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REPORT

TITLE

Data report: Organic geochemical analysis of seven oil samples.

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SUMMARY

This data report contains the results of organic geochemical analyses of seven oil samples from six exploration wells in the Barents Sea. The analyses include qualitative gas chromatography (GC) of whole oil, topping, separation into fractions, quantification of fractions by TLC-FID, stable carbon isotope analysis of oil fractions, quantitative GC of saturated hydrocarbons, quantitative gas chromatography-mass spectrometry (GC-MS) of saturated biomarkers, GC-MS of aromatic compounds (PAH and biomarkers).

KEYWORDS ENGLISH	KEYWORDS NORWEGIAN
Oil analysis	oljeanalyse
Organic geochemistry	organisk geokjemi
Barents Sea	Barentshavet

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1. Introduction

In summer 2006 the Norwegian Petroleum Directorate (NPD) provided seven oil samples from six wells in the Barents Sea and requested the following organic geochemical analyses (NPD project number 103608):

1. Topping (>210 °C) and preparative fractionation (SAT, ARO, POL, ASPH)
2. Semiquantitative bulk analysis using TLC-FID (Iatroscan)
3. Gas chromatography (GC) of saturated hydrocarbon fraction with internal standard
4. Gas chromatography- mass spectrometry (GC-MS) of saturated biomarkers with internal standard
5. GC-MS of aromatic fraction (selected polycyclic aromatics and aromatic biomarkers) with internal standard
6. Stable carbon isotope analysis of oil and oil fractions (SAT, ARO, POL, ASPH).

The analytical work was carried out by Applied Petroleum Technology (APT) in Kjeller (Report APT07-1105). Whole-oil GC-FID analysis was performed by SINTEF Petroleum Research outside the contract for general orientation. Methods are described in Chapter 3.

This data report presents the results. The enclosed CD-ROM contains the digital (PDF) version of this report and the digital results in GC-NPD-95 Version 2 format. The report replaces an incorrect version submitted in November 2006 (24.6712.00/01/06).

2. Samples

The samples were received by air mail on 13 July 2006. The oils were contained in glass vials, sealed with plastic screw caps (Figure 2.1). All samples were intact. Sample specifications are listed in Table 4.1. The samples were assigned SINTEF's sample identifiers, and aliquots bearing only these identifiers were forwarded to APT for analysis.

Figure 2.1 Oil samples as received from NPD.

3. Methods

All procedures follow NIGOGA, 4th Edition (Weiss et al. 2000). Below are brief descriptions of procedures/analytical conditions.

Gas chromatographic analysis of whole oil
An Agilent 6890 gas chromatograph with FID was used. The column is a 50 m HP PONA (crosslinked methyl silicone gum) with and i.d. of 0.2 mm and a film thickness of 0.5 µm.

Temperature programme
35 °C (15 min.) - 5 °C/min. - 320 °C (38 min.)

Topping
A rotary evaporator was used and ~ 1ml of oil was weighted accurately into a small round bottom flask. The oil was evaporated for 15 min at 90 °C with the water pump turned to maximum. After the evaporation the oil was weighed again. One aliquot of NSO-1 was run as a reference sample together with the topping series.

Deasphaltening
Pentane was added in excess (40 times the volume of oil). The solution was stored for at least 12 hours in a dark place before the solution was filtered or centrifuged and the weight of the asphaltenes was determined.

Iatroscan
A Iatroscan MK-5 (TLC-FID Analyser) instrument was used. 2 µl of extract or diluted oil was spotted on Chromarod S-III rods before elution in hexane (25 min), toluene (8 min) and dichloromethane with 7 % methanol (vol/vol). The solvent was allowed to evaporate before the rods were placed into the next elution chamber. Before running the rods in the analyser, the rods were heated for 90 sec. in a heating chamber at 60 °C.

MPLC
The MPLC is constructed as described by Radke et al. (1980). The system includes two HPLC pumps, sample injector, sample collector, RI-detector, UV-detector and two packed columns. The pre column is filled with Kieselgel 100 (silica gel), which is heated at 600 °C for 2 hours to deactivate it. The main column is a LiChroprep Si60, which is heated at 120 °C for 2 hours to make it water-free. Approximately 30 mg of deasphaltened oil or EOM diluted in 1 ml hexane were injected and separated into a saturated, an aromatic and a polar fraction.

Stable carbon isotope analysis of fractions
The samples were dissolved in a known amount of dichloromethane, and 1-2 mg of the sample (or as much as possible) was then transferred to a glass container. The solvent was evaporated in an oven at 50 °C. CuO and some silver wires were added to the containers, which were then sealed by melting in a vacuum. The samples were then combusted in an oven at 550 °C for 1 hour (Sofer, 1980). The combustion products CO_2 and H_2O were separated at –80 °C before the isotopic ratio was determined on a Finnigan MAT 251 mass spectrometer.

A standard (NGS NSO-1, topped oil) is analysed for each 10th sample. The $\delta^{13}C$ value obtained for this standard is –28.77 ‰ PDB. The variation in the isotopic values for the standard by repeated analysis over a period of five years is ± 0.13 ‰.

Gas chromatographic analysis of saturated fraction

A HP5890 II instrument was used. The column is a CP-Sil-5 CB-MS, length 60 m, i.d. 0.25 mm, film thickness 0.25 µm. $C_{20}D_{42}$ was used as an internal standard.

Temperature programme

50 °C (1 min.) - 4 °C/min. - 320 °C (25 min.)

Gas chromatography - mass spectrometry (GCMS) of saturated fraction

A Micromass ProSpec high resolution instrument was used. The instrument is tuned to a resolution of 3000 and data is acquired in Selected Ion Recording (SIR) mode. The column used is a 60 m CP-Sil-5 CB-MS with an i.d. of 0.25 mm and a film thickness 0.25 µm.

D_4-27ααR was used as internal standard.

Temperature programme

50 °C (1 min.) - 20 °C/min. - 120 °C - 2 °C/min - 320 °C (20 min.)

GCMS of aromatic fraction

A Micromass ProSpec high resolution instrument is used. The instrument is tuned to a resolution of 3000 and data is acquired in Selected Ion Recording (SIR) mode. The column used is a 60 m CP-Sil-5 CB-MS with an i.d. of 0.25 mm and a film thickness 0.25 µm. D_8-naphthalene and D_{10}-phenanthrene are used as internal standards when quantitative results are required for the aromatic compounds.

Temperature programme

50 °C (1 min.) - 20 °C/min. - 120 °C - 2 °C/min - 320 °C (20 min.)

The NGS reference oil (NSO-1) was included as a control sample.

References

GC-NPD-95 format for transfer of geochemical data. Version 2.0, May 2005. 38 pp., Norwegian Petroleum Directorate (Stavanger). Only available online: http://www.npd.no/NR/rdonlyres/7642FDBE-4EC9-4A91-AA12-114AA2F09969/0/GCNPD95_V2_SPEC_TOTAL.pdf.

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4. Results

Tables

Figures

Table 4.1 Samples and analytical program.

Sample ID (SINTEF)	Well	Sample type	Sample name	Upper depth (m RKB)	Lower depth (m RKB)	Sample ID (APT)	Topping	De-asphalting	TLC-FID group anal.	MPLC group sep.	C-isotope analysis of groups	GC SAT	GCMS SAT	GCMS ARO
Analysed oil samples														
H6217	7120/6-1	OIL	DST 2	2432.05	2436.05	35643	x	x	x	x	x	x	x	x
H6218	7121/5-1	OIL	DST 1	2436	2439	35644	x	x	x	x	x	x	x	x
H6219	7122/7-1	OIL	MDT 1	1114	1114	35645	x	x	x	x	x	x	x	x
H6220	7122/7-3	OIL	MDT 16	1195	1195	35646	x	x	x	x	x	x	x	x
H6221	7122/7-3	OIL	MDT 3	1812	1812	35647	x	x	x	x	x	x	x	x
H6222	7128/4-1	OIL	DST 2	1577	1586	35648	x	x	x	x	x	x	x	x
H6223	7228/7-1 A	OIL	MDT	2091.1	2091.1	35649	x	x	x	x	x	x	x	x
Control samples:														
H2795		OIL	NSO-1			35642	x	x	x	x	x			
		OIL	NGS NSO-1, Aliquot # 11.1			10042A	x		x	x	x	x	x	x
		OIL	NGS NSO-1, Aliquot # 11.1			10042B	x		x				x	x
		OIL	NGS NSO-1, Aliquot # 11.1			10042C			x					
		COCH	NGS JR-1, Aliquot # 63			10639A		x	x					

Table 4.2 Separation of boiling point > 210°C fraction (topping).

Sample ID	Well	Upper depth (m)	Lower depth (m)	Sample name	Sample ID (APT)	Topped oil (wt%)
H6217	7120/6-1	2432.05	2436.05	DST 2	35643	85.2
H6218	7121/5-1	2436	2439	DST 1	35644	87.1
H6219	7122/7-1	1114	1114	MDT 1	35645	82.9
H6220	7122/7-3	1195	1195	MDT 16	35646	83.5
H6221	7122/7-3	1812	1812	MDT 3	35647	71.4
H6222	7128/4-1	1577	1586	DST 2	35648	69.5
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649	88.7
Control samples:						
H2795				NSO-1	35642	79.9
				NSO-1, #11.1	10042A	83.0
				NSO-1, #11.1	10042B	82.4

Table 4.3 Asphaltene precipitation and TLC-FID analysis of maltenes: C15+ bulk composition.

Sample ID	Well	Upper depth (m)	Lower depth (m)	Sample name	Sample ID (APT)	SAT/ OIL	ARO/ OIL	HC/ OIL	POL/ OIL	ASPH/ OIL	SAT/ ARO	HC/ Non-HC
						(wt% of topped oil)					(wt/wt)	(wt/wt)
H6217	7120/6-1	2432.05	2436.05	DST 2	35643	64.7	31.5	96.3	2.3	1.4	2.1	26.0
H6218	7121/5-1	2436	2439	DST 1	35644	62.3	34.6	96.9	1.5	1.6	1.8	31.3
H6219	7122/7-1	1114	1114	MDT 1	35645	70.3	25.9	96.1	2.3	1.5	2.7	25.3
H6220	7122/7-3	1195	1195	MDT 16	35646	68.9	26.9	95.8	2.4	1.8	2.6	22.8
H6221	7122/7-3	1812	1812	MDT 3	35647	79.7	18.3	98.0	2.0		4.4	49.0
H6222	7128/4-1	1577	1586	DST 2	35648	87.7	11.9	99.5	0.5		7.4	199.2
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649	91.1	7.9	99.0	1.0		11.5	99.0
Control samples:												
				NSO-1	35642	51.2	37.9	89.0	7.0	4.0	1.4	8.1
				NSO-1, #11.1	10042A	59	34	93	7		1.7	13.3
				NSO-1, #11.1	10042B	54	37	91	9		1.5	10.1
				NSO-1, #11.1	10042C	58	33	91	9		1.8	10.1
				JR-1, #63	10639A	28	41	69	31		0.7	2.2
				JR-1, #63	10639A					13.6		

Table 4.4 Stable carbon isotope data of topped oil and chromatographic fractions.

Sample ID	Well	Upper depth (m)	Lower depth (m)	Sample name	Sample ID (APT)	δ^{13}C-OIL (‰ PDB)	δ^{13}C-SAT (‰ PDB)	δ^{13}C-ARO (‰ PDB)	δ^{13}C-POL (‰ PDB)	δ^{13}C-ASP (‰ PDB)
H6217	7120/6-1	2432.05	2436.05	DST 2	35643	-29.6	-30.2	-28.7	-28.3	-29.1
H6218	7121/5-1	2436	2439	DST 1	35644	-29.5	-30.2	-28.6	-28.2	-28.8
H6219	7122/7-1	1114	1114	MDT 1	35645	-29.4	-30.0	-28.7	-28.5	-28.9
H6220	7122/7-3	1195	1195	MDT 16	35646	-29.1	-30.1	-28.6	-28.6	-28.8
H6221	7122/7-3	1812	1812	MDT 3	35647	-30.4	-30.9	-29.5	-29.4	
H6222	7128/4-1	1577	1586	DST 2	35648	-27.0	-27.3	-26.5	-27.4	
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649	-29.2	-29.2	-28.3	-28.9	
Control samples:										
				NSO-1	35642	-28.7	-29.3	-28.3	-28.1	-28.6
				NSO-1, #11.1	10042A	-28.7				

Table 4.5 Peak area ratios derived from gas chromatograms of saturated hydrocarbons.

Sample ID	Well	Upper depth (m)	Lower depth (m)	Sample name	Sample ID (APT)	Pristane / nC17 [=A]	Phytane / n-C18 [=B]	[A] / [B]	Pristane/ Phytane	CPI 1	n-C17 / (n-C17+n-C27)
H6217	7120/6-1	2432.05	2436.05	DST 2	35643	0.87	0.62	1.41	1.42	1.12	0.47
H6218	7121/5-1	2436	2439	DST 1	35644	0.86	0.62	1.38	1.41	1.13	0.51
H6219	7122/7-1	1114	1114	MDT 1	35645	0.87	0.56	1.56	1.74	1.13	0.74
H6220	7122/7-3	1195	1195	MDT 16	35646	0.88	0.54	1.63	1.82	1.13	0.74
H6221	7122/7-3	1812	1812	MDT 3	35647	1.13	0.83	1.36	1.57	1.13	0.77
H6222	7128/4-1	1577	1586	DST 2	35648	0.45	0.19	2.39	2.24	1.10	0.59
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649	0.45	0.29	1.55	1.56	1.13	0.69
Control samples:											
10042A				NSO-1, #11.1	10042A	0.62	0.48	1.29	1.48	1.07	0.76

Legend:

Pr Pristane
Ph Phytane
CPI 1 $0.5 * [(\Sigma\ n\text{-}C_{25} \ldots n\text{-}C_{31}\ \text{odd}) / ((\Sigma\ n\text{-}C_{24} \ldots n\text{-}C_{30}\ \text{even}) + (\Sigma\ n\text{-}C_{25} \ldots n\text{-}C_{31}\ \text{odd}) / (\Sigma\ n\text{-}C_{26} \ldots n\text{-}C_{32}\ \text{even})]$

Table 4.6 Peak area ratios for quality control of saturated hydrocarbon gas chromatograms.

Sample ID	Well	Upper depth (m)	Lower depth (m)	Sample name	Sample ID (APT)	n-C15 / n-C20	n-C30 / n-C20
Control samples:							
				NSO-1, #11.1	10042A	1.65	0.24

Table 4.7 Peak height ratios derived from mass fragmentograms of aromatic hydrocarbons (naphthalenes, phenanthrenes and dibenzothiophenes).

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	Sample ID (APT)	MNR	%2-MN	DNR (DNR 1)	MPI1	MPI2	F1	F2	%4-MDBT	4-MDBT / 1-MDBT
H6217	7120/6-1	2432.05	2436.05	DST 2	35643	1.53	60.44	5.77	0.70	0.74	0.43	0.23	79.17	3.80
H6218	7121/5-1	2436	2439	DST 1	35644	1.51	60.09	5.51	0.68	0.72	0.43	0.23	78.98	3.76
H6219	7122/7-1	1114	1114	MDT 1	35645	1.75	63.58	5.97	0.69	0.70	0.46	0.23	79.97	3.99
H6220	7122/7-3	1195	1195	MDT 16	35646	2.97	74.81	6.09	0.70	0.72	0.46	0.24	79.53	3.88
H6221	7122/7-3	1812	1812	MDT 3	35647	1.65	62.31	6.25	0.59	0.62	0.44	0.23	80.73	4.19
H6222	7128/4-1	1577	1586	DST2	35648	1.69	62.85	8.04	0.76	0.73	0.52	0.25	83.29	4.98
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649	1.72	63.27	7.34	0.61	0.59	0.45	0.22	81.77	4.49
Control samples:														
				NSO-1, # 11.1	10042A	1.39	58.19	4.59	0.63	0.65	0.42	0.22	73.25	2.74
				NSO-1, # 11.1	10042B	1.38	57.90	4.53	0.62	0.64	0.42	0.22	73.06	2.71

Legend:

MNR	2-MN / 1-MN
%2-MN	100 * 2-MN / (2-MN + 1-MN)
DNR 1	(2,6-DMN + 2,7-DMN) / (1,5-DMN)
MPI 1	1.5 * (3-MP + 2-MP) / (P + 9-MP + 1-MP)
MPI 2	3 * 2-MP / (P + 9-MP + 1-MP)
F1	(3-MP + 2-MP) / (3-MP + 2-MP + 9-MP + 1-MP)
F2	2-MP / (3-MP + 2-MP + 9-MP + 1-MP)
%4-MDBT	100 *4-MDBT / (4-MDBT + 1-MDBT)

For peak labels and identifications see Figure 4.4.

Table 4.8 Peak height ratios for quality control of aromatic fraction mass fragmentograms.

Sample ID	Well	Upper depth	Lower depth	Sample name	1-MP/P	A1/E1	a1/d1
Control samples:							
10042A				NSO-1, # 11.1	0.62	0.52	0.33
10042B				NSO-1, # 11.1	0.60	0.53	0.33

Table 4.9 Molecular ratios from terpane mass fragmentograms.

Sample ID	Well	Upper depth (m RKB)	Lower depth (m RKB)	Sample name	%23/3	%24/3	%27Ts	%28ab	%25nor 30ab	%29Ts	%30d	%30ab	%31 abS	%32 abS	%33 abS	%34 abS	%35 abS	%31-35 abS
H6217	7120/6-1	2432.05	2436.05	DST 2	4.19	4.13	50.94	5.73	3.04	14.90	8.17	91.79	58.97	58.70	60.33	60.32	59.44	59.55
H6218	7121/5-1	2436	2439	DST 1	4.17	4.31	49.05	5.54	2.60	14.54	7.85	92.10	59.03	59.89	60.06	59.76	59.97	59.74
H6219	7122/7-1	1114	1114	MDT 1	5.81	5.56	48.86	5.25	3.05	14.04	7.11	90.36	59.54	58.67	60.02	60.25	59.28	59.55
H6220	7122/7-3	1195	1195	MDT 16	5.45	5.11	46.41	5.17	3.07	12.66	6.54	90.58	59.02	59.23	59.73	58.81	58.86	59.13
H6221	7122/7-3	1812	1812	MDT 3	14.51	13.45	81.23	3.12	0.00	23.08	23.91	89.74	57.28	57.78	59.76	56.61	58.09	57.91
H6222	7128/4-1	1577	1586	DST 2	38.31	28.36	55.19	4.19	0.00	22.32	17.30	85.54	58.33	58.98	58.82	62.83	58.40	59.47
H6223	7228/7-1 A	2091.1	2091.1	MDT	19.60	14.88	32.57	2.24	0.00	15.30	11.58	80.21	59.12	58.73	58.86	59.47	58.22	58.88
Control samples:																		
10042A				NSO-1, # 11.1	5.24	4.34	52.93	19.94	6.48	13.77	7.76	89.97	57.67	57.57	60.89	61.36	60.00	59.50
10042B				NSO-1, # 11.1	5.19	4.51	53.26	20.73	6.81	13.63	7.81	89.89	59.07	58.21	59.01	61.46	58.48	59.25

Legend:

%23/3	100 * (23/3) / (23/3 + 30αβ) in m/z 191
%24/3	100 * (24/3) / (24/3 + 30αβ) in m/z 191
%27Ts	100 * 27Ts / (27Ts + 27Tm) in m/z 191
%28ab	100 * 28αβ / (28αβ + 30αβ) in m/z 191
%25nor30ab	100 * 25nor30αβ / (25nor30αβ + 30αβ) in m/z 191
%29Ts	100 * 29Ts / (29Ts + 29αβ) in m/z 191
%30d	100 * 30d / (30d + 30αβ) in m/z 191
%30ab	100 * 30αβ/(30αβ + 30βα) in m/z 191
%31abS	100 * 31αβS / (31αβS + 31αβR) in m/z 191
%32abS	100 * 32αβS / (32αβS + 32αβR) in m/z 191
%33abS	100 * 33αβS / (33αβS + 33αβR) in m/z 191
%34abS	100 * 34αβS / (34αβS + 34αβR) in m/z 191
%35abS	100 * 35αβS / (35αβS + 35αβR) in m/z 191
%32-35abS	100 * average of 31αβS/(31αβS + 31αβR),.....35αβS/(35αβS + 35αβR) in m/z 191

Ratios are based on peak heights.
For peak labels and identifications see Figure 4.3.

Table 4.10 Molecular ratios from sterane mass fragmentograms.

Sample ID	Well	Upper depth (m RKB)	Lower depth (m RKB)	Sample name	Sample ID (APT)	%27dia	%27dbS	%29aaS	%29bb (R+S)	%27aaR	%28aaR	%29aaR	%27bb	%28bb	%29bb
H6217	7120/6-1	2432.05	2436.05	DST 2	35643	70.36	54.48	54.48	61.15	35.61	20.98	43.41	31.69	25.57	42.74
H6218	7121/5-1	2436	2439	DST 1	35644	70.63	55.05	54.61	61.20	37.16	21.17	41.67	31.78	25.47	42.75
H6219	7122/7-1	1114	1114	MDT 1	35645	72.03	56.80	53.37	56.87	35.47	20.80	43.73	32.83	25.28	41.88
H6220	7122/7-3	1195	1195	MDT 16	35646	70.35	55.20	53.73	56.14	35.95	21.41	42.64	33.22	24.84	41.94
H6221	7122/7-3	1812	1812	MDT 3	35647	81.68	68.46	50.86	58.34	29.46	20.14	50.41	30.46	24.15	45.39
H6222	7128/4-1	1577	1586	DST 2	35648	75.04	62.66	53.09	49.06	49.73	15.50	34.78	42.33	22.25	35.42
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649	78.96	67.83	51.82	46.32	32.36	19.53	48.10	29.07	25.22	45.72
Control samples:															
10042A				NSO-1, # 11.1	10042A	77.60	61.48	57.69	59.06	39.35	25.00	35.65	34.10	29.83	36.08
10042B				NSO-1, # 11.1	10042B	77.07	61.48	57.43	58.62	39.87	23.97	36.16	34.44	29.47	36.09

Legend:

%27dia	100 * 27dβS / (27dβS + 27dαR) in m/z 217
%29aaS	100 * 29ααS/(29ααS + 29ααR) in m/z 217
%29bb(R+S)	100 * 29ββS/(29ααS + 29ββR + 29ββS + 29ααR) in m/z 217
%27aaR, %28aaR, %29aaR	distribution (in percent) of peak heights 27ααR,28ααR,29ααR in m/z 217
%27bb, %28bb, %29bb	distribution (in percent) of peak heights (27ββR + 27ββS),(28ββR + 28ββS),(29ββR + 29ββS) in m/z 218

Ratios are based on peak heights.
For peak labels and identifications see Figure 4.3.

Table 4.11 Peak height ratios for quality control of terpane and sterane mass fragmentograms.

Sample ID	Well	Upper depth	Lower depth	Sample name	(23/3) / 30ab in m/z 191	35abR / 30ab in m/z 191	25nor30ab / 25nor28ab in m/z 177	29aaR / 27dbS in m/z 217	29bbS / 27bbR in m/z 218
Control samples:									
10042A				NSO-1, # 11.1	0.06	0.08	0.75	0.26	0.98
10042B				NSO-1, # 11.1	0.05	0.09	0.77	0.27	0.92

Table 4.12 Molecular ratios from mass fragmentograms of aromatic steroid hydrocarbons.

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	Sample ID (APT)	%C20TA / (C20TA + C27 TA)	%C20TA / (C20TA + C28TA)	%C28TA / (C28TA + C29 MA)
H6217	7120/6-1	2432.05	2436.05	DST 2	35643	39.54	40.59	58.55
H6218	7121/5-1	2436	2439	DST 1	35644	38.88	39.54	57.80
H6219	7122/7-1	1114	1114	MDT 1	35645	23.60	26.76	58.41
H6220	7122/7-3	1195	1195	MDT 16	35646	22.03	24.89	60.26
H6221	7122/7-3	1812	1812	MDT 3	35647	54.01	42.83	56.35
H6222	7128/4-1	1577	1586	DST 2	35648	65.03	71.38	56.33
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649	48.17	41.02	60.89
Control samples:								
				NSO-1, # 11.1	10042A	19.06	27.37	62.68
				NSO-1, # 11.1	10042B	19.26	27.22	68.72

Legend:

%20TA / (20TA + 27 TA) 100 * C20TA/(C20TA+(RC26TA+SC27TA) + RC27TA) in m/z 231
%C20TA / (C20TA + RC28TA) 100 * C20TA/(C20TA+SC28TA + RC28TA) in m/z 231
%C28TA / (C28TA + C29 MA) 100* (SC28TA + RC28TA) in m/z 231 / ((SC28TA + RC28TA) in m/z 231 + (bSC29MA + bSC29DMA + aSC29MA + bRC29MA + bRC29DMA + aRC29MA) in m/z 253)
TA tri-aromatic steroid
MA mono-aromatic steroid
Ratios are based on peak heights.
For peak labels and identifications see Figure 4.4.

Table 4.13 SAT GC-FID peak areas.

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	APT ID	n-C10	n-C11	n-C12	i-C13	i-C14	n-C13	i-C15	n-C14	i-C16	n-C15	n-C16	i-C18
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	1.59e5	2.39e5	3.03e5	1.03e5	1.18e5	3.76e5	1.44e5	4.42e5	2.43e5	5.12e5	5.45e5	2.73e5
H6218	7121/5-1	2436	2439	DST 1	35644T	1.84e5	2.51e5	3.07e5	1.05e5	1.23e5	4.02e5	1.52e5	4.74e5	2.53e5	5.42e5	5.61e5	2.74e5
H6219	7122/7-1	1114	1114	MDT 1	35645T	0.00e0	0.00e0	0.00e0	1.38e5	2.95e5	2.24e5	2.99e5	6.86e5	4.66e5	9.70e5	9.61e5	4.22e5
H6220	7122/7-3	1195	1195	MDT 16	35646T	0.00e0	0.00e0	0.00e0	1.09e5	2.75e5	2.35e5	2.97e5	7.24e5	5.06e5	1.05e6	1.05e6	4.61e5
H6221	7122/7-3	1812	1812	MDT 3	35647T	5.80e5	6.76e5	7.23e5	2.95e5	2.91e5	7.78e5	3.01e5	7.65e5	4.58e5	7.85e5	6.96e5	4.56e5
H6222	7128/4-1	1577	1586	DST 2	35648T	6.11e5	7.09e5	7.45e5	1.60e5	1.73e5	8.07e5	1.61e5	8.76e5	3.12e5	9.53e5	9.81e5	2.40e5
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	4.73e5	6.09e5	7.47e5	1.60e5	1.56e5	9.22e5	1.84e5	1.09e6	3.66e5	1.27e6	1.33e6	4.09e5
Control samples:																	
				NSO-1, #11.1	10042A	5.26e5	6.19e5	6.56e5	1.44e5	1.74e5	6.63e5	1.48e5	6.22e5	2.27e5	6.11e5	5.56e5	1.75e5

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	APT ID	n-C17	Pr	n-C18	Ph	n-C19	n-C20	n-C21	n-C22	n-C23	n-C24	n-C25	n-C26
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	5.86e5	5.10e5	5.84e5	3.60e5	5.93e5	6.31e5	6.33e5	6.75e5	6.99e5	7.36e5	7.81e5	6.96e5
H6218	7121/5-1	2436	2439	DST 1	35644T	5.90e5	5.08e5	5.77e5	3.61e5	5.84e5	6.14e5	6.11e5	6.44e5	6.58e5	6.87e5	7.18e5	6.23e5
H6219	7122/7-1	1114	1114	MDT 1	35645T	9.43e5	8.23e5	8.47e5	4.73e5	7.93e5	7.44e5	6.60e5	6.10e5	5.48e5	4.97e5	4.66e5	3.70e5
H6220	7122/7-3	1195	1195	MDT 16	35646T	1.03e6	9.03e5	9.24e5	4.96e5	8.74e5	8.16e5	7.33e5	6.77e5	6.14e5	5.56e5	5.22e5	4.11e5
H6221	7122/7-3	1812	1812	MDT 3	35647T	6.93e5	7.80e5	6.02e5	4.98e5	5.81e5	5.57e5	4.68e5	4.13e5	3.52e5	2.97e5	3.02e5	2.30e5
H6222	7128/4-1	1577	1586	DST 2	35648T	1.05e6	4.68e5	1.12e6	2.08e5	1.18e6	1.25e6	1.30e6	1.29e6	1.29e6	1.20e6	1.13e6	9.25e5
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	1.40e6	6.23e5	1.38e6	3.98e5	1.36e6	1.30e6	1.19e6	1.06e6	9.70e5	8.63e5	8.39e5	6.94e5
Control samples:																	
				NSO-1, #11.1	10042A	5.22e5	3.23e5	4.55e5	2.19e5	3.99e5	3.71e5	3.21E+05	2.94E+05	2.62E+05	2.46E+05	2.24E+05	1.89E+05

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	APT ID	n-C27	n-C28	n-C29	n-C30	n-C31	n-C32	n-C33	n-C34	n-C35	n-C36
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	6.67e5	5.17e5	4.84e5	3.28e5	2.56e5	1.61e5	1.59e5	1.47e5	5.61e4	3.55e4
H6218	7121/5-1	2436	2439	DST 1	35644T	5.73e5	4.22e5	3.73e5	2.30e5	1.64e5	9.31e4	9.93e4	1.01e5	2.77e4	1.29e4
H6219	7122/7-1	1114	1114	MDT 1	35645T	3.27e5	2.43e5	2.22e5	1.47e5	1.14e5	7.01e4	6.41e4	6.96e4	2.23e4	1.10e4
H6220	7122/7-3	1195	1195	MDT 16	35646T	3.63e5	2.63e5	2.38e5	1.58e5	1.24e5	7.92e4	7.57e4	9.18e4	2.91e4	1.43e4
H6221	7122/7-3	1812	1812	MDT 3	35647T	2.05e5	1.56e5	1.46e5	1.17e5	1.00e5	6.53e4	6.04e4	4.71e4	4.15e4	2.37e4
H6222	7128/4-1	1577	1586	DST 2	35648T	7.28e5	4.97e5	3.67e5	2.20e5	1.34e5	7.77e4	6.00e4	3.93e4	1.73e4	9.34e3
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	6.25e5	4.43e5	4.05e5	2.73e5	2.08e5	1.32e5	1.21e5	1.08e5	5.45e4	3.82e4
Control samples:															
				NSO-1, #11.1	10042A	1.65E+05	1.21E+05	1.11E+05	8.84E+04	6.88E+04	5.21E+04	4.45E+04	4.68E+04	2.05E+04	1.14E+04

Table 4.14 SAT GC-FID concentrations (in ng/g topped oil).

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	APT ID	n-C10	n-C11	n-C12	i-C13	i-C14	n-C13	i-C15	n-C14	i-C16	n-C15	n-C16	i-C18
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	1.73e6	2.60e6	3.30e6	1.12e6	1.28e6	4.09e6	1.57e6	4.81e6	2.65e6	5.58e6	5.94e6	2.97e6
H6218	7121/5-1	2436	2439	DST 1	35644T	2.01e6	2.75e6	3.36e6	1.15e6	1.34e6	4.40e6	1.66e6	5.19e6	2.77e6	5.93e6	6.14e6	3.00e6
H6219	7122/7-1	1114	1114	MDT 1	35645T	0.00e0	0.00e0	0.00e0	1.50e6	3.20e6	2.43e6	3.24e6	7.44e6	5.05e6	1.05e7	1.04e7	4.57e6
H6220	7122/7-3	1195	1195	MDT 16	35646T	0.00e0	0.00e0	0.00e0	1.10e6	2.79e6	2.39e6	3.02e6	7.35e6	5.13e6	1.07e7	1.07e7	4.68e6
H6221	7122/7-3	1812	1812	MDT 3	35647T	6.81e6	7.94e6	8.49e6	3.46e6	3.41e6	9.13e6	3.53e6	8.99e6	5.38e6	9.21e6	8.17e6	5.35e6
H6222	7128/4-1	1577	1586	DST 2	35648T	8.24e6	9.55e6	1.00e7	2.15e6	2.33e6	1.09e7	2.17e6	1.18e7	4.21e6	1.28e7	1.32e7	3.23e6
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	4.64e6	5.98e6	7.33e6	1.57e6	1.53e6	9.05e6	1.81e6	1.07e7	3.59e6	1.25e7	1.31e7	4.01e6
Control samples:																	
				NSO-1, #11.1	10042A	5.82e6	6.86e6	7.27e6	1.59e6	1.93e6	7.34e6	1.63e6	6.89e6	2.52e6	6.76e6	6.16e6	1.94e6

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	APT ID	n-C17	Pr	n-C18	Ph	n-C19	n-C20	n-C21	n-C22	n-C23	n-C24	n-C25	n-C26
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	6.38e6	5.56e6	6.36e6	3.92e6	6.47e6	6.88e6	6.89e6	7.36e6	7.62e6	8.01e6	8.50e6	7.59e6
H6218	7121/5-1	2436	2439	DST 1	35644T	6.46e6	5.56e6	6.32e6	3.94e6	6.39e6	6.72e6	6.68e6	7.05e6	7.20e6	7.51e6	7.85e6	6.82e6
H6219	7122/7-1	1114	1114	MDT 1	35645T	1.02e7	8.92e6	9.18e6	5.13e6	8.60e6	8.06e6	7.15e6	6.62e6	5.94e6	5.39e6	5.05e6	4.01e6
H6220	7122/7-3	1195	1195	MDT 16	35646T	1.05e7	9.17e6	9.38e6	5.04e6	8.87e6	8.29e6	7.44e6	6.87e6	6.23e6	5.64e6	5.30e6	4.18e6
H6221	7122/7-3	1812	1812	MDT 3	35647T	8.13e6	9.15e6	7.07e6	5.84e6	6.82e6	6.54e6	5.49e6	4.85e6	4.13e6	3.49e6	3.54e6	2.70e6
H6222	7128/4-1	1577	1586	DST 2	35648T	1.42e7	6.30e6	1.50e7	2.81e6	1.59e7	1.68e7	1.76e7	1.74e7	1.73e7	1.62e7	1.52e7	1.25e7
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	1.37e7	6.11e6	1.36e7	3.91e6	1.33e7	1.27e7	1.16e7	1.05e7	9.52e6	8.47e6	8.24e6	6.81e6
Control samples:																	
				NSO-1, #11.1	10042A	5.78e6	3.58e6	5.04e6	2.43e6	4.42e6	4.11e6	3.55e6	3.25e6	2.90e6	2.72e6	2.48e6	2.09e6

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	APT ID	n-C27	n-C28	n-C29	n-C30	n-C31	n-C32	n-C33	n-C34	n-C35	n-C36
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	7.26e6	5.63e6	5.28e6	3.57e6	2.79e6	1.75e6	1.73e6	1.60e6	6.11e5	3.87e5
H6218	7121/5-1	2436	2439	DST 1	35644T	6.27e6	4.62e6	4.08e6	2.51e6	1.79e6	1.02e6	1.09e6	1.10e6	3.03e5	1.41e5
H6219	7122/7-1	1114	1114	MDT 1	35645T	3.54e6	2.63e6	2.41e6	1.60e6	1.23e6	7.60e5	6.95e5	7.54e5	2.42e5	1.19e5
H6220	7122/7-3	1195	1195	MDT 16	35646T	3.69e6	2.67e6	2.42e6	1.60e6	1.26e6	8.04e5	7.68e5	9.32e5	2.96e5	1.45e5
H6221	7122/7-3	1812	1812	MDT 3	35647T	2.41e6	1.84e6	1.71e6	1.38e6	1.17e6	7.66e5	7.09e5	5.53e5	4.87e5	2.78e5
H6222	7128/4-1	1577	1586	DST 2	35648T	9.81e6	6.70e6	4.95e6	2.96e6	1.81e6	1.05e6	8.09e5	5.29e5	2.34e5	1.26e5
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	6.13e6	4.35e6	3.98e6	2.68e6	2.04e6	1.29e6	1.19e6	1.06e6	5.35e5	3.75e5
Control samples:															
				NSO-1, #11.1	10042A	1.83e6	1.34e6	1.23e6	9.79e5	7.62e5	5.76e5	4.93e5	5.18e5	2.27e5	1.26e5

Table 4.15 SAT GC-HRMS SIR peak heights. (For peak labels, identifications, coeluting compounds etc. see Figure 4.3.)

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	177 25nor28αβ	25nor29αβ	25nor30αβ	25nor31αβ	191 19/3	20/3	21/3	23/3	24/3	25/3R	25/3S	24/4
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	1.56e6	2.25e6	1.79e6	4.58e6	1.16e6	1.24e6	1.52e6	2.50e6	2.46e6	9.48e5	1.00e6	3.37e6
H6218	7121/5-1	2436	2439	DST 1	35644T	1.31e6	1.88e6	1.43e6	4.10e6	1.13e6	1.22e6	1.48e6	2.33e6	2.41e6	9.35e5	9.60e5	3.25e6
H6219	7122/7-1	1114	1114	MDT 1	35645T	7.21e5	1.15e6	9.93e5	2.50e6	1.51e6	1.42e6	1.48e6	1.95e6	1.86e6	6.48e5	6.73e5	2.00e6
H6220	7122/7-3	1195	1195	MDT 16	35646T	9.56e5	1.56e6	1.33e6	3.35e6	1.91e6	1.75e6	1.80e6	2.42e6	2.26e6	7.66e5	8.07e5	2.49e6
H6221	7122/7-3	1812	1812	MDT 3	35647T	2.62e5	1.65e5	0.00e0	9.40e5	6.12e5	5.54e5	1.11e6	2.02e6	1.85e6	7.83e5	8.66e5	4.86e5
H6222	7128/4-1	1577	1586	DST 2	35648T	8.60e4	0.00e0	0.00e0	1.12e5	6.06e5	6.52e5	5.72e5	8.82e5	5.62e5	2.04e5	2.04e5	4.27e5
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	1.69e5	8.67e4	0.00e0	5.35e5	4.37e5	5.75e5	1.04e6	1.66e6	1.19e6	4.88e5	5.29e5	4.69e5
				NSO-1, # 11.1	10042A	2.97e6	2.36e6	2.23e6	2.92e6	7.73e5	8.40e5	1.15e6	1.78e6	1.46e6	7.44e5	7.57e5	1.56e6
				NSO-1, # 11.1	10042B	3.03e6	2.34e6	2.34e6	2.90e6	7.92e5	8.56e5	1.15e6	1.75e6	1.51e6	7.60e5	7.89e5	1.59e6

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	191 26/3R	26/3S	28/3R	28/3S	29/3R	29/3S	27Ts	27Tm	30/3R	30/3S	28αβ	25nor30αβ	29αβ	29Ts	30d
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	1.20e6	1.10e6	1.26e6	1.19e6	1.65e6	1.55e6	9.53e6	9.18e6	1.22e6	1.34e6	3.47e6	2.20e6	2.87e7	1.00e7	5.08e6
H6218	7121/5-1	2436	2439	DST 1	35644T	1.07e6	1.08e6	1.17e6	1.10e6	1.51e6	1.47e6	8.23e6	8.55e6	1.10e6	1.22e6	3.14e6	1.77e6	2.60e7	9.10e6	4.56e6
H6219	7122/7-1	1114	1114	MDT 1	35645T	7.41e5	6.95e5	6.62e5	6.04e5	8.26e5	7.89e5	4.92e6	5.15e6	5.74e5	5.82e5	1.75e6	1.20e6	1.63e7	5.16e6	2.42e6
H6220	7122/7-3	1195	1195	MDT 16	35646T	9.03e5	8.50e5	7.84e5	7.59e5	9.46e5	9.34e5	5.63e6	6.50e6	6.59e5	7.28e5	2.29e6	1.64e6	2.14e7	6.09e6	2.94e6
H6221	7122/7-3	1812	1812	MDT 3	35647T	1.00e6	1.06e6	1.26e6	1.31e6	1.53e6	1.48e6	4.50e6	1.04e6	1.07e6	1.02e6	3.83e5	0.00e0	3.36e6	3.57e6	3.74e6
H6222	7128/4-1	1577	1586	DST 2	35648T	2.28e5	2.17e5	2.25e5	2.16e5	2.10e5	1.92e5	5.00e5	4.06e5	1.43e5	1.42e5	6.21e4	0.00e0	9.95e5	4.08e5	2.97e5
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	6.03e5	5.84e5	6.94e5	6.75e5	6.52e5	6.04e5	9.13e5	1.89e6	4.78e5	4.31e5	1.56e5	0.00e0	5.38e6	1.23e6	8.92e5
				NSO-1, # 11.1	10042A	6.02e5	5.92e5	6.29e5	5.49e5	9.14e5	8.74e5	4.97e6	4.42e6	8.16e5	8.71e5	8.02e6	2.77e6	1.22e7	5.14e6	2.71e6
				NSO-1, # 11.1	10042B	6.34e5	6.09e5	6.18e5	5.95e5	9.47e5	9.09e5	5.06e6	4.44e6	7.94e5	9.18e5	8.37e6	2.93e6	1.22e7	5.05e6	2.71e6

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	191 29βα	30O	30αβ	30βα	31αβS	31αβR	30G	31βα	32αβS	32αβR	33αβS	33αβR	34αβS	34αβR
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	2.10e6	0.00e0	5.71e7	5.11e6	1.84e7	1.28e7	1.80e6	2.25e6	1.16e7	8.16e6	8.32e6	5.47e6	4.94e6	3.25e6
H6218	7121/5-1	2436	2439	DST 1	35644T	1.96e6	0.00e0	5.35e7	4.59e6	1.83e7	1.27e7	1.59e6	2.08e6	1.19e7	7.97e6	8.15e6	5.42e6	5.05e6	3.40e6
H6219	7122/7-1	1114	1114	MDT 1	35645T	1.34e6	0.00e0	3.16e7	3.37e6	1.12e7	7.61e6	9.11e5	1.41e6	7.51e6	5.29e6	5.51e6	3.67e6	3.41e6	2.25e6
H6220	7122/7-3	1195	1195	MDT 16	35646T	1.81e6	0.00e0	4.20e7	4.37e6	1.38e7	9.58e6	1.15e6	1.75e6	9.11e6	6.27e6	6.69e6	4.51e6	4.14e6	2.90e6
H6221	7122/7-3	1812	1812	MDT 3	35647T	3.54e5	0.00e0	1.19e7	1.36e6	3.50e6	2.61e6	8.23e5	1.27e6	2.71e6	1.98e6	1.96e6	1.32e6	1.28e6	9.81e5
H6222	7128/4-1	1577	1586	DST 2	35648T	9.92e4	0.00e0	1.42e6	2.40e5	5.88e5	4.20e5	9.60e4	1.47e5	3.58e5	2.49e5	1.80e5	1.26e5	1.19e5	7.04e4
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	9.74e5	0.00e0	6.81e6	1.68e6	2.95e6	2.04e6	3.42e5	8.97e5	1.85e6	1.30e6	9.33e5	6.52e5	6.31e5	4.30e5
				NSO-1, # 11.1	10042A	1.34e6	0.00e0	3.22e7	3.59e6	1.09e7	8.00e6	1.34e6	1.54e6	7.76e6	5.72e6	6.60e6	4.24e6	3.97e6	2.50e6
				NSO-1, # 11.1	10042B	1.36e6	0.00e0	3.20e7	3.60e6	1.15e7	7.97e6	1.39e6	1.63e6	8.01e6	5.75e6	6.45e6	4.48e6	4.21e6	2.64e6

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	191 35αβS	35αβR	217 21αα	21ββ	22αα	22ββ	27dβS	27dβR	27dαR	27dαS	28dβS#1	28dβS#2	28dβR#1
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	2.96e6	2.02e6	1.88e6	2.50e6	1.89e6	1.82e6	6.93e6	4.26e6	1.68e6	2.27e6	3.21e6	3.20e6	1.81e6
H6218	7121/5-1	2436	2439	DST 1	35644T	3.43e6	2.29e6	1.81e6	2.31e6	1.80e6	1.78e6	6.54e6	4.01e6	1.66e6	2.14e6	3.01e6	3.02e6	1.72e6
H6219	7122/7-1	1114	1114	MDT 1	35645T	2.14e6	1.47e6	1.66e6	2.00e6	1.54e6	1.24e6	3.76e6	2.24e6	9.43e5	1.26e6	1.65e6	1.59e6	9.31e5
H6220	7122/7-3	1195	1195	MDT 16	35646T	2.59e6	1.81e6	1.89e6	2.34e6	1.82e6	1.45e6	4.46e6	2.68e6	1.10e6	1.42e6	1.95e6	1.91e6	1.12e6
H6221	7122/7-3	1812	1812	MDT 3	35647T	7.68e5	5.54e5	5.56e5	6.29e5	5.60e5	2.98e5	1.93e6	1.19e6	4.57e5	6.78e5	8.05e5	8.12e5	4.70e5
H6222	7128/4-1	1577	1586	DST 2	35648T	7.09e4	5.05e4	2.86e5	2.54e5	2.39e5	1.06e5	4.90e5	2.80e5	1.18e5	1.46e5	1.62e5	1.65e5	8.84e4
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	3.40e5	2.44e5	3.16e5	2.00e5	2.36e5	7.47e4	8.33e5	4.96e5	2.22e5	2.83e5	3.58e5	4.12e5	2.23e5
				NSO-1, # 11.1	10042A	3.81e6	2.54e6	2.61e6	3.20e6	1.81e6	1.89e6	5.89e6	3.65e6	1.51e6	1.96e6	2.81e6	2.76e6	1.60e6
				NSO-1, # 11.1	10042B	4.07e6	2.89e6	2.38e6	2.78e6	1.60e6	1.68e6	5.41e6	3.24e6	1.40e6	1.81e6	2.50e6	2.44e6	1.52e6

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	217 28dβR#2	28dαR	27ααS	27ββR+29dβS	27ββS	28dαS	27ααR	29dβR	29dαR	28ααS	29dαS	28ββR	28ββS
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	2.53e6	1.48e6	2.87e6	6.82e6	4.50e6	1.26e6	2.92e6	4.71e6	2.74e6	1.11e6	2.60e6	3.29e6	5.35e6
H6218	7121/5-1	2436	2439	DST 1	35644T	2.28e6	1.34e6	2.62e6	5.99e6	3.89e6	1.11e6	2.72e6	4.31e6	2.53e6	9.85e5	2.31e6	2.91e6	4.65e6
H6219	7122/7-1	1114	1114	MDT 1	35645T	1.17e6	7.45e5	1.40e6	3.22e6	1.95e6	6.30e5	1.46e6	2.22e6	1.33e6	5.13e5	1.22e6	1.44e6	2.15e6
H6220	7122/7-3	1195	1195	MDT 16	35646T	1.46e6	8.91e5	1.74e6	3.96e6	2.40e6	7.11e5	1.88e6	2.75e6	1.66e6	6.70e5	1.46e6	1.72e6	2.60e6
H6221	7122/7-3	1812	1812	MDT 3	35647T	5.81e5	3.62e5	4.56e5	1.96e6	6.81e5	3.44e5	4.33e5	1.36e6	9.04e5	1.70e5	7.81e5	5.44e5	8.54e5
H6222	7128/4-1	1577	1586	DST 2	35648T	1.04e5	6.57e4	1.29e5	3.65e5	1.34e5	6.87e4	1.63e5	2.09e5	1.18e5	3.22e4	1.15e5	7.41e4	9.94e4
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	2.64e5	1.83e5	1.73e5	8.43e5	1.89e5	1.59e5	2.22e5	5.29e5	3.42e5	8.57e4	3.12e5	1.70e5	2.48e5
				NSO-1, # 11.1	10042A	2.01e6	1.36e6	1.99e6	4.31e6	2.31e6	9.98e5	1.70e6	3.25e6	1.89e6	7.61e5	1.68e6	2.02e6	2.95e6
				NSO-1, # 11.1	10042B	1.82e6	1.26e6	1.78e6	3.84e6	2.12e6	9.21e5	1.61e6	2.97e6	1.64e6	7.04e5	1.57e6	1.84e6	2.66e6

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	217 28ααR	29ααS	29ββR	29ββS	29ααR	30ααS	30ββR	30ββS	30ααR
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	1.72e6	4.26e6	6.38e6	5.93e6	3.56e6	1.91e6	2.10e6	1.40e6	1.08e6
H6218	7121/5-1	2436	2439	DST 1	35644T	1.55e6	3.67e6	5.42e6	5.18e6	3.05e6	1.58e6	1.85e6	1.18e6	9.41e5
H6219	7122/7-1	1114	1114	MDT 1	35645T	8.56e5	2.06e6	2.61e6	2.48e6	1.80e6	8.40e5	8.32e5	5.59e5	5.22e5
H6220	7122/7-3	1195	1195	MDT 16	35646T	1.12e6	2.59e6	3.09e6	3.08e6	2.23e6	1.11e6	1.02e6	6.59e5	6.81e5
H6221	7122/7-3	1812	1812	MDT 3	35647T	2.96e5	7.67e5	1.12e6	9.92e5	7.41e5	2.81e5	3.47e5	2.32e5	1.54e5
H6222	7128/4-1	1577	1586	DST 2	35648T	5.08e4	1.29e5	1.24e5	1.10e5	1.14e5	4.32e4	2.15e4	1.93e4	2.24e4
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	1.34e5	3.55e5	3.21e5	2.70e5	3.30e5	1.51e5	6.76e4	5.72e4	4.85e4
				NSO-1, # 11.1	10042A	1.08e6	2.10e6	2.80e6	2.45e6	1.54e6	1.42e6	1.28e6	8.04e5	7.76e5
				NSO-1, # 11.1	10042B	9.68e5	1.97e6	2.67e6	2.19e6	1.46e6	1.33e6	1.17e6	6.75e5	7.73e5

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	218 27ββR	27ββS	28ββR	28ββS	29ββR	29ββS	30ββR	30ββS
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	7.76e6	6.93e6	5.08e6	6.77e6	1.01e7	9.71e6	2.58e6	2.30e6
H6218	7121/5-1	2436	2439	DST 1	35644T	6.61e6	6.14e6	4.42e6	5.80e6	8.67e6	8.48e6	2.24e6	1.96e6
H6219	7122/7-1	1114	1114	MDT 1	35645T	3.36e6	2.99e6	2.15e6	2.74e6	4.06e6	4.04e6	9.78e5	9.32e5
H6220	7122/7-3	1195	1195	MDT 16	35646T	4.10e6	3.79e6	2.56e6	3.34e6	4.96e6	5.00e6	1.20e6	1.10e6
H6221	7122/7-3	1812	1812	MDT 3	35647T	1.24e6	9.81e5	7.64e5	9.97e5	1.71e6	1.60e6	4.24e5	3.56e5
H6222	7128/4-1	1577	1586	DST 2	35648T	2.12e5	1.80e5	9.00e4	1.16e5	1.71e5	1.57e5	2.08e4	2.15e4
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	3.07e5	2.29e5	2.04e5	2.61e5	4.40e5	4.03e5	7.50e4	7.79e4
				NSO-1, # 11.1	10042A	3.82e6	3.60e6	2.84e6	3.65e6	4.12e6	3.73e6	1.40e6	1.25e6
				NSO-1, # 11.1	10042B	3.63e6	3.23e6	2.57e6	3.30e6	3.86e6	3.33e6	1.28e6	1.13e6

Table 4.16 SAT GC-HRMS (SIR) concentrations (in ng/g topped oil). . (For peak labels, identifications, coeluting compounds etc. see Figure 4.3.)

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	177 25nor28αβ	25nor29αβ	25nor30αβ	25nor31αβ	191 19/3	20/3	21/3	23/3	24/3	25/3R	25/3S	24/4
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	1.86e4	2.68e4	2.14e4	5.45e4	1.38e4	1.48e4	1.81e4	2.97e4	2.93e4	1.13e4	1.19e4	4.01e4
H6218	7121/5-1	2436	2439	DST 1	35644T	1.63e4	2.34e4	1.78e4	5.10e4	1.41e4	1.51e4	1.84e4	2.90e4	3.00e4	1.16e4	1.19e4	4.04e4
H6219	7122/7-1	1114	1114	MDT 1	35645T	9.76e3	1.55e4	1.35e4	3.39e4	2.05e4	1.92e4	2.01e4	2.65e4	2.52e4	8.77e3	9.11e3	2.71e4
H6220	7122/7-3	1195	1195	MDT 16	35646T	1.22e4	1.99e4	1.70e4	4.28e4	2.44e4	2.24e4	2.30e4	3.09e4	2.88e4	9.79e3	1.03e4	3.18e4
H6221	7122/7-3	1812	1812	MDT 3	35647T	3.57e3	2.24e3	0.00e0	1.28e4	8.32e3	7.53e3	1.51e4	2.75e4	2.52e4	1.07e4	1.18e4	6.61e3
H6222	7128/4-1	1577	1586	DST 2	35648T	1.66e3	0.00e0	0.00e0	2.16e3	1.17e4	1.26e4	1.10e4	1.70e4	1.09e4	3.93e3	3.94e3	8.23e3
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	1.86e3	9.57e2	0.00e0	5.90e3	4.82e3	6.35e3	1.14e4	1.83e4	1.31e4	5.39e3	5.85e3	5.18e3
				NSO-1, # 11.1	10042A	3.97e4	3.16e4	2.99e4	3.91e4	1.03e4	1.12e4	1.53e4	2.38e4	1.96e4	9.96e3	1.01e4	2.09e4
				NSO-1, # 11.1	10042B	4.37e4	3.38e4	3.37e4	4.17e4	1.14e4	1.23e4	1.65e4	2.52e4	2.18e4	1.10e4	1.14e4	2.30e4

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	191 26/3R	26/3S	28/3R	28/3S	29/3R	29/3S	27Ts	27Tm	30/3R	30/3S	28αβ	25nor30αβ	29αβ	29Ts	30d
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	1.43e4	1.31e4	1.50e4	1.41e4	1.96e4	1.85e4	1.13e5	1.09e5	1.46e4	1.59e4	4.13e4	2.61e4	3.41e5	1.19e5	6.05e4
H6218	7121/5-1	2436	2439	DST 1	35644T	1.33e4	1.34e4	1.45e4	1.36e4	1.87e4	1.83e4	1.02e5	1.06e5	1.37e4	1.52e4	3.90e4	2.20e4	3.23e5	1.13e5	5.66e4
H6219	7122/7-1	1114	1114	MDT 1	35645T	1.00e4	9.41e3	8.97e3	8.18e3	1.12e4	1.07e4	6.66e4	6.98e4	7.77e3	7.88e3	2.37e4	1.62e4	2.20e5	6.98e4	3.27e4
H6220	7122/7-3	1195	1195	MDT 16	35646T	1.15e4	1.09e4	1.00e4	9.70e3	1.21e4	1.19e4	7.19e4	8.31e4	8.41e3	9.30e3	2.93e4	2.10e4	2.73e5	7.78e4	3.76e4
H6221	7122/7-3	1812	1812	MDT 3	35647T	1.36e4	1.44e4	1.71e4	1.79e4	2.08e4	2.01e4	6.13e4	1.42e4	1.46e4	1.39e4	5.22e3	0.00e0	4.57e4	4.85e4	5.09e4
H6222	7128/4-1	1577	1586	DST 2	35648T	4.39e3	4.18e3	4.34e3	4.16e3	4.06e3	3.70e3	9.65e3	7.84e3	2.75e3	2.74e3	1.20e3	0.00e0	1.92e4	7.87e3	5.73e3
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	6.66e3	6.45e3	7.67e3	7.46e3	7.20e3	6.67e3	1.01e4	2.08e4	5.28e3	4.75e3	1.73e3	0.00e0	5.93e4	1.36e4	9.84e3
				NSO-1, # 11.1	10042A	8.06e3	7.92e3	8.42e3	7.35e3	1.22e4	1.17e4	6.65e4	5.91e4	1.09e4	1.17e4	1.07e5	3.71e4	1.63e5	6.88e4	3.63e4
				NSO-1, # 11.1	10042B	9.13e3	8.78e3	8.90e3	8.57e3	1.36e4	1.31e4	7.29e4	6.39e4	1.14e4	1.32e4	1.21e5	4.23e4	1.76e5	7.27e4	3.90e4

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	191 29βα	30O	30αβ	30βα	31αβS	31αβR	30G	31βα	32αβS	32αβR	33αβS	33αβR	34αβS	34αβR
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	2.50e4	0.00e0	6.80e5	6.08e4	2.19e5	1.52e5	2.15e4	2.68e4	1.38e5	9.71e4	9.91e4	6.52e4	5.88e4	3.86e4
H6218	7121/5-1	2436	2439	DST 1	35644T	2.44e4	0.00e0	6.65e5	5.71e4	2.27e5	1.58e5	1.97e4	2.58e4	1.47e5	9.91e4	1.01e5	6.74e4	6.27e4	4.23e4
H6219	7122/7-1	1114	1114	MDT 1	35645T	1.82e4	0.00e0	4.28e5	4.57e4	1.51e5	1.03e5	1.23e4	1.91e4	1.02e5	7.17e4	7.46e4	4.98e4	4.61e4	3.05e4
H6220	7122/7-3	1195	1195	MDT 16	35646T	2.31e4	0.00e0	5.37e5	5.58e4	1.76e5	1.22e5	1.47e4	2.24e4	1.16e5	8.00e4	8.55e4	5.76e4	5.29e4	3.70e4
H6221	7122/7-3	1812	1812	MDT 3	35647T	4.81e3	0.00e0	1.62e5	1.85e4	4.77e4	3.55e4	1.12e4	1.73e4	3.68e4	2.69e4	2.67e4	1.79e4	1.74e4	1.33e4
H6222	7128/4-1	1577	1586	DST 2	35648T	1.91e3	0.00e0	2.74e4	4.63e3	1.13e4	8.11e3	1.85e3	2.84e3	6.91e3	4.81e3	3.47e3	2.44e3	2.29e3	1.36e3
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	1.08e4	0.00e0	7.52e4	1.85e4	3.25e4	2.25e4	3.78e3	9.90e3	2.04e4	1.44e4	1.03e4	7.20e3	6.97e3	4.74e3
				NSO-1, # 11.1	10042A	1.79e4	0.00e0	4.31e5	4.80e4	1.45e5	1.07e5	1.80e4	2.06e4	1.04e5	7.65e4	8.84e4	5.67e4	5.31e4	3.35e4
				NSO-1, # 11.1	10042B	1.95e4	0.00e0	4.62e5	5.19e4	1.65e5	1.15e5	2.00e4	2.34e4	1.15e5	8.29e4	9.29e4	6.45e4	6.06e4	3.81e4

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	191 35αβS	35αβR	217 21αα	21ββ	22αα	22ββ	27dβS	27dβR	27dαR	27dαS	28dβS#1	28dβS#2	28dβR#1
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	3.53e4	2.40e4	2.24e4	2.97e4	2.26e4	2.17e4	8.25e4	5.07e4	2.00e4	2.70e4	3.82e4	3.81e4	2.16e4
H6218	7121/5-1	2436	2439	DST 1	35644T	4.26e4	2.85e4	2.25e4	2.88e4	2.24e4	2.22e4	8.13e4	4.98e4	2.06e4	2.66e4	3.74e4	3.75e4	2.14e4
H6219	7122/7-1	1114	1114	MDT 1	35645T	2.90e4	1.98e4	2.24e4	2.71e4	2.09e4	1.67e4	5.10e4	3.03e4	1.28e4	1.70e4	2.23e4	2.16e4	1.26e4
H6220	7122/7-3	1195	1195	MDT 16	35646T	3.31e4	2.31e4	2.42e4	2.99e4	2.32e4	1.85e4	5.69e4	3.43e4	1.40e4	1.81e4	2.49e4	2.44e4	1.43e4
H6221	7122/7-3	1812	1812	MDT 3	35647T	1.04e4	7.53e3	7.56e3	8.55e3	7.61e3	4.05e3	2.62e4	1.62e4	6.22e3	9.22e3	1.09e4	1.10e4	6.40e3
H6222	7128/4-1	1577	1586	DST 2	35648T	1.37e3	9.75e2	5.53e3	4.91e3	4.62e3	2.05e3	9.47e3	5.40e3	2.28e3	2.82e3	3.12e3	3.18e3	1.71e3
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	3.76e3	2.70e3	3.49e3	2.21e3	2.60e3	8.24e2	9.20e3	5.47e3	2.45e3	3.12e3	3.96e3	4.55e3	2.46e3
				NSO-1, # 11.1	10042A	5.09e4	3.40e4	3.49e4	4.28e4	2.42e4	2.53e4	7.88e4	4.89e4	2.02e4	2.62e4	3.75e4	3.69e4	2.14e4
				NSO-1, # 11.1	10042B	5.87e4	4.16e4	3.42e4	4.00e4	2.30e4	2.41e4	7.79e4	4.67e4	2.01e4	2.61e4	3.60e4	3.52e4	2.19e4

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	217 28dβR#2	28dαR	27ααS	27ββR+29dβS	27ββS	28dαS	27ααR	29dβR	29dαR	28ααS	29dαS	28βββR	28βββS
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	3.02e4	1.76e4	3.41e4	8.12e4	5.36e4	1.49e4	3.48e4	5.60e4	3.26e4	1.33e4	3.09e4	3.92e4	6.37e4
H6218	7121/5-1	2436	2439	DST 1	35644T	2.84e4	1.66e4	3.26e4	7.44e4	4.84e4	1.38e4	3.38e4	5.36e4	3.14e4	1.22e4	2.88e4	3.62e4	5.77e4
H6219	7122/7-1	1114	1114	MDT 1	35645T	1.58e4	1.01e4	1.90e4	4.37e4	2.64e4	8.54e3	1.98e4	3.00e4	1.80e4	6.95e3	1.66e4	1.95e4	2.91e4
H6220	7122/7-3	1195	1195	MDT 16	35646T	1.87e4	1.14e4	2.22e4	5.05e4	3.06e4	9.09e3	2.40e4	3.52e4	2.12e4	8.56e3	1.87e4	2.19e4	3.32e4
H6221	7122/7-3	1812	1812	MDT 3	35647T	7.91e3	4.92e3	6.20e3	2.66e4	9.27e3	4.68e3	5.90e3	1.85e4	1.23e4	2.31e3	1.06e4	7.40e3	1.16e4
H6222	7128/4-1	1577	1586	DST 2	35648T	2.01e3	1.27e3	2.48e3	7.04e3	2.58e3	1.33e3	3.14e3	4.04e3	2.27e3	6.22e2	2.22e3	1.43e3	1.92e3
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	2.92e3	2.03e3	1.91e3	9.31e3	2.08e3	1.76e3	2.45e3	5.84e3	3.78e3	9.46e2	3.45e3	1.88e3	2.73e3
				NSO-1, # 11.1	10042A	2.68e4	1.82e4	2.66e4	5.76e4	3.09e4	1.34e4	2.28e4	4.35e4	2.53e4	1.02e4	2.25e4	2.70e4	3.95e4
				NSO-1, # 11.1	10042B	2.62e4	1.81e4	2.56e4	5.53e4	3.06e4	1.33e4	2.32e4	4.28e4	2.37e4	1.01e4	2.26e4	2.65e4	3.84e4

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	28ααR	217 29ααS	29ββR	29βββS	29ααR	30ααS	30βββR	30βββS	30ααR
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	2.05e4	5.07e4	7.60e4	7.06e4	4.24e4	2.27e4	2.50e4	1.66e4	1.29e4
H6218	7121/5-1	2436	2439	DST 1	35644T	1.93e4	4.57e4	6.74e4	6.44e4	3.79e4	1.96e4	2.30e4	1.47e4	1.17e4
H6219	7122/7-1	1114	1114	MDT 1	35645T	1.16e4	2.79e4	3.53e4	3.36e4	2.44e4	1.14e4	1.13e4	7.56e3	7.07e3
H6220	7122/7-3	1195	1195	MDT 16	35646T	1.43e4	3.31e4	3.95e4	3.94e4	2.85e4	1.41e4	1.30e4	8.42e3	8.70e3
H6221	7122/7-3	1812	1812	MDT 3	35647T	4.03e3	1.04e4	1.53e4	1.35e4	1.01e4	3.83e3	4.72e3	3.16e3	2.09e3
H6222	7128/4-1	1577	1586	DST 2	35648T	9.81e2	2.49e3	2.39e3	2.12e3	2.21e3	8.34e2	4.15e2	3.72e2	4.33e2
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	1.48e3	3.92e3	3.54e3	2.98e3	3.64e3	1.67e3	7.47e2	6.32e2	5.36e2
				NSO-1, # 11.1	10042A	1.44e4	2.81e4	3.75e4	3.28e4	2.06e4	1.90e4	1.71e4	1.08e4	1.04e4
				NSO-1, # 11.1	10042B	1.39e4	2.83e4	3.85e4	3.16e4	2.11e4	1.92e4	1.69e4	9.72e3	1.11e4

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	218 27ββR	27ββS	28ββR	28ββS	29ββR	29ββS	30ββR	30ββS
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	9.24e4	8.25e4	6.05e4	8.06e4	1.20e5	1.16e5	3.07e4	2.73e4
H6218	7121/5-1	2436	2439	DST 1	35644T	8.22e4	7.64e4	5.50e4	7.21e4	1.08e5	1.05e5	2.78e4	2.44e4
H6219	7122/7-1	1114	1114	MDT 1	35645T	4.55e4	4.05e4	2.91e4	3.71e4	5.50e4	5.47e4	1.32e4	1.26e4
H6220	7122/7-3	1195	1195	MDT 16	35646T	5.24e4	4.84e4	3.27e4	4.27e4	6.34e4	6.38e4	1.53e4	1.41e4
H6221	7122/7-3	1812	1812	MDT 3	35647T	1.69e4	1.33e4	1.04e4	1.36e4	2.33e4	2.18e4	5.77e3	4.84e3
H6222	7128/4-1	1577	1586	DST 2	35648T	4.09e3	3.47e3	1.74e3	2.24e3	3.29e3	3.02e3	4.01e2	4.14e2
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	3.39e3	2.53e3	2.26e3	2.88e3	4.86e3	4.45e3	8.28e2	8.60e2
				NSO-1, # 11.1	10042A	5.11e4	4.82e4	3.80e4	4.89e4	5.51e4	4.99e4	1.88e4	1.68e4
				NSO-1, # 11.1	10042B	5.23e4	4.65e4	3.70e4	4.75e4	5.55e4	4.80e4	1.84e4	1.63e4

Table 4.17 ARO GC-HRMS SIR peak heights.

