

Table 4.7 MDT-GR Run 2A

Test #	Depth m MD RKB	Depth m TVD MSL	Formation pressure (bar)	Hydrost. pressure Before (bar)	Hydrost. pressure After (bar)	Mobilit y mD/CP	Temp. °C	Comments
1	3725.5	3687.6	477.68	515.36	515.31	76	128	Good test
2	3726.1	3688.2	477.75	515.55	515.45	29	128.7	Good test
3	3727.8	3689.9	477.92	515.88	513.63	27	-	Stabilized at 477.92 but then partially lost seal and restabilized at 478.79
4	3730.9	3693.0	478.48*	516.32	516.08	-	-	Low perm, supercharged
5	3732.0	3694.1	478.19*	516.43	516.28	0.8	130.4	Low perm, supercharged
6	3735.3	3697.4	480.36*	516.99	515.79	0.1	130.7	Low perm, supercharged
7	3748.8	3710.9	-	519.51	-	-	-	Lost seal
8	3761.3	3723.4	481.25	521.27	521.04	1.3	-	Poor test, 4.8 cc
9	3793.2	3755.0	-	524.66	524.49	-	-	Tight test
10	3798.6	3760.4	522.43*	525.45	525.20	0.1	-	Tight test, 2.8 cc
11	3821.5	3783.3	484.89	529.06	528.82	4.5	135.0	Good test
12	3829.5	3791.3	485.63	530.08	529.87	30.1	135.3	Good test
13	3831.2	3793.0	485.27	530.20	530.00	19.6	135.8	Good test
14	3848.0	3809.7	-	533.33	532.23	3.2	136.6	Tight test, 3.2 cc
15	3851.3	3813.0	-	533.20	533.03	-	136.0	Tight test, 3.1 cc
16	3885.5	3847.1	-	538.06	537.75	-	137.0	Tight test, 3.9 cc
17	3891.3	3852.9	-	538.57	538.37	-	137.6	Tight tes, 3.2 cc
18	3931.6	3893.1	503.09*	543.57	543.33	-	-	Supercharged, 3.3 cc
19	3949.9	3911.4	493.41	546.77	545.98	30	139.1	Good test
20	3953.4	3914.8	-	546.60	-	-	139.6	Tight test, 3.5 cc
21	3965.6	3926.9	494.81	548.36	548.18	400	139.7	Good test
22	3973.7	3935	-	549.45	549.27	-	140.1	Tight test
23	3978.5	3939.8	496.06	550.10	549.9	15.2	140.2	Good test
24	4032.2	3993.3	-	557.88	557.72	-	140.7	Tight test, 3.1 cc
25	4045.6	4006.7	-	559.63	-	-	141.1	Tool failed while setting

Table 4.8 MDT-GR Run 2B

Test #	Depth m MD RKB	Depth m TVD MSL	Formation pressure (bar)	Hydrost. pressure Before (bar)	Hydrost. pressure After (bar)	Mobility mD/CP	Temp. °C	Comments
1	3726.6	3688.7	477.806	515.83	-	-	-	Lost communication with tool, 2.5 cc

Table 4.9 MDT-GR Run 2C

Test #	Depth m MD RKB	Depth m TVD MSL	Formation pressure (bar)	Hydrost. pressure Before (bar)	Hydrost. pressure After (bar)	Mobility mD/CP	Temp. °C	Comments
1	3725.5	3687.6	-	515.11	-	-	132.2	No seal obtained
2	3728.0	3692.0	477.90	515.67	515.49	2.9	132.3	Leaking
3	3726.0	3688.1	477.72	515.24	515.25	9.2	132.4	Pretest before sample-1gal + 3 x 450 cc water
4	3726.0	3688.1	477.71	-	516.23	298	133.8	Pretest after sample
5	3829.8	3791.6	485.76	529.52	530.19	53.9	137.6	Pretest before sample – 1 x 450 cc
6	3949.9	3911.4	493.551	546.53	546.54	191.1	140.8	Pretest before sample – 1gal + 2 x 450 cc

4.9 Reservoir fluid sampling

Table 4.10 Samples collected

Sample depth (m MD)	Run No.	Chamber (volume)	Drawdown (bar)	Formation Pressure (bar)	Pump Volume (liters)	Mobility (mD/CP)
3725.5	2C	1 gal	9-12	477.71	119	9.2
3725.5	2C	450 cc	9-12	477.71	132	9.2
3725.5	2C	450 cc	9-12	477.71	137	9.2
3725.5	2C	450 cc	9-12	477.71	140	9.2
3829.8	2C	1 gal	1-2	485.76	70	53.9
3829.8	2C	450 cc	37	485.76	76	53.9
3949.9	2C	1 gal	9	493.55	73	191.1
3949.9	2C	450 cc	8	493.55	86	191.1
3949.9	2C	450 cc	9.5	493.55	94	191.1

5.10.6 Drilling fluids

Table 5.4 Summary of Drilling fluids program

Well: 6507/3-4																				DRILLING FLUIDS PROGRAMME																			
Field: PL159, Alve																				Rig: West Navigator																			
HOLE		CASING		MUD TYPE	MW [SG]	LGS [KG/m ³]	10 sec. [Pa]	10 min. [Pa]	Fann 100 rpm	Fann 3 rpm	O / W ratio	PV [mPa]	API FL [ml]	HTHP FL [ml]	MBT [KG/m ³]	pH	Kcl [KG/m ³]	Glyc. [%]	ES	Funnel Visc. [%]	Usage Volume [m ³]																		
SIZE	TVD MD	SIZE	TVD MD																																				
36"	470 470	30"	468 468	Seawater/ Bentonite	1.03 - 1.35																> 150	147																	
<p>Made up 160 m³ Bentonite HiVis mud and 75 m³ 1.35sg displacement mud. The displacement mud was made with 20 kg/m³ Bentonite and 3 kg/m³ CMC, and gave an API fluid loss of 9 ml.</p>																																							
26"	1250 1250	20"	1241 1241	Seawater/ Bentonite	1.03 - 1.35																> 150	1289 (includes 9 7/8" pithole)																	
<p>Cut 1.6sg mud with seawater and CMC to make up displacement mud with fluid loss of 8 ml and mud weight of 1.35sg. Pumped 375 m³ 1.35sg mud. Converted 40 m³ displacement mud to HiVis and used it for sweeps when drilling out cement. Spotted 5 m³ HiVis on TD before setting the squeeze plug. Had to make additional HiVis for use when drilling out cement.</p>																																							
17"	2310 2310	13 3/8"	2300 2300	KCl/ Polymer/ Glycol	1.42 - 1.54	63 - 118	4.5 - 6	9 - 13	35 - 37	9 - 11	na	20 - 28	2.6 - 3	na	21 - 45	8 - 8.5	122 - 140	3.5 - 4	na	60 - 80	387																		
<p>The well was displaced to 1.42sg Glydril, and a FIT was performed. During drilling the properties were mainly maintained by addition of premix. The mud weight was increased in steps, starting at 1625m where it was increased to 1.48sg. At 1720m it was increased further to 1.51sg and at 1800m to 1.54sg, where it was kept the rest of the section. Built a 22 m³ LCM pill @ 1704m due to down hole losses. The losses stopped, and the pill was later screened over the shakers.</p>																																							
12 1/4"	3684 3686	9 5/8"	3675 3677	Paratherm	1.5	86 - 99	5 - 7	6 - 9	22 - 27	8 - 10	68/32 - 72/28	26 - 31	na	2.4 - 3	na	na	na	na	580 - 761	na	158																		
<p>360 m³ new Paratherm OBM at 1,50sg was received from shore. After the displacement new premixes were made with slightly higher O/W ratio than programmed, as the O/W ratio decreased during the displacement. All new premix was sheared with the rig pump. While drilling, the 3-rpm rheology was maintained at 9 by adding VG Supreme directly to active. As the stability picked up, the fluid loss stayed below 3 ml without problem. The hole cleaning was good, and the mud weight was stable after trips and running liner.</p>																																							
8 1/2"	4089 4092			Paratherm	1.38 - 1.4	36 - 69	6 - 7	7 - 8	20 - 22	7 - 8	71/29 - 72/28	23 - 24	na	2.3 - 2.8	na	na	na	na	567 - 659	na	100																		
<p>100 m³ of un-weighted premix was made up prior to start of this section, and used to cut the weight to 1.38sg. The influx of water from liner cement job and drilling rat hole decreased the oil water ratio from 72/28 to 69/19. This necessitated a higher oil water ratio in the dilution volume than normal (90/10). As a consequence extra sheering on surface was necessary as sheering through the bit was inadequate.</p>																																							

Petroleum Geochemistry Report - Well NOCS 6507/3-4



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1 Introduction

The well 6507/4-3 was drilled as an appraisal well on the Alve Discovery to a TD of 4092 m (RKB), into the Lower Jurassic Åre Fm. The well was completed on the 30th April 2004, and P&A as a gas/condensate discovery (NPD Fact pages).

This geochemical study of well 6507/3-4 was commissioned by May Ritt Pedersen/Ann Elen Gilje, Statoil, Stavanger. Thirty-seven cuttings, 18 core-chip, 3 mud and one fluid sample (mud filtrate), covering the depth 1280 to 4074m, were received by APT for analysis according to the program requested by Statoil. Table 1-1 below shows the types and numbers of analyses performed. The program includes analysis of both potential source rocks and reservoir sequences as well as establishing a maturity profile throughout the well. The stratigraphy applied in the report was supplied by Statoil. Mud- additive apparently affecting the geochemical results has been used when drilling of the well, although all cutting samples were pre-extracted before analysis.

Table 1-1: Number of analyses performed

Analysis	Cuttings	Core	Fluid	Mud	Total
Lithology description	37	18			55
TOC/Rock-Eval	46	18			64
Thermal extraction GC	4	7		1	12
Pyrolysis GC	4				4
Vitrinite Reflectance	10	1			11
Iatroscan	3	7	1	3	14
Solvent Extraction	3	7		3	13
Asphaltene precipitation	3	7	1	3	14
MPLC Separation	3	7	1	3	14
Stable isotopes of fractions	3*4	7*5	1*4		51
GC of Whole Oil			1		1
GC of Saturated hydrocarbons	3	7	1	3	14
GC of Aromatic hydrocarbons	3	7	1	3	14
GC-MS of Saturated hydrocarbons	3	7	1	3	14
GC-MS of Aromatic hydrocarbons	3	7	1	3	14

Table 2. Lithology Description

+	Sample type	Lower Depth (m)	APT ID	%	Lithology	Attributes
6507/3-4	COCH	3728.05	22021	100 %	SST	f-m, gry, v hd sem, Tr Mic
6507/3-4	COCH	3733	22022A	100%	SST	f-m-c, gry, v hd sem, Tr Mic
6507/3-4	COCH	3733	22022B	trace	CLYST	tr.
6507/3-4	COCH	3734.40	22023A	100%	SST	f-m-c, gry, v hd sem, Tr Mic
6507/3-4	COCH	3734.40	22023B	trace	CLYST	tr.
6507/3-4	COCH	3738	22024A	100%	SST	f-m, gry, v hd sem, Tr Mic
6507/3-4	COCH	3738	22024B	trace	CLYST	tr.
6507/3-4	COCH	3743.90	22025A	100%	SST	f-m, lt gry, v hd sem
6507/3-4	COCH	3743.90	22025B	trace	CLYST	tr.
6507/3-4	COCH	3748.95	22026A	100%	SST	f-m, lt gry, v hd sem
6507/3-4	COCH	3748.95	22026B	trace	CLYST	tr.
6507/3-4	COCH	3754.85	22027A	100%	SST	f-m, lt gry, v hd sem, bioturb
6507/3-4	COCH	3754.85	22027B	trace	COAL	frag
6507/3-4	COCH	3762	22028A	100%	SST	f-m, lt gry, v hd sem
6507/3-4	COCH	3762	22028B	trace	COAL	frag
6507/3-4	COCH	3765.35	22029A	95%	SST	f-m, lt gry, v hd sem
6507/3-4	COCH	3765.35	22029B	5%	CLYST	dk gry - dk brn, lam
6507/3-4	COCH	3769	22030A	90%	SST	f-m, lt gry, v hd sem
6507/3-4	COCH	3769	22030B	10%	CLYST	dk gry - brn, lam
6507/3-4	COCH	3773.90	22031A	50%	SST	f-m, lt gry, v hd sem
6507/3-4	COCH	3773.90	22031B	50%	CLYST	dk gry - brn, slty
6507/3-4	COCH	3780.30	22032	100 %	CLYST	dk gry - brn, slty
6507/3-4	COCH	3792	22033A	100%	SST	f-m, lt gry, v hd sem
6507/3-4	COCH	3792	22033B	trace	CLYST	dk gry, lam
6507/3-4	COCH	3799.20	22034A	100%	SST	f-m, lt gry, v hd sem
6507/3-4	COCH	3799.20	22034B	trace	CLYST	dk gry, lam
6507/3-4	COCH	3802	22035A	100%	SST	f-m, lt gry, v hd sem, bioturb
6507/3-4	COCH	3802	22035B	trace	CLYST	dk gry, lam
6507/3-4	COCH	3806.10	22036A	50%	SST	f-m, lt gry, v hd sem
6507/3-4	COCH	3806.10	22036B	50%	GRAVEL	lt gry
6507/3-4	COCH	3810.90	22037A	100%	SST	f-m, lt-m gry, v hd sem, Tr Mic
6507/3-4	COCH	3810.90	22037B	trace	CLYST	dk gry, lam
6507/3-4	COCH	3817.40	22038A	95%	SST	f-m, lt gry, v hd sem, Tr Mic
6507/3-4	COCH	3817.40	22038B	5%	CLYST	dk gry - brn, lam
6507/3-4	DC	1280	22056A	100%	CLYST	lt gry - dk gry, lt brn
6507/3-4	DC	1280	22056B	trace	SST	tr.
6507/3-4	DC	1480	22057A	100%	CLYST	lt gry - dk gry, lt brn - dk brn
6507/3-4	DC	1480	22057B	trace	SST	tr.
6507/3-4	DC	1680	22058	100 %	CLYST	lt gry - dk gry, lt brn - dk brn
6507/3-4	DC	1880	22059	100 %	CLYST	lt gry - dk gry, brn
6507/3-4	DC	2080	22060A	100%	CLYST	lt gry - dk gry, brn
6507/3-4	DC	2080	22060B	trace	PYR	tr.
6507/3-4	DC	2280	22061	100 %	CLYST	lt gry - dk gry, brn
6507/3-4	DC	2480	22062	100 %	CLYST	lt gry - dk gry, brn
6507/3-4	DC	2680	22063	100 %	CLYST	lt gry - dk gry, lt brn - dk brn
6507/3-4	DC	2859	22064	100 %	CLYST	gry - brn
6507/3-4	DC	2940	22065	100 %	CLYST	lt gry - dk gry, brn
6507/3-4	DC	3021	22066	100 %	CLYST	lt gry - dk gry, brn
6507/3-4	DC	3081	22067	100 %	CLYST	gry - brn

+	Sample type	Lower Depth (m)	APT ID	%	Lithology	Attributes
6507/3-4	DC	3150	22068	100 %	CLYST	lt gry - dk gry, brn
6507/3-4	DC	3174	22069	100 %	CLYST	lt gry - dk gry, brn
6507/3-4	DC	3183	22070	100 %	CLYST	dk gry - brn
6507/3-4	DC	3192	22071	100 %	CLYST	lt gry - dk gry, brn
6507/3-4	DC	3246	22072	100 %	CLYST	lt gry - dk gry, brn
6507/3-4	DC	3294	22073	100 %	CLYST	lt gry - dk gry, brn
6507/3-4	DC	3342	22074	100 %	CLYST	lt gry - dk gry, brn
6507/3-4	DC	3393	22075	100 %	CLYST	lt gry - dk gry, brn
6507/3-4	DC	3444	22076	100 %	CLYST	dk gry - brn
6507/3-4	DC	3492	22077	100 %	CLYST	dk gry - brn
6507/3-4	DC	3546	22078	100 %	CLYST	dk gry - brn
6507/3-4	DC	3591	22079	100 %	CLYST	lt gry - dk gry, brn
6507/3-4	DC	3642	22080	100 %	CLYST	dk gry - brn
6507/3-4	DC	3696	22081	100 %	CLYST	dk gry - brn
6507/3-4	DC	3831	22082A	95%	SST	
6507/3-4	DC	3831	22082B	5%	CLYST	lt gry - dk gry, lt brn - dk brn
6507/3-4	DC	3843	22083A	90%	SST	
6507/3-4	DC	3843	22083B	10%	CLYST	lt gry - dk gry, lt brn - dk brn
6507/3-4	DC	3888	22084A	95%	SST	
6507/3-4	DC	3888	22084B	5%	CLYST	lt gry - dk gry, lt brn - dk brn
6507/3-4	DC	3900	22085A	90%	SST	
6507/3-4	DC	3900	22085B	10%	CLYST	lt gry - dk gry, lt brn - dk brn
6507/3-4	DC	3915	22086A	90%	CLYST	lt gry - dk gry, lt brn - dk brn
6507/3-4	DC	3915	22086B	10%	SST	
6507/3-4	DC	3942	22087A	50%	CLYST	lt gry - dk gry, lt brn - dk brn
6507/3-4	DC	3942	22087B	50%	SST	
6507/3-4	DC	3981	22088A	90%	SST	
6507/3-4	DC	3981	22088B	10%	CLYST	lt gry - dk gry, lt brn - dk brn
6507/3-4	DC	4008	22089A	50%	CLYST	lt gry - dk gry, lt brn - dk brn
6507/3-4	DC	4008	22089B	50%	SST	
6507/3-4	DC	4053	22090A	90%	CLYST	lt gry - dk gry, lt brn - dk brn
6507/3-4	DC	4053	22090B	10%	SST	
6507/3-4	DC	4062	22091A	100%	CLYST	lt gry - dk gry, lt brn - dk brn
6507/3-4	DC	4062	22091B	trace	SST	tr.
6507/3-4	DC	4074	22092	100 %	CLYST	lt gry - dk gry, brn

Table 3. Vitrinite reflectance data

Well	Sample type	Lower Depth	APT ID	Sample prep.	%Lithology	%Ro	Std. dev.	No. of measurements	Quality rating	Overall quality	Comment
6507/3-4	DC	1280	22056	bulk	clyst/sst	0.17	0.01	2	-o---o	P	Immature
6507/3-4	DC	1680	22058	bulk	clyst/sst	0.19	0.03	13	-oo--o	P	Immature
6507/3-4	DC	2080	22060	bulk	clyst/sst	0.26	0.04	10	-oo--o	M/P	
6507/3-4	DC	2480	22062	bulk	clyst	0.26	0.02	7	-±o-oo	P	
6507/3-4	DC	2859	22064	bulk	clyst	0.47	0.05	21	ooo-oo	M	
6507/3-4	DC	3081	22067	bulk	clyst	0.53	0.04	20	ooo-oo	M	
6507/3-4	DC	3183	22070	bulk	clyst	0.46	0.07	28	ooo-o+	M	
6507/3-4	DC	3393	22075	bulk	clyst	0.54	0.04	3	-±o--+	P	See data sheet
6507/3-4	DC	3591	22079	bulk	clyst	0.63	0.06	20	ooo--o	M	
6507/3-4	COCH	3780.3	22032	bulk	clyst	0.72	0.05	23	ooo-o+	M	
6507/3-4	DC	4074	22092	bulk	clyst	0.72	0.05	23	oooooo	G	

Table 4. GC of Whole Oil (parameters)

Well	Sample type	Lower Depth	APT ID	A	B	X	W	C	I	F	H	U	R	S
6507/3-4	Oil	3726	22055											

- A: Benz/n-C₆
- B: Tol/n-C₇
- X: m+p-Xyl/n-C₈
- W: Benz*10/CyC₆
- C: (n-C₆+n-C₇)/(CyC₆+MCyC₆)
- I: (2-MC₆+3-MC₆)/(c1,3-DMCyC₅+t1,3-DMCyC₅+t1,2-DMCyC₅)
- F: n-C₇/MCyC₆
- H: n-C₇*100/(CyC₆+2-MC₆+3-MC₆+c1,3-DMCyC₅+t1,3-DMCyC₅+t1,2-DMCyC₅+n-C₇+MCyC₆)
- U: CyC₆/MCyC₅
- R: n-C₇/2-MC₆
- S: n-C₆/2,2-DMC₄

Table 5. GC of saturated compounds (parameters)

Well	Sample type	Lower Depth	APT ID	CPI 1	Pr/n-C17	Ph/n-C18	(Pr/n-C17)/ (Ph/n-C18)	Pr/Ph	n-C17/ (n-C17C27)
6507/3-4	COCH	3728.05	22021	1.10	0.29	0.99	0.29	0.80	0.91
6507/3-4	COCH	3734.40	22023	1.10	0.27	0.30	0.92	1.80	0.67
6507/3-4	COCH	3743.90	22025	1.10	0.56	0.81	0.69	0.99	0.75
6507/3-4	COCH	3754.85	22027	1.08	0.25	0.32	0.80	1.91	0.80
6507/3-4	COCH	3769	22030	1.14	0.45	1.51	0.30	0.70	0.97
6507/3-4	COCH	3792	22033	1.07	0.58	1.03	0.56	0.83	0.76
6507/3-4	COCH	3810.90	22037	1.11	0.48	0.86	0.56	0.94	0.82
6507/3-4	Oil	3726	22055	1.04	0.12	0.23	0.49	2.45	0.92
6507/3-4	DC	3183	22070	0.96	0.10	0.22	0.46	3.22	1.00
6507/3-4	DC	3342	22074	0.84	0.08	0.20	0.41	3.06	1.00
6507/3-4	DC	4074	22092	1.03	0.08	0.15	0.52	3.75	1.00
6507/3-4	Mud	2500	22093		0.06	0.17	0.38	2.66	1.00
6507/3-4	Mud	3702	22094		0.08	0.17	0.47	3.72	1.00
6507/3-4	Mud	4060	22095		0.07	0.23	0.33	2.74	1.00

