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WELL 25/5-3

(NORWAY)

Follow-up organic geochemical study

EP/S/EXP/Lab.n° 91-135RP

Author : K. LE TRAN

adresse postale : ☐ tour Elf - Cedex 45 92078 Paris La Défense
☐ Pau - 64018 Pau Cedex
☐ Lacq - bp 22 64170 Lacq
☐ Boussens - 31360 Boussens

téléphone : - 33 - (1) 47 44 45 46
- 33 - 59 83 40 00
- 33 - 59 92 22 22
- 33 - 61 97 80 00

télex : elfa 615 400 f
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3 - **ABSTRACT** (please use space below only)

This report presents the results of the organic geochemical follow-up study carried out on eight source rock and reservoir rock extracts selected based upon the geochemical screening previously reported on well 25/5-3. Detailed geochemical characterization of the DST 1 gas condensate from the Brent reservoir is also presented on both the liquid phase and gaseous phase in standard conditions.

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I. - INTRODUCTION

This report deals with the organic geochemical follow-up aiming at characterizing in detail the hydrocarbons contained in Jurassic source rocks and reservoir rocks as well as in the fluids (liquid and gas) recovered from DST 1 gas condensate sample

Eight samples of sidewall cores and ditch cuttings, selected on the basis of geochemical screening analyses (tables 1, 2, 3 and figure 1) were submitted to further solvent extraction and detailed GC, GC-MS and carbon isotope analyses.
The distribution of the samples is as follows.

Heather Formation : 2 shales
Brent Group : 1 coal and 2 sandstones
Dunlin Group : 2 shales
Statfjord Formation : 1 coal

TABLES

LEGENDS OF TABLES AND FIGURES OF ORGANIC INVENTORY ANALYSES : ABBREVIATIONS, UNITS AND CUT OFFS

SAMPLE TYPE : ND=unwashed cuttings; DE=cuttings washed on site..... [the ND are washed and the DE are washed anew in the laboratory]
CA=core; CL=sidewall core; TE=outcrop; BO=mud; XX=other or undetermined
IR : Insoluble residue after HCl attack (% weight of rock)

TOC : Total organic carbon (% weight of rock) ..... [measured with Rock Eval+TOC analyser or LECO]
IOC : Insoluble organic carbon in chloroform (% weight of rock) Id.
OC : Organic carbon (total or insoluble)

X-RAY DIFF. : ALBite ; ORThoclase ; ANHydrite (or chlorite/kaolinite) ; QuaRtZ ; CALcite ; DOLomite ; SIDerite ; uNDosed (% weight of rock)

ROCK EVAL ANALYSIS

Carried out on : ..... [generally not performed if OC< .3%]
RT : Total rock
RI_RT : Insoluble residue after HCl attack
RE : Rock extracted with chloroform
RI_RE : Rock extracted with chloroform, and after HCl attack

Measured parameters : .... [# : result not given because meaningless; <S : lower than the detection threshold]
Tmax : Temperature of S2 peak (°C) ..... [meaningless if S2 small]
S1 : Free hydrocarbons in the rock (mgHC/g of rock) ..... [meaningless if the analysis is performed on the extracted rock]
S2 : Hydrocarbons yielded by pyrolysis (mgHC/g of rock)
S3 : CO2 yielded by pyrolysis (mg CO2/g of rock)

Calculated parameters :
PI : Production Index= S1/(S1+S2) ..... [# : meaningless if S1 and S2 < .2]
HI : Hydrogen Index = (S2/OC)x100 (mg HC/g OC)
OI : Oxygen Index = (S3/OC)x100 (mg CO2/g OC) .. [to be used with caution for analyses carried out on RT or RE if OC < 2%;
IO>170 : mineral contribution to S3 peak]

EXTRACT ANALYSIS

EOM: extractable organic matter with chloroform (% per weight of rock) ..... [<S if lower than .01 %]
Normalized composition of the extract (% EOM) .....[generally not performed if EOM < .03 %]
SAT: Saturated hydrocarbons
ARO: Aromatic hydrocarbons
POL: Polar compounds (Resins+Asphaltenes)
HC: SAT+ARO (mg HC/g of rock)