For peak labels and identifications see Figure 4.4.

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	142 2-MN	1-MN	156 2-EN	1-EN	2,6-DMN	2,7-DMN	1,3- + 1,7-DMN	1,6-DMN	2,3- + 1,4-DMN	1,5-DMN	1,2-DMN	1,8-DMN
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	5.47e8	3.58e8	4.94e7	1.52e7	1.41e8	1.36e8	3.10e8	2.63e8	1.02e8	4.80e7	4.19e7	1.59e5
H6218	7121/5-1	2436	2439	DST 1	35644T	5.54e8	3.68e8	5.00e7	1.61e7	1.41e8	1.36e8	3.17e8	2.62e8	1.02e8	5.03e7	4.28e7	1.56e5
H6219	7122/7-1	1114	1114	MDT 1	35645T	8.80e8	5.04e8	6.93e7	3.14e7	1.92e8	1.85e8	4.08e8	3.15e8	1.38e8	6.32e7	6.48e7	9.79e5
H6220	7122/7-3	1195	1195	MDT 16	35646T	1.09e9	3.67e8	8.00e7	3.55e7	2.19e8	2.16e8	4.66e8	2.39e8	1.66e8	7.14e7	7.64e7	1.24e6
H6221	7122/7-3	1812	1812	MDT 3	35647T	6.05e8	3.66e8	4.98e7	2.33e7	1.15e8	1.18e8	2.73e8	2.05e8	9.26e7	3.73e7	3.87e7	8.22e5
H6222	7128/4-1	1577	1586	DST 2	35648T	7.95e8	4.70e8	5.21e7	2.69e7	1.60e8	1.69e8	3.38e8	2.34e8	1.08e8	4.09e7	4.47e7	3.70e5
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	2.98e8	1.73e8	2.08e7	1.06e7	7.62e7	7.80e7	1.73e8	1.05e8	5.10e7	2.10e7	1.90e7	4.81e5
				NSO-1, # 11.1	10042A	4.05e8	2.91e8	3.42e7	1.66e7	9.33e7	9.95e7	2.40e8	1.75e8	7.59e7	4.20e7	3.03e7	5.39e5
				NSO-1, # 11.1	10042B	3.81e8	2.77e8	3.33e7	1.65e7	9.28e7	1.02e8	2.46e8	1.77e8	7.58e7	4.30e7	3.14e7	5.59e5

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	170 1,3,7-TMN	1,3,6-TMN	1,3,5- + 1,4,6-TMN	2,3,6-TMN	1,2,7-TMN	1,6,7 + 1,2,6-TMN	1,2,4-TMN	1,2,5-TMN	178 P	192 3-MP	2-MP	9-MP
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	9.32e7	1.21e8	1.00e8	8.51e7	2.23e7	7.49e7	1.09e7	4.68e7	1.58e8	8.82e7	1.01e8	1.42e8
H6218	7121/5-1	2436	2439	DST 1	35644T	9.30e7	1.28e8	1.01e8	8.65e7	2.32e7	7.79e7	1.13e7	4.91e7	1.53e8	8.26e7	9.35e7	1.35e8
H6219	7122/7-1	1114	1114	MDT 1	35645T	1.19e8	1.51e8	1.27e8	1.04e8	3.27e7	9.10e7	1.78e7	7.55e7	1.07e8	5.25e7	5.44e7	7.10e7
H6220	7122/7-3	1195	1195	MDT 16	35646T	1.47e8	1.79e8	1.58e8	1.27e8	3.88e7	1.13e8	2.05e7	9.05e7	1.34e8	6.60e7	6.96e7	8.78e7
H6221	7122/7-3	1812	1812	MDT 3	35647T	8.20e7	1.10e8	7.61e7	6.95e7	1.68e7	5.81e7	8.80e6	2.86e7	9.50e7	3.67e7	3.99e7	5.96e7
H6222	7128/4-1	1577	1586	DST 2	35648T	1.05e8	1.30e8	8.44e7	9.01e7	2.09e7	6.40e7	1.05e7	2.84e7	1.11e8	5.32e7	5.01e7	5.87e7
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	6.31e7	7.32e7	5.00e7	4.86e7	1.06e7	3.60e7	5.24e6	1.58e7	4.04e7	1.66e7	1.60e7	2.43e7
				NSO-1, # 11.1	10042A	6.53e7	8.65e7	7.56e7	5.16e7	1.61e7	4.81e7	9.17e6	2.97e7	9.64e7	4.67e7	5.08e7	7.75e7
				NSO-1, # 11.1	10042B	7.28e7	9.30e7	8.41e7	5.72e7	1.80e7	5.45e7	9.99e6	3.27e7	1.11e8	5.21e7	5.66e7	8.63e7

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	192 1-MP	206 2-EP+9-EP+3,6-DMP	1-EP	2,6- + 2,7- + 3,5-DMP	1,3- + 2,10- + 3,9- + 3,10-DMP	1,6- + 2,5- + 2,9-DMP	1,7-DMP	2,3-DMP	1,9- + 4,9- + 4,10-DMP	1,8-DMP	1,2-DMP	219 Retene
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	1.08e8	1.71e7	2.97e7	1.83e7	1.25e8	5.68e7	6.60e7	2.07e7	3.41e7	1.44e7	9.26e6	2.38e7
H6218	7121/5-1	2436	2439	DST 1	35644T	9.97e7	1.60e7	2.62e7	1.59e7	1.09e8	5.02e7	5.96e7	1.71e7	3.18e7	1.33e7	8.92e6	2.27e7
H6219	7122/7-1	1114	1114	MDT 1	35645T	5.51e7	1.05e7	1.48e7	7.99e6	5.34e7	2.52e7	2.96e7	8.94e6	1.66e7	6.40e6	5.19e6	1.94e7
H6220	7122/7-3	1195	1195	MDT 16	35646T	6.91e7	1.29e7	2.01e7	1.11e7	7.06e7	3.24e7	3.81e7	1.17e7	2.09e7	8.04e6	6.01e6	2.74e7
H6221	7122/7-3	1812	1812	MDT 3	35647T	3.88e7	8.03e6	1.05e7	5.93e6	4.35e7	1.87e7	2.18e7	7.03e6	1.29e7	5.36e6	3.29e6	1.75e7
H6222	7128/4-1	1577	1586	DST 2	35648T	3.48e7	1.07e7	1.56e7	8.02e6	4.40e7	1.88e7	1.49e7	8.24e6	1.01e7	3.69e6	2.90e6	1.07e6
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	1.61e7	3.87e6	5.67e6	2.73e6	1.86e7	8.32e6	6.60e6	3.70e6	5.64e6	2.13e6	1.37e6	2.63e6
				NSO-1, # 11.1	10042A	5.95e7	9.90e6	1.44e7	7.95e6	6.34e7	2.86e7	3.13e7	9.13e6	1.97e7	8.57e6	4.88e6	3.32e7
				NSO-1, # 11.1	10042B	6.63e7	1.09e7	1.46e7	8.04e6	6.58e7	2.98e7	3.62e7	9.96e6	2.14e7	8.89e6	5.52e6	3.30e7

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	184 DBT	198 4-MDBT	(3+2)-MDBT	1-MDBT	253 C21MA	C22MA	βSC27MA	βSC27DMA	βRC27MA+ βRC27DMA	αSC27MA	βSC28MA+ βSC28DMA+ αRC27DMA
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	5.02e7	7.64e7	4.44e7	2.01e7	2.29e6	1.87e6	3.44e5	2.89e6	2.17e6	4.54e5	3.48e6
H6218	7121/5-1	2436	2439	DST 1	35644T	5.21e7	7.74e7	4.52e7	2.06e7	2.22e6	1.91e6	2.91e5	2.76e6	2.32e6	3.76e5	3.45e6
H6219	7122/7-1	1114	1114	MDT 1	35645T	4.12e7	6.15e7	3.18e7	1.54e7	1.85e6	1.49e6	3.82e5	3.07e6	2.23e6	4.78e5	4.06e6
H6220	7122/7-3	1195	1195	MDT 16	35646T	3.97e7	5.40e7	3.24e7	1.39e7	2.28e6	1.83e6	4.96e5	3.81e6	3.10e6	6.16e5	5.25e6
H6221	7122/7-3	1812	1812	MDT 3	35647T	9.34e6	9.01e6	6.22e6	2.15e6	7.14e5	5.56e5	9.29e4	3.64e5	2.50e5	1.61e5	4.41e5
H6222	7128/4-1	1577	1586	DST 2	35648T	2.57e7	1.59e7	1.03e7	3.19e6	3.74e5	2.93e5	6.01e4	1.57e5	1.18e5	6.55e4	1.61e5
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	5.09e6	3.45e6	1.92e6	7.69e5	1.33e5	1.09e5	3.01e4	1.05e5	6.56e4	3.43e4	1.60e5
				NSO-1, # 11.1	10042A	1.46e7	2.24e7	1.06e7	8.18e6	2.45e6	1.69e6	1.21e6	2.89e6	2.69e6	1.27e6	4.67e6
				NSO-1, # 11.1	10042B	1.85e7	2.47e7	1.20e7	9.11e6	1.85e6	1.27e6	8.39e5	2.17e6	2.02e6	9.58e5	3.46e6

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	253 αSC27DMA	αRC27MA	αSC28MA	βRC28MA+ βRC28DMA	βSC29MA+ βSC29DMA	αSC29MA	αRC28MA+ βRC29MA+ βRC29DMA	αRC29MA
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	6.54e5	3.13e5	5.60e5	2.58e6	3.26e6	3.53e5	2.22e6	2.20e5
H6218	7121/5-1	2436	2439	DST 1	35644T	6.45e5	2.35e5	4.94e5	2.63e6	3.23e6	3.07e5	2.18e6	1.88e5
H6219	7122/7-1	1114	1114	MDT 1	35645T	7.59e5	3.42e5	5.73e5	2.72e6	3.40e6	4.87e5	2.35e6	3.28e5
H6220	7122/7-3	1195	1195	MDT 16	35646T	9.17e5	5.04e5	7.46e5	3.47e6	4.28e6	6.79e5	3.00e6	4.94e5
H6221	7122/7-3	1812	1812	MDT 3	35647T	1.22e5	1.27e5	1.79e5	2.83e5	7.35e5	2.42e5	5.33e5	1.53e5
H6222	7128/4-1	1577	1586	DST 2	35648T	2.36e4	4.05e4	4.62e4	8.48e4	1.47e5	4.56e4	9.12e4	2.94e4
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	4.55e4	1.98e4	3.84e4	1.05e5	2.57e5	4.57e4	1.72e5	2.73e4
				NSO-1, # 11.1	10042A	5.93e5	1.09e6	1.78e6	3.19e6	3.30e6	1.06e6	2.53e6	7.75e5
				NSO-1, # 11.1	10042B	4.24e5	8.52e5	1.22e6	2.34e6	2.37e6	7.49e5	1.87e6	5.81e5

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	231 C20TA	C21TA	SC26TA	RC26TA+ SC27TA	SC28TA	RC27TA	RC28TA
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	5.63e6	7.06e6	1.48e6	5.84e6	3.83e6	2.77e6	4.41e6
H6218	7121/5-1	2436	2439	DST 1	35644T	5.12e6	6.31e6	1.32e6	5.45e6	3.57e6	2.60e6	4.26e6
H6219	7122/7-1	1114	1114	MDT 1	35645T	3.20e6	3.52e6	2.58e6	7.35e6	4.05e6	3.01e6	4.71e6
H6220	7122/7-3	1195	1195	MDT 16	35646T	4.00e6	4.52e6	3.72e6	1.01e7	5.61e6	4.06e6	6.46e6
H6221	7122/7-3	1812	1812	MDT 3	35647T	1.46e6	1.06e6	3.73e5	8.80e5	9.49e5	3.63e5	1.00e6
H6222	7128/4-1	1577	1586	DST 2	35648T	9.13e5	6.01e5	2.11e5	3.74e5	1.78e5	1.17e5	1.88e5
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	5.14e5	2.56e5	1.54e5	3.95e5	3.69e5	1.58e5	3.70e5
				NSO-1, # 11.1	10042A	4.36e6	4.81e6	4.47e6	1.31e7	5.37e6	5.41e6	6.20e6
				NSO-1, # 11.1	10042B	4.10e6	4.55e6	4.07e6	1.23e7	5.14e6	4.89e6	5.82e6

Table 4.18 ARO GC-HRMS SIR concentrations (in ng/g topped oil).

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	142 2-MN	1-MN	156 2-EN	1-EN	2,6-DMN	2,7-DMN	1,3- + 1,7-DMN	1,6-DMN	2,3- + 1,4-DMN	1,5-DMN	1,2-DMN	1,8-DMN
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	1.50e6	9.84e5	1.36e5	4.18e4	3.88e5	3.75e5	8.53e5	7.23e5	2.79e5	1.32e5	1.15e5	4.38e2
H6218	7121/5-1	2436	2439	DST 1	35644T	1.57e6	1.04e6	1.41e5	4.57e4	4.00e5	3.85e5	8.98e5	7.40e5	2.89e5	1.42e5	1.21e5	4.41e2
H6219	7122/7-1	1114	1114	MDT 1	35645T	3.21e6	1.84e6	2.53e5	1.15e5	7.00e5	6.75e5	1.49e6	1.15e6	5.03e5	2.31e5	2.37e5	3.58e3
H6220	7122/7-3	1195	1195	MDT 16	35646T	3.11e6	1.04e6	2.27e5	1.01e5	6.21e5	6.12e5	1.32e6	6.80e5	4.72e5	2.03e5	2.17e5	3.51e3
H6221	7122/7-3	1812	1812	MDT 3	35647T	1.90e6	1.15e6	1.57e5	7.32e4	3.63e5	3.70e5	8.60e5	6.45e5	2.91e5	1.17e5	1.22e5	2.59e3
H6222	7128/4-1	1577	1586	DST 2	35648T	2.81e6	1.66e6	1.84e5	9.51e4	5.65e5	5.97e5	1.19e6	8.28e5	3.82e5	1.45e5	1.58e5	1.31e3
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	9.61e5	5.59e5	6.73e4	3.42e4	2.46e5	2.52e5	5.58e5	3.38e5	1.65e5	6.78e4	6.14e4	1.55e3
				NSO-1, # 11.1	10042A	1.32e6	9.49e5	1.12e5	5.41e4	3.05e5	3.25e5	7.82e5	5.71e5	2.48e5	1.37e5	9.88e4	1.76e3
				NSO-1, # 11.1	10042B	1.49e6	1.08e6	1.30e5	6.44e4	3.63e5	3.98e5	9.63e5	6.93e5	2.97e5	1.68e5	1.23e5	2.19e3

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	170 1,3,7-TMN	1,3,6-TMN	1,3,5- + 1,4,6-TMN	2,3,6-TMN	1,2,7-TMN	1,6,7 + 1,2,6-TMN	1,2,4-TMN	1,2,5-TMN	178 P	192 3-MP	2-MP	9-MP
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	2.56e5	3.34e5	2.76e5	2.34e5	6.14e4	2.06e5	3.00e4	1.29e5	3.79e5	2.11e5	2.43e5	3.39e5
H6218	7121/5-1	2436	2439	DST 1	35644T	2.63e5	3.63e5	2.86e5	2.45e5	6.55e4	2.20e5	3.20e4	1.39e5	3.70e5	2.00e5	2.26e5	3.26e5
H6219	7122/7-1	1114	1114	MDT 1	35645T	4.36e5	5.52e5	4.64e5	3.78e5	1.20e5	3.32e5	6.51e4	2.76e5	2.80e5	1.38e5	1.43e5	1.86e5
H6220	7122/7-3	1195	1195	MDT 16	35646T	4.16e5	5.07e5	4.48e5	3.62e5	1.10e5	3.21e5	5.82e4	2.57e5	3.00e5	1.48e5	1.56e5	1.97e5
H6221	7122/7-3	1812	1812	MDT 3	35647T	2.58e5	3.46e5	2.40e5	2.19e5	5.28e4	1.83e5	2.77e4	9.00e4	2.43e5	9.36e4	1.02e5	1.52e5
H6222	7128/4-1	1577	1586	DST 2	35648T	3.71e5	4.59e5	2.98e5	3.18e5	7.39e4	2.26e5	3.70e4	1.00e5	2.91e5	1.39e5	1.31e5	1.53e5
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	2.03e5	2.36e5	1.61e5	1.57e5	3.42e4	1.16e5	1.69e4	5.08e4	1.09e5	4.46e4	4.31e4	6.54e4
				NSO-1, # 11.1	10042A	2.13e5	2.82e5	2.47e5	1.68e5	5.26e4	1.57e5	2.99e4	9.70e4	2.95e5	1.43e5	1.55e5	2.37e5
				NSO-1, # 11.1	10042B	2.85e5	3.64e5	3.29e5	2.24e5	7.05e4	2.14e5	3.91e4	1.28e5	2.93e5	1.38e5	1.50e5	2.29e5

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	192 1-MP	206 2-EP+9-EP+3,6-DMP	1-EP	2,6- + 2,7- + 3,5-DMP	1,3- + 2,10- + 3,9- + 3,10-DMP	1,6- + 2,5- + 2,9-DMP	1,7-DMP	2,3-DMP	1,9- + 4,9- + 4,10-DMP	1,8-DMP	1,2-DMP	219 Retene
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	2.58e5	4.10e4	7.11e4	4.37e4	3.00e5	1.36e5	1.58e5	4.96e4	8.15e4	3.45e4	2.22e4	5.69e4
H6218	7121/5-1	2436	2439	DST 1	35644T	2.41e5	3.87e4	6.33e4	3.85e4	2.63e5	1.22e5	1.44e5	4.14e4	7.69e4	3.23e4	2.16e4	5.50e4
H6219	7122/7-1	1114	1114	MDT 1	35645T	1.45e5	2.75e4	3.89e4	2.09e4	1.40e5	6.62e4	7.77e4	2.34e4	4.35e4	1.68e4	1.36e4	5.08e4
H6220	7122/7-3	1195	1195	MDT 16	35646T	1.55e5	2.89e4	4.50e4	2.48e4	1.58e5	7.25e4	8.54e4	2.61e4	4.67e4	1.80e4	1.35e4	6.14e4
H6221	7122/7-3	1812	1812	MDT 3	35647T	9.90e4	2.05e4	2.68e4	1.52e4	1.11e5	4.77e4	5.56e4	1.80e4	3.30e4	1.37e4	8.41e3	4.48e4
H6222	7128/4-1	1577	1586	DST 2	35648T	9.06e4	2.79e4	4.07e4	2.09e4	1.15e5	4.89e4	3.89e4	2.15e4	2.63e4	9.61e3	7.57e3	2.79e3
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	4.33e4	1.04e4	1.52e4	7.35e3	5.01e4	2.23e4	1.77e4	9.94e3	1.52e4	5.72e3	3.69e3	7.07e3
				NSO-1, # 11.1	10042A	1.82e5	3.03e4	4.39e4	2.43e4	1.94e5	8.76e4	9.58e4	2.79e4	6.03e4	2.62e4	1.49e4	1.01e5
				NSO-1, # 11.1	10042B	1.76e5	2.90e4	3.87e4	2.13e4	1.75e5	7.90e4	9.60e4	2.64e4	5.67e4	2.36e4	1.46e4	8.76e4

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	184 DBT	198 4-MDBT	(3+2)-MDBT	1-MDBT	253 C21MA	C22MA	βSC27MA	βSC27DMA	βRC27MA+ βRC27DMA	αSC27MA	βSC28MA+ βSC28DMA + αRC27DMA
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	1.20e5	1.83e5	1.06e5	4.81e4	5.03e3	4.09e3	7.54e2	6.35e3	4.76e3	9.96e2	7.64e3
H6218	7121/5-1	2436	2439	DST 1	35644T	1.26e5	1.87e5	1.09e5	4.98e4	5.09e3	4.39e3	6.68e2	6.36e3	5.33e3	8.64e2	7.94e3
H6219	7122/7-1	1114	1114	MDT 1	35645T	1.08e5	1.61e5	8.34e4	4.05e4	5.46e3	4.41e3	1.13e3	9.07e3	6.59e3	1.41e3	1.20e4
H6220	7122/7-3	1195	1195	MDT 16	35646T	8.88e4	1.21e5	7.25e4	3.10e4	5.42e3	4.37e3	1.18e3	9.07e3	7.39e3	1.47e3	1.25e4
H6221	7122/7-3	1812	1812	MDT 3	35647T	2.39e4	2.30e4	1.59e4	5.48e3	1.94e3	1.51e3	2.53e2	9.91e2	6.81e2	4.37e2	1.20e3
H6222	7128/4-1	1577	1586	DST 2	35648T	6.69e4	4.15e4	2.68e4	8.30e3	1.23e3	9.58e2	1.97e2	5.14e2	3.88e2	2.14e2	5.28e2
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	1.37e4	9.26e3	5.15e3	2.07e3	4.59e2	3.77e2	1.04e2	3.62e2	2.27e2	1.18e2	5.52e2
				NSO-1, # 11.1	10042A	4.47e4	6.87e4	3.24e4	2.50e4	7.52e3	5.19e3	3.71e3	8.87e3	8.26e3	3.89e3	1.43e4
				NSO-1, # 11.1	10042B	4.90e4	6.54e4	3.19e4	2.42e4	5.97e3	4.10e3	2.71e3	7.02e3	6.55e3	3.10e3	1.12e4

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	253 αSC27DMA	αRC27MA	αSC28MA	βRC28MA+ βRC28DMA	βSC29MA+ βSC29DMA	αSC29MA	αRC28MA+ βRC29MA+ βRC29DMA	αRC29MA
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	1.44e3	6.88e2	1.23e3	5.67e3	7.14e3	7.76e2	4.86e3	4.82e2
H6218	7121/5-1	2436	2439	DST 1	35644T	1.48e3	5.39e2	1.13e3	6.05e3	7.42e3	7.06e2	5.00e3	4.32e2
H6219	7122/7-1	1114	1114	MDT 1	35645T	2.25e3	1.01e3	1.70e3	8.05e3	1.00e4	1.44e3	6.96e3	9.69e2
H6220	7122/7-3	1195	1195	MDT 16	35646T	2.18e3	1.20e3	1.78e3	8.27e3	1.02e4	1.62e3	7.15e3	1.18e3
H6221	7122/7-3	1812	1812	MDT 3	35647T	3.31e2	3.46e2	4.87e2	7.70e2	2.00e3	6.57e2	1.45e3	4.16e2
H6222	7128/4-1	1577	1586	DST 2	35648T	7.72e1	1.33e2	1.51e2	2.78e2	4.81e2	1.49e2	2.99e2	9.62e1
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	1.57e2	6.84e1	1.33e2	3.62e2	8.90e2	1.58e2	5.96e2	9.44e1
				NSO-1, # 11.1	10042A	1.82e3	3.34e3	5.45e3	9.77e3	1.01e4	3.25e3	7.77e3	2.38e3
				NSO-1, # 11.1	10042B	1.37e3	2.75e3	3.95e3	7.56e3	7.68e3	2.42e3	6.03e3	1.88e3

Sample-ID	Well	Upper depth (m)	Lower depth (m)	Sample name	m/z APT ID	231 C20TA	C21TA	SC26TA	RC26TA+ SC27TA	SC28TA	RC27TA	RC28TA
H6217	7120/6-1	2432.05	2436.05	DST 2	35643T	1.24e4	1.55e4	3.26e3	1.28e4	8.40e3	6.07e3	9.68e3
H6218	7121/5-1	2436	2439	DST 1	35644T	1.18e4	1.45e4	3.03e3	1.25e4	8.21e3	5.98e3	9.78e3
H6219	7122/7-1	1114	1114	MDT 1	35645T	9.47e3	1.04e4	7.62e3	2.17e4	1.20e4	8.91e3	1.39e4
H6220	7122/7-3	1195	1195	MDT 16	35646T	9.52e3	1.08e4	8.85e3	2.40e4	1.34e4	9.67e3	1.54e4
H6221	7122/7-3	1812	1812	MDT 3	35647T	3.98e3	2.89e3	1.02e3	2.39e3	2.58e3	9.88e2	2.73e3
H6222	7128/4-1	1577	1586	DST 2	35648T	2.99e3	1.97e3	6.91e2	1.23e3	5.82e2	3.83e2	6.17e2
H6223	7228/7-1 A	2091.1	2091.1	MDT	35649T	1.78e3	8.84e2	5.32e2	1.37e3	1.28e3	5.47e2	1.28e3
				NSO-1, # 11.1	10042A	1.34e4	1.47e4	1.37e4	4.02e4	1.65e4	1.66e4	1.90e4
				NSO-1, # 11.1	10042B	1.33e4	1.47e4	1.31e4	3.97e4	1.66e4	1.58e4	1.88e4

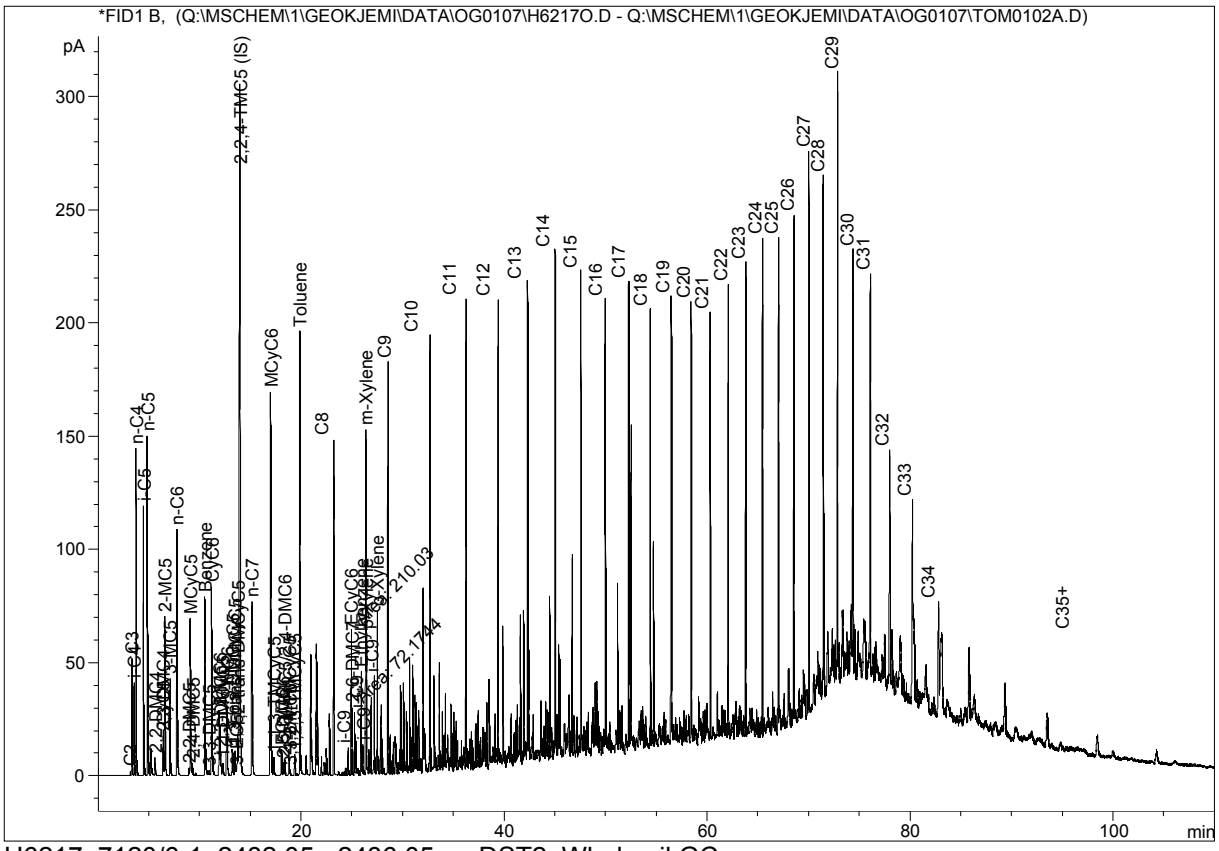
Figure 4.1

Gas chromatograms of whole oil (GC-FID).

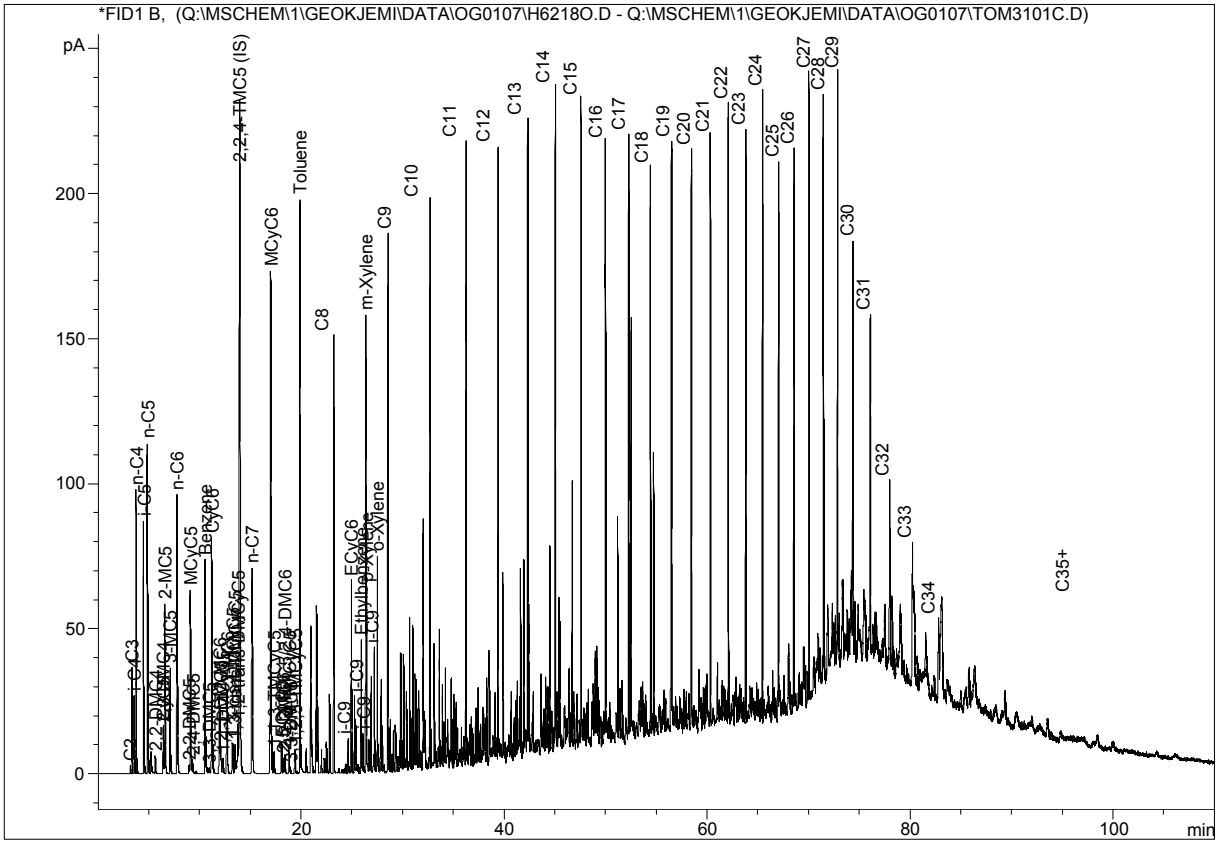
Not quantified. For general orientation only.

Legend:

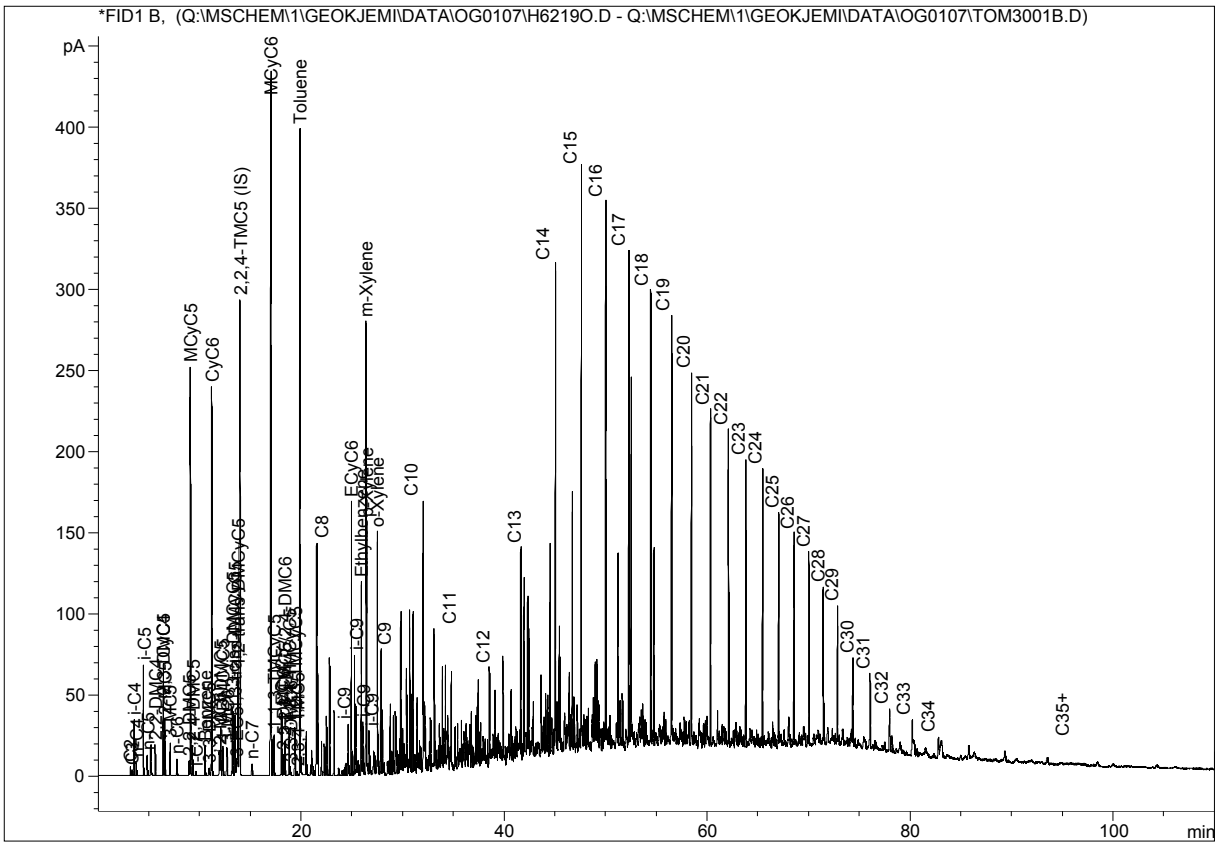
n-C20 etc.	n-alkanes
i-C16 etc.	acyclic isoprenoids
2,2,4-TMC5 (IS)	2,2,4-trimethylpentane (internal standard for quantification)



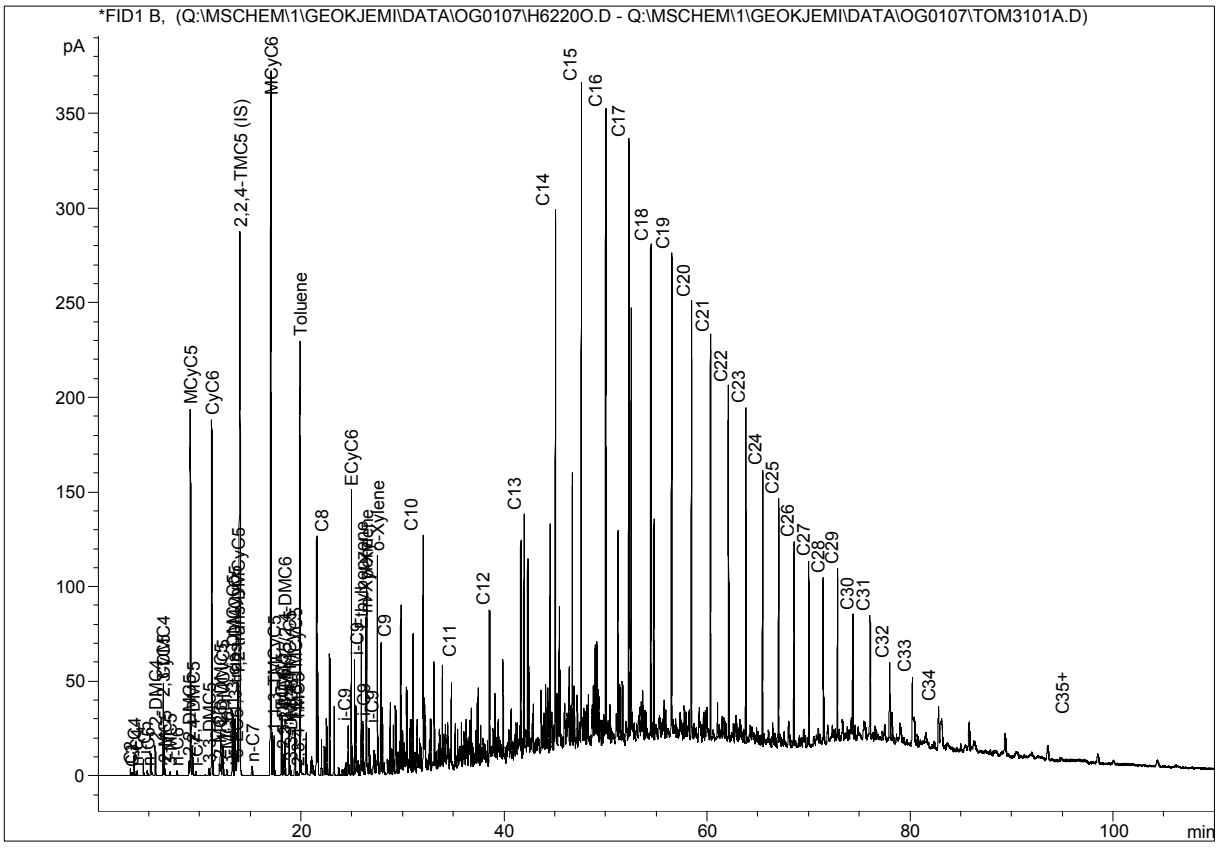
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST2, Whole oil GC



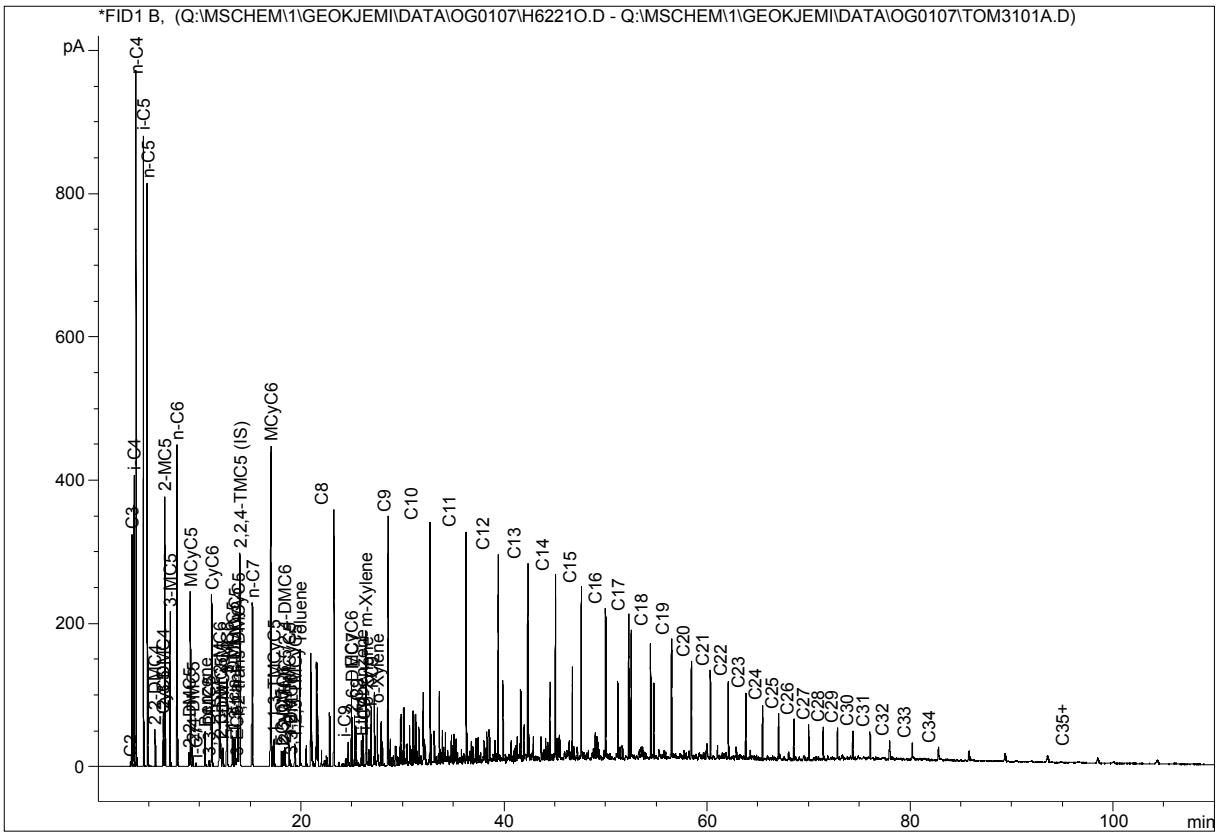
H6218, 7121/5-1, 2436 - 2439 m, DST 1, Whole oil GC



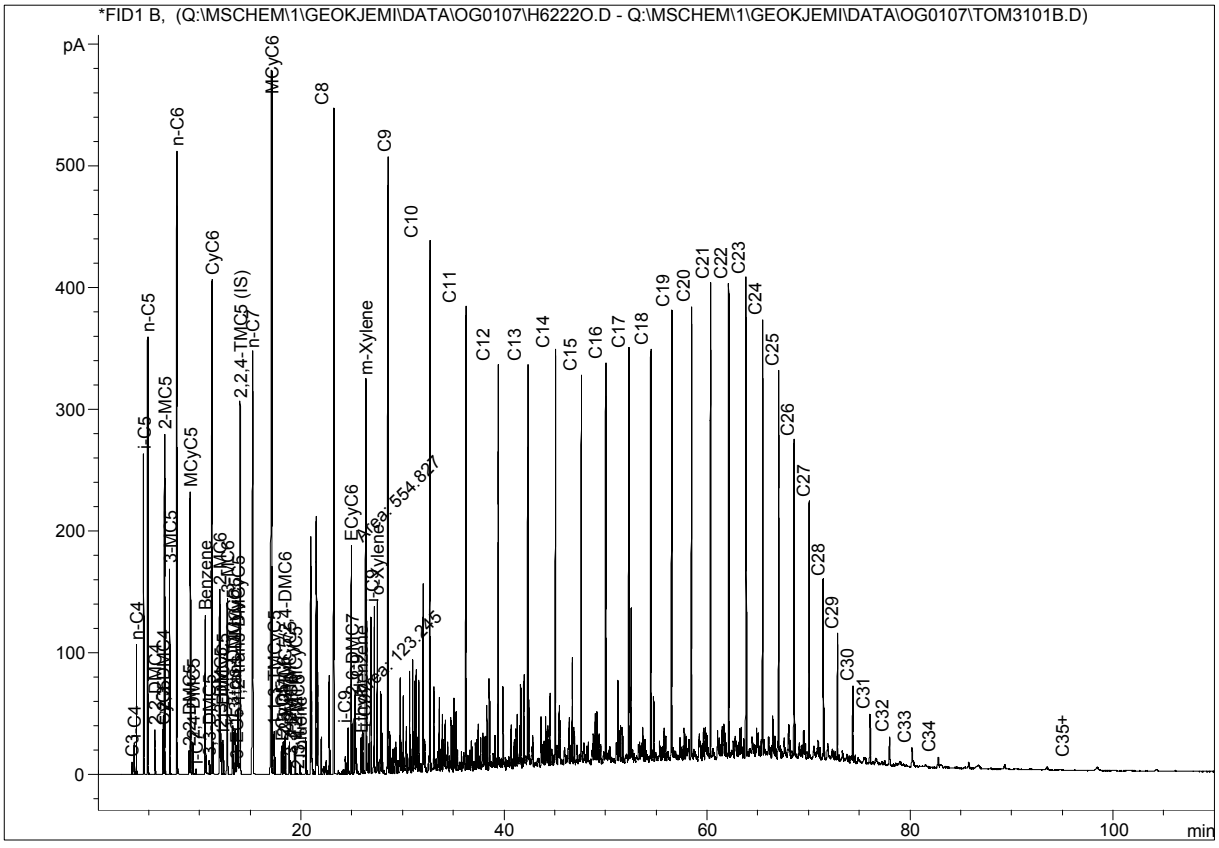
H6219, 7122/7-1, 1114 m, MDT 1, Whole oil GC



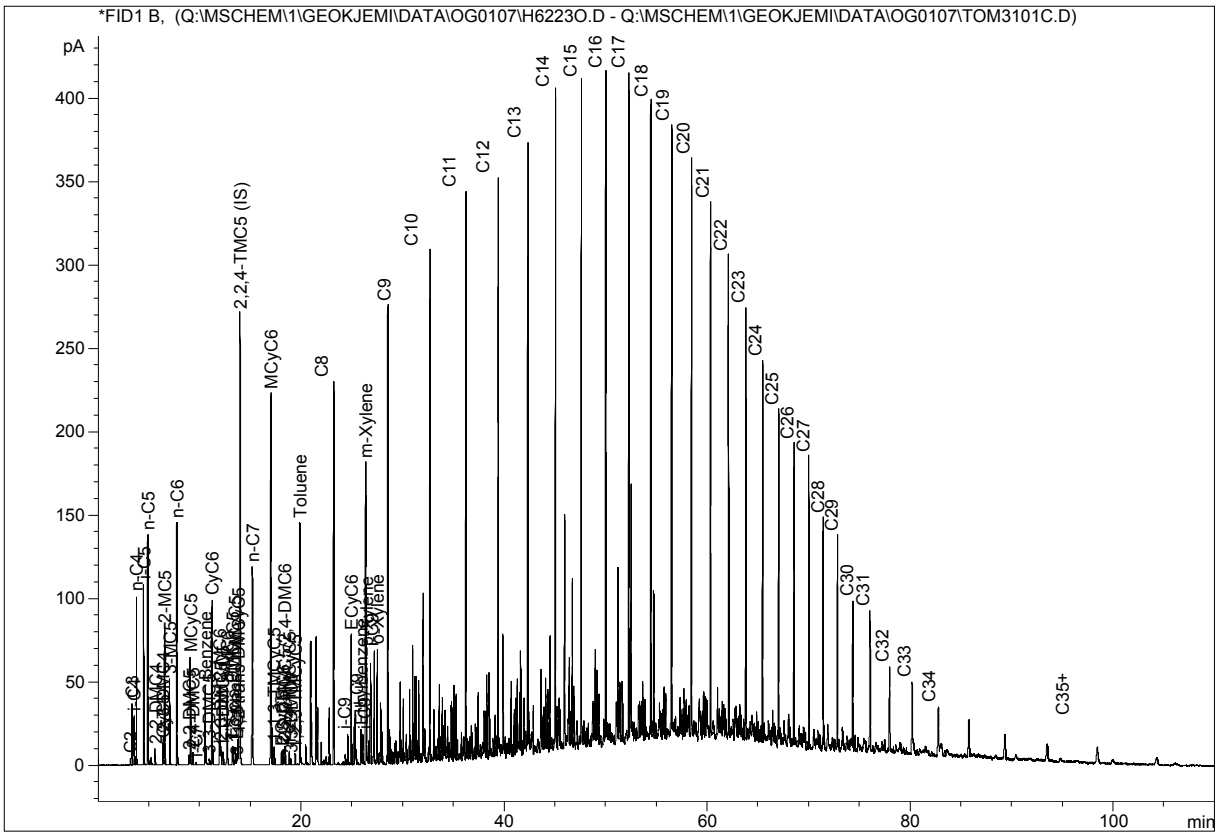
H6220, 7122/7-3, 1195 m, MDT 16, Whole oil GC



H6221, 7122/7-3, 1812 m, MDT 3, Whole oil GC



H6222, 7128/4-1, 1577 - 1586 m, DST 2, Whole oil GC



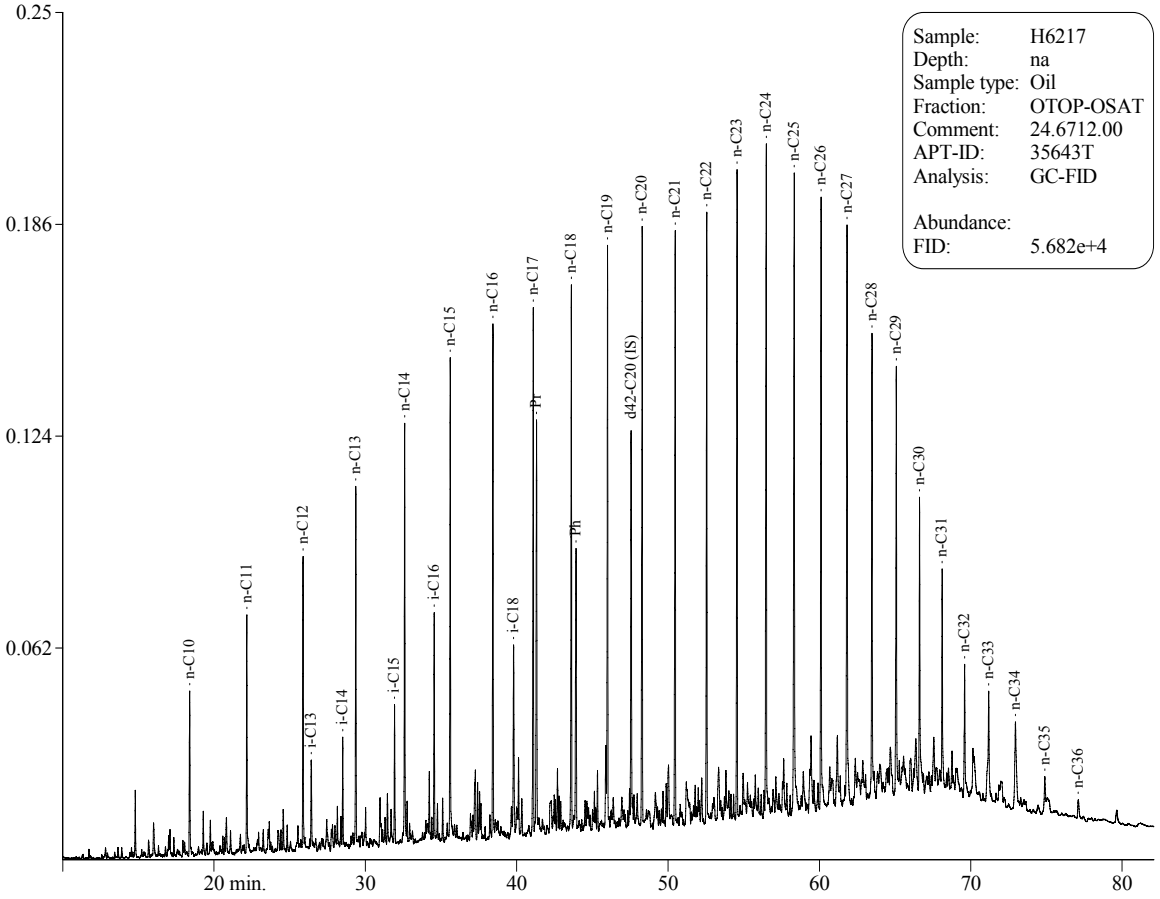
H6223, 7228/7-1 A, 2091.1 m, MDT, Whole oil GC

Figure 4.2

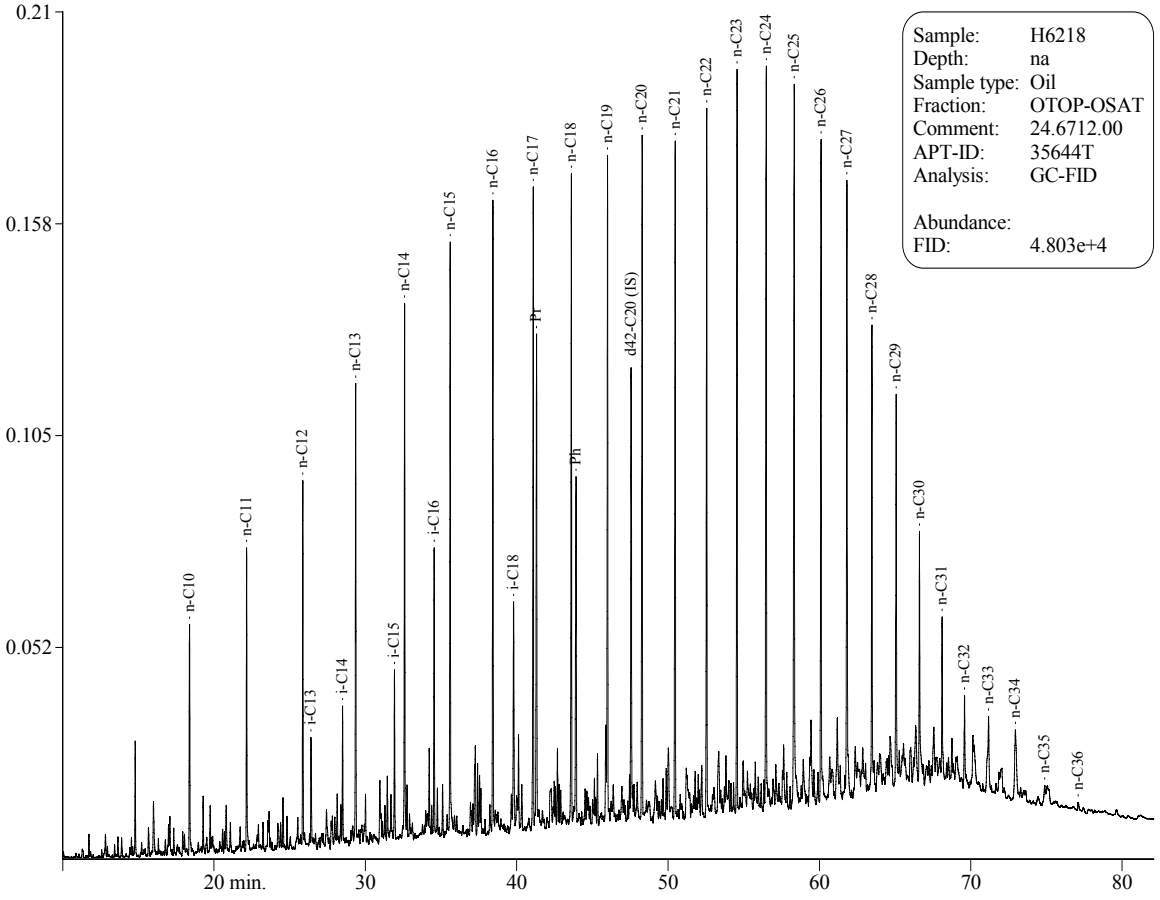
Gas chromatograms of saturated hydrocarbons (GC-FID).