Table 6. GCMS SIR of saturated compounds (parameters)

Well	Sample type	Lower Depth	APT ID	%23:3	%28ab	%30D	%27Ts	%22S	%29Ts	%20S	%6bb	%27dbS	%C27	%C29	28/29	24:4/23:3
6507/3-4	COCH	3728.05	22021	22.91	6.19	5.75	42.50	57.56	8.61	51.31	52.96	54.15	31.97	40.02	0.72	0.42
6507/3-4	COCH	3734.40	22023	6.32	9.95	11.01	50.11	59.54	12.47	57.20	60.38	57.38	30.15	42.99	0.63	1.30
6507/3-4	COCH	3743.90	22025	32.23	12.55	12.45	61.99	58.66	16.74	58.37	61.46	62.53	34.26	39.27	0.66	0.53
6507/3-4	COCH	3754.85	22027	7.00	8.73	8.85	45.02	58.85	10.10	54.60	57.94	54.96	30.20	41.95	0.68	1.11
6507/3-4	COCH	3769	22030	45.31	4.98	3.13	45.44	58.05	9.60	20.37	44.19	45.26	33.82	35.84	0.60	0.27
6507/3-4	COCH	3792	22033	27.48	10.29	11.49	61.48	59.16	15.16	38.91	52.88	55.51	32.64	40.78	0.63	0.46
6507/3-4	COCH	3810.90	22037	20.09	8.75	10.55	59.74	58.30	11.97	56.27	59.18	61.12	31.13	41.69	0.67	0.52
6507/3-4	Oil	3726	22055	5.53	4.73	5.50	30.11	56.74	6.43	53.00	51.04	47.38	28.94	41.37	0.76	1.15
6507/3-4	DC	3183	22070	4.31	21.10	1.83	3.84	58.24	2.42	39.47	43.19	35.33	19.22	47.41	0.58	0.88
6507/3-4	DC	3342	22074	3.22	0.56	1.92	7.59	58.51	3.84	40.35	27.03	13.64	15.05	44.88	0.79	1.17
6507/3-4	DC	4074	22092	5.34	0.52	0.88	4.41	57.86	1.36	38.78	23.50	8.03	12.99	40.86	1.01	0.84
6507/3-4	Mud	2500	22093	6.36	0.73		3.75	53.45	1.45	36.21	26.10	7.39	15.09	37.99	0.98	0.60
6507/3-4	Mud	3702	22094	5.85	0.67	0.38	4.09	58.99	1.54	38.23	23.58	6.26	15.25	38.14	1.05	0.69
6507/3-4	Mud	4060	22095	5.52	0.60	0.34	4.58	56.83	1.94	38.48	27.08	8.94	14.70	38.77	1.04	0.74

- %23:3** $23:3/(23:3+30\alpha\beta)*100$
- %28αβ** $28\alpha\beta/(28\alpha\beta+30\alpha\beta)*100$
- %30D** $30D/(30D+30\alpha\beta)*100$
- %27Ts** $27Ts/(27Ts+27Im)*100$
- %22S** $(32\alpha\beta S)/(32\alpha\beta S+32\alpha\beta R)*100$
- %29Ts** $(29Ts/29Ts+30\alpha\beta)*100$
- %20S** $(29\alpha\alpha S/29\alpha\alpha S+29\alpha\alpha R)*100$
- %ββ** $(29\beta\beta(R+S)/(29\beta\beta(R+S)+29\alpha\alpha(R+S))*100$
- %27dβS** $27d\beta S/(27d\beta S+27\alpha\alpha(R+S))*100$
- %C27** $(27\beta\beta(R+S)/(27\beta\beta(R+S)+28\beta\beta(R+S)+29\beta\beta(R+S))*100$
- %C29** $(29\beta\beta(R+S)/(27\beta\beta(R+S)+28\beta\beta(R+S)+29\beta\beta(R+S))*100$
- 28/29** $(28\alpha\alpha(R+S)+28\beta\beta(R+S))/(29\alpha\alpha(R+S)+29\beta\beta(R+S))$
- 24:4/23:3** 24:4/23:3

Table 7. GCMS SIR of aromatic compounds (parameters)

Well	Sample type	Lower Depth	APT ID	AROM2	Crack1	Crack2	MSAro1	MSAro2	MSAro3	MSAro4	MSAro5	MSAro6	MSAro7	MSAro8	MSAro9
6507/3-4	COCH	3728.05	22021	0.65	0.71	0.55	0.40	4.90	0.46	1.26	6.00	2.05	0.09	4.96	0.64
6507/3-4	COCH	3734.40	22023	0.65	0.78	0.63	0.45	4.87	0.45	1.44	6.11	2.55	0.08	4.74	0.59
6507/3-4	COCH	3743.90	22025	0.63	0.80	0.66	0.47	4.96	0.45	1.57	6.46	2.16	0.09	5.71	0.56
6507/3-4	COCH	3754.85	22027	0.66	0.79	0.63	0.49	5.43	0.44	1.76	6.83	2.16	0.09	5.57	0.63
6507/3-4	COCH	3769	22030	0.57	0.47	0.28	0.11	6.78	0.45	1.90	6.46	1.25	0.06	5.71	0.60
6507/3-4	COCH	3792	22033	0.63	0.88	0.75	0.51	4.82	0.44	1.44	5.42	2.36	0.07	6.47	0.51
6507/3-4	COCH	3810.90	22037	0.62	0.90	0.77	0.58	5.54	0.44	1.50	5.66	2.21	0.06	6.74	0.54
6507/3-4	Oil	3726	22055	0.68	0.74	0.58	0.35	6.64	0.46	1.56	6.38	1.92	0.06	6.24	0.63
6507/3-4	Oil	3726	22055	0.68	0.71	0.55	0.36	4.86	0.46	1.70	7.41	1.68	0.11	6.41	0.66
6507/3-4	DC	3183	22070	0.67	0.33	0.14	0.17	1.01	0.35	1.26	3.88	0.47	0.23	1.01	0.56
6507/3-4	DC	3342	22074	0.85	0.48	0.26	0.24	2.32	0.42	1.33	4.81	0.43	0.04	0.59	0.76
6507/3-4	DC	4074	22092	0.77	0.48	0.30	0.17	4.49	0.50	1.66	6.47	0.85	0.05	23.47	0.80
6507/3-4	Mud	2500	22093	0.68	0.16	0.07	0.11	3.14	0.47	1.15	6.29	1.59	0.04	0.91	0.74
6507/3-4	Mud	3702	22094	0.66	0.27	0.12	0.14	4.84	0.48	1.11	5.20	1.11	0.03	2.51	0.75
6507/3-4	Mud	4060	22095	0.64	0.26	0.13	0.12	3.94	0.46	1.05	5.01	1.26	0.03	2.29	0.72

AROM2: $(C_{20}TA+C_{21}TA+SC_{26}TA+RC_{26}TA+SC_{27}TA+SC_{28}TA+RC_{27}TA+RC_{28}TA)/(C_{20}TA+C_{21}TA+SC_{26}TA+RC_{26}TA+SC_{27}TA+SC_{28}TA+RC_{27}TA+RC_{28}TA+C_{21}MA+C_{22}MA+\beta SC_{27}MA+\beta RC_{27}MA+\alpha SC_{27}MA+\beta SC_{28}MA+\beta SC_{28}DMA+\alpha RC_{27}DMA+\alpha SC_{27}DMA+\alpha RC_{27}MA+\alpha SC_{28}MA+\alpha SC_{29}MA+\alpha RC_{29}MA)$

Crack1: $(C_{20}TA)/(C_{20}TA+RC_{28}TA)$

Crack2: $(C_{20}TA+C_{21}TA)/(C_{20}TA+C_{21}TA+SC_{26}TA+RC_{26}TA+SC_{27}TA+SC_{28}TA+RC_{27}TA+RC_{28}TA)$

MSAro1: $(C_{21}MA+C_{22}MA)/(C_{21}MA+C_{22}MA+\beta SC_{27}MA+\beta RC_{27}MA+\beta RC_{27}DMA+\alpha SC_{27}MA+\beta SC_{28}MA+\beta SC_{28}DMA+\alpha RC_{27}DMA+\alpha SC_{27}DMA+\alpha RC_{27}MA+\alpha SC_{28}MA+\alpha SC_{29}MA+\alpha RC_{29}MA)$

MSAro2: 4-MDBT/1-MDBT

MSAro3: $(2-MP+3-MP)/(1-MP+2-MP+3-MP+9-MP)$

MSAro4: 2-MN/1-MN

MSAro5: $(2,6-DMN+2,7-DMN)/1,5-DMN$

MSAro6: 4-MDBT/DBT

MSAro7: DBT/P

MSAro8: 3-MP/Retene

MSAro9: $RC_{28}TA/(RC_{28}TA+\alpha RC_{28}MA+\beta RC_{29}MA+\beta RC_{29}DMA)$

Table 8. Isotopes of fractions, $\delta^{13}\text{C}$ (‰ PDB)

Well	Sample type	Lower Depth	APT ID	$\delta^{13}\text{C}$ - Oil/EOM	$\delta^{13}\text{C}$ -Sat	$\delta^{13}\text{C}$ -Aro	$\delta^{13}\text{C}$ -Pol	$\delta^{13}\text{C}$ -Asp
6507/3-4	COCH	3728.05	22021	-29.7	-29.6	-27.2	-28.6	-28.5
6507/3-4	COCH	3734.40	22023	-29.2	-29.4	-27.2	-28.2	-28.0
6507/3-4	COCH	3743.90	22025	-28.5	-28.5	-27.0	-27.8	-28.1
6507/3-4	COCH	3754.85	22027	-29.7	-30.1	-27.0	-28.5	-27.8
6507/3-4	COCH	3769	22030	-28.8	-28.7	-27.1	-28.1	-27.2
6507/3-4	COCH	3792	22033	-28.5	-28.7	-27.5	-27.0	-27.8
6507/3-4	COCH	3810.90	22037	-28.9	-28.7	-27.1	-28.1	-27.9
6507/3-4	Oil	3726	22055	-32.0	-29.9	-27.0	-31.2	*
6507/3-4	DC	3183	22070	-29.8	-30.6	*	-29.0	-26.4
6507/3-4	DC	3342	22074	-30.8	-30.7	*	-28.6	-26.6
6507/3-4	DC	4074	22092	-29.3	-30.5	*	-27.9	-27.8

*: Too small amount for isotopic measurements

Table 9. TOC and Rock-Eval data

Well	Sample type	Lower Depth	APT ID	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	Tmax (-C)	PP (mg/g)	PI (wt ratio)	HI (mg HC/ g TOC)	OI (mg CO2/ g TOC)	TOC (%)
6507/3-4	COCH	3728.05	22021	12.66	0.69	0.01	430	13.35	0.95	59	1	1.17
6507/3-4	COCH	3733	22022	8.32	0.63	0.39	293	8.95	0.93	76	48	0.82
6507/3-4	COCH	3734.40	22023	6.57	1.16	0.01	409	7.72	0.85	152	1	0.76
6507/3-4	COCH	3738	22024	5.12	1.17	0.02	263	6.28	0.81	188	3	0.62
6507/3-4	COCH	3743.90	22025	11.12	1.48	0.21	263	12.60	0.88	125	18	1.18
6507/3-4	COCH	3748.95	22026	11.15	1.90	0.00	425	13.05	0.85	157		1.21
6507/3-4	COCH	3754.85	22027	6.80	1.74	0.00	429	8.54	0.80	167		1.04
6507/3-4	COCH	3762	22028	4.27	1.59	0.05	446	5.85	0.73	189	6	0.84
6507/3-4	COCH	3765.35	22029	2.99	0.59	0.00	451	3.57	0.84	99		0.59
6507/3-4	COCH	3769	22030	4.32	0.89	0.20	263	5.21	0.83	148	33	0.60
6507/3-4	COCH	3773.90	22031	0.45	1.23	0.08	450	1.68	0.27	170	11	0.72
6507/3-4	COCH	3780.30	22032	0.44	2.70	0.03	449	3.15	0.14	150	2	1.80
6507/3-4	COCH	3792	22033	10.53	2.74	0.07	432	13.26	0.79	210	5	1.30
6507/3-4	COCH	3799.20	22034	5.37	1.36	0.12	316	6.74	0.80	201	18	0.68
6507/3-4	COCH	3802	22035	0.43	0.43	0.76	447	0.86	0.50	149	262	0.29
6507/3-4	COCH	3806.10	22036	0.86	0.31	1.61	264	1.17	0.74	128	671	0.24
6507/3-4	COCH	3810.90	22037	4.75	1.33	0.01	324	6.07	0.78	195	1	0.68
6507/3-4	COCH	3817.40	22038	4.80	1.36	0.34	300	6.16	0.78	189	47	0.72
6507/3-4	DC	1280	22056	0.14	1.11	2.78	450	1.25	0.11	222	556	0.50
6507/3-4	DC	1480	22057	0.32	2.16	3.72	386	2.48	0.13	238	409	0.91
6507/3-4	DC	1680	22058	0.37	7.21	4.48	409	7.59	0.05	210	130	3.44
6507/3-4	DC	1880	22059	0.33	2.93	3.58	360	3.27	0.10	296	362	0.99
6507/3-4	DC	2080	22060	0.29	2.58	1.96	349	2.86	0.10	314	239	0.82
6507/3-4	DC	2280	22061	0.21	2.45	1.44	352	2.66	0.08	255	150	0.96
6507/3-4	DC	2480	22062	0.19	2.00	1.04	434	2.18	0.09	249	130	0.80
6507/3-4	DC	2680	22063	0.33	1.72	0.56	432	2.05	0.16	162	53	1.06
6507/3-4	DC	2859	22064	0.10	2.35	1.28	434	2.44	0.04	185	101	1.27
6507/3-4	DC	2940	22065	0.09	2.24	0.69	437	2.33	0.04	207	64	1.08
6507/3-4	DC	3021	22066	0.04	0.97	0.83	395	1.01	0.04	137	117	0.71
6507/3-4	DC	3081	22067	0.11	1.45	1.24	432	1.56	0.07	118	101	1.23

Well	Sample type	Lower Depth	APT ID	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	Tmax (-C)	PP (mg/g)	PI (wt ratio)	HI (mg HC/ g TOC)	OI (mg CO2/ g TOC)	TOC (%)
6507/3-4	DC	3150	22068	0.10	0.97	1.08	403	1.07	0.09	205	230	0.47
6507/3-4	DC	3174	22069	0.10	24.46	0.48	427	24.56	0.00	395	8	6.19
6507/3-4	DC	3183	22070	0.16	24.51	0.42	428	24.67	0.01	288	5	8.52
6507/3-4	DC	3192	22071	0.68	5.59	1.75	437	6.27	0.11	114	36	4.89
6507/3-4	DC	3246	22072	0.45	1.90	0.81	437	2.34	0.19	174	74	1.09
6507/3-4	DC	3294	22073	0.75	4.11	1.30	439	4.86	0.15	206	65	2.00
6507/3-4	DC	3342	22074	0.10	6.72	0.81	438	6.81	0.01	265	32	2.53
6507/3-4	DC	3393	22075	0.06	4.76	1.05	440	4.83	0.01	300	66	1.59
6507/3-4	DC	3444	22076	0.11	2.69	0.72	440	2.80	0.04	249	67	1.08
6507/3-4	DC	3492	22077	0.08	2.40	0.88	441	2.49	0.03	209	77	1.15
6507/3-4	DC	3546	22078	0.06	3.06	0.78	442	3.12	0.02	159	40	1.93
6507/3-4	DC	3591	22079	0.08	2.96	1.35	442	3.04	0.03	153	70	1.94
6507/3-4	DC	3642	22080	0.13	3.14	1.13	444	3.26	0.04	113	41	2.77
6507/3-4	DC	3696	22081	0.06	2.38	0.73	446	2.44	0.03	123	38	1.93
6507/3-4	DC	3831	22082	0.05	0.69	1.09	430	0.74	0.07	429	681	0.16
6507/3-4	DC	3831	22082	36.18	4.23	0.92	429	40.41	0.90	117	25	3.61
6507/3-4	DC	3843	22083	0.23	1.33	1.13	438	1.56	0.15	493	419	0.27
6507/3-4	DC	3843	22083	37.54	5.26	0.85	433	42.80	0.88	139	23	3.77
6507/3-4	DC	3888	22084	0.04	0.63	0.35	437	0.67	0.06	369	206	0.17
6507/3-4	DC	3888	22084	38.60	4.47	0.88	435	43.06	0.90	117	23	3.82
6507/3-4	DC	3900	22085	0.09	0.83	0.42	445	0.92	0.10	286	145	0.29
6507/3-4	DC	3900	22085	34.82	4.61	0.55	435	39.43	0.88	129	15	3.56
6507/3-4	DC	3915	22086	0.03	1.12	0.36	445	1.15	0.03	254	82	0.44
6507/3-4	DC	3915	22086	32.94	5.63	0.66	433	38.57	0.85	152	18	3.71
6507/3-4	DC	3942	22087	0.06	0.84	0.38	447	0.90	0.06	248	112	0.34
6507/3-4	DC	3942	22087	33.38	6.20	0.53	437	39.57	0.84	161	14	3.85
6507/3-4	DC	3981	22088	0.03	0.72	1.65	432	0.74	0.04	239	550	0.30
6507/3-4	DC	3981	22088	31.64	4.09	1.21	421	35.73	0.89	125	37	3.28
6507/3-4	DC	4008	22089	0.06	1.44	0.45	446	1.50	0.04	215	67	0.67
6507/3-4	DC	4008	22089	29.65	6.00	0.53	434	35.64	0.83	166	15	3.61
6507/3-4	DC	4053	22090	0.09	1.99	0.30	446	2.08	0.04	229	34	0.87



Well	Sample type	Lower Depth	APT ID	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	Tmax (-C)	PP (mg/g)	PI (wt ratio)	HI (mg HC/ g TOC)	OI (mg CO2/ g TOC)	TOC (%)
<i>6507/3-4</i>	<i>DC</i>	<i>4053</i>	<i>22090</i>	<i>23.01</i>	<i>6.80</i>	<i>0.33</i>	<i>433</i>	<i>29.81</i>	<i>0.77</i>	<i>204</i>	<i>10</i>	<i>3.33</i>
<i>6507/3-4</i>	<i>DC</i>	<i>4062</i>	<i>22091</i>	<i>0.04</i>	<i>1.91</i>	<i>0.44</i>	<i>449</i>	<i>1.95</i>	<i>0.02</i>	<i>163</i>	<i>38</i>	<i>1.17</i>
<i>6507/3-4</i>	<i>DC</i>	<i>4074</i>	<i>22092</i>	<i>0.46</i>	<i>8.37</i>	<i>0.80</i>	<i>449</i>	<i>8.84</i>	<i>0.05</i>	<i>201</i>	<i>19</i>	<i>4.16</i>

Data in Italics made on un-extracted samples

Table 10. Thermal extraction GC (peak area)

Well	Sample type	Lower Depth	APT ID	n-C10	n-C11	n-C12	n-C13	n-C14	n-C15	n-C16	n-C17	Pr	n-C18	Ph	n-C19	n-C20	n-C21
6507/3-4	COCH	3728.05	22021	6.22e3	6.51e3	2.06e4	4.23e6	1.06e7	1.34e7	5.82e6	1.11e6	2.74e5	3.36e5	3.50e5	2.24e5	1.80e5	1.29e5
6507/3-4	COCH	3734.40	22023	0.00e0	3.99e4	6.38e5	4.89e6	4.18e6	4.85e6	2.69e6	7.08e5	1.78e5	3.62e5	1.25e5	3.89e5	4.35e5	4.61e5
6507/3-4	COCH	3743.90	22025	0.00e0	1.27e5	1.74e6	8.91e6	5.09e6	2.85e6	1.56e6	9.78e5	5.82e5	7.52e5	6.82e5	6.11e5	6.28e5	5.41e5
6507/3-4	COCH	3754.85	22027	0.00e0	9.10e4	1.50e6	1.09e7	8.91e6	7.80e6	3.72e6	8.48e5	2.46e5	4.24e5	1.57e5	4.34e5	4.48e5	4.10e5
6507/3-4	COCH	3769	22030	0.00e0	3.44e4	5.05e5	3.72e6	3.14e6	4.00e6	1.96e6	6.31e5	2.86e5	2.55e5	3.99e5	1.30e5	9.74e4	0.00e0
6507/3-4	COCH	3792	22033	7.76e4	1.62e5	2.84e6	1.63e7	1.00e7	6.54e6	3.31e6	1.27e6	7.15e5	7.06e5	8.27e5	4.61e5	4.09e5	3.10e5
6507/3-4	COCH	3810.90	22037	0.00e0	1.23e4	2.12e5	1.74e6	1.61e6	2.04e6	1.04e6	2.84e5	1.39e5	2.35e5	1.24e5	2.44e5	2.57e5	2.53e5
6507/3-4	DC	3831	22082	2.30e5	1.42e7	6.30e7	1.78e8	7.63e7	5.19e7	1.70e7	2.27e6	1.32e5	3.06e5	2.33e4	1.59e5	1.04e5	5.93e4
6507/3-4	DC	3900	22085	4.71e5	1.93e7	6.93e7	1.97e8	8.23e7	5.28e7	1.81e7	2.14e6	1.70e5	2.67e5	5.52e4	1.52e5	9.77e4	6.47e4
6507/3-4	DC	3981	22088	3.55e5	1.79e7	7.63e7	2.14e8	8.74e7	5.99e7	2.01e7	2.43e6	1.73e5	2.94e5	0.00e0	1.63e5	1.02e5	7.20e4
6507/3-4	DC	4053	22090	3.43e4	2.50e6	1.56e7	4.92e7	2.14e7	1.57e7	5.48e6	7.01e5	3.51e4	9.35e4	2.43e4	4.50e4	3.01e4	1.81e4
6507/3-4	Mud	3702	22094	1.72e6	3.05e7	8.86e7	1.83e8	7.73e7	5.03e7	1.62e7	1.97e6	0.00e0	2.44e5	0.00e0	1.36e5	8.75e4	4.93e4

