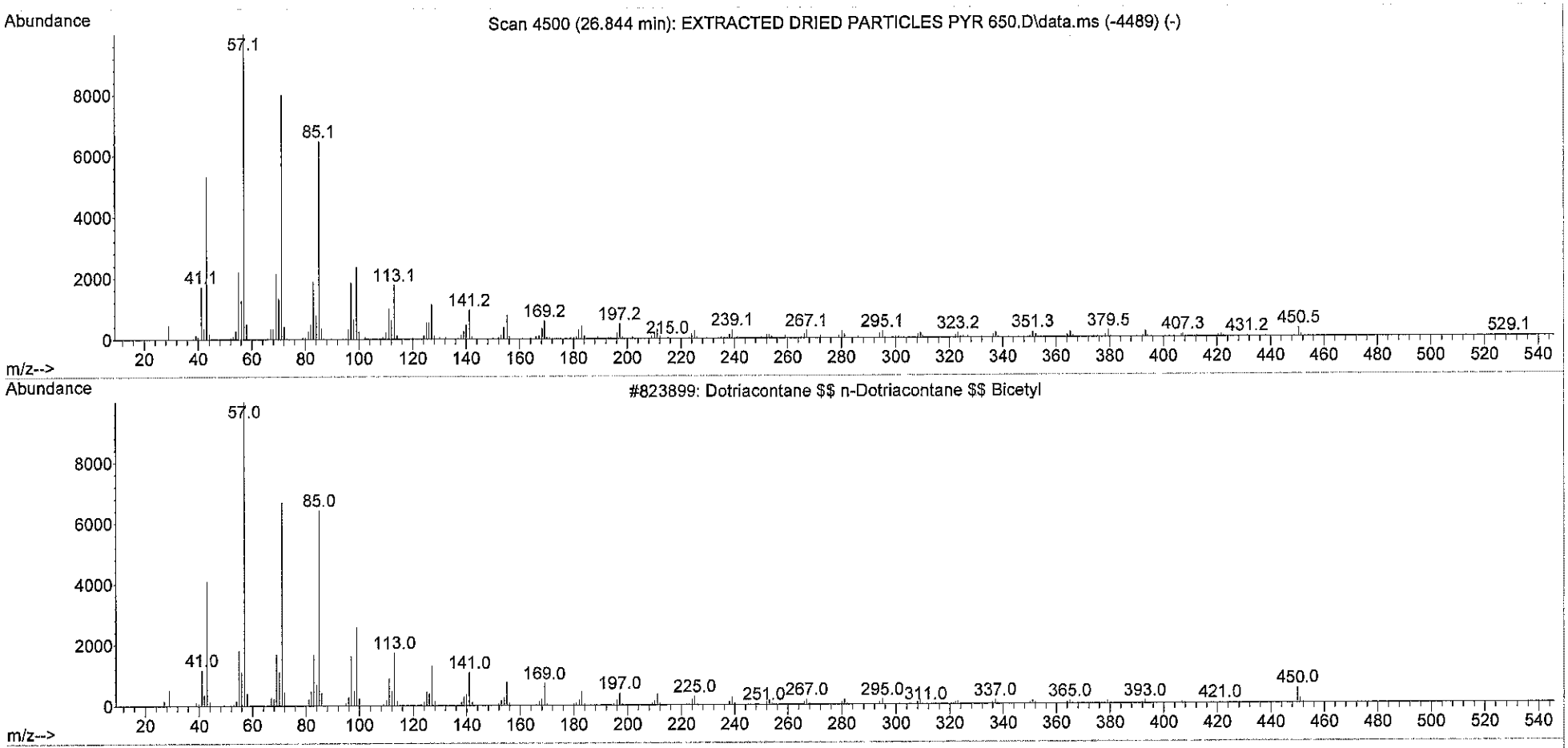
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 97
ID : Triacontane $$ n-Triacontane