Legend:

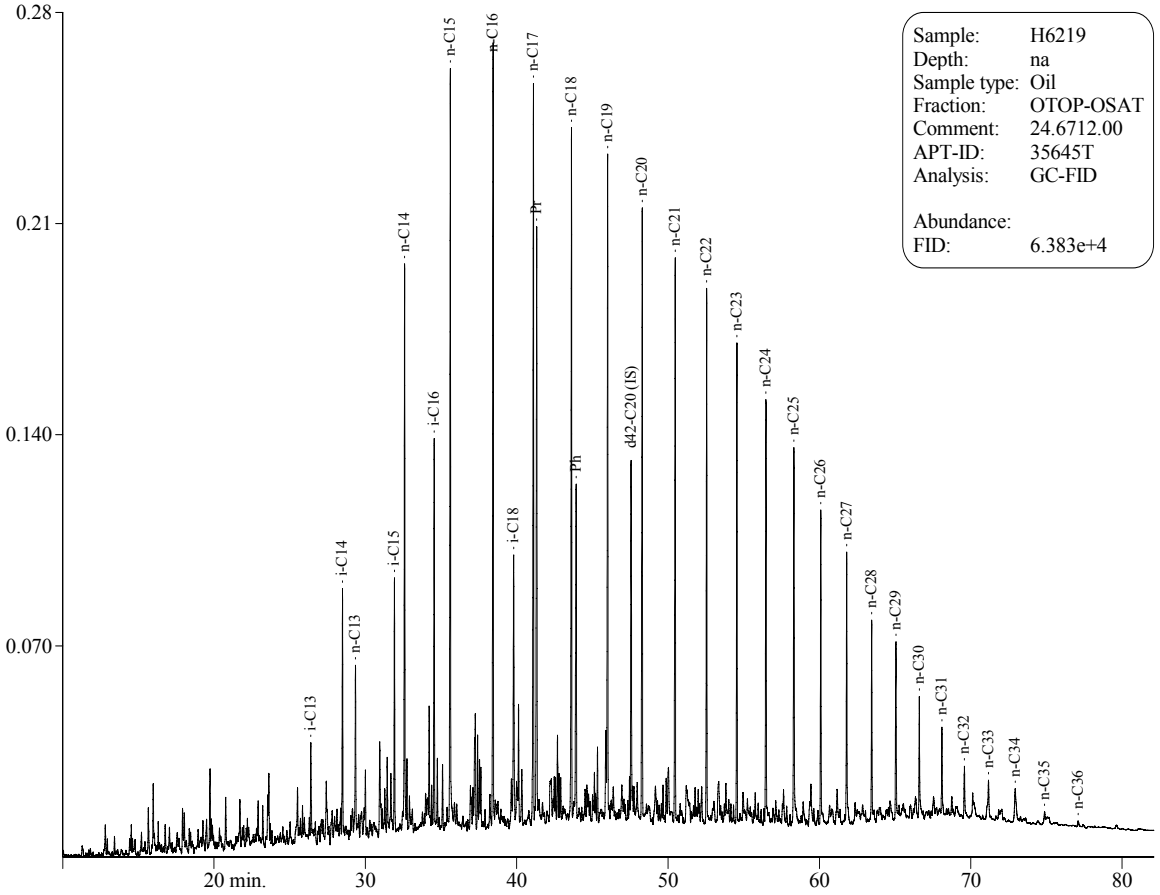
n-C20 etc.	n-alkanes
i-C16 etc.	acyclic isoprenoids
d42-C20 (IS)	deuterated n-alkane (internal standard for quantification)



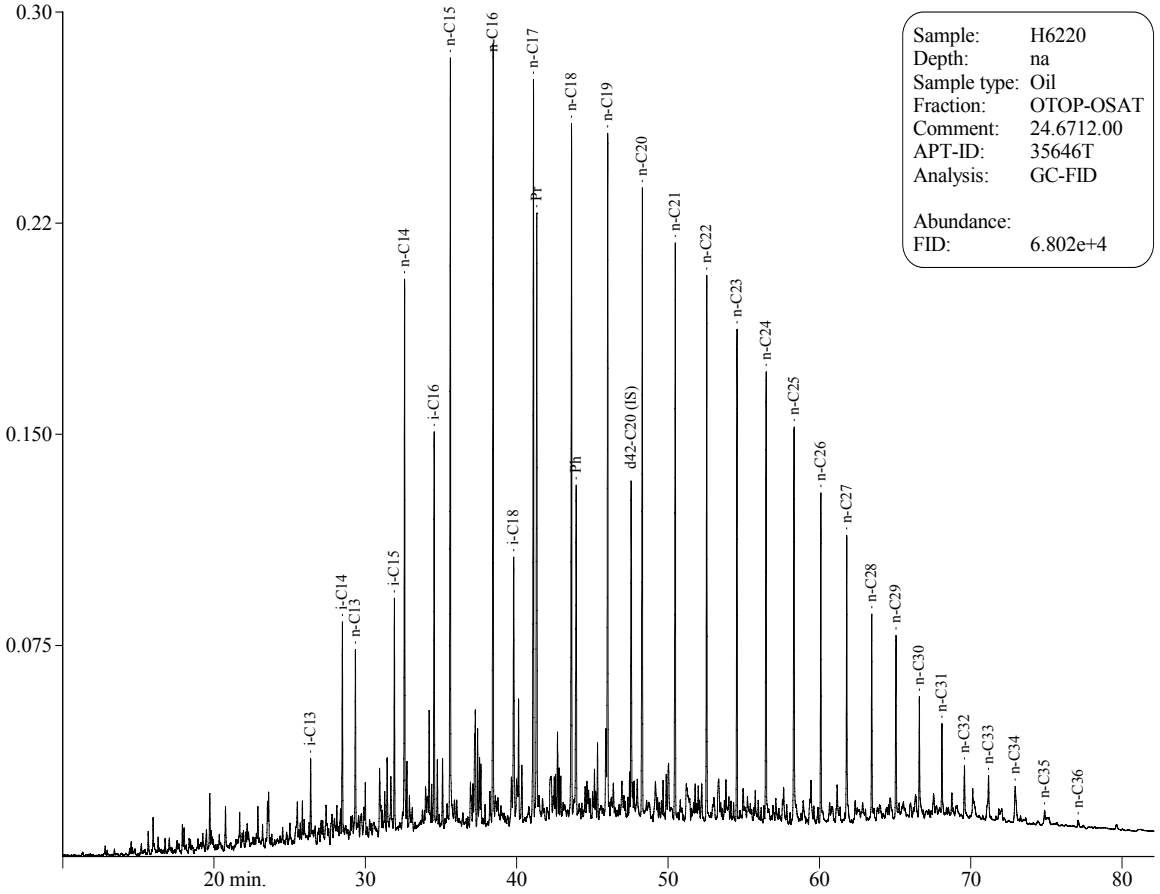
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST2, SAT GC



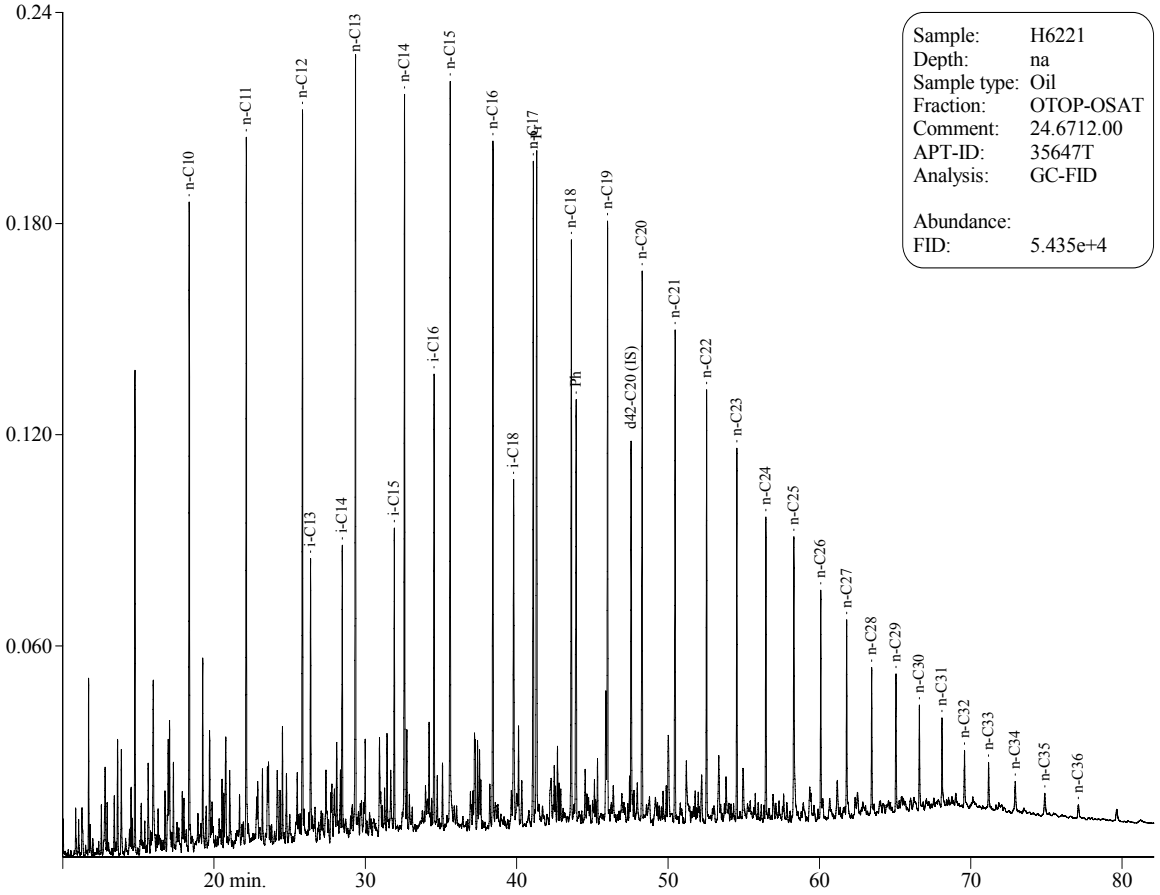
H6218, 7121/5-1, 2436 - 2439 m, DST 1, SAT GC



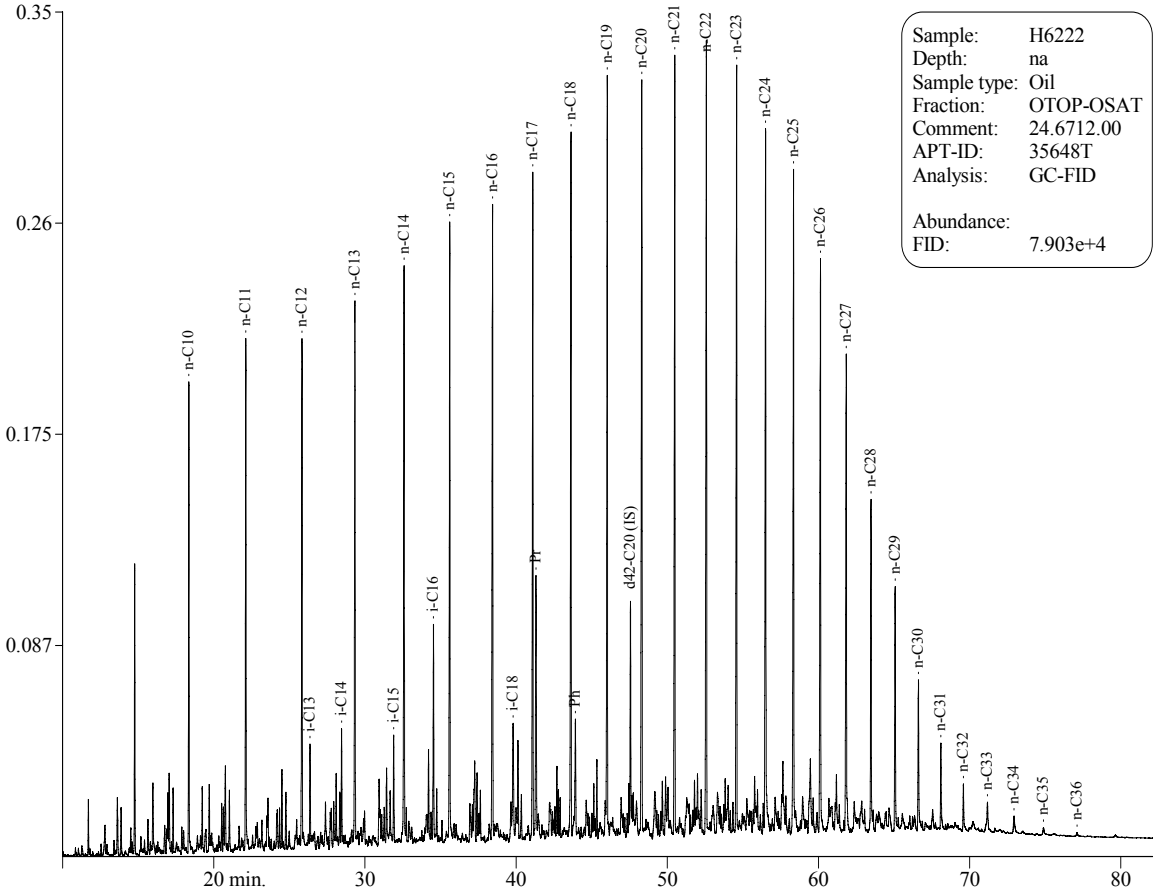
H6219, 7122/7-1, 1114 m, MDT 1, SAT GC



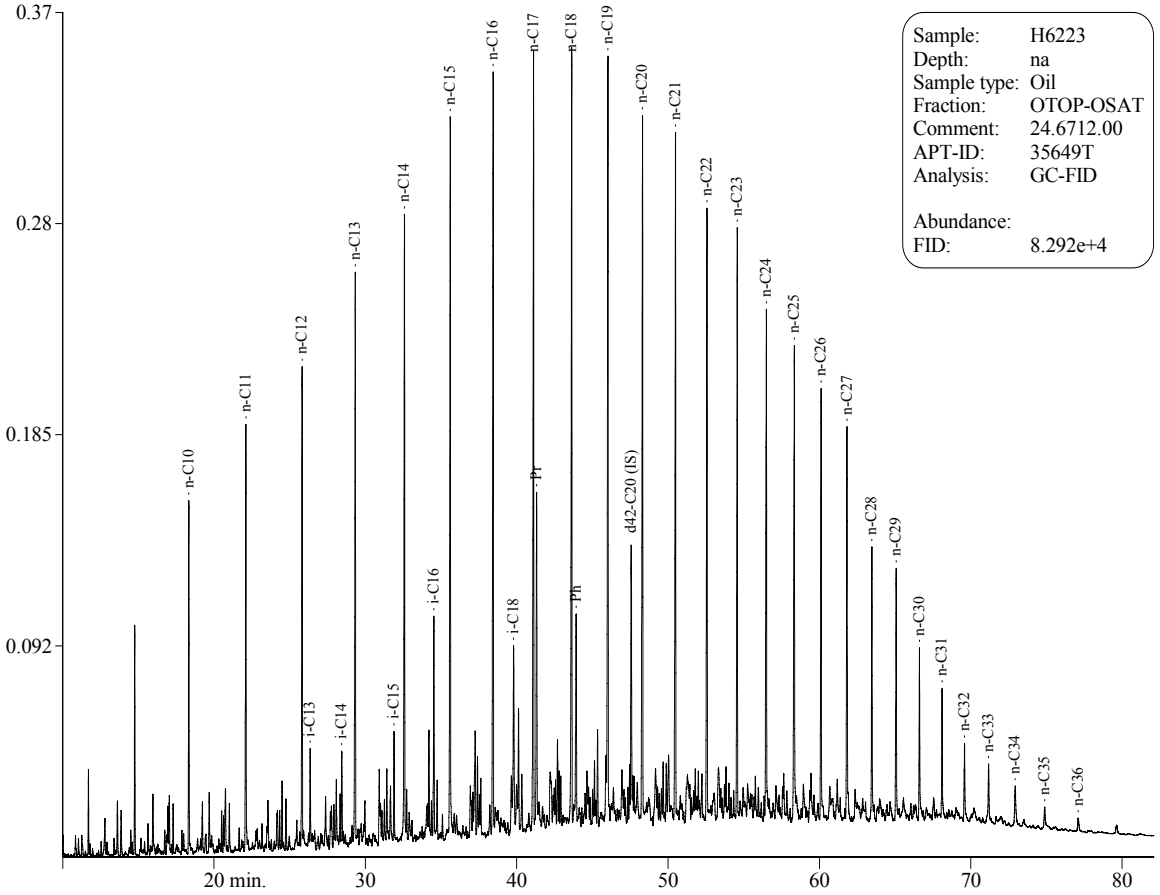
H6220, 7122/7-3, 1195 m, MDT 16, SAT GC



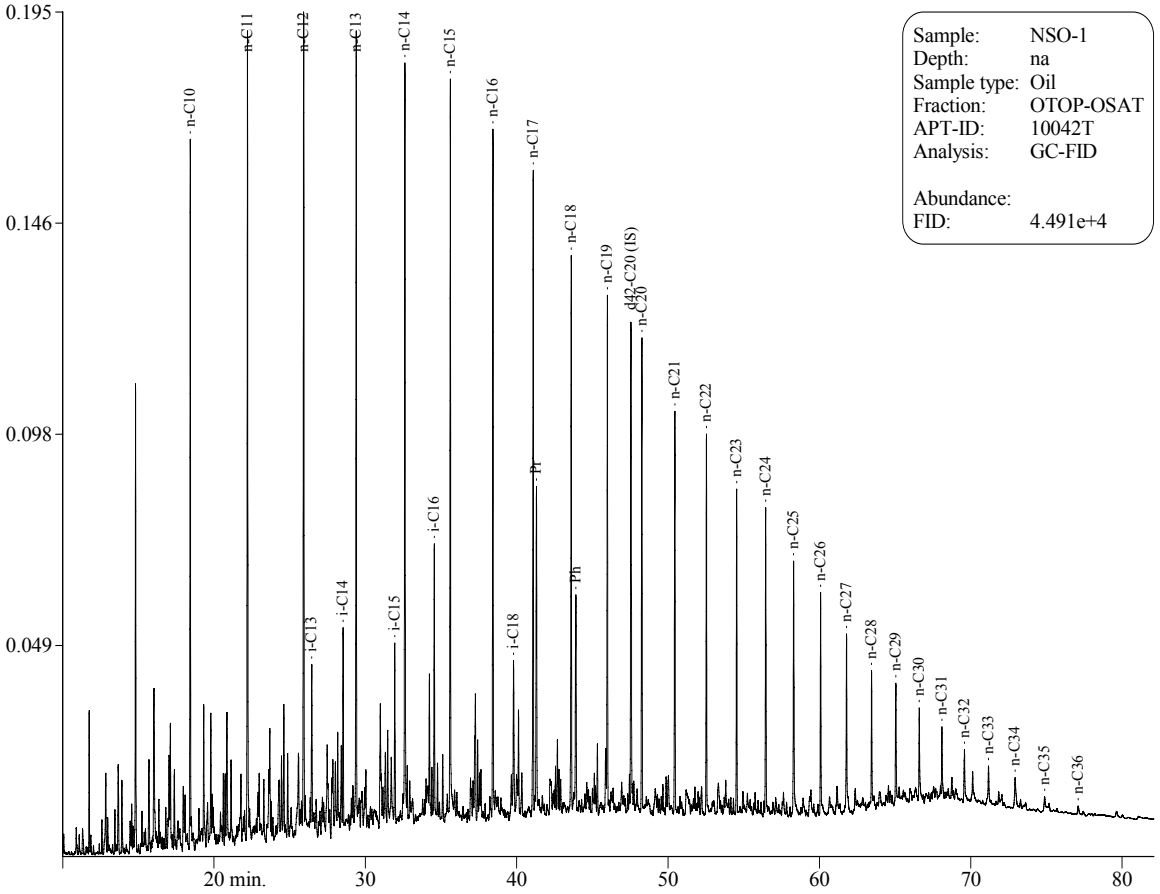
H6221, 7122/7-3, 1812 m, MDT 3, SAT GC



H6222, 7128/4-1, 1577 - 1586 m, DST 2, SAT GC



H6223, 7228/7-1 A, 2091.1 m, MDT, SAT GC



NSO-1, NGS reference oil, SAT GC

Figure 4.3

GC-HRMS (SIR) mass fragmentograms of saturated hydrocarbons.

(m/z 177, 191, 205, 217, 218, 231, 259, 253)

Peak labels

DEMETHYLATED TRITERPANES (m/z 177)

Label	Name	Footnotes
25nor28αβ	17α(H), 21β(H)-25,28,30-trisnorhopane	
25nor29αβ	17α(H), 21β(H)-25,30-bisnorhopane	
25nor30αβ	17α(H), 21β(H)-25-norhopane	
25nor31αβR	17α(H), 21β(H), 22(R/S)-25-norhomohopane	
30nor32αβ	17α(H), 21β(H)-30-norbishomohopane	

DI- and TRITERPANES (m/z 191)

Label	Name	Footnotes
19/3	$C_{19}H_{34}$ tricyclic terpane	
20/3	$C_{20}H_{36}$ tricyclic terpane	
21/3	$C_{21}H_{38}$ tricyclic terpane	
23/3	$C_{23}H_{42}$ tricyclic terpane	
24/3	$C_{24}H_{44}$ tricyclic terpane	
25/3R	$C_{25}H_{46}$ tricyclic terpane	1
25/3S	$C_{25}H_{46}$ tricyclic terpane	1
24/4	$C_{24}H_{42}$ tetracyclic terpane	
26/3R	$C_{26}H_{48}$ tricyclic terpane	1
26/3S	$C_{26}H_{48}$ tricyclic terpane	1
28/3R	$C_{28}H_{52}$ tricyclic terpane	1
28/3S	$C_{28}H_{52}$ tricyclic terpane	1
29/3R	$C_{29}H_{54}$ tricyclic terpane	1
29/3S	$C_{29}H_{54}$ tricyclic terpane	1
30/3R	$C_{30}H_{56}$ tricyclic terpane	1
30/3S	$C_{30}H_{56}$ tricyclic terpane	1
27Ts	18α(H)-22,29,30-trisnorneohopane	
25nor28αβ	17α(H), 21β(H)-25,28,30-trisnorhopane	
27Tm	17α(H)-22,29,30-trisnorhopane	
27β	17β(H)-22,29,30-trisnorhopane	
28αβ	17α(H), 21β(H)-28,30-bisnorhopane	
25nor30αβ	17α(H), 21β(H)-25-norhopane	
29αβ	17α(H), 21β(H)-30-norhopane	
29Ts	18α(H)-30-norneohopane	
30d	15α-methyl-17α(H)-27-norhopane (diahopane)	
29βα	17β(H), 21α(H)-30-norhopane (normoretane)	5
30O	18α(H)-oleanane	
30αβ	17α(H), 21β(H)-hopane	
29ββ	17β(H), 21β(H)-norhopane	
30G	gammacerane	
30βα	17β(H), 21α(H)-hopane (moretane)	
31αβS	17α(H), 21β(H), 22(S)-homohopane	
31αβR	17α(H), 21β(H), 22(R)-homohopane	
30ββ	17β(H), 21β(H)-hopane	
31βα	17β(H), 21α(H)-homohopane	
32αβS	17α(H), 21β(H), 22(S)-bishomohopane	
32αβR	17α(H), 21β(H), 22(R)-bishomohopane	
32βα	17β(H), 21α(H)-bishomohopane	
33αβS	17α(H), 21β(H), 22(S)-trishomohopane	
33αβR	17α(H), 21β(H), 22(R)-trishomohopane	
34αβS	17α(H), 21β(H), 22(S)-tetrakishomohopane	
34αβR	17α(H), 21β(H), 22(R)-tetrakishomohopane	
35αβS	17α(H), 21β(H), 22(S)-pentakishomohopane	
35αβR	17α(H), 21β(H), 22(R)-pentakishomohopane	
30D13	$C_{30}H_{54}$ $\Delta^{13(18)}$-hopene	

Footnotes regarding di- and triterpanes:

1 The elution order of the 22R- and 22S-isomers of the tricyclic diterpanes still appears to be uncertain. In this report it is assumed that 22R elutes before 22S on non-polar columns.

5 29βα may co-elute with at least two other compounds, depending on column polarity.

STERANES (m/z 217)

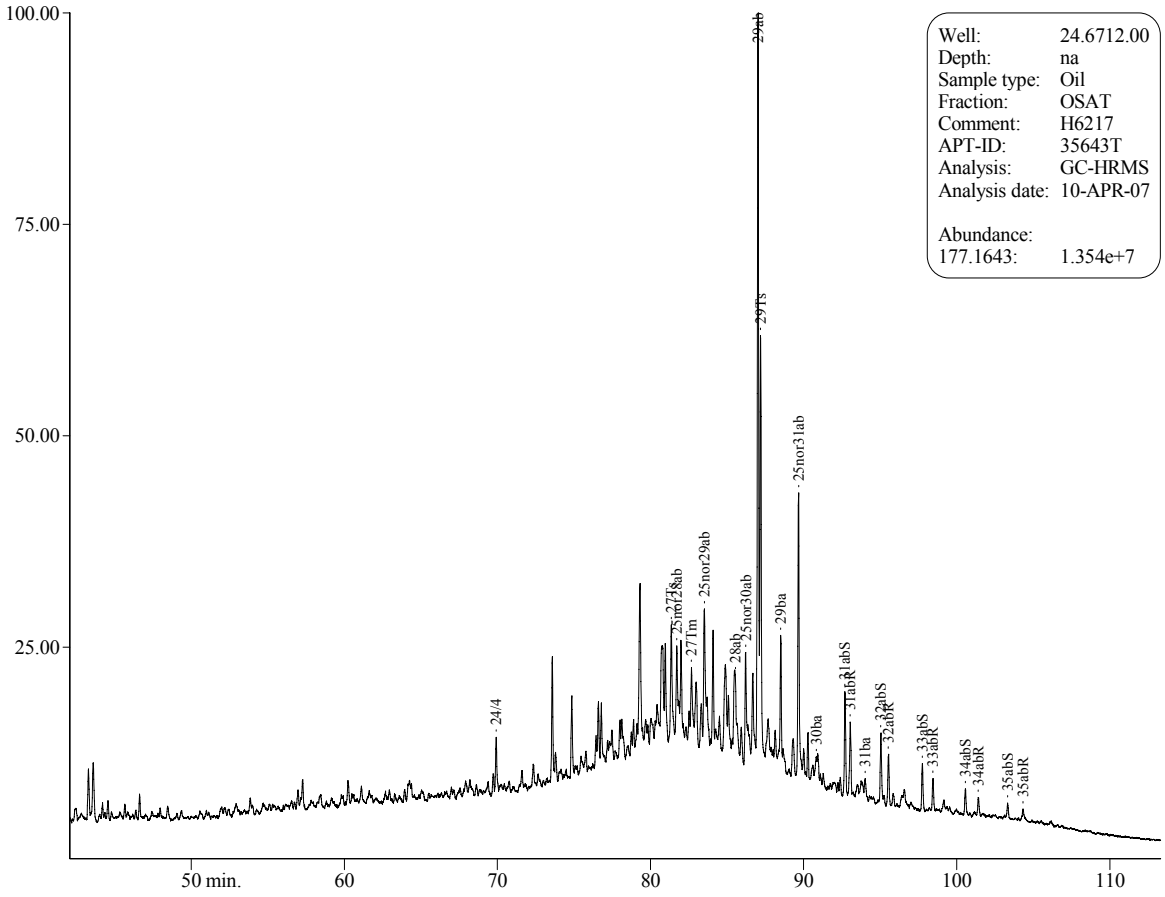
Label	Name	Footnotes
21α (21αα)	5α(H),14α(H),17α(H)-pregnane	
21β (21ββ)	5α(H),14β(H),17β(H)-pregnane	
22α (22αα)	5α(H),14α(H),17α(H)-methylpregnane	
22β (22ββ)	5α(H),14β(H),17β(H)-methylpregnane	
27dβS	13β(H), 17α(H), 20(S)-cholestane (diasterane)	
27dβR	13β(H), 17α(H), 20(R)-cholestane (diasterane)	
27dαR	13α(H), 17β(H), 20(R)-cholestane (diasterane)	
27dαS	13α(H), 17β(H), 20(S)-cholestane (diasterane)	8
27ααS	5α(H), 14α(H), 17α(H), 20(S)-cholestane	6
27ββR	5α(H), 14β(H), 17β(H), 20(R)-cholestane	7
27ββS	5α(H), 14β(H), 17β(H), 20(S)-cholestane	8
27ααR	5α(H), 14α(H), 17α(H), 20(R)-cholestane	
28dβS	24-methyl-13β(H), 17α(H), 20(S)-cholestane (diasterane)	
28dβR	24-methyl-13β(H), 17α(H), 20(R)-cholestane (diasterane)	10
28dαR	24-methyl-13α(H), 17β(H), 20(R)-cholestane (diasterane)	6
28dαS	24-methyl-13α(H), 17β(H), 20(S)-cholestane (diasterane)	
28ααS	24-methyl-5α(H), 14α(H), 17α(H), 20(S)-cholestane	
28ββR	24-methyl-5α(H), 14β(H), 17β(H), 20(R)-cholestane	9
28ββS	24-methyl-5α(H), 14β(H), 17β(H), 20(S)-cholestane	
28ααR	24-methyl-5α(H), 14α(H), 17α(H), 20(R)-cholestane	
29dβS	24-ethyl-13β(H), 17α(H), 20(S)-cholestane (diasterane)	7
29dβR	24-ethyl-13β(H), 17α(H), 20(R)-cholestane (diasterane)	
29dαR	24-ethyl-13α(H), 17β(H), 20(R)-cholestane (diasterane)	
29dαS	24-ethyl-13α(H), 17β(H), 20(S)-cholestane (diasterane)	9
29ααS	24-ethyl-5α(H), 14α(H), 17α(H), 20(S)-cholestane	
29ββR	24-ethyl-5α(H), 14β(H), 17β(H), 20(R)-cholestane	
29ββS	24-ethyl-5α(H), 14β(H), 17β(H), 20(S)-cholestane	
29ααR	24-ethyl-5α(H), 14α(H), 17α(H), 20(R)-cholestane	
30ααS	24-propyl-5α(H), 14α(H), 17α(H), 20(S)-cholestane	
30ββR	24-propyl-5α(H), 14β(H), 17β(H), 20(R)-cholestane	
30ββS	24-propyl-5α(H), 14β(H), 17β(H), 20(S)-cholestane	
30ααR	24-propyl-5α(H), 14α(H), 17α(H), 20(R)-cholestane	
M28αα	4-methyl-14α(H), 17α(H)-cholestanes	11
M29αα	4,24-dimethyl-14α(H), 17α(H)-cholestanes	12
M30αα	4-methyl-24-ethyl-14α(H), 17α(H)-cholestanes	12
M30D	4,23,24-trimethyl-14α(H), 17α(H)-cholestanes (dinosteranes)	13

STERANES (m/z 218)

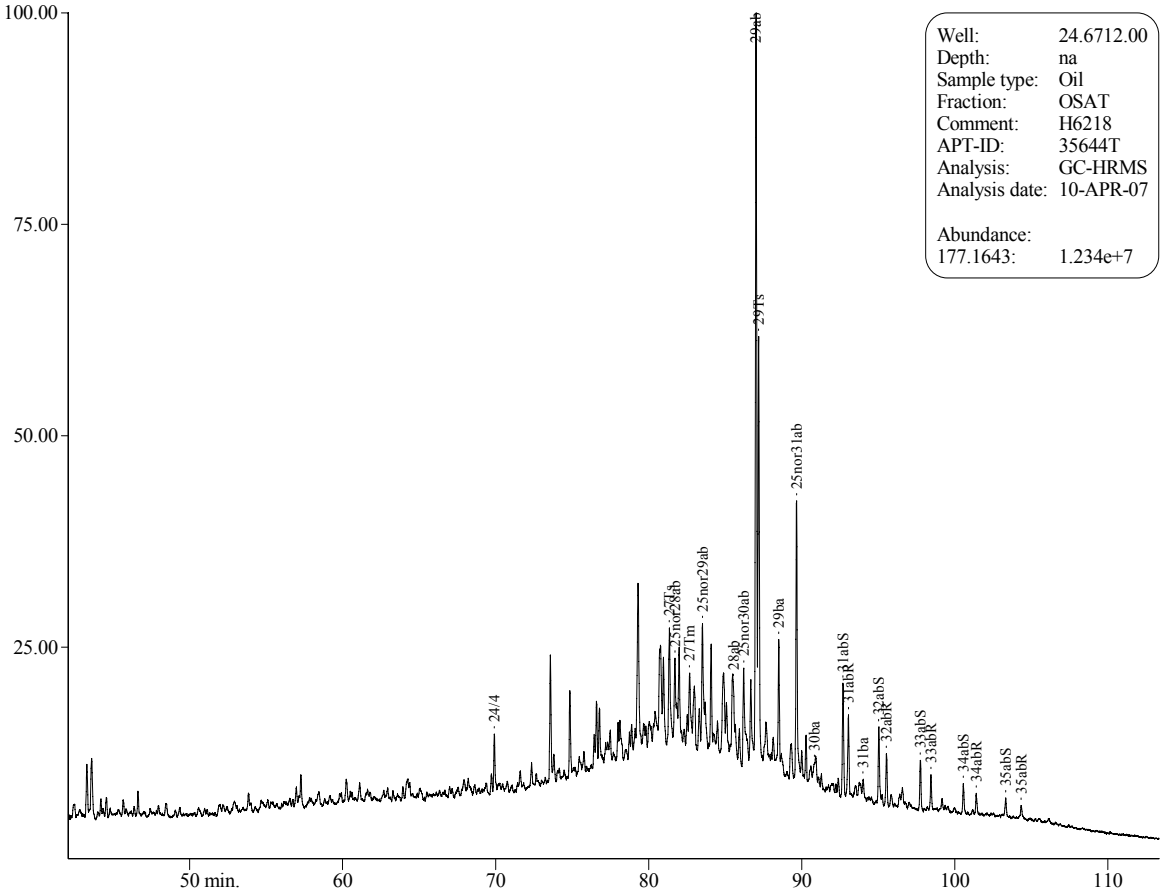
Label	Name	Footnotes
27ββR	5α(H), 14β(H), 17β(H), 20(R)-cholestane	
27ββS	5α(H), 14β(H), 17β(H), 20(S)-cholestane	
28ββR	24-methyl-5α(H), 14β(H), 17β(H), 20(R)-cholestane	
28ββS	24-methyl-5α(H), 14β(H), 17β(H), 20(S)-cholestane	
29ββR	24-ethyl-5α(H), 14β(H), 17β(H), 20(R)-cholestane	
29ββS	24-ethyl-5α(H), 14β(H), 17β(H), 20(S)-cholestane	
30ββR	24-propyl-5α(H), 14β(H), 17β(H), 20(R)-cholestane	
30ββS	24-propyl-5α(H), 14β(H), 17β(H), 20(S)-cholestane	

Footnotes regarding steranes:

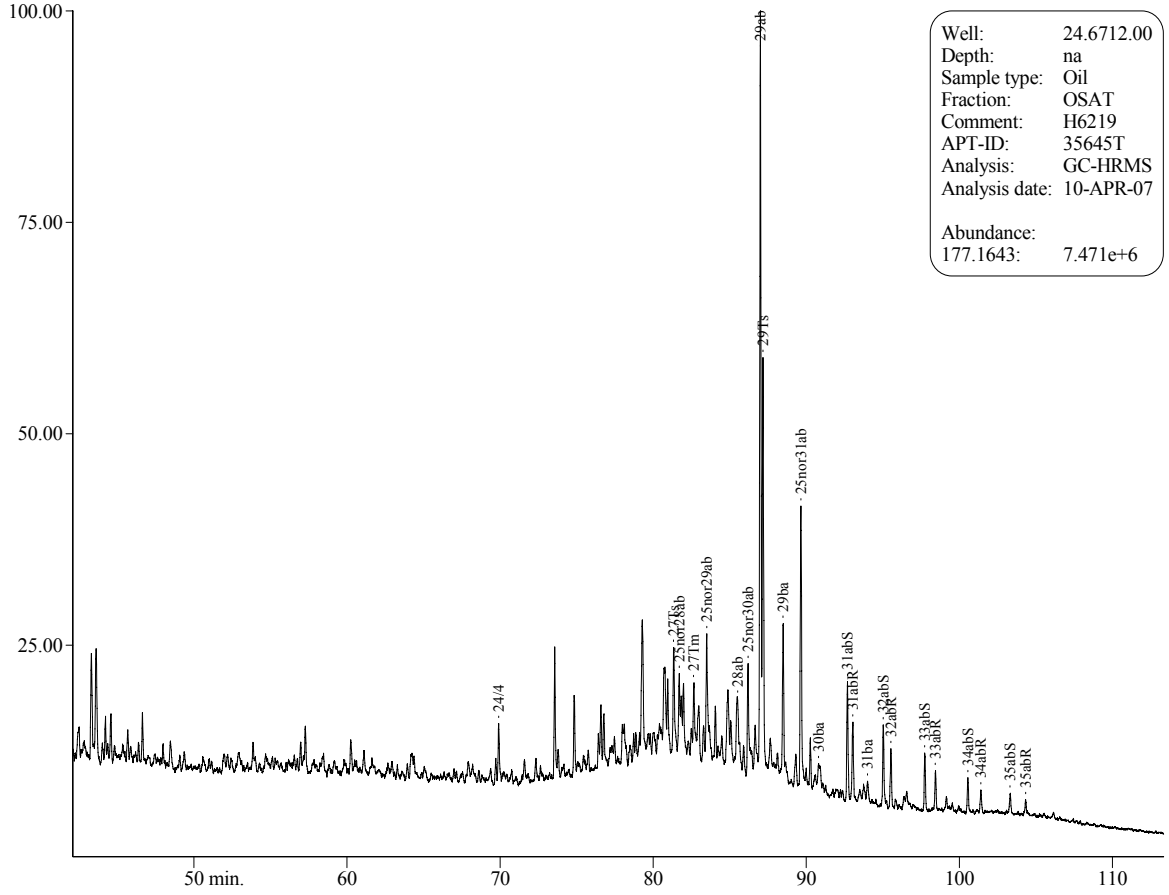
6, 7, 8, 9	Pairs of coeluting compounds.
10	Occurs as 24S/24R doublet.
11	Various possible isomers at 4,5,20 positions.
12	Various possible isomers at 4,5,20,24 positions.
13	Various possible isomers at 4,5,20,23,24 positions.



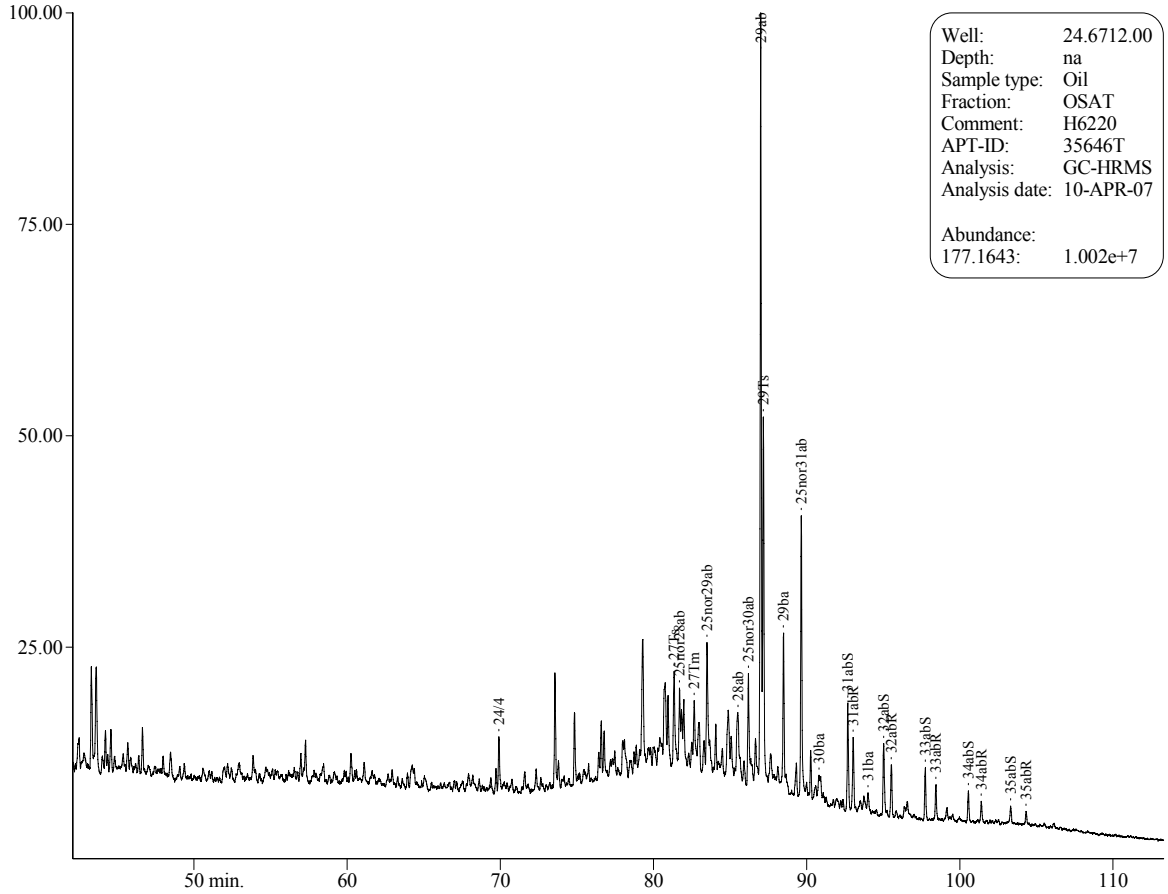
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST 2, SAT GCMS Terpanes (m/z 177)



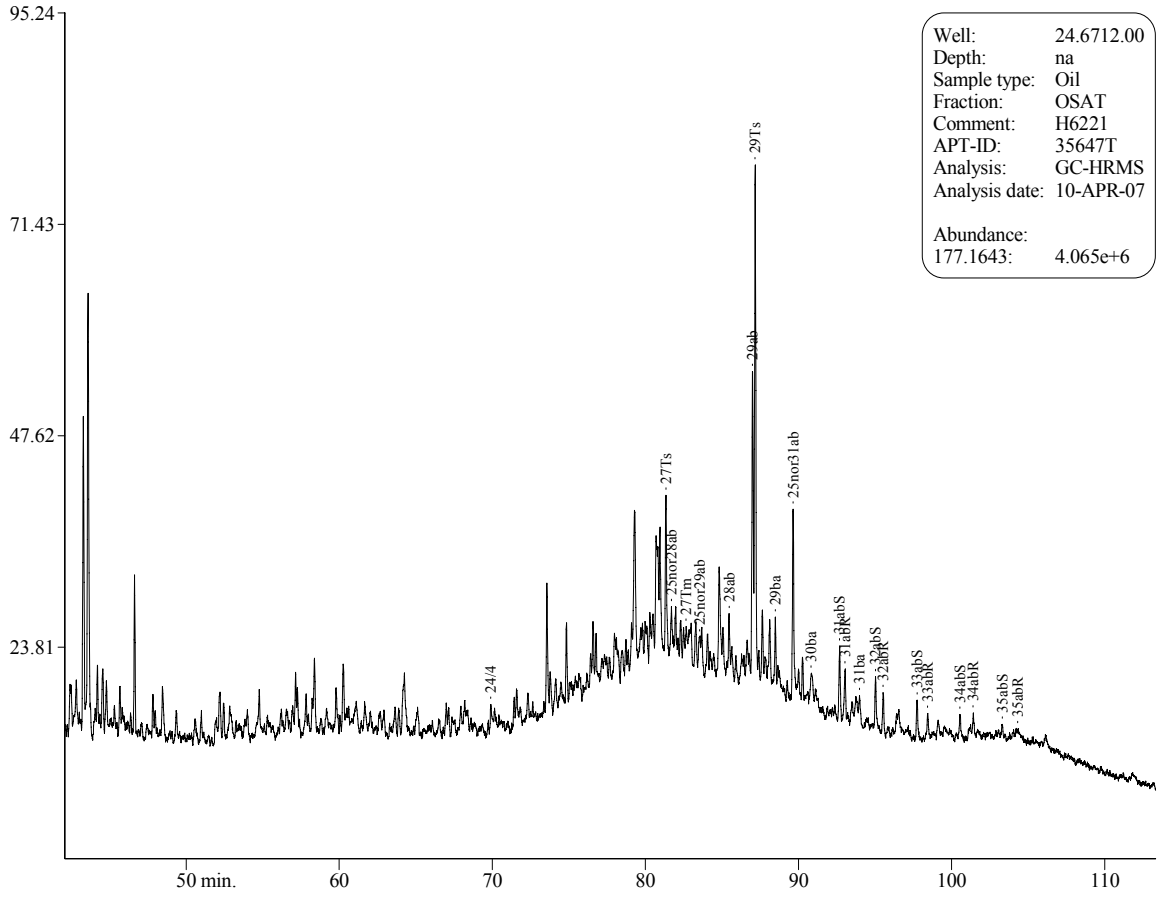
H6218, 7121/5-1, 2436 - 2439 m, DST 1, SAT GCMS Terpanes (m/z 177)



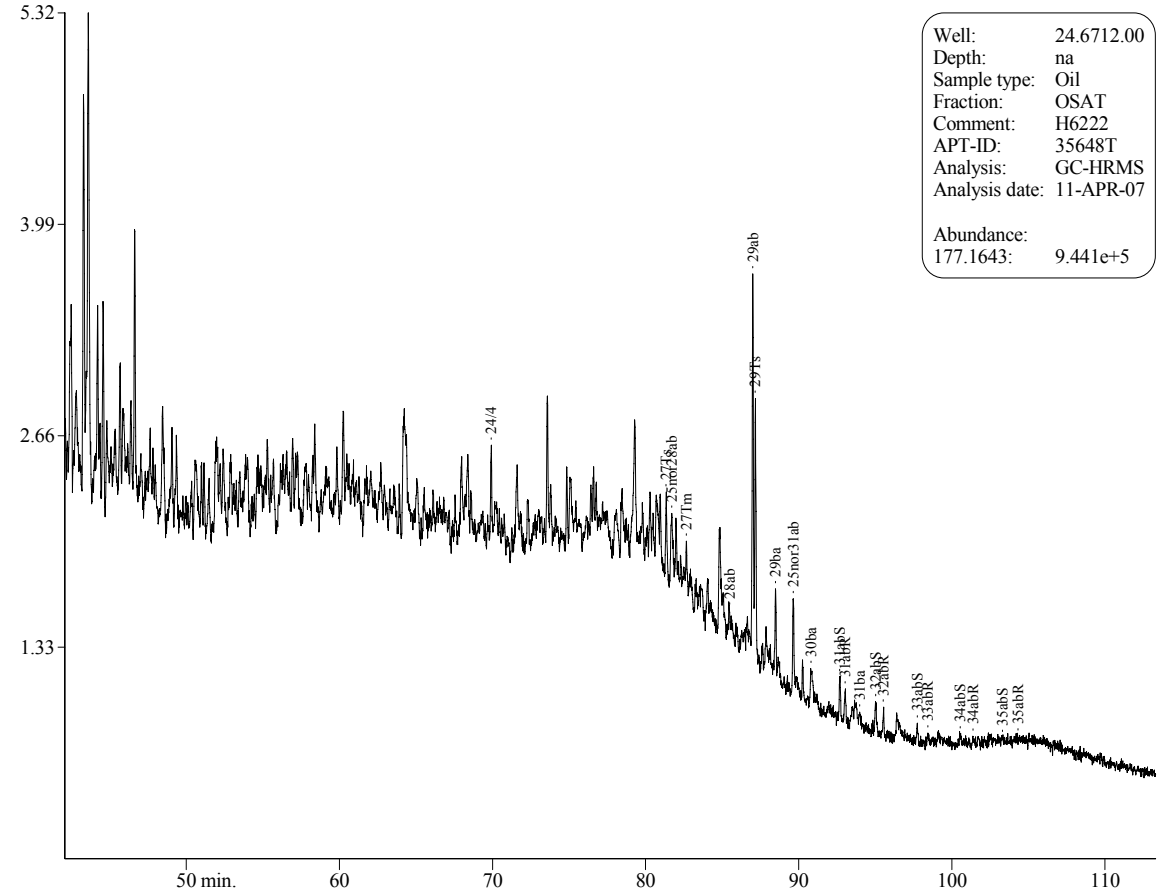
H6219, 7122/7-1, 1114 m, MDT 1, SAT GCMS Terpanes (m/z 177)



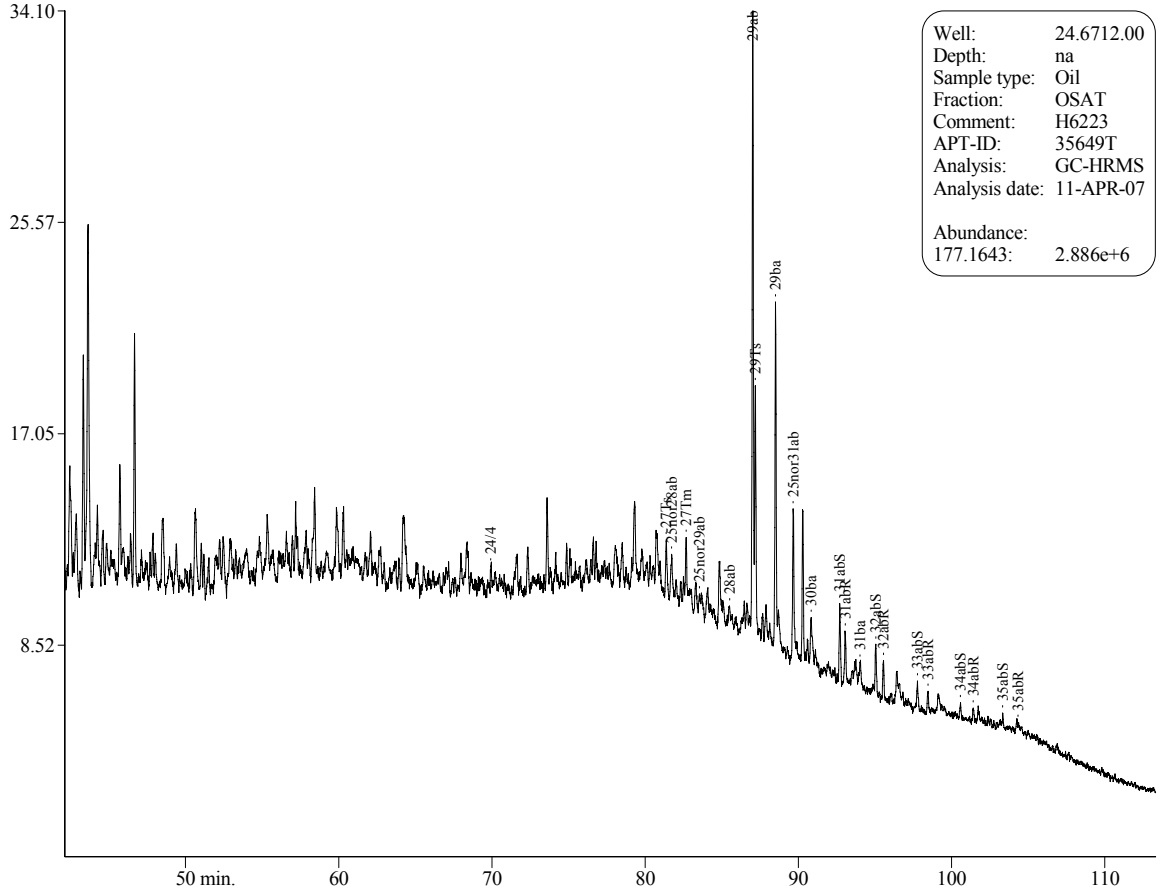
H6220, 7122/7-3, 1195 m, MDT 16, SAT GCMS Terpanes (m/z 177)



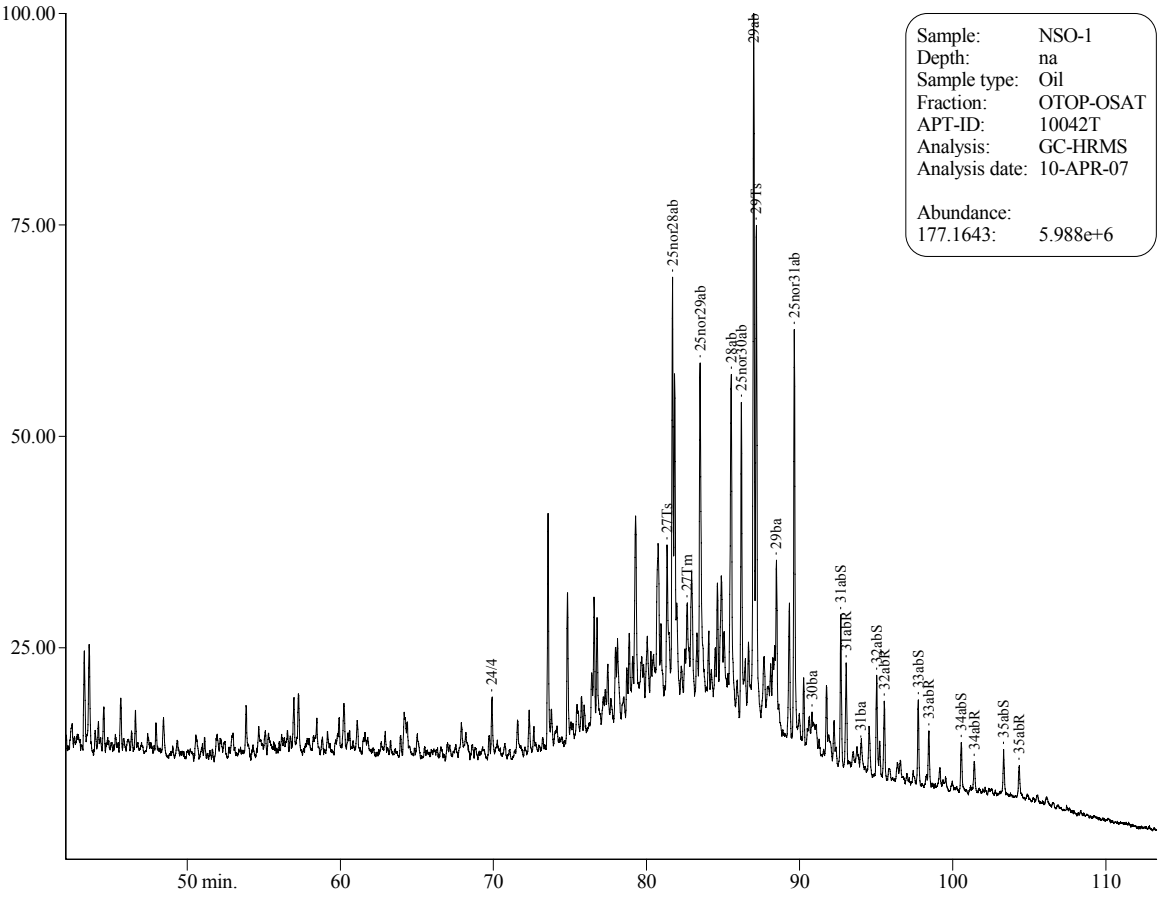
H6221, 7122/7-3, 1812 m, MDT 3 SAT GCMS Terpanes (m/z 177)



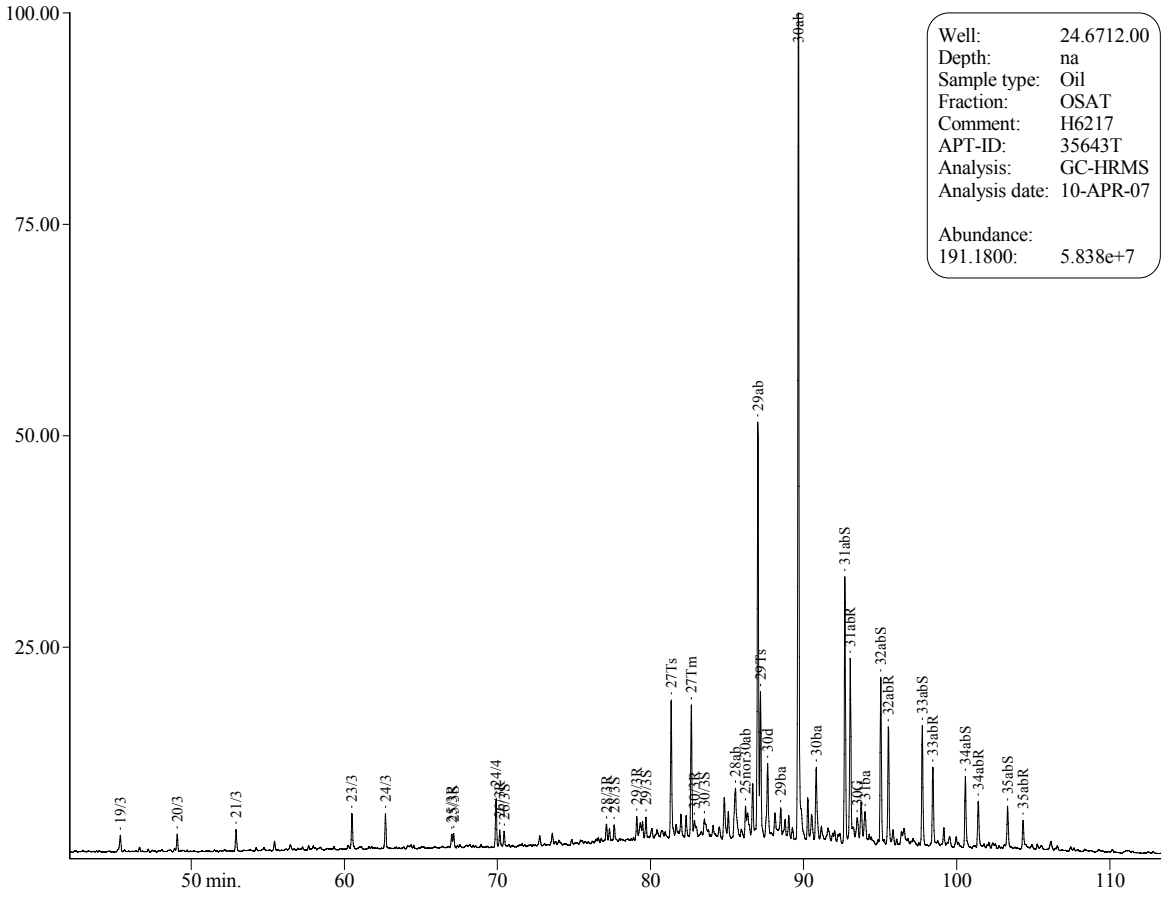
H6222, 7128/4-1, 1577 - 1586 m, DST 2, SAT GCMS Terpanes (m/z 177)



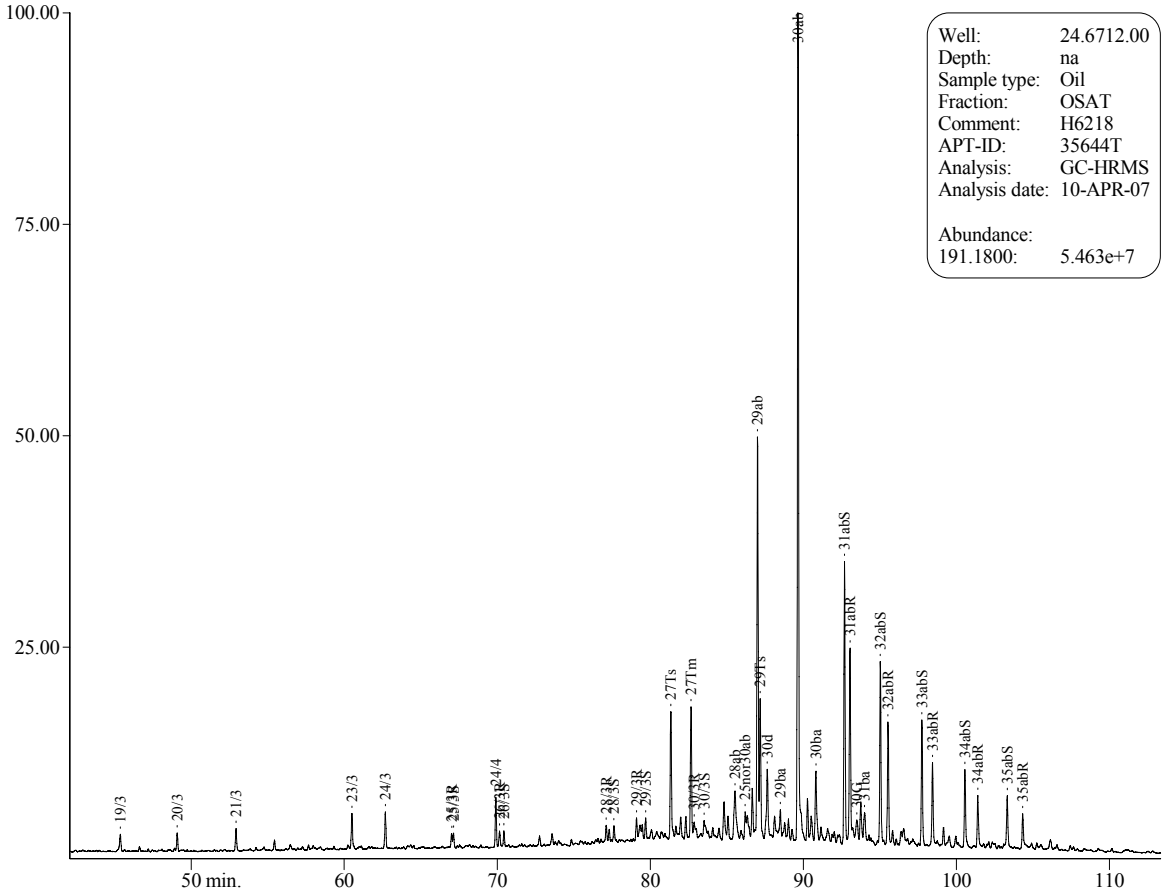
H6223, 7228/7-1 A, 2091.1 m, MDT, SAT GCMS — Terpanes (m/z 177)



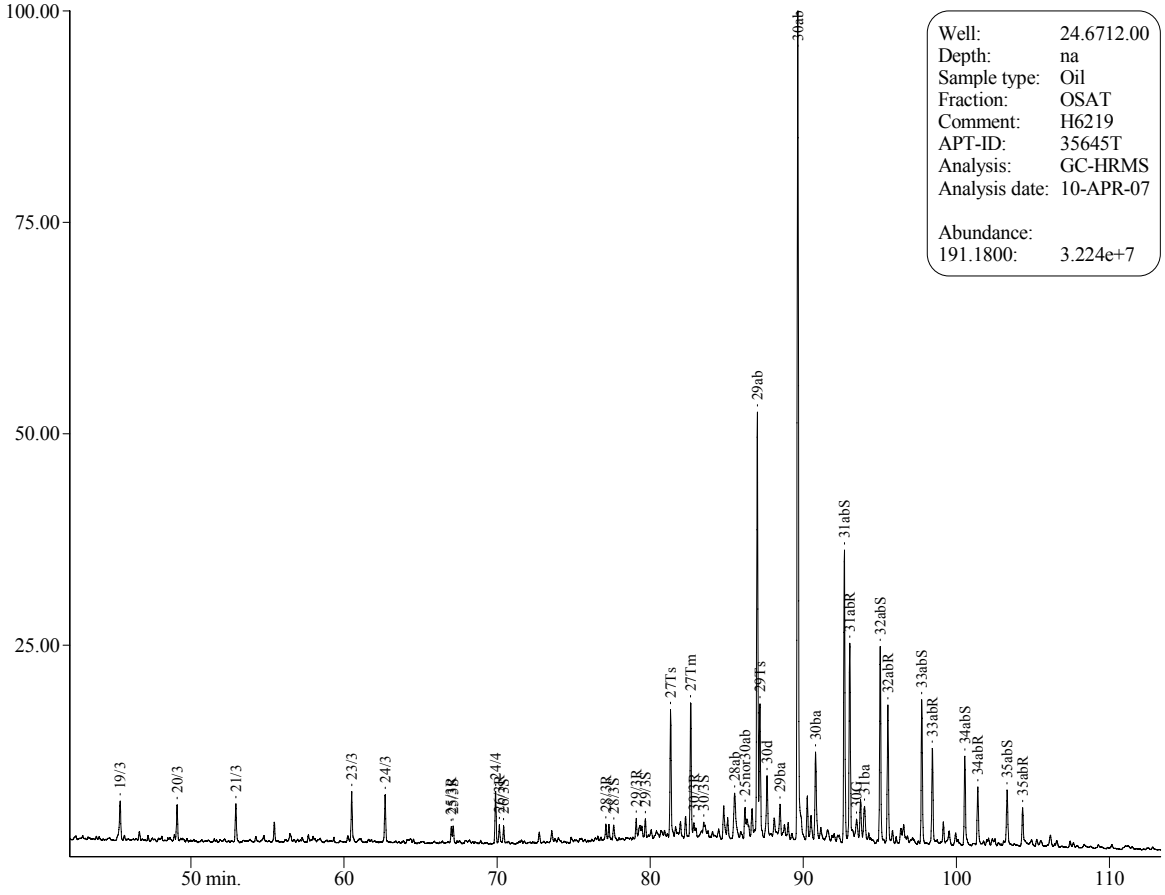
NSO-1, NGS reference oil, SAT GCMS — Terpanes (m/z 177)



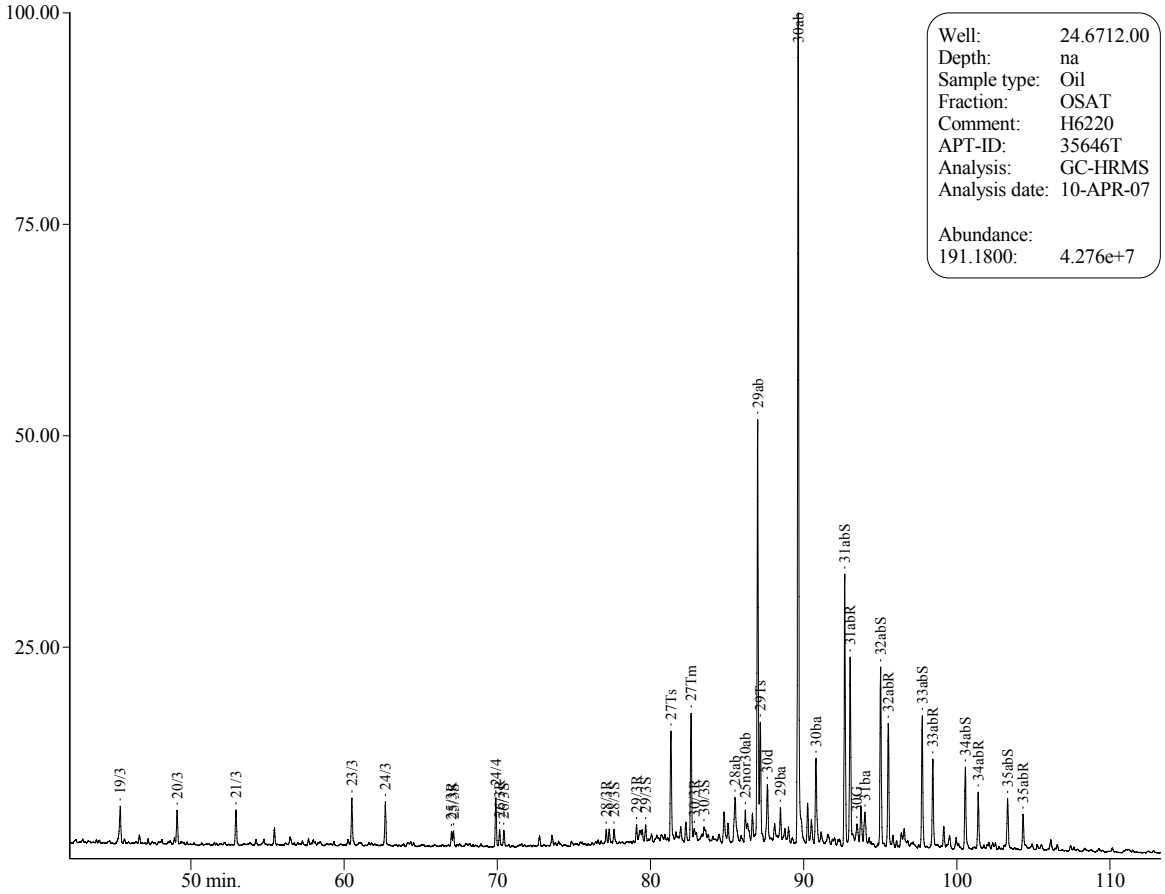
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST 2, SAT GCMS Terpanes (m/z 191)



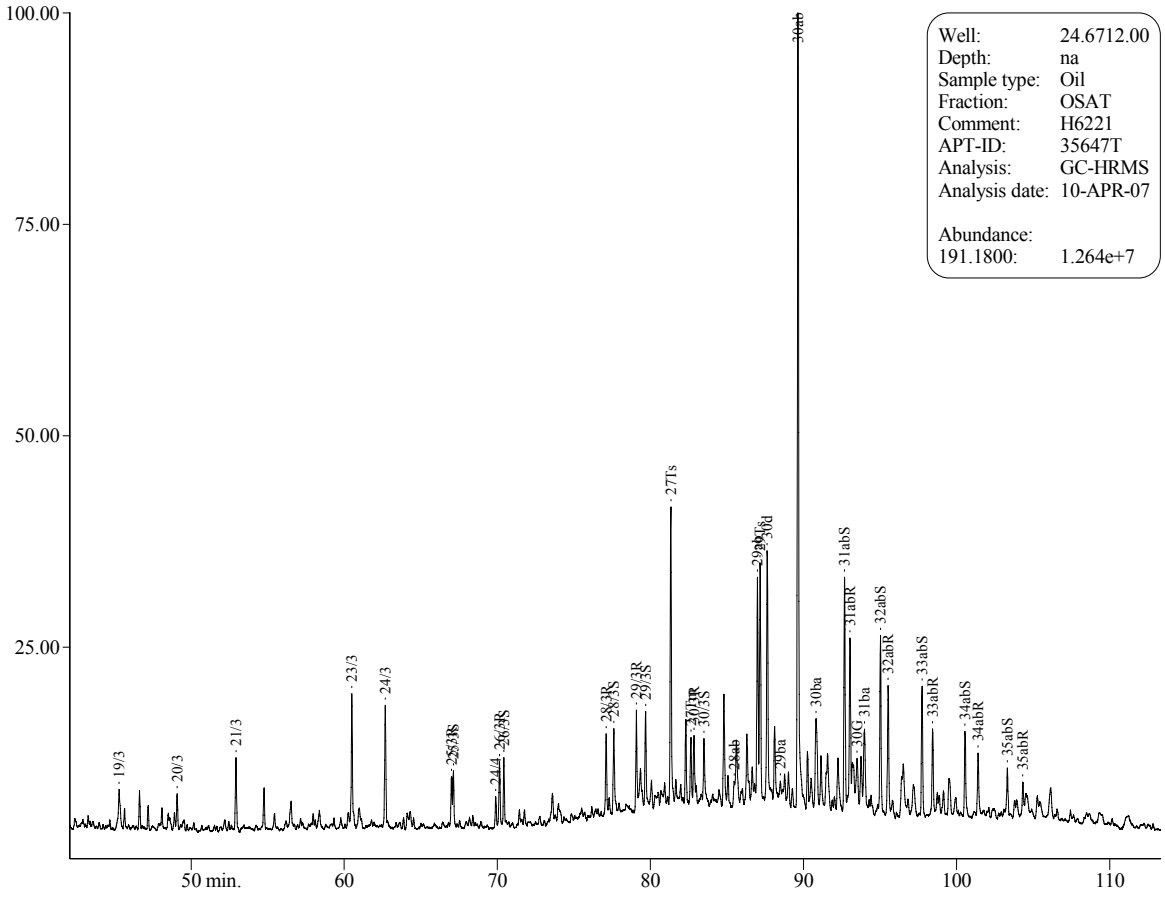
H6218, 7121/5-1, 2436 - 2439 m, DST 1, SAT GCMS Terpanes (m/z 191)