Q1: Contaminations or cavings, affecting the Rock Eval and TOC analyses | I=high; M=medium; F=low;
Q2: Contaminations or cavings, affecting the organic extract | N=null or not detected; U=unknown

TABLE: 1 25/5-3

DESCRIPTION OF ANALYSED SAMPLES AND ORGANIC CARBON CONTENT

LAB. REF.	SAMPLE TYPE	DEPTHS Metres	IR %	TOC %	IOC %	L I T H O L O G Y
B28871	CL	2139.00		.19		SAND, CLEAR, WHITE, LIGHT GREY, LOOSE FRIABLE, ARGILLACEOUS
B28870	CL	2140.00		.43		SAND, CLEAR, WHITE, LIGHT GREY, LOOSE FRIABLE, ARGILLACEOUS
B28832	CL	2367.00		2.08		SHALE, DARK OLIVE BROWN, MODERATELY HARD, WAXY, SL. MICROMICACEOUS
B28872	CL	2380.00		4.12		SHALE, DARK OLIVE BROWN, MODERATELY HARD, WAXY, SL. MICROMICACEOUS
B28882	CA01	2388.00				SANDSTONE, FINE GRAINED, VERY MICROMICACEOUS
B28883	CA01	2391.00				SANDSTONE, FINE GRAINED, VERY MICROMICACEOUS
B28884	CA01	2393.00				SANDSTONE, FINE GRAINED, VERY MICROMICACEOUS, PYRITE NODULES
B28885	CA01	2394.50				SANDSTONE, FINE GRAINED, VERY MICROMICACEOUS,
B28886	CA01	2397.00				SANDSTONE, FINE GRAINED, SLIGHTLY MICROMICACEOUS, LIGHT BROWN
B28887	CA01	2399.00				SANDSTONE, FINE GRAINED, SLIGHTLY MICROMICACEOUS
B28888	CA01	2402.00				SANDSTONE, FINE GRAINED, SLIGHTLY MICROMICACEOUS
B28889	CA01	2403.80				SANDSTONE, SHALY, GREENISH GREY, VERY MICROMICACEOUS
B28873	CL	2421.50				SANDSTONE, LIGHT GREY, FINE, POORLY CONSOLIDATED, SL. MICROMICACEOUS
B28874	CL	2425.00				SANDSTONE, LIGHT GREY, FINE, POORLY CONSOLIDATED, SL. MICROMICACEOUS
B28875	CL	2428.70				SANDSTONE, LIGHT GREY, FINE, POORLY CONSOLIDATED, SL. MICROMICACEOUS
B29286	ND	2430.00		71.81		COAL
B28876	CL	2439.50				SANDSTONE, LIGHT GREY, FINE, POORLY CONSOLIDATED, SL. MICROMICACEOUS
B28877	CL	2460.00		2.31		SHALE, OLIVE GREY BROWN, SLIGHTLY SILTY, SLIGHTLY MICROCACEOUS
B28878	CL	2476.00		2.13		SHALE, OLIVE GREY BROWN, SLIGHTLY SILTY, SLIGHTLY MICROCACEOUS
B28879	CL	2512.50		.67		SHALE, GREYISH BROWN, MOD. HARD, SLIGHTLY CALCAREOUS, LOC. MICROCACEOUS
B28844	CL	2535.00		1.24		SHALE, BROWNISH GREY, MOD. HARD, WAXY, SL. MICROMICACEOUS, LOC. SILTY
B28880	CL	2590.00		.68		SHALE, BROWNISH GREY, MOD. HARD, SLIGHTLY SILTY, SLIGHTLY CALCAREOUS
B28881	CL	2601.00		.54		SHALE, BROWNISH GREY, MOD. HARD, SLIGHTLY SILTY, SLIGHTLY CALCAREOUS
B28890	CA02	2615.00				SANDSTONE, COARSE GRAINED
B28892	DE	2615.00		.44		SANDSTONE, COARSE GRAIN
B28891	CA02	2628.20		1.12		SHALE, BROWNISH GREY, MICROMICACEOUS
B28893	DE	2660.00		42.06		COAL
B28850	CL	2700.00		2.16		SHALE, GREENISH GREY, FIRM, SLIGHTLY SILTY, SLIGHTLY CALCAREOUS
B28894	DE	2705.00		7.82		SHALE, COALY
B28854	CL	2782.50		.21		SHALE, MOD. BROWN, LOC. GREENISH GREY, MOTTLED, MOD. HARD, SL.CALCAREOUS
B28895	DE	2845.00 2855.00		.44		SHALE, RED

