FMT PRESSURE WELL 6506/11-4S

Table 3.3.1 Formation Pressure (bar)

Run No	Depth mMD RT	Depth m TVD RT	Formation Pressure bar	Comments
FMT 1A	2876,5	2781,0		No seal
	2876,5	2781,1		No seal
	2897,5	2800,1	347,00	Tight
	2951,5	2850,2		No seal
	2952,0	2850,7		No seal
	3502,5	3360,6	516,00	Tight/superch?
	3573,5	3426,5	590.05	Tight
	3576,0	3428,9	489,07	Good test
	3583,0	3435,4	379,40	Tight
	3588,5	3440,5	592,16	No seal
	3589,0	3441,0	370,20	Tight
	3598,5	3449,8	355,80	Tight
	4085,0	3908,1		Tight
	4100,0	3922,3		Tight
	4239,5	4055,8		Tight
	4273,5	4088,4		Tight
	4272,8	4087,8	666,05	Good test
	4275,5	4090,4		Tight
	4275,1	4090,0		Tight
	4278,5	4093,3		Tight
	4301,0	4114,9		Tight
	4304,0	4117,8		Tight
	4319,0	4187,8		Tight
	4272,8	4187,8		Tight
	4273,4	4088,3		Tight
	4272,3	4087,3		Tight
	4272,6	4087,6	666,97	Segregated smpl.
FMT 2B	4522,0	4236,4		No seal
	4523,0	4327,3		No seal
	4526,5	4330,7		No seal
	4529,2	4333,4		No seal
	4532,0	4336,1		No seal
	4532,7	4336,8		No seal
	4538,0	4341,9		No seal
	4539,0	4342,9	439,80	Poor perm
	4544,3	4348,0	511,20	Poor perm
	4550,0	4353,6		No seal
	4552,0	4355,6		No seal
	4560,0	4363,4		No seal
	4569,5	4372,7	512,50	Poor perm
	4579,5	4382,5		No seal
	4583,5	4386,4	507,10	Poor perm
	4588,0	4390,8	503,80	Very poor perm
	4592,0	4394,7		Tight
	4598,0	4400,6	507,00	Tight
	4602,5	4405,0		Tight
	4672,7	4474,2		Tight

Run No	Depth mMD RT	Depth m TVD RT	Formation Pressure bar	Comments
FMT 2B	4686,1	4487,5	482,60	Good perm
	4691,8	4493,1		Tight
	4697,0	4498,3		Tight
	4700,5	4501,7		No seal
	4702,3	4503,4	499,00	Good ??
	4702,3	4503,5	491,70	Good ?
	4702,5	4503,7	493,20	Good ?
	4708,5	4509,7		No seal
	4720,5	4521,6		Tight
	4725,0	4526,1		Tight
	4569,5	4372,7	502,50	Sample
FMT 2C	4686,1	4487,5		Tight
	4702,3	4503,5	482,60	Poor perm
	4588,0	4390,8	501,30	Sample
RUN 3D,E,F,G,H	4685,80	4487,19	483,10	4.7 md
	4702,00	4503,22	484,80	34 md
	4867,00	4667,38	545,70	Supercharge ? (2.36 md)
	4874,30	4674,65	525,00	Supercharge? (1.66 md)
	4874,10	4674,45	524,70	Supercharge? (1.55 md)
	4879,00	4679,33		Tight
	4904,00	4704,22	546,80	Incr. 0.4 Bar(1.43 md)supercharge
	4905,50	4705,71		
	4907,50	4707,70	541,80	Supersh
	4910,50,	4710,69		Tett
	4913,50	4713,68		Tett
	4919,00	4719,18	560,60	Incr.0.3 Bar/min1.55md)supercharge
	4925.00	4725,15		Tett
	4935,20	4735,31		Tett
	4936,20	4736,31		Tett
	4925.00	4725,15		Tett
	4935,20	4735,31		Tett
	4936,20	4736,31		Tett
	4939,30	4739,40	557,60	Supercharge? (3.64 md)
	4941,00	4741,09		
	4946,50	4746,57		Tett
	5040.50	4840,18		Tett
	5041,00	4840,68	500,70	Sample 101 fill time 1 min.419 sec
	4685.80	4487,19		Tight
	4686,00	4487,39	484,40	9.1 md
	4702,00	4503,22		Tight
	4702,50	4503,71	484,80	23.0 md. Sample
	4901,20	4701,43		Tight
	4903,80	4704,02		Lost seal
	4905,80	4706,01		No seal
	4908,20	4708,40	546,30	Tight,supercharged 0.7 md
	4919,50	4719,68		No seal
	4963,00	4763,00	558,10	Tight,supercharged 1.5 md
	4979,70	4779,63		Tool failure
	4979,20	4779,13		Tool failure

Run No	Depth mMD RT	Depth m TVD RT	Formation Pressure bar	Comments
RUN 3D,E,F,G,H	4976,60	4776,54	479,50	Tight 0.5 md
	4979,00	4778,93		Tight 0.6 md
	4996,00	4795,86	499,80	Strange Build up
	5000,50	4800,34		Tight
	5002,00	4801,84		Tight
	5007,00	4806,82		Tight
	5010,00	4809,80	500,10	Poor
	5010,00	4809,80	500,10	25.8 md Try sampling but line to cha
	5015,50	4815,28	500,70	216 md
	5010,00	4809,80	500,10	19.3 md
	5041,00	4840,68	500,20	708 md
	5042,00	4841,67	500,30	7.6 md
	5047,50	4847,15		No seal
	5047,50	4847,15		No seal
	5067,50	4867,07		No seal
	5087,00	4886,49		
	5010,00	4809,80	500,10	
	4806,50	4607,14		
	4807,50	4608,14		
	4820,20	4620,79		
	4874,10	4674,46		
	5015,50	4815,28	500,50	
	5047,50	4847,15		
	5067,00	4866,69		
	5086,50	4886,13		

3.4 Well Testing

Test	Perforation interval m MD RKB/ M TVD RKB		Main objekctives
1A	5066 - 5073 / 4866 - 4873		Productivity, res properties and fluid
1B	5066 - 5073/ 4866 - 4873 + 5039 - 5043/ 4839 - 4843		Fluid samples, res properties, productivity and barriers
Micro frac	5030.0 - 5030.3/ 4830.0 - 4830.3		Formation stsrength in barrier

All test objectives were fulfilled, but test 1A did not flow to surface. Table 3.4.1.

Production data and test analysis results from the main flow period are listed in table 3.4.2

DST NO. FORMATION PERFORATED INTERVAL	1B 4116.5 - 4137 M MD RT
PRODUCTION DATA (main flow)	
Oil flow rate	725 SM^3/day
Gas flow rate	395.000 SM^3/day
GOR	545 SM^3/day
Bottomhole flowing pressure	459 bar at 4995.42 m (gauge depth)
Bottomhole flowing temperature	163 deg. C
Flowing wellhead pressure	139.5 bar
Flowing wellhead temperature	39 deg. C
CO_2/H_2S	7%/15 ppm
Oil density	806 kg/m^3 at 35 deg. C
Gas gravity	0.738 (air=1)