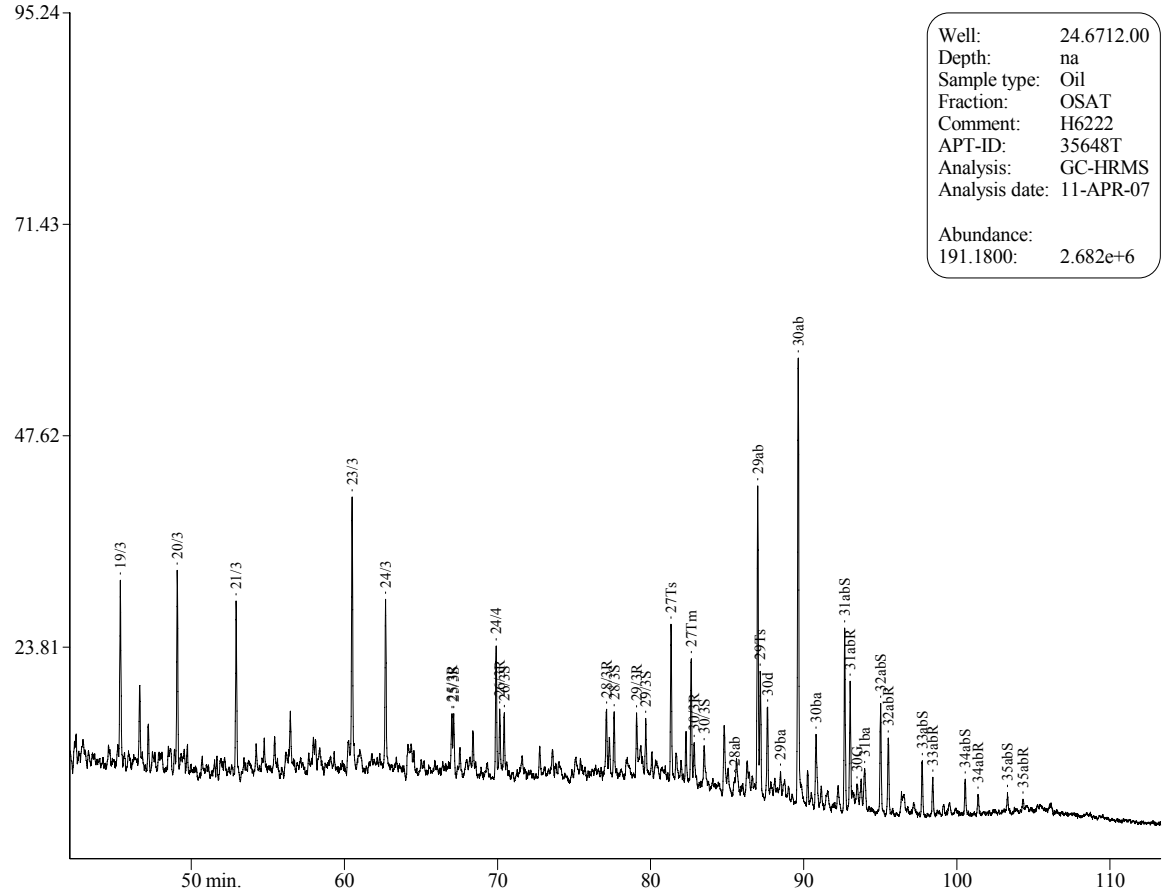
H6219, 7122/7-1, 1114 m, MDT 1, SAT GCMS Terpanes (m/z 191)



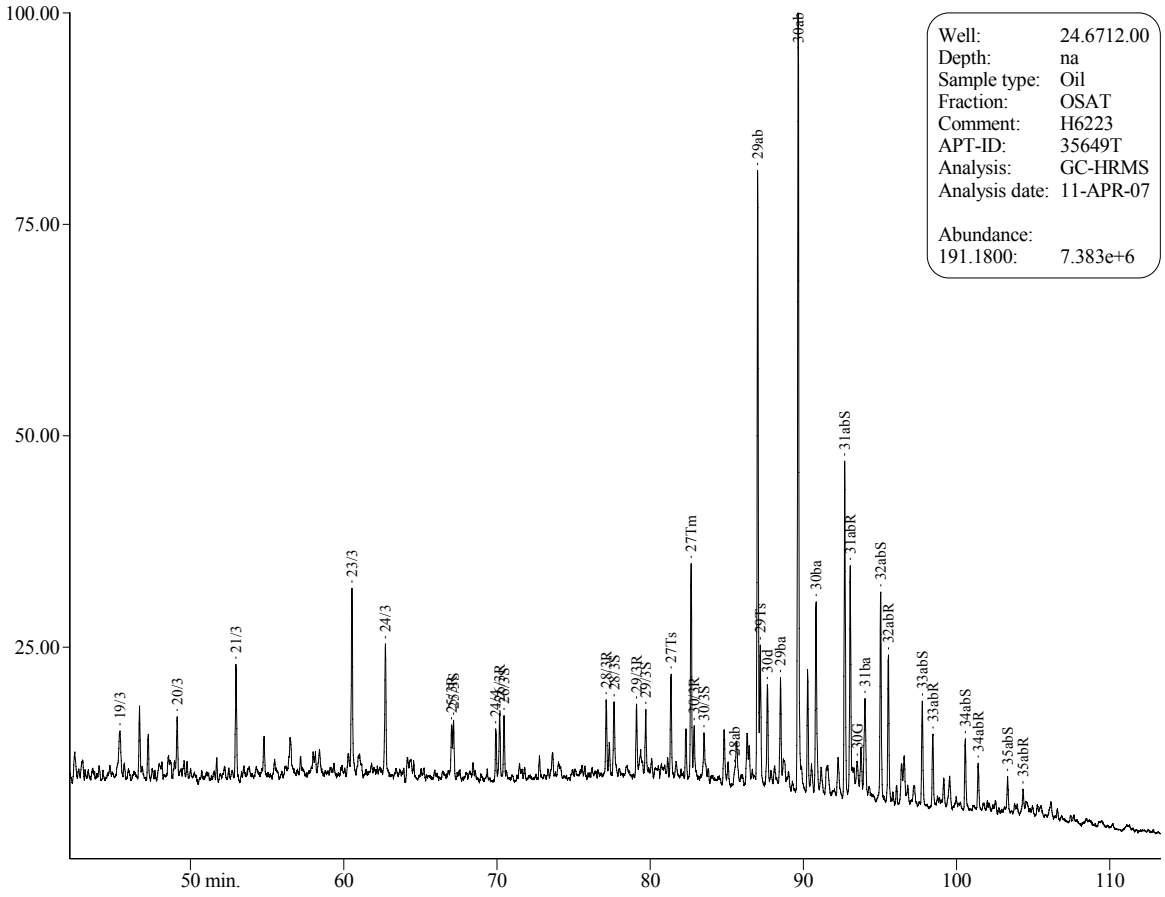
H6220, 7122/7-3, 1195 m, MDT 16, SAT GCMS Terpanes (m/z 191)



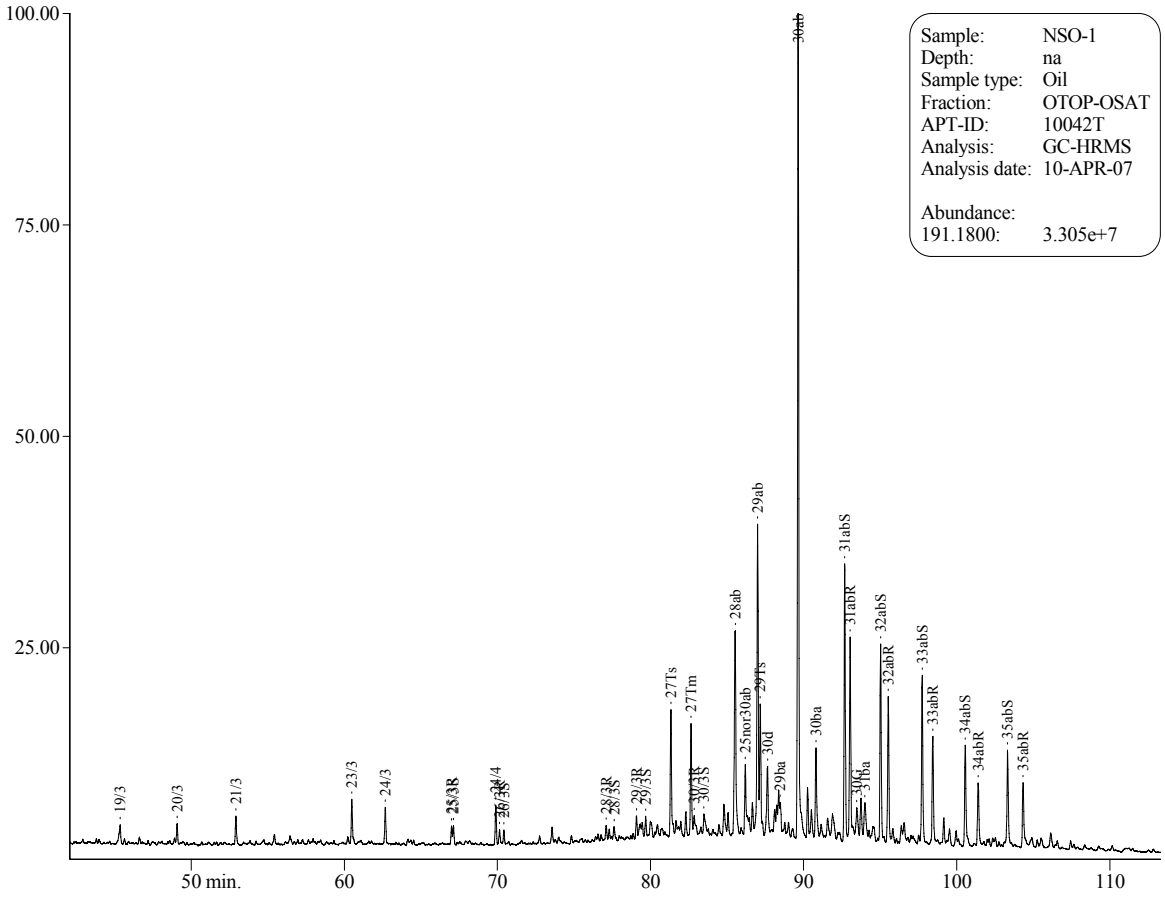
H6221, 7122/7-3, 1812 m, MDT 3 SAT GCMS Terpanes (m/z 191)



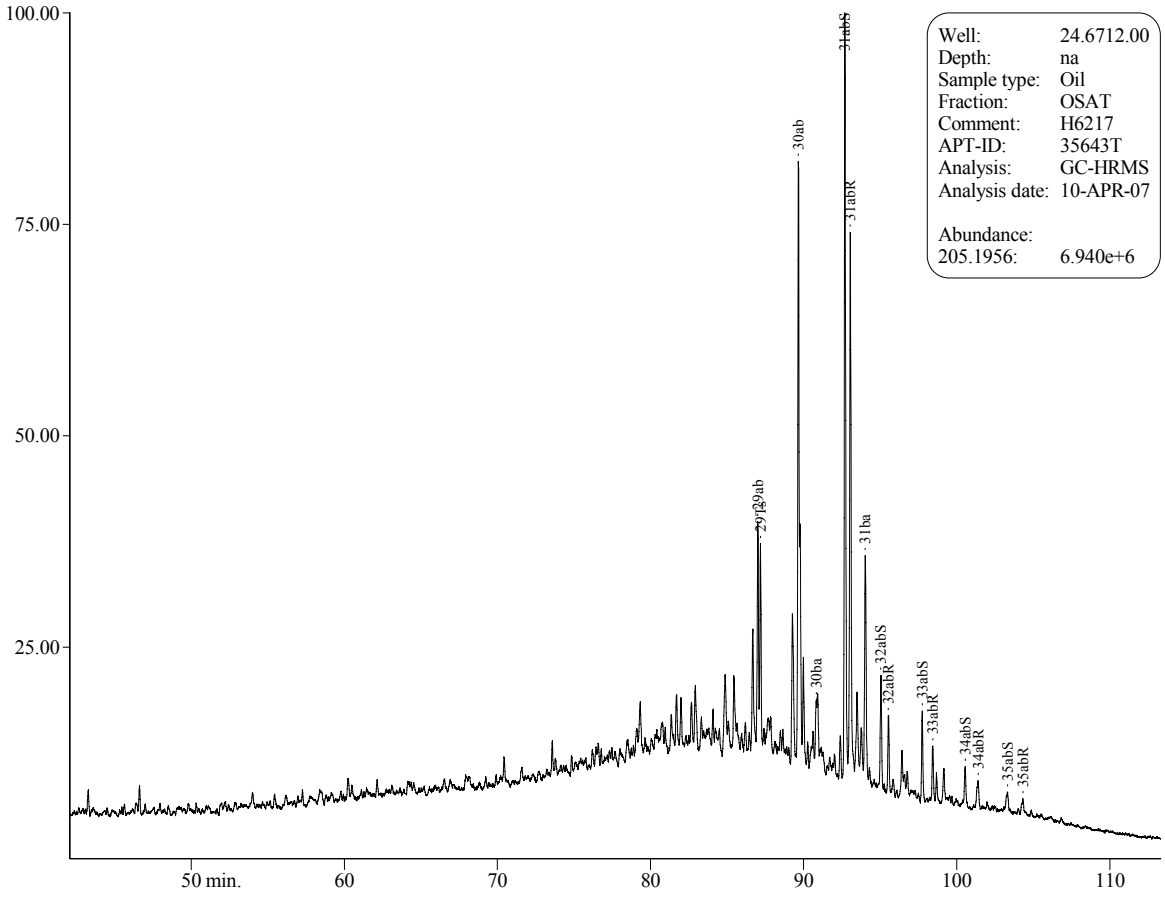
H6222, 7128/4-1, 1577 - 1586 m, DST 2, SAT GCMS Terpanes (m/z 191)



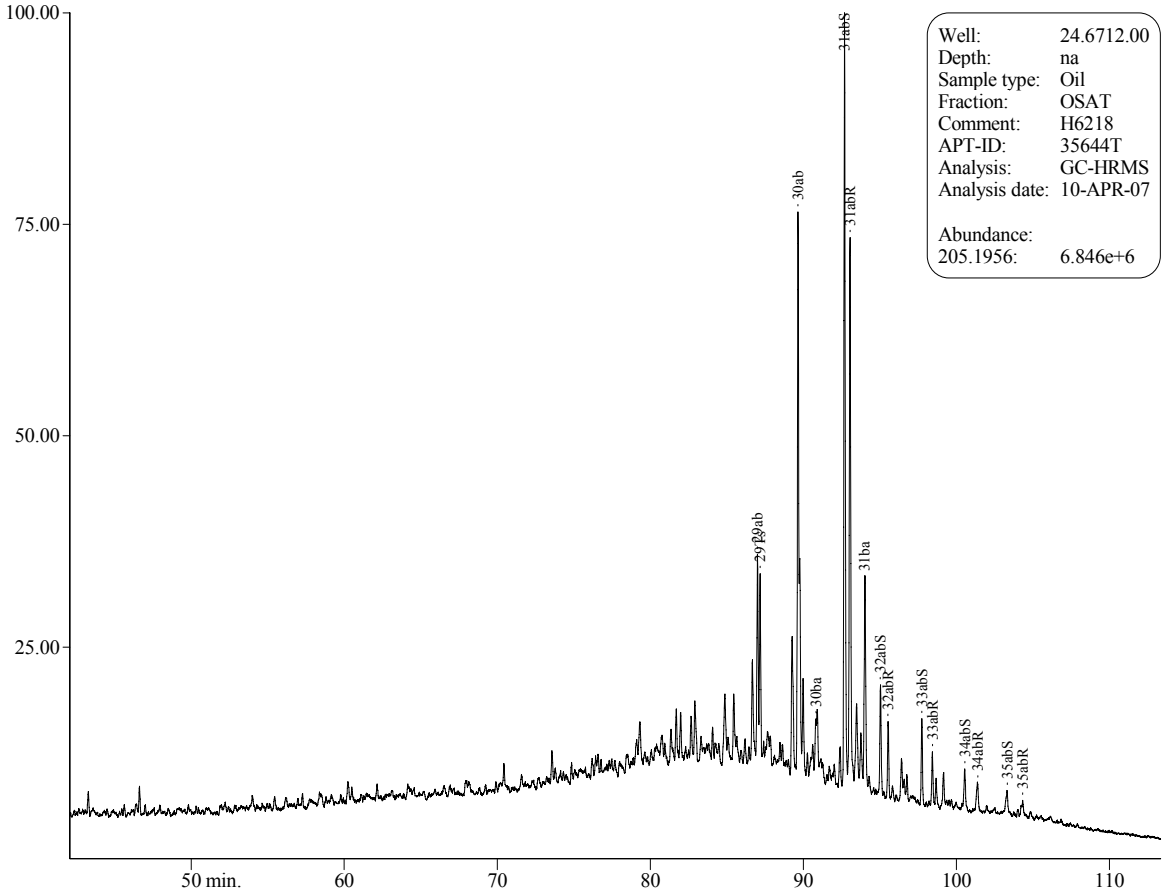
H6223, 7228/7-1 A, 2091.1 m, MDT, SAT GCMS — Terpanes (m/z 191)



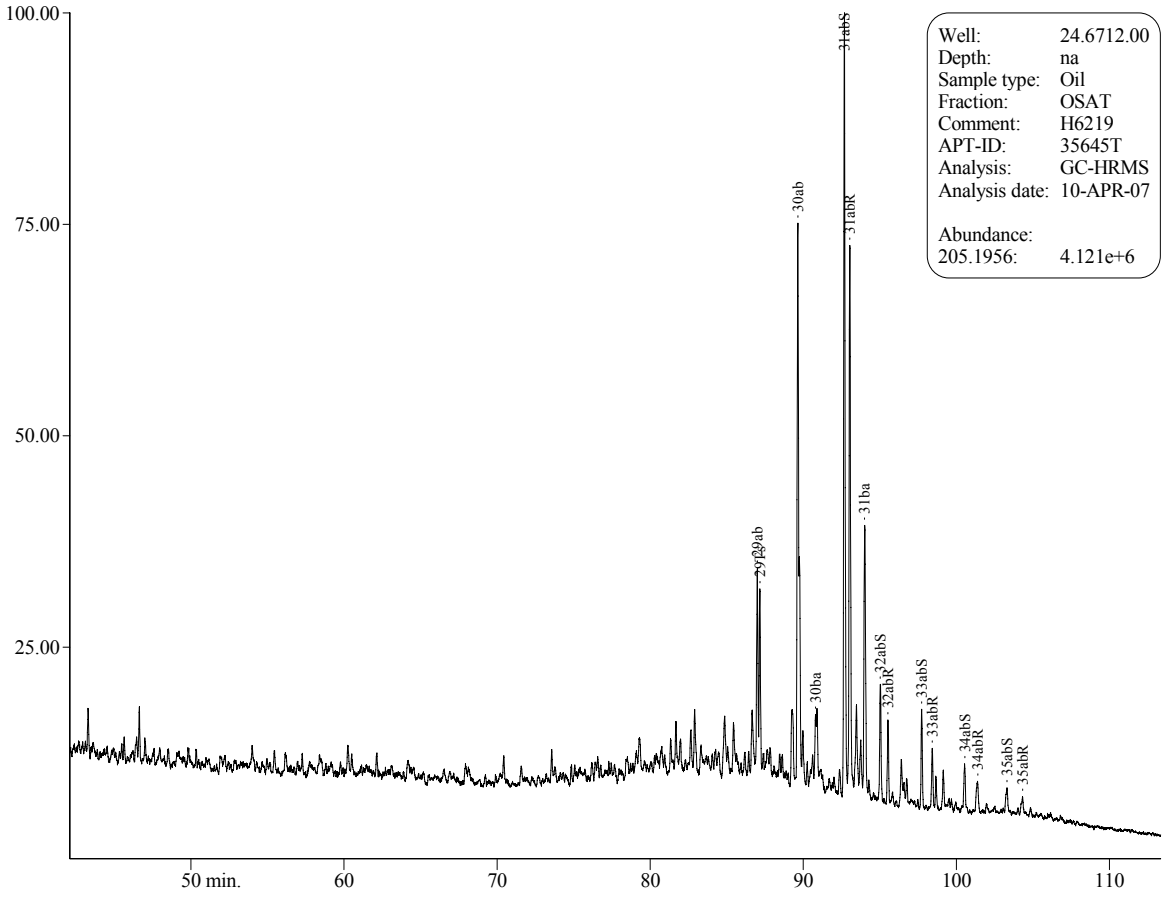
NSO-1,NGS reference oil, SAT GCMS — Terpanes (m/z 191)



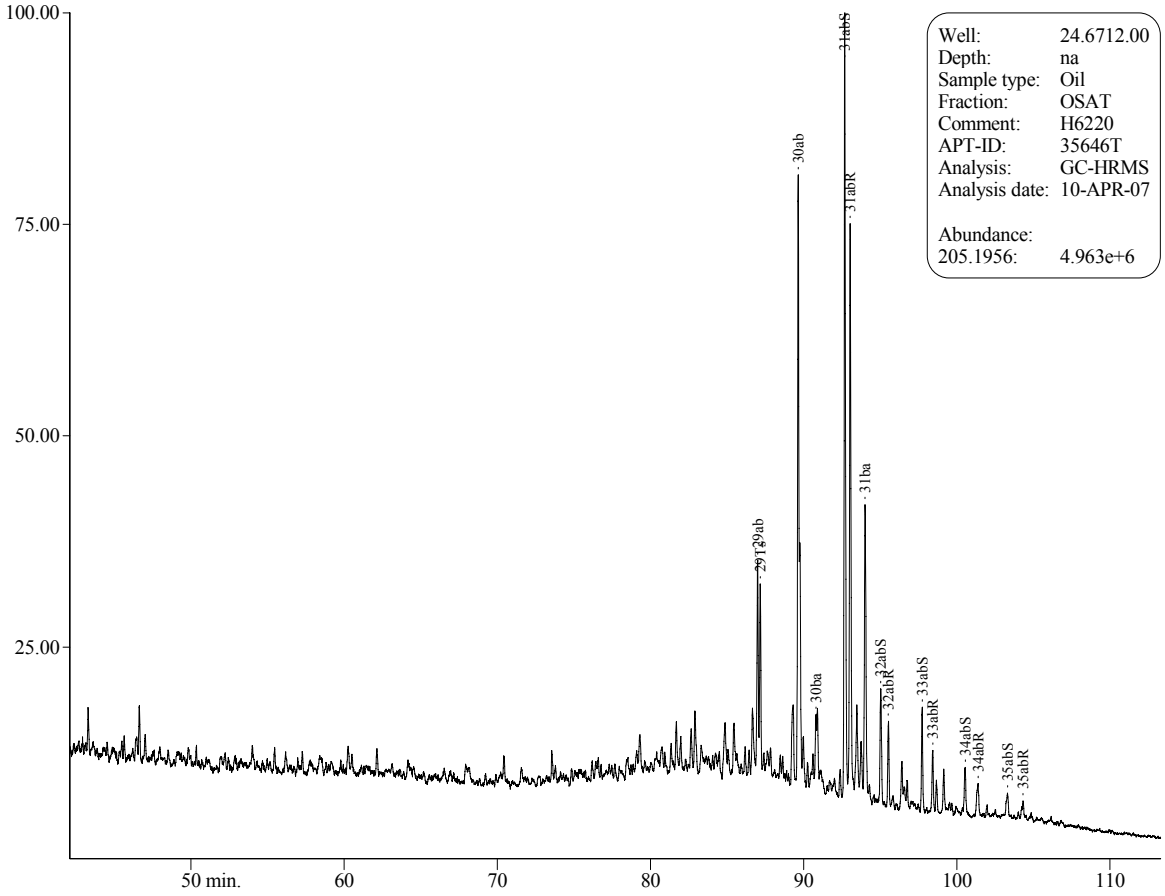
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST 2, SAT GCMS Terpanes (m/z 205)



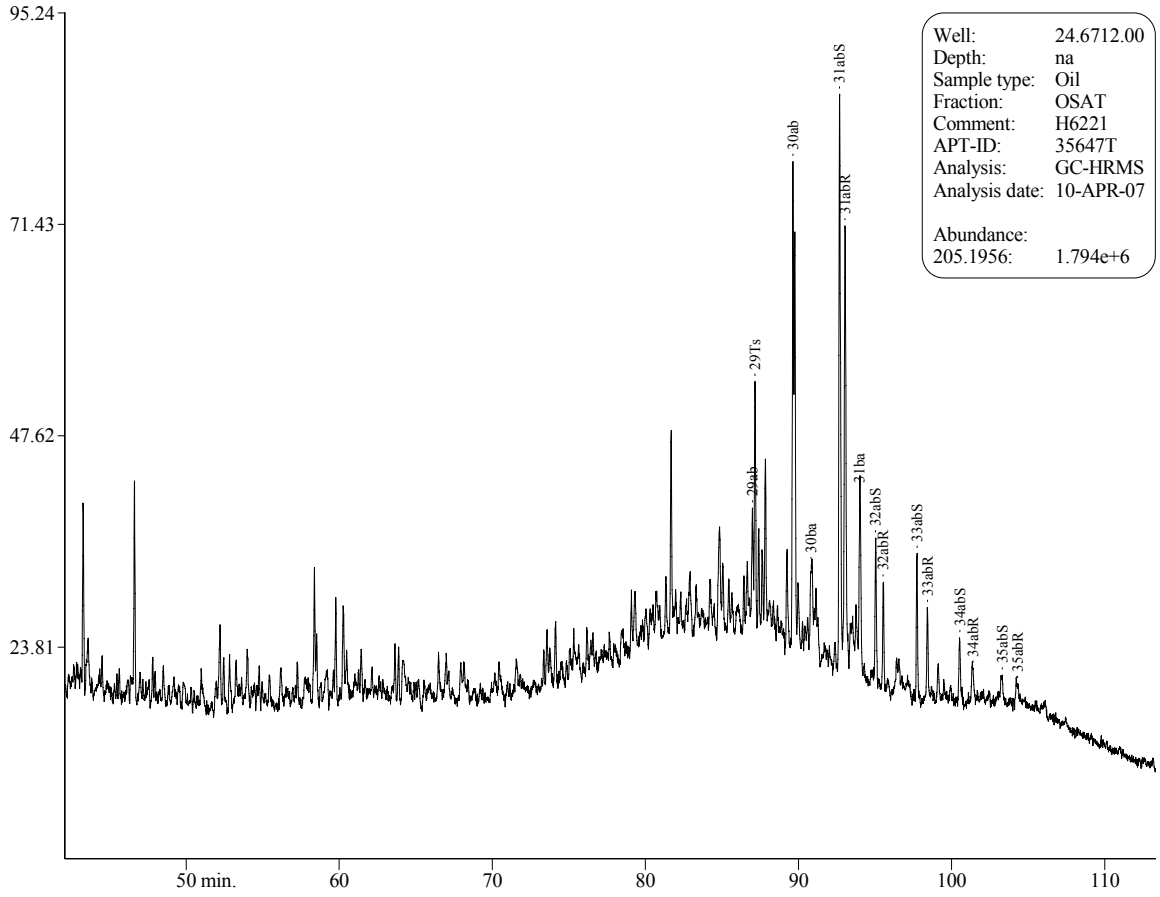
H6218, 7121/5-1, 2436 - 2439 m, DST 1, SAT GCMS Terpanes (m/z 205)



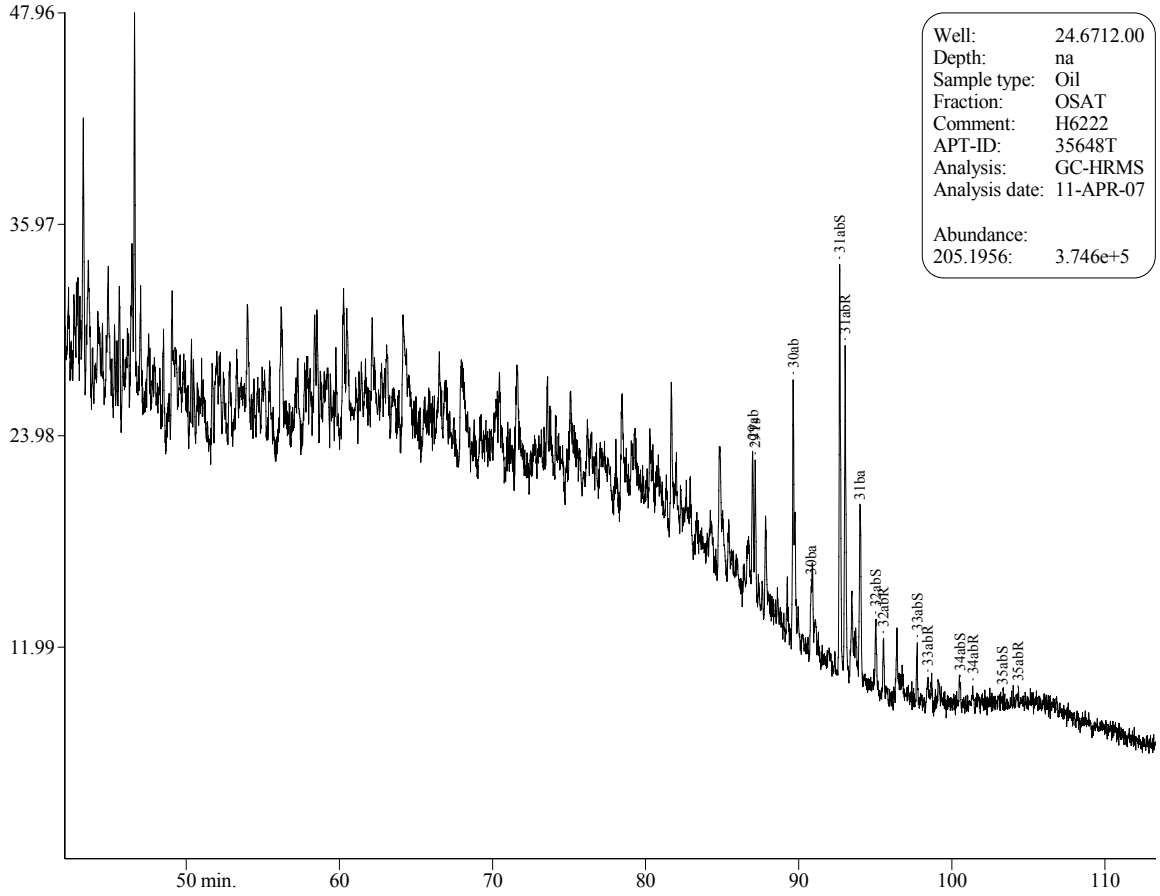
H6219, 7122/7-1, 1114 m, MDT 1, SAT GCMS Terpanes (m/z 205)



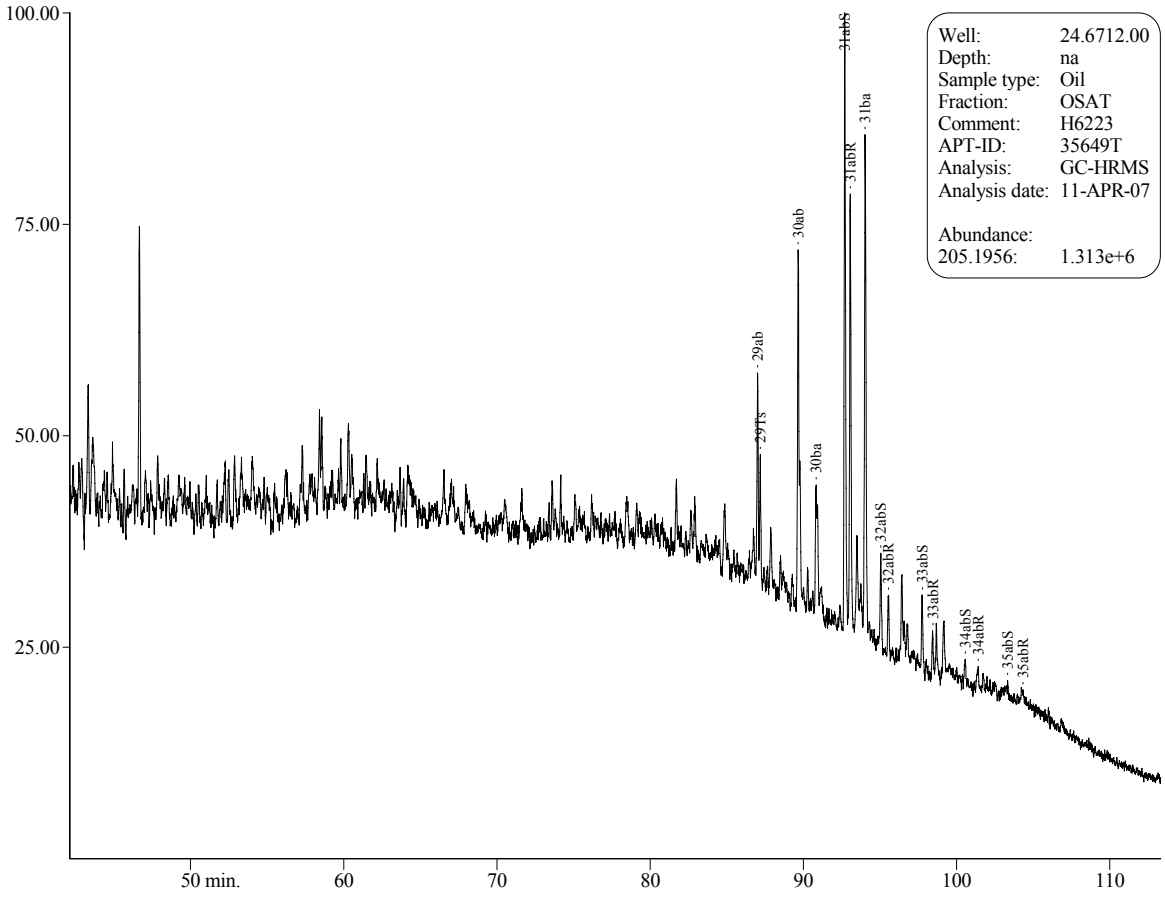
H6220, 7122/7-3, 1195 m, MDT 16, SAT GCMS Terpanes (m/z 205)



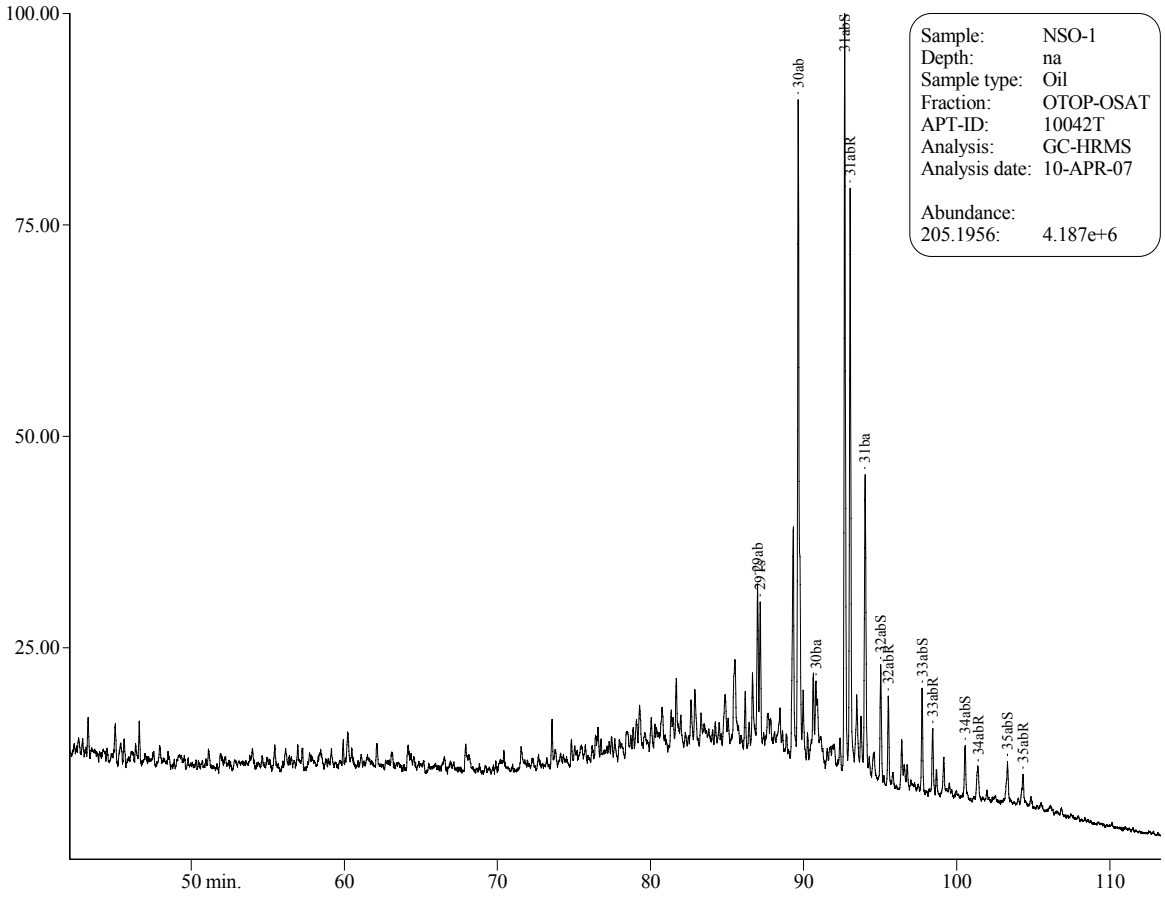
H6221, 7122/7-3, 1812 m, MDT 3 SAT GCMS — Terpanes (m/z 205)



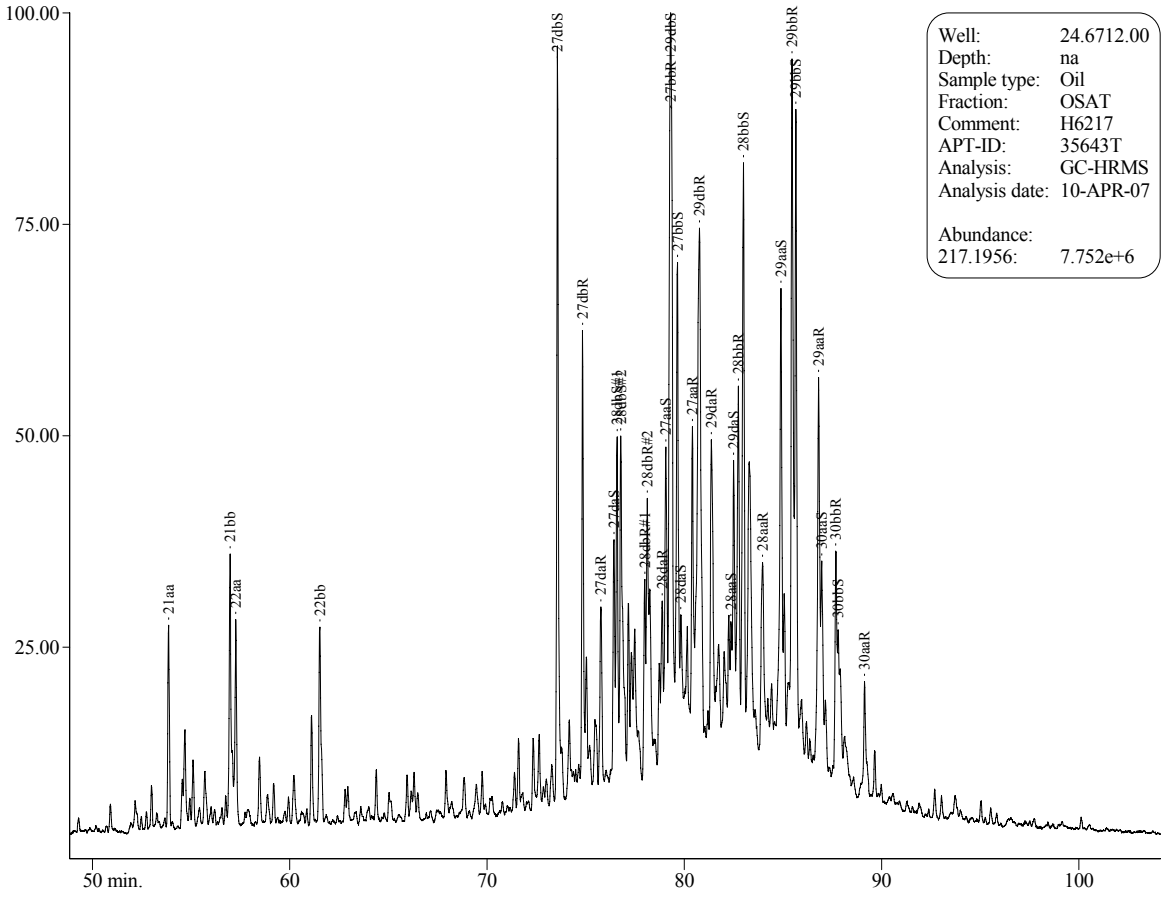
H6222, 7128/4-1, 1577 - 1586 m, DST 2, SAT GCMS — Terpanes (m/z 205)



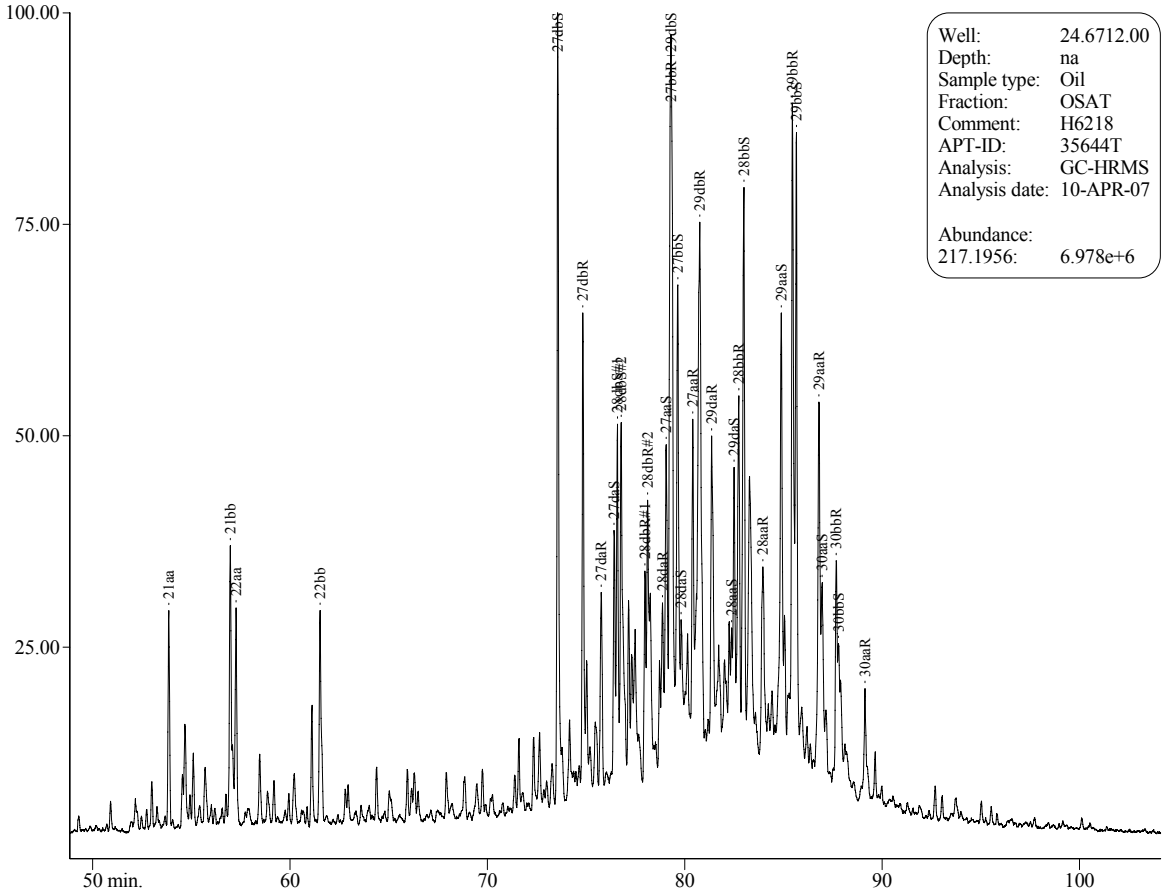
H6223, 7228/7-1 A, 2091.1 m, MDT, SAT GCMS Terpanes (m/z 205)



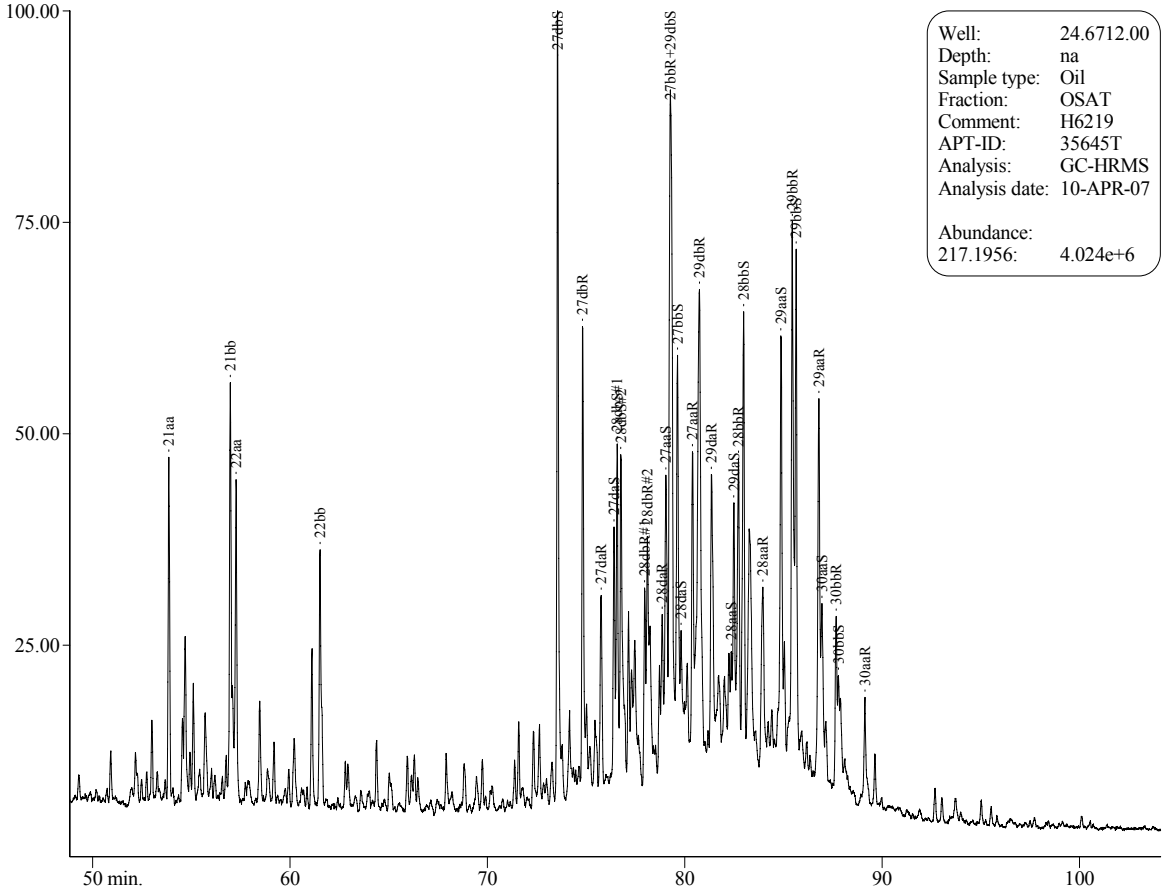
NSO-1, NGS reference oil, SAT GCMS Terpanes (m/z 205)



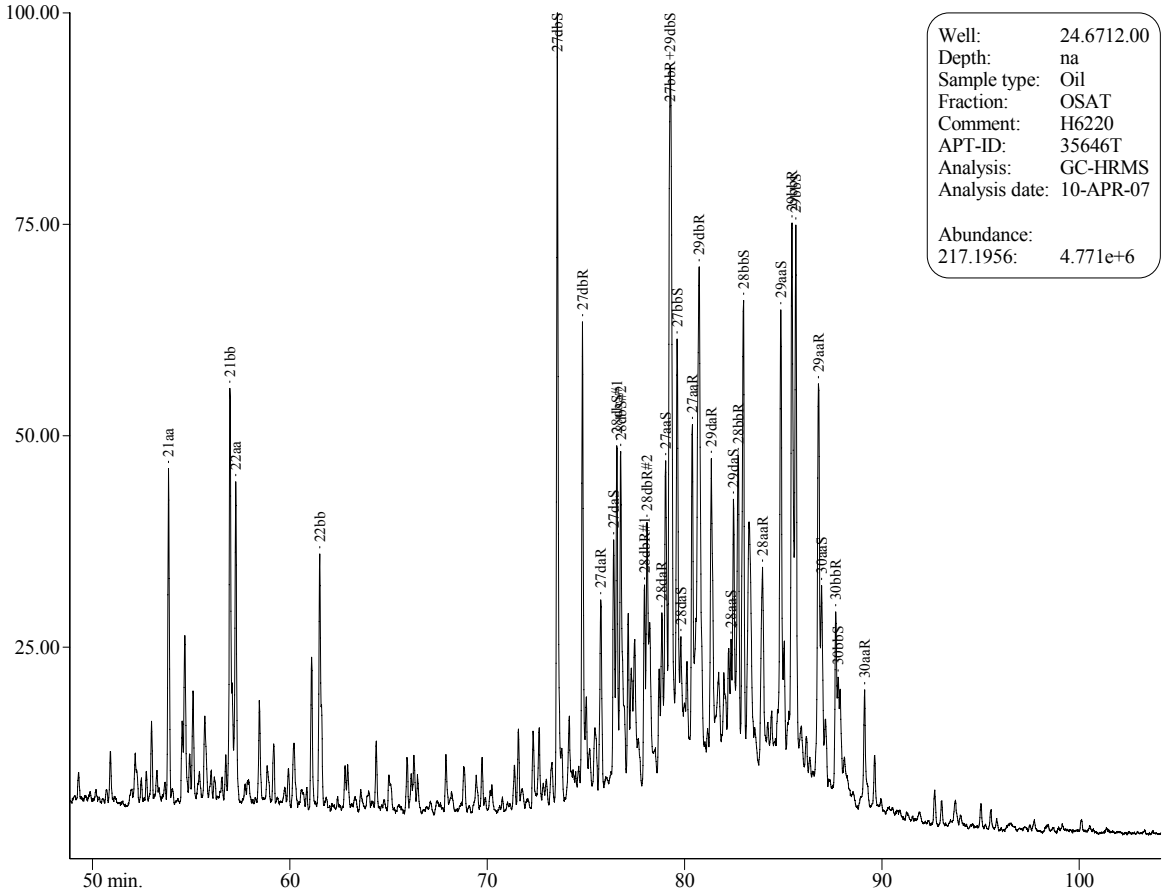
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST 2, SAT GCMS Steranes (m/z 217)



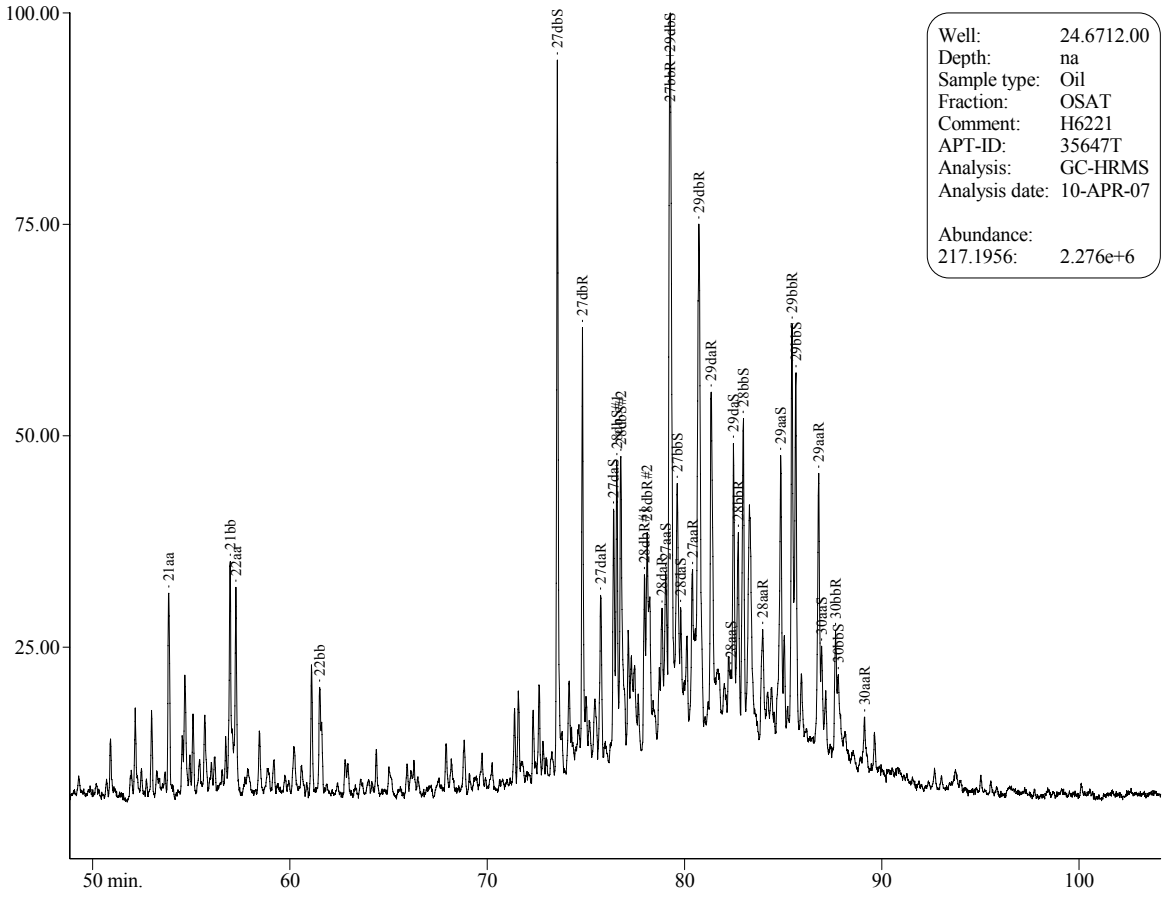
H6218, 7121/5-1, 2436 - 2439 m, DST 1, SAT GCMS Steranes (m/z 217)



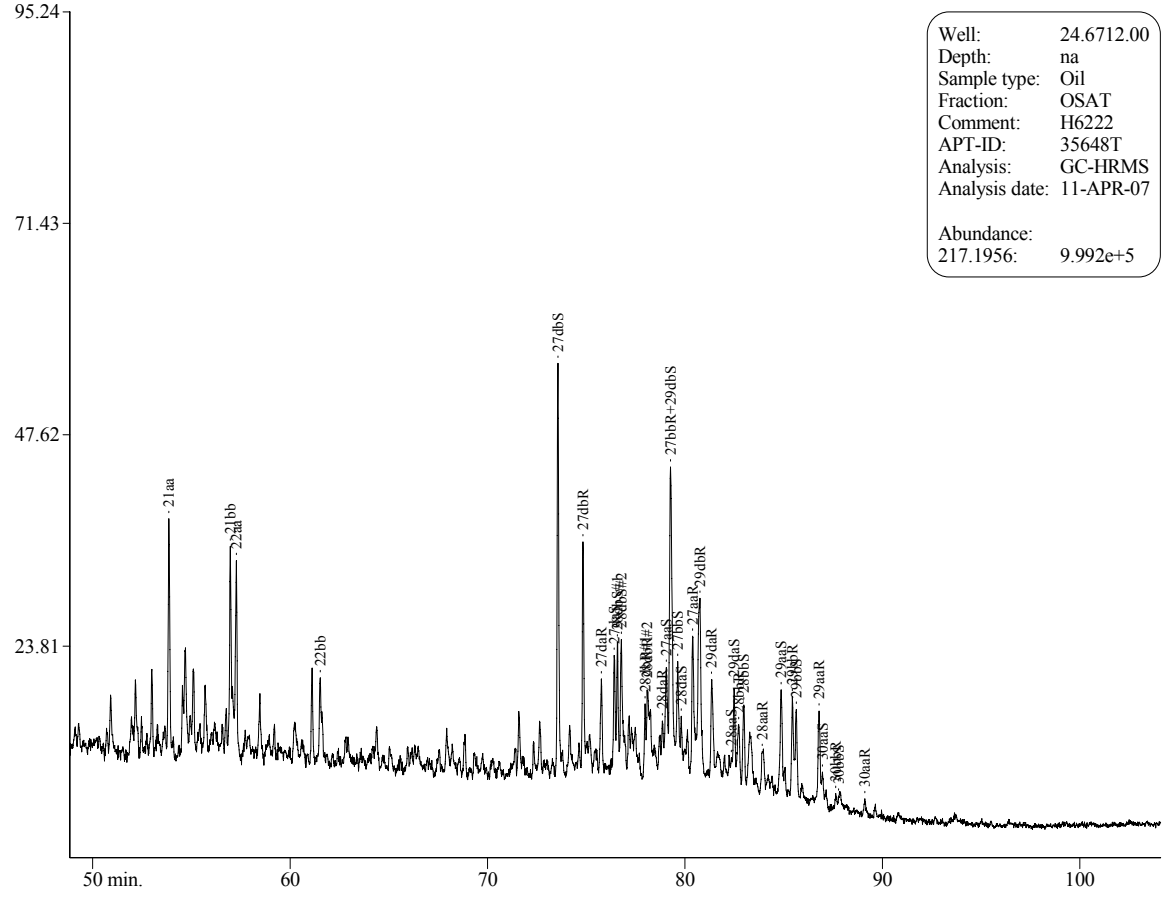
H6219, 7122/7-1, 1114 m, MDT 1, SAT GCMS Steranes (m/z 217)



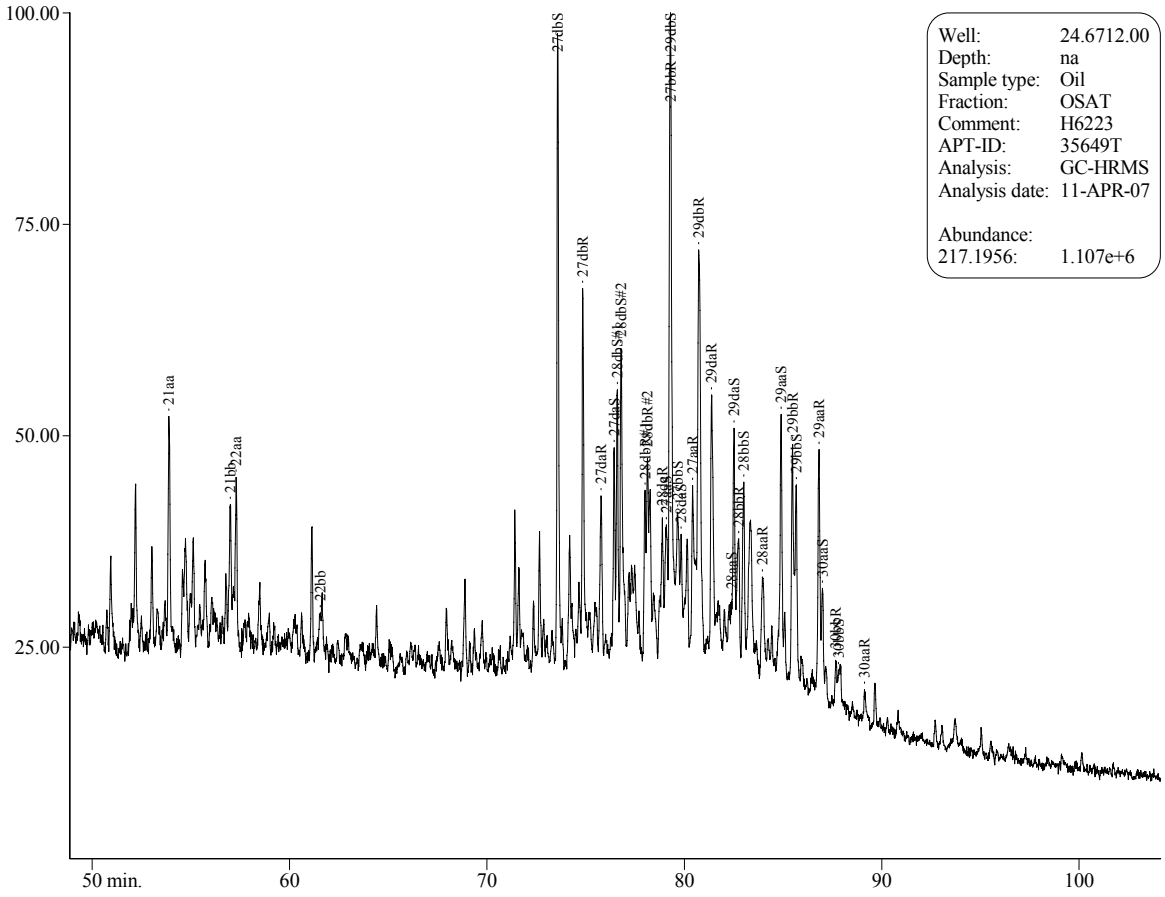
H6220, 7122/7-3, 1195 m, MDT 16, SAT GCMS Steranes (m/z 217)



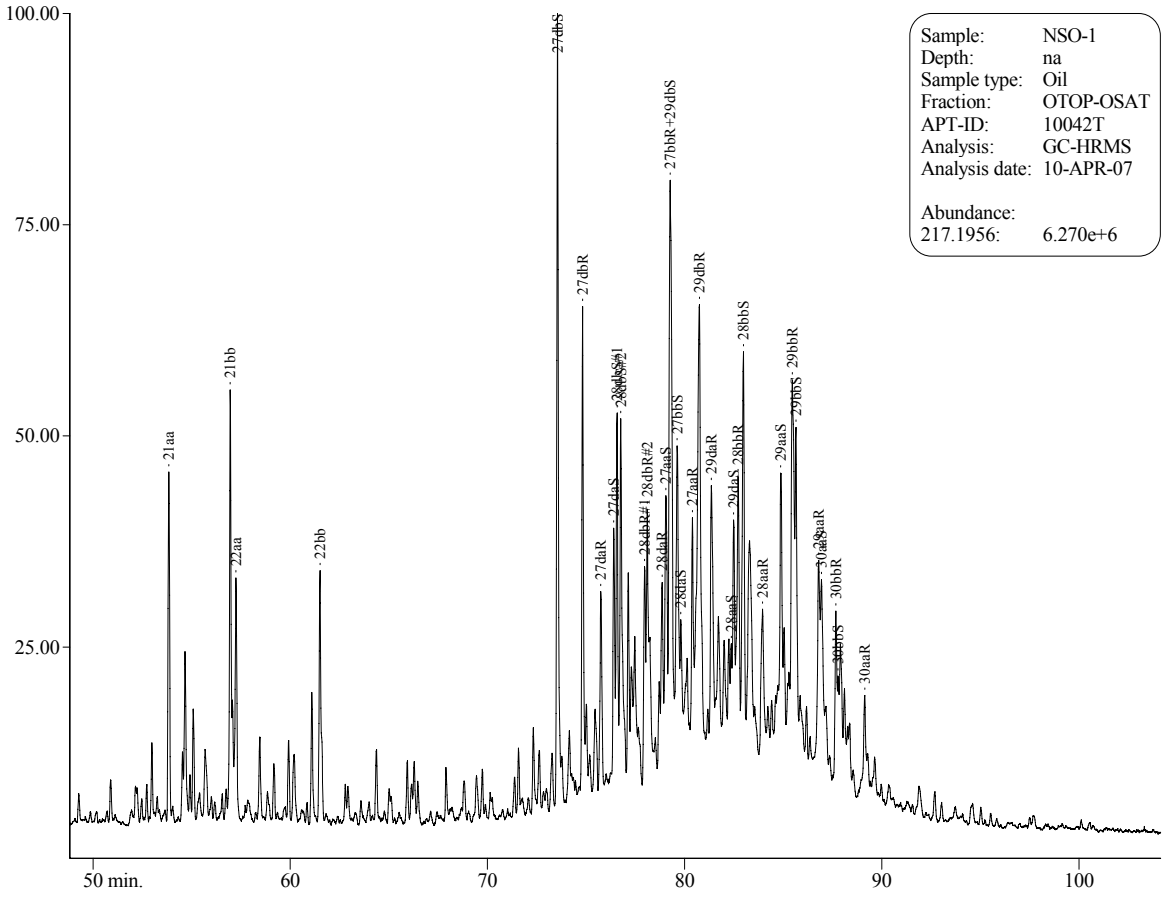
H6221, 7122/7-3, 1812 m, MDT 3 SAT GCMS Steranes (m/z 217)