TABLE 2 25/5-3

MINERALOGICAL COMPOSITION BY X-RAY DIFFRACTION

LAB. REF.	SAMPLE TYPE	DEPTHS Metres	IR %	TOC %	IOC %	ALB %	ORT %	ANH %	QRZ %	CAL %	DOL %	SID %	ND %
B28871	CL	2139.00		.19		10	4	1	50	0	0	0	35
B28870	CL	2140.00		.43		4	3	1	46	0	0	0	46
B28832	CL	2367.00		2.08		1	0	0	18	1	0	0	80
B28872	CL	2380.00		4.12		5	2	1	27	0	0	1	64
B28882	CA01	2388.00				8	7	1	55	0	1	0	28
B28883	CA01	2391.00				6	11	2	55	0	1	0	25
B28884	CA01	2393.00				6	8	1	44	0	10	0	31
B28885	CA01	2394.50				6	10	2	56	0	1	0	25
B28886	CA01	2397.00				3	6	1	68	5	0	6	11
B28887	CA01	2399.00				5	6	2	62	1	1	0	23
B28888	CA01	2402.00				4	9	2	67	0	1	0	17
B28889	CA01	2403.80				4	9	2	36	0	2	3	44
B28873	CL	2421.50				5	7	1	57	0	2	0	28
B28874	CL	2425.00				4	5	1	67	0	1	0	22
B28875	CL	2428.70				3	7	3	42	1	1	1	42
B29286	ND	2430.00		71.81									
B28876	CL	2439.50				2	5	2	30	0	0	1	60
B28877	CL	2460.00		2.31		2	1	0	18	1	1	1	76
B28878	CL	2476.00		2.13		2	1	0	21	7	0	2	67
B28879	CL	2512.50		.67		1	0	0	6	0	0	40	53
B28844	CL	2535.00		1.24		3	1	2	29	0	0	1	64
B28880	CL	2590.00		.68		0	1	2	30	0	0	0	67
B28881	CL	2601.00		.54		3	2	2	26	2	0	0	65
B28890	CA02	2615.00				2	3	0	87	0	0	1	7
B28892	DE	2615.00		.44		2	4	1	52	4	0	4	33
B28891	CA02	2628.20		1.12		3	2	1	23	0	0	0	71
B28893	DE	2660.00		42.06		0	0	0	11	0	0	0	89
B28850	CL	2700.00		2.16		1	1	0	10	1	0	29	58
B28894	DE	2705.00		7.82		0	1	0	18	1	0	6	74
B28854	CL	2782.50		.21		7	0	1	12	3	0	0	77
B28895	DE	2845.00 2855.00		.44		6	0	1	13	9	2	0	69