Table 10. continued, Thermal extraction GC (peak area)

Well	Sample type	Lower Depth	APT ID	n-C22	n-C23	n-C24	n-C25	n-C26	n-C27	n-C28	n-C29	n-C30	n-C31	n-C32	n-C33	n-C34	n-C35
6507/3-4	COCH	3728.05	22021	1.11e5	8.66e4	7.04e4	4.60e4	1.68e4	2.62e3	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	COCH	3734.40	22023	4.74e5	4.63e5	4.30e5	3.76e5	2.92e5	2.22e5	1.28e5	1.09e5	5.48e4	3.49e4	1.94e4	0.00e0	0.00e0	0.00e0
6507/3-4	COCH	3743.90	22025	5.20e5	4.82e5	4.34e5	3.70e5	2.91e5	2.34e5	1.46e5	1.28e5	7.25e4	4.50e4	2.10e4	1.19e4	0.00e0	0.00e0
6507/3-4	COCH	3754.85	22027	3.76e5	3.37e5	2.99e5	2.46e5	1.73e5	1.29e5	6.95e4	6.00e4	3.53e4	2.07e4	1.14e4	0.00e0	0.00e0	0.00e0
6507/3-4	COCH	3769	22030	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	COCH	3792	22033	2.87e5	2.66e5	2.52e5	2.07e5	1.42e5	7.79e4	2.09e4	1.68e4	7.99e3	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	COCH	3810.90	22037	2.30e5	1.78e5	1.13e5	5.18e4	1.38e4	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	DC	3831	22082	2.84e4	1.08e4	2.39e3	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	DC	3900	22085	3.66e4	1.73e4	7.94e3	3.64e3	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	DC	3981	22088	3.96e4	1.73e4	6.73e3	3.40e3	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	DC	4053	22090	9.98e3	4.72e3	1.90e3	1.10e3	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	Mud	3702	22094	1.97e4	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 11. Pyrolysis GC (peak area)

Well	Sample type	Lower Depth	APT ID	%C1(UCM)	%C2-C5 (UCM)	%C6-C14 (UCM)	%C15+ (UCM)	%C1 (X-UCM)	%C2-C5 (X-UCM)	%C6-C14 (X-UCM)	%C15+ (X-UCM)	C1	C2-C5	C6-C14	C15+	C6-C14 (UCM)	C15+ (UCM)
6507/3-4	DC	1680	22058	3.67	22.65	43.25	30.43	5.51	33.95	51.00	9.54	3.25e6	2.00e7	3.01e7	5.62e6	3.82e7	2.69e7
6507/3-4	DC	3174	22069	3.66	12.75	37.68	45.91	7.12	24.81	54.13	13.94	7.65e6	2.67e7	5.82e7	1.50e7	7.88e7	9.60e7
6507/3-4	DC	3393	22075	4.10	18.32	40.22	37.37	6.37	28.46	50.04	15.14	4.67e6	2.08e7	3.67e7	1.11e7	4.58e7	4.25e7
6507/3-4	DC	4074	22092	11.67	18.72	32.23	37.39	17.39	27.91	38.72	15.98	1.32e7	2.11e7	2.93e7	1.21e7	3.64e7	4.22e7

Table 11. continued, Pyrolysis GC (peak area)

Well	Sample type	Lower Depth	APT ID	n-Heptene	Tol	n-Octene	mp-Xyl
6507/3-4	DC	1680	22058	2.35e5	7.85e5	1.91e5	5.22e5
6507/3-4	DC	3174	22069	1.20e6	1.16e6	8.77e5	1.20e6
6507/3-4	DC	3393	22075	7.24e5	8.14e5	4.74e5	6.38e5
6507/3-4	DC	4074	22092	5.54e5	1.23e6	4.25e5	9.45e5

Table 12. Extraction, Asphaltene precipitation and Iatroscan data

Well	Sample type	Lower Depth	APT ID	Rock weight (g)	EOM (mg)	EOM (mg/kg Rock)	SAT (wt% of EOM/Oil)	ARO (wt% of EOM/Oil)	POL (wt% of EOM/Oil)	ASP (wt% of EOM/Oil)	HC (wt% of EOM/Oil)
6507/3-4	COCH	3728.05	22021	3.570	37	10365	92.5	2.2	4.5	0.8	94.7
6507/3-4	COCH	3734.40	22023	5.196	26	5004	83.0	12.5	2.9	1.5	95.5
6507/3-4	COCH	3743.90	22025	6.167	78	12647	86.2	10.7	1.3	1.8	96.9
6507/3-4	COCH	3754.85	22027	3.891	29	7453	76.6	18.2	4.1	1.0	94.8
6507/3-4	COCH	3769	22030	9.678	44	4546	92.2	2.3	5.2	0.2	94.5
6507/3-4	COCH	3792	22033	5.964	63	10563	89.1	3.7	6.9	0.3	92.8
6507/3-4	COCH	3810.90	22037	8.743	43	4918	91.1	4.3	3.2	1.4	95.4
6507/3-4	Oil	3726	22055				88.1	7.8	4.1	0.0	95.9
6507/3-4	DC	3183	22070	10.062	386	38363	25.6	7.9	46.5	20.0	33.5
6507/3-4	DC	3342	22074	11.713	325	27747	60.6	5.9	26.5	7.0	66.4
6507/3-4	DC	4074	22092	16.140	333	20631	28.3	6.5	52.1	13.1	34.8
6507/3-4	Mud	2500	22093	0.000	111		91.2	0.0	8.8	0.0	91.2
6507/3-4	Mud	3702	22094	0.000	114		86.8	1.7	11.5	0.0	88.5
6507/3-4	Mud	4060	22095	0.000	97		70.3	1.8	27.9	0.0	72.1

Table 13. GC of Whole Oil (peak area)

Well	Sample type	Lower Depth	APT ID	IS 2,2,4-TMC5	n-C3	i-C4	n-C4	i-C5	n-C5	2,2-DMC4	CyC5	2,3-DMC4	2-MC5	3-MC5	n-C6	2,2-DMC5	MCyC5
6507/3-4	Oil	3726	22055	6.43e4	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 13. continued, GC of Whole Oil (peak area)

Well	Sample type	Lower Depth	APT ID	2,4-DMC5	2,2,3-TMC4	Benz	3,3-DMC5	CyC6	2-MC6	2,3-DMC5	1,1-DMCyC5	3-MC6	c-1,3-DMCyC5	t-1,3-DMCyC5	3-EC5	t-1,2-DMCyC5	n-C7
6507/3-4	Oil	3726	22055	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 13. continued, GC of Whole Oil (peak area)

Well	Sample type	Lower Depth	APT ID	c-1,2-DMCyC5	MCyC6	1,1,3-TMCyC5	ECyC5	2,5-DMC6	2,2,3-TMC5/2,4-DMC6	c,t-1,2,4-TMCyC5	3,3-DMC6	t,c-1,2,3-TMCyC5	2,3,4-TMC5	Tol	2,3-DMC6	2-MC7	4-MC7
6507/3-4	Oil	3726	22055	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 13. continued, GC of Whole Oil (peak area)

Well	Sample type	Lower Depth	APT ID	3-MC7	c-1,3-DMCyC6	t-1,4-DMCyC6	1,1-DMCyC6	t-1,2-DMCyC6	n-C8	E-CyC6	i-C9	E-Benz	m-Xyl	p-Xyl	4-MC8	2-MC8	3-MC8
6507/3-4	Oil	3726	22055	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 13. continued, GC of Whole Oil (peak area)

Well	Sample type	Lower Depth	APT ID	o-Xyl	n-C9	i-C10	n-C10	i-C11	n-C11	n-C12	i-C13	i-C14	n-C13	i-C15	n-C14	i-C16	n-C15
6507/3-4	Oil	3726	22055	0.00e0	0.00e0	0.00e0	3.96e4	0.00e0	5.88e5	1.52e6	0.00e0	0.00e0	3.24e6	0.00e0	8.33e4	0.00e0	7.38e5

Table 13. continued, GC of Whole Oil (peak area)

Well	Sample type	Lower Depth	APT ID	n-C16	i-C18	n-C17	i-C19	n-C18	i-C20	n-C19	n-C20	n-C21	n-C22	n-C23	n-C24	n-C25
6507/3-4	Oil	3726	22055	4.31e4	0.00e0	3.06e4	0.00e0	6.17e3	0.00e0	5.23e3	4.15e3	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 14. GC of Whole Oil (amounts in ng/g)

Well	Sample type	Lower Depth	APT ID	IS 2,2,4-TMC5	n-C3	i-C4	n-C4	i-C5	n-C5	2,2-DMC4	CyC5	2,3-DMC4	2-MC5	3-MC5	n-C6	2,2-DMC5	MCyC5
6507/3-4	Oil	3726	22055	6.94e6	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 14. continued, GC of Whole Oil (amounts in ng/g)

Well	Sample type	Lower Depth	APT ID	2,4-DMC5	2,2,3-TMC4	Benz	3,3-DMC5	CyC6	2-MC6	2,3-DMC5	1,1-DMCyC5	3-MC6	c-1,3-DMCyC5	t-1,3-DMCyC5	3-EC5	t-1,2-DMCyC5	n-C7
6507/3-4	Oil	3726	22055	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 14. continued, GC of Whole Oil (amounts in ng/g)

Well	Sample type	Lower Depth	APT ID	c-1,2-DMCyC5	MCyC6	1,1,3-TMCyC5	ECyC5	2,5-DMC6	2,2,3-TMC5/2,4-DMC6	c,t-1,2,4-TMCyC5	3,3-DMC6	t,c-1,2,3-TMCyC5	2,3,4-TMC5	Tol	2,3-DMC6	2-MC7	4-MC7
6507/3-4	Oil	3726	22055	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 14 continued, GC of Whole Oil (amounts in ng/g)

Well	Sample type	Lower Depth	APT ID	3-MC7	c-1,3-DMCyC6	t-1,4-DMCyC6	1,1-DMCyC6	t-1,2-DMCyC6	n-C8	E-CyC6	i-C9	E-Benz	m-Xyl	p-Xyl	4-MC8	2-MC8	3-MC8
6507/3-4	Oil	3726	22055	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 14. continued, GC of Whole Oil (amounts in ng/g)

Well	Sample type	Lower Depth	APT ID	o-Xyl	n-C9	i-C10	n-C10	i-C11	n-C11	n-C12	i-C13	i-C14	n-C13	i-C15	n-C14	i-C16	n-C15
6507/3-4	Oil	3726	22055	0.00e0	0.00e0	0.00e0	4.25e6	0.00e0	6.31e7	1.63e8	0.00e0	0.00e0	3.48e8	0.00e0	8.92e6	0.00e0	7.90e7

Table 14 continued, GC of Whole Oil (amounts in ng/g)

Well	Sample type	Lower Depth	APT ID	n-C16	i-C18	n-C17	i-C19	n-C18	i-C20	n-C19	n-C20	n-C21	n-C22	n-C23	n-C24	n-C25
6507/3-4	Oil	3726	22055	4.61e6	0.00e0	3.27e6	0.00e0	6.59e5	0.00e0	5.59e5	4.43e5	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 15. GC of saturated compounds (peak area)

Well	Sample type	Lower Depth	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	n-C17	Pr
6507/3-4	COCH	3728.05	22021	0.00e0	2.80e4	1.45e6	4.39e3	1.29e4	1.88e7	6.67e4	1.83e7	2.08e5	1.97e7	8.35e6	3.08e5	1.70e6	4.95e5
6507/3-4	COCH	3734.40	22023	0.00e0	1.65e4	7.24e5	3.57e3	9.63e3	8.82e6	4.19e4	8.72e6	1.34e5	1.04e7	4.82e6	1.50e5	1.04e6	2.83e5
6507/3-4	COCH	3743.90	22025	0.00e0	3.27e4	7.73e5	7.46e3	1.34e4	5.45e6	3.48e4	3.54e6	1.45e5	3.18e6	1.71e6	3.28e5	1.00e6	5.61e5
6507/3-4	COCH	3754.85	22027	0.00e0	9.25e4	1.99e6	9.06e3	1.84e4	1.55e7	7.45e4	1.23e7	1.65e5	1.24e7	5.20e6	1.40e5	9.97e5	2.53e5
6507/3-4	COCH	3769	22030	0.00e0	1.09e5	1.70e6	4.62e3	9.34e3	1.10e7	3.50e4	8.60e6	1.29e5	1.02e7	5.24e6	3.80e5	1.50e6	6.77e5
6507/3-4	COCH	3792	22033	0.00e0	2.95e4	1.03e6	6.06e3	1.51e4	9.77e6	5.01e4	7.38e6	1.71e5	6.87e6	3.18e6	4.38e5	1.34e6	7.78e5
6507/3-4	COCH	3810.90	22037	0.00e0	9.07e4	1.85e6	1.34e4	3.04e4	1.39e7	8.86e4	1.14e7	2.72e5	1.25e7	6.07e6	4.62e5	1.92e6	9.32e5
6507/3-4	Oil	3726	22055	6.20e5	9.58e6	2.53e7	2.75e4	3.65e4	5.55e7	7.73e4	2.01e7	1.11e5	1.37e7	4.59e6	3.81e4	6.20e5	7.16e4
6507/3-4	DC	3183	22070	0.00e0	9.41e4	1.57e6	2.73e3	6.38e3	1.67e7	5.96e4	1.83e7	1.12e5	1.66e7	5.67e6	4.93e4	7.19e5	7.32e4
6507/3-4	DC	3342	22074	1.37e4	2.76e6	1.65e7	1.63e4	2.50e4	4.07e7	8.42e4	2.30e7	1.23e5	1.71e7	5.66e6	5.33e4	7.23e5	5.97e4
6507/3-4	DC	4074	22092	2.54e3	9.22e4	6.75e5	1.85e3	5.05e3	7.84e6	3.22e4	1.12e7	9.55e4	1.50e7	7.16e6	7.07e4	1.10e6	8.28e4
6507/3-4	Mud	2500	22093	2.76e5	8.05e6	2.22e7	2.30e4	2.81e4	3.38e7	8.19e4	2.22e7	1.05e5	1.59e7	5.04e6	4.32e4	6.37e5	4.14e4
6507/3-4	Mud	3702	22094	3.90e5	6.35e6	1.68e7	1.66e4	2.24e4	3.58e7	4.87e4	1.35e7	7.06e4	9.22e6	3.09e6	2.70e4	3.94e5	3.12e4
6507/3-4	Mud	4060	22095	5.18e5	8.31e6	2.24e7	1.99e4	2.84e4	4.99e7	6.98e4	1.82e7	9.26e4	1.22e7	4.01e6	3.01e4	4.93e5	3.66e4

Table 15. continued, GC of saturated compounds (peak area)

Well	Sample type	Lower Depth	APT ID	n-C18	Ph	n-C19	n-C20	n-C21	n-C22	n-C23	n-C24	n-C25	n-C26	n-C27	n-C28	n-C29	n-C30
6507/3-4	COCH	3728.05	22021	6.23e5	6.20e5	4.09e5	3.62e5	3.07e5	2.59e5	2.17e5	2.04e5	2.16e5	1.79e5	1.65e5	1.32e5	1.25e5	9.33e4
6507/3-4	COCH	3734.40	22023	5.28e5	1.57e5	5.47e5	5.80e5	6.03e5	6.29e5	6.40e5	6.27e5	6.39e5	5.56e5	5.14e5	4.17e5	4.00e5	2.98e5
6507/3-4	COCH	3743.90	22025	6.98e5	5.67e5	5.32e5	5.25e5	5.01e5	4.88e5	4.67e5	4.17e5	4.32e5	3.63e5	3.28e5	2.66e5	2.55e5	1.90e5
6507/3-4	COCH	3754.85	22027	4.19e5	1.33e5	3.92e5	3.87e5	3.70e5	3.60e5	3.48e5	3.26e5	3.16e5	2.71e5	2.46e5	2.01e5	1.91e5	1.44e5
6507/3-4	COCH	3769	22030	6.41e5	9.68e5	3.29e5	2.54e5	1.03e5	7.94e4	4.46e4	4.07e4	5.57e4	4.50e4	4.43e4	3.75e4	4.42e4	4.09e4
6507/3-4	COCH	3792	22033	9.05e5	9.34e5	6.67e5	6.77e5	5.35e5	5.17e5	4.81e5	4.72e5	4.89e5	4.41e5	4.11e5	3.52e5	3.34e5	2.69e5
6507/3-4	COCH	3810.90	22037	1.15e6	9.90e5	8.96e5	8.38e5	7.49e5	7.13e5	5.87e5	5.53e5	5.54e5	4.64e5	4.26e5	3.45e5	3.36e5	2.50e5
6507/3-4	Oil	3726	22055	1.25e5	2.92e4	9.46e4	8.89e4	7.93e4	7.60e4	7.39e4	7.15e4	6.99e4	6.06e4	5.59e4	4.64e4	4.09e4	3.23e4
6507/3-4	DC	3183	22070	1.02e5	2.27e4	5.49e4	3.95e4	2.16e4	1.22e4	6.29e3	3.56e3	2.17e3	1.08e3	1.50e3	9.21e2	9.78e2	1.64e3
6507/3-4	DC	3342	22074	9.74e4	1.95e4	5.75e4	3.54e4	2.34e4	1.38e4	7.80e3	4.91e3	4.22e3	2.79e3	3.41e3	1.90e3	1.89e3	1.53e3
6507/3-4	DC	4074	22092	1.52e5	2.21e4	9.31e4	6.43e4	4.26e4	2.66e4	1.62e4	9.95e3	7.84e3	4.51e3	3.64e3	2.24e3	1.63e3	2.72e3
6507/3-4	Mud	2500	22093	9.23e4	1.56e4	4.84e4	3.56e4	1.60e4	8.26e3	3.23e3	1.18e3	5.25e2	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	Mud	3702	22094	4.94e4	8.39e3	2.57e4	1.76e4	9.80e3	4.69e3	1.82e3	5.30e2	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	Mud	4060	22095	5.85e4	1.33e4	3.18e4	2.02e4	1.16e4	6.16e3	2.99e3	1.42e3	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 15. continued, GC of saturated compounds (peak area)

Well	Sample type	Lower Depth	APT ID	n-C31	n-C32	n-C33	n-C34	n-C35	n-C36
6507/3-4	COCH	3728.05	22021	7.95e4	6.85e4	5.75e4	6.17e4	2.67e4	1.88e4
6507/3-4	COCH	3734.40	22023	2.71e5	2.09e5	1.79e5	1.99e5	9.60e4	7.70e4
6507/3-4	COCH	3743.90	22025	1.67e5	1.26e5	1.19e5	1.09e5	6.01e4	4.17e4
6507/3-4	COCH	3754.85	22027	1.27e5	1.02e5	9.03e4	9.52e4	4.75e4	3.22e4
6507/3-4	COCH	3769	22030	4.58e4	4.65e4	4.01e4	3.71e4	2.87e4	2.19e4
6507/3-4	COCH	3792	22033	2.51e5	2.11e5	1.78e5	1.76e5	1.03e5	8.12e4
6507/3-4	COCH	3810.90	22037	2.27e5	1.73e5	1.60e5	1.70e5	7.78e4	5.96e4
6507/3-4	Oil	3726	22055	2.62e4	2.62e4	2.07e4	1.81e4	8.08e3	5.90e3
6507/3-4	DC	3183	22070	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	DC	3342	22074	8.99e2	7.68e3	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	DC	4074	22092	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	Mud	2500	22093	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	Mud	3702	22094	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	Mud	4060	22095	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 16. GC of saturated compounds (amounts in ng/g)