Table 3.4.2

Anchor Drilling Fluids

WELL: 6506/11-4S, 6506/11-4ST2

TOTAL MATERIAL COST AND CONSUMPTION

OPERATOR: STATOIL

AREA: ÅSGARD

Product	Unit size	Unit price NOK	36" sect.	Cost NOK	26" sect.	Cost NOK	17 1/2" sect.	Cost NOK	12 1/4" sect.	Cost NOK	12 1/4" sect. T2	Cost NOK	8 1/2" sect. T2	Cost NOK	Test sect. T2	Cost NOK	P & A sect. T2	Cost NOK	Total consumed	Total cost NOK
Barite	mt	708,68	37	26 221,16	231	163 705,08	531	376 309,08	541	383 395,88	175	124 019,00	42	29 764,56	42	29 764,56	14	9 921,52	1613	1 143 100,84
Base Oil	m3	2946,86							324	954 782,64	57	167 971,02	235	692 512,10	20	58 937,20			636	1 874 202,96
Anco Vert P	kg	33,00							12800	422 400,00	9620	317 460,00	9220	304 260,00	200	6 600,00			31840	1 050 720,00
Anco Vert S	kg	33,25							5500	182 875,00	4950	164 587,50	3450	114 712,50	200	6 650,00			14100	468 825,00
Anco Vert Vis	kg	31,29							7500	234 675,00			8625	269 876,25	125	3 911,25			16250	508 462,50
Anco Vert F	kg	27,90							5000	139 500,00	1780	49 662,00	5365	149 683,50	585	16 321,50			12730	355 167,00
Anco Vert M	kg	54,60									380	20 748,00	190	10 374,00					570	31 122,00
CaCl2	kg	2,63							7225	19 001,75	1050	2 761,50	2100	5 523,00					10375	27 286,25
Lime	kg	2,02							9960	20 119,20	440	888,80	5500	11 110,00					15900	32 118,00
Celpol ESL	kg	30,49					6125	186 751,25											6125	186 751,25
Celpol SL	kg	27,10					7575	205 282,50											7575	205 282,50
Citric Acid	kg	15,42					800	12 336,00											800	12 336,00
CMC EHV	kg	13,82	500	6 910,00	8300	114 706,00													8800	121 616,00
Anco 208	lit	16,36					16000	261 693,60											16000	261 693,60
Anco 208 bulk	lit	15,31					29000	443 869,65											29000	443 869,65
Bentonite	mt	1799,85	24	43 196,40	59	106 191,15											3	5 399,55	86	154 787,10
KCl Brine	m3	518,70					600	311 220,00											600	311 220,00
KCl Powder	kg	1,71					1000	1 710,00											1000	1 710,00
Rhodopol 23P	kg	79,05					1750	138 337,50							650	51 382,50	100	7 905,00	2500	197 625,00
Sod. Bicarb	kg	3,73					1250	4 662,50											1250	4 662,50
Soda Ash	kg	2,92	375	1 095,00	3200	9 344,00	1175	3 431,00											4750	13 870,00
Anco Vert OBM	m3	2500,00							-220	-550 000,00	36	90 000,00	-190	-475 000,00	77	192 500,00			-297	-742 500,00
Anco 2000 Mud	m3	700,00					170	119 000,00											170	119 000,00
NaCl Brine	m3	458,79													440	201 867,60	18	8 258,22	458	210 125,82
NaCl Powder	kg	1,15													7000	8 050,00	3000	3 450,00	10000	11 500,00
Anco Superwash	kg	45,00													2352	105 840,00			2352	105 840,00
TOTAL COST	NOK			77 422,56		393 946,23		2 064 603,08		1 806 749,47		938 097,82		1 112 815,91		681 824,61		34 934,29		7 110 393,97
SECTION DAYS				3		10		13		26		13		29		18		4		116
COST PER DAY	NOK			25 807,52		39 394,62		158 815,62		69 490,36		72 161,37		38 372,96		37 879,15		8 733,57		61 296,50
SECTION LENGTH	M			63		1027		1410		1706		1349		590						6145
COST PER METER	NOK			1 228,93		383,59		1 464,26		1 059,06		695,40		1 886,13						1 157,10
VOLUME MIXED	m3			377		1 520		942		517		127		271		469		45		4268
COST PER m3	NOK			205,36		259,18		2 191,72		3 494,68		7 386,60		4 106,33		1 453,78		776,32		1 665,98

L-839

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STATOIL

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1 Introduction

This report presents the results of a geochemical evaluation of well 6506/11-4S on Haltenbanken (Figure 1), offshore mid-Norway. The well was drilled down to 5109 mMD RKB using oil-based mud.

The aims of this project were to evaluate potential source rock and to characterise migrated petroleum in sandstone in terms of the parent source rock facies and level of thermal maturity.

A total of 9 core chips of mudrock lithology and 1 oil sample were analysed according to the analytical programme described in Table 1 (Appendix).

The analytical work was performed in accordance with the guidelines given in "The Norwegian Industry Guide to Organic Geochemical Analyses (1993)" by Geolab Nor.

APPENDIX

GEOLAB NOR

GEOCHEMICAL DATA REPORT

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TITLE

NOCS 6506/11-4S CRETACEOUS STUDY

AUTHOR(S)

Henning Jensen

GEOLAB PROJECT NO.	DATE
62277	28.08.96
PROJECT MANAGER	QA RESPONSIBLE
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REPORT NO./FILE	PAGE 1 of 1

Experimental

Headspace Gas Analysis

The analysis is performed using a Perkin Elmer 8310 gas chromatograph with a 50 m Plot fused silica Al_2O_3/KCL column, loop injector and flame ionization detector. Nitrogen is used as carrier gas and the column is run from 70°C to 200°C, at a rate of 12°C/min. Final hold time is 5 min.

Two cm^3 of headspace gas are removed from each sample can for chromatographic analysis of the C_1 to C_7 range of hydrocarbons.

Occluded Gas Analysis

The gas chromatograph used for this analysis is identical to that used for headspace gas analysis and is operated under the same conditions. The canned samples are washed in thermostat-controlled water to remove drilling contaminants and sieved on a 2 mm mesh sieve to remove large, caved rock fragments. An aliquot (ca 25 mg) of sieved sample is crushed with 25 cm^3 water in an airtight ball mill. After crushing, 2 cm^3 of the released gas are removed from the ball mill for gas chromatographic analysis.

Total Organic Carbon (TOC) and Total Carbon Analysis

This analysis is performed using a LECO CS244 Carbon Analyser.

Hand-picked lithologies from cuttings samples are crushed with a mortar and pestle and approximately 200 mg (50 mg for coals) are accurately weighed into LECO crucibles. The

samples are then treated three times with 10 % hydrochloric acid to remove oxidized (carbonate) carbon, and washed four times with distilled water. The samples are dried on a hotplate at 60 - 70°C before analysis of total organic carbon.
Total carbon is also analysed on the same instrument using approximately 200 mg of untreated crushed whole rock. Oxidized (carbonate) carbon is calculated by weight difference.

Total organic carbon can also be analysed on the Rock-Eval II Pyrolyser during the normal run of the instrument.

Rock-Eval Pyrolysis

This analysis is performed by using a Rock-Eval II Pyrolyser. Approximately 100 mg crushed whole rock is analysed. The sample is first heated at 300°C for three min in an atmosphere of helium to release the free hydrocarbons present (S1 peak) and then pyrolysed by increasing the temperature from 300°C to 600°C (temp. gradient 25°C/min) (S2 peak). Both the S1 and S2 yields are measured using a flame ionization detector (FID). In the temperature interval between 300°C and 390°C, the released gases are split and a proportion passed through a carbon dioxide trap, which is connected to a thermal conductivity detector (TCD). The value obtained from the TCD corresponds to the amount of oxygen contained in the kerogen of the sample and is reported as the S3 peak.

The Rock-Eval II Pyrolyser also analyses the TOC of each sample during the normal run of the instrument.

Thermal Extraction/Pyrolysis Gas Chromatography

The instrument used for this analysis is a Varian 3400 Gas Chromatogaph interfaced to a pyrolysis oven (the pyrolyser). Up to 15 mg of whole rock sample is loaded on the pyrolyser and heated isothermally, at 300°C, for 4 min, during which time thermal extraction of the free hydrocarbons occurs (equivalent to the S1 peak of the Rock-Eval). The released gases pass to a 25 m OV1 column with a liquid nitrogen-cooled trap.

After 4 min the pyrolysis oven is temperature programmed up to 530°C, at a rate of 37°C/min, causing bound hydrocarbons to be released from the kerogen (equivalent to the S2 peak of the Rock-Eval). The released gases pass to a 25 m OV1 column with a liquid nitrogen-cooled trap.

The temperature program of the gas chromatograph oven, in which the columns are housed is -10°C to 290°C at a rate of 6°C/min. Both the columns are linked to a FID.

Solvent Extraction of Organic Matter (EOM)

The samples are extracted using a Tecator Soxtec HT-System. Carefully weighed samples are taken in a pre-extracted thimble. Some activated copper is added to the extraction cup and dichloromethane/methanol (93/7) is used as an extraction solvent. The samples are boiled for 1 hour and then rinsed for 2 hours. If the samples contain more than 10 % TOC, then the whole procedure is repeated once. The resulting solution is filtered and the solvent removed by rotary evaporation (200 mb, 30°C). The amount of EOM is gravimetrically established.

Removal of Asphaltenes

The EOM is dissolved in tetrahydrofuran in a flask and n-pentane is added to precipitate the

asphaltenes.The solution is then stored in the dark and at ambient temperature for at least 8 hours. The solution is then filtered (Baker 10-spe system) and the precipitated asphaltenes returned to the original flask by dissolution in dichloromethane. The solvent is removed by rotary evaporation at 200 mB and 30°C.

Iatroscan

Saturates, aromatics and polars are qualitatively and quantitatively assessed using Iatroscan TLC-FID and employing Chromarod S-III rods. Deasphaltened EOM was dissolved in DCM/MeOH. 1-3 μl of the solution is spotted on the pre-activated rods, using an auto-spotter. The rods are developed in n-hexane (35 mins), followed by toluene (14 mins) and DCM/MeOH (4 mins) with 2 mins air-drying between every stage. The developed rods are introduced in a 60°C oven for 90 seconds. The rods are analysed using Iatroscan and the data collected and processed using Multichrom data system.