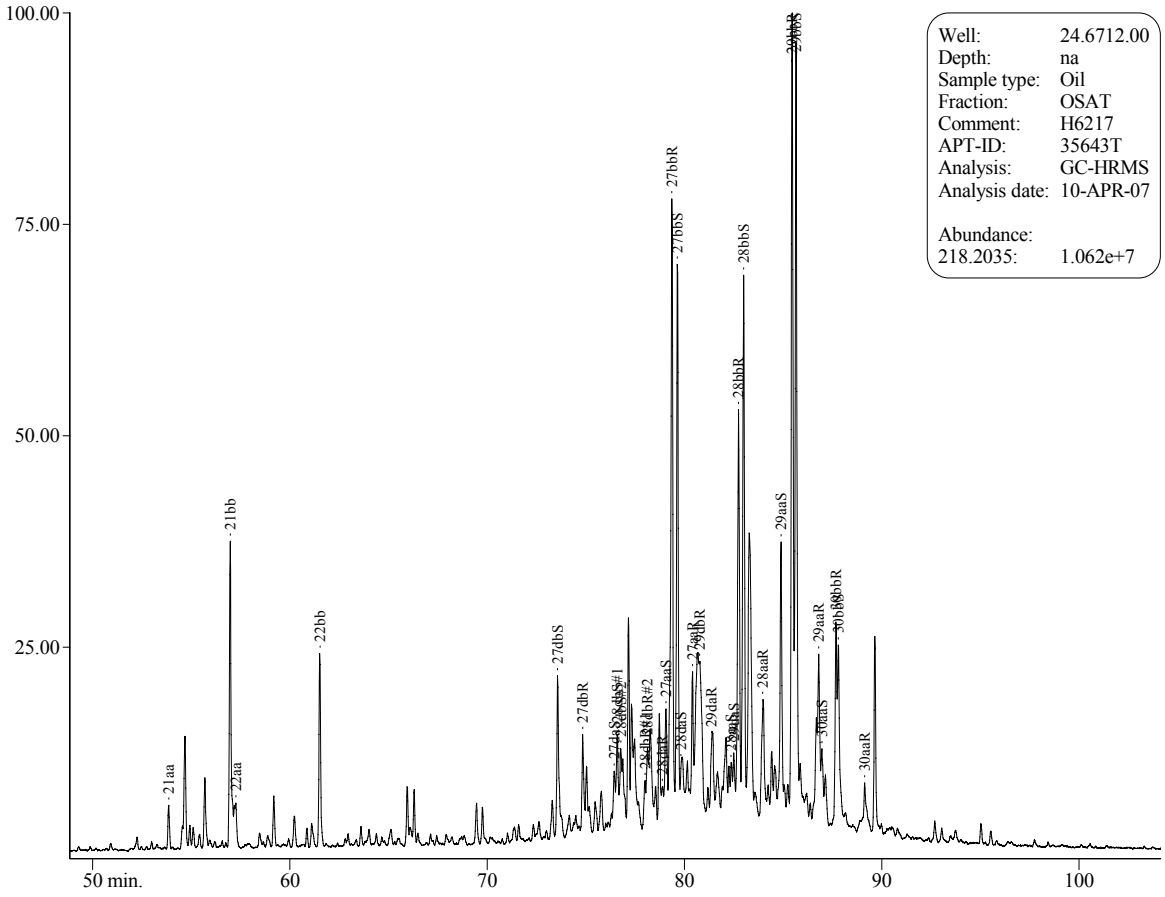
H6222, 7128/4-1, 1577 - 1586 m, DST 2, SAT GCMS Steranes (m/z 217)



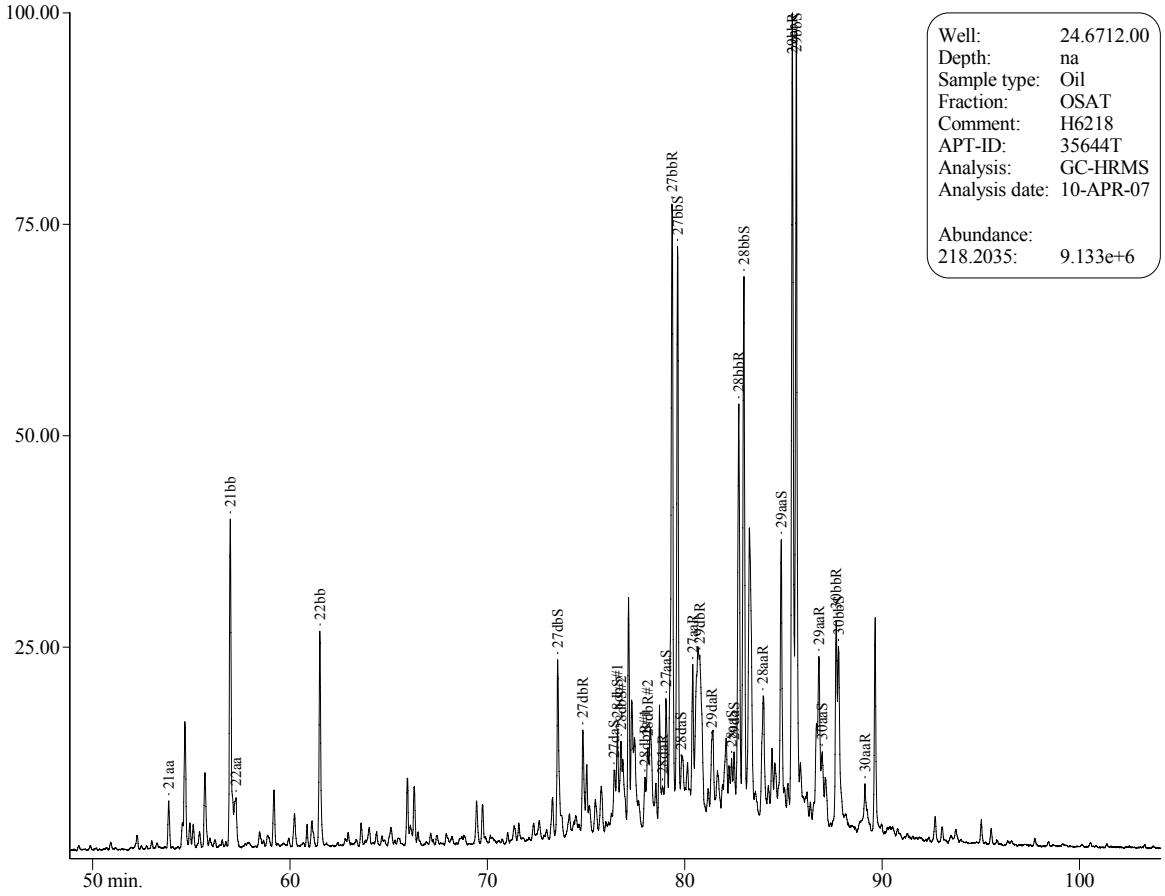
H6223, 7228/7-1 A, 2091.1 m, MDT, SAT GCMS — Steranes (m/z 217)



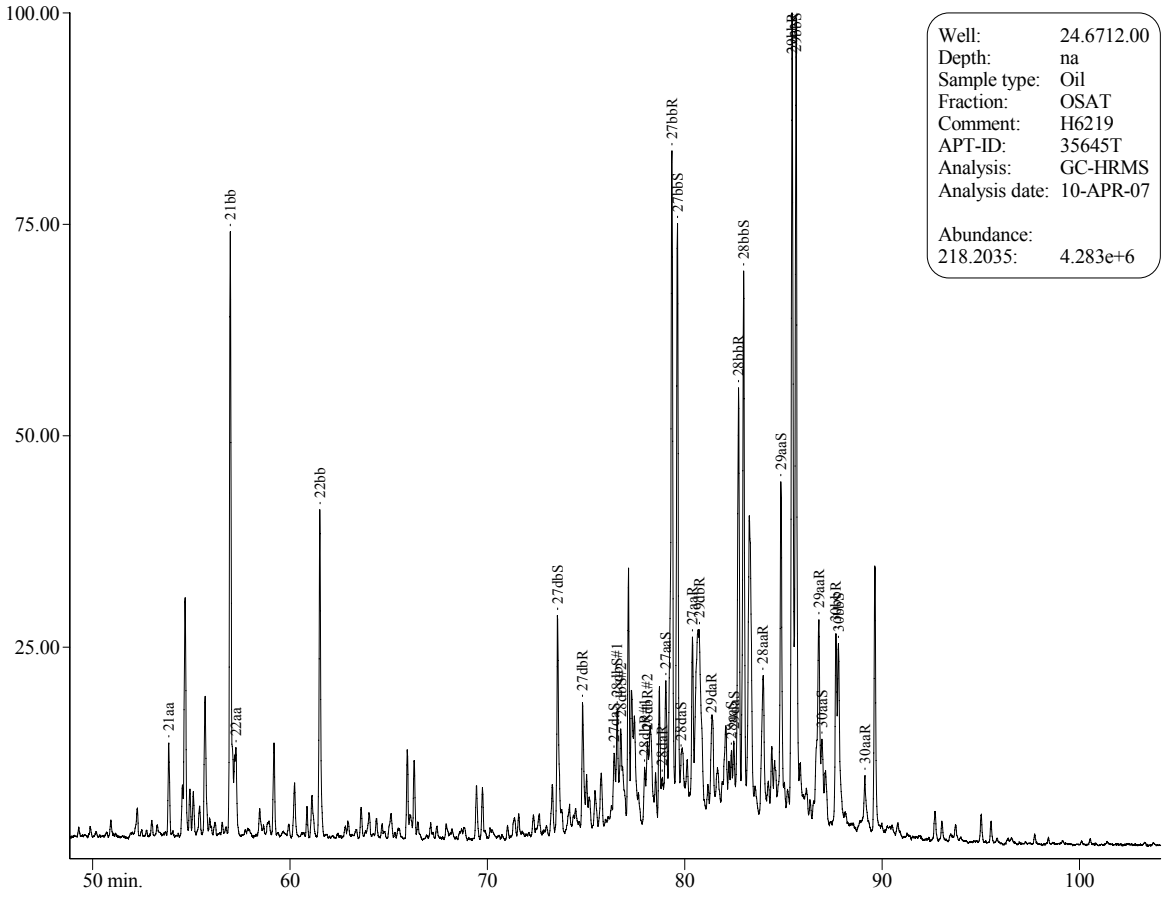
NSO-1, NGS reference oil, SAT GCMS — Steranes (m/z 217)



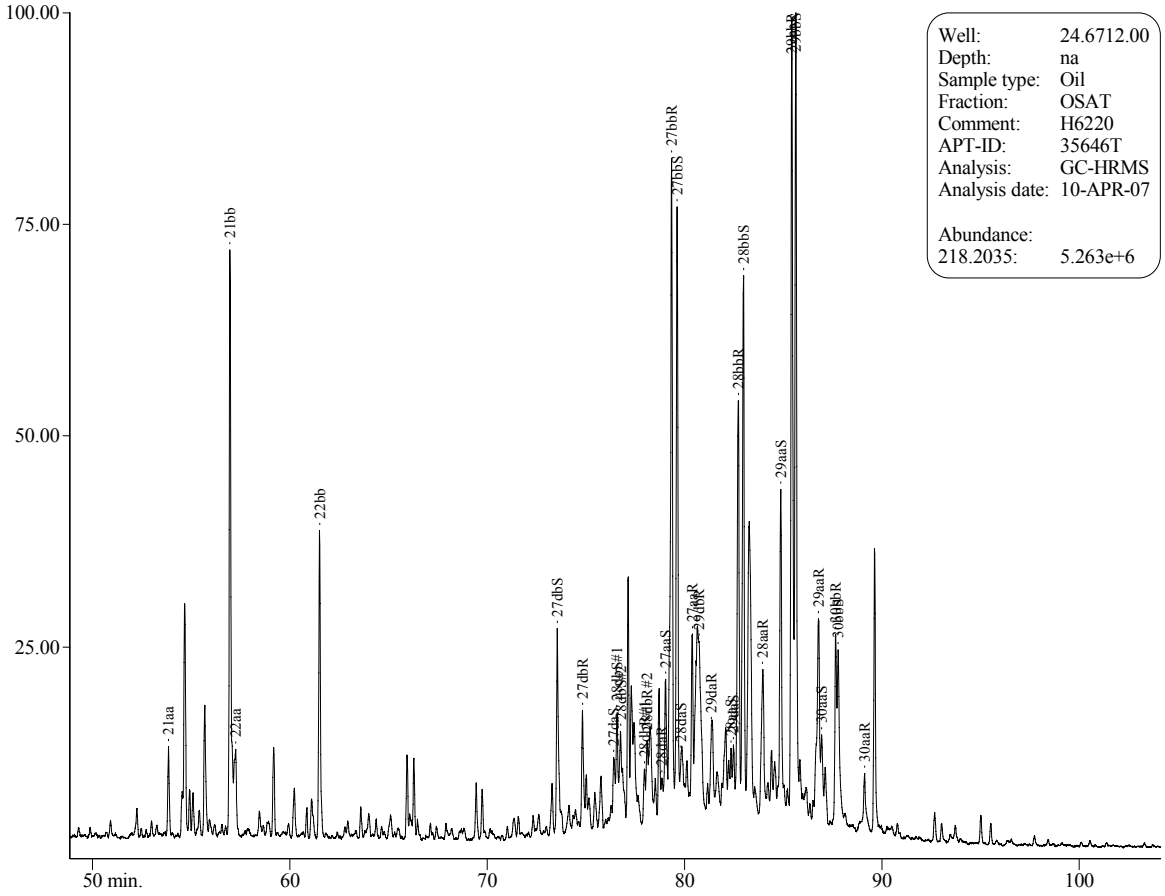
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST 2, SAT GCMS Steranes (m/z 218)



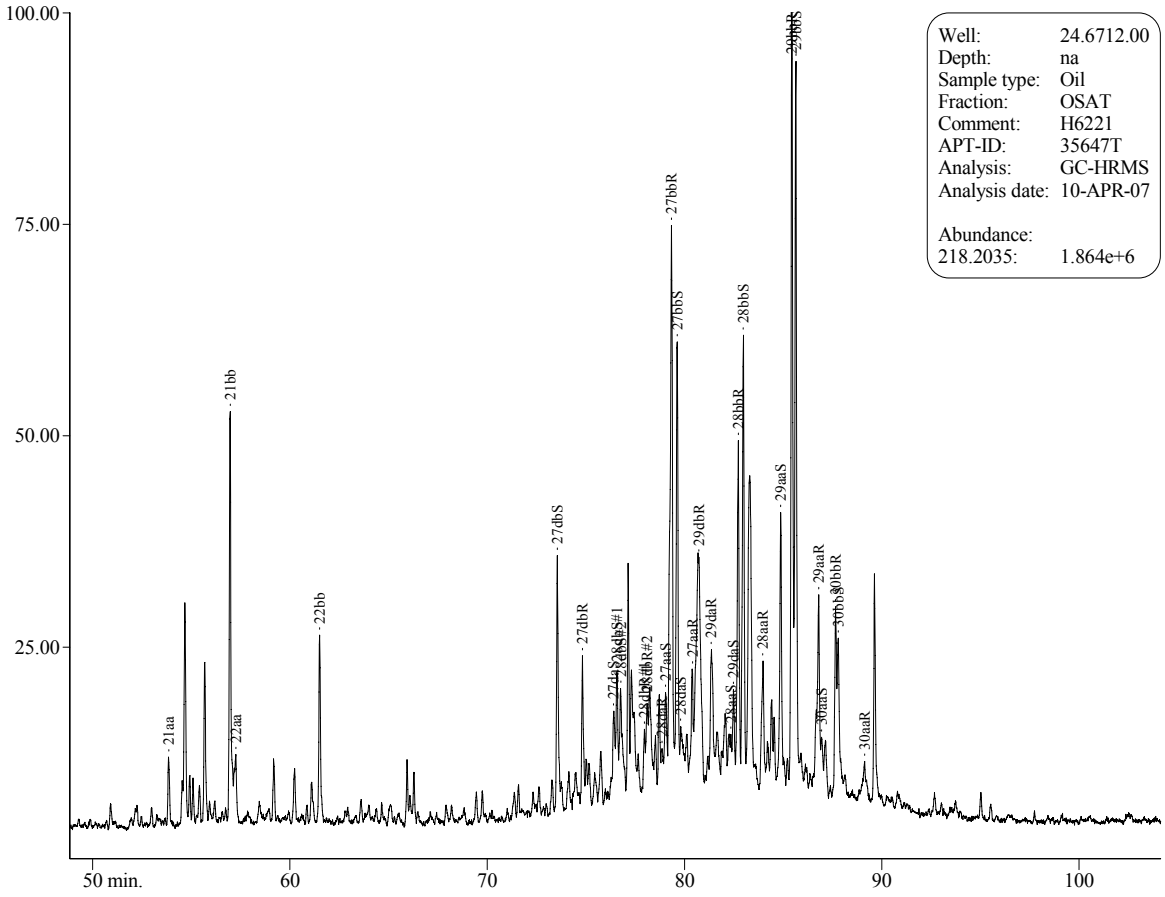
H6218, 7121/5-1, 2436 - 2439 m, DST 1, SAT GCMS Steranes (m/z 218)



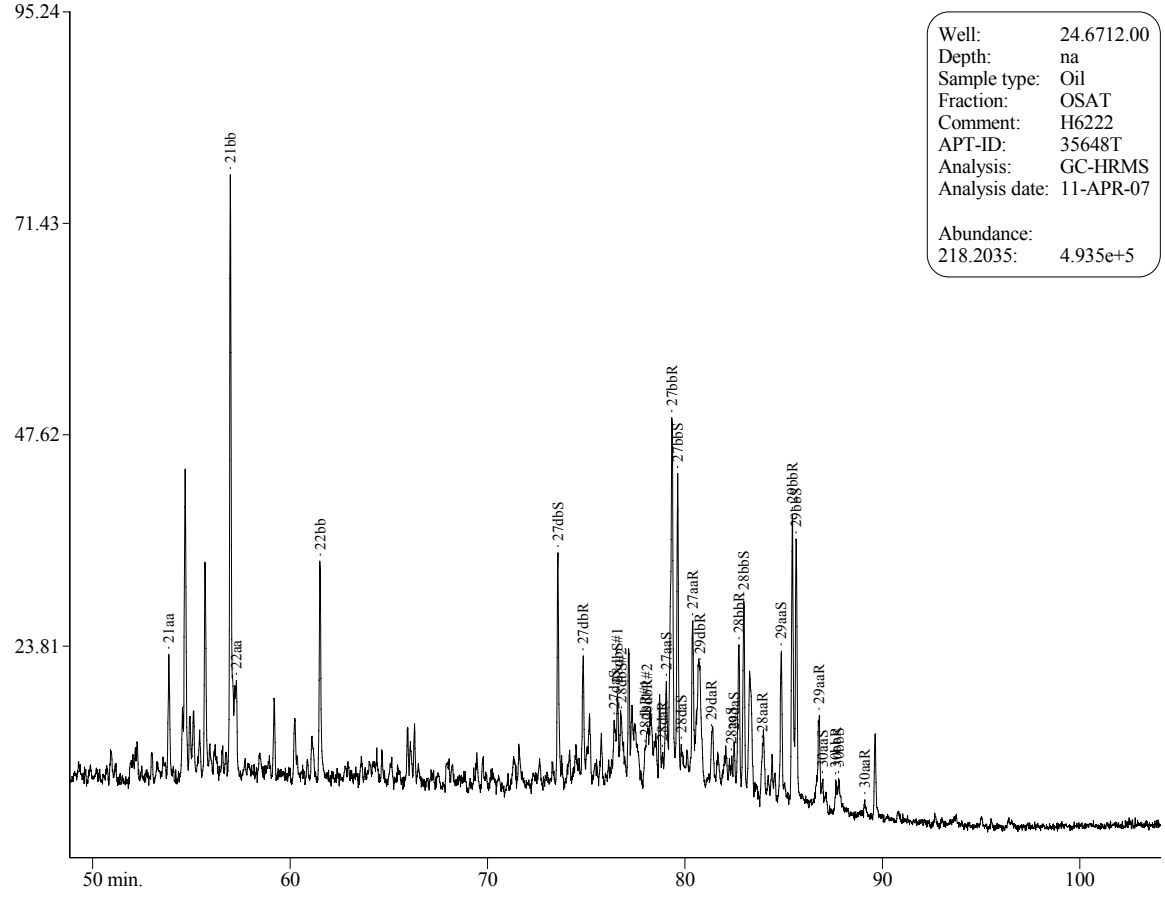
H6219, 7122/7-1, 1114 m, MDT 1, SAT GCMS Steranes (m/z 218)



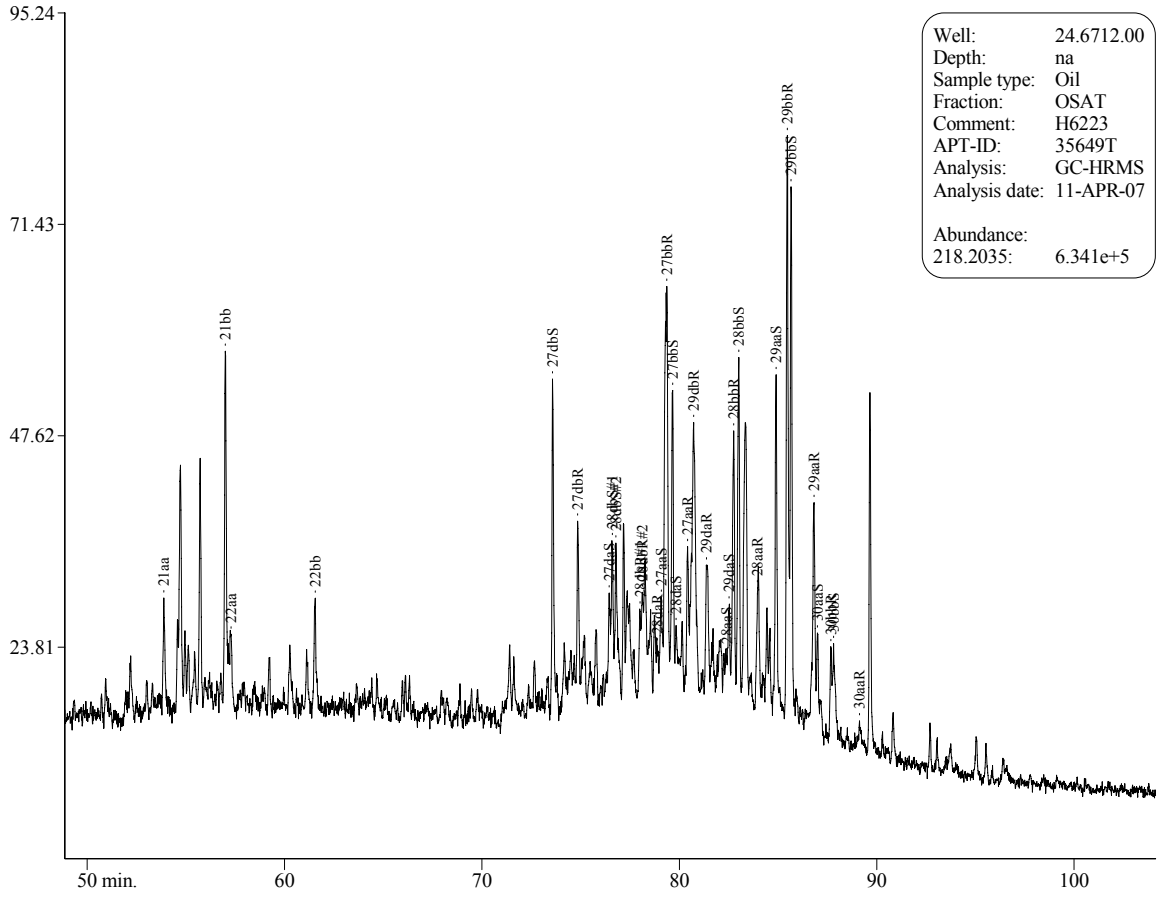
H6220, 7122/7-3, 1195 m, MDT 16, SAT GCMS Steranes (m/z 218)



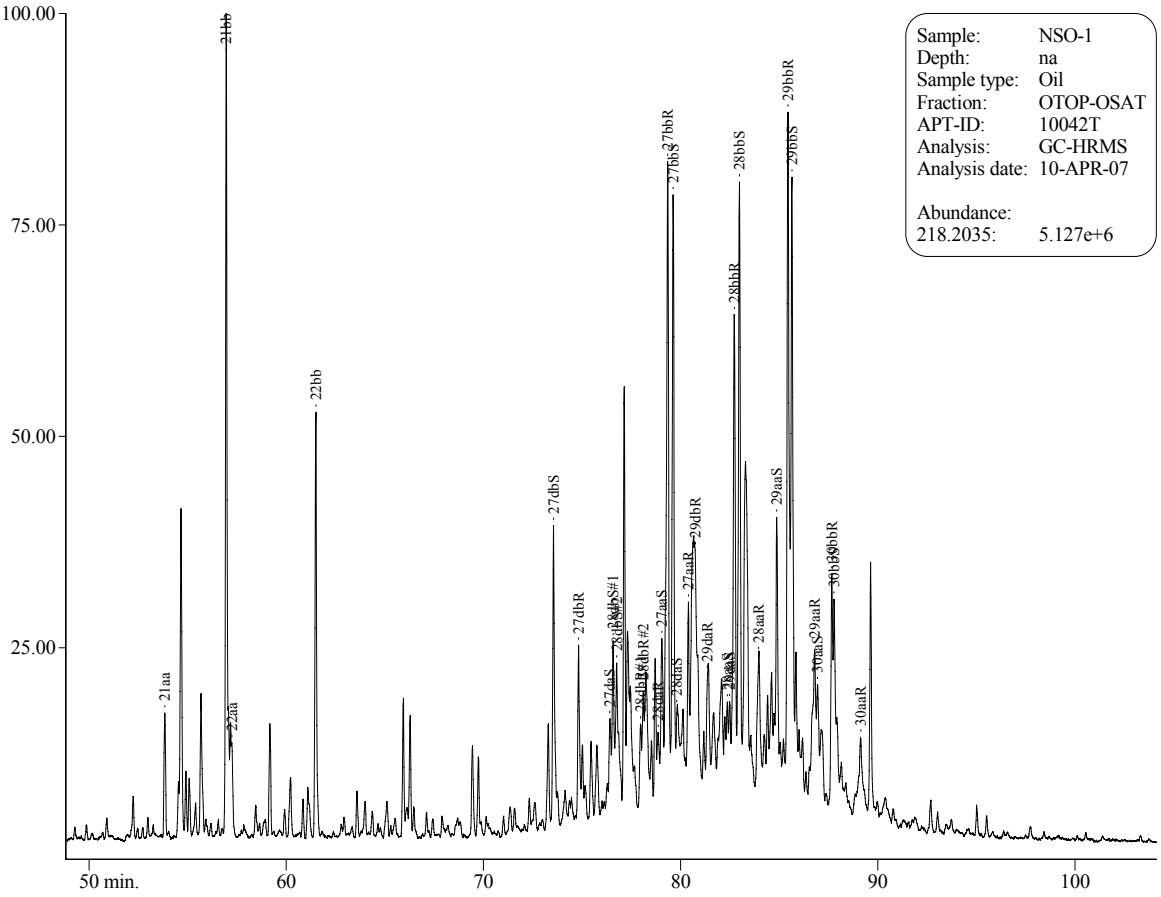
H6221, 7122/7-3, 1812 m, MDT 3 SAT GCMS — Steranes (m/z 218)



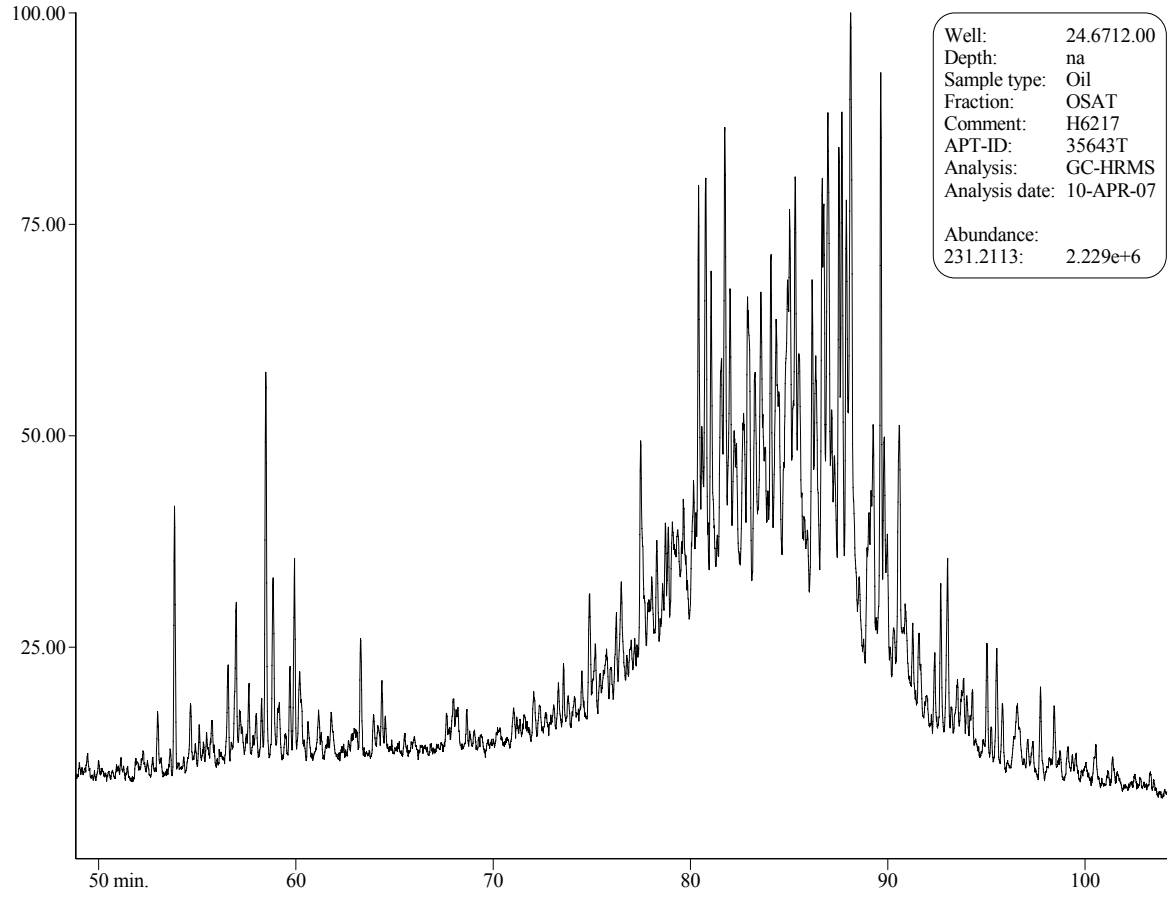
H6222, 7128/4-1, 1577 - 1586 m, DST 2, SAT GCMS — Steranes (m/z 218)



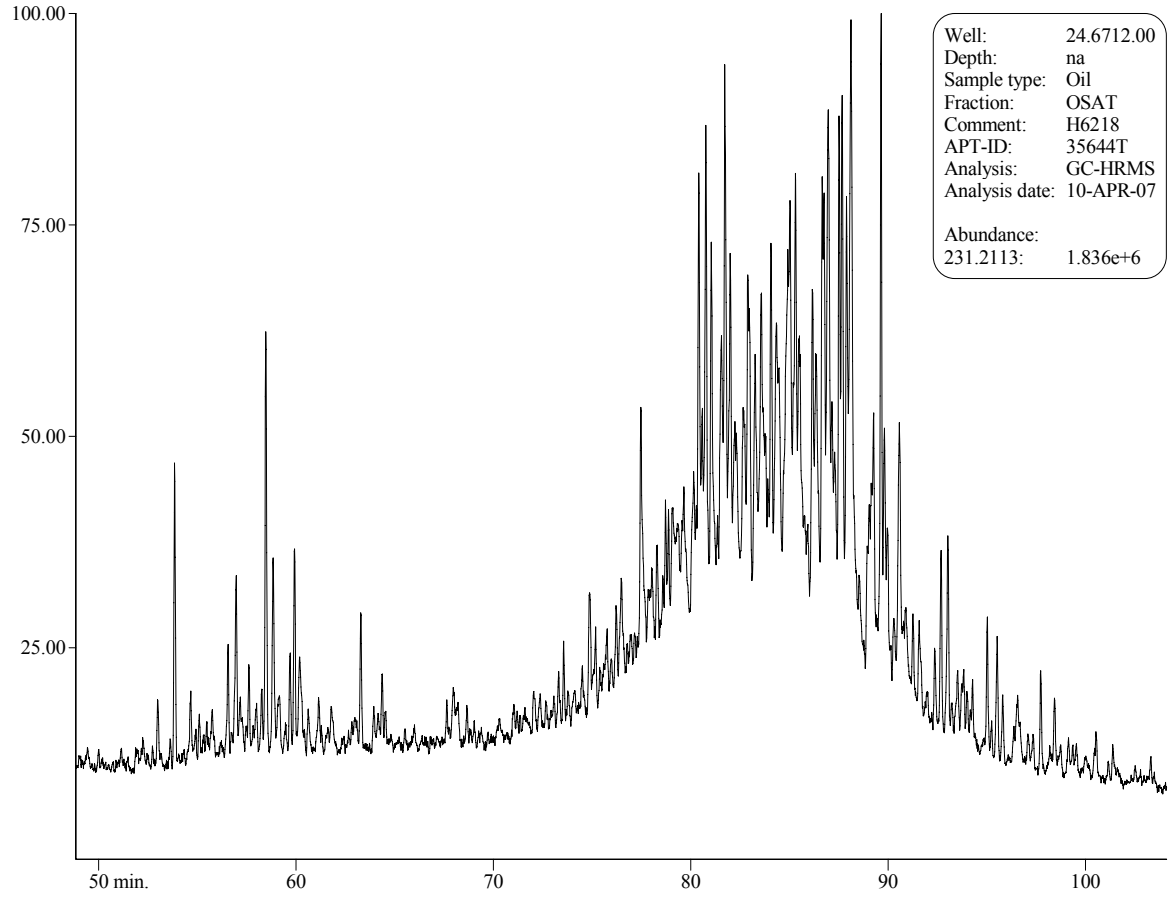
H6223, 7228/7-1 A, 2091.1 m, MDT, SAT GCMS Steranes (m/z 218)



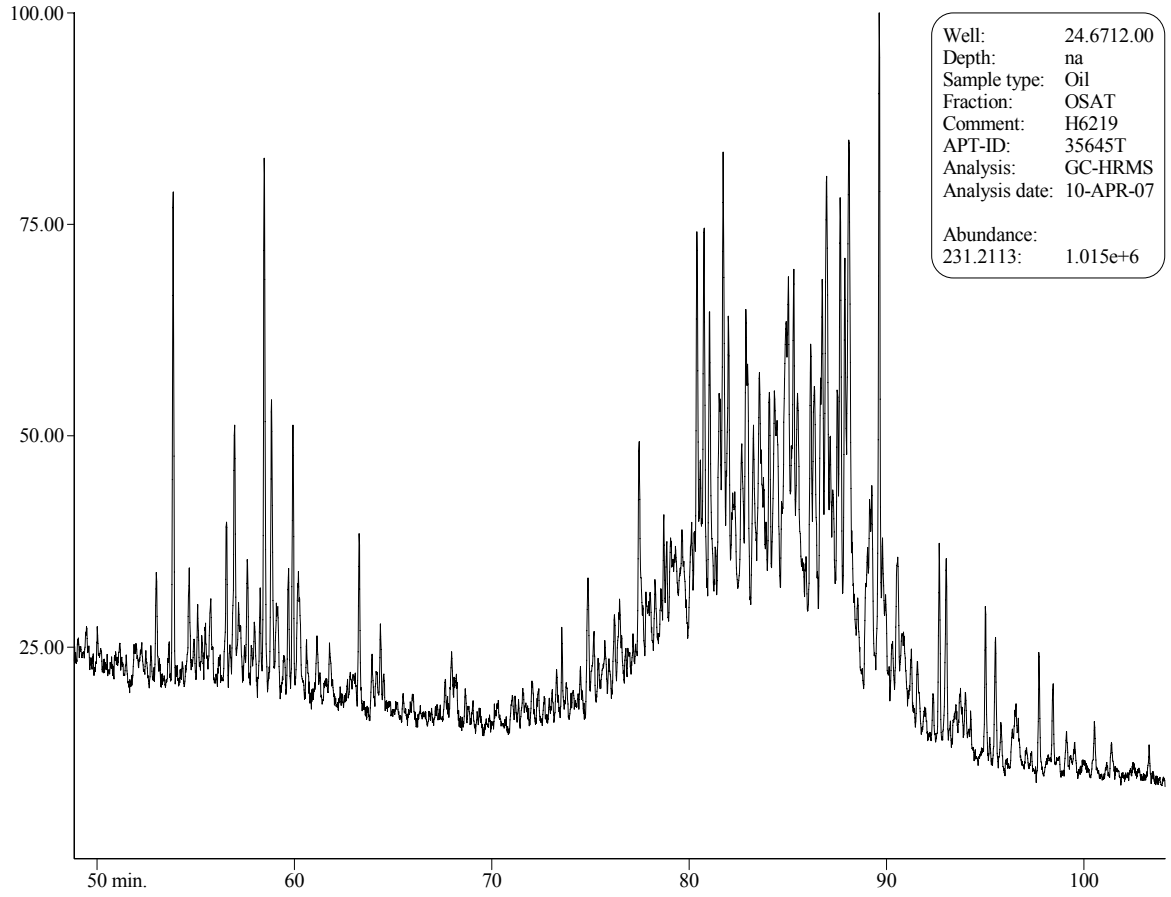
NSO-1, NGS reference oil, SAT GCMS Steranes (m/z 218)



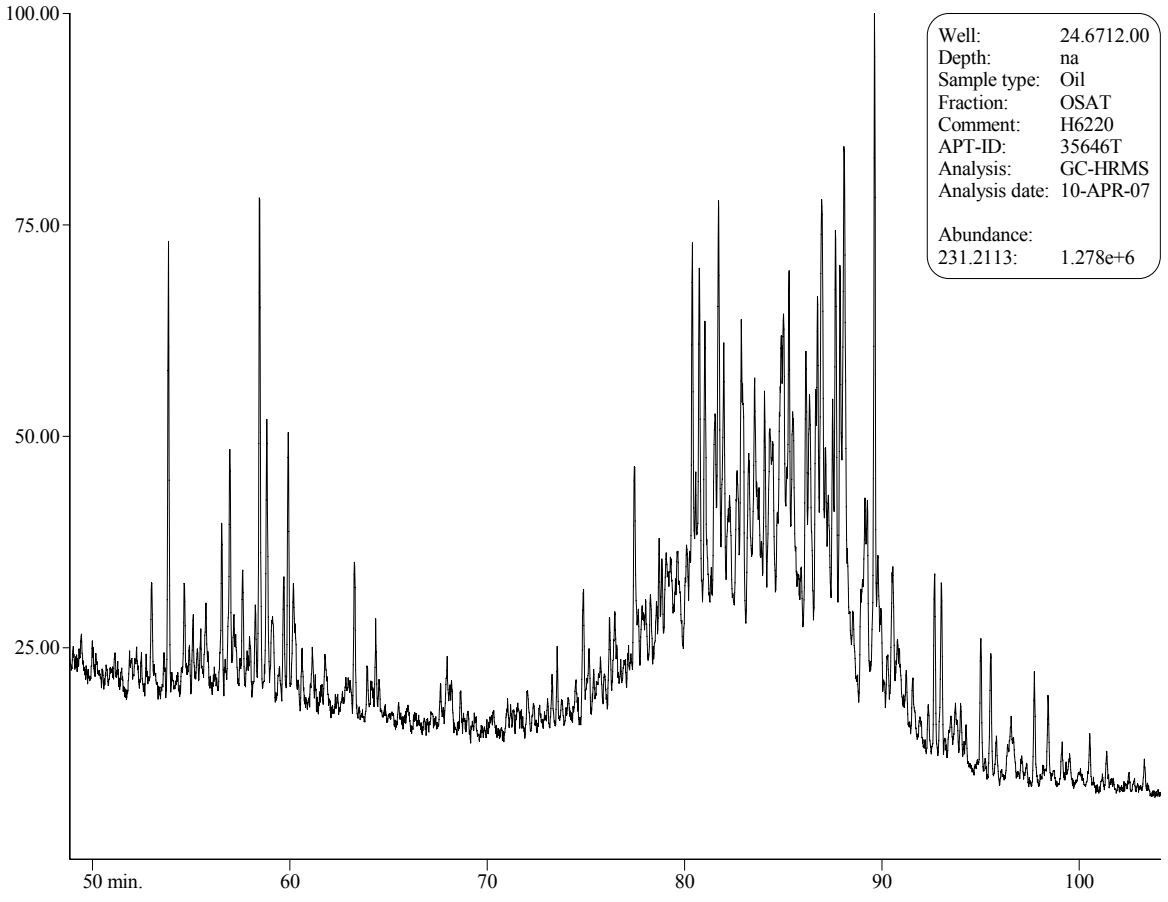
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST 2, SAT GCMS 4-Methylsteranes (m/z 231)



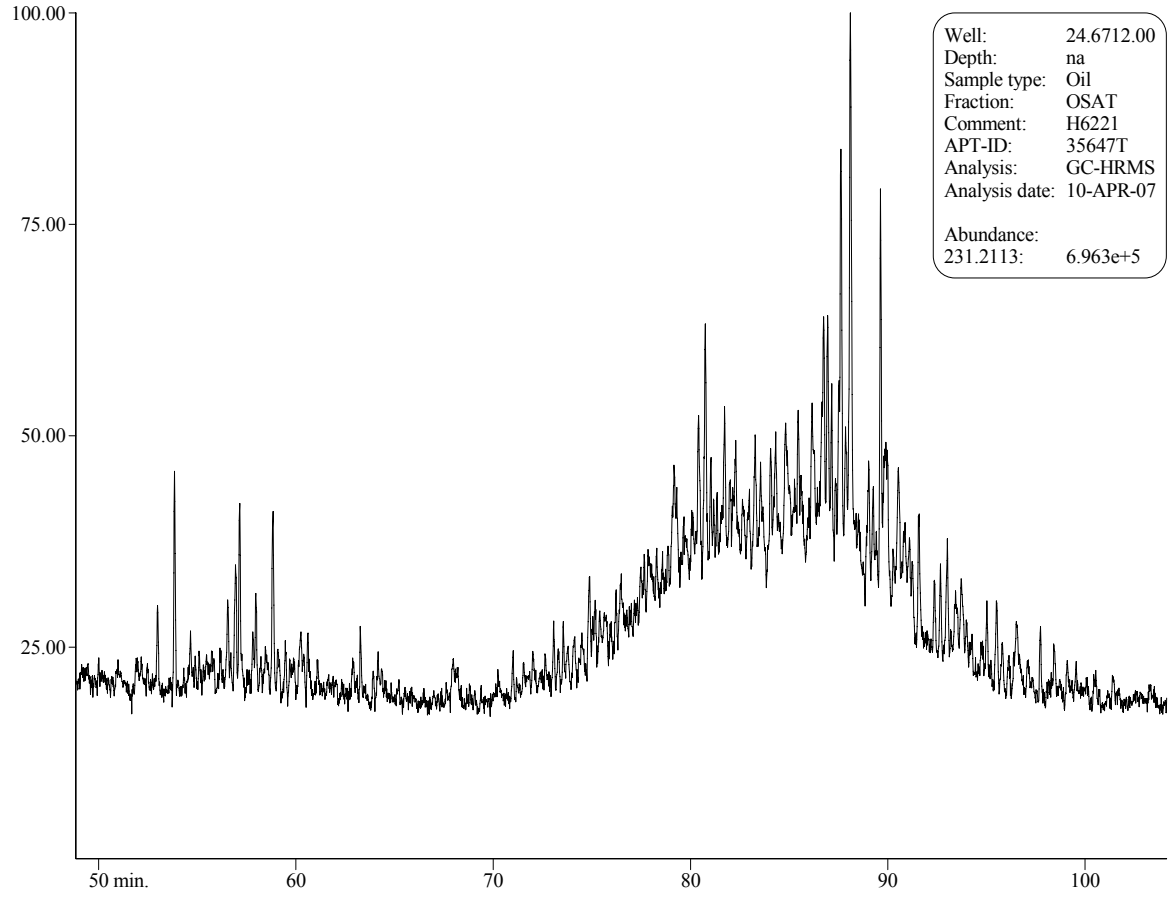
H6218, 7121/5-1, 2436 - 2439 m, DST 1, SAT GCMS 4-Methylsteranes (m/z 231)



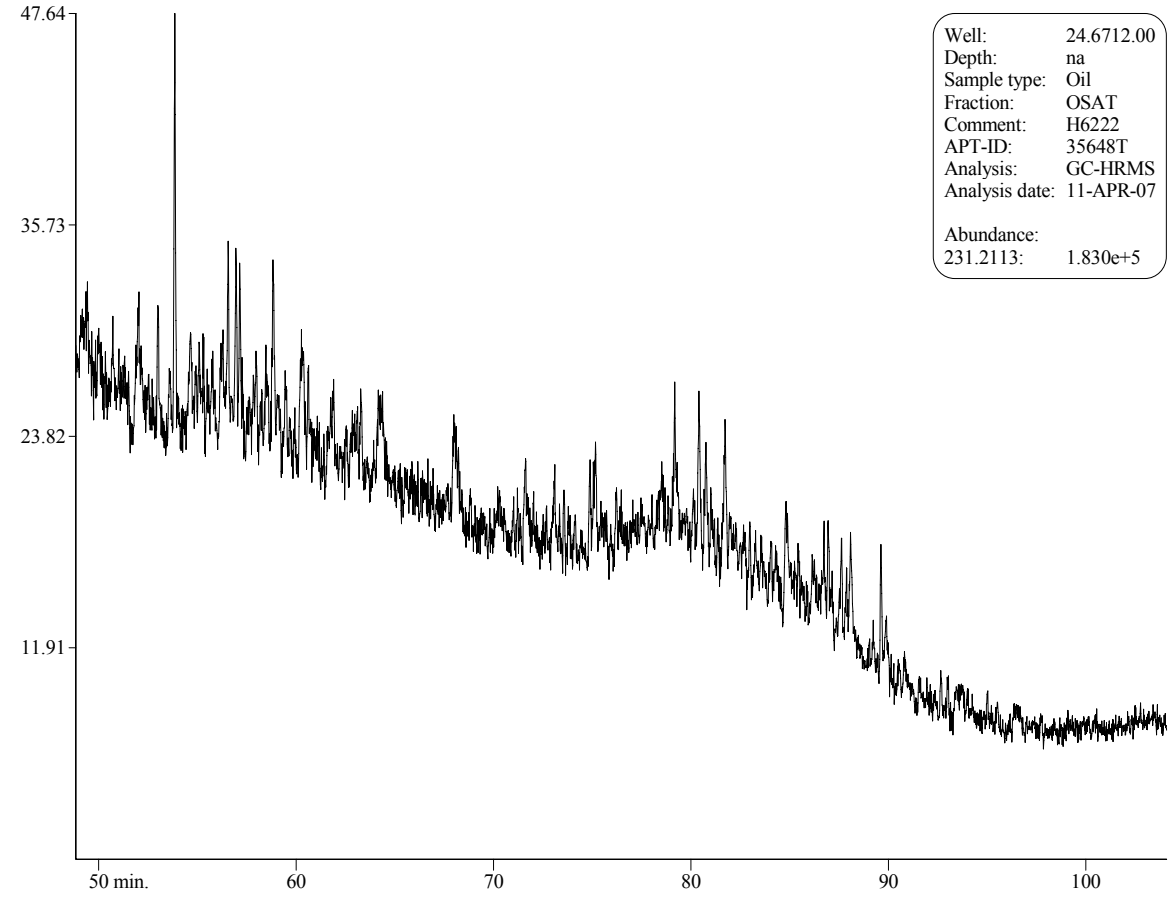
H6219, 7122/7-1, 1114 m, MDT 1, SAT GCMS 4-Methylsteranes (m/z 231)



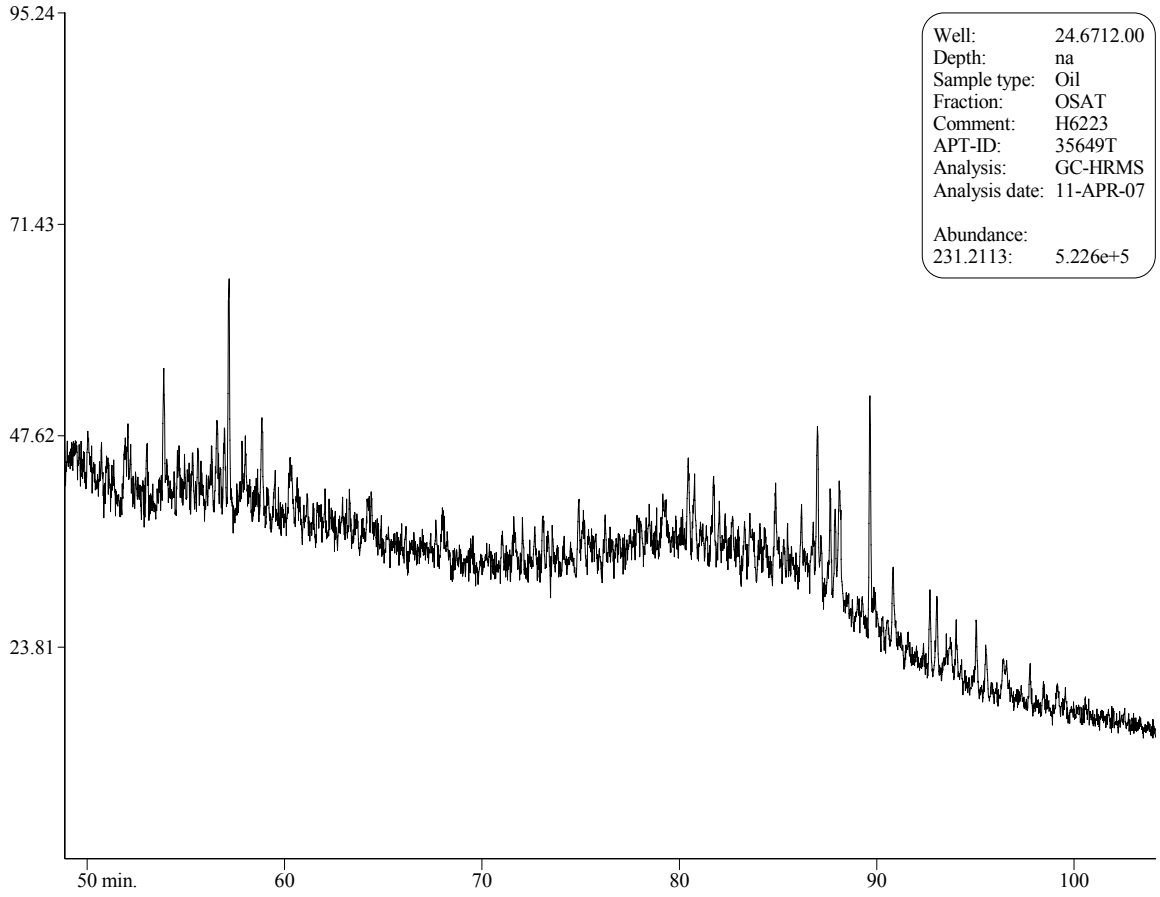
H6220, 7122/7-3, 1195 m, MDT 16, SAT GCMS 4-Methylsteranes (m/z 231)



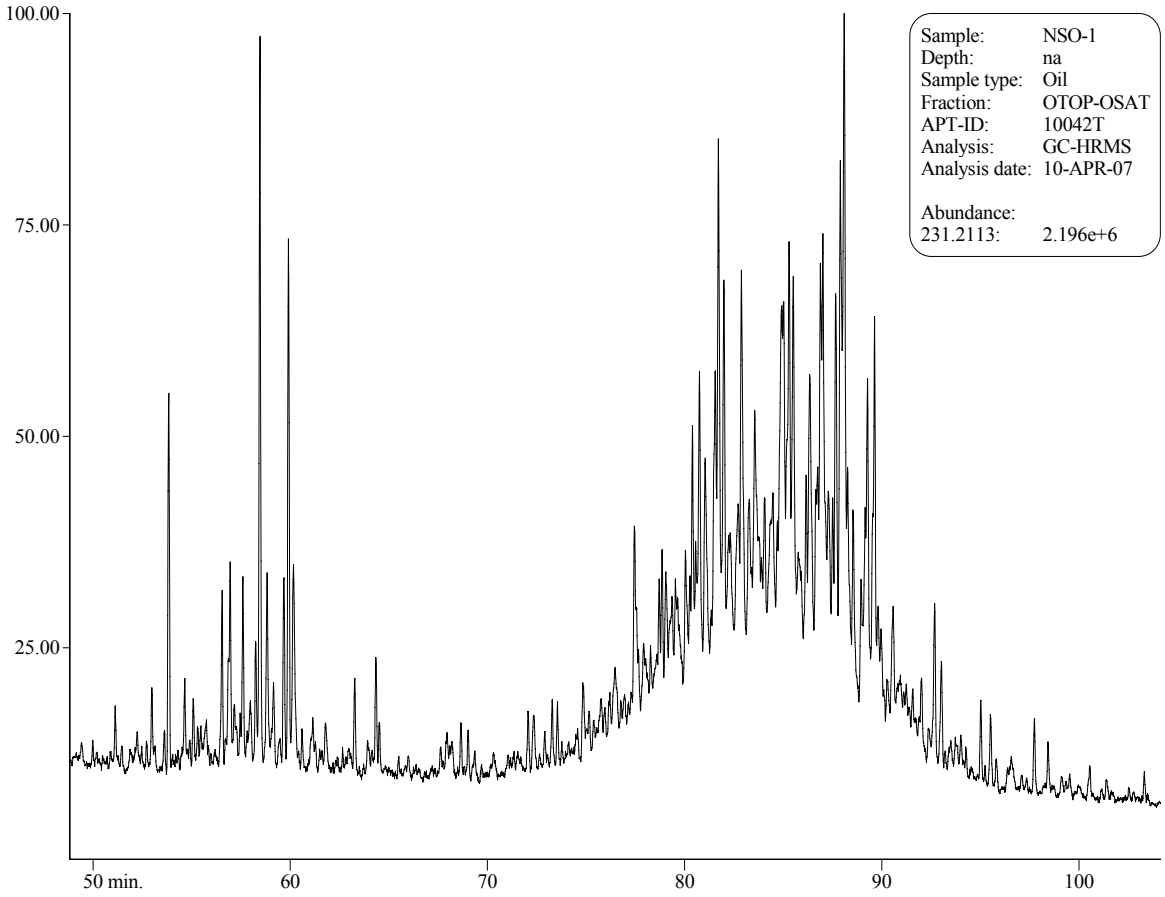
H6221, 7122/7-3, 1812 m, MDT 3 SAT GCMS 4-Methylsteranes (m/z 231)



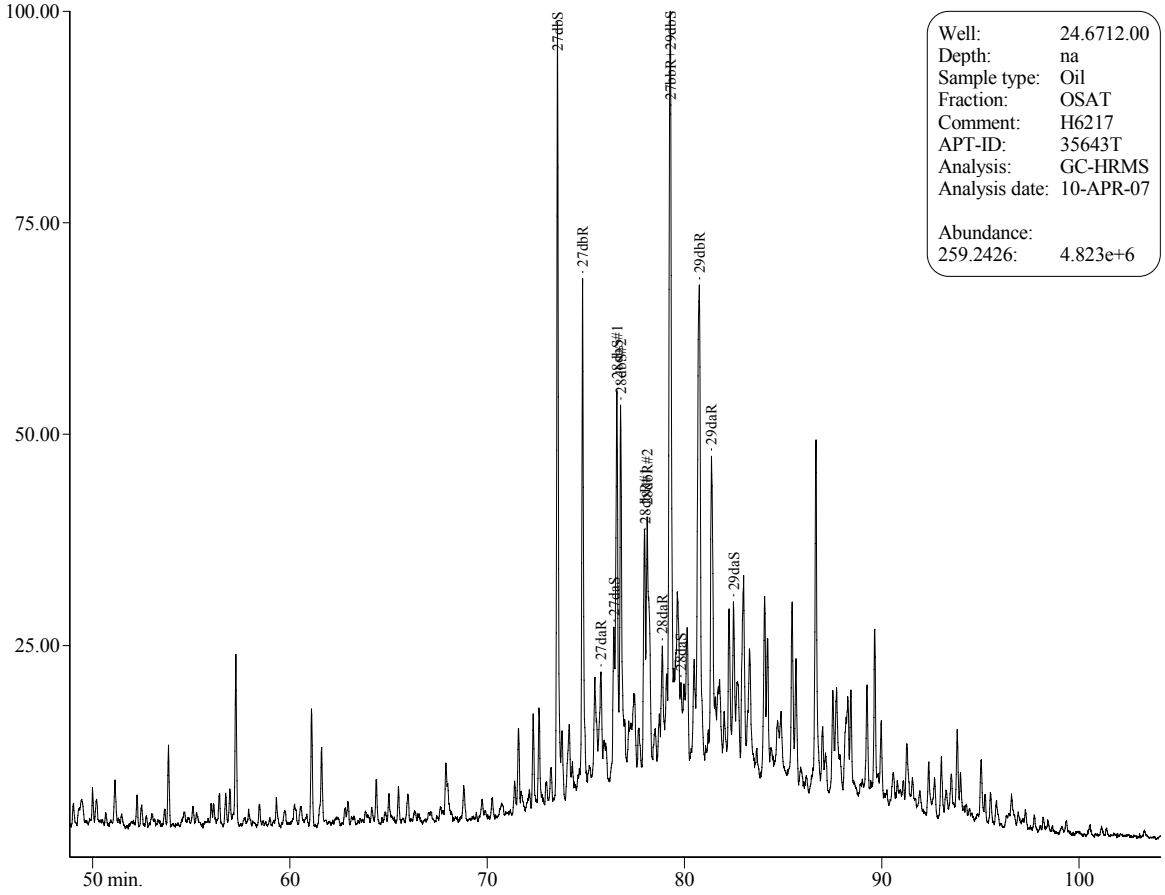
H6222, 7128/4-1, 1577 - 1586 m, DST 2, SAT GCMS 4-Methylsteranes (m/z 231)



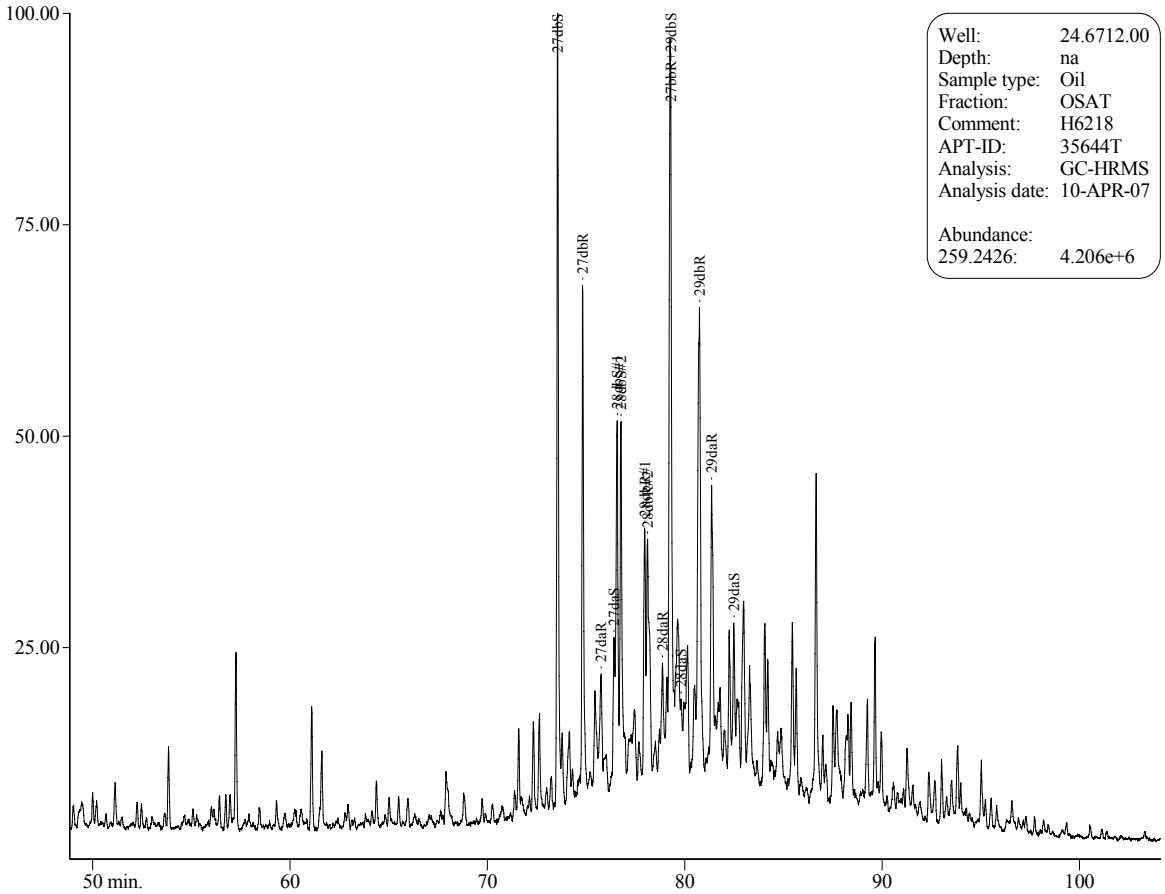
H6223, 7228/7-1 A, 2091.1 m, MDT, SAT GCMS — 4-Methylsteranes (m/z 231)



NSO-1, NGS reference oil, SAT GCMS — 4-Methylsteranes (m/z 231)