Well	Sample type	Lower Depth	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	n-C17	Pr
6507/3-4	COCH	3728.05	22021	0.00e0	1.43e5	7.41e6	2.25e4	6.59e4	9.62e7	3.41e5	9.34e7	1.06e6	1.01e8	4.27e7	1.57e6	8.70e6	2.53e6
6507/3-4	COCH	3734.40	22023	0.00e0	1.33e5	5.83e6	2.87e4	7.74e4	7.10e7	3.37e5	7.02e7	1.08e6	8.37e7	3.87e7	1.21e6	8.35e6	2.28e6
6507/3-4	COCH	3743.90	22025	0.00e0	2.07e5	4.89e6	4.71e4	8.49e4	3.45e7	2.20e5	2.24e7	9.17e5	2.01e7	1.08e7	2.07e6	6.34e6	3.55e6
6507/3-4	COCH	3754.85	22027	0.00e0	8.22e5	1.77e7	8.06e4	1.64e5	1.38e8	6.62e5	1.09e8	1.46e6	1.11e8	4.63e7	1.25e6	8.86e6	2.25e6
6507/3-4	COCH	3769	22030	0.00e0	6.11e5	9.52e6	2.58e4	5.22e4	6.13e7	1.96e5	4.81e7	7.21e5	5.71e7	2.93e7	2.12e6	8.37e6	3.79e6
6507/3-4	COCH	3792	22033	0.00e0	1.84e5	6.46e6	3.79e4	9.46e4	6.11e7	3.13e5	4.62e7	1.07e6	4.30e7	1.99e7	2.74e6	8.35e6	4.87e6
6507/3-4	COCH	3810.90	22037	0.00e0	5.52e5	1.13e7	8.18e4	1.85e5	8.46e7	5.39e5	6.93e7	1.65e6	7.61e7	3.69e7	2.81e6	1.17e7	5.67e6
6507/3-4	Oil	3726	22055	3.56e6	5.49e7	1.45e8	1.57e5	2.09e5	3.18e8	4.43e5	1.15e8	6.35e5	7.86e7	2.63e7	2.18e5	3.55e6	4.10e5
6507/3-4	DC	3183	22070	0.00e0	8.15e5	1.36e7	2.37e4	5.53e4	1.45e8	5.16e5	1.59e8	9.66e5	1.44e8	4.91e7	4.27e5	6.23e6	6.34e5
6507/3-4	DC	3342	22074	1.09e5	2.19e7	1.31e8	1.29e5	1.99e5	3.23e8	6.69e5	1.83e8	9.77e5	1.36e8	4.50e7	4.23e5	5.74e6	4.75e5
6507/3-4	DC	4074	22092	1.75e4	6.37e5	4.66e6	1.28e4	3.49e4	5.41e7	2.22e5	7.71e7	6.59e5	1.03e8	4.94e7	4.88e5	7.61e6	5.72e5
6507/3-4	Mud	2500	22093	2.27e6	6.63e7	1.83e8	1.89e5	2.31e5	2.78e8	6.75e5	1.82e8	8.64e5	1.31e8	4.15e7	3.56e5	5.25e6	3.41e5
6507/3-4	Mud	3702	22094	3.85e6	6.27e7	1.66e8	1.64e5	2.21e5	3.53e8	4.80e5	1.34e8	6.96e5	9.10e7	3.05e7	2.67e5	3.89e6	3.08e5
6507/3-4	Mud	4060	22095	4.31e6	6.91e7	1.86e8	1.65e5	2.36e5	4.15e8	5.80e5	1.52e8	7.69e5	1.01e8	3.33e7	2.50e5	4.10e6	3.04e5

Table 16. continued, GC of saturated compounds (amounts in ng/g)

Well	Sample type	Lower Depth	APT ID	n-C18	Ph	n-C19	n-C20	n-C21	n-C22	n-C23	n-C24	n-C25	n-C26	n-C27	n-C28	n-C29	n-C30
6507/3-4	COCH	3728.05	22021	3.19e6	3.17e6	2.09e6	1.85e6	1.57e6	1.32e6	1.11e6	1.04e6	1.10e6	9.15e5	8.43e5	6.73e5	6.39e5	4.77e5
6507/3-4	COCH	3734.40	22023	4.25e6	1.26e6	4.40e6	4.67e6	4.85e6	5.06e6	5.15e6	5.04e6	5.14e6	4.47e6	4.14e6	3.35e6	3.22e6	2.40e6
6507/3-4	COCH	3743.90	22025	4.41e6	3.59e6	3.36e6	3.32e6	3.17e6	3.08e6	2.95e6	2.64e6	2.73e6	2.30e6	2.07e6	1.68e6	1.61e6	1.20e6
6507/3-4	COCH	3754.85	22027	3.72e6	1.18e6	3.48e6	3.44e6	3.28e6	3.20e6	3.10e6	2.90e6	2.81e6	2.41e6	2.19e6	1.78e6	1.70e6	1.28e6
6507/3-4	COCH	3769	22030	3.59e6	5.41e6	1.84e6	1.42e6	5.76e5	4.44e5	2.49e5	2.28e5	3.11e5	2.52e5	2.48e5	2.10e5	2.47e5	2.29e5
6507/3-4	COCH	3792	22033	5.66e6	5.84e6	4.17e6	4.23e6	3.35e6	3.24e6	3.01e6	2.96e6	3.06e6	2.76e6	2.57e6	2.20e6	2.09e6	1.68e6
6507/3-4	COCH	3810.90	22037	6.97e6	6.02e6	5.45e6	5.10e6	4.56e6	4.34e6	3.57e6	3.37e6	3.37e6	2.82e6	2.60e6	2.10e6	2.05e6	1.52e6
6507/3-4	Oil	3726	22055	7.19e5	1.68e5	5.43e5	5.09e5	4.55e5	4.36e5	4.24e5	4.10e5	4.01e5	3.48e5	3.21e5	2.66e5	2.35e5	1.85e5
6507/3-4	DC	3183	22070	8.86e5	1.97e5	4.75e5	3.42e5	1.87e5	1.06e5	5.45e4	3.08e4	1.88e4	9.36e3	1.30e4	7.98e3	8.47e3	1.42e4
6507/3-4	DC	3342	22074	7.74e5	1.55e5	4.57e5	2.81e5	1.86e5	1.09e5	6.19e4	3.90e4	3.35e4	2.22e4	2.71e4	1.51e4	1.50e4	1.22e4
6507/3-4	DC	4074	22092	1.05e6	1.52e5	6.43e5	4.44e5	2.94e5	1.84e5	1.12e5	6.86e4	5.41e4	3.11e4	2.51e4	1.54e4	1.12e4	1.88e4
6507/3-4	Mud	2500	22093	7.60e5	1.28e5	3.99e5	2.93e5	1.32e5	6.80e4	2.66e4	9.73e3	4.32e3	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	Mud	3702	22094	4.88e5	8.28e4	2.54e5	1.74e5	9.68e4	4.63e4	1.80e4	5.23e3	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	Mud	4060	22095	4.86e5	1.11e5	2.64e5	1.68e5	9.63e4	5.12e4	2.48e4	1.18e4	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 16. continued, GC of saturated compounds (amounts in ng/g)

Well	Sample type	Lower Depth	APT ID	n-C31	n-C32	n-C33	n-C34	n-C35	n-C36
6507/3-4	COCH	3728.05	22021	4.07e5	3.50e5	2.94e5	3.16e5	1.36e5	9.63e4
6507/3-4	COCH	3734.40	22023	2.18e6	1.68e6	1.44e6	1.60e6	7.72e5	6.19e5
6507/3-4	COCH	3743.90	22025	1.05e6	7.95e5	7.50e5	6.91e5	3.80e5	2.63e5
6507/3-4	COCH	3754.85	22027	1.13e6	9.11e5	8.02e5	8.46e5	4.22e5	2.86e5
6507/3-4	COCH	3769	22030	2.56e5	2.60e5	2.24e5	2.08e5	1.60e5	1.23e5
6507/3-4	COCH	3792	22033	1.57e6	1.32e6	1.12e6	1.10e6	6.46e5	5.08e5
6507/3-4	COCH	3810.90	22037	1.38e6	1.05e6	9.71e5	1.04e6	4.73e5	3.63e5
6507/3-4	Oil	3726	22055	1.50e5	1.50e5	1.19e5	1.04e5	4.63e4	3.38e4
6507/3-4	DC	3183	22070	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	DC	3342	22074	7.14e3	6.10e4	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	DC	4074	22092	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	Mud	2500	22093	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	Mud	3702	22094	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0
6507/3-4	Mud	4060	22095	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0

Table 17. GC of aromatic compounds (peak area)

Well	Sample type	Lower Depth	APT ID	2-MN	1-MN	P	3-MP	2-MP	9-MP	1-MP
6507/3-4	COCH	3728.05	22021	0	0	10126	5770	0	8008	4093
6507/3-4	COCH	3734.40	22023	22063	17890	86601	61645	65848	84074	64047
6507/3-4	COCH	3743.90	22025	44971	33673	51854	35910	33271	45516	33174
6507/3-4	COCH	3754.85	22027	114149	83699	99829	53107	56117	73408	62211
6507/3-4	COCH	3769	22030	12795	10081	0	0	0	0	0
6507/3-4	COCH	3792	22033	30170	25645	57888	33674	29662	43738	31509
6507/3-4	COCH	3810.90	22037	28842	24425	45455	20469	20010	33984	23059
6507/3-4	Oil	3726	22055	0	0	0	0	0	0	0
6507/3-4	DC	3183	22070	48108	46578	24683	9708	5729	16096	13131
6507/3-4	DC	3342	22074	16255	25196	0	0	0	0	0
6507/3-4	DC	4074	22092	61039	49993	43632	15620	19212	21688	19270
6507/3-4	Mud	2500	22093	0	0	0	0	0	0	0
6507/3-4	Mud	3702	22094	0	0	0	0	0	0	0
6507/3-4	Mud	4060	22095	0	0	0	0	0	0	0

Table 18. GC of aromatic compounds (amounts in ng/g)

Well	Sample type	Lower Depth	APT ID	2-MN	1-MN	P	3-MP	2-MP	9-MP	1-MP
6507/3-4	COCH	3728.05	22021	0	0	62868	35824	0	49717	25414
6507/3-4	COCH	3734.40	22023	38125	30914	149648	106523	113786	145280	110674
6507/3-4	COCH	3743.90	22025	86893	65063	100190	69384	64285	87944	64097
6507/3-4	COCH	3754.85	22027	176201	129198	154097	81976	86623	113312	96030
6507/3-4	COCH	3769	22030	154405	121653	0	0	0	0	0
6507/3-4	COCH	3792	22033	56193	47764	107817	62719	55245	81462	58687
6507/3-4	COCH	3810.90	22037	109682	92887	172860	77842	76097	129236	87689
6507/3-4	Oil	3726	22055	0	0	0	0	0	0	0
6507/3-4	DC	3183	22070	154133	149229	79081	31103	18355	51569	42069
6507/3-4	DC	3342	22074	56638	87793	0	0	0	0	0
6507/3-4	DC	4074	22092	220049	180229	157297	56310	69262	78186	69470
6507/3-4	Mud	2500	22093	0	0	0	0	0	0	0
6507/3-4	Mud	3702	22094	0	0	0	0	0	0	0
6507/3-4	Mud	4060	22095	0	0	0	0	0	0	0

Table 19. GCMS SIR of saturated compounds (peak height)

m/e				177		191											
Well	Sample type	Lower Depth	APT ID	25nor28αβ	25nor30αβ	20/3	21/3	23/3	24/3	25/3R	25/3S	24/4	26/3R	26/3S	28/3R	28/3S	29/3R
6507/3-4	COCH	3728.05	22021	1.10e6	6.17e5	6.03e6	5.71e6	7.78e6	3.15e6	9.35e5	9.15e5	3.23e6	7.58e5	7.03e5	5.97e5	4.67e5	6.09e5
6507/3-4	COCH	3734.40	22023	3.01e6	1.92e6	2.47e6	2.01e6	2.88e6	2.38e6	1.04e6	9.31e5	3.73e6	1.06e6	1.02e6	1.08e6	8.80e5	1.39e6
6507/3-4	COCH	3743.90	22025	1.93e6	1.10e6	4.20e6	4.46e6	9.74e6	4.83e6	1.65e6	1.66e6	5.17e6	1.16e6	1.10e6	9.27e5	7.64e5	1.02e6
6507/3-4	COCH	3754.85	22027	1.57e6	1.05e6	2.07e6	1.72e6	2.05e6	1.62e6	6.41e5	5.71e5	2.27e6	6.33e5	6.38e5	6.34e5	5.03e5	7.87e5
6507/3-4	COCH	3769	22030	4.30e5	1.08e5	8.07e6	8.18e6	1.20e7	4.03e6	1.09e6	1.00e6	3.24e6	6.25e5	5.79e5	4.32e5	3.55e5	3.20e5
6507/3-4	COCH	3792	22033	2.06e6	1.21e6	7.05e6	6.99e6	9.84e6	4.66e6	1.44e6	1.35e6	4.50e6	1.09e6	1.05e6	9.83e5	8.28e5	1.18e6
6507/3-4	COCH	3810.90	22037	2.88e6	1.80e6	7.41e6	7.21e6	1.03e7	5.39e6	1.74e6	1.63e6	5.32e6	1.44e6	1.40e6	1.30e6	1.18e6	1.63e6
6507/3-4	Oil	3726	22055	1.84e5	1.20e5	5.82e5	4.45e5	3.24e5	2.12e5	8.49e4	7.33e4	3.73e5	9.00e4	9.62e4	8.60e4	5.73e4	7.78e4
6507/3-4	DC	3183	22070	1.78e4	0.00e0	6.57e5	4.74e5	2.29e5	9.64e4	3.60e4	3.09e4	2.01e5	3.53e4	3.44e4	2.29e4	1.51e4	1.48e4
6507/3-4	DC	3342	22074	9.43e3	0.00e0	5.78e5	3.75e5	1.73e5	7.41e4	2.32e4	2.15e4	2.03e5	2.97e4	2.92e4	1.99e4	1.30e4	1.05e4
6507/3-4	DC	4074	22092	1.14e4	1.90e4	1.06e6	7.58e5	4.03e5	1.52e5	5.74e4	5.54e4	3.38e5	7.04e4	6.72e4	3.33e4	2.72e4	1.90e4
6507/3-4	Mud	2500	22093	0.00e0	0.00e0	3.00e5	2.21e5	9.55e4	3.66e4	1.35e4	1.10e4	5.72e4	1.58e4	1.50e4	6.80e3	7.74e3	4.82e3
6507/3-4	Mud	3702	22094	0.00e0	0.00e0	2.88e5	2.12e5	1.01e5	3.47e4	1.43e4	1.24e4	7.02e4	1.63e4	1.52e4	7.94e3	7.38e3	4.26e3
6507/3-4	Mud	4060	22095	5.60e3	0.00e0	3.52e5	2.40e5	1.07e5	4.28e4	1.41e4	1.49e4	7.85e4	1.86e4	2.11e4	8.69e3	8.72e3	6.98e3

Table 19 continued, GCMS SIR of saturated compounds (peak height)
m/e 191

Well	Sample type	Lower Depth	APT ID	29/3S	27Ts	27Tm	30/3R	30/3S	28αβ	25nor30αβ	29αβ	29Ts	30d	29βα	30O	30αβ	30βα
6507/3-4	COCH	3728.05	22021	6.04e5	3.84e6	5.20e6	2.15e5	3.83e5	1.73e6	1.08e6	1.59e7	2.47e6	1.60e6	1.72e6	0.00e0	2.62e7	5.07e6
6507/3-4	COCH	3734.40	22023	1.37e6	7.72e6	7.69e6	5.52e5	9.88e5	4.71e6	3.13e6	2.21e7	6.07e6	5.28e6	2.04e6	0.00e0	4.26e7	6.40e6
6507/3-4	COCH	3743.90	22025	1.05e6	6.72e6	4.12e6	3.20e5	6.25e5	2.94e6	1.77e6	1.22e7	4.12e6	2.91e6	1.05e6	0.00e0	2.05e7	2.49e6
6507/3-4	COCH	3754.85	22027	7.84e5	4.23e6	5.17e6	3.04e5	5.29e5	2.61e6	1.65e6	1.46e7	3.06e6	2.65e6	1.46e6	0.00e0	2.73e7	4.58e6
6507/3-4	COCH	3769	22030	3.43e5	2.68e6	3.21e6	1.12e5	2.30e5	7.57e5	2.51e5	1.10e7	1.53e6	4.66e5	1.19e6	0.00e0	1.44e7	3.04e6
6507/3-4	COCH	3792	22033	1.23e6	7.60e6	4.76e6	4.17e5	7.47e5	2.98e6	1.96e6	1.50e7	4.64e6	3.37e6	1.40e6	0.00e0	2.60e7	3.37e6
6507/3-4	COCH	3810.90	22037	1.70e6	9.94e6	6.70e6	5.37e5	1.00e6	3.94e6	2.94e6	2.18e7	5.59e6	4.85e6	2.02e6	0.00e0	4.11e7	5.76e6
6507/3-4	Oil	3726	22055	8.41e4	4.94e5	1.15e6	4.02e4	6.47e4	2.75e5	1.85e5	3.31e6	3.80e5	3.22e5	3.89e5	0.00e0	5.53e6	1.22e6
6507/3-4	DC	3183	22070	1.38e4	6.64e4	1.66e6	2.05e4	2.06e4	1.36e6	0.00e0	3.26e6	1.26e5	9.48e4	5.17e5	0.00e0	5.08e6	1.47e6
6507/3-4	DC	3342	22074	1.03e4	1.04e5	1.27e6	1.31e4	1.53e4	2.95e4	0.00e0	3.32e6	2.08e5	1.02e5	4.11e5	0.00e0	5.21e6	1.25e6
6507/3-4	DC	4074	22092	1.73e4	6.53e4	1.42e6	1.52e4	1.76e4	3.76e4	3.31e4	4.42e6	9.90e4	6.32e4	4.43e5	0.00e0	7.16e6	1.52e6
6507/3-4	Mud	2500	22093	5.60e3	1.11e4	2.84e5	0.00e0	0.00e0	1.04e4	0.00e0	8.96e5	2.06e4	0.00e0	9.65e4	0.00e0	1.41e6	3.31e5
6507/3-4	Mud	3702	22094	4.43e3	1.48e4	3.48e5	5.23e3	5.19e3	1.10e4	0.00e0	1.09e6	2.55e4	6.17e3	1.03e5	0.00e0	1.63e6	3.67e5
6507/3-4	Mud	4060	22095	5.75e3	1.89e4	3.93e5	0.00e0	0.00e0	1.09e4	1.04e4	1.22e6	3.61e4	6.21e3	1.27e5	0.00e0	1.83e6	4.38e5

Table 19. continued, GCMS SIR of saturated compounds (peak height)

m/e				191									217				
Well	Sample type	Lower Depth	APT ID	31αβS	31αβR	30G	32αβS	32αβR	33αβS	33αβR	34αβS	34αβR	35αβS	35αβR	21αα	21ββ	22αα
6507/3-4	COCH	3728.05	22021	6.21e6	4.72e6	5.93e6	3.26e6	2.41e6	2.03e6	1.47e6	1.19e6	8.66e5	8.12e5	5.41e5	4.43e6	3.41e6	2.32e6
6507/3-4	COCH	3734.40	22023	1.17e7	9.19e6	5.10e6	7.55e6	5.13e6	4.64e6	3.19e6	3.04e6	2.21e6	2.07e6	1.42e6	1.86e6	2.25e6	1.64e6
6507/3-4	COCH	3743.90	22025	6.55e6	5.14e6	1.38e6	4.21e6	2.97e6	2.58e6	1.72e6	1.66e6	1.17e6	1.22e6	7.89e5	4.51e6	4.36e6	2.97e6
6507/3-4	COCH	3754.85	22027	6.58e6	5.10e6	4.62e6	4.09e6	2.86e6	2.46e6	1.68e6	1.59e6	1.15e6	1.08e6	7.25e5	1.27e6	1.50e6	1.16e6
6507/3-4	COCH	3769	22030	3.93e6	2.95e6	3.80e6	1.93e6	1.39e6	1.17e6	8.22e5	6.20e5	4.60e5	4.79e5	3.16e5	6.83e6	4.48e6	3.08e6
6507/3-4	COCH	3792	22033	7.87e6	6.25e6	2.78e6	4.90e6	3.39e6	3.14e6	2.11e6	1.95e6	1.48e6	1.46e6	9.68e5	6.25e6	5.13e6	3.69e6
6507/3-4	COCH	3810.90	22037	1.11e7	8.38e6	5.52e6	6.52e6	4.67e6	4.09e6	2.82e6	2.55e6	1.80e6	1.88e6	1.19e6	6.84e6	5.55e6	4.14e6
6507/3-4	Oil	3726	22055	1.15e6	9.06e5	1.48e6	5.80e5	4.42e5	3.69e5	2.65e5	2.05e5	1.51e5	1.46e5	9.65e4	1.16e5	1.47e5	9.62e4
6507/3-4	DC	3183	22070	1.66e6	1.14e6	1.16e6	6.26e5	4.49e5	3.57e5	2.50e5	2.60e5	1.74e5	1.89e5	1.22e5	9.05e4	4.78e4	2.92e4
6507/3-4	DC	3342	22074	1.48e6	1.06e6	1.27e6	6.11e5	4.33e5	3.76e5	2.68e5	2.14e5	1.56e5	1.09e5	7.07e4	2.96e4	2.89e4	1.41e4
6507/3-4	DC	4074	22092	9.99e5	7.67e5	2.28e6	3.83e5	2.79e5	2.16e5	1.62e5	9.20e4	6.89e4	5.65e4	3.79e4	2.43e4	3.03e4	1.31e4
6507/3-4	Mud	2500	22093	1.98e5	1.49e5	5.14e5	7.26e4	6.33e4	4.77e4	3.36e4	1.97e4	1.52e4	1.34e4	1.01e4	8.63e3	7.42e3	2.85e3
6507/3-4	Mud	3702	22094	2.17e5	1.72e5	5.55e5	8.28e4	5.76e4	4.71e4	3.50e4	1.97e4	1.50e4	1.31e4	9.52e3	6.89e3	6.97e3	2.65e3
6507/3-4	Mud	4060	22095	2.55e5	2.01e5	6.68e5	9.38e4	7.13e4	5.21e4	4.30e4	2.35e4	1.72e4	1.58e4	1.24e4	7.90e3	8.40e3	3.21e3