Chromatographic Separation of deasphaltened EOM

Chromatographic separation is performed using an MPLC system developed by the company. The EOM (minus asphaltenes) is injected into the MPLC and separated using hexane as an eluent. The saturated and aromatic hydrocarbon fractions are collected and the solvent removed using a rotary evaporator at 30°C. The fractions are then transferred to small pre-weighed vials and evaporated to dryness in a stream of nitrogen. The vials are re-weighed to obtain the weights of both the saturated and the aromatic fractions. The weight of the NSO fraction which is retained on the column, is obtained by weight difference.

Gas Chromatographic Analyses

Saturated hydrocarbon fractions:

The instrument used for this analysis is a PERKIN ELMER 8320 Gas Chromatograph equipped with an FID detector and an OV1 column. The carrier gas is helium and the temperature program runs from 80°C to 300°C at a rate of 4°C/min. Final hold time is 20 mins. The saturated hydrocarbon fraction is diluted by 1:30 and a 1 microlitre aliquot of this is injected into the instrument.

Aromatic hydrocarbon fractions:

The instrument used is a Varian 3400 Gas Chromatograph with a 25 m SE 54 capillary column, split injector and a column splitter leading to FID and FPD detectors, which allows simultaneous analysis of co-eluting hydrocarbons and sulphur compounds. The carrier gas is helium and the temperature program runs from 40°C to 290°C at a rate of 4°C/min. Final hold time is 10 mins. The aromatic hydrocarbon fraction is diluted by 1:30 and a 1 microlitre aliquot of this is injected into the instrument.

Whole Oil/Whole Extract

Whole oil chromatograms are determined on a Perkin Elmer Sigma 2000 gas chromatograph fitted with a split injector, 25 m SE54 capillary column and effluent splitter connected to FID and FPD detectors allowing simultaneous determination of hydrocarbons and sulphur compounds. Approximately 0.1 microlitres of whole oil are injected and the temperature program on the chromatograph runs from -10°C to 300°C at 4°C/min.

Vitrinite Reflectance Analysis

Samples to be analysed for vitrinite reflectance are ground to small granules (if necessary)

using a pestle and mortar and are then mounted in a fast setting resin. The resin blocks are first ground flat using a coarse corundum paper to expose the rock granule surfaces and then with three finer grades of corundum paper to improve these surfaces and reduce scratches. The blocks are finally polished on a rotating Selvyt-covered lap using three grades of diamond suspension fluid. An appropriate lubricant is used when necessary.

Reflectance measurements are made under oil immersion at 546 nm using a Zeiss Universal Photo microscope II equipped with a HP 9000 series computer system. The polished blocks are mounted on the microscope stage and scanned manually in order to locate and measure particles of vitrinite. An attempt is made to obtain readings from 15-20 individual particles per sample, but this is not always possible in samples with low amounts of phytoclasts.

Visual Kerogen Misroscopy

Kerogen concentrates are obtained from samples prepared by HCl and HF digestion followed by zinc bromide flotation to remove pyrite and other heavy mineral residues. The cleaned concentrates are mounted on slides by smearing, these being analysed microscopically in transmitted white light and UV light (530 nm barrier filter) to determine the Spore Colour or Thermal Alteration Indices (SCI or TAI) and the colour and intensity of spore fluorescence. The spore colour index ,backed by spore fluorescence, is used as an alternative maturity parameter to verify the results obtained from vitrinite reflectance.

Fluorescence Colour	**Colour Index**	**Corresp. Vitrinite Reflectance**
Green	1	0.2 %
Green/yellow	2	0.2-0.3 %

Yellow	3	0.3 %
Yellow/orange	4	0.4 %
Light orange	5	0.5 %
Moderate-orange	6	0.6 %
Dark orange	7	0.8 %
Dark orange/red	8	1.0 %
Spore fluorescence extinction	9	1.3 %

NB. This table only provides a rudimentary correlation as vitrinite reflectance and spore fluorescence colour are both independently affected by factors such as depositional environment and categanic history.

Combined Gas Chromatography - Mass Spectrometry (GC-MS)

The GC-MS analyses are performed on a VG TS250 system interfaced to a Hewlett Packard 5890 gas chromatograph. The GC is fitted with a fused silica SE54 capillary column (40 m x 0.22 mm i.d.) directly into the ion source. Helium (12 psi) is used as carrier gas and the injections are performed in splitless mode. The GC oven is programmed from 45°C to 150°C at 35°C/min, at which point the programme rate is 2°C/min up to 310°C where the column is held isothermally for 15 min. For the aromatic hydrocarbons, the GC oven is programmed from 50°C to 310°C at 5°C/min. and held isothermally at 310°C for 15 min. The mass spectrometer is operated in electron impact (EI) mode at 70 eV electron energy, a trap current of 500 uA and a source temperature of 220°C. The instrument resolution used is 2500 (10 % value).

The data system used is a VG PDP11/73 for acquiring data, and a Vax station 3100 for peak processing the data. The samples are analysed in multiple ion detection mode (MID) at a scan cycle time of approximately 1.1 sec. Calculation of peak ratios is performed from peak

heights in the appropriate mass fragmentograms.

Saturated Fractions

Terpanes

The most commonly used fragment ions for detection of terpanes are M/Z 163 for detection of 25,28,30 trisnormoretane or 25,28,30 trisnorhopane, M/Z 177 for detection of demethylated hopanes or moretanes, M/Z 191 for detection of tricyclic, tetracyclic- and pentacyclic terpanes and M/Z 205 for methylated hopanes or moretanes. The molecular ions M/Z 370 and 384 are also recorded for identification of C_{27} and C_{28} triterpanes respectively.

Steranes

The most commonly used fragment ions for detection of steranes are M/Z 149 to distinguish between 5α and 5β steranes, M/Z 189 and 259 for detection of rearranged steranes, M/Z 217 for detection of rearranged and normal steranes and M/Z 218 for detection of 14β(H) 17β(H) steranes.

The M/Z 231 fragment ion is used to detect possible aromatic contamination of the saturated fraction. It is also used for detection of methyl steranes.

Aromatic Fractions

Alkyl-substituted Benzenes

The M/Z 106 fragment ion is often used to detect the alkyl-substituted benzenes. It is

especially useful for the detection of di-substituted benzenes. M/Z 134 can also be used for the detection of C_4-alkylbenzenes, but benzothiophene will also give a signal with this fragment ion.

Naphthalenes

Methyl naphthalenes are normally detected by the M/Z 142 fragment ion, while C_2-naphthalenes are detected by M/Z 156 and C_3-naphthalenes by M/Z 170.

Benzothiophenes and Dibenzothiophenes

Benzothiophene can be detected, as mentioned above, by M/Z 134. The M/Z 184 fragment ion is used to detect the dibenzothiophenes. The M/Z 198 and M/Z 212 fragment ions are used for methyl-substituted dibenzothiophenes and dimethyl-substituted dibenzothiophenes respectively.

Phenanthrenes

Phenanthrene is detected using the M/Z 178 fragment ion. Anthracene will, if present, also give a signal in the M/Z 178 fragment ion. Methyl-substituted phenanthrenes give signals in the M/Z 192 fragment ion, while the M/Z 206 fragment ion shows the dimethyl-substituted phenanthrenes and the M/Z 220 fragment ion shows the C_3 substituted phenanthrenes.

Aromatic Steranes

Monoaromatic steranes are detected using the M/Z 253 fragment ion, while the triaromatic

steranes are detected using the M/Z 231 fragment ion.

Mass Fragmentograms representing Terpanes
(M/Z 163, 177, 191, 205, 370, 384, 398, 412 and 426)

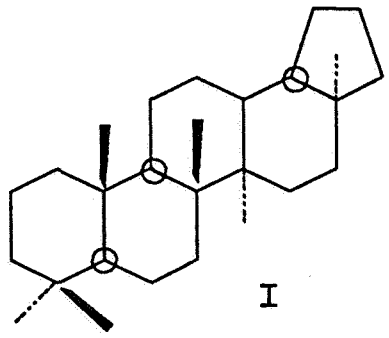
Peak Identification: (α and β refer to hydrogen atoms at C-17 and C-21 respectively unless indicated otherwise).