TABLE: 3 25/5-3

RESULTS OF ORGANIC INVENTORY ANALYSIS

LAB. REF.	SAMPLE TYPE	DEPTHS Metres	ROCK-EVAL Q1	on	Tmax	S1	S2	S3	PI	HI	OI	TOC	Follow-up	EXTRACT ANALYSIS Q2	EOM	100(EOM/TOC)	SAT	ARO	POL	SAT/ARO	HC
B28871	CL	2139.00	N	RT			#		#			.19		N	<S						
B28870	CL	2140.00	N	RT	#	.10	.88	.44	.10	205	102	.43		N	.013	3.0					
B28832	CL	2367.00	N	RT	422	.18	4.48	.60	.04	215	29	2.08	*	N	.061	2.9	18.5	35.9	45.6	.51	.33
B28872	CL	2380.00	N	RT	423	.57	14.04	.32	.04	341	8	4.12	*	N	.187	4.5	25.1	25.3	49.6	.99	.94
B28882	CA01	2388.00	N											N	<S						
B28883	CA01	2391.00	N											N	<S						
B28884	CA01	2393.00	N											N	<S						
B28885	CA01	2394.50	N											N	.011						
B28886	CA01	2397.00	N											N	.010						
B28887	CA01	2399.00	N											N	<S						
B28888	CA01	2402.00	N											N	<S						
B28889	CA01	2403.80	N											N	.026						
B28873	CL	2421.50	N											N	.052		66.4	20.4	13.2	3.25	.45
B28874	CL	2425.00	N											N	.042		67.6	20.5	12.0	3.30	.37
B28875	CL	2428.70	N										*	N	.145		68.3	18.6	13.1	3.68	1.26
B29286	ND	2430.00	N	RT	428	19.31	184.11	1.76	.09	256	2	71.81	*	N	1.858	2.6	5.5	41.7	52.8	.13	8.76
B28876	CL	2439.50	N										*	N	.113		3.4	26.8	69.8	.13	.34
B28877	CL	2460.00	N	RT	420	.23	5.29	.45	.04	229	19	2.31	*	N	.100	4.3	14.1	38.1	47.8	.37	.52
B28878	CL	2476.00	N	RT	428	.09	3.78	1.02	.02	177	48	2.13	*	N	.097	4.5	13.7	28.7	57.6	.48	.41
B28879	CL	2512.50	N	RT	436	<S	.42	5.42		63	>170	.67		N	.012	1.8					
B28844	CL	2535.00	N	RT	435	.05	1.58	1.70	.03	127	137	1.24		N	.033	2.7	22.8	27.1	50.0	.84	.16
B28880	CL	2590.00	N	RT	429	.02	.38	.46	.05	56	68	.68		N	<S						
B28881	CL	2601.00	N	RT	429	.02	.23	.44	.08	43	81	.54		N	<S						
B28890	CA02	2615.00	N											N	<S						
B28892	DE	2615.00	N	RT	431	.04	.28	.60	.13	64	136	.44		N	.012	2.6					
B28891	CA02	2628.20	N	RT	431	.06	.61	.18	.09	54	16	1.12		N	.014	1.2					
B28893	DE	2660.00	N	RT	426	7.88	135.10	.72	.06	321	2	42.06	*	N	1.280	3.0	6.5	34.2	59.3	.19	5.21
B28850	CL	2700.00	N	RT	#	<S	.04	4.41	#	2	>170	2.16		N	<S						
B28894	DE	2705.00	N	RT	432	.64	16.31	1.00	.04	209	13	7.82		N	.260	3.3	7.8	38.2	53.9	.20	1.20
B28854	CL	2782.50	N	RT			#		#			.21		N	<S						
B28895	DE	2845.00 2855.00	N	RT	426	.04	.18	1.19	#	41	>170	.44		N	.014	3.2					