Table 19. continued, GCMS SIR of saturated compounds (peak height)

Well	Sample type	Lower Depth	APT ID	22ββ	27dbS	27dbR	27daR	27daS	28dbS#1	28dbS#2	28dbR#1	28dbR#2	28daR	27ααS	27ββR+29dbS	27ββS	28daS
6507/3-4	COCH	3728.05	22021	1.32e6	2.72e6	1.94e6	6.18e5	8.06e5	1.06e6	1.09e6	6.52e5	7.97e5	5.44e5	8.99e5	1.94e6	1.24e6	4.18e5
6507/3-4	COCH	3734.40	22023	1.48e6	6.09e6	4.38e6	1.35e6	1.82e6	2.82e6	2.77e6	1.70e6	2.07e6	1.38e6	2.06e6	5.55e6	3.18e6	1.05e6
6507/3-4	COCH	3743.90	22025	2.29e6	5.40e6	3.81e6	1.28e6	1.59e6	2.16e6	2.15e6	1.25e6	1.49e6	1.01e6	1.54e6	3.66e6	2.25e6	7.58e5
6507/3-4	COCH	3754.85	22027	9.29e5	3.27e6	2.41e6	7.54e5	1.04e6	1.56e6	1.52e6	9.45e5	1.08e6	7.70e5	1.16e6	2.96e6	1.76e6	5.79e5
6507/3-4	COCH	3769	22030	1.48e6	1.62e6	1.10e6	4.09e5	5.00e5	5.30e5	5.18e5	3.14e5	3.71e5	2.52e5	7.19e5	7.19e5	5.92e5	1.86e5
6507/3-4	COCH	3792	22033	2.08e6	5.30e6	3.85e6	1.22e6	1.58e6	2.25e6	2.25e6	1.31e6	1.56e6	1.05e6	1.61e6	4.07e6	2.46e6	7.88e5
6507/3-4	COCH	3810.90	22037	2.39e6	7.12e6	5.24e6	1.65e6	2.14e6	3.12e6	3.02e6	1.83e6	2.21e6	1.52e6	2.02e6	5.89e6	3.13e6	1.11e6
6507/3-4	Oil	3726	22055	8.43e4	3.24e5	2.39e5	6.35e4	9.38e4	1.51e5	1.40e5	7.28e4	1.03e5	6.68e4	1.23e5	2.86e5	1.76e5	5.45e4
6507/3-4	DC	3183	22070	2.80e4	1.09e5	6.40e4	2.73e4	3.28e4	3.98e4	4.05e4	2.24e4	3.05e4	1.72e4	5.63e4	1.26e5	2.53e4	1.71e4
6507/3-4	DC	3342	22074	1.74e4	2.21e4	1.47e4	6.03e3	6.84e3	7.83e3	9.50e3	4.33e3	9.02e3	5.48e3	4.01e4	3.02e4	1.21e4	0.00e0
6507/3-4	DC	4074	22092	2.74e4	2.14e4	1.24e4	5.37e3	5.19e3	7.95e3	7.41e3	5.54e3	1.25e4	0.00e0	6.97e4	1.70e4	1.45e4	0.00e0
6507/3-4	Mud	2500	22093	6.67e3	4.12e3	3.36e3	1.78e3	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	1.20e4	4.14e3	3.63e3	0.00e0
6507/3-4	Mud	3702	22094	6.18e3	3.87e3	2.72e3	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	1.72e4	0.00e0	2.85e3	0.00e0
6507/3-4	Mud	4060	22095	7.32e3	5.89e3	4.64e3	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	1.89e4	4.94e3	4.48e3	0.00e0

Table 19 continued, GCMS SIR of saturated compounds (peak height)
m/e 217

Well	Sample type	Lower Depth	APT ID	27 α R	29 δ R	29 δ aR	28 α S	29 δ aS	28 β R	28 β S	28 α R	29 α S	29 β R	29 β S	29 α R	30 α S	30 β R
6507/3-4	COCH	3728.05	22021	1.40e6	1.42e6	9.21e5	6.01e5	7.96e5	1.17e6	1.44e6	1.17e6	1.46e6	1.54e6	1.66e6	1.38e6	4.66e5	5.69e5
6507/3-4	COCH	3734.40	22023	2.47e6	3.98e6	2.35e6	1.16e6	2.19e6	2.80e6	3.97e6	1.83e6	3.52e6	4.68e6	4.69e6	2.63e6	1.37e6	1.81e6
6507/3-4	COCH	3743.90	22025	1.69e6	2.65e6	1.59e6	6.79e5	1.47e6	1.72e6	2.40e6	9.65e5	1.98e6	2.67e6	2.73e6	1.41e6	7.43e5	1.02e6
6507/3-4	COCH	3754.85	22027	1.52e6	2.18e6	1.34e6	6.99e5	1.20e6	1.64e6	2.19e6	1.20e6	1.92e6	2.34e6	2.50e6	1.60e6	7.23e5	9.51e5
6507/3-4	COCH	3769	22030	1.24e6	5.55e5	4.01e5	2.90e5	2.94e5	1.03e6	4.81e5	1.50e6	6.24e5	5.22e5	1.90e6	2.44e6	0.00e0	1.45e5
6507/3-4	COCH	3792	22033	2.64e6	2.84e6	1.72e6	7.90e5	1.52e6	2.29e6	2.53e6	2.01e6	2.23e6	3.01e6	3.43e6	3.51e6	0.00e0	1.18e6
6507/3-4	COCH	3810.90	22037	2.51e6	4.06e6	2.48e6	1.13e6	2.25e6	2.64e6	3.72e6	1.77e6	3.20e6	4.18e6	4.05e6	2.49e6	1.20e6	1.59e6
6507/3-4	Oil	3726	22055	2.37e5	2.26e5	1.40e5	1.05e5	1.24e5	2.18e5	2.34e5	2.28e5	2.66e5	2.57e5	2.67e5	2.36e5	7.71e4	9.17e4
6507/3-4	DC	3183	22070	1.43e5	8.61e4	4.24e4	4.34e4	5.66e4	8.14e4	4.39e4	1.22e5	1.12e5	5.72e4	1.58e5	1.71e5	3.50e4	9.61e3
6507/3-4	DC	3342	22074	9.98e4	2.87e4	1.72e4	3.01e4	1.42e4	5.57e4	2.56e4	1.03e5	8.00e4	3.40e4	3.94e4	1.18e5	0.00e0	7.69e3
6507/3-4	DC	4074	22092	1.75e5	2.53e4	2.71e4	5.60e4	0.00e0	9.95e4	5.19e4	2.03e5	1.20e5	4.52e4	4.99e4	1.89e5	0.00e0	0.00e0
6507/3-4	Mud	2500	22093	3.96e4	6.74e3	5.16e3	1.18e4	0.00e0	1.86e4	9.79e3	3.96e4	2.18e4	1.01e4	1.11e4	3.84e4	0.00e0	0.00e0
6507/3-4	Mud	3702	22094	4.08e4	6.13e3	6.51e3	1.16e4	3.48e3	2.00e4	1.04e4	3.83e4	2.23e4	7.74e3	1.03e4	3.61e4	0.00e0	0.00e0
6507/3-4	Mud	4060	22095	4.11e4	8.31e3	7.80e3	1.37e4	5.31e3	2.38e4	1.25e4	4.74e4	2.62e4	1.21e4	1.31e4	4.18e4	7.20e3	0.00e0

Table 19. continued, GCMS SIR of saturated compounds (peak height)

m/e				217	218								
Well	Sample type	Lower Depth	APT ID	30ββS	30ααR	27ββR	27ββS	28ββR	28ββS	29ββR	29ββS	30ββR	30ββS
6507/3-4	COCH	3728.05	22021	4.06e5	2.45e5	2.36e6	2.04e6	1.74e6	2.11e6	2.74e6	2.76e6	7.75e5	6.53e5
6507/3-4	COCH	3734.40	22023	1.42e6	7.69e5	6.07e6	5.25e6	4.54e6	5.54e6	8.20e6	7.94e6	2.59e6	2.26e6
6507/3-4	COCH	3743.90	22025	7.80e5	4.47e5	4.33e6	3.86e6	2.82e6	3.50e6	4.73e6	4.65e6	1.42e6	1.28e6
6507/3-4	COCH	3754.85	22027	7.32e5	3.95e5	3.21e6	2.95e6	2.55e6	3.12e6	4.26e6	4.29e6	1.35e6	1.12e6
6507/3-4	COCH	3769	22030	8.96e4	5.38e4	1.09e6	9.32e5	1.00e6	8.14e5	9.14e5	1.23e6	1.46e5	1.14e5
6507/3-4	COCH	3792	22033	8.92e5	4.66e5	4.47e6	3.95e6	3.20e6	3.66e6	5.24e6	5.28e6	1.62e6	1.39e6
6507/3-4	COCH	3810.90	22037	1.31e6	6.99e5	5.61e6	5.11e6	4.13e6	5.24e6	7.38e6	6.98e6	2.31e6	1.98e6
6507/3-4	Oil	3726	22055	7.27e4	3.53e4	3.41e5	2.89e5	3.03e5	3.44e5	4.49e5	4.53e5	1.22e5	1.04e5
6507/3-4	DC	3183	22070	0.00e0	1.45e4	4.29e4	3.99e4	8.03e4	6.35e4	8.69e4	1.17e5	9.61e3	8.01e3
6507/3-4	DC	3342	22074	0.00e0	6.96e3	2.06e4	1.60e4	5.46e4	4.30e4	5.67e4	5.26e4	5.94e3	0.00e0
6507/3-4	DC	4074	22092	0.00e0	0.00e0	2.73e4	2.38e4	9.96e4	8.17e4	7.77e4	8.29e4	0.00e0	0.00e0
6507/3-4	Mud	2500	22093	0.00e0	0.00e0	5.82e3	5.74e3	1.95e4	1.65e4	1.52e4	1.39e4	0.00e0	0.00e0
6507/3-4	Mud	3702	22094	0.00e0	0.00e0	5.97e3	6.40e3	2.10e4	1.68e4	1.50e4	1.59e4	0.00e0	0.00e0
6507/3-4	Mud	4060	22095	0.00e0	0.00e0	7.44e3	6.38e3	2.49e4	1.88e4	1.69e4	1.95e4	0.00e0	0.00e0

Abbreviations of saturated biomarkers

17 α (H), 21 β (H)-25,28,30-trisnorhopane	25nor28 $\alpha\beta$	17 α (H), 21 β (H), 22(R)-tetrakishomohopane	34 $\alpha\beta$ R
17 α (H), 21 β (H)-25-norhopane	25nor30 $\alpha\beta$	17 α (H), 21 β (H), 22(S)-pentakishomohopane	35 $\alpha\beta$ S
C ₂₀ H ₃₆ tricyclic terpane	20/3	17 α (H), 21 β (H), 22(R)-pentakishomohopane	35 $\alpha\beta$ R
C ₂₁ H ₃₈ tricyclic terpane	21/3	C21-5 α (H), 14 α (H), 17 α (H)-pregnane	21 $\alpha\alpha$
C ₂₃ H ₄₂ tricyclic terpane	23/3	C21-5 α (H), 14 β (H), 17 β (H)-pregnane	21 $\beta\beta$
C ₂₄ H ₄₄ tricyclic terpane	24/3	C22-5 α (H), 14 α (H), 17 α (H)-pregnane	22 $\alpha\alpha$
C ₂₅ H ₄₆ tricyclic terpane	25/3R	C22-5 α (H), 14 β (H), 17 β (H)-pregnane	22 $\beta\beta$
C ₂₅ H ₄₆ tricyclic terpane	25/3S	13 β (H), 17 α (H), 20(S)-cholestane (diasterane)	27d β S
C ₂₄ H ₄₂ tetracyclic terpane	24/4	13 β (H), 17 α (H), 20(R)-cholestane (diasterane)	27d β R
C ₂₆ H ₄₈ tricyclic terpane	26/3R	13 α (H), 17 β (H), 20(R)-cholestane (diasterane)	27d α R
C ₂₆ H ₄₈ tricyclic terpane	26/3S	13 α (H), 17 β (H), 20(S)-cholestane (diasterane)	27d α S
C ₂₈ H ₅₂ tricyclic terpane	28/3R	24-methyl-13 β (H), 17 α (H), 20(S)-cholestane (diasterane)	28d β S
C ₂₈ H ₅₂ tricyclic terpane	28/3S	24-methyl-13 β (H), 17 α (H), 20(R)-cholestane (diasterane)	28d β R
C ₂₉ H ₅₄ tricyclic terpane	29/3R	24-methyl-13 α (H), 17 β (H), 20(R)-cholestane (diasterane)	28d α R
C ₂₉ H ₅₄ tricyclic terpane	29/3S	5 α (H), 14 α (H), 17 α (H), 20(S)-cholestane	27 $\alpha\alpha$ S
18 α (H)-22,29,30-trisnorneohopane	27Ts	5 α (H), 14 β (H), 17 β (H), 20(R)-cholestane	27 $\beta\beta$ R
17 α (H)-22,29,30-trisnorhopane	27Tm	24-ethyl-13 β (H), 17 α (H), 20(S)-cholestane (diasterane)	29d β S
C ₃₀ H ₅₆ tricyclic terpane	30/3R	5 α (H), 14 β (H), 17 β (H), 20(S)-cholestane	27 $\beta\beta$ S
C ₃₀ H ₅₆ tricyclic terpane	30/3S	24-methyl-13 α (H), 17 β (H), 20(S)-cholestane (diasterane)	28d α S
17 α (H), 21 β (H)-28,30-bisnorhopane	28 $\alpha\beta$	5 α (H), 14 α (H), 17 α (H), 20(R)-cholestane	27 $\alpha\alpha$ R
17 α (H), 21 β (H)-30-norhopane	29 $\alpha\beta$	24-ethyl-13 β (H), 17 α (H), 20(R)-cholestane (diasterane)	29d β R
18 α (H)-30-norneohopane	29Ts	24-ethyl-13 α (H), 17 β (H), 20(R)-cholestane (diasterane)	29d α R
15 α -methyl-17 α (H)-27-norhopane (diahopane)	30d	24-methyl-5 α (H), 14 α (H), 17 α (H), 20(S)-cholestane	28 $\alpha\alpha$ S
17 β (H), 21 α (H)-30-norhopane (normoretane)	29 $\beta\alpha$	24-ethyl-13 α (H), 17 β (H), 20(S)-cholestane (diasterane)	29d α S
18 α (H)-oleanane	30O	24-methyl-5 α (H), 14 β (H), 17 β (H), 20(R)-cholestane	28 $\beta\beta$ R
17 α (H), 21 β (H)-hopane	30 $\alpha\beta$	24-methyl-5 α (H), 14 β (H), 17 β (H), 20(S)-cholestane	28 $\beta\beta$ S
17 β (H), 21 α (H)-hopane (moretane)	30 $\beta\alpha$	24-methyl-5 α (H), 14 α (H), 17 α (H), 20(R)-cholestane	28 $\alpha\alpha$ R
17 α (H), 21 β (H), 22(S)-homohopane	31 $\alpha\beta$ S	24-ethyl-5 α (H), 14 α (H), 17 α (H), 20(S)-cholestane	29 $\alpha\alpha$ S
17 α (H), 21 β (H), 22(R)-homohopane	31 $\alpha\beta$ R	24-ethyl-5 α (H), 14 β (H), 17 β (H), 20(R)-cholestane	29 $\beta\beta$ R
Gammacerane	30G	24-ethyl-5 α (H), 14 β (H), 17 β (H), 20(S)-cholestane	29 $\beta\beta$ S
17 α (H), 21 β (H), 22(S)-bishomohopane	32 $\alpha\beta$ S	24-ethyl-5 α (H), 14 α (H), 17 α (H), 20(R)-cholestane	29 $\alpha\alpha$ R
17 α (H), 21 β (H), 22(R)-bishomohopane	32 $\alpha\beta$ R	24-propyl-5 α (H), 14 α (H), 17 α (H), 20(S)-cholestane	30 $\alpha\alpha$ S
17 α (H), 21 β (H), 22(S)-trishomohopane	33 $\alpha\beta$ S	24-propyl-5 α (H), 14 β (H), 17 β (H), 20(R)-cholestane	30 $\beta\beta$ R
17 α (H), 21 β (H), 22(R)-trishomohopane	33 $\alpha\beta$ R	24-propyl-5 α (H), 14 β (H), 17 β (H), 20(S)-cholestane	30 $\beta\beta$ S
17 α (H), 21 β (H), 22(S)-tetrakishomohopane	34 $\alpha\beta$ S	24-propyl-5 α (H), 14 α (H), 17 α (H), 20(R)-cholestane	30 $\alpha\alpha$ R

Table 20. GCMS SIR of saturated compounds (amounts in ng/g)

m/e				177	191												
Well	Sample type	Lower Depth	APT ID	25nor28αβ	25nor30αβ	20/3	21/3	23/3	24/3	25/3R	25/3S	24/4	26/3R	26/3S	28/3R	28/3S	29/3R
6507/3-4	COCH	3728.05	22021	4.70e3	2.63e3	2.57e4	2.43e4	3.32e4	1.34e4	3.99e3	3.90e3	1.38e4	3.24e3	3.00e3	2.55e3	1.99e3	2.60e3
6507/3-4	COCH	3734.40	22023	1.80e4	1.14e4	1.47e4	1.20e4	1.72e4	1.42e4	6.18e3	5.56e3	2.23e4	6.34e3	6.08e3	6.45e3	5.25e3	8.27e3
6507/3-4	COCH	3743.90	22025	1.08e4	6.13e3	2.35e4	2.49e4	5.43e4	2.69e4	9.22e3	9.28e3	2.89e4	6.50e3	6.16e3	5.18e3	4.26e3	5.69e3
6507/3-4	COCH	3754.85	22027	1.06e4	7.09e3	1.40e4	1.16e4	1.38e4	1.09e4	4.33e3	3.85e3	1.54e4	4.27e3	4.31e3	4.28e3	3.40e3	5.31e3
6507/3-4	COCH	3769	22030	2.44e3	6.15e2	4.59e4	4.65e4	6.81e4	2.29e4	6.21e3	5.71e3	1.84e4	3.55e3	3.29e3	2.46e3	2.02e3	1.82e3
6507/3-4	COCH	3792	22033	1.28e4	7.49e3	4.36e4	4.32e4	6.09e4	2.88e4	8.94e3	8.38e3	2.79e4	6.76e3	6.48e3	6.08e3	5.13e3	7.33e3
6507/3-4	COCH	3810.90	22037	1.43e4	8.91e3	3.68e4	3.58e4	5.13e4	2.68e4	8.65e3	8.10e3	2.64e4	7.13e3	6.95e3	6.45e3	5.86e3	8.09e3
6507/3-4	Oil	3726	22055	1.43e3	9.27e2	4.51e3	3.45e3	2.51e3	1.64e3	6.58e2	5.68e2	2.89e3	6.97e2	7.45e2	6.66e2	4.44e2	6.02e2
6507/3-4	DC	3183	22070	4.59e2	0.00e0	1.70e4	1.22e4	5.92e3	2.49e3	9.29e2	7.99e2	5.19e3	9.11e2	8.88e2	5.93e2	3.90e2	3.82e2
6507/3-4	DC	3342	22074	2.00e2	0.00e0	1.23e4	7.94e3	3.68e3	1.57e3	4.92e2	4.56e2	4.29e3	6.31e2	6.18e2	4.23e2	2.75e2	2.22e2
6507/3-4	DC	4074	22092	2.01e2	3.37e2	1.88e4	1.34e4	7.14e3	2.68e3	1.02e3	9.81e2	5.98e3	1.25e3	1.19e3	5.89e2	4.82e2	3.37e2
6507/3-4	Mud	2500	22093	0.00e0	0.00e0	8.79e3	6.47e3	2.80e3	1.07e3	3.96e2	3.24e2	1.68e3	4.65e2	4.40e2	1.99e2	2.27e2	1.41e2
6507/3-4	Mud	3702	22094	0.00e0	0.00e0	8.26e3	6.08e3	2.91e3	9.95e2	4.11e2	3.55e2	2.01e3	4.68e2	4.35e2	2.27e2	2.11e2	1.22e2
6507/3-4	Mud	4060	22095	1.53e2	0.00e0	9.63e3	6.56e3	2.92e3	1.17e3	3.87e2	4.07e2	2.15e3	5.10e2	5.77e2	2.38e2	2.38e2	1.91e2

Table 20. continued, GCMS SIR of saturated compounds (amounts in ng/g)