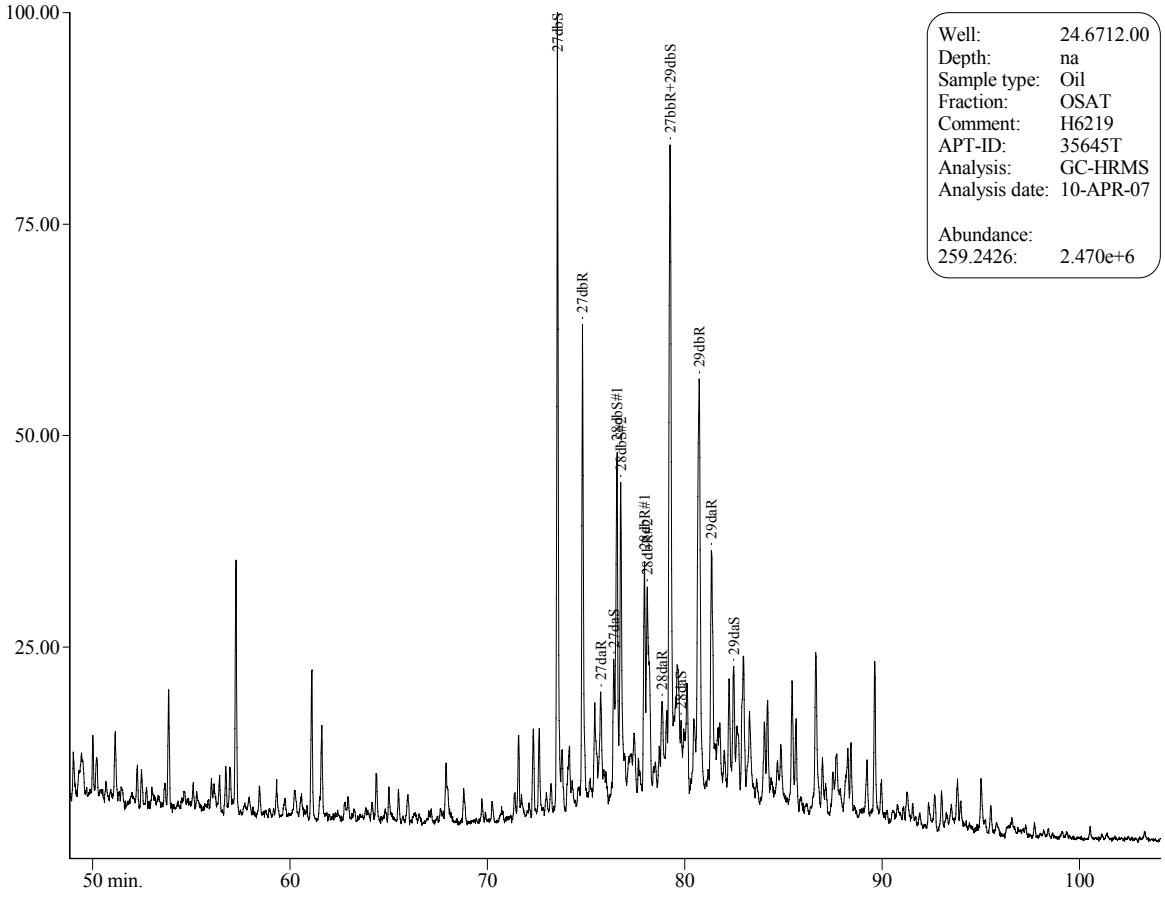


H6217, 7120/6-1, 2432.05 - 2436.05 m, DST 2, SAT GCMS Diasteranes (m/z 259)



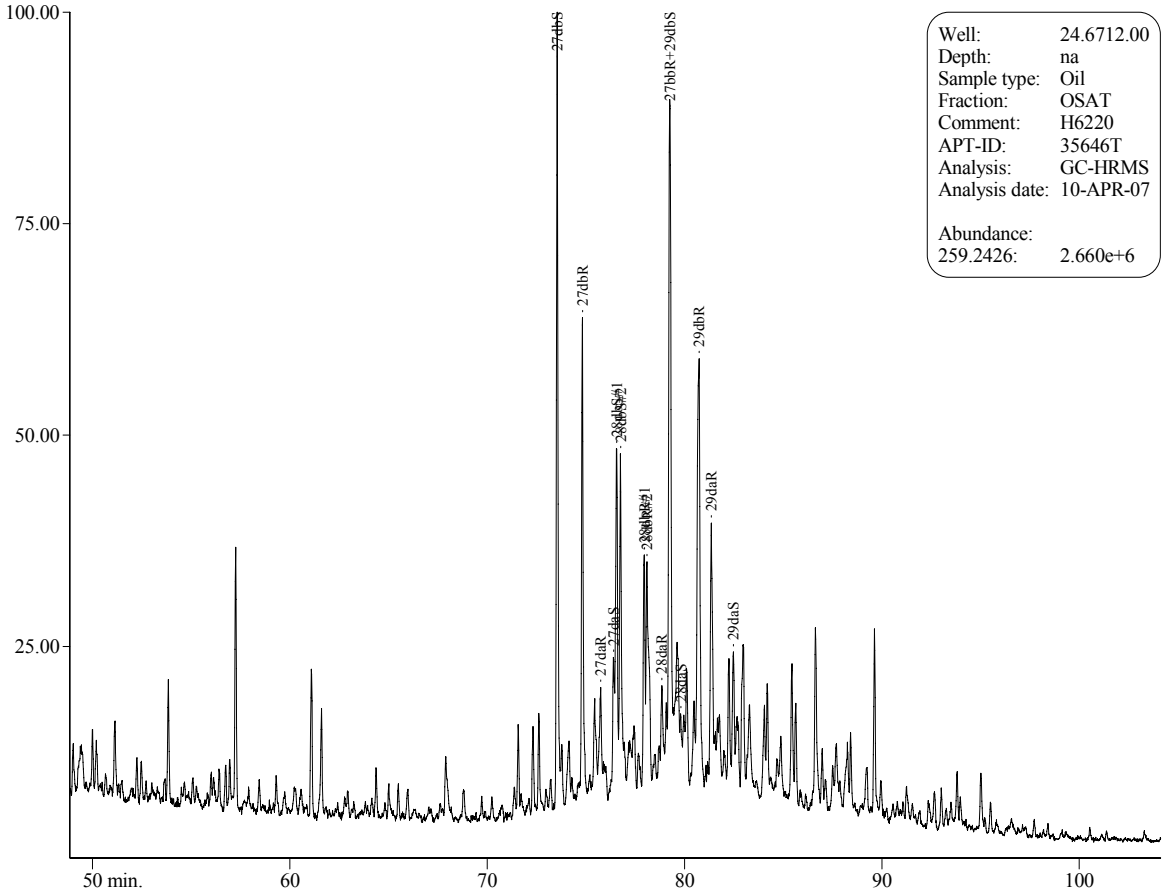
H6218, 7121/5-1, 2436 - 2439 m, DST 1, SAT GCMS

Diasteranes (m/z 259)



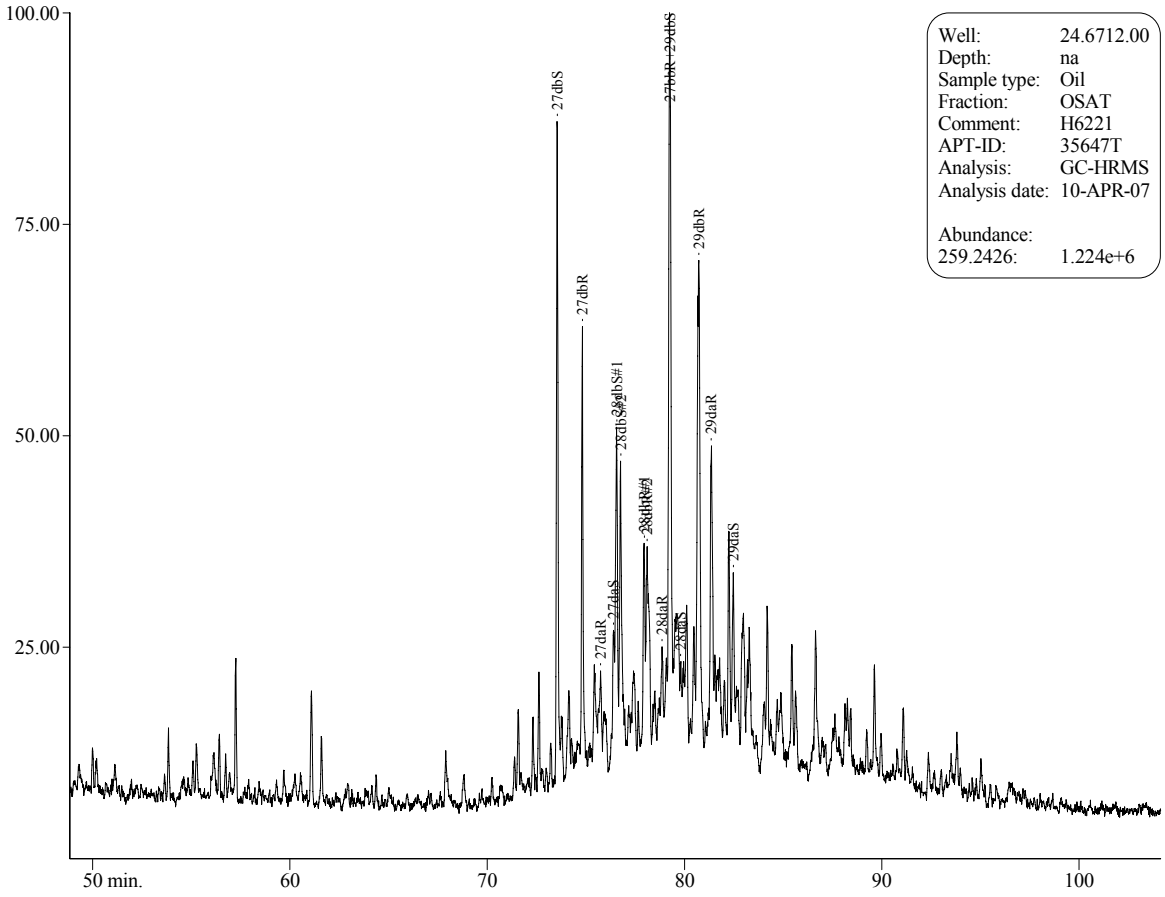
H6219, 7122/7-1, 1114 m, MDT 1, SAT GCMS

Diasteranes (m/z 259)

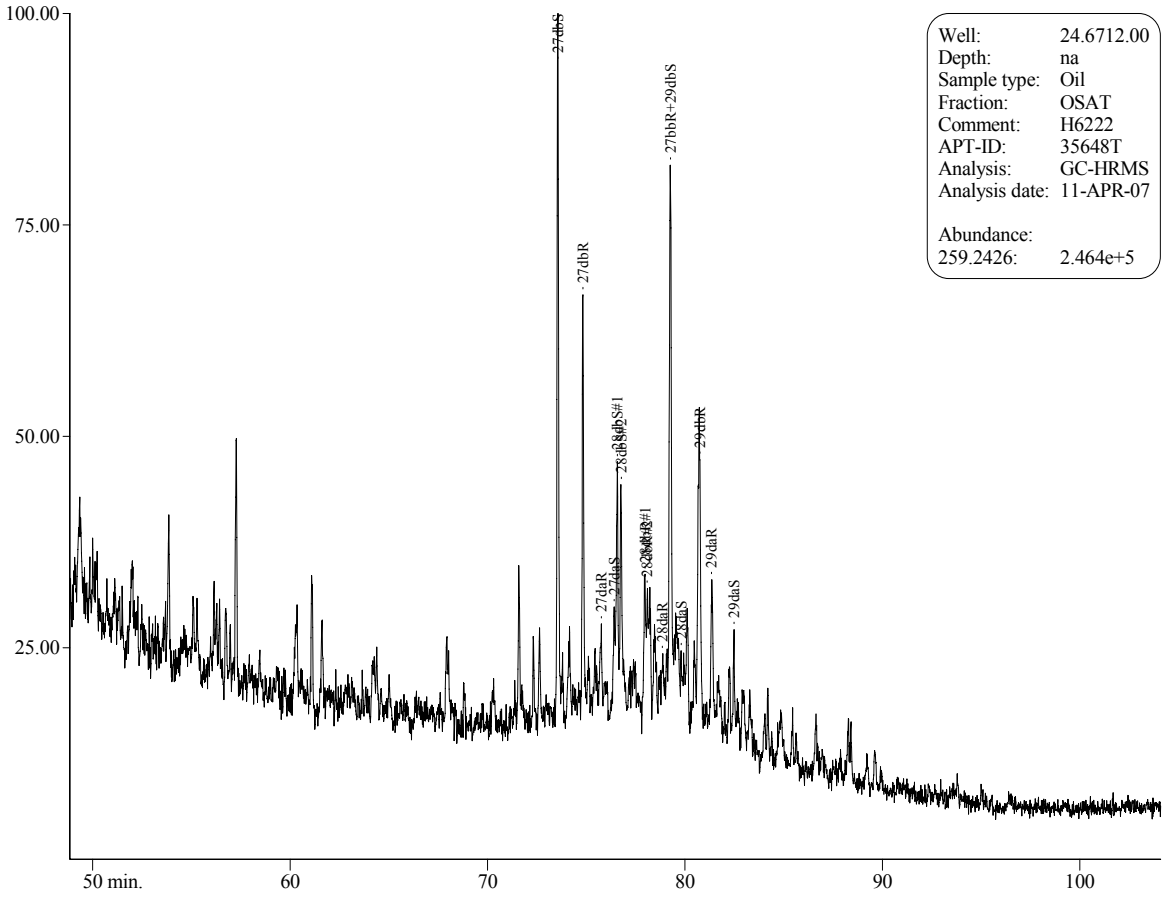


H6220, 7122/7-3, 1195 m, MDT 16, SAT GCMS

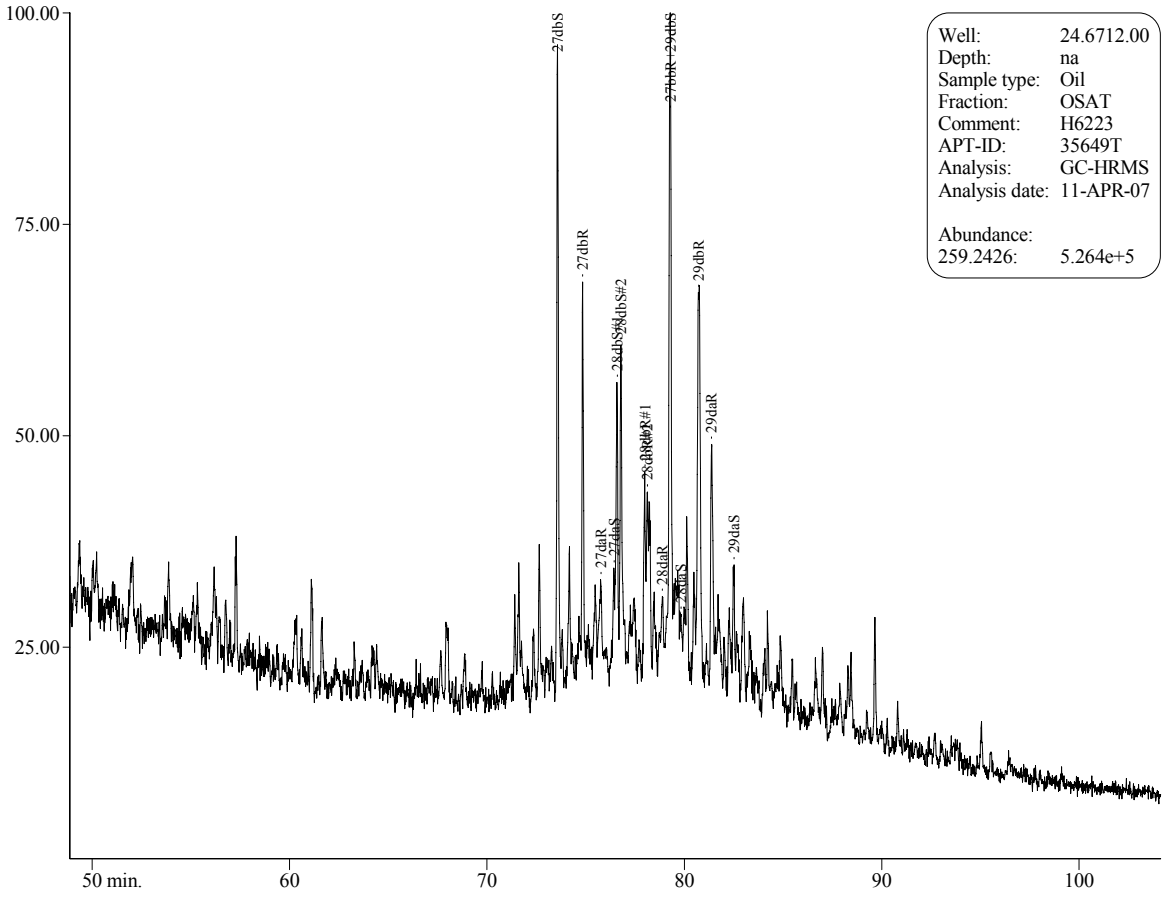
Diasteranes (m/z 259)



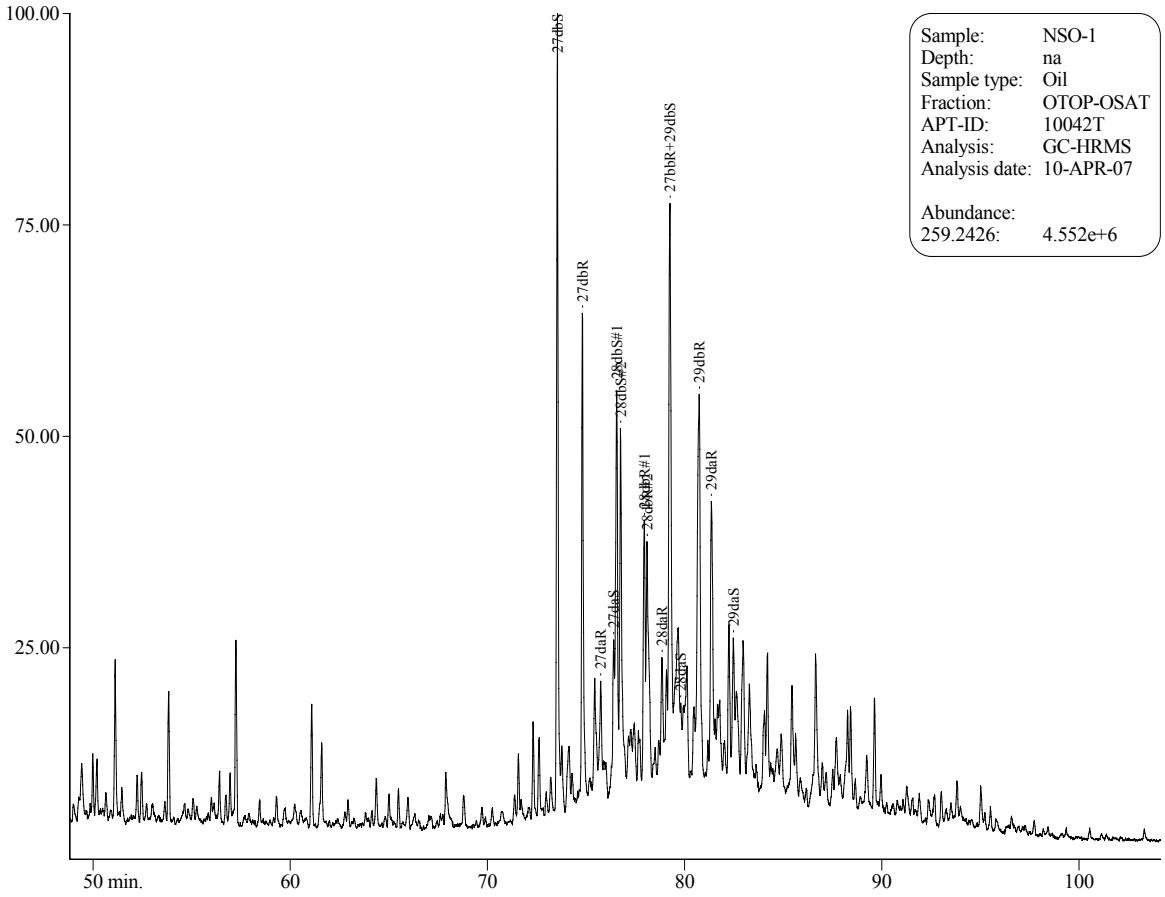
H6221, 7122/7-3, 1812 m, MDT 3 SAT GCMS Diasteranes (m/z 259)



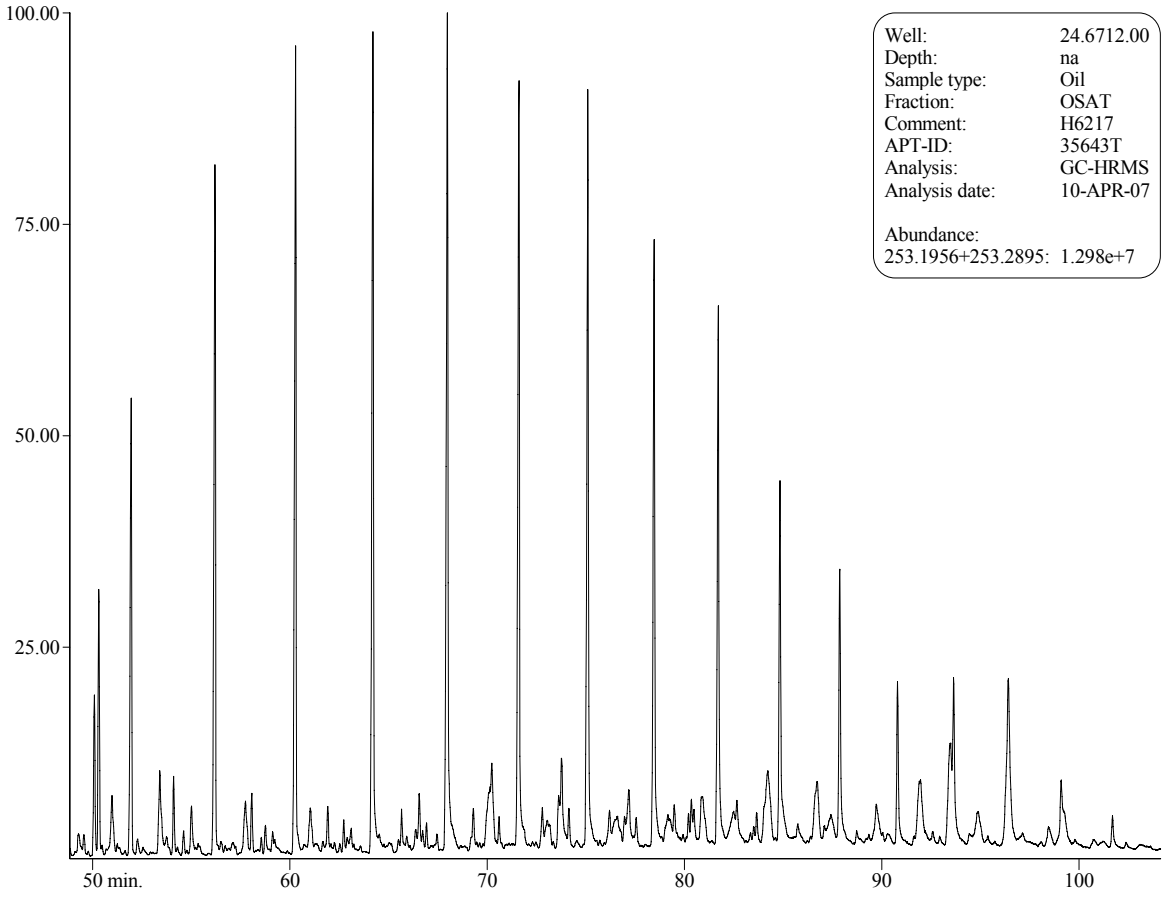
H6222, 7128/4-1, 1577 - 1586 m, DST 2, SAT GCMS Diasteranes (m/z 259)



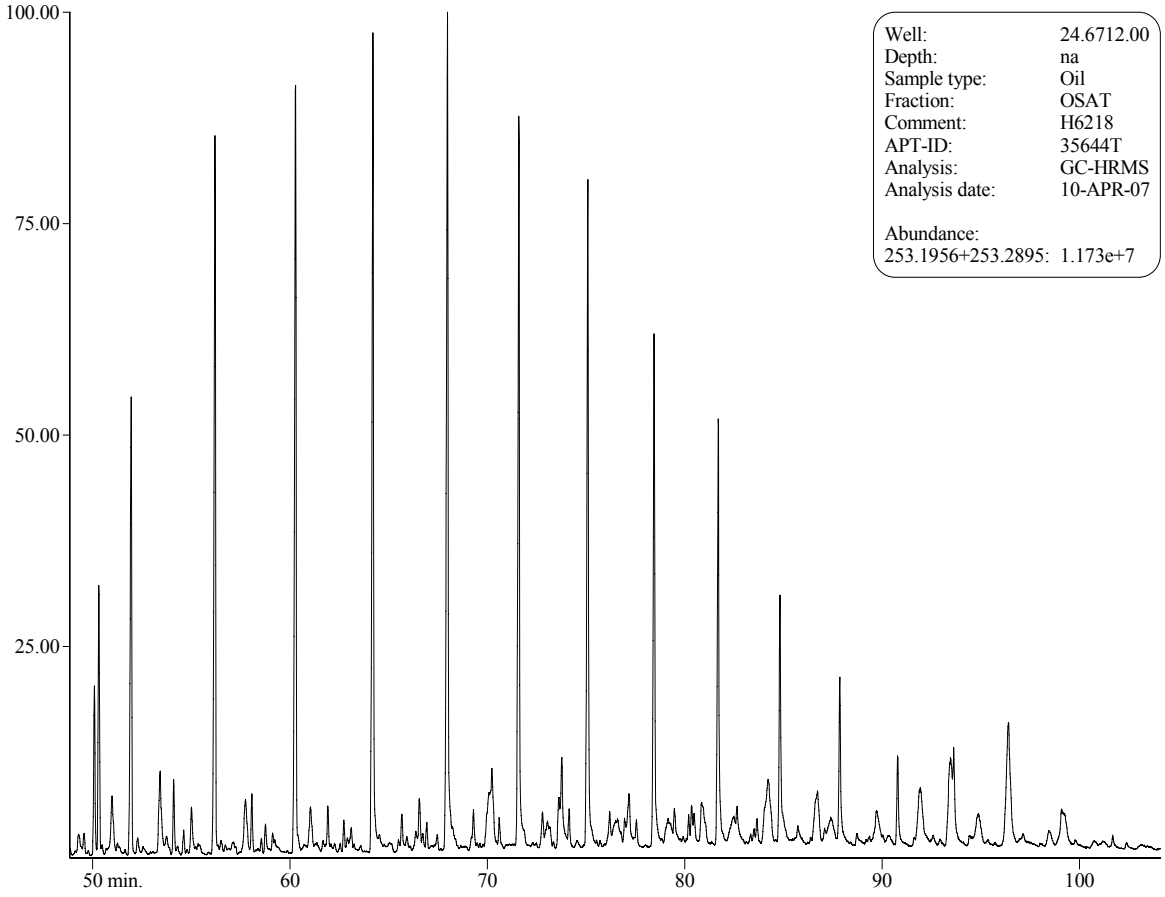
H6223, 7228/7-1 A, 2091.1 m, MDT, SAT GCMS — Diasteranes (m/z 259)



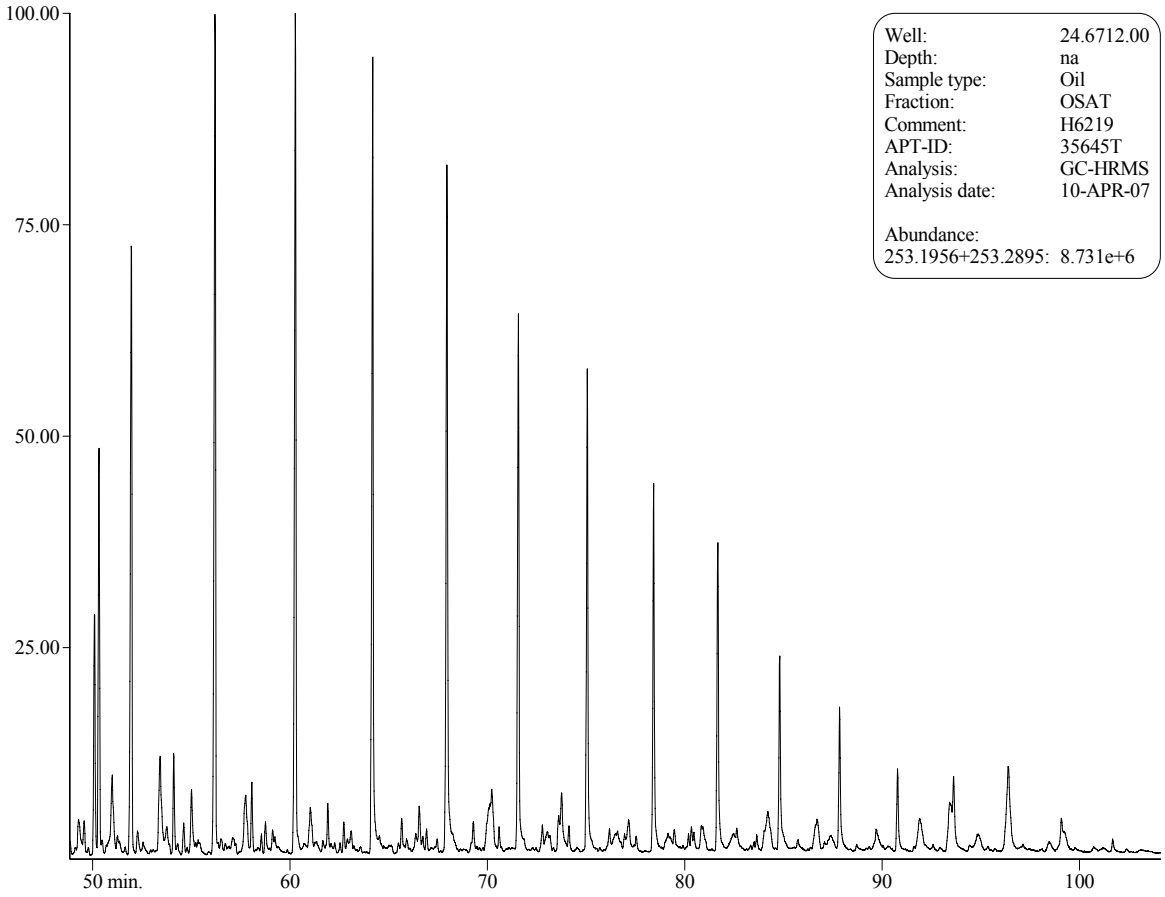
NSO-1, NGS reference oil, SAT GCMS — Diasteranes (m/z 259)



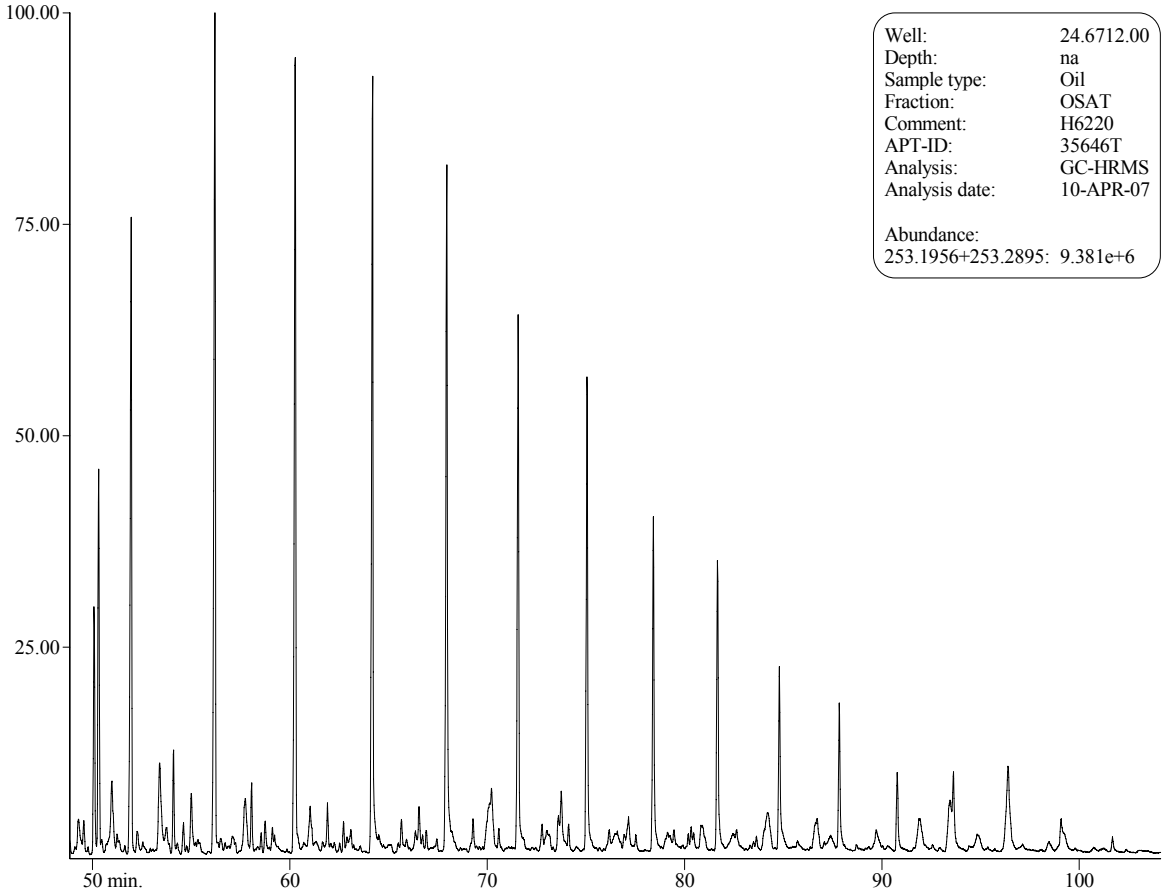
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST 2, SAT GCMS Test for absence of monoaromatic steroids (m/z 253)



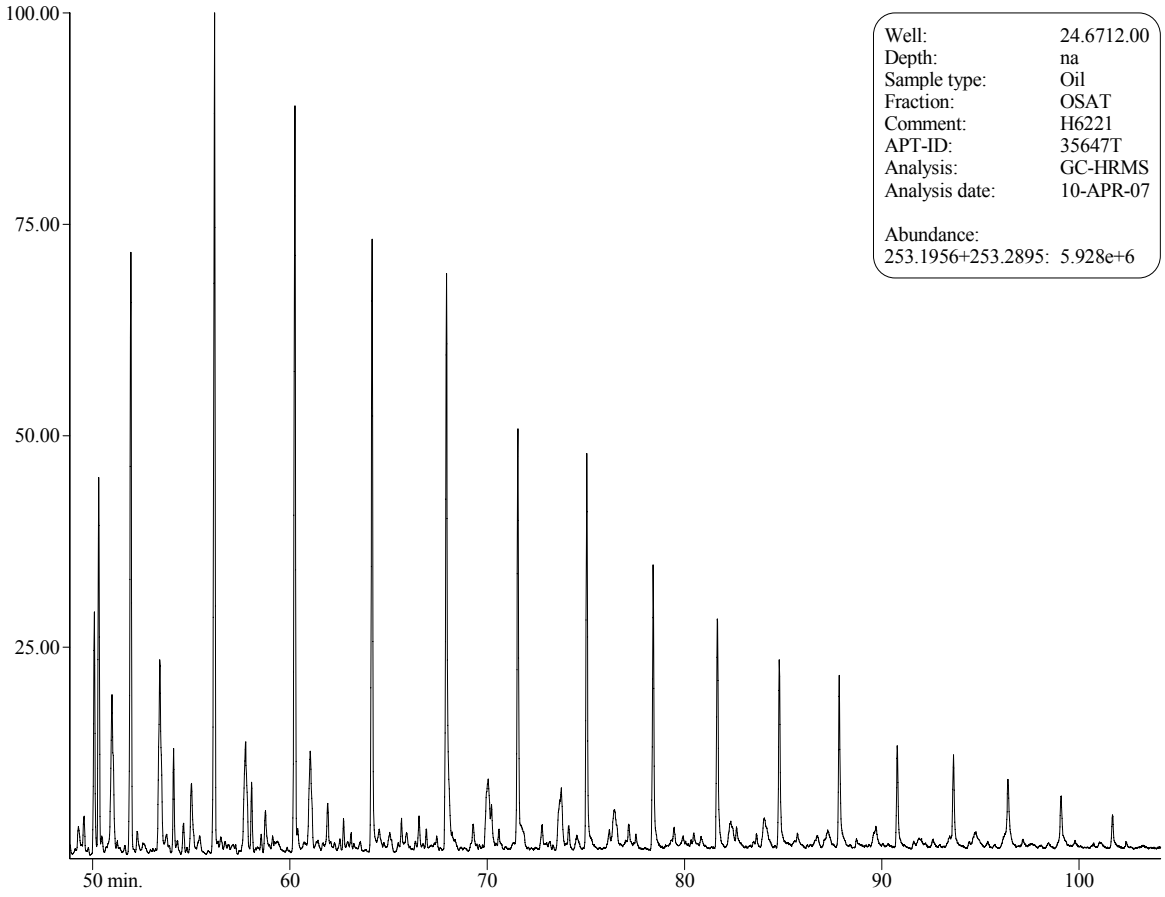
H6218, 7121/5-1, 2436 - 2439 m, DST 1, SAT GCMS Test for absence of monoaromatic steroids (m/z 253)



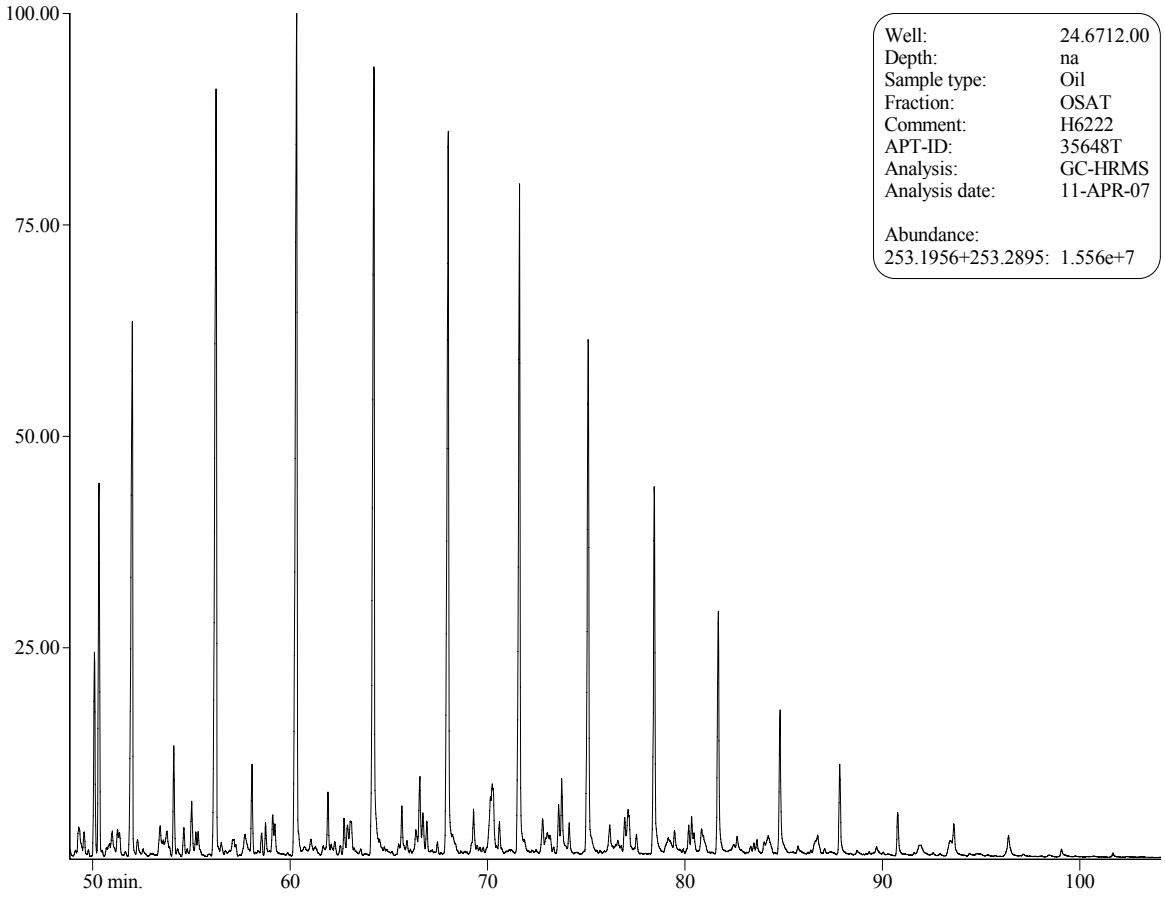
H6219, 7122/7-1, 1114 m, MDT 1, SAT GCMS Test for absence of monoaromatic steroids (m/z 253)



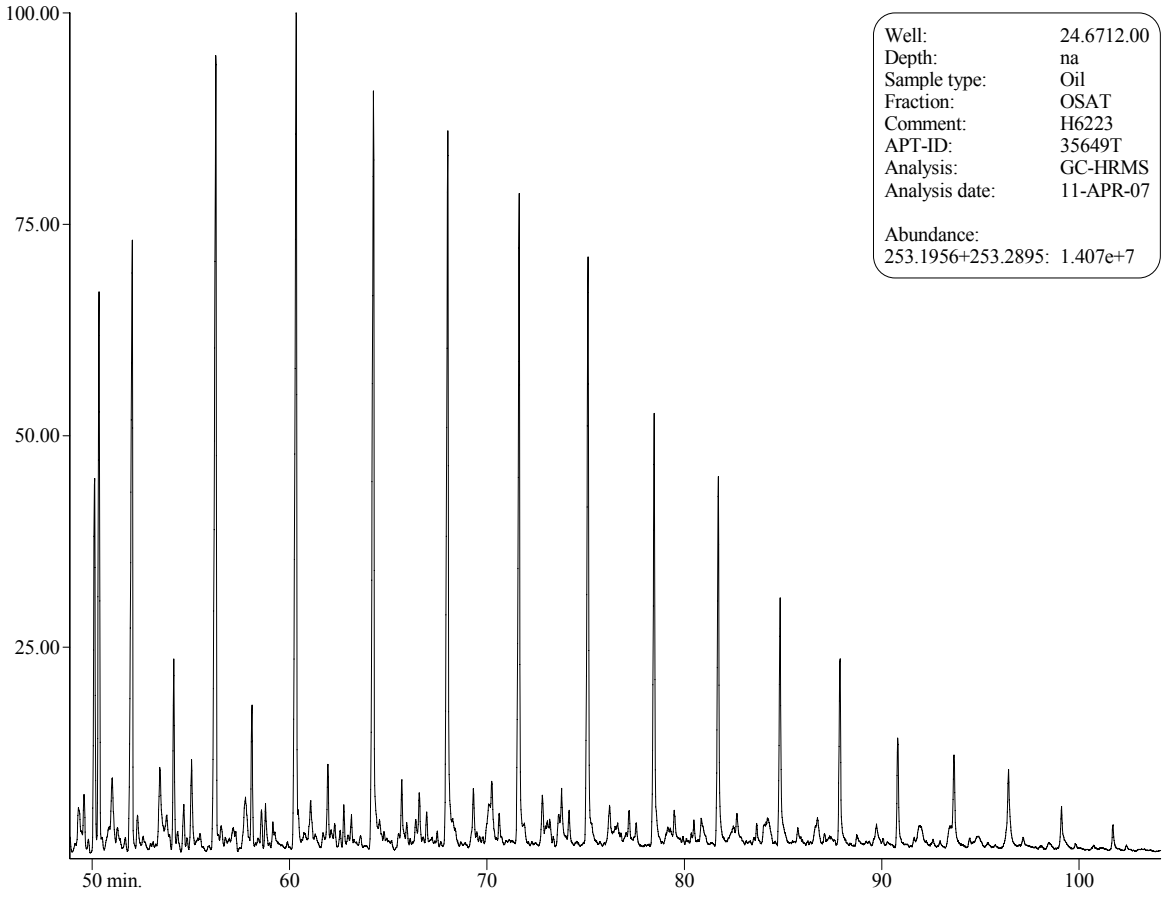
H6220, 7122/7-3, 1195 m, MDT 16, SAT GCMS Test for absence of monoaromatic steroids (m/z 253)



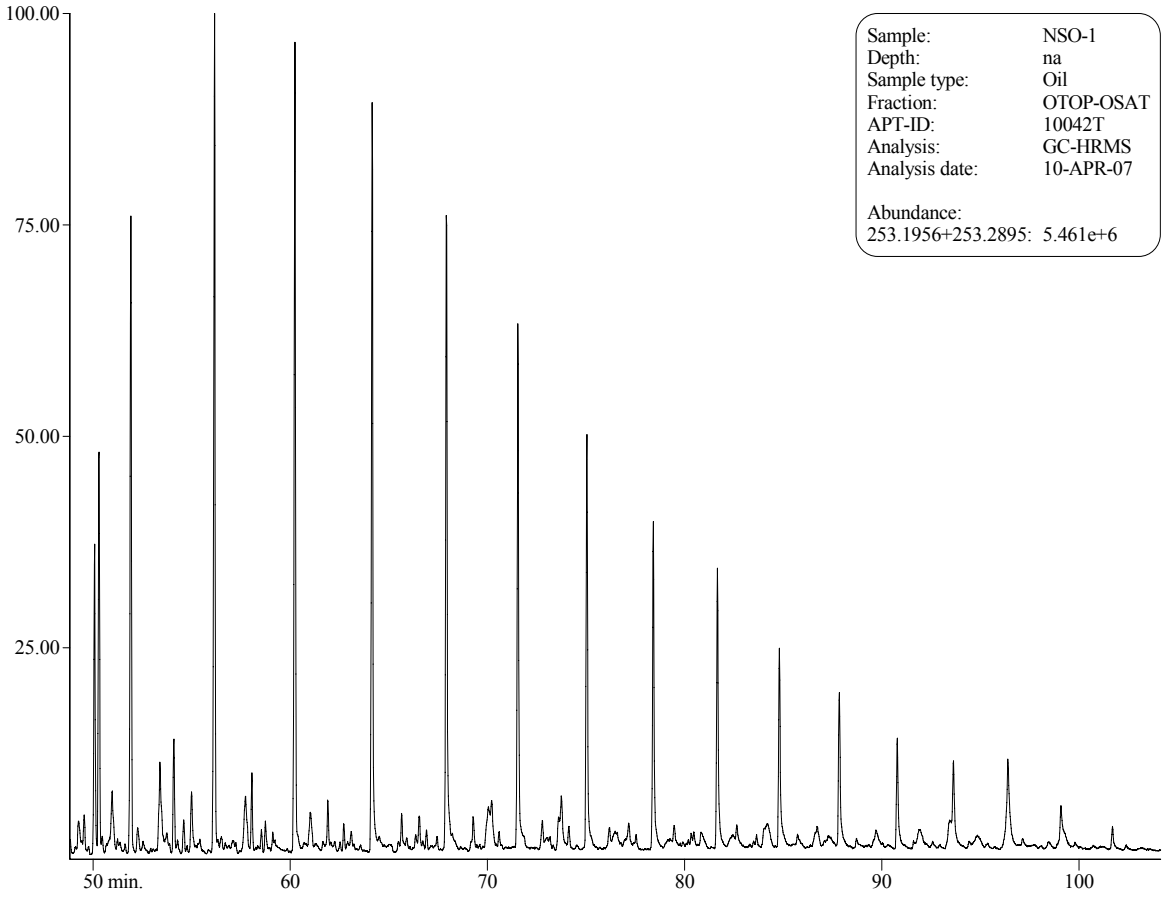
H6221, 7122/7-3, 1812 m, MDT 3 SAT GCMS Test for absence of monoaromatic steroids (m/z 253)



H6222, 7128/4-1, 1577 - 1586 m, DST 2, SAT GCMS Test for absence of monoaromatic steroids (m/z 253)



H6223, 7228/7-1 A, 2091.1 m, MDT, SAT GCMS Test for absence of monoaromatic steroids (m/z 253)



NSO-1, NGS reference oil, SAT GCMS Test for absence of monoaromatic steroids (m/z 253)

Figure 4.4

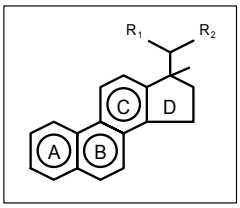
GC-HRMS (SIR) mass fragmentograms of aromatic hydrocarbons.

m/z	*142, 156, 170*	*naphthalenes*
	178, 182, 206, 219	*phenanthrenes*
	184, 198, 212	*dibenzothiophenes*
	231	*triaromatic steroid hydrocarbons*
	253	*monoaromatic steroid hydrocarbons*

Peak labels:

ABC-RING TRIAROMATIC STEROID HYDROCARBONS (m/z 231)

Peak or peak group	Substituents (see figure below)		Label
	R_1	**R_2**	
a1	CH_3	H	$C_{20}TA$
b1	CH_3	CH_3	$C_{21}TA$
c1	$S(CH_3)$	C_6H_{13}	$SC_{26}TA$
d1	$R(CH_3)$	C_6H_{13}	$RC_{26}TA$
	$S(CH_3)$	C_7H_{15}	$SC_{27}TA$
e1	$S(CH_3)$	C_8H_{17}	$SC_{28}TA$
f1	$R(CH_3)$	C_7H_{15}	$RC_{27}TA$
g1	$R(CH_3)$	C_8H_{17}	$RC_{28}TA$

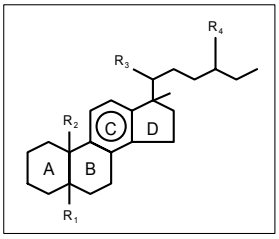


Positions of substituents in triaromatic steroid hydrocarbons

C-RING MONOAROMATIC STEROID HYDROCARBONS (m/z 253)[1]

Peak or	Substituents (see figure below)				Label
peak group	R_1	R_2	R_3	R_4	
A1					$C_{21}MA$
B1					$C_{22}MA$
C1	$\beta(H)$	CH_3	$S(CH_3)$	H	$\beta SC_{27}MA$
	$\beta(CH_3)$	H	$S(CH_3)$	H	$\beta SC_{27}DMA$
D1	$\beta(CH_3)$	H	$R(CH_3)$	H	$\beta RC_{27}DMA$
	$\beta(H)$	CH_3	$R(CH_3)$	H	$\beta RC_{27}MA$
	$\alpha(H)$	CH_3	$S(CH_3)$	H	$\alpha SC_{27}MA$
E1	$\beta(H)$	CH_3	$S(CH_3)$	CH_3	$\beta SC_{28}MA$
	$\alpha(CH_3)$	H	$R(CH_3)$	H	$\alpha RC_{27}DMA$
	$\beta(CH_3)$	H	$S(CH_3)$	CH_3	$\beta SC_{28}DMA$
F1	$\alpha(CH_3)$	H	$S(CH_3)$	CH_3	$\alpha SC_{27}DMA$
G1	$\alpha(H)$	CH_3	$R(CH_3)$	H	$\alpha RC_{27}MA$
	$\alpha(H)$	CH_3	$S(CH_3)$	CH_3	$\alpha SC_{28}MA$
	$\beta(H)$	CH_3	$R(CH_3)$	CH_3	$\beta RC_{28}MA$
	$\beta(CH_3)$	H	$R(CH_3)$	CH_3	$\beta RC_{28}DMA$
	$\beta(H)$	CH_3	$S(CH_3)$	C_2H_5	$\beta SC_{29}MA$
	bCH_3	H	$S(CH_3)$	C_2H_5	$\beta SC_{29}DMA$
H1	$\alpha(H)$	CH_3	$S(CH_3)$	C_2H_5	$\alpha SC_{29}MA$
	$\alpha(H)$	CH_3	$R(CH_3)$	CH_3	$\alpha RC_{28}MA$
	$\beta(H)$	CH_3	$R(CH_3)$	C_2H_5	$\beta RC_{29}MA$
	bCH_3	H	$R(CH_3)$	C_2H_5	$\beta RC_{29}DMA$
I1	$\alpha(H)$	CH_3	$R(CH_3)$	C_2H_5	$\alpha RC_{29}MA$

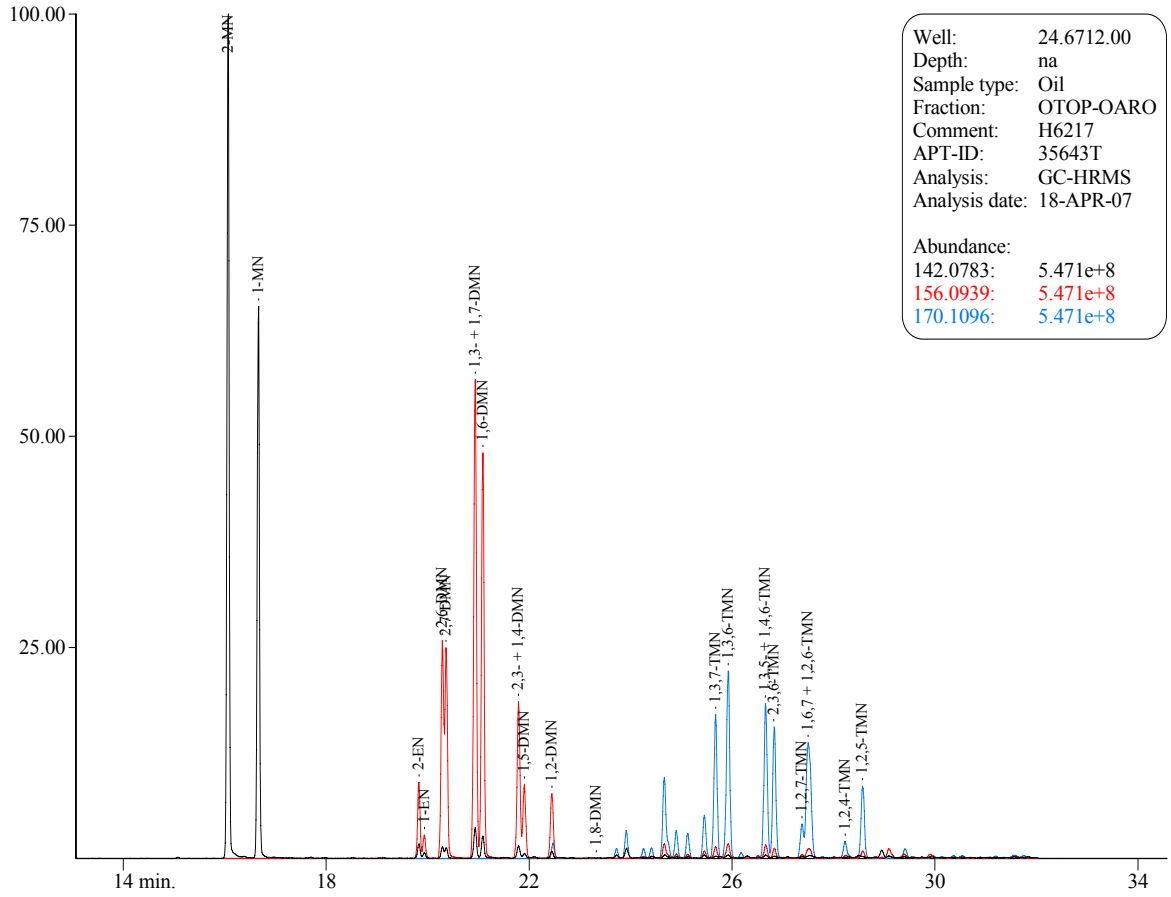
[1] Not all possible αDMA isomers are tabulated (rarely present in geological samples).
[2] The monoaromatic steroid groups C1, D1, E1, G1 and H1 can all be present as multiple peaks.



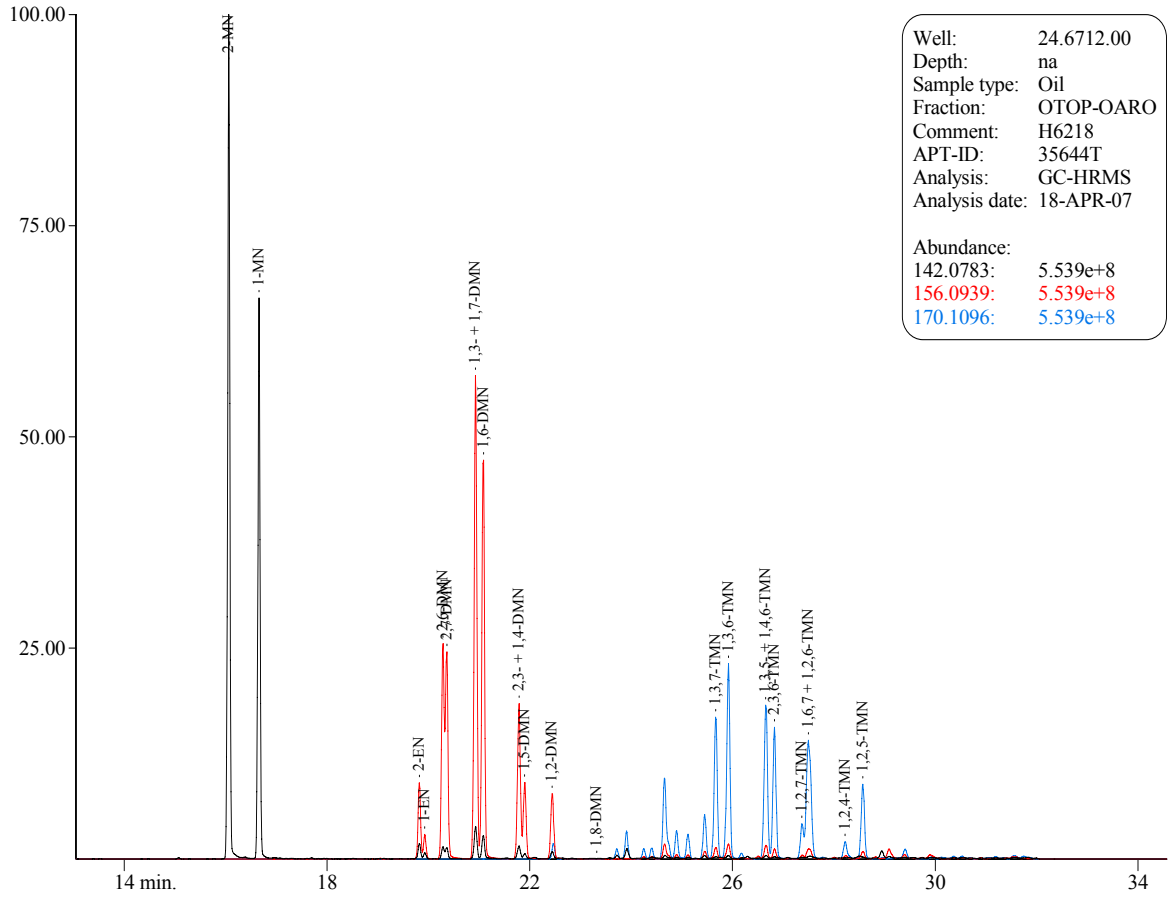
Positions of substituents in monoaromatic steroid hydrocarbons.