27Ts	18α trisnorneohopane (T_s)	$C_{27}H_{44}$	(I)
27Tm	17α trisnorhopane (T_m)	$C_{27}H_{46}$	(II, R=H)
28αβ	Bisnorhopane	$C_{28}H_{48}$	(IV)
25nor30αβ*	norhopane	$C_{29}H_{50}$	
29αβ	αβ norhopane	$C_{29}H_{50}$	(II, R=C_2H_5)
29Ts	norneohopane	$C_{29}H_{50}$	
29βα	βα norhopane	$C_{29}H_{50}$	(III, R=C_2H_5)
30αβ	αβ hopane	$C_{30}H_{52}$	(II, R=i-C_3H_7)
30O	Oleanane	$C_{30}H_{52}$	
30βα	βα hopane	$C_{30}H_{52}$	(III, R=i-C_3H_7)
31αβS	22S αβ homohopane	$C_{31}H_{54}$	(II, R=i-C_4H_9)
31αβR	22R αβ homohopane	$C_{31}H_{54}$	(II, R=i-C_4H_9)
30G	gammacerane	$C_{30}H_{52}$	
31βα	βα homohopane	$C_{31}H_{54}$	(III, R=i-C_4H_9)
32αβS	22S αβ bishomohopane	$C_{32}H_{56}$	(II, R=i-C_5H_{11})
32αβR	22R αβ bishomohopane	$C_{32}H_{56}$	(II, R=i-C_5H_{11})
33αβS	22S αβ trishomohopane	$C_{33}H_{56}$	(II, R=i-C_5H_{11})
33αβR	22R αβ trishomohopane	$C_{33}H_{58}$	(II, R=i-C_6H_{13})
34αβS	22S αβ tetrakishomohopane	$C_{34}H_{60}$	(II, R=i-C_7H_{15})
34αβR	22R αβ tetrakishomohopane	$C_{34}H_{60}$	(II, R=i-C_7H_{15})
35αβS	22S αβ pentakishomohopane	$C_{35}H_{62}$	(II, Ri-C_8H_{17})
35αβR	22R αβ pentakishomohopane	$C_{35}H_{62}$	(II, R=i-C_8H_{17})
23/3	Tricyclic terpane	$C_{23}H_{42}$	(V, R=i-C_4H_9)

24/3	Tricyclic terpane	$C_{24}H_{44}$	(V, R=i-C_5H_{11})
25/3	Tricyclic terpane (17R, 17S)	$C_{25}H_{66}$	(V, R=i-C_6H_{13})
24/4	Tetracyclic terpane	$C_{24}H_{42}$	(VI)
26/3	Tricyclic terpane (17R, 17S)	$C_{26}H_{48}$	(V, R=i-C_7H_{15})
21/3	Tricyclic terpane	$C_{21}H_{38}$	(V, R=C_2H_5)
22/3	Tricyclic terpane	$C_{22}H_{40}$	(V, R=C_3H_7)
25nor28αβ*	25,28,30-trisnorhopane/moretane	$C_{27}H_{46}$	(VII)
30d	αβ diahopane	$C_{30}H_{52}$	(VIII)

* Also identified and quantified in M/Z 177 fragmentograms

STRUCTURES REPRESENTING TERPANES



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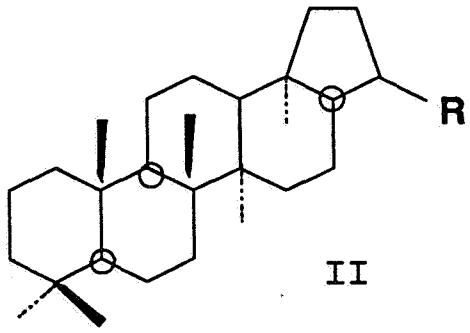

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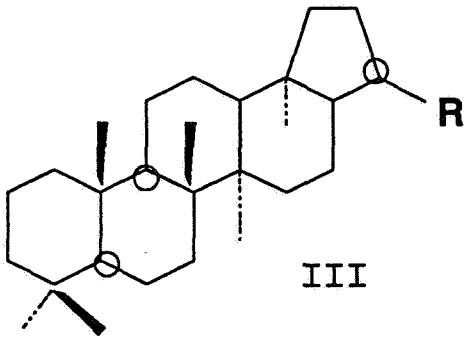

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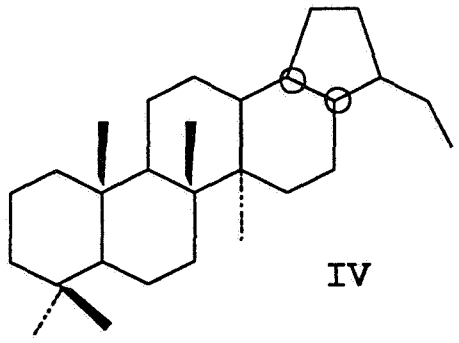

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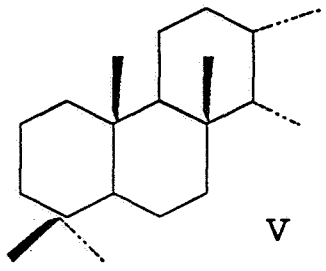

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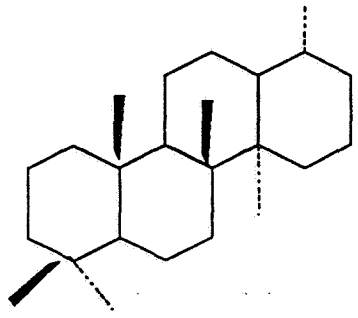

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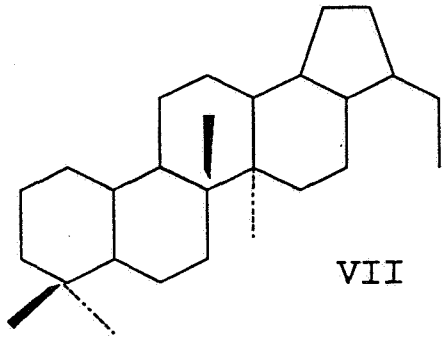


VII

Mass Fragmentograms representing Steranes

(M/Z 149, 189, 217, 218, 259, 372, 386, 400 and 414)

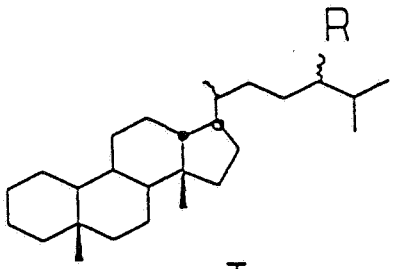
Peak Identifications: α and β refer to hydrogen atoms at C-5, C-14 and C-17 in regular steranes and at C-13 and C-17 in diasteranes.

21α	5α sterane	$C_{21}H_{36}$	(VI, R=C_2H_5)
22α	5α sterane	$C_{22}H_{38}$	(VI, R=C_3H_7)
27dβS	20S βα diacholestane	$C_{27}H_{48}$	(I, R=H)
27dβR	20R βα diacholestane	$C_{27}H_{48}$	(I, R=H)
27dαS	20S αβ diacholestane	$C_{27}H_{48}$	(II, R=H)
27dαR	20R αβ diacholestane	$C_{27}H_{48}$	(II, R=H)
28dβS	20S βα 24-methyl-diacholestane	$C_{28}H_{50}$	(I, R=CH_3)
28dβR	20R βα 24-methyl-diacholestane	$C_{28}H_{50}$	(I, R=CH_3)
28dαR	20R αβ 24-methyl-diacholestane	$C_{28}H_{50}$	(II, R=CH_3)
27ααS	+ 20S ααα cholestane	$C_{27}H_{48}$	(III, R=H)
29dβS	20S βα 24-ethyl-diacholestane	$C_{29}H_{52}$	(II, R=C_2H_5)
27ββR*	+ 20R αββ cholestane	$C_{27}H_{48}$	(IV, R=H)
27ββS*	20S αββ cholestane	$C_{27}H_{48}$	(IV, R=H)
28dαS	+ 20S αβ 24-methyl-diacholestane	$C_{28}H_{50}$	(II, R=CH_3)
27ααR	20R ααα cholestane	$C_{27}H_{48}$	(III, R=H)
29dβR	20R βα 24-ethyl-diacholestane	$C_{29}H_{52}$	(I, R=C_2H_5)
29dαR	20R αβ 24-ethyl-diacholestane	$C_{29}H_{52}$	(II, R=C_2H_5)
28ααS	20S ααα 24-methyl-cholestane	$C_{28}H_{50}$	(III, R=CH_3)
28ββR*	20R αββ 24-methyl-cholestane	$C_{28}H_{50}$	(IV, R=CH_3)
29dαS	+ 20S αβ 24-ethyl-diacholestane	$C_{29}H_{52}$	(II, R=C_2H_5)
28ββS*	20S αββ 24-methyl-cholestane	$C_{28}H_{50}$	(IV, R=CH_3)
28ααR	20R ααα 24-methyl-cholestane	$C_{28}H_{50}$	(III, R=CH_3)
29ααS	20S ααα 24-ethyl-cholestane	$C_{29}H_{52}$	(III, R=C_2H_5)