Well	Sample type	Lower Depth	APT ID	29/3S	27Ts	27Tm	30/3R	30/3S	28αβ	25nor30αβ	29αβ	29Ts	30d	29βα	30O	30αβ	30βα
6507/3-4	COCH	3728.05	22021	2.58e3	1.64e4	2.22e4	9.16e2	1.63e3	7.37e3	4.61e3	6.79e4	1.05e4	6.82e3	7.32e3	0.00e0	1.12e5	2.16e4
6507/3-4	COCH	3734.40	22023	8.20e3	4.61e4	4.59e4	3.29e3	5.90e3	2.81e4	1.87e4	1.32e5	3.63e4	3.15e4	1.22e4	0.00e0	2.55e5	3.82e4
6507/3-4	COCH	3743.90	22025	5.84e3	3.75e4	2.30e4	1.78e3	3.49e3	1.64e4	9.87e3	6.79e4	2.30e4	1.63e4	5.87e3	0.00e0	1.14e5	1.39e4
6507/3-4	COCH	3754.85	22027	5.29e3	2.86e4	3.49e4	2.05e3	3.57e3	1.76e4	1.12e4	9.88e4	2.07e4	1.79e4	9.83e3	0.00e0	1.84e5	3.09e4
6507/3-4	COCH	3769	22030	1.95e3	1.52e4	1.83e4	6.38e2	1.31e3	4.30e3	1.42e3	6.27e4	8.72e3	2.65e3	6.79e3	0.00e0	8.22e4	1.73e4
6507/3-4	COCH	3792	22033	7.59e3	4.70e4	2.95e4	2.58e3	4.62e3	1.84e4	1.22e4	9.27e4	2.87e4	2.09e4	8.66e3	0.00e0	1.61e5	2.09e4
6507/3-4	COCH	3810.90	22037	8.42e3	4.94e4	3.33e4	2.67e3	4.98e3	1.96e4	1.46e4	1.08e5	2.78e4	2.41e4	1.00e4	0.00e0	2.04e5	2.86e4
6507/3-4	Oil	3726	22055	6.51e2	3.83e3	8.89e3	3.12e2	5.01e2	2.13e3	1.43e3	2.56e4	2.94e3	2.49e3	3.01e3	0.00e0	4.28e4	9.45e3
6507/3-4	DC	3183	22070	3.56e2	1.71e3	4.30e4	5.30e2	5.33e2	3.51e4	0.00e0	8.42e4	3.26e3	2.45e3	1.34e4	0.00e0	1.31e5	3.78e4
6507/3-4	DC	3342	22074	2.19e2	2.21e3	2.70e4	2.78e2	3.24e2	6.25e2	0.00e0	7.04e4	4.41e3	2.16e3	8.71e3	0.00e0	1.10e5	2.65e4
6507/3-4	DC	4074	22092	3.06e2	1.16e3	2.50e4	2.69e2	3.11e2	6.65e2	5.85e2	7.82e4	1.75e3	1.12e3	7.84e3	0.00e0	1.27e5	2.70e4
6507/3-4	Mud	2500	22093	1.64e2	3.25e2	8.33e3	0.00e0	0.00e0	3.04e2	0.00e0	2.63e4	6.05e2	0.00e0	2.83e3	0.00e0	4.12e4	9.70e3
6507/3-4	Mud	3702	22094	1.27e2	4.25e2	9.98e3	1.50e2	1.49e2	3.16e2	0.00e0	3.12e4	7.31e2	1.77e2	2.96e3	0.00e0	4.67e4	1.05e4
6507/3-4	Mud	4060	22095	1.57e2	5.16e2	1.07e4	0.00e0	0.00e0	2.99e2	2.84e2	3.34e4	9.88e2	1.70e2	3.47e3	0.00e0	4.99e4	1.20e4

Table 20. continued, GCMS SIR of saturated compounds (amounts in ng/g)

m/e				191									217				
Well	Sample type	Lower Depth	APT ID	31αβS	31αβR	30G	32αβS	32αβR	33αβS	33αβR	34αβS	34αβR	35αβS	35αβR	21αα	21ββ	22αα
6507/3-4	COCH	3728.05	22021	2.65e4	2.02e4	2.53e4	1.39e4	1.03e4	8.67e3	6.29e3	5.06e3	3.69e3	3.47e3	2.31e3	1.89e4	1.45e4	9.90e3
6507/3-4	COCH	3734.40	22023	6.98e4	5.48e4	3.04e4	4.51e4	3.06e4	2.77e4	1.90e4	1.81e4	1.32e4	1.24e4	8.45e3	1.11e4	1.34e4	9.77e3
6507/3-4	COCH	3743.90	22025	3.66e4	2.87e4	7.68e3	2.35e4	1.66e4	1.44e4	9.62e3	9.29e3	6.56e3	6.80e3	4.41e3	2.52e4	2.43e4	1.66e4
6507/3-4	COCH	3754.85	22027	4.44e4	3.44e4	3.12e4	2.76e4	1.93e4	1.66e4	1.14e4	1.07e4	7.74e3	7.26e3	4.89e3	8.57e3	1.01e4	7.82e3
6507/3-4	COCH	3769	22030	2.23e4	1.68e4	2.16e4	1.10e4	7.93e3	6.68e3	4.67e3	3.52e3	2.62e3	2.72e3	1.79e3	3.88e4	2.55e4	1.75e4
6507/3-4	COCH	3792	22033	4.87e4	3.87e4	1.72e4	3.04e4	2.10e4	1.94e4	1.31e4	1.21e4	9.19e3	9.01e3	5.99e3	3.87e4	3.17e4	2.28e4
6507/3-4	COCH	3810.90	22037	5.50e4	4.16e4	2.74e4	3.24e4	2.32e4	2.03e4	1.40e4	1.26e4	8.96e3	9.33e3	5.92e3	3.40e4	2.76e4	2.06e4
6507/3-4	Oil	3726	22055	8.93e3	7.02e3	1.15e4	4.49e3	3.43e3	2.86e3	2.05e3	1.59e3	1.17e3	1.13e3	7.47e2	9.02e2	1.14e3	7.45e2
6507/3-4	DC	3183	22070	4.29e4	2.95e4	3.00e4	1.62e4	1.16e4	9.23e3	6.47e3	6.70e3	4.49e3	4.89e3	3.14e3	2.34e3	1.23e3	7.55e2
6507/3-4	DC	3342	22074	3.14e4	2.26e4	2.69e4	1.30e4	9.19e3	7.98e3	5.69e3	4.55e3	3.30e3	2.30e3	1.50e3	6.27e2	6.13e2	2.99e2
6507/3-4	DC	4074	22092	1.77e4	1.36e4	4.03e4	6.78e3	4.94e3	3.83e3	2.87e3	1.63e3	1.22e3	1.00e3	6.70e2	4.29e2	5.36e2	2.32e2
6507/3-4	Mud	2500	22093	5.80e3	4.37e3	1.51e4	2.13e3	1.86e3	1.40e3	9.87e2	5.77e2	4.45e2	3.93e2	2.96e2	2.53e2	2.18e2	8.36e1
6507/3-4	Mud	3702	22094	6.23e3	4.93e3	1.59e4	2.37e3	1.65e3	1.35e3	1.00e3	5.65e2	4.31e2	3.76e2	2.73e2	1.97e2	2.00e2	7.60e1
6507/3-4	Mud	4060	22095	6.98e3	5.50e3	1.83e4	2.57e3	1.95e3	1.42e3	1.18e3	6.42e2	4.71e2	4.33e2	3.40e2	2.16e2	2.30e2	8.77e1

Table 20. continued, GCMS SIR of saturated compounds (amounts in ng/g)

Well	Sample type	Lower Depth	APT ID	22ββ	27dbS	27dbR	27daR	27daS	28dbS#1	28dbS#2	28dbR#1	28dbR#2	28daR	27ααS	27ββR+29dbS	27ββS	28daS
6507/3-4	COCH	3728.05	22021	5.62e3	1.16e4	8.28e3	2.64e3	3.44e3	4.50e3	4.67e3	2.78e3	3.40e3	2.32e3	3.84e3	8.29e3	5.30e3	1.78e3
6507/3-4	COCH	3734.40	22023	8.83e3	3.64e4	2.61e4	8.09e3	1.09e4	1.68e4	1.65e4	1.01e4	1.23e4	8.24e3	1.23e4	3.31e4	1.90e4	6.28e3
6507/3-4	COCH	3743.90	22025	1.28e4	3.01e4	2.13e4	7.13e3	8.87e3	1.21e4	1.20e4	6.97e3	8.30e3	5.62e3	8.60e3	2.04e4	1.25e4	4.23e3
6507/3-4	COCH	3754.85	22027	6.27e3	2.21e4	1.63e4	5.09e3	7.01e3	1.05e4	1.02e4	6.38e3	7.30e3	5.19e3	7.83e3	2.00e4	1.19e4	3.91e3
6507/3-4	COCH	3769	22030	8.40e3	9.22e3	6.24e3	2.33e3	2.84e3	3.02e3	2.95e3	1.79e3	2.11e3	1.43e3	4.09e3	4.09e3	3.36e3	1.06e3
6507/3-4	COCH	3792	22033	1.29e4	3.28e4	2.38e4	7.58e3	9.75e3	1.39e4	1.39e4	8.11e3	9.63e3	6.52e3	9.94e3	2.52e4	1.52e4	4.88e3
6507/3-4	COCH	3810.90	22037	1.19e4	3.54e4	2.60e4	8.18e3	1.06e4	1.55e4	1.50e4	9.10e3	1.10e4	7.54e3	1.00e4	2.92e4	1.56e4	5.50e3
6507/3-4	Oil	3726	22055	6.53e2	2.51e3	1.85e3	4.91e2	7.26e2	1.17e3	1.08e3	5.64e2	7.99e2	5.18e2	9.50e2	2.22e3	1.37e3	4.22e2
6507/3-4	DC	3183	22070	7.23e2	2.81e3	1.65e3	7.05e2	8.46e2	1.03e3	1.04e3	5.79e2	7.87e2	4.44e2	1.45e3	3.26e3	6.53e2	4.42e2
6507/3-4	DC	3342	22074	3.69e2	4.69e2	3.12e2	1.28e2	1.45e2	1.66e2	2.02e2	9.18e1	1.91e2	1.16e2	8.51e2	6.41e2	2.56e2	0.00e0
6507/3-4	DC	4074	22092	4.85e2	3.78e2	2.19e2	9.50e1	9.18e1	1.41e2	1.31e2	9.80e1	2.22e2	0.00e0	1.23e3	3.01e2	2.56e2	0.00e0
6507/3-4	Mud	2500	22093	1.96e2	1.21e2	9.84e1	5.22e1	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	3.52e2	1.22e2	1.06e2	0.00e0
6507/3-4	Mud	3702	22094	1.77e2	1.11e2	7.79e1	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	4.92e2	0.00e0	8.17e1	0.00e0
6507/3-4	Mud	4060	22095	2.00e2	1.61e2	1.27e2	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	0.00e0	5.17e2	1.35e2	1.22e2	0.00e0

Table 20. continued, GCMS SIR of saturated compounds (amounts in ng/g)

m/e 217

Well	Sample type	Lower Depth	APT ID	27 α R	29 δ R	29 δ aR	28 α S	29 δ aS	28 β R	28 β S	28 α R	29 α S	29 β R	29 β S	29 α R	30 α S	30 β R
6507/3-4	COCH	3728.05	22021	5.97e3	6.08e3	3.93e3	2.57e3	3.40e3	4.98e3	6.14e3	4.99e3	6.23e3	6.59e3	7.07e3	5.91e3	1.99e3	2.43e3
6507/3-4	COCH	3734.40	22023	1.47e4	2.38e4	1.40e4	6.90e3	1.31e4	1.67e4	2.37e4	1.09e4	2.10e4	2.79e4	2.80e4	1.57e4	8.20e3	1.08e4
6507/3-4	COCH	3743.90	22025	9.45e3	1.48e4	8.89e3	3.79e3	8.21e3	9.61e3	1.34e4	5.39e3	1.10e4	1.49e4	1.52e4	7.86e3	4.15e3	5.68e3
6507/3-4	COCH	3754.85	22027	1.03e4	1.47e4	9.02e3	4.72e3	8.11e3	1.10e4	1.48e4	8.11e3	1.30e4	1.58e4	1.69e4	1.08e4	4.88e3	6.42e3
6507/3-4	COCH	3769	22030	7.06e3	3.15e3	2.28e3	1.65e3	1.67e3	5.88e3	2.74e3	8.52e3	3.55e3	2.97e3	1.08e4	1.39e4	0.00e0	8.22e2
6507/3-4	COCH	3792	22033	1.63e4	1.76e4	1.06e4	4.89e3	9.43e3	1.42e4	1.57e4	1.25e4	1.38e4	1.86e4	2.13e4	2.17e4	0.00e0	7.29e3
6507/3-4	COCH	3810.90	22037	1.25e4	2.02e4	1.23e4	5.60e3	1.12e4	1.31e4	1.85e4	8.79e3	1.59e4	2.08e4	2.01e4	1.23e4	5.95e3	7.92e3
6507/3-4	Oil	3726	22055	1.84e3	1.75e3	1.09e3	8.11e2	9.59e2	1.69e3	1.82e3	1.76e3	2.06e3	1.99e3	2.07e3	1.83e3	5.97e2	7.10e2
6507/3-4	DC	3183	22070	3.69e3	2.22e3	1.09e3	1.12e3	1.46e3	2.10e3	1.13e3	3.15e3	2.89e3	1.48e3	4.08e3	4.43e3	9.04e2	2.48e2
6507/3-4	DC	3342	22074	2.12e3	6.09e2	3.64e2	6.39e2	3.01e2	1.18e3	5.44e2	2.19e3	1.70e3	7.21e2	8.36e2	2.51e3	0.00e0	1.63e2
6507/3-4	DC	4074	22092	3.10e3	4.48e2	4.80e2	9.92e2	0.00e0	1.76e3	9.19e2	3.59e3	2.12e3	8.00e2	8.83e2	3.35e3	0.00e0	0.00e0
6507/3-4	Mud	2500	22093	1.16e3	1.98e2	1.51e2	3.47e2	0.00e0	5.44e2	2.87e2	1.16e3	6.39e2	2.97e2	3.26e2	1.13e3	0.00e0	0.00e0
6507/3-4	Mud	3702	22094	1.17e3	1.76e2	1.86e2	3.33e2	9.98e1	5.74e2	2.98e2	1.10e3	6.39e2	2.22e2	2.95e2	1.03e3	0.00e0	0.00e0
6507/3-4	Mud	4060	22095	1.12e3	2.27e2	2.13e2	3.74e2	1.45e2	6.52e2	3.43e2	1.29e3	7.16e2	3.32e2	3.59e2	1.14e3	1.97e2	0.00e0

Table 20. continued, GCMS SIR of saturated compounds (amounts in ng/g)

m/e				217	218								
Well	Sample type	Lower Depth	APT ID	30βPS	30αR	27βR	27βS	28βR	28βS	29βR	29βS	30βR	30βS
6507/3-4	COCH	3728.05	22021	1.73e3	1.04e3	1.01e4	8.72e3	7.43e3	9.02e3	1.17e4	1.18e4	3.31e3	2.78e3
6507/3-4	COCH	3734.40	22023	8.48e3	4.59e3	3.63e4	3.13e4	2.71e4	3.31e4	4.90e4	4.74e4	1.55e4	1.35e4
6507/3-4	COCH	3743.90	22025	4.36e3	2.49e3	2.42e4	2.15e4	1.58e4	1.95e4	2.64e4	2.60e4	7.94e3	7.16e3
6507/3-4	COCH	3754.85	22027	4.94e3	2.67e3	2.17e4	1.99e4	1.72e4	2.11e4	2.88e4	2.89e4	9.12e3	7.57e3
6507/3-4	COCH	3769	22030	5.10e2	3.06e2	6.20e3	5.30e3	5.69e3	4.63e3	5.20e3	6.99e3	8.29e2	6.50e2
6507/3-4	COCH	3792	22033	5.52e3	2.89e3	2.77e4	2.44e4	1.98e4	2.27e4	3.25e4	3.27e4	1.00e4	8.59e3
6507/3-4	COCH	3810.90	22037	6.48e3	3.47e3	2.79e4	2.54e4	2.05e4	2.60e4	3.67e4	3.47e4	1.15e4	9.85e3
6507/3-4	Oil	3726	22055	5.63e2	2.74e2	2.64e3	2.24e3	2.35e3	2.67e3	3.48e3	3.51e3	9.45e2	8.06e2
6507/3-4	DC	3183	22070	0.00e0	3.75e2	1.11e3	1.03e3	2.07e3	1.64e3	2.24e3	3.03e3	2.48e2	2.07e2
6507/3-4	DC	3342	22074	0.00e0	1.48e2	4.38e2	3.39e2	1.16e3	9.11e2	1.20e3	1.11e3	1.26e2	0.00e0
6507/3-4	DC	4074	22092	0.00e0	0.00e0	4.83e2	4.21e2	1.76e3	1.45e3	1.38e3	1.47e3	0.00e0	0.00e0
6507/3-4	Mud	2500	22093	0.00e0	0.00e0	1.71e2	1.68e2	5.72e2	4.83e2	4.46e2	4.09e2	0.00e0	0.00e0
6507/3-4	Mud	3702	22094	0.00e0	0.00e0	1.71e2	1.83e2	6.01e2	4.82e2	4.31e2	4.55e2	0.00e0	0.00e0
6507/3-4	Mud	4060	22095	0.00e0	0.00e0	2.03e2	1.74e2	6.81e2	5.15e2	4.62e2	5.34e2	0.00e0	0.00e0

Table 21. GCMS SIR of aromatic compounds (peak height)

m/e				142		156				170							
Well	Sample type	Lower Depth	APT ID	2-MN	1-MN	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	1,3,7-TMN	1,3,6-TMN
6507/3-4	COCH	3728.05	22021	3.25e7	2.58e7	8.13e6	3.13e6	3.52e7	3.36e7	8.11e7	5.89e7	2.35e7	1.15e7	8.70e6	3.15e4	3.92e7	5.26e7
6507/3-4	COCH	3734.40	22023	5.42e7	3.76e7	9.82e6	3.43e6	4.66e7	4.59e7	1.07e8	7.60e7	3.12e7	1.51e7	1.25e7	4.39e4	5.99e7	8.08e7
6507/3-4	COCH	3743.90	22025	1.36e8	8.69e7	1.91e7	6.21e6	8.03e7	7.83e7	1.84e8	1.34e8	5.19e7	2.45e7	1.98e7	5.52e4	7.56e7	1.02e8
6507/3-4	COCH	3754.85	22027	2.53e8	1.44e8	2.68e7	8.37e6	1.06e8	1.04e8	2.17e8	1.67e8	6.84e7	3.08e7	2.48e7	5.55e4	8.12e7	1.04e8
6507/3-4	COCH	3769	22030	5.18e7	2.73e7	2.96e6	1.27e6	1.04e7	1.07e7	2.14e7	1.67e7	6.65e6	3.27e6	2.80e6	6.36e3	4.33e6	5.96e6
6507/3-4	COCH	3792	22033	7.18e7	4.98e7	1.13e7	4.57e6	4.14e7	4.19e7	1.11e8	7.88e7	3.19e7	1.54e7	1.36e7	3.01e4	4.30e7	6.19e7
6507/3-4	COCH	3810.90	22037	2.39e8	1.60e8	3.79e7	1.33e7	1.36e8	1.41e8	3.28e8	2.40e8	9.70e7	4.89e7	4.22e7	1.30e5	1.41e8	1.86e8
6507/3-4	Oil	3726	22055	3.14e8	1.85e8	2.43e7	1.18e7	7.20e7	7.06e7	1.55e8	1.07e8	3.92e7	1.92e7	1.41e7	6.10e4	3.88e7	4.93e7
6507/3-4	DC	3183	22070	2.85e8	2.26e8	4.36e7	3.33e7	4.54e7	5.00e7	1.47e8	1.20e8	5.85e7	2.45e7	3.39e7	1.90e6	1.95e7	3.17e7
6507/3-4	DC	3342	22074	4.47e8	3.36e8	4.40e7	2.98e7	5.46e7	6.52e7	1.67e8	1.54e8	6.63e7	2.49e7	3.70e7	7.93e5	1.93e7	3.04e7
6507/3-4	DC	4074	22092	4.04e8	2.43e8	2.64e7	1.47e7	8.51e7	8.43e7	1.87e8	1.37e8	5.95e7	2.62e7	2.14e7	9.20e4	3.77e7	5.26e7
6507/3-4	Mud	2500	22093	1.93e7	1.68e7	3.02e6	3.07e6	3.81e6	4.45e6	8.54e6	5.59e6	2.01e6	1.31e6	8.33e5	1.52e4	5.80e5	1.30e6
6507/3-4	Mud	3702	22094	4.25e7	3.84e7	6.05e6	6.69e6	6.73e6	8.50e6	1.92e7	1.13e7	4.22e6	2.93e6	1.83e6	2.88e4	1.15e6	1.82e6
6507/3-4	Mud	4060	22095	3.71e7	3.55e7	5.81e6	6.45e6	6.29e6	7.88e6	1.82e7	1.06e7	3.83e6	2.83e6	1.69e6	2.94e4	1.19e6	1.73e6