POLYCYCLIC AROMATIC HYDROCARBONS AND SULPHUR COMPOUNDS

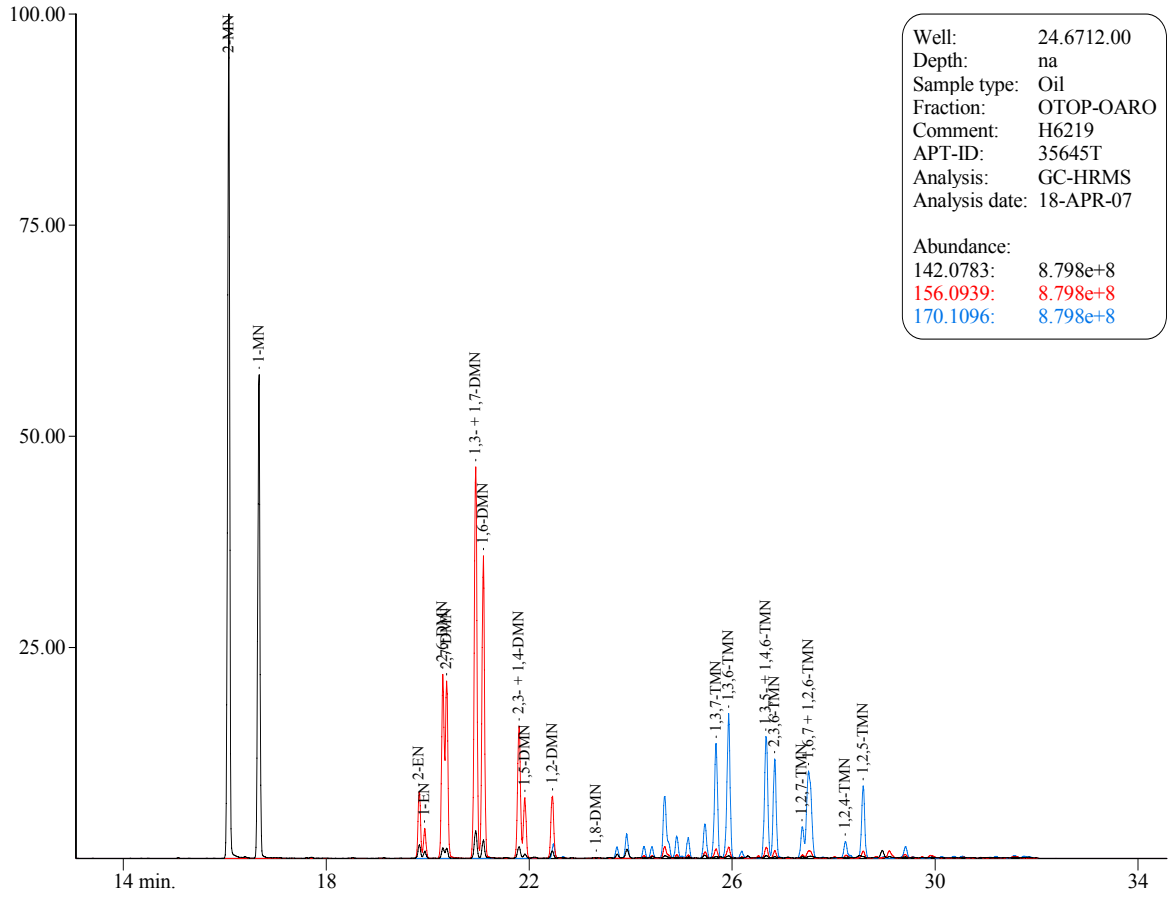
Label	Name	m/z (ion)
2-MN	2-Methylnaphthalene	142
1-MN	1-Methylnaphthalene	142
2-EN	2-Ethylnaphthalene	156
1-EN	1-Ethylnaphthalene	156
2,6- + 2,7-DMN	2,6+2,7-Dimethylnaphthalene	156
1,3- + 1,7-DMN	1,3+1,7-Dimethylnaphthalene	156
1,6-DMN	1,6-Dimethylnaphthalene	156
2,3- + 1,4-DMN	2,3+1,4-Dimethylnaphthalene	156
1,5-DMN	1,5-Dimethylnaphthalene	156
1,2-DMN	1,2-Dimethylnaphthalene	156
1,3,7-TMN	1,3,7-Trimethylnaphthalene	170
1,3,6-TMN	1,3,6-Trimethylnaphthalene	170
1,3,5- + 1,4,6-TMN	1,3,5+1,4,6-Trimethylnaphthalene	170
2,3,6-TMN	2,3,6-Trimethylnaphthalene	170
1,6,7- + 1,2,7-TMN	1,6,7+1,2,7-Trimethylnaphthalene	170
1,2,6-TMN	1,2,6-Trimethylnaphthalene	170
1,2,4-TMN	1,2,4-Trimethylnaphthalene	170
1,2,5-TMN	1,2,5-Trimethylnaphthalene	170
P	Phenanthrene	178
3-MP	3-Methylphenanthrene	192
2-MP	2-Methylphenanthrene	192
9-MP	9-Methylphenanthrene	192
1-MP	1-Methylphenanthrene	192
2-EP+9-EP+3,6-DMP	2- Ethylphenanthrene +9-Ethylphenanthrene +3,6-Dimethylphenanthrene	206
1-EP	1-Ethylphenanthrene	206
2,6- + 2,7- + 3,5-DMP	2,6+2,7+3,5-Dimethylphenanthrene	206
1,3- + 2,10- + 3,9- + 3,10-DMP	1,3+2,10+3,9+3,10-Dimethylphenanthrene	206
1,6- + 2,5- + 2,9-DMP	1,6+2,5+2,9-Dimethylphenanthrene	206
1,7-DMP	1,7-Dimethylphenanthrene	206
2,3-DMP	2,3-Dimethylphenanthrene	206
1,9- + 4,9- + 4,10-DMP	1,9+4,9+4,10-Dimethylphenanthrene	206
1,8-DMP	1,8-Dimethylphenanthrene	206
Retene	Retene (= 1-methyl-7-isopropylphenanthrene)	219
DBT	Dibenzothiophene	184
4-MDBT	4-Methyldibenzothiophene	198
(3+2)-MDBT	3+2-Methyldibenzothiophene	198
1-MDBT	1-Methyldibenzothiophene	198



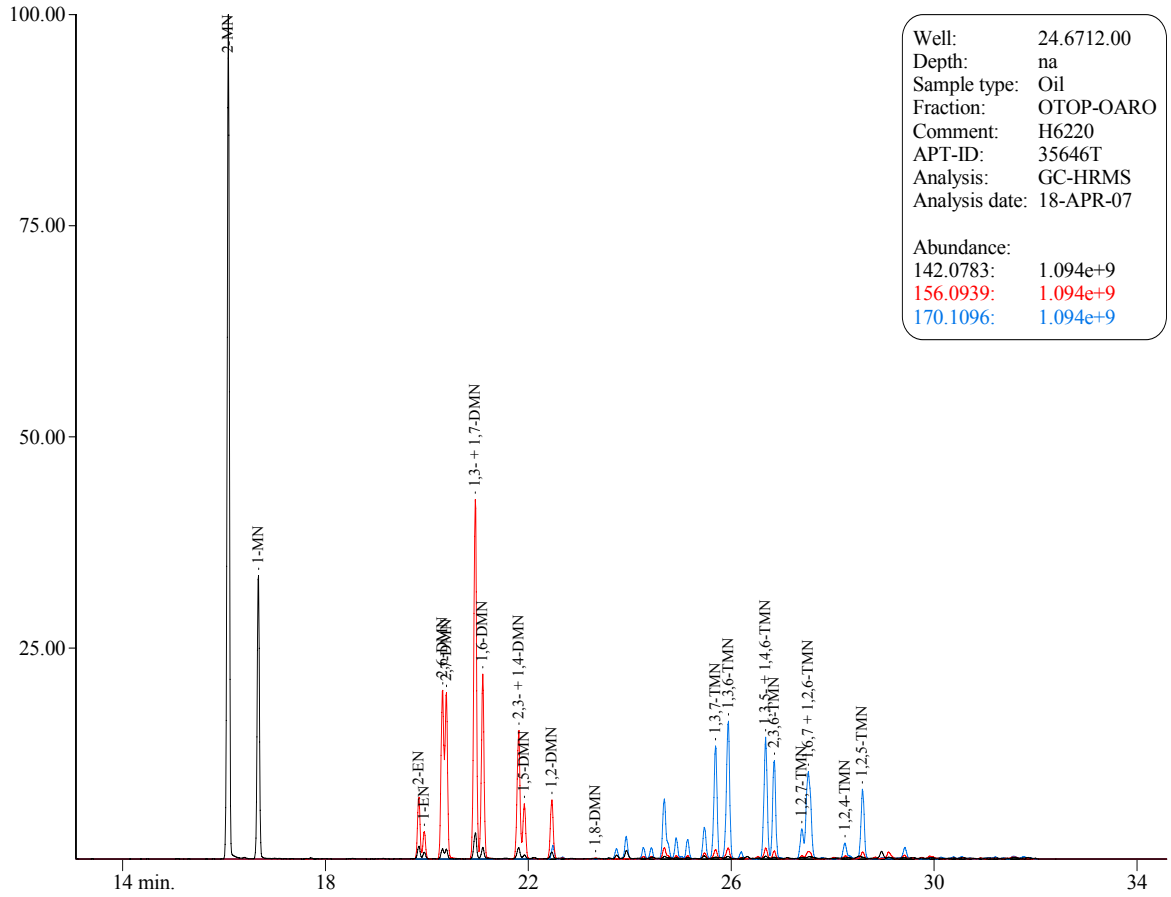
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST 2, ARO GCMS Naphthalenes



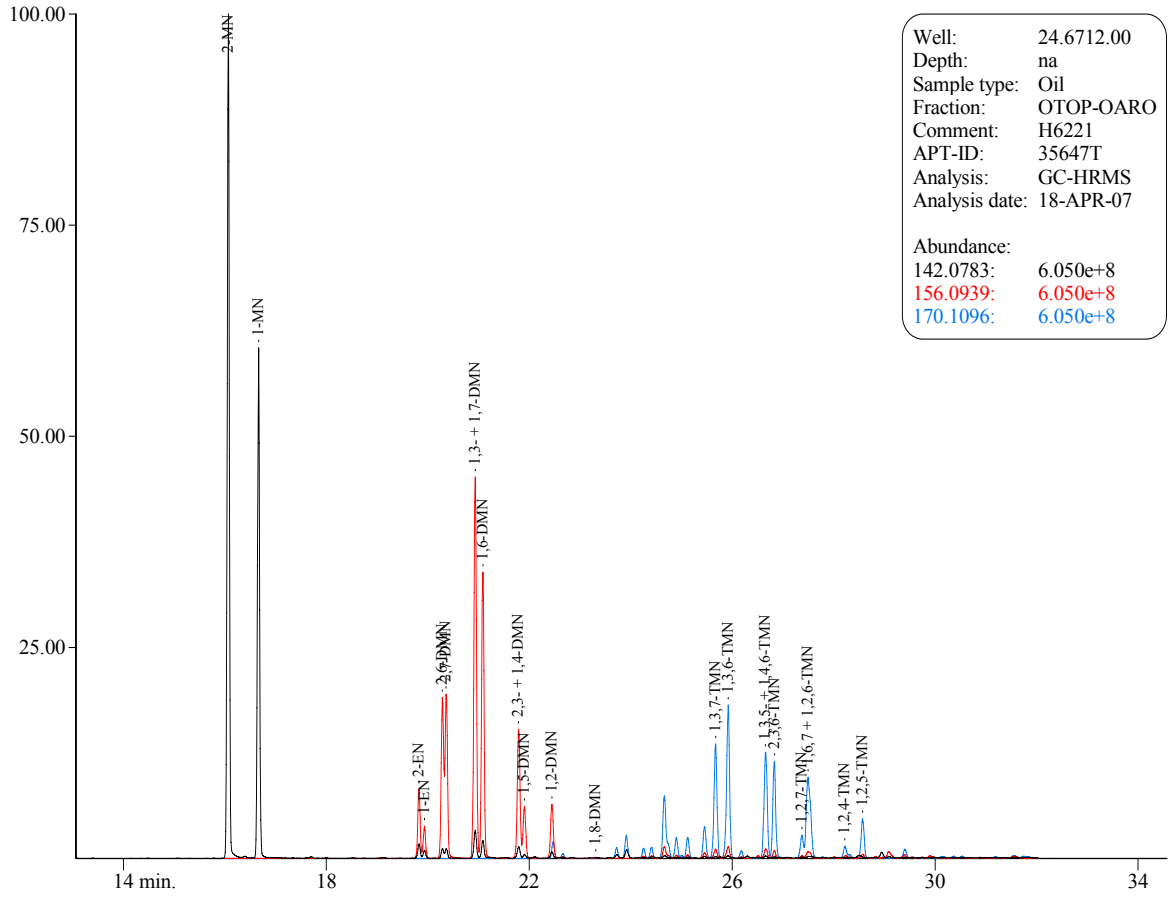
H6218, 7121/5-1, 2436 - 2439 m, DST 1, ARO GCMS Naphthalenes



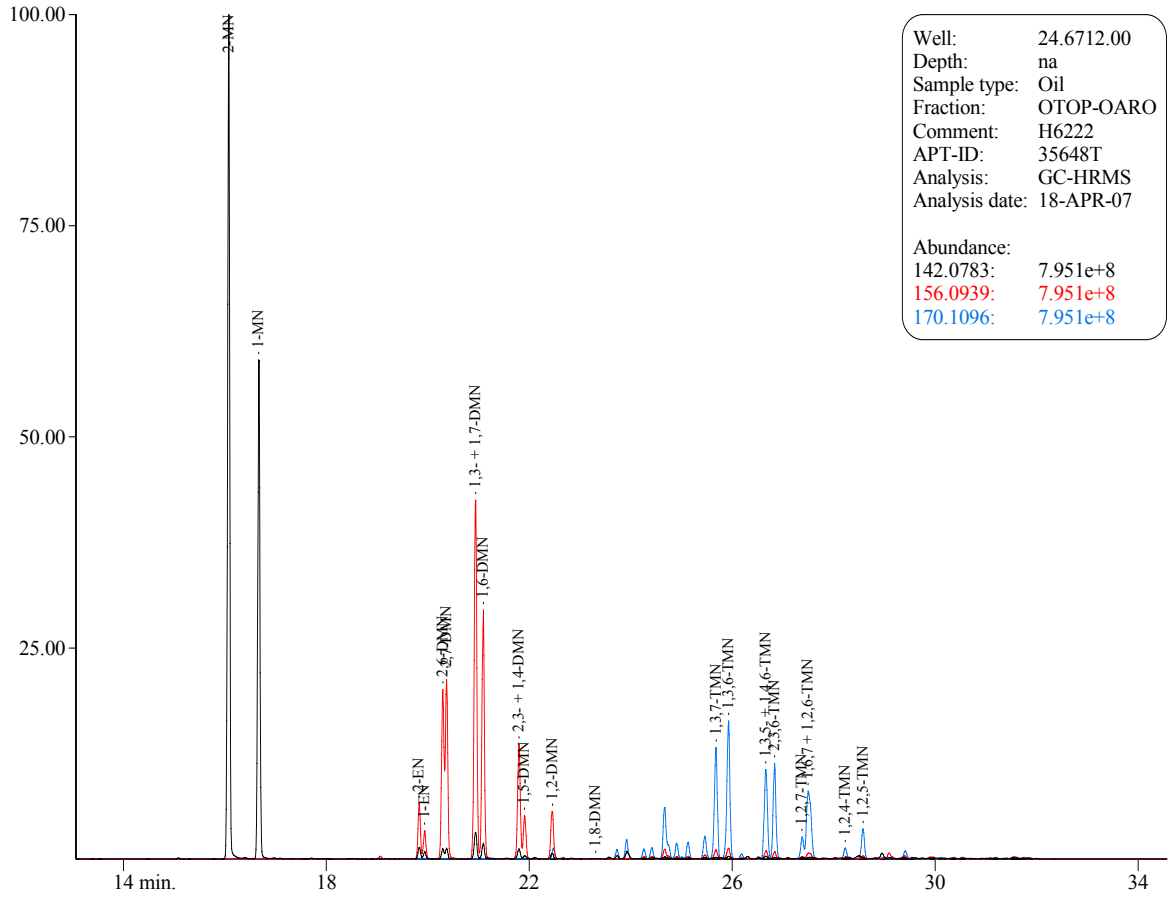
H6219, 7122/7-1, 1114 m, MDT 1, ARO GCMS Naphthalenes



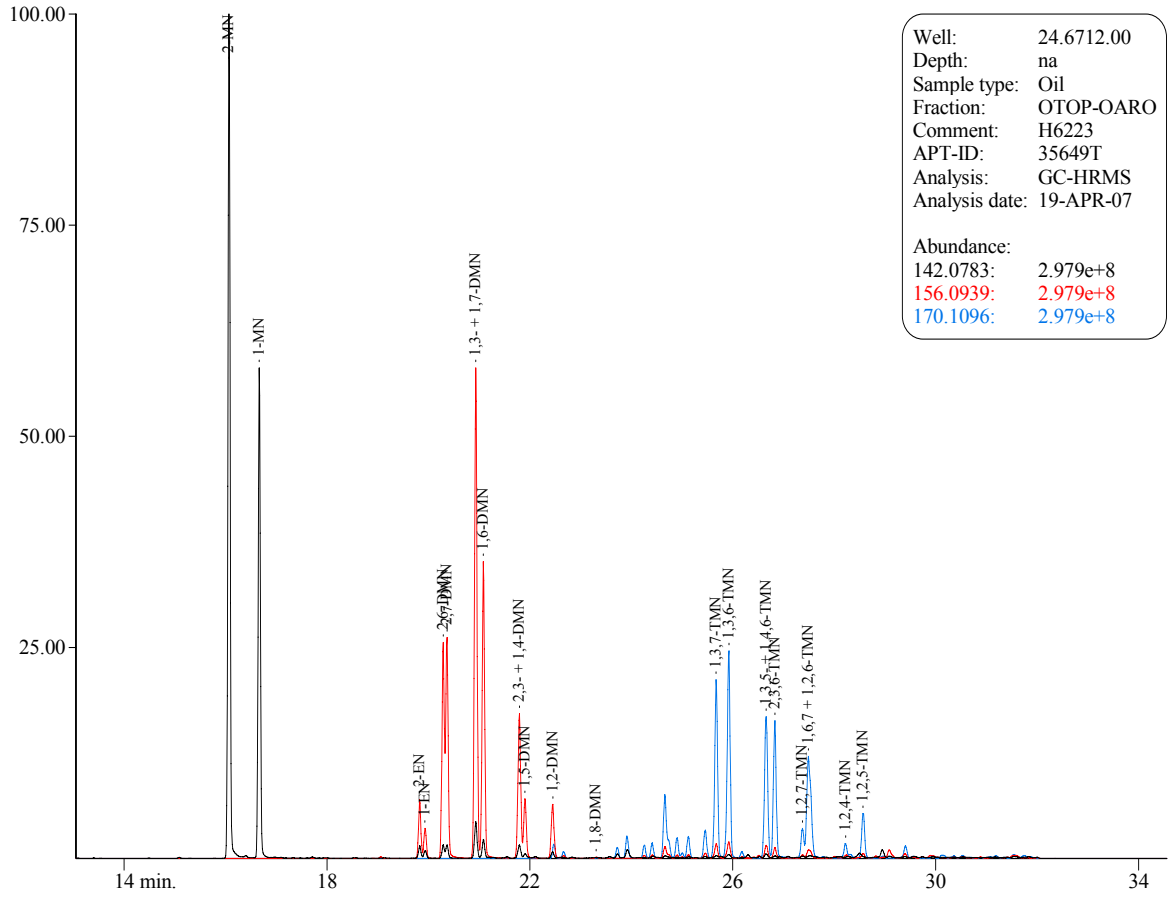
H6220, 7122/7-3, 1195 m, MDT 16, ARO GCMS Naphthalenes



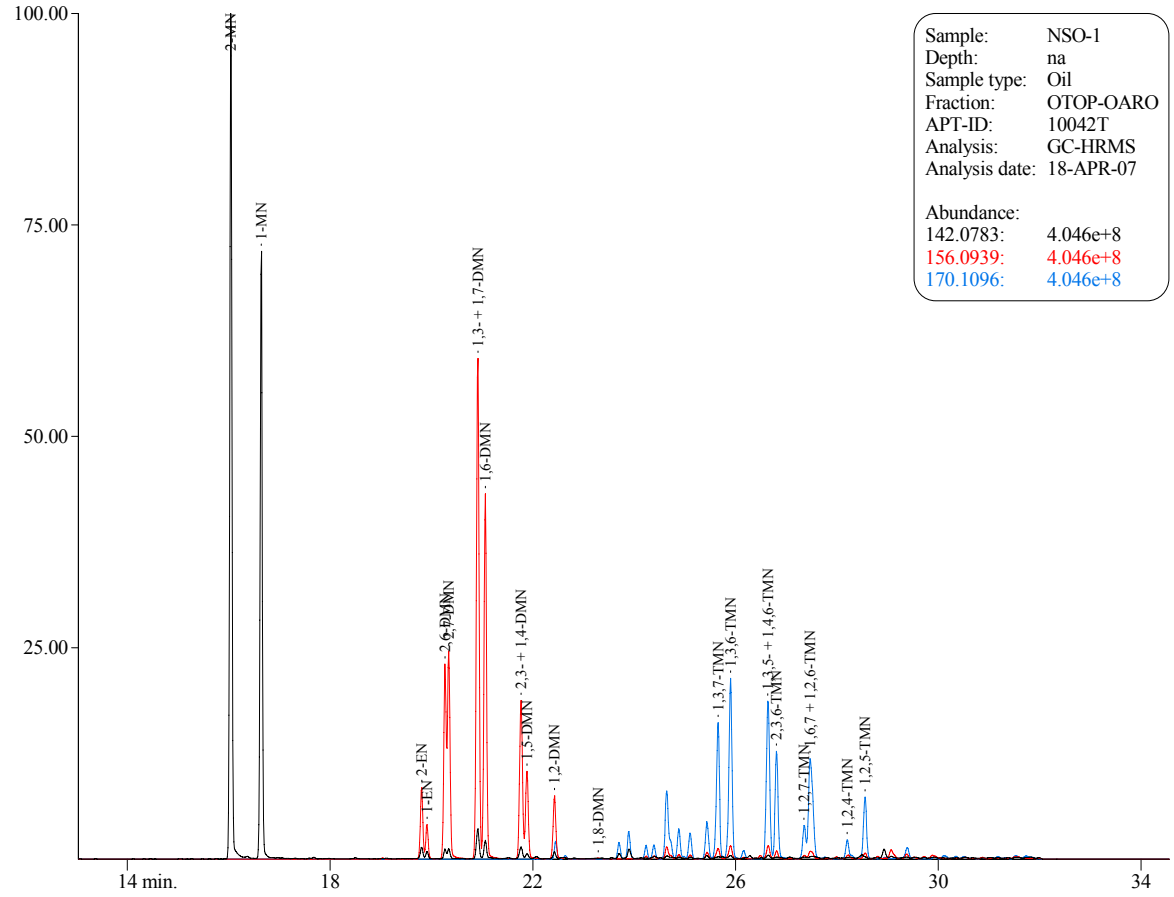
H6221, 7122/7-3, 1812 m, MDT 3, ARO GCMS Naphthalenes



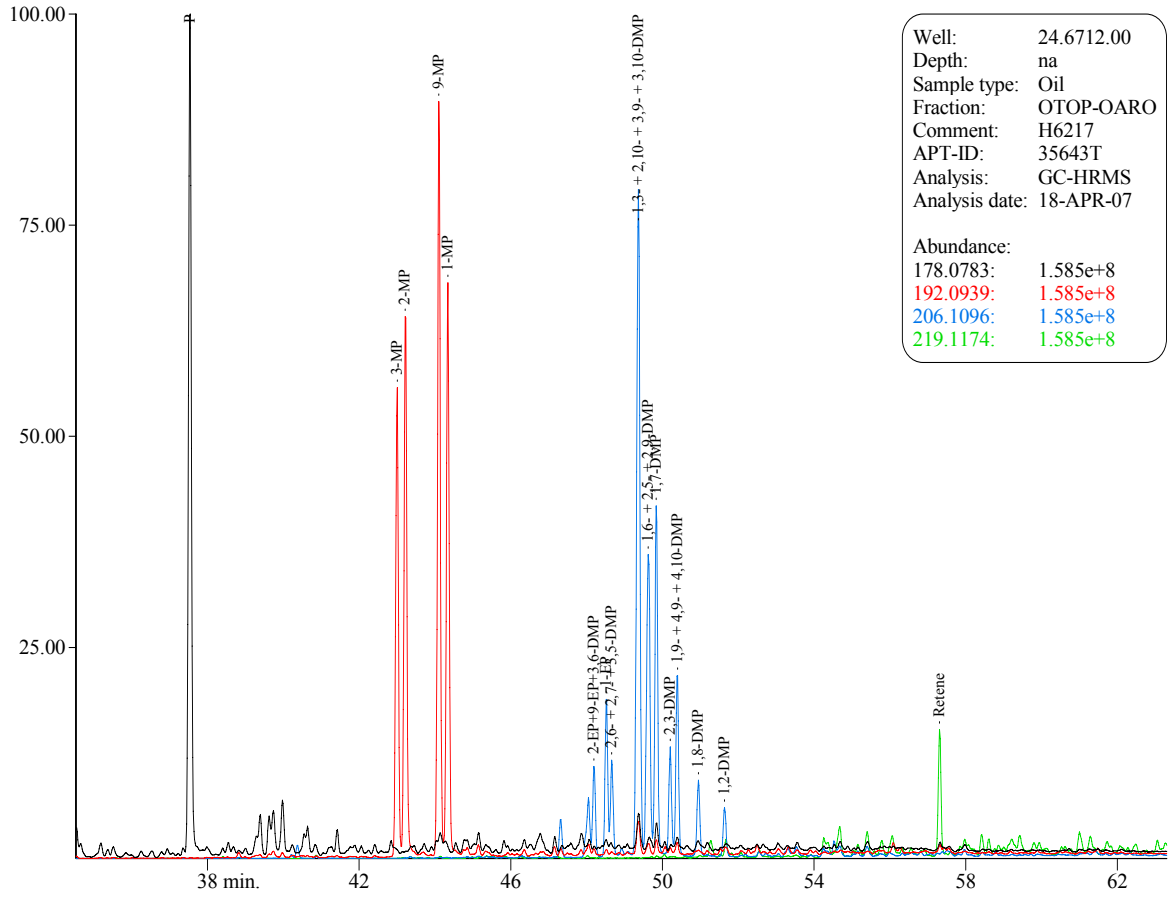
H6222, 7128/4-1, 1577 - 1586 m, DST 2, ARO GCMS Naphthalenes



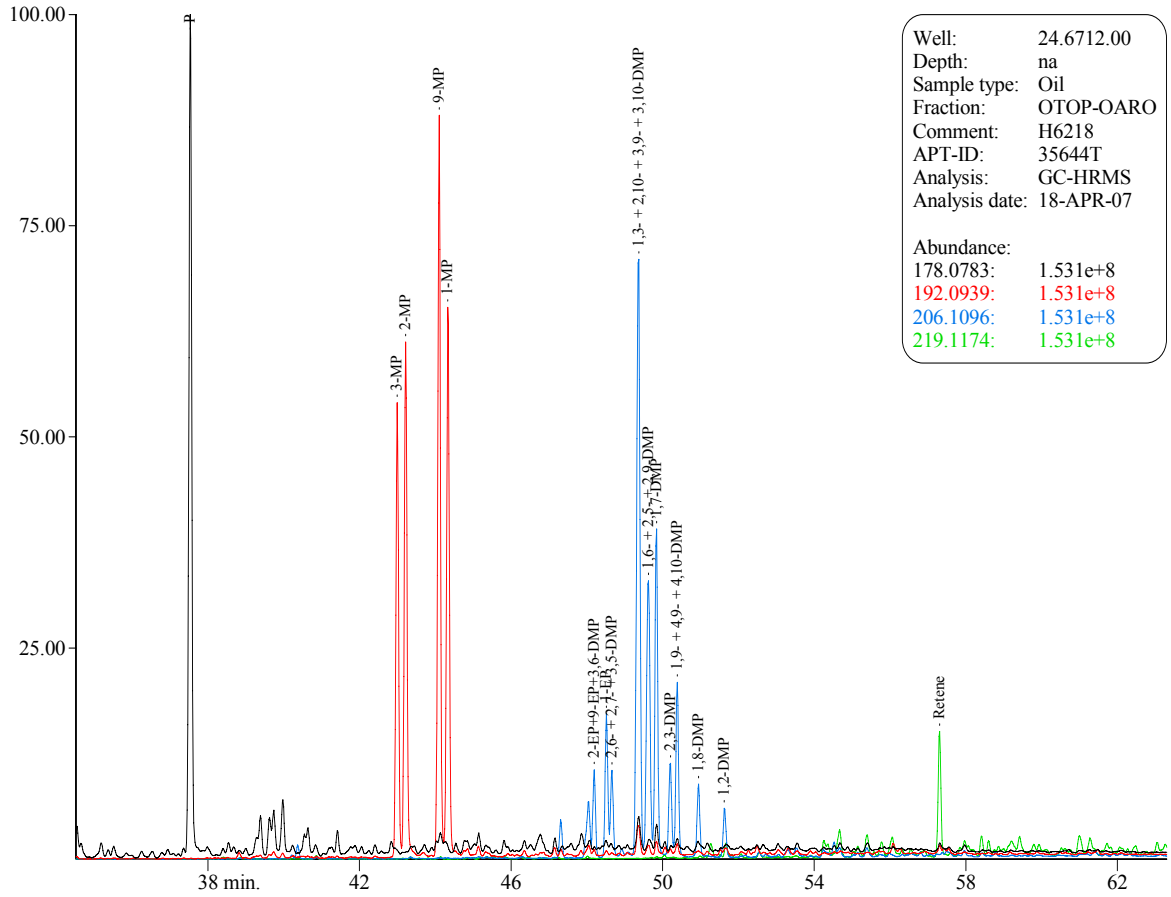
H6223, 7228/7-1 A, 2091.1 m, MDT, ARO GCMS Naphthalenes



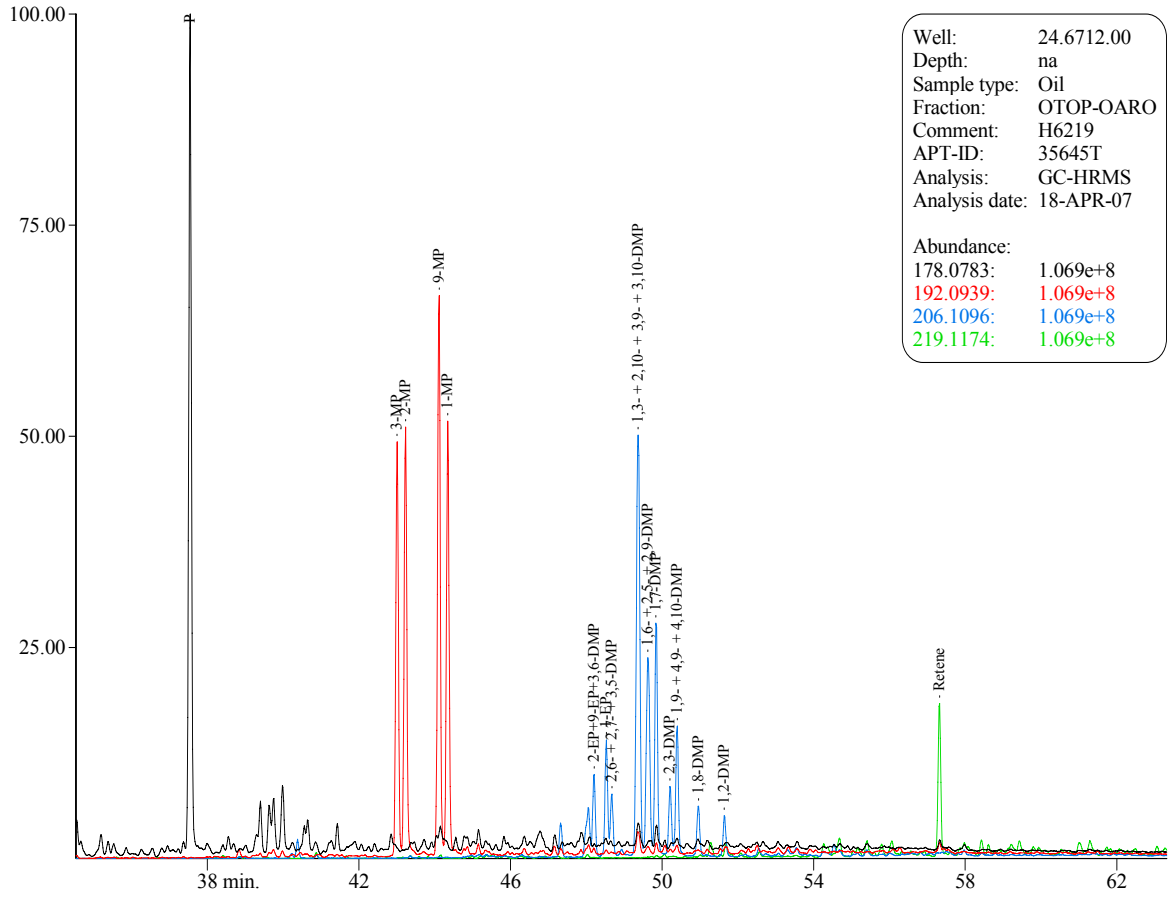
NSO- 1, NGS reference oil, ARO GCMS Naphthalenes



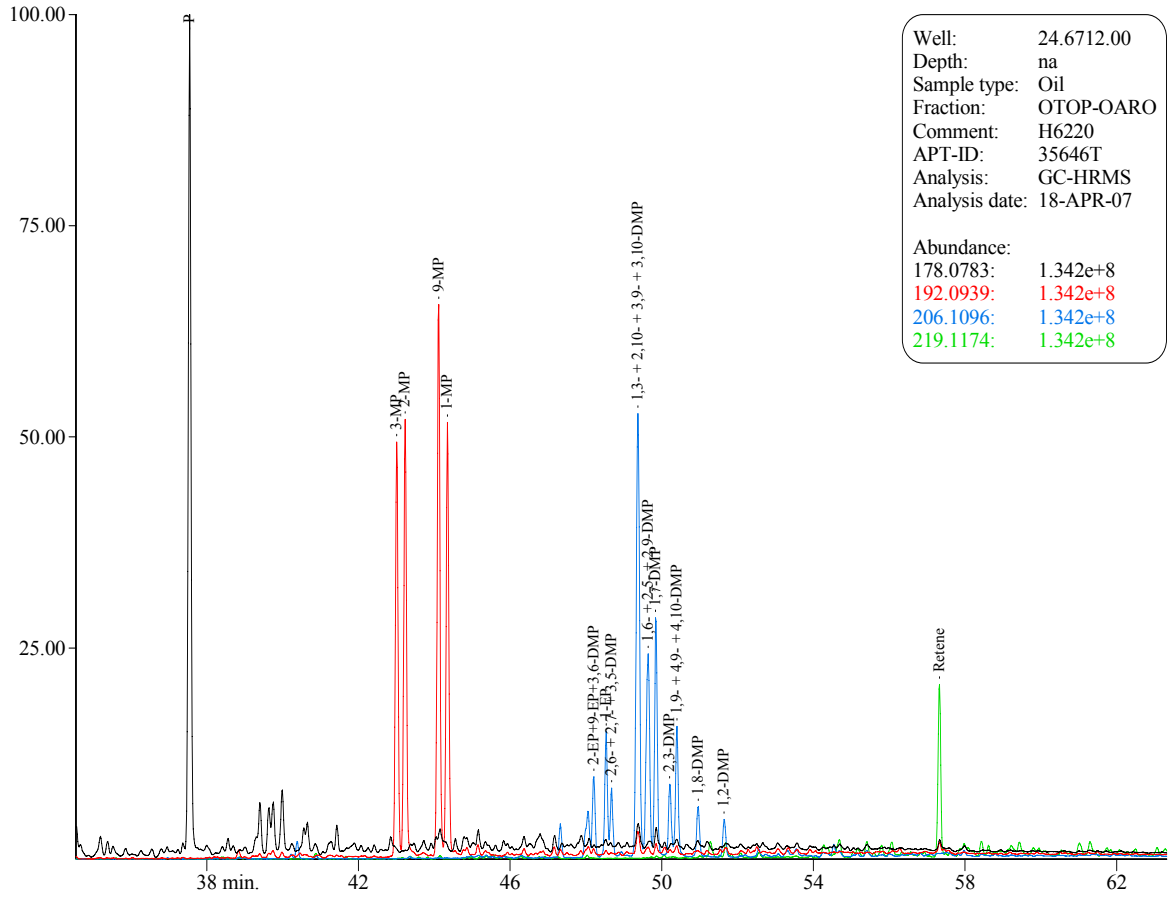
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST 2, ARO GCMS Phenanthrenes



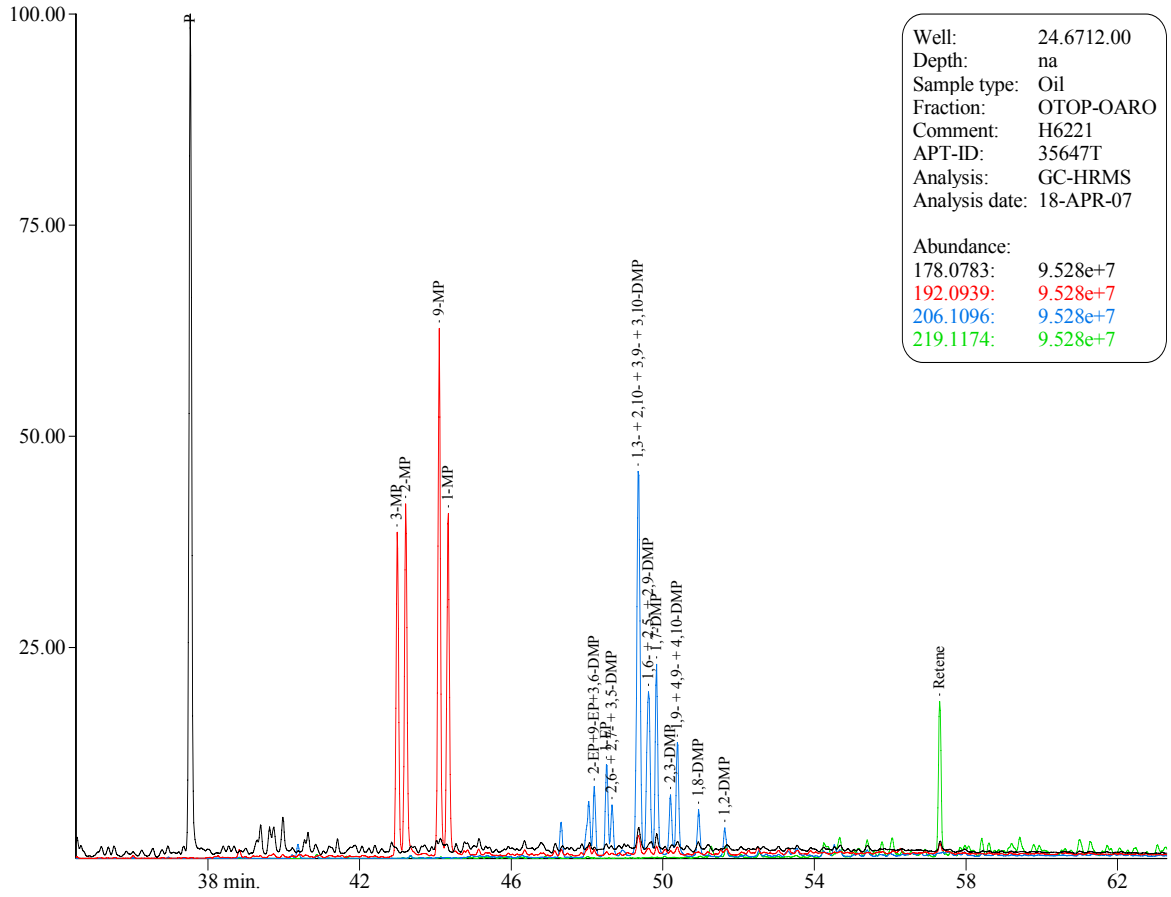
H6218, 7121/5-1, 2436 - 2439 m, DST 1, ARO GCMS Phenanthrenes



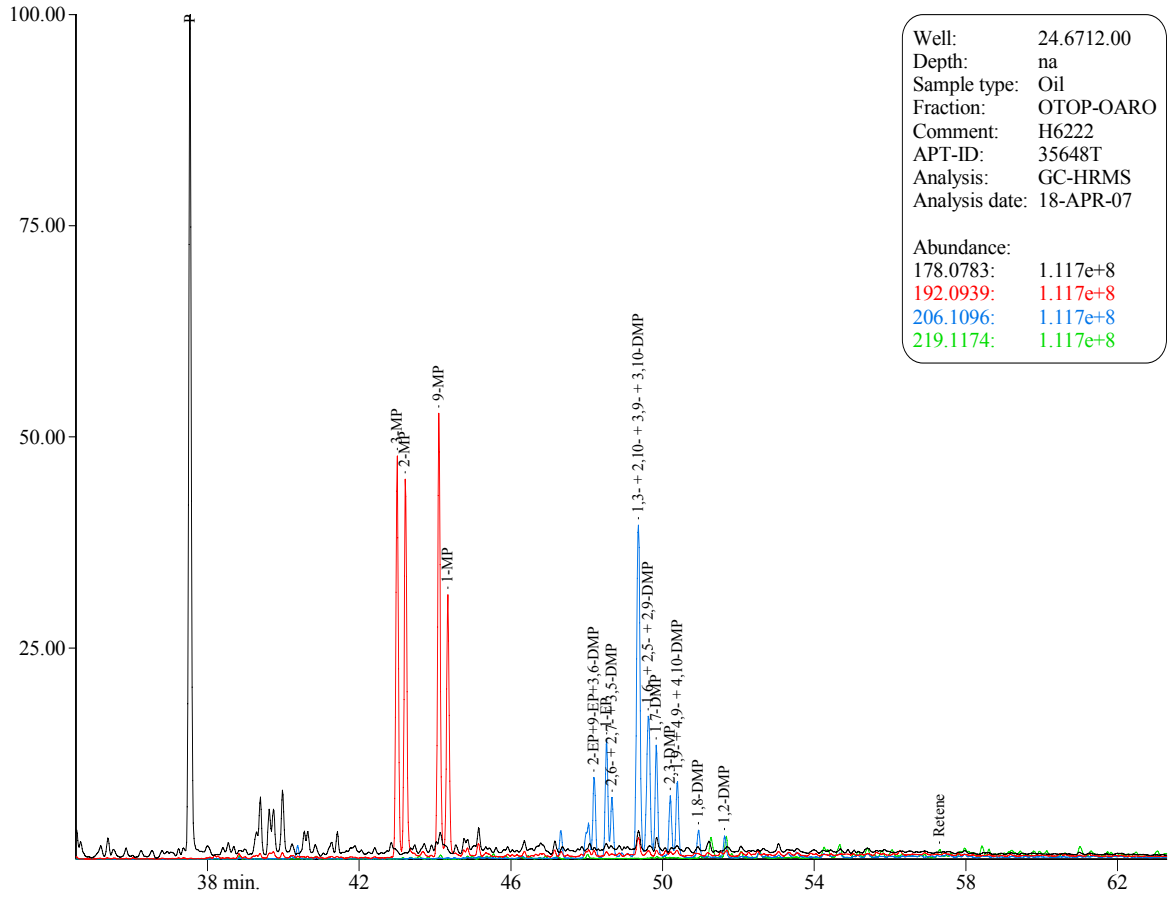
H6219, 7122/7-1, 1114 m, MDT 1, ARO GCMS Phenanthrenes



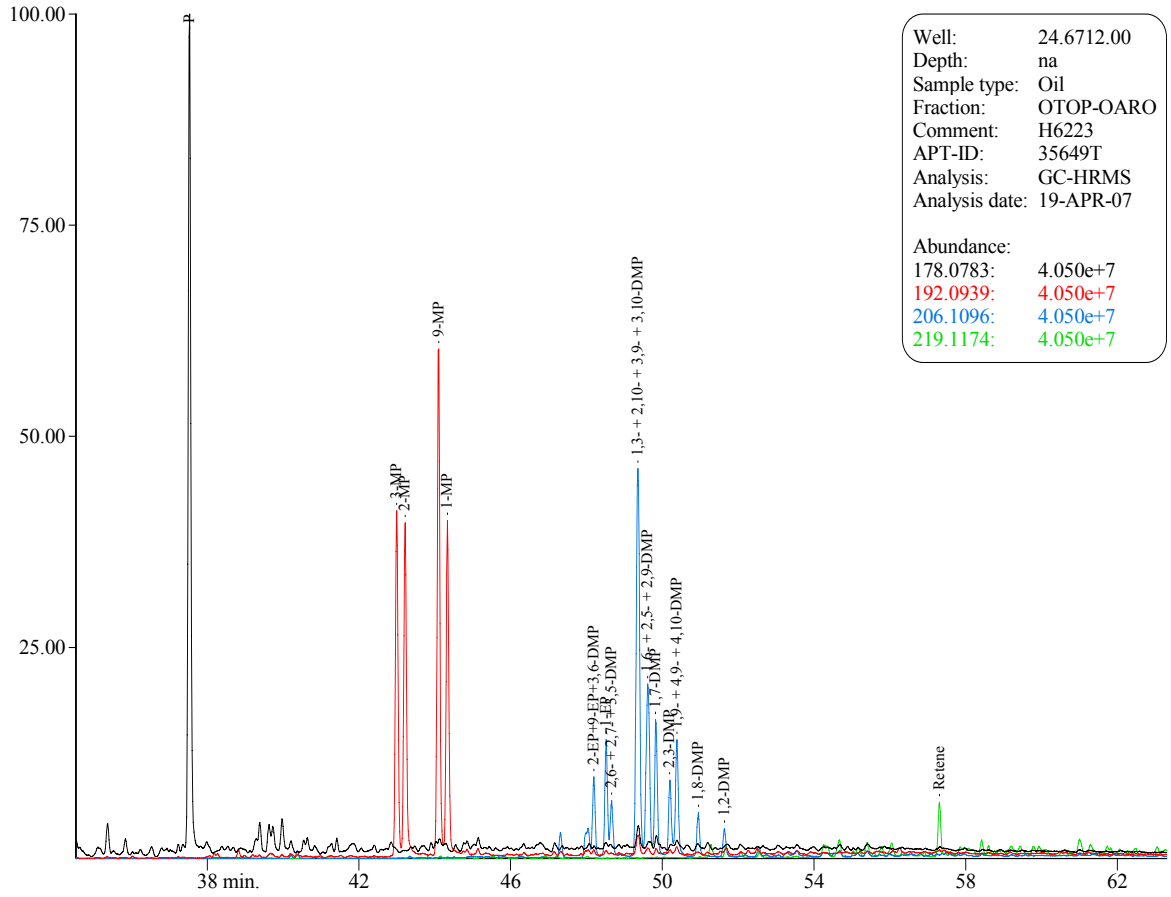
H6220, 7122/7-3, 1195 m, MDT 16, ARO GCMS Phenanthrenes



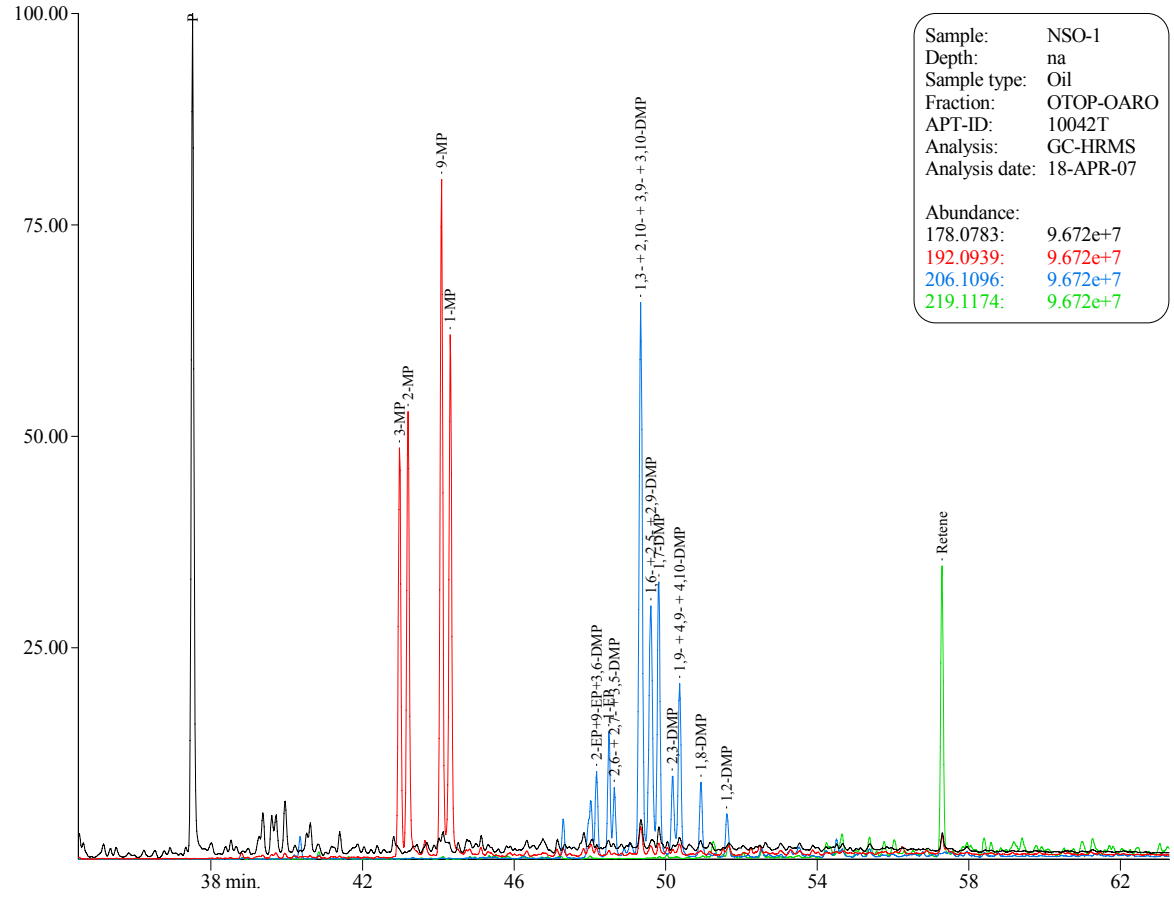
H6221, 7122/7-3, 1812 m, MDT 3, ARO GCMS Phenanthrenes



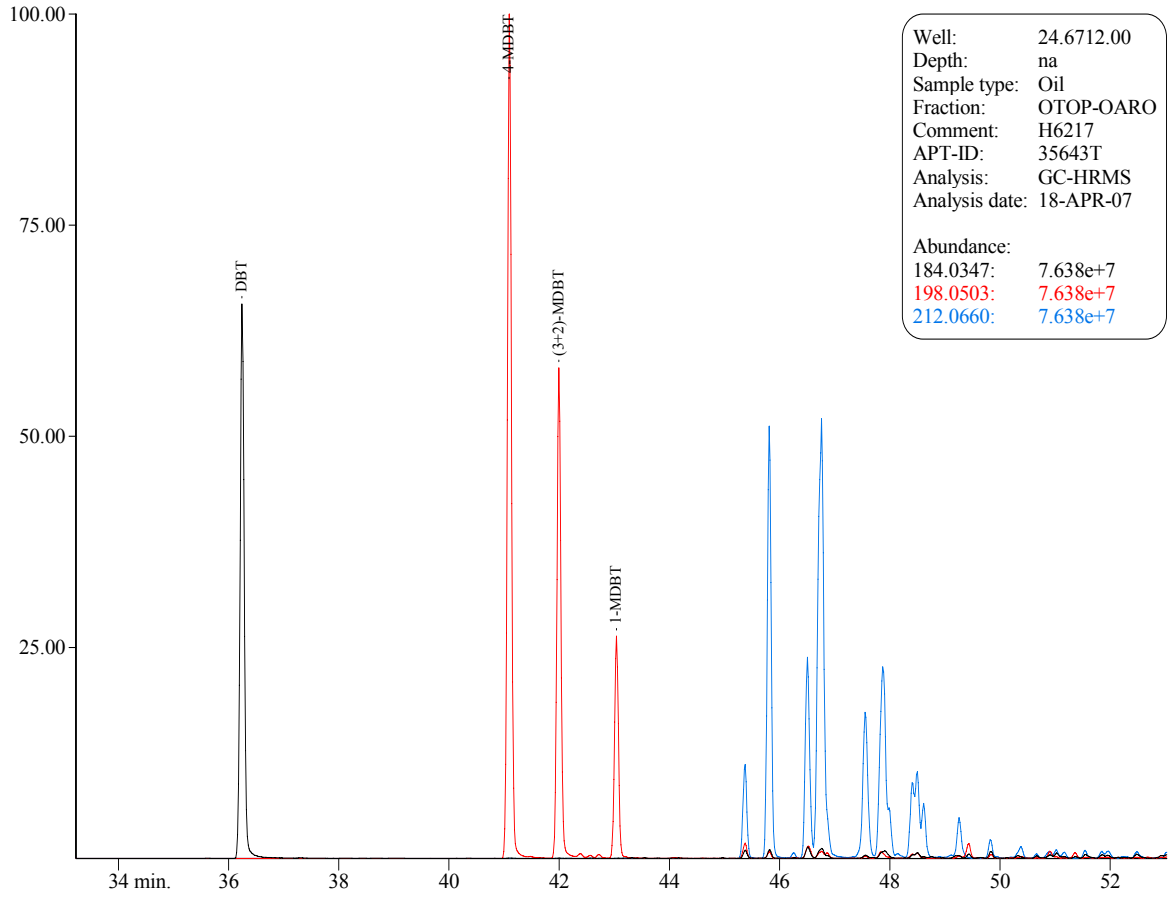
H6222, 7128/4-1, 1577 - 1586 m, DST 2, ARO GCMS Phenanthrenes



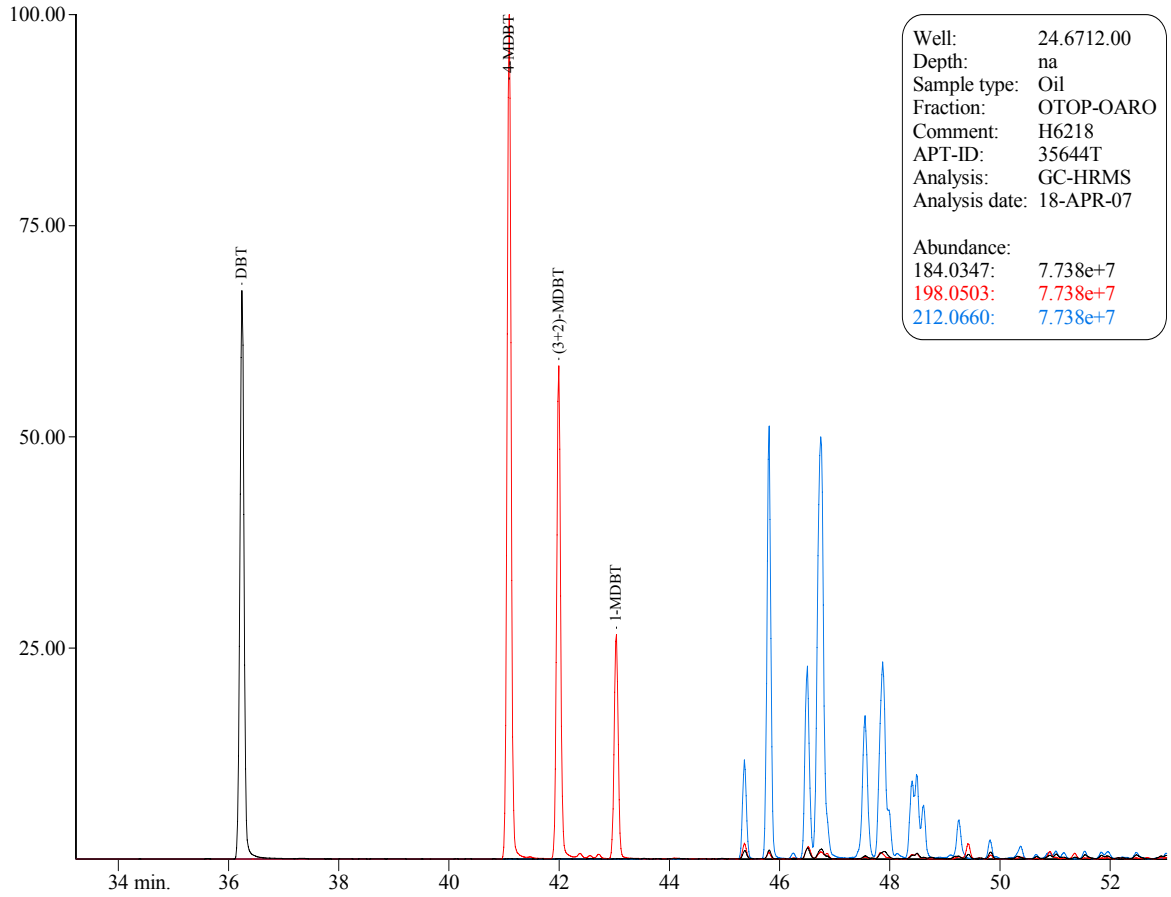
H6223, 7228/7-1 A, 2091.1 m, MDT, ARO GCMS Phenanthrenes



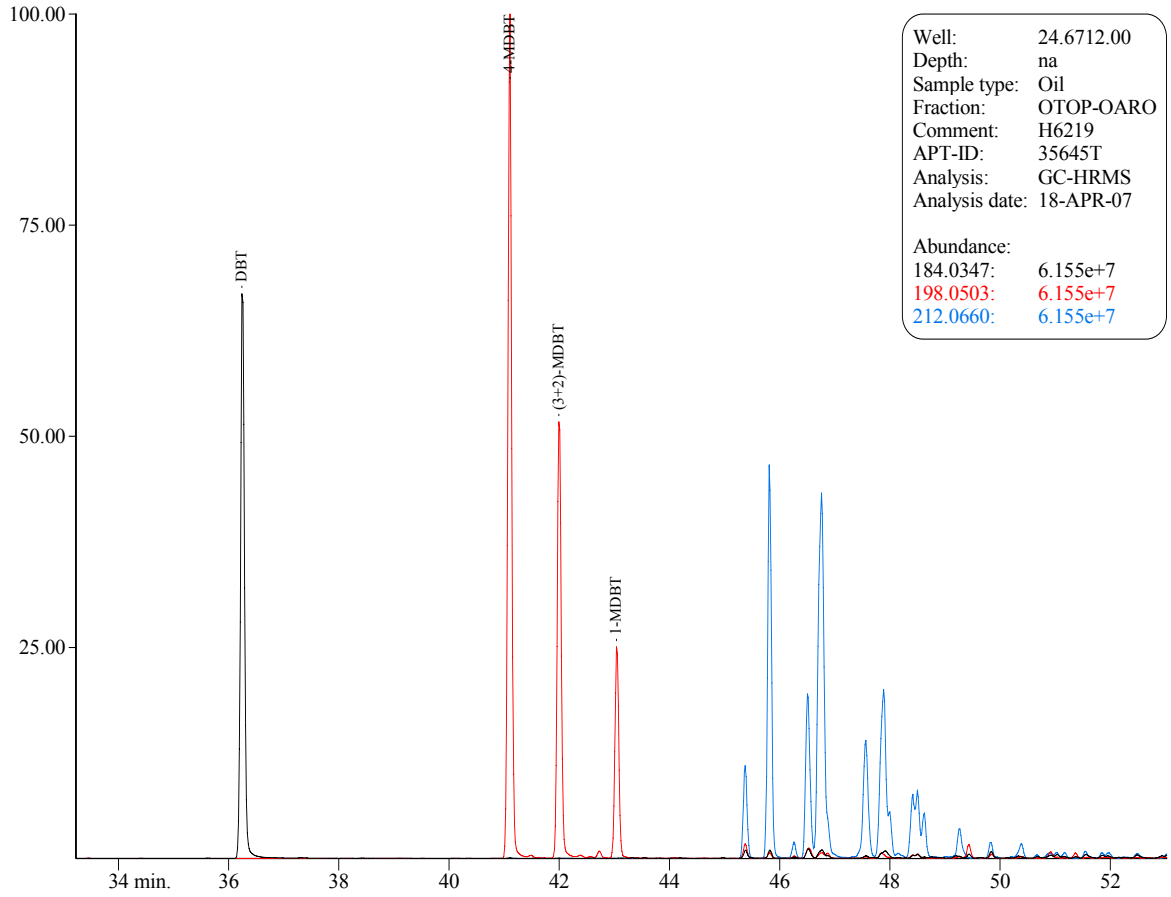
NSO- 1, NGS reference oil, ARO GCMS Phenanthrenes



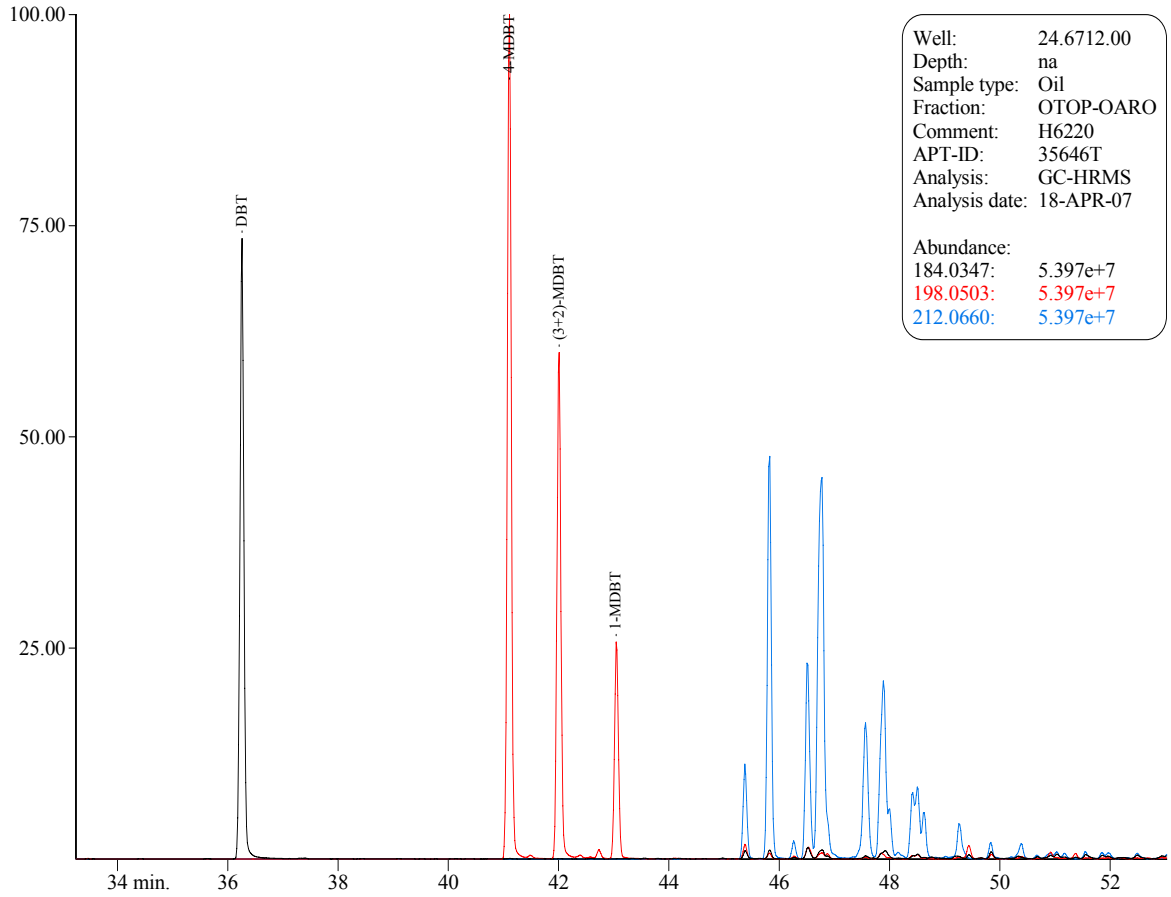
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST 2, ARO GCMS Dibenzothiophenes



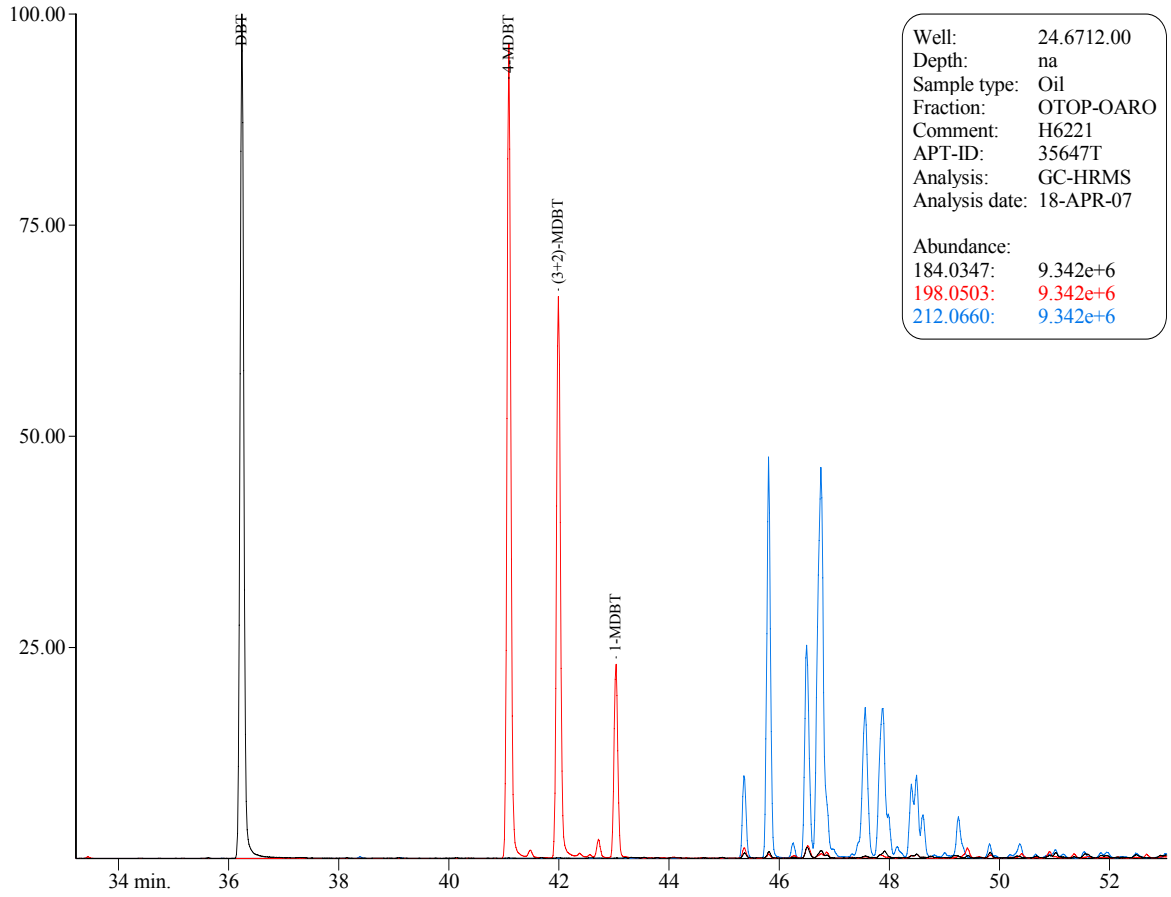
H6218, 7121/5-1, 2436 - 2439 m, DST 1, ARO GCMS Dibenzothiophenes



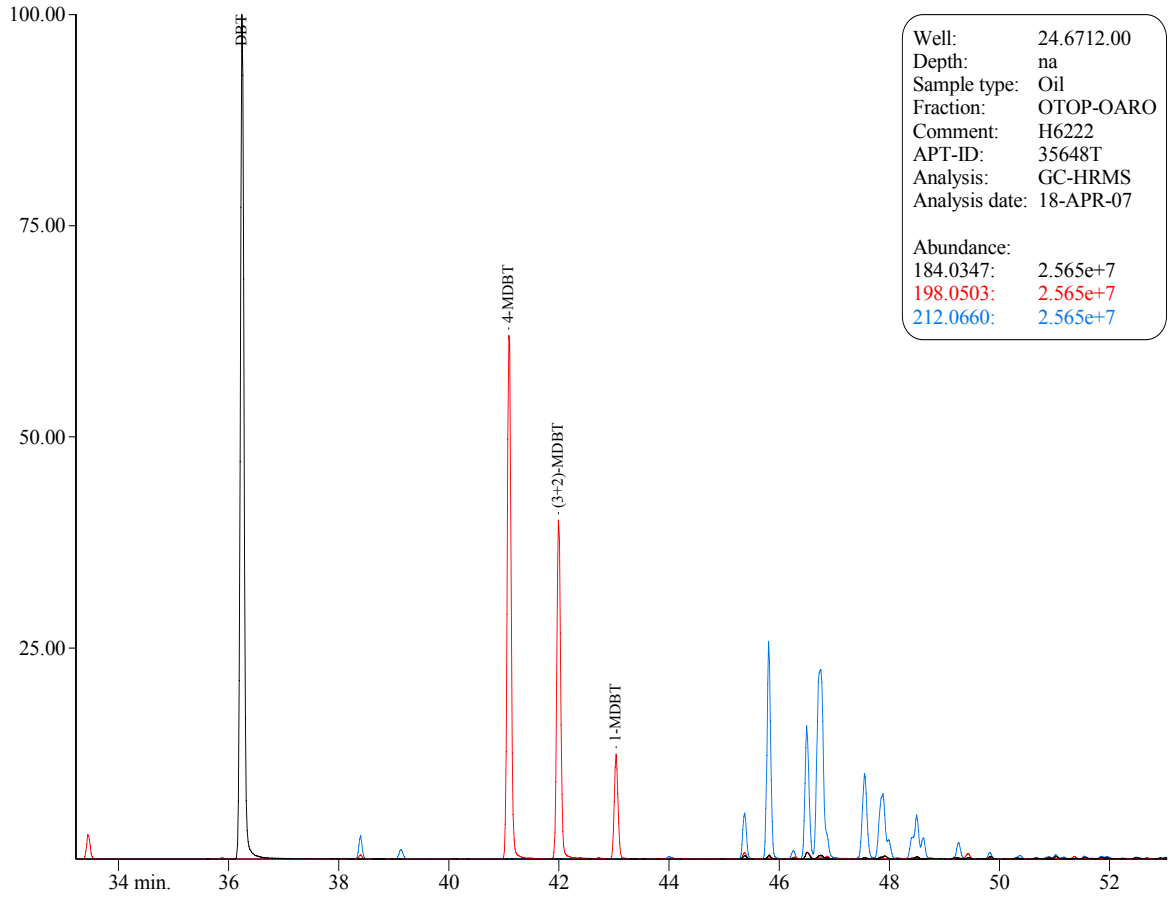
H6219, 7122/7-1, 1114 m, MDT 1, ARO GCMS Dibenzothiophenes