29ββR*	20R αββ 24-ethyl-cholestane	$C_{29}H_{52}$	(IV, R=C_2H_5)
29ββS*	20S αββ 24-ethyl-cholestane	$C_{29}H_{52}$	(IV, R=C_2H_5)
29ααR	20R ααα 24-ethyl-cholestane	$C_{29}H_{52}$	(III, R=C_2H_5)
M30αα	αα 4-methyl-24-ethyl-cholestane	$C_{30}H_{54}$	
M30D	αα 4,23,24-trimethyl-cholestane	$C_{30}H_{54}$	
30ααS	20S ααα 24-propyl-cholestane	$C_{30}H_{54}$	(IV, R=C_3H_7)
30ββR*	20R αββ 24-propyl-cholestane	$C_{30}H_{54}$	(V, R=C_3H_7)
30ββS*	20S αββ 24-propyl-cholestane	$C_{30}H_{54}$	(IV, R=C_3H_7)
30ααR	20R ααα-24-propyl-cholestane	$C_{30}H_{54}$	(IV, R=C_3H_7)

* Compounds identified and quantified in M/Z 218 fragmentograms

STRUCTURES REPRESENTING STERANES



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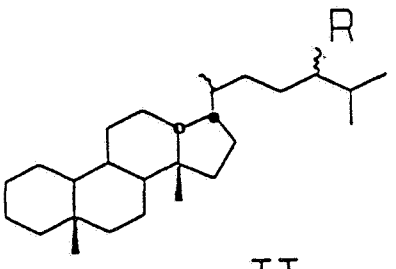

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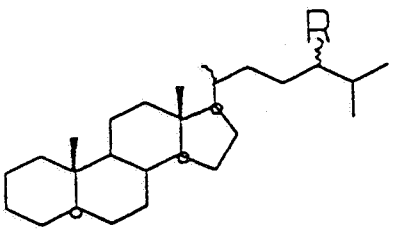

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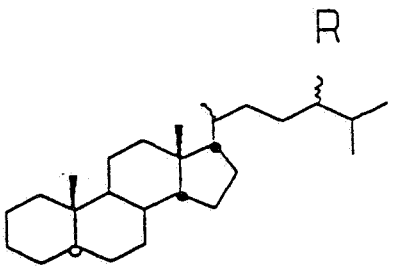

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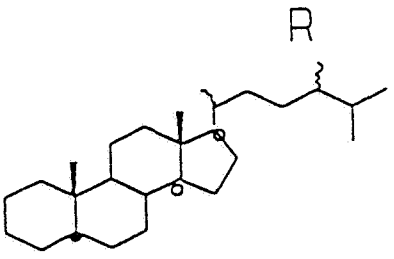

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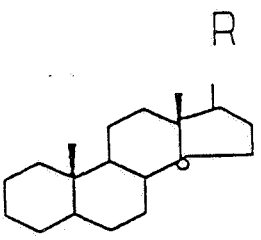


VI

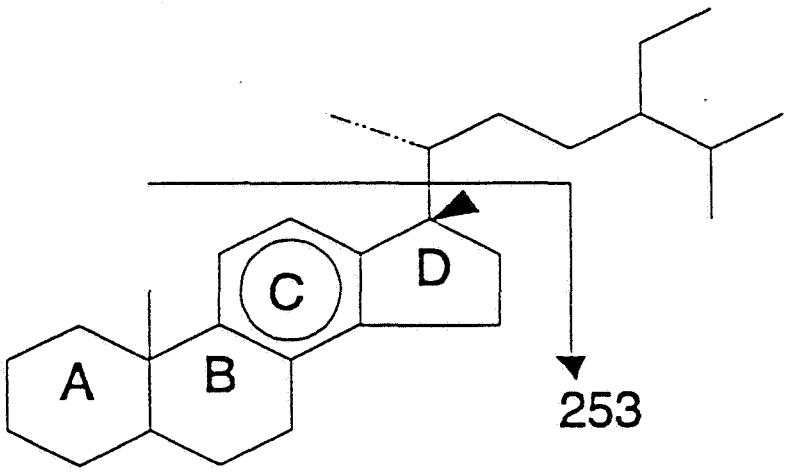
Mass Fragmentograms representing Monoaromatic Steranes (M/Z 253)

Description of C-ring monoaromatic steroid hydrocarbons

Peak	Substituents R_1	R_2	R_3	R_4	Abbreviation of Compound
A1					$C_{21}M$
B1					$C_{22}MA$
C1	β(H)	CH_3	$S(CH_3)$	H	$\beta SC_{27}MA$
	β(H)	CH_3	$R(CH_3)$	H	$\beta RC_{27}MA$
D1	CH_3	H	$R(CH_3)$	H	$RC_{27}DMA$
	α(H)	CH_3	$S(CH_3)$	H	$\alpha SC_{27}MA$
E1	β(H)	CH_3	$S(CH_3)$	CH_3	$\beta SC_{28}MA$
	CH_3	H	$S(CH_3)$	CH_3	$SC_{28}DMA$
F1	α(H)	CH_3	$R(CH_3)$	H	$\alpha RC_{27}MA$
	α(H)	CH_3	$S(CH_3)$	CH_3	$\alpha SC_{28}MA$
	β(H)	CH_3	$R(CH_3)$	CH_3	$\beta RC_{28}MA$
G1	CH_3	H	$R(CH_3)$	CH_3	$RC_{28}DMA$
	β(H)	CH_3	$S(CH_3)$	C_2H_5	$\beta SC_{29}MA$
	CH_3	H	$S(CH_3)$	C_2H_5	$SC_{29}DMA$
	α(H)	CH_3	$R(CH_3)$	CH_3	$\alpha RC_{28}MA$
H1	β(H)	CH_3	$R(CH_3)$	C_2H_5	$\beta RC_{29}MA$
	CH_3	H	$R(CH_3)$	C_2H_5	$RC_{29}DMA$

I1	α(H)	CH_3	$R(CH_3)$	C_2H_5	$\alpha RC_{29}MA$

STRUCTURES REPRESENTING MONOAROMATIC STERANES



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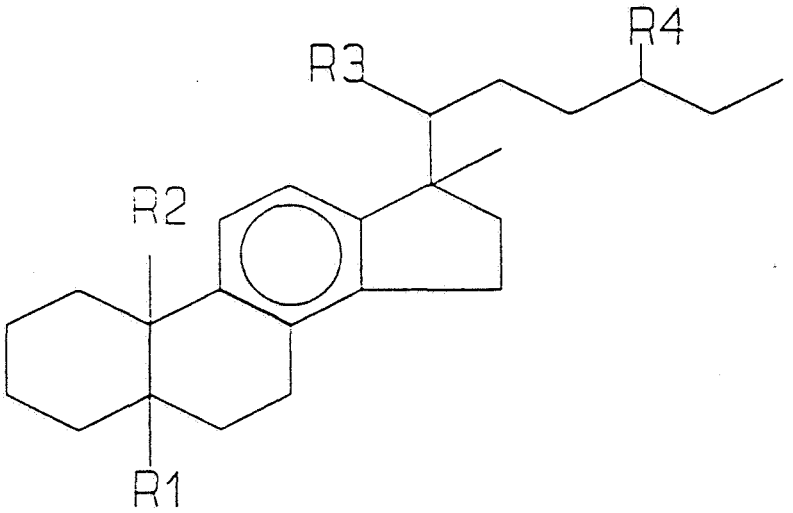
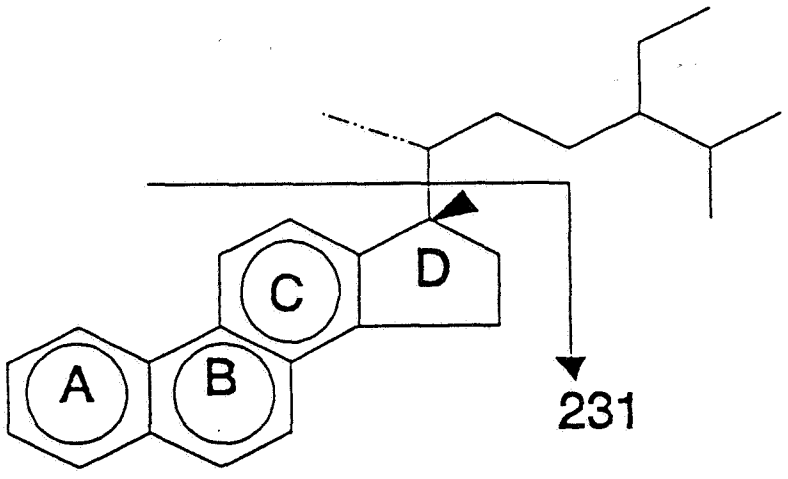