Table 21. continued, GCMS SIR of aromatic compounds (peak height)

m/e				170						178	192	206					
Well	Sample type	Lower Depth	APT ID	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	P	3-MP	2-MP	9-MP	1-MP	2-EP+9-EP+3,6-DMP	1-EP	2,6- + 2,7- + 3,5-DMP
6507/3-4	COCH	3728.05	22021	3.52e7	3.37e7	7.37e6	2.55e7	3.80e6	1.17e7	6.11e7	3.41e7	3.95e7	5.07e7	3.56e7	6.32e6	1.18e7	6.92e6
6507/3-4	COCH	3734.40	22023	6.03e7	5.54e7	1.19e7	4.83e7	6.39e6	1.95e7	1.70e8	1.14e8	1.31e8	1.78e8	1.25e8	2.38e7	4.11e7	2.55e7
6507/3-4	COCH	3743.90	22025	7.23e7	6.71e7	1.40e7	5.28e7	7.37e6	2.21e7	1.34e8	7.68e7	8.91e7	1.15e8	8.50e7	1.37e7	2.48e7	1.50e7
6507/3-4	COCH	3754.85	22027	7.62e7	7.48e7	1.50e7	6.06e7	7.51e6	2.81e7	1.76e8	8.53e7	1.06e8	1.36e8	1.06e8	1.43e7	2.50e7	1.58e7
6507/3-4	COCH	3769	22030	4.17e6	4.27e6	1.05e6	3.46e6	4.64e5	2.15e6	2.21e7	5.88e6	7.98e6	9.46e6	7.25e6	6.71e5	1.12e6	6.62e5
6507/3-4	COCH	3792	22033	4.33e7	3.81e7	9.24e6	3.36e7	4.81e6	1.67e7	1.14e8	6.42e7	7.02e7	9.57e7	7.46e7	1.06e7	1.74e7	9.79e6
6507/3-4	COCH	3810.90	22037	1.37e8	1.27e8	2.94e7	1.12e8	1.47e7	4.97e7	2.72e8	1.33e8	1.56e8	2.05e8	1.61e8	2.21e7	3.72e7	2.26e7
6507/3-4	Oil	3726	22055	3.34e7	3.23e7	7.04e6	2.42e7	3.46e6	1.04e7	5.25e7	2.34e7	2.57e7	3.24e7	2.48e7	3.96e6	6.84e6	4.08e6
6507/3-4	DC	3183	22070	2.71e7	1.82e7	1.11e7	2.12e7	8.71e6	3.84e7	1.00e8	3.06e7	2.92e7	6.64e7	4.52e7	6.16e6	7.93e6	2.77e6
6507/3-4	DC	3342	22074	2.45e7	2.14e7	1.06e7	2.33e7	6.79e6	5.58e7	1.78e8	4.00e7	4.57e7	6.25e7	5.60e7	5.31e6	7.23e6	3.21e6
6507/3-4	DC	4074	22092	3.49e7	3.93e7	8.87e6	3.13e7	4.30e6	1.81e7	2.15e8	6.72e7	9.25e7	9.37e7	6.86e7	7.81e6	1.58e7	1.08e7
6507/3-4	Mud	2500	22093	7.01e5	5.06e5	2.18e5	3.92e5	5.51e4	2.12e5	2.92e5	8.54e4	1.15e5	1.29e5	9.35e4	2.43e4	2.96e4	2.27e4
6507/3-4	Mud	3702	22094	1.26e6	1.06e6	3.84e5	8.77e5	1.63e5	1.07e6	1.90e6	4.69e5	5.04e5	5.61e5	4.76e5	6.77e4	9.16e4	5.60e4
6507/3-4	Mud	4060	22095	1.21e6	1.05e6	3.74e5	8.77e5	1.61e5	9.42e5	2.04e6	5.16e5	6.09e5	7.25e5	5.71e5	8.04e4	1.19e5	6.75e4

Table 21 continued, GCMS SIR of aromatic compounds (peak height)

m/e				206	206					219	184	198			253		
Well	Sample type	Lower Depth	APT ID	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	Retene	DBT	4-MDBT	(3+2)-MDBT	1-MDBT	C21MA	C22MA
6507/3-4	COCH	3728.05	22021	4.35e7	1.98e7	2.25e7	7.00e6	1.16e7	4.68e6	2.73e6	6.87e6	5.41e6	1.11e7	5.83e6	2.26e6	5.69e5	4.67e5
6507/3-4	COCH	3734.40	22023	1.65e8	7.63e7	8.16e7	2.69e7	4.69e7	1.83e7	1.09e7	2.41e7	1.44e7	3.67e7	2.00e7	7.54e6	2.09e6	1.82e6
6507/3-4	COCH	3743.90	22025	9.38e7	4.55e7	4.80e7	1.57e7	2.79e7	1.09e7	6.35e6	1.34e7	1.24e7	2.68e7	1.40e7	5.40e6	1.26e6	9.98e5
6507/3-4	COCH	3754.85	22027	1.01e8	4.80e7	5.91e7	1.68e7	3.04e7	1.28e7	7.78e6	1.53e7	1.62e7	3.49e7	1.68e7	6.43e6	1.32e6	1.08e6
6507/3-4	COCH	3769	22030	3.93e6	1.95e6	2.48e6	8.44e5	1.29e6	5.19e5	4.42e5	1.03e6	1.31e6	1.64e6	6.44e5	2.42e5	9.86e3	7.93e3
6507/3-4	COCH	3792	22033	6.98e7	3.33e7	3.87e7	1.23e7	2.23e7	9.35e6	5.92e6	9.93e6	7.62e6	1.80e7	8.86e6	3.73e6	1.22e6	1.02e6
6507/3-4	COCH	3810.90	22037	1.53e8	7.41e7	8.57e7	2.58e7	4.81e7	1.99e7	1.16e7	1.98e7	1.60e7	3.53e7	1.52e7	6.36e6	3.05e6	2.09e6
6507/3-4	Oil	3726	22055	2.58e7	1.21e7	1.30e7	4.42e6	7.13e6	2.88e6	1.71e6	3.65e6	5.53e6	9.29e6	4.90e6	1.91e6	2.56e5	2.22e5
6507/3-4	DC	3183	22070	2.42e7	1.38e7	1.53e7	6.13e6	9.26e6	4.94e6	6.30e6	3.02e7	2.33e7	1.08e7	1.06e7	1.07e7	1.56e6	8.75e5
6507/3-4	DC	3342	22074	2.25e7	1.26e7	1.78e7	6.18e6	8.09e6	4.58e6	5.16e6	6.78e7	7.75e6	3.34e6	3.01e6	1.44e6	2.12e5	1.62e5
6507/3-4	DC	4074	22092	4.83e7	2.60e7	2.43e7	1.26e7	1.48e7	5.57e6	5.19e6	2.86e6	9.79e6	8.32e6	5.90e6	1.85e6	3.71e4	3.27e4
6507/3-4	Mud	2500	22093	1.30e5	6.56e4	9.96e4	1.83e4	2.64e4	1.34e4	8.79e3	9.37e4	1.18e4	1.87e4	6.57e3	5.97e3	4.67e3	5.93e3
6507/3-4	Mud	3702	22094	2.70e5	1.36e5	1.78e5	5.87e4	7.00e4	3.05e4	3.92e4	1.87e5	5.36e4	5.94e4	1.19e4	1.23e4	6.62e3	7.86e3
6507/3-4	Mud	4060	22095	3.55e5	1.74e5	2.18e5	7.64e4	9.33e4	3.72e4	4.42e4	2.25e5	6.81e4	8.61e4	2.43e4	2.18e4	8.61e3	7.21e3

Table 21. continued, GCMS SIR of aromatic compounds (peak height)

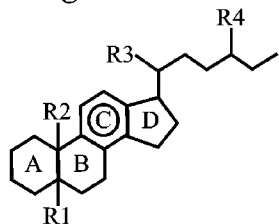
Well	Sample type	Lower Depth	APT ID	253												231	
m/e				bSC27MA	bSC27DMA	bRC27MA+ bRC27DMA	aSC27MA	bSC28MA+ bSC28DMA+ aRC27DMA	aSC27DMA	aRC27MA	aSC28MA	bRC28MA+ bRC28DMA	bSC29MA+ bSC29DMA	aSC29MA	aRC28MA+ bRC29MA+ bRC29DMA	aRC29MA	C20TA
6507/3-4	COCH	3728.05	22021	1.05e5	2.72e5	2.35e5	1.07e5	4.79e5	9.87e4	8.04e4	1.83e5	2.91e5	4.23e5	1.56e5	2.84e5	1.07e5	1.23e6
6507/3-4	COCH	3734.40	22023	3.48e5	9.31e5	8.13e5	3.99e5	1.43e6	3.72e5	3.24e5	5.24e5	9.75e5	1.45e6	3.54e5	8.94e5	2.38e5	4.68e6
6507/3-4	COCH	3743.90	22025	1.87e5	5.17e5	4.32e5	2.15e5	7.70e5	2.06e5	1.73e5	2.83e5	5.32e5	7.82e5	1.89e5	4.88e5	1.11e5	2.46e6
6507/3-4	COCH	3754.85	22027	1.57e5	4.63e5	3.97e5	2.09e5	7.25e5	1.91e5	1.77e5	3.08e5	4.97e5	7.36e5	1.99e5	4.59e5	1.36e5	2.87e6
6507/3-4	COCH	3769	22030	9.69e3	2.24e4	1.90e4	6.73e3	5.05e4	5.28e3	5.69e3	1.76e4	2.24e4	3.33e4	1.63e4	2.41e4	1.10e4	3.20e4
6507/3-4	COCH	3792	22033	1.65e5	3.84e5	3.09e5	2.03e5	5.80e5	1.63e5	1.55e5	2.80e5	4.09e5	6.06e5	1.64e5	3.62e5	1.09e5	2.74e6
6507/3-4	COCH	3810.90	22037	3.19e5	6.18e5	5.40e5	3.68e5	9.79e5	2.98e5	2.98e5	4.46e5	6.59e5	1.09e6	3.03e5	6.00e5	1.89e5	6.24e6
6507/3-4	Oil	3726	22055	5.98e4	1.33e5	1.19e5	5.46e4	2.67e5	6.24e4	4.41e4	9.49e4	1.50e5	2.26e5	7.44e4	1.44e5	6.35e4	7.04e5
6507/3-4	DC	3183	22070	3.10e5	3.68e6	2.83e6	3.48e5	5.30e6	1.06e6	2.60e5	6.63e5	3.30e6	6.17e6	4.67e5	3.88e6	2.94e5	2.47e6
6507/3-4	DC	3342	22074	3.94e4	2.79e5	2.08e5	3.23e4	5.06e5	9.62e4	3.16e4	9.29e4	3.24e5	6.82e5	8.43e4	4.54e5	6.71e4	1.37e6
6507/3-4	DC	4074	22092	2.20e4	3.91e4	2.54e4	1.60e4	8.94e4	1.37e4	1.71e4	6.57e4	6.05e4	7.75e4	5.16e4	5.43e4	3.77e4	2.00e5
6507/3-4	Mud	2500	22093	4.76e3	5.01e3	5.93e3	5.17e3	1.77e4	0.00e0	3.42e3	2.04e4	1.38e4	2.09e4	1.44e4	1.58e4	1.53e4	8.44e3
6507/3-4	Mud	3702	22094	5.98e3	1.21e4	8.83e3	5.33e3	2.17e4	0.00e0	3.53e3	1.80e4	1.90e4	1.89e4	1.60e4	1.38e4	1.29e4	1.57e4
6507/3-4	Mud	4060	22095	8.11e3	1.13e4	1.07e4	5.82e3	3.02e4	0.00e0	5.25e3	2.00e4	2.10e4	2.47e4	1.79e4	1.80e4	1.46e4	1.62e4

Table 21. continued, GCMS SIR of aromatic compounds (peak height)
m/e 231

Well	Sample type	Lower Depth	APT ID	C21TA	SC26TA	RC26TA+ SC27TA	SC28TA	RC27TA	RC28TA
6507/3-4	COCH	3728.05	22021	1.43e6	1.86e5	7.03e5	4.83e5	3.22e5	5.07e5
6507/3-4	COCH	3734.40	22023	5.64e6	5.66e5	1.92e6	1.27e6	8.90e5	1.31e6
6507/3-4	COCH	3743.90	22025	2.98e6	2.70e5	9.07e5	5.96e5	4.32e5	6.31e5
6507/3-4	COCH	3754.85	22027	3.12e6	3.90e5	1.20e6	7.02e5	5.17e5	7.71e5
6507/3-4	COCH	3769	22030	2.59e4	9.69e3	5.24e4	3.19e4	2.30e4	3.55e4
6507/3-4	COCH	3792	22033	2.86e6	2.53e5	6.21e5	3.87e5	2.54e5	3.75e5
6507/3-4	COCH	3810.90	22037	5.16e6	4.26e5	1.06e6	7.24e5	4.77e5	7.01e5
6507/3-4	Oil	3726	22055	8.01e5	1.04e5	4.02e5	2.76e5	1.91e5	2.84e5
6507/3-4	DC	3183	22070	1.56e6	3.56e6	8.45e6	4.50e6	3.12e6	4.96e6
6507/3-4	DC	3342	22074	9.59e5	7.98e5	2.01e6	1.38e6	8.21e5	1.46e6
6507/3-4	DC	4074	22092	2.15e5	7.69e4	3.05e5	2.14e5	1.53e5	2.19e5
6507/3-4	Mud	2500	22093	6.12e3	1.14e4	6.49e4	4.11e4	2.70e4	4.45e4
6507/3-4	Mud	3702	22094	9.41e3	1.20e4	5.97e4	4.55e4	2.61e4	4.22e4
6507/3-4	Mud	4060	22095	1.38e4	1.64e4	6.71e4	4.24e4	3.04e4	4.53e4

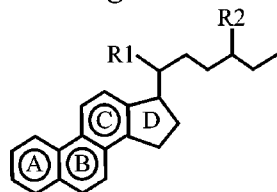
Abbreviation of aromatic biomarkers

C-ring monoaromatic steroid



R ₁	Substituents			Label
	R ₂	R ₃	R ₄	
				C ₂₁ MA
				C ₂₂ MA
β(H)	CH ₃	S(CH ₃)	H	βSC ₂₇ MA
β(CH ₃)	H	S(CH ₃)	H	βSC ₂₇ DMA
β(CH ₃)	H	RCH ₃	H	βRC ₂₇ DMA+
β(H)	CH ₃	R(CH ₃)	H	βRC ₂₇ MA
α(H)	CH ₃	S(CH ₃)	H	αSC ₂₇ MA
β(H)	CH ₃	S(CH ₃)	CH ₃	βSC ₂₈ MA+
α(CH ₃)	H	R(CH ₃)	H	αRC ₂₇ DMA+
β(CH ₃)	H	S(CH ₃)	CH ₃	βSC ₂₈ DMA
α(CH ₃)	H	S(CH ₃)	CH ₃	αSC ₂₇ DMA
α(H)	CH ₃	R(CH ₃)	H	αRC ₂₇ MA
α(H)	CH ₃	S(CH ₃)	CH ₃	αSC ₂₈ MA
β(H)	CH ₃	R(CH ₃)	CH ₃	βRC ₂₈ MA+
β(CH ₃)	H	R(CH ₃)	CH ₃	βRC ₂₈ DMA
β(H)	CH ₃	S(CH ₃)	C ₂ H ₅	βSC ₂₉ MA+
β(CH ₃)	H	S(CH ₃)	C ₂ H ₅	βSC ₂₉ DMA
α(H)	CH ₃	S(CH ₃)	C ₂ H ₅	αSC ₂₉ MA
α(H)	CH ₃	R(CH ₃)	CH ₃	αRC ₂₈ MA+
β(H)	CH ₃	R(CH ₃)	C ₂ H ₅	βRC ₂₉ MA+
β(CH ₃)	H	R(CH ₃)	C ₂ H ₅	βRC ₂₉ DMA
α(H)	CH ₃	R(CH ₃)	C ₂ H ₅	αRC ₂₉ MA

ABC-ring triaromatic steroids



Substituents		Label
R ₁	R ₂	
CH ₃	H	C ₂₀ TA
CH ₃	CH ₃	C ₂₁ TA
S(CH ₃)	C ₆ H ₁₃	SC ₂₆ TA
R(CH ₃)	C ₆ H ₁₃	RC ₂₆ TA+
S(CH ₃)	C ₇ H ₁₅	SC ₂₇ TA
S(CH ₃)	C ₈ H ₁₇	SC ₂₈ TA
R(CH ₃)	C ₇ H ₁₅	RC ₂₇ TA
R(CH ₃)	C ₈ H ₁₇	RC ₂₈ TA

Polycyclic aromatic hydrocarbons and sulphur compounds

MN	Methylnaphthalene
EN	Ethyl naphthalene
DMN	Dimethylnaphthalene
TMN	Trimethylnaphthalene
P	Phenanthrene
MP	Methylphenanthrene
EP	Ethylphenanthrene
DMP	Dimethylphenanthrene
DBT	Dibenzothiophene
MDBT	Methyldibenzothiophene

Table 22. GCMS SIR of aromatic compounds (amounts in ng/g)

m/c				142		156										170	
Well	Sample type	Lower Depth	APT ID	2-MN	1-MN	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	1,3,7-TMN	1,3,6-TMN
6507/3-4	COCH	3728.05	22021	1.38e4	1.10e4	3.46e3	1.33e3	1.49e4	1.43e4	3.45e4	2.50e4	9.97e3	4.87e3	3.70e3	1.34e1	1.67e4	2.24e4
6507/3-4	COCH	3734.40	22023	4.11e4	2.85e4	7.44e3	2.60e3	3.53e4	3.48e4	8.10e4	5.77e4	2.37e4	1.15e4	9.48e3	3.33e1	4.54e4	6.13e4
6507/3-4	COCH	3743.90	22025	9.46e4	6.03e4	1.32e4	4.31e3	5.57e4	5.43e4	1.28e5	9.28e4	3.60e4	1.70e4	1.38e4	3.83e1	5.24e4	7.10e4
6507/3-4	COCH	3754.85	22027	1.98e5	1.13e5	2.10e4	6.57e3	8.34e4	8.18e4	1.70e5	1.31e5	5.37e4	2.42e4	1.95e4	4.36e1	6.38e4	8.18e4
6507/3-4	COCH	3769	22030	7.05e4	3.72e4	4.03e3	1.73e3	1.42e4	1.45e4	2.91e4	2.27e4	9.06e3	4.45e3	3.81e3	8.65e0	5.90e3	8.12e3
6507/3-4	COCH	3792	22033	6.05e4	4.20e4	9.50e3	3.85e3	3.49e4	3.53e4	9.33e4	6.64e4	2.69e4	1.29e4	1.14e4	2.54e1	3.62e4	5.21e4
6507/3-4	COCH	3810.90	22037	1.55e5	1.03e5	2.45e4	8.57e3	8.79e4	9.09e4	2.12e5	1.55e5	6.27e4	3.16e4	2.73e4	8.42e1	9.08e4	1.20e5
6507/3-4	Oil	3726	22055	9.32e4	5.50e4	7.22e3	3.50e3	2.14e4	2.10e4	4.60e4	3.20e4	1.16e4	5.72e3	4.19e3	1.81e1	1.15e4	1.47e4
6507/3-4	DC	3183	22070	1.06e5	8.44e4	1.63e4	1.24e4	1.69e4	1.86e4	5.50e4	4.49e4	2.18e4	9.16e3	1.26e4	7.11e2	7.27e3	1.18e4
6507/3-4	DC	3342	22074	1.17e5	8.79e4	1.15e4	7.81e3	1.43e4	1.71e4	4.37e4	4.03e4	1.74e4	6.52e3	9.68e3	2.08e2	5.04e3	7.96e3
6507/3-4	DC	4074	22092	1.39e5	8.36e4	9.06e3	5.04e3	2.92e4	2.90e4	6.42e4	4.71e4	2.04e4	8.99e3	7.36e3	3.16e1	1.29e4	1.81e4
6507/3-4	Mud	2500	22093	3.83e3	3.34e3	6.00e2	6.10e2	7.56e2	8.84e2	1.70e3	1.11e3	3.99e2	2.61e2	1.65e2	3.01e0	1.15e2	2.57e2
6507/3-4	Mud	3702	22094	9.66e3	8.73e3	1.37e3	1.52e3	1.53e3	1.93e3	4.36e3	2.58e3	9.58e2	6.65e2	4.16e2	6.55e0	2.61e2	4.15e2
6507/3-4	Mud	4060	22095	1.04e4	9.90e3	1.62e3	1.80e3	1.75e3	2.20e3	5.09e3	2.95e3	1.07e3	7.89e2	4.71e2	8.21e0	3.33e2	4.82e2

Table 22. continued, GCMS SIR of aromatic compounds (amounts in ng/g)

m/e				170					178		192			206			
Well	Sample type	Lower Depth	APT ID	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	P	3-MP	2-MP	9-MP	1-MP	2-EP+9-EP+3,6-DMP	1-EP	2,6- + 2,7- + 3,5-DMP
6507/3-4	COCH	3728.05	22021	1.50e4	1.43e4	3.13e3	1.08e4	1.61e3	4.96e3	2.83e4	1.58e4	1.83e4	2.35e4	1.65e4	2.93e3	5.45e3	3.21e3
6507/3-4	COCH	3734.40	22023	4.57e4	4.20e4	9.04e3	3.66e4	4.84e3	1.48e4	1.39e5	9.30e4	1.07e5	1.46e5	1.02e5	1.94e4	3.36e4	2.08e4
6507/3-4	COCH	3743.90	22025	5.02e4	4.66e4	9.72e3	3.67e4	5.11e3	1.53e4	9.33e4	5.34e4	6.19e4	8.03e4	5.91e4	9.55e3	1.72e4	1.04e4
6507/3-4	COCH	3754.85	22027	5.99e4	5.88e4	1.18e4	4.76e4	5.90e3	2.21e4	1.47e5	7.13e4	8.90e4	1.13e5	8.86e4	1.20e4	2.09e4	1.32e4
6507/3-4	COCH	3769	22030	5.68e3	5.82e3	1.42e3	4.71e3	6.32e2	2.92e3	2.91e4	7.74e3	1.05e4	1.25e4	9.55e3	8.83e2	1.47e3	8.72e2
6507/3-4	COCH	3792	22033	3.65e4	3.21e4	7.78e3	2.83e4	4.05e3	1.41e4	9.34e4	5.26e4	5.75e4	7.84e4	6.11e4	8.73e3	1.42e4	8.03e3
6507/3-4	COCH	3810.90	22037	8.87e4	8.17e4	1.90e4	7.21e4	9.53e3	3.21e4	1.72e5	8.47e4	9.90e4	1.30e5	1.02e5	1.40e4	2.36e4	1.44e4
6507/3-4	Oil	3726	22055	9.92e3	9.61e3	2.09e3	7.18e3	1.03e3	3.08e3	1.48e4	6.60e3	7.26e3	9.16e3	7.02e3	1.12e3	1.93e3	1.15e3
6507/3-4	DC	3183	22070	1.01e4	6.81e3	4.13e3	7.91e3	3.25e3	1.43e4	4.15e4	1.27e4	1.21e4	2.75e4	1.87e4	2.55e3	3.28e3	1.15e3
6507/3-4	DC	3342	22074	6.41e3	5.59e3	2.76e3	6.09e3	1.78e3	1.46e4	5.46e4	1.23e4	1.40e4	1.92e4	1.72e4	1.63e3	2.22e3	9.84e2
6507/3-4	DC	4074	22092	1.20e4	1.35e4	3.05e3	1.07e4	1.48e3	6.22e3	8.89e4	2.78e4	3.82e4	3.88e4	2.84e4	3.23e3	6.52e3	4.47e3
6507/3-4	Mud	2500	22093	1.39e2	1.01e2	4.33e1	7.79e1	1.10e1	4.22e1	7.22e1	2.11e1	2.84e1	3.19e1	2.31e1	6.00e0	7.32e0	5.62e0
6507/3-4	Mud	3702	22094	2.86e2	2.40e2	8.72e1	1.99e2	3.70e1	2.44e2	5.70e2	1.40e2	1.51e2	1.68e2	1.43e2	2.03e1	2.74e1	1.68e1
6507/3-4	Mud	4060	22095	3.37e2	2.92e2	1.04e2	2.45e2	4.50e1	2.63e2	6.73e2	1.71e2	2.01e2	2.40e2	1.89e2	2.66e1	3.93e1	2.23e1