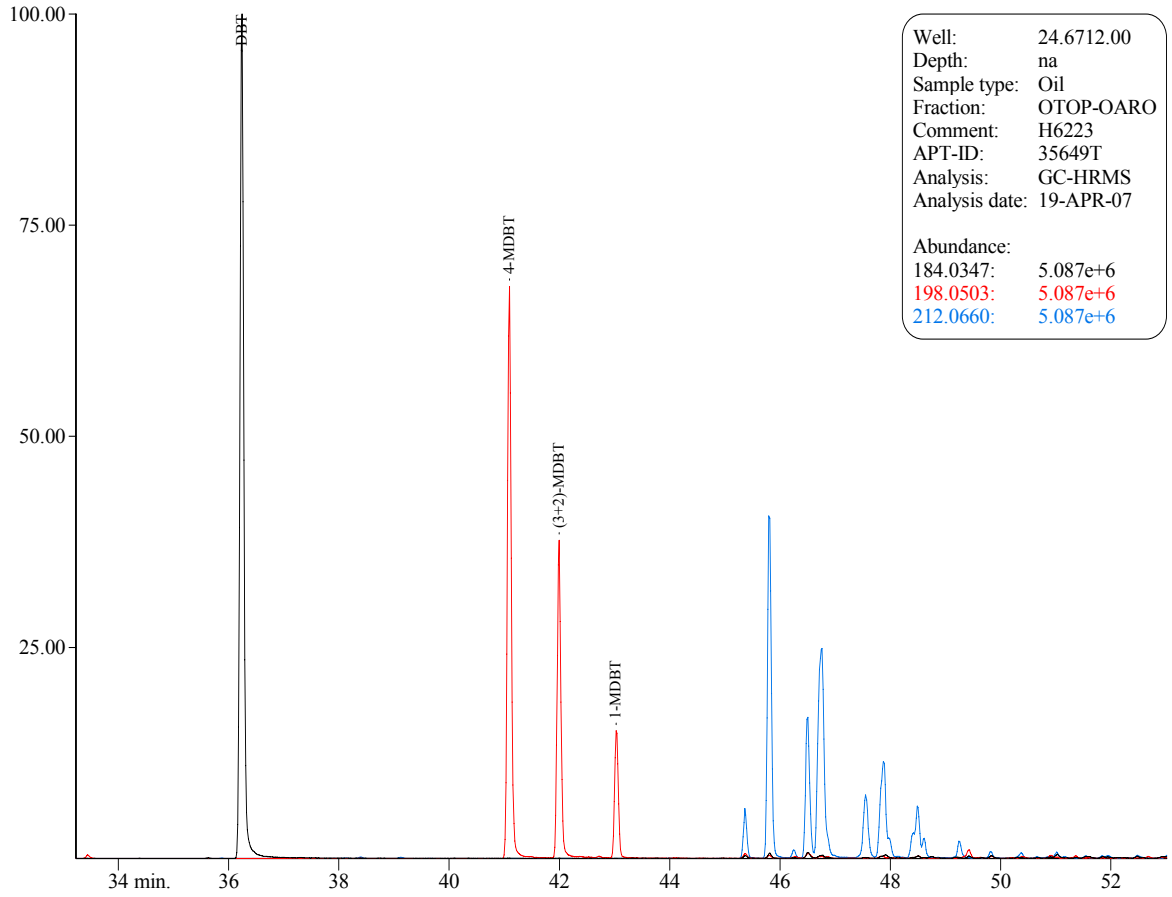
H6220, 7122/7-3, 1195 m, MDT 16, ARO GCMS Dibenzothiophenes



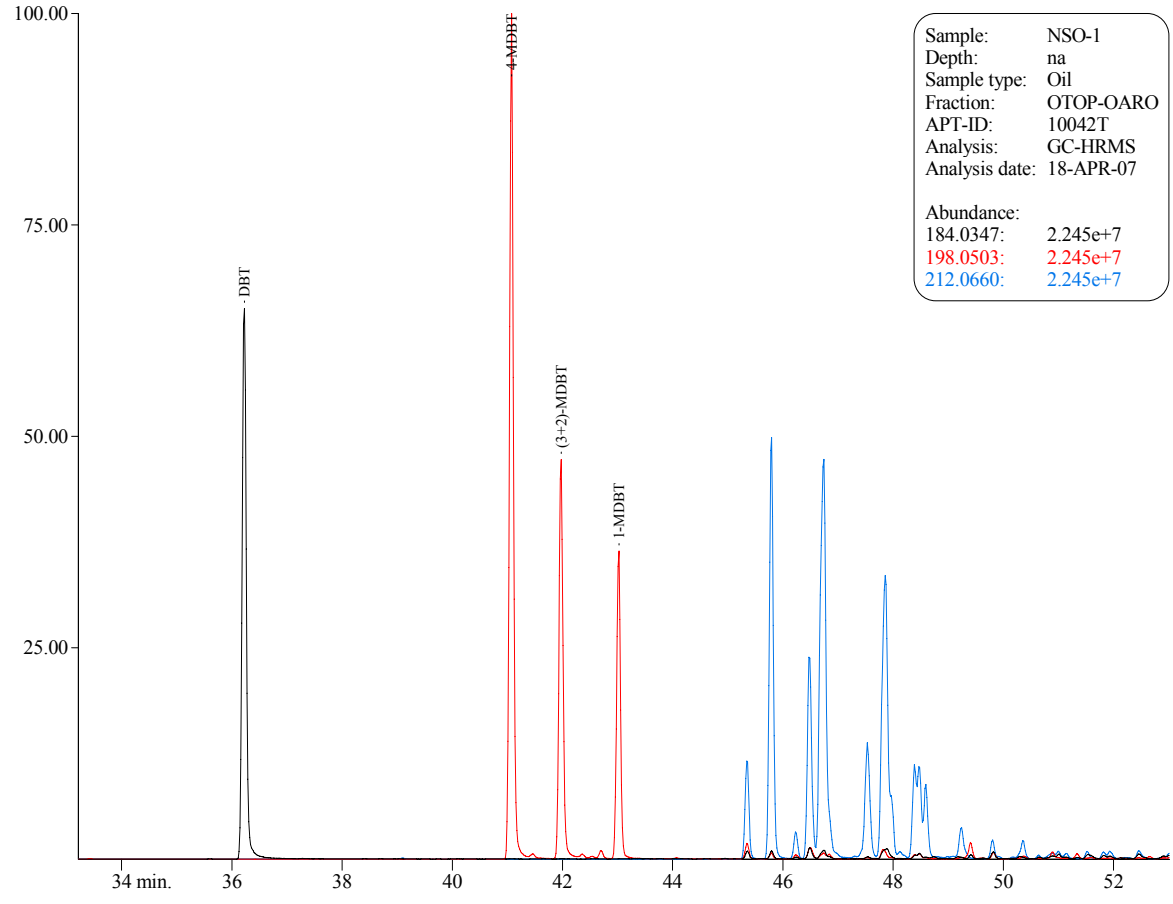
H6221, 7122/7-3, 1812 m, MDT 3, ARO GCMS — Dibenzothiophenes



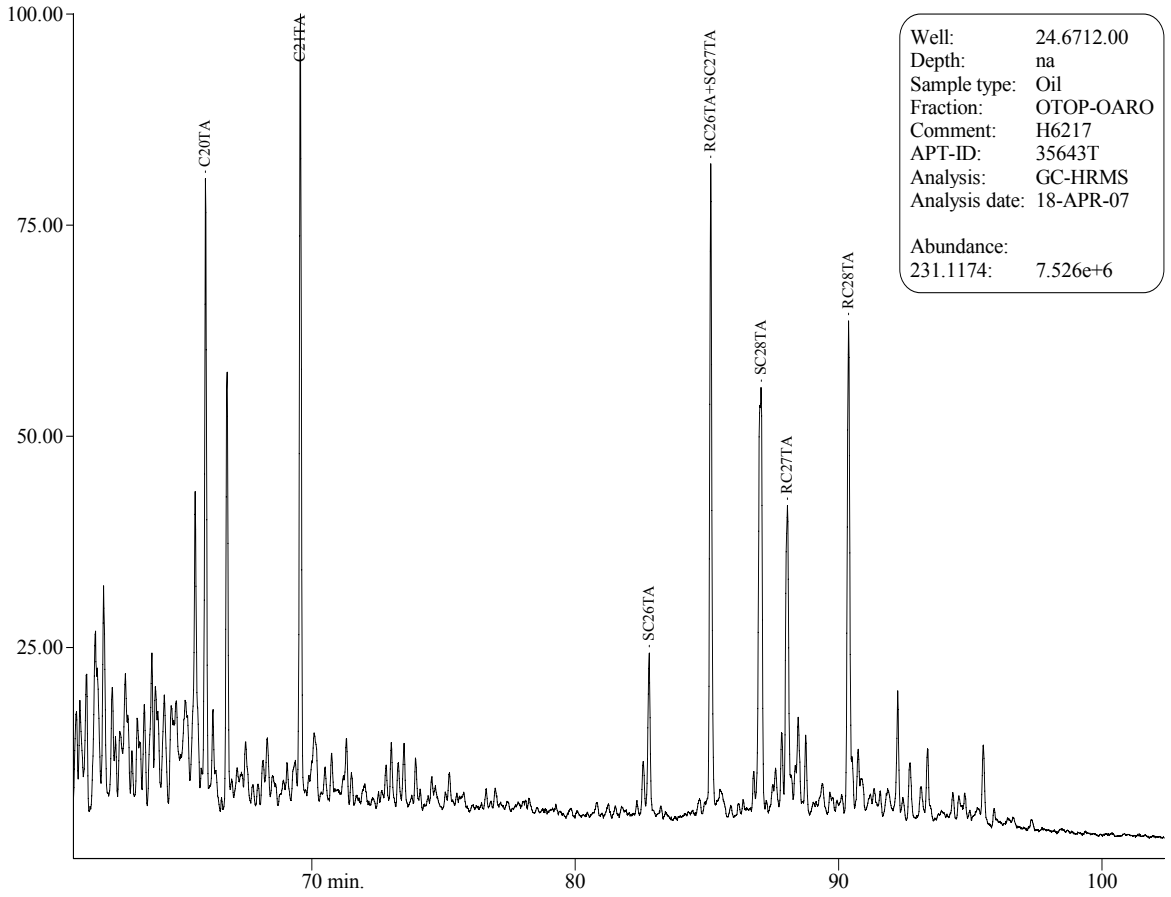
H6222, 7128/4-1, 1577 - 1586 m, DST 2, ARO GCMS — Dibenzothiophenes



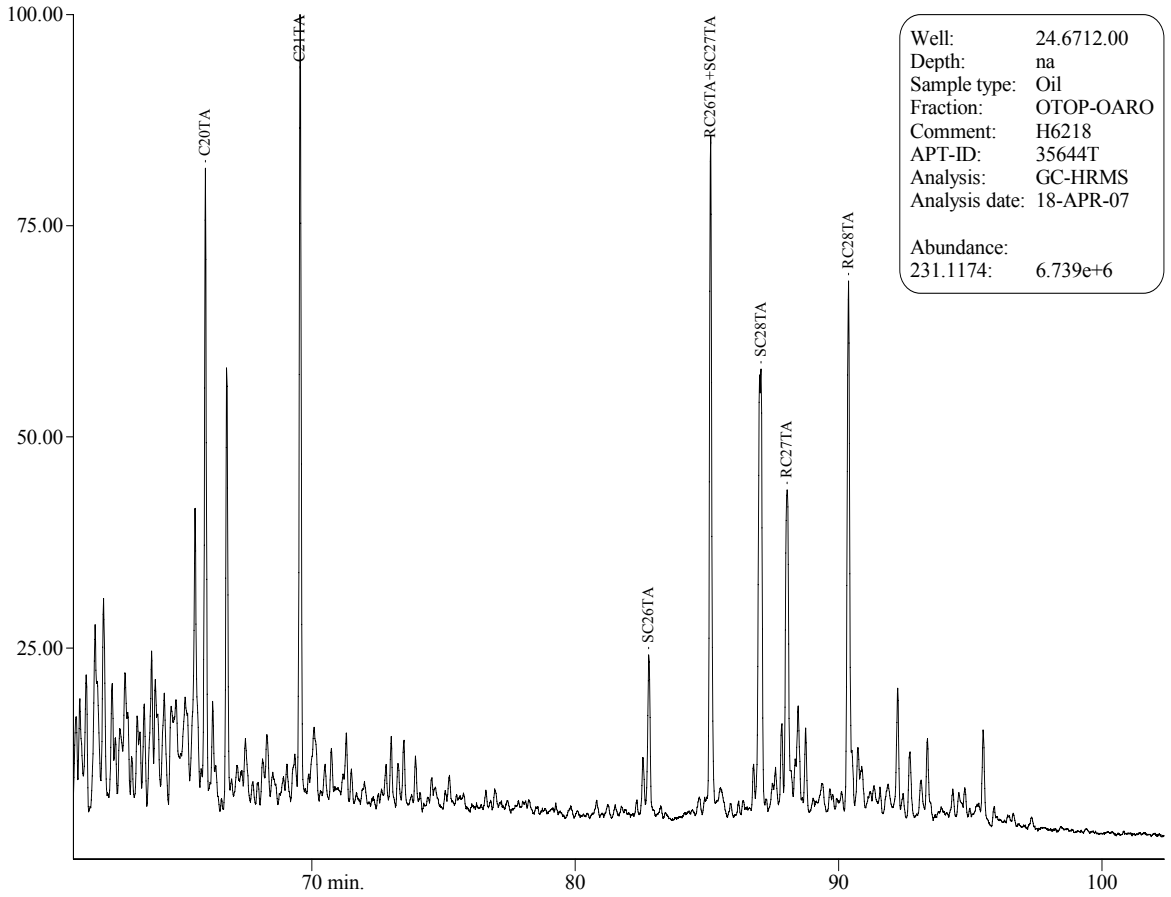
H6223, 7228/7-1 A, 2091.1 m, MDT, ARO GCMS — Dibenzothiophenes



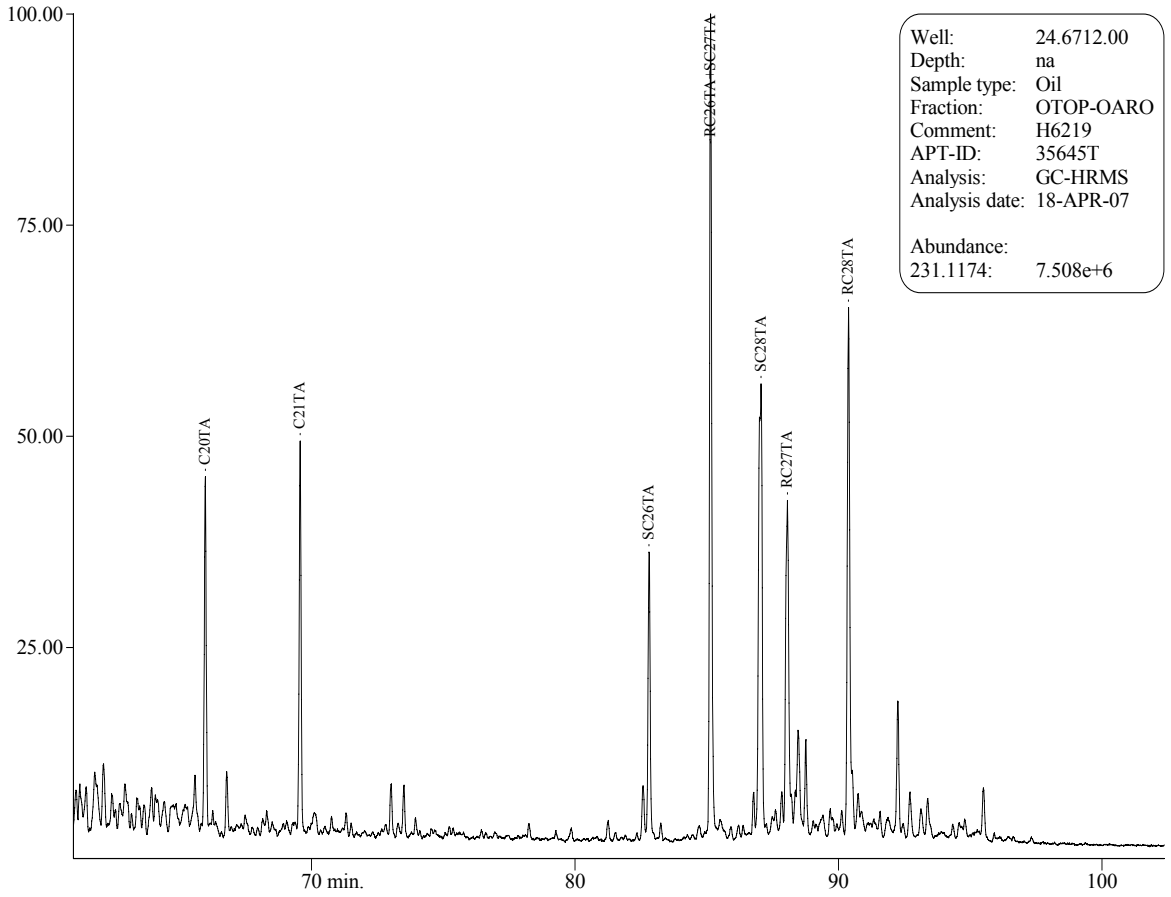
NSO- 1 reference oil, ARO GCMS — Dibenzothiophenes



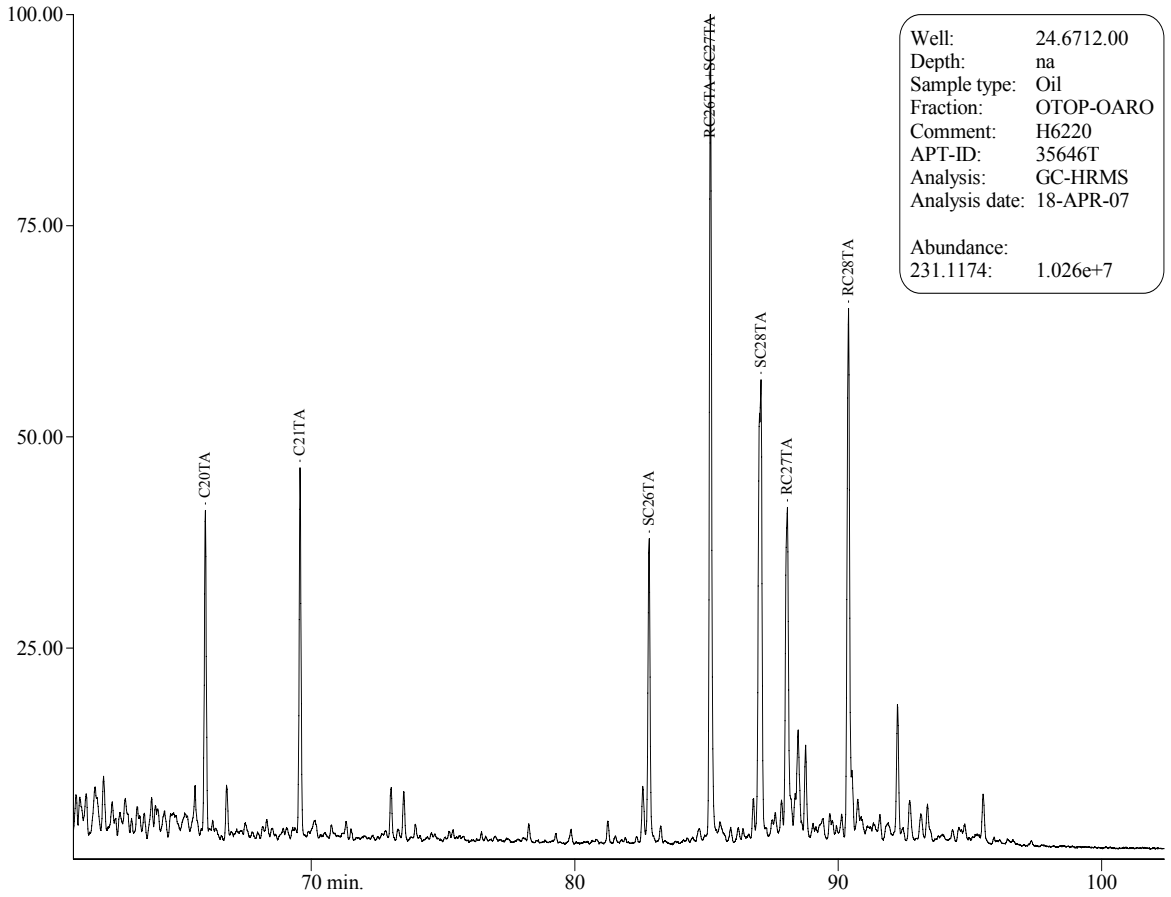
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST 2, ARO GCMS Triaromatic steroid hydrocarbons (m/z 231)



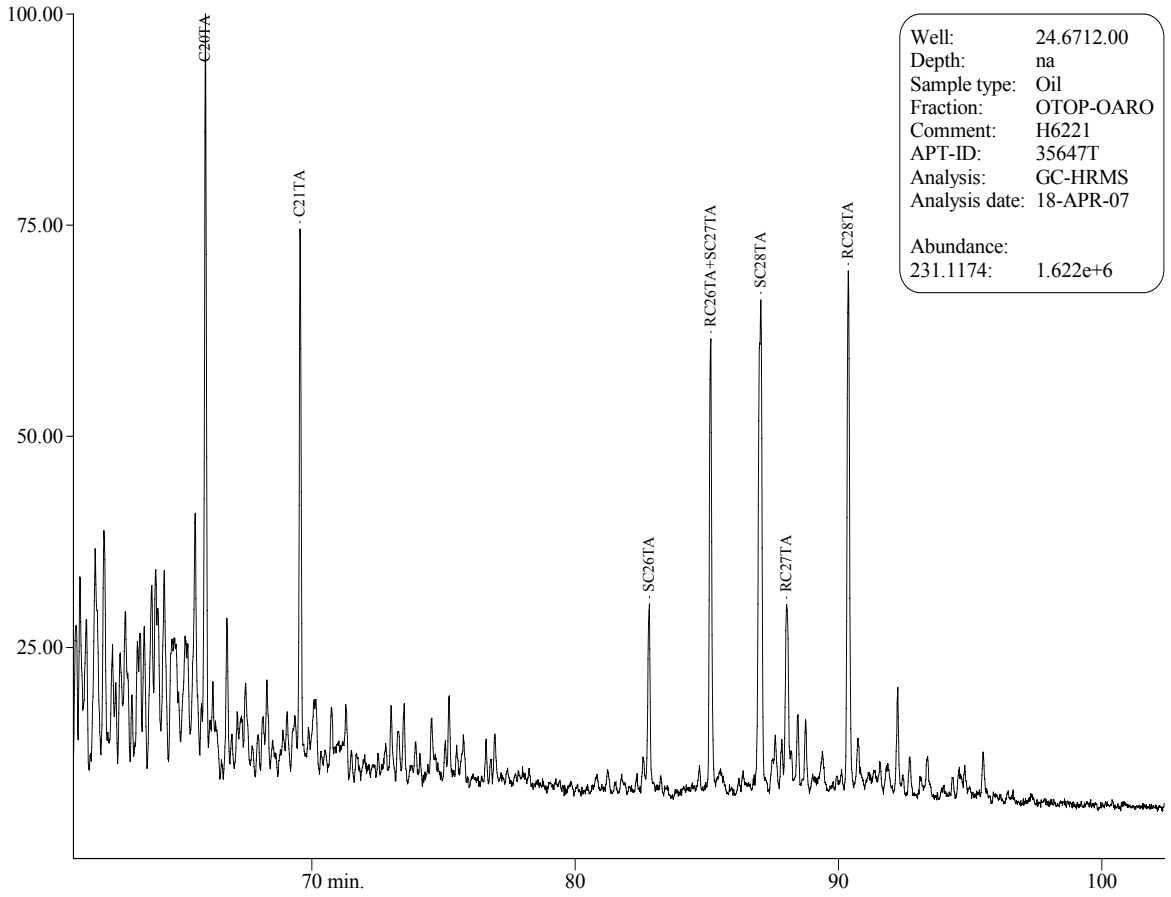
H6218, 7121/5-1, 2436 - 2439 m, DST 1, ARO GCMS Triaromatic steroid hydrocarbons (m/z 231)



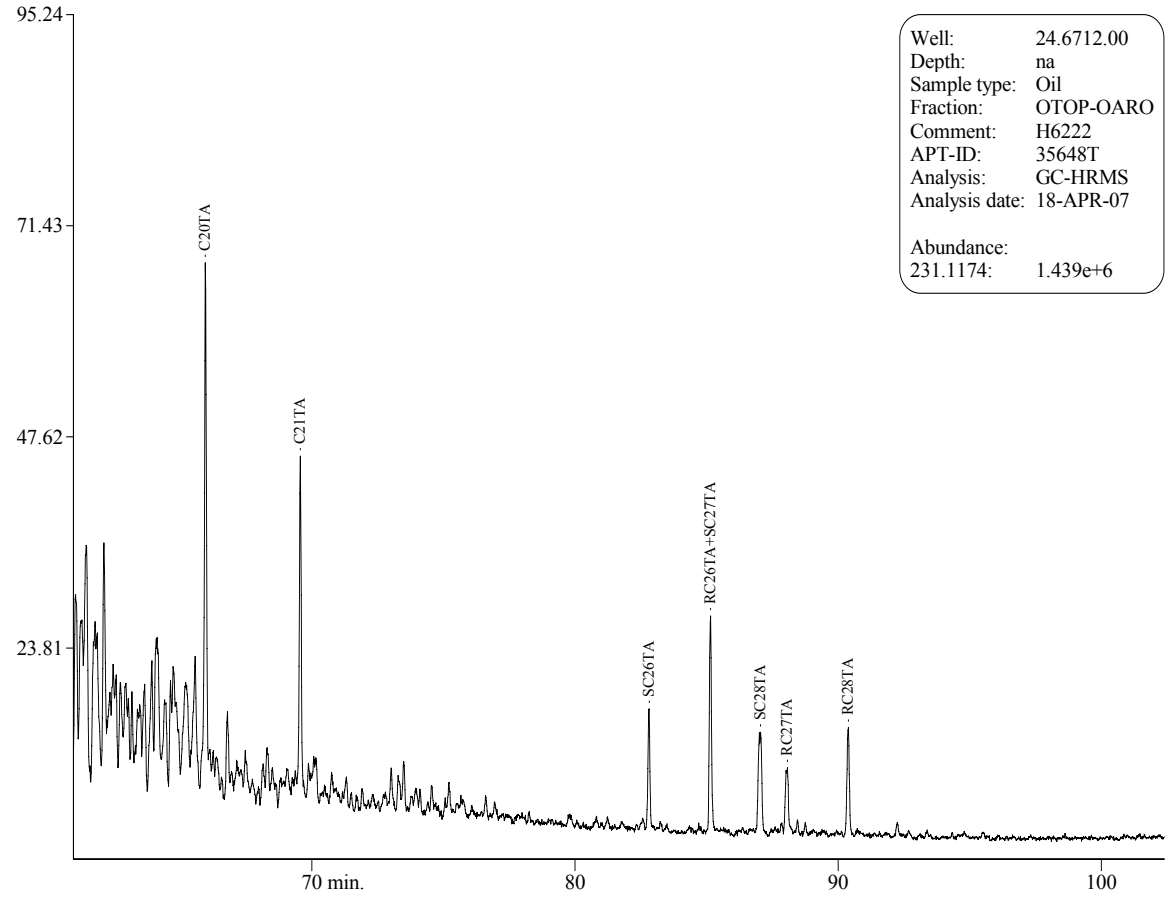
H6219, 7122/7-1, 1114 m, MDT 1, ARO GCMS Triaromatic steroid hydrocarbons (m/z 231)



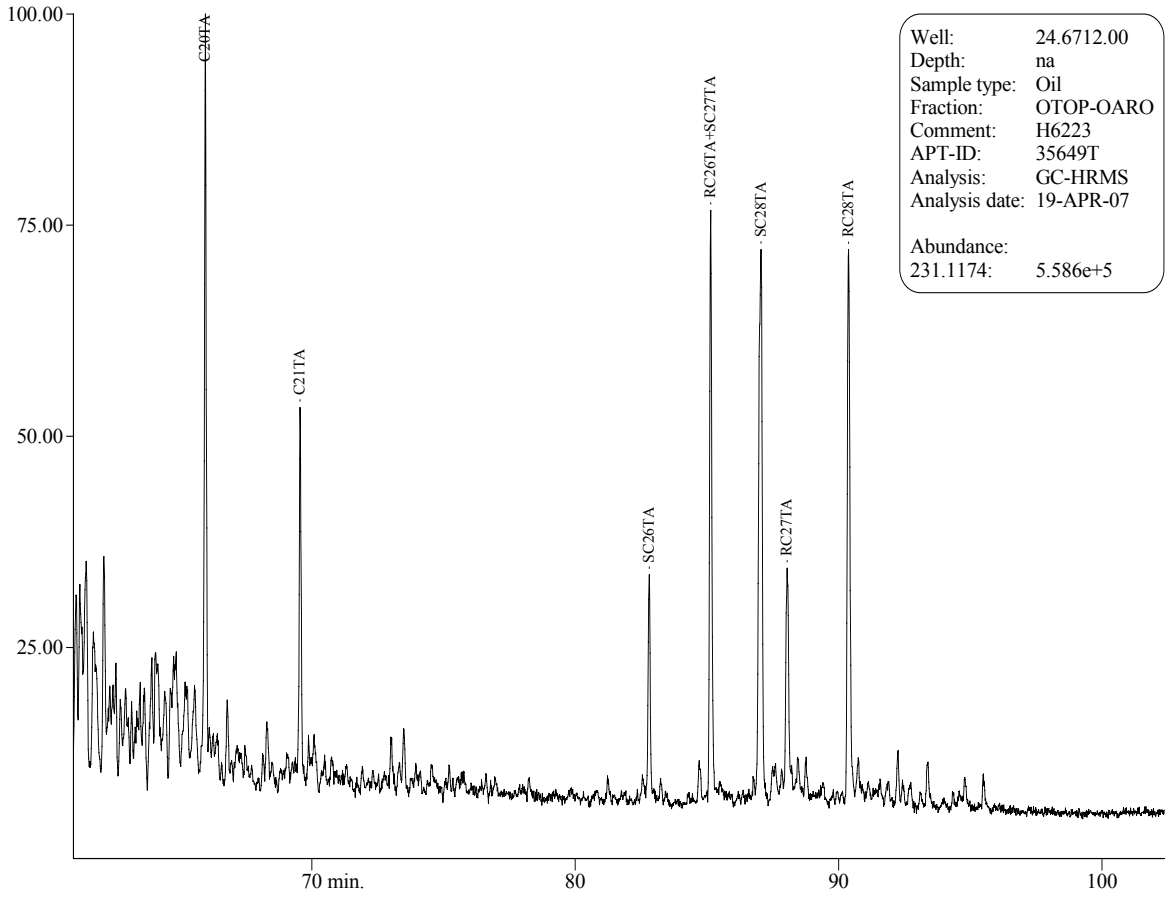
H6220, 7122/7-3, 1195 m, MDT 16, ARO GCMS Triaromatic steroid hydrocarbons (m/z 231)



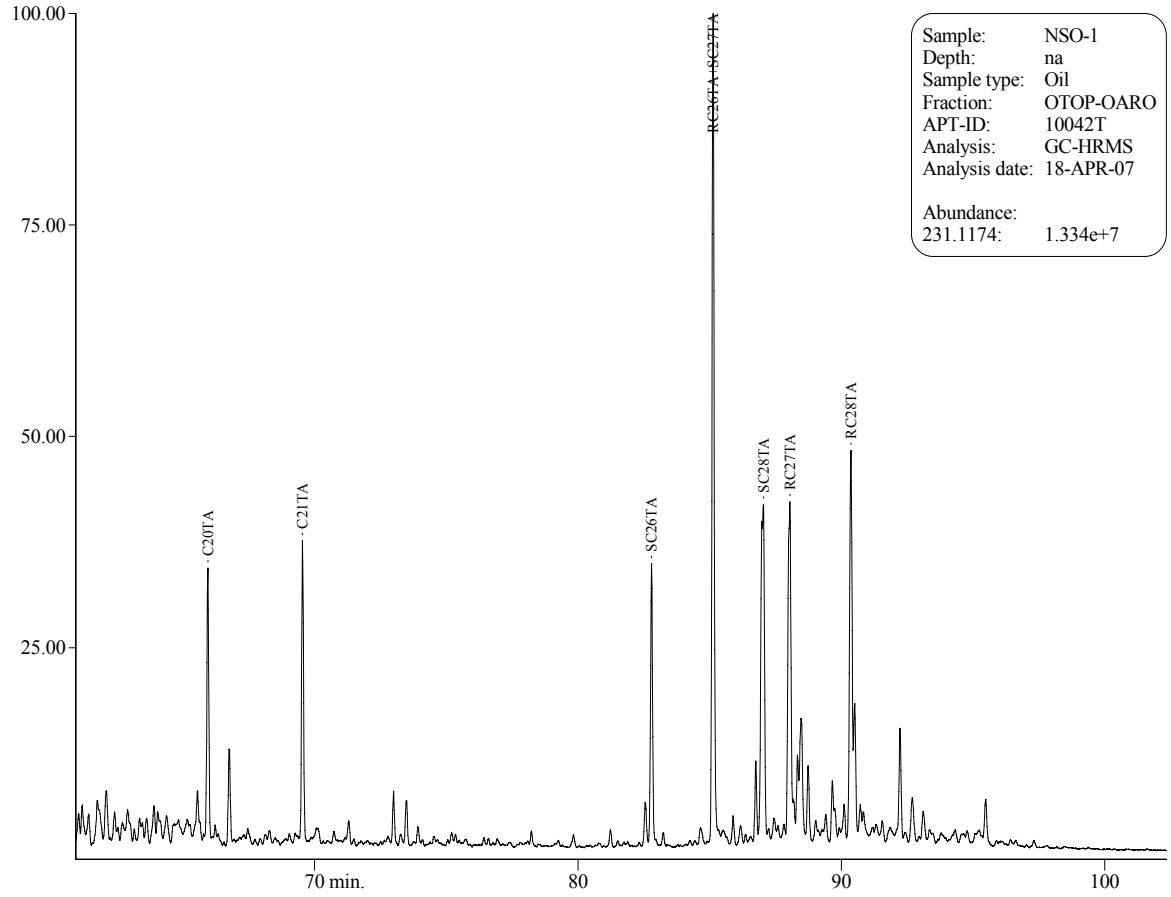
H6221, 7122/7-3, 1812 m, MDT 3 ARO GCMS Triaromatic steroid hydrocarbons (m/z 231)



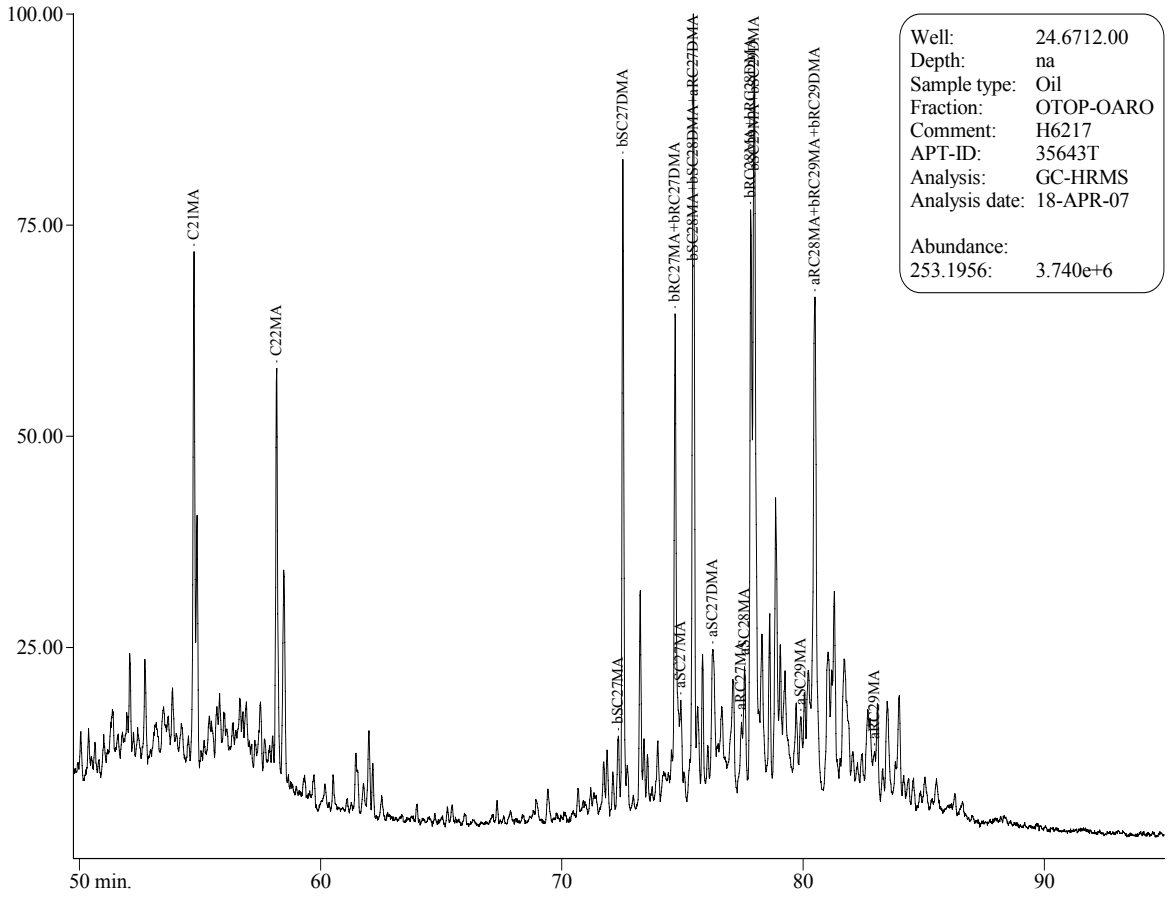
H6222, 7128/4-1, 1577 - 1586 m, DST 2, ARO GCMS Triaromatic steroid hydrocarbons (m/z 231)



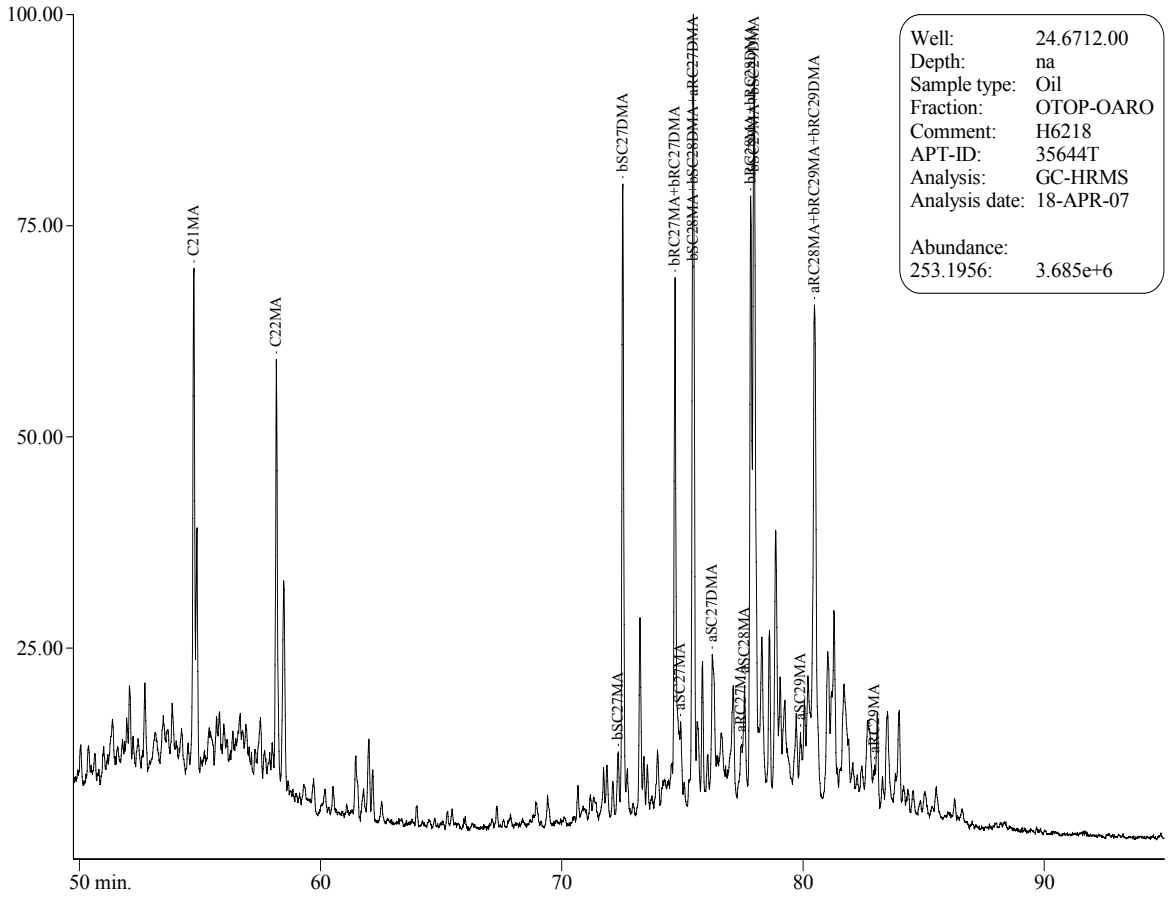
H6223, 7228/7-1 A, 2091.1 m, MDT, ARO GCMS — Triaromatic steroid hydrocarbons (m/z 231)



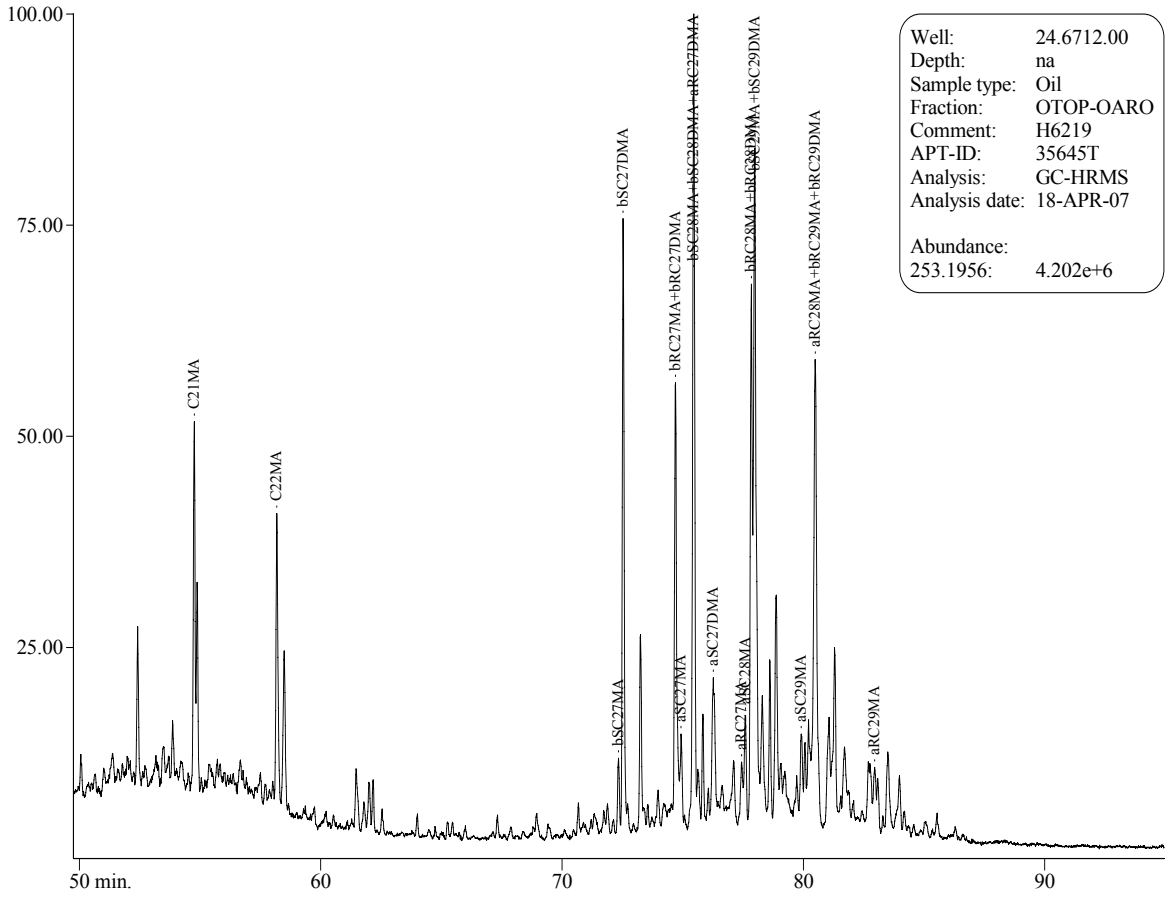
NSO-1, NGS reference oil, ARO GCMS — Triaromatic steroid hydrocarbons (m/z 231)



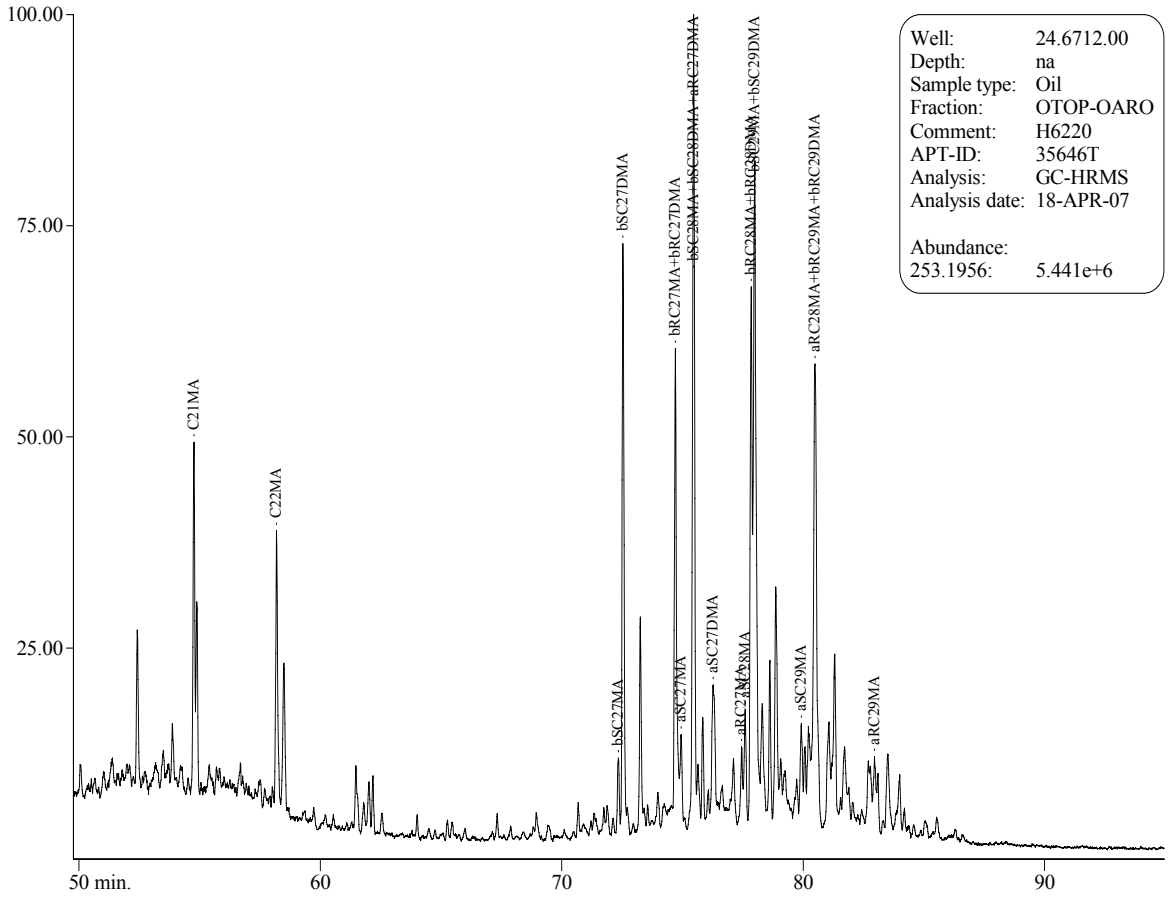
H6217, 7120/6-1, 2432.05 - 2436.05 m, DST 2, ARO GCMS Monoaromatic steroid hydrocarbons (m/z 253)



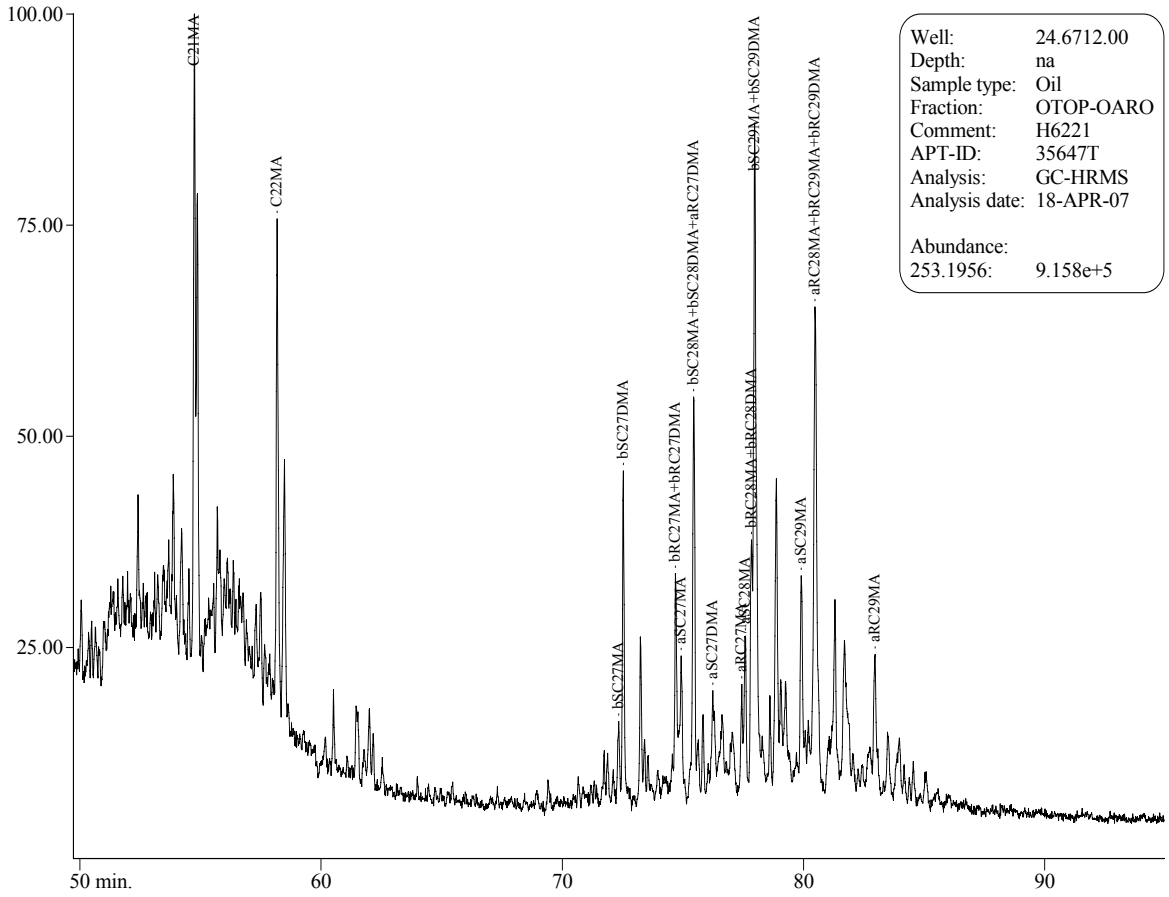
H6218, 7121/5-1, 2436 - 2439 m, DST 1, ARO GCMS Monoaromatic steroid hydrocarbons (m/z 253)



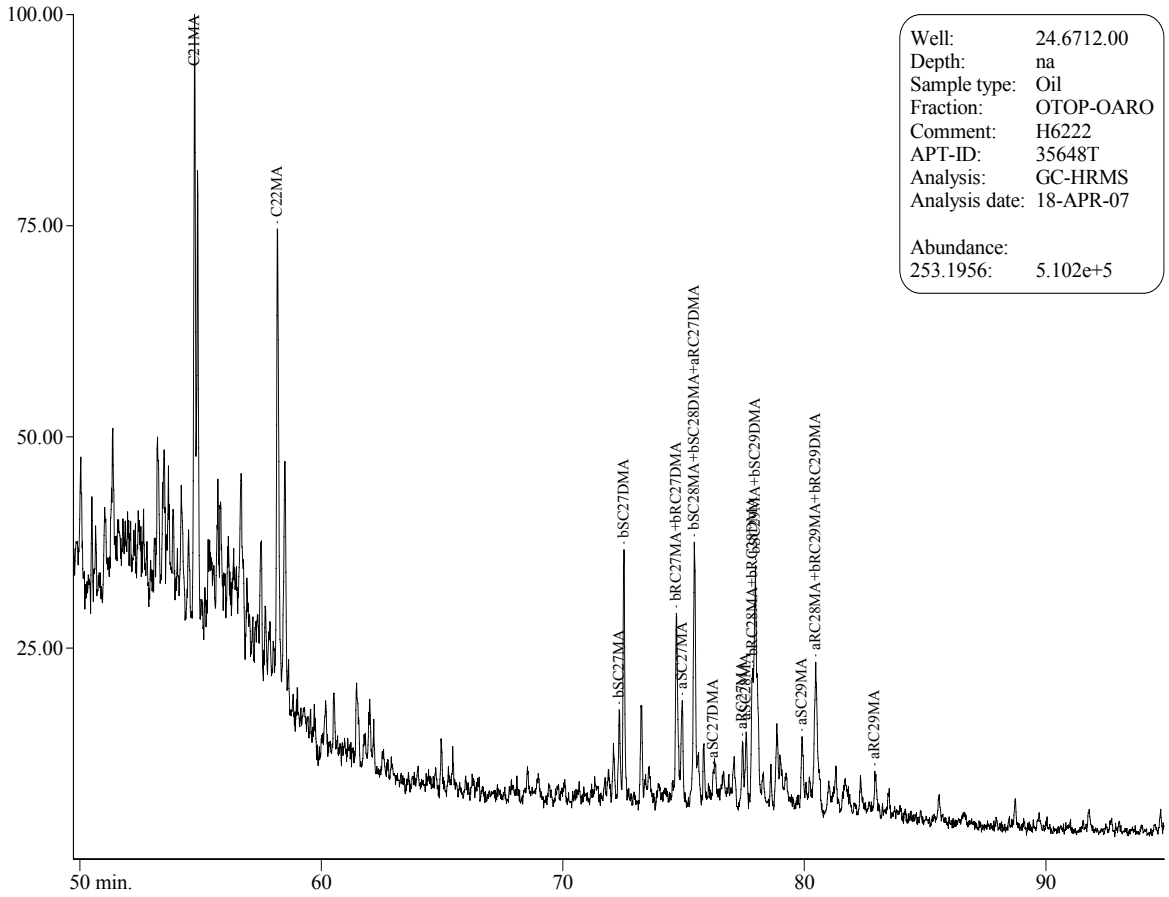
H6219, 7122/7-1, 1114 m, MDT 1, ARO GCMS Monoaromatic steroid hydrocarbons (m/z 253)



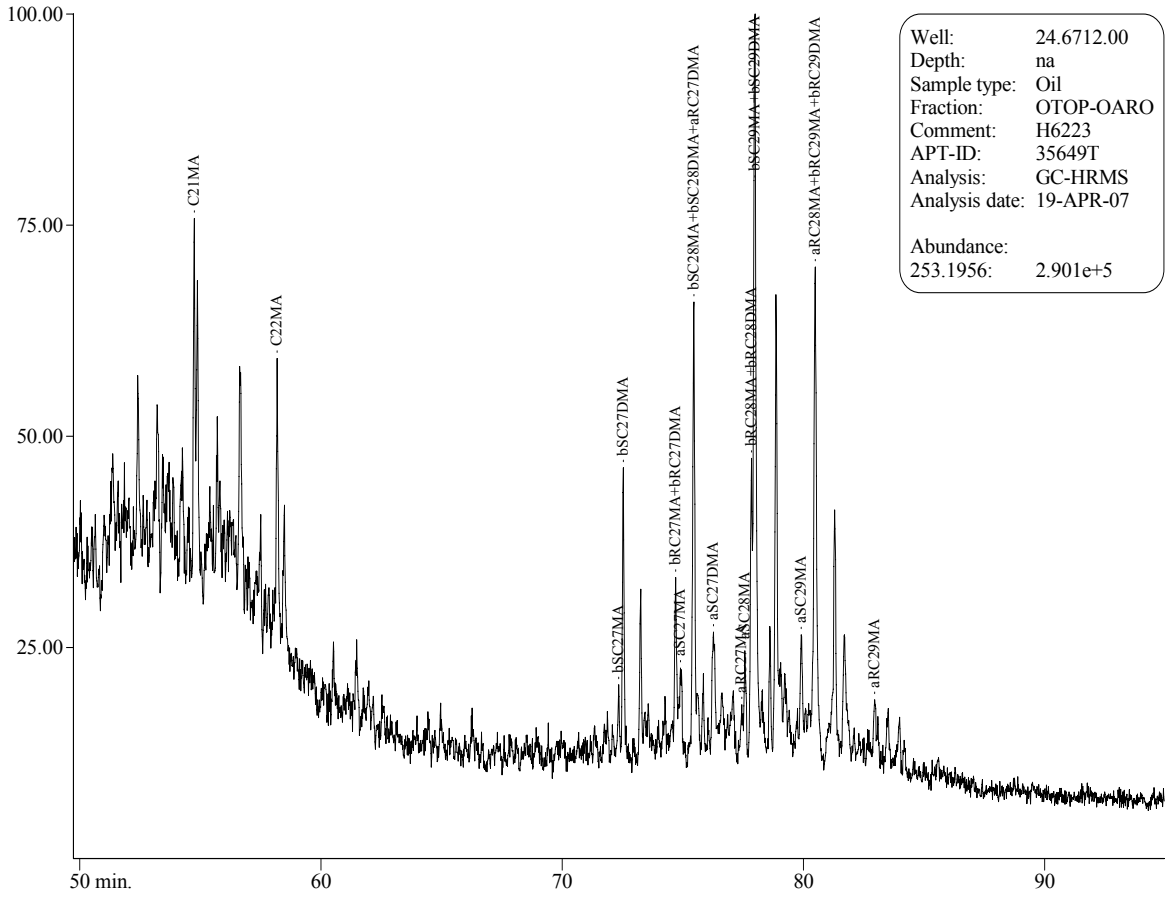
H6220, 7122/7-3, 1195 m, MDT 16, ARO GCMS Monoaromatic steroid hydrocarbons (m/z 253)



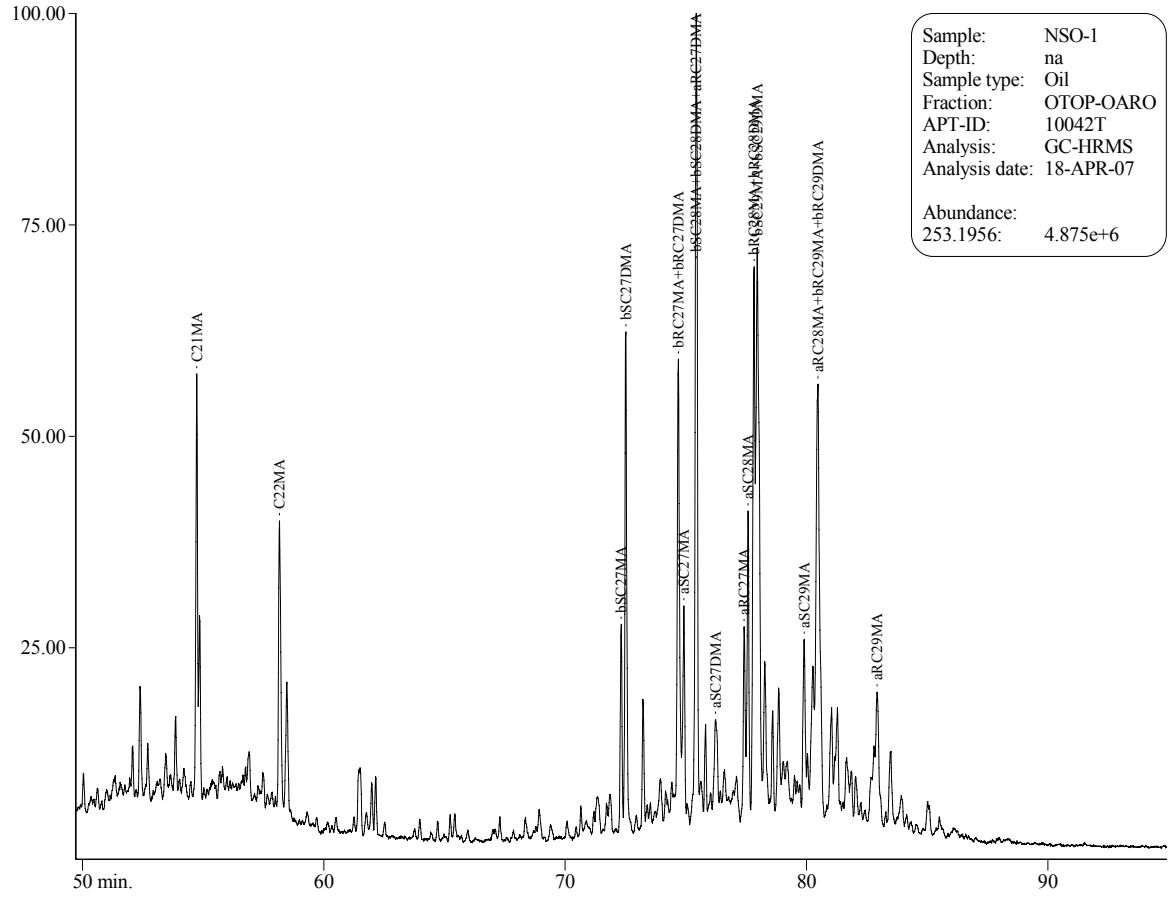
H6221, 7122/7-3, 1812 m, MDT 3 ARO GCMS Monoaromatic steroid hydrocarbons (m/z 253)



H6222, 7128/4-1, 1577 - 1586 m, DST 2, ARO GCMS Monoaromatic steroid hydrocarbons (m/z 253)



H6223, 7228/7-1 A, 2091.1 m, MDT, ARO GCMS Monoaromatic steroid hydrocarbons (m/z 253)



NSO-1, NGS reference oil, ARO GCMS Monoaromatic steroid hydrocarbons (m/z 253)