Mass Fragmentograms representing Triaromatic Steranes (M/Z 231)

Description of ABC-ring triaromatic steroid hydrocarbon

	Substituents		
Peak	**R_1**	**R_2**	**Abbreviation of Compound**
a1	CH_3	H	$C_{20}TA$
b1	CH_3	CH_3	$C_{21}TA$
c1	$S(CH_3)$	C_6H_{1-3}	$SC_{26}TA$
d1	$R(CH_3)$	C_6H_{13}	$RC_{26}TA$
	$S(CH_3)$	C_7H_{15}	$SC_{27}TA$
e1	$S(CH_3)$	C_8H_{17}	$SC_{28}TA$
f1	$S(CH_3)$	C_7H_{15}	$RC_{27}TA$
g1	$R(CH_3)$	C_8H_{17}	$RC_{28}TA$

STRUCTURES REPRESENTING TRIAROMATIC STERANES



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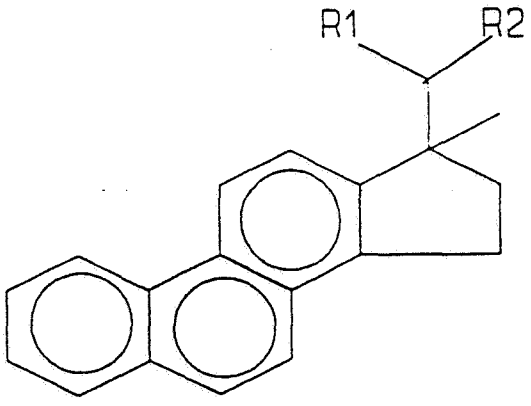

Stable Carbon Isotope Ratio Mass Spectrometry

Carbon isotope analysis is performed on a dual inlet VG SIRA 10 instrument. The combustion of the samples is performed by a Carlo Erba EA 1108 element analyser directly connected to the inlet system of the mass spectrometer.

The combustion temperature is 1020°C and the carrier gas used was Helium. After the combustion H_2O and CO_2 are trapped in individual cool traps. The CO_2 gas is then heated up before admission into the mass spectrometer. The whole operation is controlled by an IBM PC50 computer system.

δ-values

The isotope ratios are given as δ-values in ‰ versus the PDB-standard:

$$\delta^{13}C = (R\ sample - R\ standard/R\ standard) \times 1000$$

$$R = {}^{13}C/{}^{12}C$$

The PDB-standard (a marine chalk of the Pee Dee-formation, USA) was created by Craig 1957. All results of $^{13}C/^{12}C$-analysis of organic matter today are calculated (Craig correction) against this international standard.

Reproducibility

The precision of the combustion system and the mass spectrometer is controlled by determination of an international calibrated standard, NBS22 oil and a house standard carbon. Replicate analyses are also performed on samples.

PART 1 - ROCK SAMPLES

TABLES

* Not included in this project

** Not included in this project

Table 1. ANALYTICAL PROGRAM

Sample Depth & Type c= Cutt s= SWC p= Conv core/ plug m= Mud R= Reservoir S= Source	Fraction	HS & Occ Gas	Leco TOC	Rock Eval	Therm Ext GC	Pyrolysis GC	Extraction	MPLC & Deasp	Iatroscan	EOM GC	Sat GC Quan.	Aro GC	Sat GCMS Quan.	Aro GCMS	Bulk C Isot	Vis Kerogen	Vit Reflect
4260.73 pS	0010B		X	X	X	X										X	
4263.77 pS	0020B		X	X													
4266.76 pS	0030B		X	X	X	X										X	
4279.89 pS	0040B		X	X													
4283.32 pS	0050B		X	X													
4286.91 pS	0060B		X	X													
4288.87 pS	0070B		X	X	X	X										X	
4293.79 pS	0080B		X	X													
4296.73 pS	0090B		X	X													

Table 5A: Rock-Eval table for well NOCS 6506/11-4S

Depth unit of measure: m

Depth	Typ	Form	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
4260.73	ccp		bulk	2.43	3.81	0.77	4.95	4.77	80	16	6.2	0.39	451	0001-0B
4263.77	ccp		bulk	0.10	0.31	0.11	2.82	0.46	67	24	0.4	0.24	529	0002-0B
4266.76	ccp		bulk	0.33	0.83	0.24	3.46	1.07	78	22	1.2	0.28	442	0003-0B
4279.89	ccp		bulk	0.09	0.31	0.10	3.10	0.61	51	16	0.4	0.23	504	0004-0B
4283.32	ccp		bulk	0.07	0.30	0.17	1.76	0.62	48	27	0.4	0.19	539	0005-0B
4286.91	ccp		bulk	0.13	0.31	0.16	1.94	0.87	36	18	0.4	0.30	454	0006-0B
4288.87	ccp		bulk	0.14	0.87	0.09	9.67	1.42	61	6	1.0	0.14	445	0007-0B
4293.79	ccp		bulk	0.18	0.32	0.15	2.13	0.72	44	21	0.5	0.36	404	0008-0B
4296.73	ccp		bulk	0.19	0.16	0.18	0.89	0.19	84	95	0.3	0.54	347	0009-0B

Table 5B: Rock-Eval table for well RE,STD

Depth unit of measure: m

Depth	Typ	Form	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
1.00	std		bulk	0.42	19.37	1.84	10.53	-	-	-	19.8	0.02	423	0081-0B

Table 6 : Pyrolysis GC Data (S2 peak) as Percentage of Total Area for Well NOCS 6506/11-4S

Depth unit of measure: m

Depth	Typ	Lithology	C1	C2-C5	C6-C14	C15+	S2 from Rock-Eval	Sample
4260.73	ccp	bulk	17.76	31.48	36.83	13.93	-	0001-0B
4266.76	ccp	bulk	10.27	26.00	46.12	17.61	-	0003-0B
4288.87	ccp	bulk	15.35	36.34	41.27	7.05	-	0007-0B

Table 7: Visual Kerogen Composition Data for well NOCS 6506/11-4S

Depth unit of measure: m

Depth	Typ	Lithology	Amorphous AM%	FA	HA	Algal/Phytoplankton AP%	Cy	Ta	Bo	Di	De	Herbaceous HE%	SP	Cu	De	Woody WO%	FL	NF	De	Coaly CO%	FS	De	SCI	Sample
4260.73	ccp	bulk	45	*		5	*			**	**	TR	**	*	**	30		*	**	20	*	**	6.5-7.0	0001-0B
4266.76	ccp	bulk	TR			10	*			**	*	15	**	*	*	50		**	*	25	**	*	6.5-7.0	0003-0B
4288.87	ccp	bulk	TR	*		5	*			**	*	20	**	*	*	40		**	*	35	**	*	6.5-7.0	0007-0B

CORRECTED GEOCHEMICAL DATA REPORT

GEOLAB NOR AS
PO Box 5740 Fossegrenda
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Tel: (47) 73 964000
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X.400: S=firmapost, O=geolab-nor, A=telemax, C=no

CLIENT:

STATOIL

REF(S)
Richard Patience
ORDER NO: G96-7
CONTRACT NO: DTJ 020215

TITLE

WELL NOCS 6506/11-4ST2, DST 1B

AUTHOR(S)

Monica Østbye Hansen

GEOLAB PROJECT NO.	DATE
62286	24.02.97
PROJECT MANAGER: Kjell Arne Bakken, Snr. Scientist	QA RESPONSIBLE: Monica Østbye Hansen
REPLACES: Replaces earlier report 62286/G96-7, dated 28.08.96	FRONTPAGE

COMMENTS

One oil sample and one gas sample from well NOCS 6506/11-4ST2, DST 1B were received for analysis. The oil was subjected to full normal oil analysis program, shown in Table 1, together with API gravity. The gas sample was analysed for composition and carbon isotope composition by IFE.

GC-MS analysis has been performed on both the whole oil and on the saturated fraction and the data tabulated as "W.OIL" and "SAT FRAC." respectively.

All analysis are performed according to the Norwegian Industry Guide to Organic Geochemical Analysis, third edition, 1992. The procedures are not included in this report.