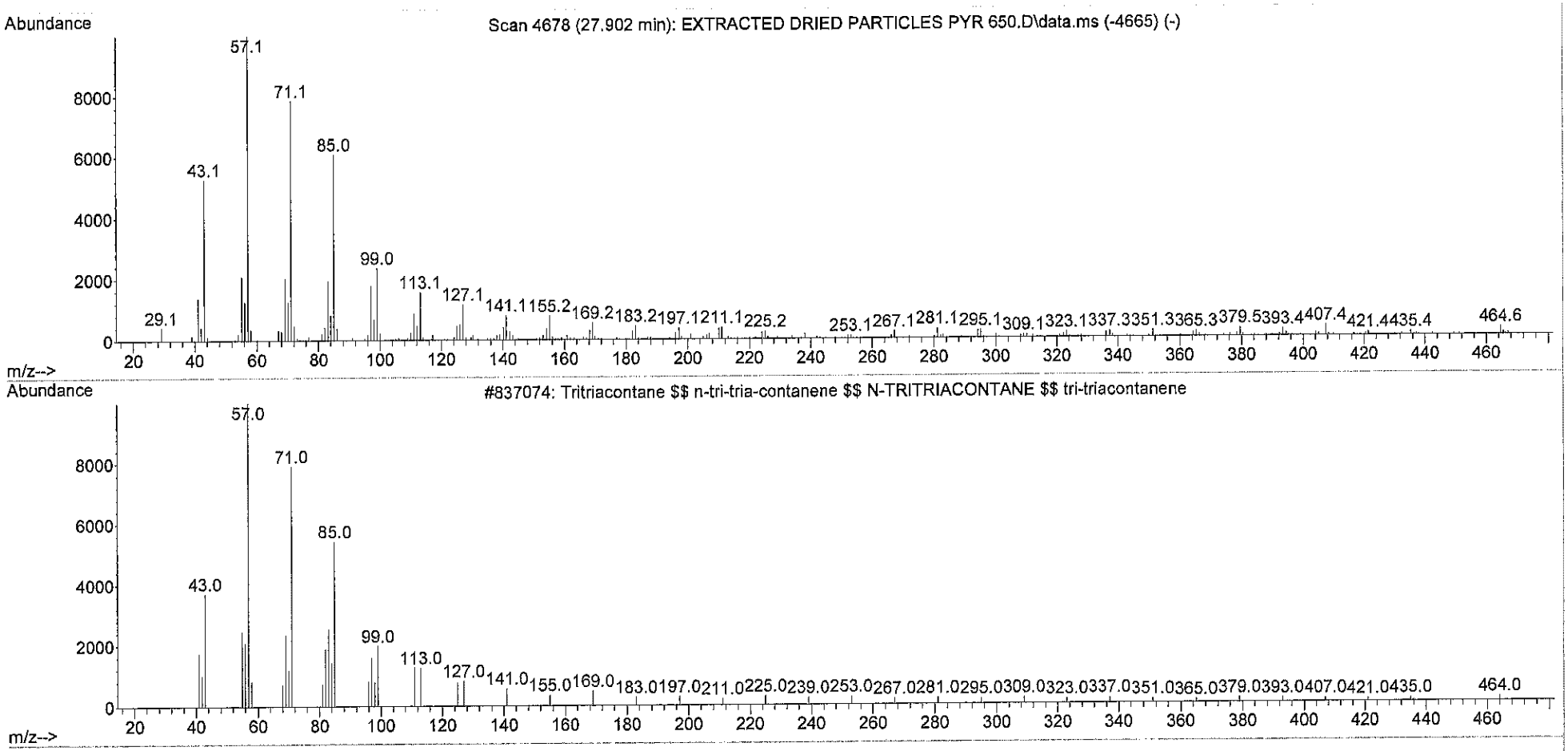
Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 95
ID : Hentriacontane $$ n-hentriacontane $$ UNTRIACONTANE $$ untriacontanene



Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 98
ID : Dotriacontane $$ n-Dotriacontane $$ Bicetyl



Library Searched : D:\MassHunter\Library\W10N11_Full.L
Quality : 94
ID : Tritriacontane $$ n-tri-tria-contanene $$ N-TRITRIACONTANE $$ tri-triacontanene



File :D:\Data 2016\LPI\Job 8029\EXTRACTED DRIED PARTICLES PYR 650.D
Operator : CG
Acquired : 30 Aug 2016 8:11 using AcqMethod PYR 650 SPLIT30.M
Instrument : Instrument #1
Sample Name: EXTRACTED DRIED PARTICLES PYR 650
Misc Info :
Vial Number: 1