Table 22. continued, GCMS SIR of aromatic compounds (amounts in ng/g)

m/e				206	206					219	184	198			253		
Well	Sample type	Lower Depth	APT ID	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	Retene	DBT	4-MDBT	(3+2)-MDBT	1-MDBT	C21MA	C22MA
6507/3-4	COCH	3728.05	22021	2.02e4	9.18e3	1.04e4	3.24e3	5.35e3	2.17e3	1.26e3	3.18e3	2.51e3	5.14e3	2.70e3	1.05e3	2.64e2	2.16e2
6507/3-4	COCH	3734.40	22023	1.35e5	6.23e4	6.66e4	2.19e4	3.83e4	1.49e4	8.89e3	1.96e4	1.17e4	3.00e4	1.63e4	6.16e3	1.70e3	1.49e3
6507/3-4	COCH	3743.90	22025	6.52e4	3.16e4	3.34e4	1.09e4	1.94e4	7.60e3	4.41e3	9.34e3	8.60e3	1.86e4	9.72e3	3.75e3	8.76e2	6.94e2
6507/3-4	COCH	3754.85	22027	8.40e4	4.02e4	4.94e4	1.40e4	2.54e4	1.07e4	6.50e3	1.28e4	1.35e4	2.91e4	1.41e4	5.37e3	1.11e3	9.01e2
6507/3-4	COCH	3769	22030	5.17e3	2.56e3	3.26e3	1.11e3	1.70e3	6.82e2	5.82e2	1.36e3	1.72e3	2.16e3	8.47e2	3.18e2	1.30e1	1.04e1
6507/3-4	COCH	3792	22033	5.72e4	2.73e4	3.18e4	1.01e4	1.82e4	7.67e3	4.85e3	8.14e3	6.25e3	1.48e4	7.26e3	3.06e3	1.00e3	8.37e2
6507/3-4	COCH	3810.90	22037	9.73e4	4.70e4	5.44e4	1.64e4	3.05e4	1.26e4	7.34e3	1.26e4	1.01e4	2.24e4	9.67e3	4.04e3	1.94e3	1.33e3
6507/3-4	Oil	3726	22055	7.30e3	3.41e3	3.67e3	1.25e3	2.01e3	8.13e2	4.84e2	1.03e3	1.56e3	2.63e3	1.38e3	5.41e2	7.24e1	6.28e1
6507/3-4	DC	3183	22070	1.00e4	5.70e3	6.33e3	2.54e3	3.84e3	2.05e3	2.61e3	1.25e4	9.64e3	4.49e3	4.39e3	4.42e3	6.44e2	3.62e2
6507/3-4	DC	3342	22074	6.89e3	3.86e3	5.45e3	1.90e3	2.48e3	1.40e3	1.58e3	2.08e4	2.38e3	1.02e3	9.22e2	4.41e2	6.50e1	4.98e1
6507/3-4	DC	4074	22092	2.00e4	1.08e4	1.00e4	5.20e3	6.12e3	2.31e3	2.15e3	1.18e3	4.05e3	3.44e3	2.44e3	7.67e2	1.54e1	1.35e1
6507/3-4	Mud	2500	22093	3.21e1	1.62e1	2.46e1	4.54e0	6.53e0	3.31e0	2.17e0	2.32e1	2.91e0	4.63e0	1.62e0	1.48e0	1.16e0	1.47e0
6507/3-4	Mud	3702	22094	8.08e1	4.07e1	5.33e1	1.76e1	2.10e1	9.12e0	1.17e1	5.59e1	1.60e1	1.78e1	3.57e0	3.67e0	1.98e0	2.35e0
6507/3-4	Mud	4060	22095	1.17e2	5.74e1	7.21e1	2.52e1	3.08e1	1.23e1	1.46e1	7.45e1	2.25e1	2.85e1	8.04e0	7.22e0	2.85e0	2.38e0

Table 22. continued, GCMS SIR of aromatic compounds (amounts in ng/g)

Well	Sample type	Lower Depth	APT ID	m/e 253													231
				bSC27MA	bSC27DMA	bRC27MA+bRC27DMA	aSC27MA	bSC28MA+bSC28DMA+aRC27DMA	aSC27DMA	aRC27MA	aSC28MA	bRC28MA+bRC28DMA	bSC29MA+bSC29DMA	aSC29MA	aRC28MA+bRC29MA+bRC29DMA	aRC29MA	C20TA
6507/3-4	COCH	3728.05	22021	4.87e1	1.26e2	1.09e2	4.96e1	2.22e2	4.58e1	3.72e1	8.47e1	1.35e2	1.96e2	7.23e1	1.32e2	4.97e1	5.70e2
6507/3-4	COCH	3734.40	22023	2.84e2	7.60e2	6.63e2	3.26e2	1.16e3	3.04e2	2.64e2	4.27e2	7.96e2	1.18e3	2.89e2	7.30e2	1.95e2	3.82e3
6507/3-4	COCH	3743.90	22025	1.30e2	3.60e2	3.00e2	1.50e2	5.35e2	1.43e2	1.21e2	1.97e2	3.70e2	5.44e2	1.32e2	3.39e2	7.69e1	1.71e3
6507/3-4	COCH	3754.85	22027	1.31e2	3.87e2	3.31e2	1.75e2	6.06e2	1.60e2	1.48e2	2.58e2	4.16e2	6.15e2	1.66e2	3.84e2	1.13e2	2.40e3
6507/3-4	COCH	3769	22030	1.27e1	2.95e1	2.50e1	8.86e0	6.65e1	6.95e0	7.49e0	2.31e1	2.94e1	4.38e1	2.15e1	3.17e1	1.45e1	4.21e1
6507/3-4	COCH	3792	22033	1.35e2	3.15e2	2.53e2	1.66e2	4.76e2	1.33e2	1.27e2	2.30e2	3.35e2	4.97e2	1.35e2	2.97e2	8.95e1	2.24e3
6507/3-4	COCH	3810.90	22037	2.03e2	3.92e2	3.43e2	2.34e2	6.21e2	1.89e2	1.89e2	2.83e2	4.18e2	6.93e2	1.92e2	3.81e2	1.20e2	3.96e3
6507/3-4	Oil	3726	22055	1.69e1	3.77e1	3.36e1	1.55e1	7.54e1	1.76e1	1.25e1	2.68e1	4.24e1	6.38e1	2.10e1	4.07e1	1.80e1	1.99e2
6507/3-4	DC	3183	22070	1.28e2	1.53e3	1.17e3	1.44e2	2.20e3	4.38e2	1.08e2	2.75e2	1.37e3	2.56e3	1.93e2	1.61e3	1.22e2	1.02e3
6507/3-4	DC	3342	22074	1.21e1	8.57e1	6.39e1	9.91e0	1.55e2	2.95e1	9.70e0	2.85e1	9.93e1	2.09e2	2.59e1	1.39e2	2.06e1	4.19e2
6507/3-4	DC	4074	22092	9.08e0	1.62e1	1.05e1	6.62e0	3.70e1	5.67e0	7.07e0	2.72e1	2.50e1	3.21e1	2.13e1	2.24e1	1.56e1	8.29e1
6507/3-4	Mud	2500	22093	1.18e0	1.24e0	1.47e0	1.28e0	4.38e0	0.00e0	8.45e-1	5.05e0	3.41e0	5.17e0	3.56e0	3.90e0	3.79e0	2.09e0
6507/3-4	Mud	3702	22094	1.79e0	3.61e0	2.64e0	1.60e0	6.50e0	0.00e0	1.06e0	5.38e0	5.70e0	5.65e0	4.79e0	4.13e0	3.87e0	4.70e0
6507/3-4	Mud	4060	22095	2.68e0	3.74e0	3.53e0	1.92e0	9.97e0	0.00e0	1.73e0	6.61e0	6.93e0	8.18e0	5.90e0	5.94e0	4.84e0	5.37e0

Table 22. continued, GCMS SIR of aromatic compounds (amounts in ng/g)
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Well	Sample type	Lower Depth	APT ID	C21TA	SC26TA	RC26TA+SC27TA	SC28TA	RC27TA	RC28TA
6507/3-4	COCH	3728.05	22021	6.63e2	8.60e1	3.26e2	2.24e2	1.49e2	2.35e2
6507/3-4	COCH	3734.40	22023	4.60e3	4.62e2	1.57e3	1.04e3	7.27e2	1.07e3
6507/3-4	COCH	3743.90	22025	2.07e3	1.88e2	6.30e2	4.14e2	3.00e2	4.39e2
6507/3-4	COCH	3754.85	22027	2.61e3	3.26e2	1.00e3	5.87e2	4.32e2	6.45e2
6507/3-4	COCH	3769	22030	3.41e1	1.28e1	6.90e1	4.20e1	3.02e1	4.67e1
6507/3-4	COCH	3792	22033	2.34e3	2.08e2	5.09e2	3.17e2	2.08e2	3.07e2
6507/3-4	COCH	3810.90	22037	3.27e3	2.70e2	6.72e2	4.59e2	3.03e2	4.45e2
6507/3-4	Oil	3726	22055	2.27e2	2.93e1	1.14e2	7.81e1	5.39e1	8.02e1
6507/3-4	DC	3183	22070	6.45e2	1.47e3	3.50e3	1.86e3	1.29e3	2.06e3
6507/3-4	DC	3342	22074	2.94e2	2.45e2	6.17e2	4.23e2	2.52e2	4.49e2
6507/3-4	DC	4074	22092	8.91e1	3.18e1	1.26e2	8.86e1	6.35e1	9.07e1
6507/3-4	Mud	2500	22093	1.51e0	2.81e0	1.60e1	1.02e1	6.67e0	1.10e1
6507/3-4	Mud	3702	22094	2.82e0	3.59e0	1.79e1	1.36e1	7.82e0	1.26e1
6507/3-4	Mud	4060	22095	4.56e0	5.44e0	2.22e1	1.40e1	1.01e1	1.50e1

Table 23. Reference data for GC Whole Oil measured on NSO-1

Variable	Permissible range	Most likely value	12.08.04
Pristane/n-C17	0.55-0.64	0.60	0.62
Benzene/Hexane	0.38-0.42	0.41	0.42

Table 24. Reference data for GC of Saturated Compounds measured on NSO-1

Variable	Permissible range	Most likely value	23.08.04	24.08.04	24.08.04
Pr/n-C17	0.55-0.66	0.60	0.63	0.63	0.63
n-C15/n-C20	1.4-2.0	1.8	1.7	1.7	1.7
n-C30/n-C20	0.20-0.32	0.29	0.28	0.29	0.29
n-C17/(n-C17C27)	0.75-0.82	0.79	0.77	0.77	0.77

Table 25. Reference data for GC-MS of Saturated Compounds measured on NSO-1

Variable	Permissible range	Most likely value	15.09.04	16.09.04	16.09.04	17.09.04
[23/3]/30ab	0.04-0.09	0.07	0.06	0.06	0.06	0.06
35abR/30ab	0.06-0.13	0.08	0.07	0.07	0.07	0.07
25nor30ab/25nor28ab	0.3-0.8	0.5	0.77	0.76	0.78	0.74
29aaR/27dbS	0.2-0.6	0.3	0.26	0.25	0.25	0.25
29bbS/27bbR	0.7-1.2	0.9	1.02	1.02	1.01	1.02

Our column resolves the 25nor28 $\alpha\beta$ doublet, thus giving a value in the high-end region of the acceptable range specified by NIGOGA.

Table 26. Reference data for GC-MS of Aromatic Compounds measured on NSO-1

Variable	Permissible range	Most likely value	09.09.04	12.09.04	13.09.04	17.09.04	17.09.04
1-MP/P	0.53-0.70	0.59	0.63	0.64	0.65	0.63	0.63
A1/E1	0.3-0.7	0.5	0.50	0.55	0.51	0.54	0.52
a1/d1	0.2-0.4	0.31	0.36	0.40	0.38	0.38	0.39

Experimental Procedures

All procedures follow NIGOGA, 4th Edition. Below are brief descriptions of procedures/analytical conditions.

Sample preparation

Cuttings samples are washed in water to remove mud. When oil based mud is used, soap (Zalo) is added to the sample and the sample is washed thoroughly in warm water to remove mud and soap.

Extraction

A Soxtec Tecator instrument is used. Thimbles are pre extracted in dichloromethane with 7% (vol/vol) methanol, 10 min boiling and 20 min rinsing. The crushed sample is weighed accurately in the pre extracted thimbles and boiled for 1 hour and rinsed for 2 hours in approximately 80 cc of dichloromethane with 7% (vol/vol) methanol. Copper blades activated in concentrated hydrochloric acid are added to the extraction cups to cause free sulphur to react with the copper. An aliquot of 10% of the extract is transferred to a pre weighed bottle and evaporated to dryness. The amount of extractable organic matter is calculated from the weight of this 10% aliquot.

Deasphalting

The extract is evaporated almost to dryness before a small amount of dichloromethane (3 times the amount of EOM) is added. Then pentane is added in excess (40 times the volume of EOM and dichloromethane). The solution is stored for at least 12 hours in a dark place before the solution is filtered or centrifuged and the weight of the asphaltenes measured.

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, 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 deasphalted oil or EOM diluted in 1 ml hexane is injected and separated into a saturated, an aromatic and a polar fraction.

TOC and Rock-Eval

A Rock-Eval 6 instrument is used. The analysis is performed in two steps, pyrolysis and oxidation, when TOC is measured. Jet-Rock 1 was run as every tenth sample and checked against the acceptable range given in NIGOGA.

Temperature programme

Pyrolysis: 300 °C (3 min.) - 25 °C/min. - 650 °C (0 min.)

Oxidation: 400 °C (3 min.) - 25 °C/min. - 850 °C (5 min.)

Rock-Eval, Reservoir cycle

A Rock-Eval 6 instrument is used. The analysis is performed in two steps, pyrolysis and oxidation, when TOC is measured. Jet-Rock 1 was run as every tenth sample and checked against the acceptable range given in NIGOGA.

Temperature programme

Pyrolysis: 180 °C (10 min.) - 1 °C/min. - 650 °C (1 min.)
Oxidation: 400 °C (3 min.) - 25 °C/min. - 450 °C (5 min.) - 25 °C/min. 850 °C (0 min.)

Bulk Kinetics

A Rock-Eval 6 instrument is used. The sample are run with 5 different rates.

Temperature programme

- 1 Pyrolysis: 300 °C (3 min.) - 1 °C/min. - 650 °C (0 min.)
- 2 Pyrolysis: 300 °C (3 min.) - 5 °C/min. - 650 °C (0 min.)
- 3 Pyrolysis: 300 °C (3 min.) - 15 °C/min. - 650 °C (0 min.)
- 4 Pyrolysis: 300 °C (3 min.) - 25 °C/min. - 650 °C (0 min.)
- 5 Pyrolysis: 300 °C (3 min.) - 50 °C/min. - 650 °C (0 min.)

TEGC

A HP5890 II instrument with an MSSV injector and an FID is used. The column is a CP-Sil-5 CB-MS, length 25 m, i.d. 0.25 mm, film thickness 0.25 µm.

Throughout the thermal extraction the oven temperature remains at 330 °C. The sample tube is placed in the injector system and then broken. The released volatile products are collected in the cold trap for four minutes before being released into the GC column, whereupon the following temperature programme is run:

Initial temperature: 20 °C (5 min. from breaking of sample tube) – heating rate: 5 °C/min. – final holding temperature: 310 °C (13 min.)

A HP5890 II instrument with an MSSV injector and an FID is used. The column is a HP-1, length 50 m, i.d. 0.32 mm, film thickness 0.52 µm.

Throughout the thermal extraction the oven temperature remains at 300 °C. The sample tube is placed in the injector system and then broken when pressure have stabilised after 4 minutes. The released volatile products are collected in the cold trap for ten minutes before being released into the GC column, whereupon the following temperature programme is run:

Initial temperature: 40 °C (13 min. from breaking of sample tube)
Ramp 1: 5 °C/min. ⇒ 300 °C (25 min.)
Ramp 2: 5 °C/min. ⇒ 320 °C (10 min.)

PyGC

A HP5890 II instrument with an MSSV injector and an FID is used. The column is a CP-Sil-5 CB-MS, length 25 m, i.d. 0.25 mm, film thickness 0.25 µm.

The pyrolysis oven is preheated to 330 °C. The sample tube is placed in the injector system and then broken. The temperature is then increased to 600 °C at a rate of 25 °C/min. The pyrolysis products are collected in the cold trap for fourteen minutes before being released into the GC column, whereupon the following temperature programme is run:

Initial temperature: 20 °C (15 min. from breaking of sample tube) – heating rate: 5 °C/min. – final hold temperature: 310 °C (23 min.)

Iatroscan

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

Stable carbon isotope analysis of fractions

The samples are dissolved in a known amount of dichloromethane, and 1-2 mg of the sample (or as much as possible) is then transferred to a glass container. The solvent is evaporated in an oven at 50 °C. CuO and some silver wires are added to the containers, which are then sealed by melting in a vacuum. The samples are then combusted in an oven at 550 °C for 1 hour (Sofer, 1980). The combustion products CO₂ and H₂O are separated at -80°C before the isotopic ratio is determined on a Finnigan MAT 251 mass spectrometer.

A standard (NGS NSO-1, topped oil) is analysed for each 10th sample. The δ¹³C 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 ‰.

GC of whole oil

A HP5890 II instrument is used. The column is a HP PONA, length 50 m, i.d. 0.2 mm, film thickness 0.5 µm. 2,2,4-tri-methyl-pentane is used as an internal standard.

Temperature programme

30 °C (10 min.) - 2 °C/min. - 60 °C (10 min.) - 2 °C/min - 240 °C (60 min.)

GC of saturated fraction

A HP5890 II instrument is used. The column is a CP-Sil-5 CB-MS, length 60 m, i.d. 0.25 mm, film thickness 0.25 µm. C20D42 is used as an internal standards.

Temperature programme

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

GC of aromatic fraction

A HP5890 instrument is used. The column is a CP-Sil-5 CB-MS, length 60 m, i.d. 0.25 mm, film thickness 0.25 µm.

Temperature programme

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

GCMS of saturated and aromatic fractions

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. D₄-27ααR is used as internal standard when quantitative results are requested for the saturated compounds. D₈-naphthalene and D₁₀-phenanthrene are used as internal standards when quantitative results are required for the aromatic compounds. The aromatic and aliphatic fractions may be analysed together or separately.

Temperature programme

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

Vitrinite reflectance analysis

The samples are prepared either as “whole rock” or are treated with hydrochloric and hydrofluoric acid prior to further preparation. The aim of the acid treatment is to avoid soft and expanding mineral phases in order to ensure good polishing quality. The whole rock or the kerogen resulting from the acid treatment is embedded in an epoxy resin to make briquettes, ground flat and polished using 0.25 micron diamond paste and magnesium oxide as the two final steps.

The analytical equipment used is a Zeiss MPM 03 photometer microscope equipped with an Epiplan-Neofluar 40/0.90 oil objective. The sensitive measuring spot is kept constant for all measurements at about 2.5 micron in diameter. The measurements are made through a green band pass filter (546 nm) and in oil immersion (refractive index 1.515 at 18 °C). The readings are made without a polarizer and using a stationary stage. This procedure is called measurement of random reflectance (%Rm). The photometer is calibrated daily against a standard of known reflectance (%Rm = 0.588) and routinely (daily) checked against two other standards of significant different reflectances (%Rm = 0.879 and 1.696). A deviation from these values of less than ± 0.01 and ± 0.02 respectively is considered acceptable. The calibration is routinely checked during the course of measurements at least every hour, and a deviation of less than ± 0.005 is considered acceptable.

For each sample at least 20 points are measured if possible, and quality ratings are given to various important aspects, which may affect the measurements. These aspects are abundance of vitrinite, uncertainties in the identification of indigenous vitrinite, type of vitrinite, particle size, particle surface quality and abundance of pyrite.