Table 1. ANALYTICAL PROGRAM:OIL NOCS 6406/11-4ST2, DST 1B

Sample Depth & Type c= Cutt s= SWC p= Conv core/ plug m= Mud R= Reservoir S= Source	Fraction	HS & Occ Gas	Leco TOC	Rock Eval	Therm Ext GC	Pyrolysis GC	Extraction	MPLC & Deasp	Iatroscan	WHOLE OIL GC	Sat GC Quan.	Aro GC	Sat GCMS	Aro GCMS	Bulk C Isot	API	Vis Kerogen	Vit Reflect
Tables								8	8	13	9	9	11	12	10	17		
DST 1B								X	X	X	X	X	X	X	X	X		
Totals								1	1	1	1	1	1*	1*	1	1		

Table 8a: MPLC Bulk Composition: Weight of Oil and Fraction for 6506/11-4ST2 DST 1B

Well	Description	Whole oil (mg)	Light (mg)	Topped (mg)	Sat (mg)	Aro (mg)	Asph (mg)	NSO (mg)	HC (mg)	Non-HC (mg)	Sample
6506/11-4ST2		**131.45**	**30.85**	100.6	69.6	18.2	10.0	2.9	87.7	12.9	04/0003

Table 8b: MPLC Bulk Composition: Oil fraction (%) for 6506/11-4ST2 DST 1B

Well	Description	Sat T.Oil	Aro T.Oil	Asph T.Oil	NSO T.Oil	HC T.Oil	Non-HC T.Oil	Sat Aro	HC Non-HC	Sample
6506/11-4ST2,		69.16	18.05	9.94	2.85	87.21	12.79	383.16	681.84	04/0003

Table 8E: Iatroscan TLC Bulk Composition: Rel. percentages of sep. fractions for 6506/11-4ST2 DST 1B

Well	Description	Sat HC	Aro HC	Resins	Asp	Tot HC	Tot Pol	Sample
6506/11-4ST2,		72.87	16.35	0.84	9.94	89.22	10.78	04/0003

Table 9A: Quantitative Analysis of Saturated Fraction for 3 CONDENSATE SAMPLES.

sample	nC15 mg/g sat	nC16 mg/g sat	IC18 mg/g sat	nC17 mg/g sat	Pr mg/g sat	nC18 mg/g sat	Ph mg/g sat	nC19 mg/g sat	nC20 mg/g sat	nC21 mg/g sat	nC22 mg/g sat	nC23 mg/g sat	nC24 mg/g sat	nC25 mg/g sat	nC26 mg/g sat	nC27 mg/g sat	nC28 mg/g sat	nC29 mg/g sat	nC30 mg/g sat	nC31 mg/g sat	nC32 mg/g sat	nC33 mg/g sat	nC34 mg/g sat
6506/11-4ST2 DST 1B	17.52	16.77	5.95	16.08	10.80	14.97	7.90	15.09	12.44	11.00	10.59	9.42	8.73	7.22	6.14	5.05	4.03	3.80	2.76	1.98	1.34	1.77	1.79

Table 9B: Saturated Hydrocarbon Ratios (peak area) for 6506/11-4ST2 DST 1B

Well	Description	Pristane / nC17	Pristane / Phytane	Pristane/nC17 / Phytane/nC18	Phytane / nC18	CPI1	nC17 / nC17+nC27	Sample
6506/11-4ST2		0.67	1.37	1.27	0.53	1.05	0.76	04/0003

Table 9Ca: Aromatic Hydrocarbon Ratios (peak area) for 6506/11-4ST2 DST 1B

Well	Description	MNR	DMNR	BPhR	2/1MP	MPI1	MPI2	Rc	DBT/P	4/1MDBT	(3+2) /1MDBT	Sample
6506/11-4ST2		2.08	3.25	0.21	2.61	1.13	1.52	1.08	-	-	-	04/0003

Table 9Cb: Aromatic Hydrocarbon Ratios (peak area) for 6506/11-4ST2 DST 1B

Well	Description	F1	F2	Sample
6506/11-4ST2		0.59	0.40	04/0003

Table 10A: Tabulation of carbon isotope data on oils for 6506/11-4ST2 DST 1B

Well	Descript.	Whole oil	Topped oil	Saturated	Aromatic	NSO	Asphaltenes	Sample
6506/11-4ST2		-28.49	-	-28.61	-27.44	-27.68	-27.31	04/0003

Table 10B: Tabulation of cv values from carbon isotope data for 6506/11-4ST2 DST 1B

Well	Descript.	Saturated	Aromatic	cv value	Sample
6506/11-4ST2		-28.61	-27.44	-0.18	04/0003

Table 11A: Variation in Triterpane Distribution (peak height) SIR for 6506/11-4ST2 DST 1B

Well	Descript.	Ratio1	Ratio2	Ratio3	Ratio4	Ratio5	Ratio6	Ratio7	Ratio8	Ratio9	Rat.10	Rat.11	Rat.12	Rat.13	Rat.14	Sample
6506/11-4ST2,	SAT FRAC.	0.31	0.24	0.41	1.38	0.58	1.84	0.44	0.32	0.30	2.07	0.85	0.58	0.17	55.39	04/0003
6506/11-4ST2,	W.OIL	0.35	0.26	0.36	1.74	0.63	1.15	0.22	0.12	0.18	1.79	0.85	0.60	0.07	51.97	04/0004

List of Triterpane Distribution Ratios

Ratio 1: 27Tm / 27Ts

Ratio 2: 27Tm / 27Tm+27Ts

Ratio 3: 27Tm / 27Tm+30aß+30ßa

Ratio 4: 29aß / 30aß

Ratio 5: 29aß / 29aß+30aß

Ratio 6: 30d / 30aß

Ratio 7: 28aß / 30aß

Ratio 8: 28aß / 29aß

Ratio 9: 28aß / 28aß+30aß

Ratio 10: 24/3 / 30aß

Ratio 11: 30aß / 30aß+30ßa

Ratio 12: 29aß+29ßa / 29aß+29ßa+30aß+30ßa

Ratio 13: 29ßa+30ßa / 29aß+30aß

Ratio 14: 32aßS / 32aßS+32aßR (%)

Table 11b: Variation in Sterane Distribution (peak height) SIR for 6506/11-4ST2 DST 1B

Well	Descript.	Ratio1	Ratio2	Ratio3	Ratio4	Ratio5	Ratio6	Ratio7	Ratio8	Ratio9	Ratio10	Sample
6506/11-4ST2,	SAT FRAC.	0.80	52.71	79.58	1.55	0.79	0.59	0.45	0.66	1.11	4.12	04/0003
6506/11-4ST2,	W.OIL	0.87	51.83	81.14	1.75	0.81	0.75	0.63	0.68	1.08	4.47	04/0004

List of Sterane Distribution Ratios

Ratio 1: 27dßS / 27dßS+27aaR

Ratio 2: 29aaS / 29aaS+29aaR (%)

Ratio 3: 2*(29ßßR+29ßßS) / (29aaS+29aaR + 2*(29ßßR+29ßßS)) (%)

Ratio 4: 27dßS+27dßR+27daR+27daS / 29dßS+29dßR+29daR+29daS

Ratio 5: 29ßßR+29ßßS / 29ßßR+29ßßS+29aaS

Ratio 6: 21a+22a / 21a+22a+29aaS+29ßßR+29ßßS+29aaR

Ratio 7: 21a+22a / 21a+22a+28daS+28aaS+29daR+29aaS+29ßßR+29ßßS+29aaR

Ratio 8: 29ßßR+29ßßS / 29aaS+29ßßR+29ßßS+29aaR

Ratio 9: 29aaS / 29aaR

Ratio 10: 29ßßR+29ßßS / 29aaR

Table 11c: Raw triterpane data (peak height) m/z 191 SIR for 6506/11-4ST2 DST 1B

Well	Descript.	23/3	24/3	25/3	24/4	26/3	27Ts	27Tm	28aß	25nor30aß	Sample
		29aß	29Ts	30d	29ßa	30O	30aß	30ßa	30G	31aßS	
		31aßR	32aßS	32aßR	33aßS	33aßR	34aßS	34aßR	35aßS	35aßR	
6506/11-4ST2,	SAT FRAC.	10342.3	8738.1	3742.0	3936.5	2680.6	11058.6	3434.4	1844.8	2305.1	04/0003
		5854.4	8206.6	7798.1	976.8	0.0	4229.3	746.6	0.0	1898.0	
		2221.3	1410.1	1135.9	680.7	1048.2	0.0	0.0	0.0	0.0	
6506/11-4ST2,	W.OIL	3848.3	2574.4	1101.5	1717.5	513.1	2671.2	947.9	309.5	529.2	04/0004
		2492.6	1755.3	1654.5	0.0	0.0	1434.2	259.4	0.0	407.5	
		602.3	333.5	308.3	0.0	250.9	0.0	0.0	0.0	0.0	

Table 11d: Raw sterane data (peak height) m/z 217 SIR for 6506/11-4ST2 DST 1B

Well	Descript.	21a	22a	27dßS	27dßR	27daR	27daS	28dßS	28dßR	28daR*	Sample
		29dßS*	28daS*	27aaR	29dßR	29daR	28aaS	29daS*	28ßßS		
		28aaR	29aaS	29ßßR	29ßßS	29aaR					
6506/11-4ST2,	SAT FRAC.	19063.8	4689.4	22699.2	16443.9	5530.8	6088.2	9580.4	8258.5	5287.7	04/0003
		12576.3	5675.1	5760.6	11518.4	3863.5	2033.6	4861.3	6111.7		
		1054.3	2929.7	5341.8	5490.8	2628.9					
6506/11-4ST2,	W.OIL	5166.8	950.0	3852.7	2299.3	883.9	812.2	1655.4	1140.2	669.0	04/0004
		1612.1	679.8	558.5	1715.3	455.5	191.0	692.7	841.0		
		180.5	343.0	725.6	698.3	318.8					

* 28daR coel with 27aaS, 29dßS coel with 27ßßR, 28daS coel with 27ßßS, 29daS coel with 28ßßR

Table 11e: Raw sterane data (peak height) m/z 218 SIR for 6506/11-4ST2 DST 1B

Well	Descript.	27ßßR	27ßßS	28ßßR	28ßßS	29ßßR	29ßßS	30ßßR	30ßßS	Sample
6506/11-4ST2,	SAT FRAC.	7445.1	6218.7	5999.2	7349.1	7788.7	8413.9	2132.0	1869.6	04/0003
6506/11-4ST2,	W.OIL	943.2	716.2	783.1	926.8	976.8	1074.4	189.6	170.3	04/0004

Table 11f: Raw triterpane data (peak height) m/z 177 SIR for 6506/11-4ST2 DST 1B

Well	Descript.	25nor28aß	25nor30aß	Sample
6506/11-4ST2,	SAT FRAC.	5656.6	1928.0	04/0003
6506/11-4ST2,	W.OIL	898.5	277.7	04/0004

Table 12a: Variation in Triaromatic Sterane Distribution (peak height) for 6506/11-4ST2 DST 1B

Well	Descript.	Ratio1	Ratio2	Ratio3	Ratio4	Ratio5	Sample
6506/11-4ST2,D	FRAC.	0.87	0.84	0.74	0.72	0.86	04/0003
6506/11-4ST2,D	W.OIL	0.45	0.36	0.25	0.24	0.40	04/0004

Ratio1: a1 / a1 + g1
Ratio2: b1 / b1 + g1
Ratio3: a1 + b1 / a1 + b1 + c1 + d1 + e1 + f1 + g1
Ratio4: a1 / a1 + e1 + f1 + g1
Ratio5: a1 / a1 + d1

Table 12b: Variation in Monoaromatic Sterane Distribution (peak height) for 6506/11-4ST2 DST 1B

Well	Descript.	Ratio1	Ratio2	Ratio3	Ratio4	Sample
6506/11-4ST2,D	FRAC.	0.88	0.82	0.79	0.77	04/0003
6506/11-4ST2,D	W.OIL	0.89	0.84	0.70	0.66	04/0004

Ratio1: A1 / A1 + E1
Ratio2: B1 / B1 + E1
Ratio3: A1 / A1 + E1 + G1
Ratio4: A1+B1 / A1+B1+C1+D1+E1+F1+G1+H1+I1

Table 12c: Aromatisation of Steranes (peak height) for 6506/11-4ST2 DST 1B

Well	Descript.	Ratio1	Ratio2	Sample
6506/11-4ST2,D	FRAC.	0.37	1.00	04/0003
6506/11-4ST2,D	W.OIL	0.05	0.99	04/0004

$$\text{Ratio1:} \quad \frac{C1+D1+E1+F1+G1+H1+I1}{C1+D1+E1+F1+G1+H1+I1 + c1+d1+e1+f1+g1}$$

Ratio2: g1 / g1 + I1

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Table 12d: Raw triaromatic sterane data (peak height) m/z 231 for 6506/11-4ST2 DST 1B

Well	Descript.	a1	b1	c1	d1	e1	f1	g1	Sample
6506/11-4ST2,D	FRAC.	8510.6	6422.2	538.9	1435.8	1196.5	871.4	1217.9	04/0003
6506/11-4ST2,D	W.OIL	3324.5	2286.8	1615.1	4933.6	4497.7	2167.3	4062.3	04/0004

Table 12e: Raw monoaromatic sterane data (peak height) m/z 253 for 6506/11-4ST2 DST 1B

Well	Descript.	A1	B1	C1	D1	E1	F1	G1	H1	I1	Sample
6506/11-4ST2,D	FRAC.	6305.1	3825.5	306.3	466.7	826.6	0.0	887.0	577.1	0.0	04/0003
6506/11-4ST2,D	W.OIL	1005.0	670.8	76.4	105.2	130.0	61.3	294.2	139.5	37.9	04/0004

Table 13A: Light Hydrocarbons from Whole Oil GC for 6506/11-4ST2 DST 1B

Well	Description	iC4	nC4	iC5	nC5	2,2DMC4	2,3DMC4	2MC5	3MC5	nC6	MCyC5	Benz	Sample
6506/11-4ST2	DST 1B	-	-	-	-	0.14	-	-	-	5.31	3.14	2.00	N80/0001

Table 13B: Light Hydrocarbons from Whole Oil GC for 6506/11-4ST2 DST 1B

Well	Description	CyC6	2MC6	3MC6	1,3ci-DMCyC5	1,3tr-DMCyC5	1,2tr-DMCyC5	nC7	MCyC6	Tol	nC8	p/m-Xylene	Sample
6506/11-4ST2	DST 1B	4.93	2.52	1.78	0.66	0.63	1.18	5.26	8.62	6.52	4.54	5.16	N80/0001

Table 13C: Thompson's indices for 6506/11-4ST2 DST 1B

Well	Description	A	B	X	W	C	I	F	H	U	R	S	Sample
6506/11-4ST2	DST 1B	0.38	1.24	1.14	4.06	0.78	1.74	0.61	20.56	1.57	2.09	37.93	N80/0001

Thompson Indices

Aromaticity

A = Benzene / n-Hexane
B = Toluene / n-Heptane
X = m+p-Xylene / n-Octane
W = Benzene × 10 / CyC_6

Paraffinicity

C = $(nC_6 + nC_7) / (CyC_6 + MCyC_6)$
I = $(2MC_6 + 3MC_6) / (1,3ciDMCyC_5 + 1,3trDMCyC_5 + 1,2trDMCyC_5)$
F = $nC_7 / MCyC_6$
H = $nC_7 \times 100 / (CyC_6 + 2MC_6 + 2,3DMCyC_5 + 3MC_6 + 1,3ciDMCyC_5 + 1,3trDMCyC_5 + 1,2trDMCyC_5 + nC_7 + MCyC_6)$

Naphthenes / Iso-compounds

U = $CyC_6 / MCyC_5$

Paraffins / Iso-compounds

R = $nC_7 / 2mC_6$
S = $nC_6 / 2,2DMC_4$

Table 14a: Gas Composition Data (IFE),
Well NOCS 6506/11-4ST2, DST 1B

Sample	IFE no GEO	C_1 %	C_2 %	C_3 %	iC_4 %	nC_4 %	iC_5 %	nC_5 %	CO_2 %	ΣC_1-C_5 %	Wet-ness	iC_4/ nC_4
DST 1B	960893	78.1	9.0	3.7	0.49	0.68	0.14	0.12	7.8	92.2	0.15	0.72

Table 14b: Gas isotope Composition Data (IFE),
Well NOCS 6506/11-4ST2, DST 1B

Sample	IFE no GEO	C_1 $\delta^{13}C$ ‰PDB	C_1 δD ‰ SMOW	C_2 $\delta^{13}C$ ‰PDB	C_3 $\delta^{13}C$ ‰PDB	iC_4 $\delta^{13}C$ ‰PDB	nC_4 $\delta^{13}C$ ‰PDB	CO_2 $\delta^{13}C$ ‰PDB	CO_2 $\delta^{18}O$ ‰PDB
DST 1B	960893	-43.5	-185	-30.5	-29.0	-28.7	-28.1	-13.0	-15.7

Table 17: API Gravity

Sample	API Gravity
6506/11-4ST2, DST 1B	40.33