TABLE 4

DETAILED CHARACTERISATION OF ROCK EXTRACTS

25/5-3

REFERENCE			SCREENING ANALYSES							GC OF SATURATED HYDROCARBONS					GC OF AROMATIC HYDROCARBONS				CARBON STABLE ISOTOPES per mil PDB				
DEPTH (m)	FM	SAMP	TOC (%)	S2 (mg/g)	EOM (ppm)	EOM/ TOC	SAT (%)	ARO (%)	POL (%)	A	B	PR/PH	A/B	CPI 22-34	MPI1	MPI3	MP/P	MPR	TOTAL EXTRACT	SAT	ARO	RES	ASP
2367	H	CL	2.08	4.48	776	3.7	18.2	31.4	50.4	2.11	1.05	2.26	2.01	1.50	.63	.79	2.05	.62	-27.2	~	-26.8	~	~
2380	H	CL	4.12	14.04	2043	5.0	27.3	27.4	45.3	1.61	1.60	1.52	1.01	1.57	.57	.75	1.80	.54	-28.4	~	-28.5	~	~
2428.7	B	CL	~	~	1571	~	66.5	16.1	17.4	1.17	.49	1.00	2.41	1.08	.87	.81	4.57	.82	-28.1	~	~	~	~
2430	B	ND	71.81	184.11	29511	4.1	4.7	36.4	58.9	20.86	2.34	11.85	8.93	1.78	.33	.56	0.98	.70	-25.3	-27.3	-25.5	-25.1	-25.4
2439.5	B	CL	~	~	1991	~	2.9	24.4	72.7	5.62	1.31	5.82	4.31	1.38	.35	.52	1.24	.77	-25.1	~	-25.1	~	~
2460	D	CL	2.31	5.29	1483	6.4	15.9	35.0	49.1	2.26	1.71	1.89	1.32	1.52	.47	.71	1.33	.70	-30.6	~	-30.6	~	~
2476	D	CL	2.13	3.78	1243	5.8	13.7	28.9	57.4	3.34	2.00	2.20	1.68	1.65	.51	.73	1.54	.80	-28.1	~	-28.3	~	~
2660	S	DE	42.06	135.10	26692	6.3	5.0	25.1	69.9	7.79	.87	7.82	8.97	~	.72	.75	3.10	.92	-27.4	-30.9	-28.0	-27.1	-26.8

Abbreviations used in this table

FM = formation (H=Heather; B=Brent; D=Dunlin; S=Statfjord)
SAMP = sample type (CL=sidewall core; DE and ND=drill cuttings)
EOM = extractable organic matter | preparative analysis
SAT = saturated hydrocarbons | (soxhlet extraction and MPLC)
ARO = aromatic hydrocarbons |
POL = polar compounds (RES+ASP) |
A = pristane/n-C17; B = phytane/n-C18
PR = Pristane; PH = Phytane
CPI(22-34) = 1/2[X/Y+X/Z] where X=sum of odd numbers from C23 to C33
Y=sum of even numbers from C22 to C32
Z=sum of even numbers from C24 to C34
MPI1 = 1.5 (2MP+3MP)/(P+1MP+9MP)
MPI3 = (2MP+3MP)/(1MP+9MP)
MP/P = Sum of Methylphenanthrenes/Phenanthrene
MPR = 2MP/1MP

RESULTS OF OIL ANALYSIS
25/5-3

IDENTIFICATION	
SAMPLE	DST 1
LAB REFERENCE	B28808
RESERVOIR	
DEPTH (m)	2386-2405
BULK PROPERTIES	
SPECIFIC GR.	.7647
API GRAVITY	53.73
SULFUR %	.04
RESIDUE C14+ %	16.57
CARBON ISOTOPY (per mil PDB)	
TOTAL OIL	-27.2
RESIDUE	-27.8
SATURATES C14+	-28.3
AROMATICS C14+	-26.1
RESINS	~
COMPOSITION OF RESIDUE C14+	
SATURATED HC	82.33
AROMATIC HC	16.63
RESINS	1.04
ASPHALTENES	.00
TOTAL HC	98.96
SAT/ARO	4.95
COMPOSITION OF WHOLE OIL	
DISTILLATE %	83.43
SAT. HC C14+	13.64
ARO. HC C14+	2.76
RESINS	.17
ASPHALTENES	0.00
GAS CHROMATOGRAPHY	
PR/PH	3.01
PR/nC17 = A	.73
PH/nC18 = B	.36
A/B	2.02
MPI-1	~
MPI-3	~
MP/P	~

~ : not available
PR = pristane; PH = phytane
MPI-1 = 1.5 (2MP+3MP)/(P+1MP+9MP)
MPI-3 = (2MP+3MP)/(1MP+9MP)
MP/P = Sum of methylphenanthrenes/phenanthrene

TABLE 6

RESULTS OF DST 1 GAS ANALYSIS
25/5-3

IDENTIFICATION	
SAMPLE	DST 1
DEPTH	2386-2405 m
COMPOSITION*	
N2	1.70
CO2	.70
C1	84.25
C2	7.40
C3	3.60
iC4	.50
nC4	1.10
iC5	.45
nC5	.40
C6+	~
MOLECULAR RATIOS	
iC4/nC4	.454
iC5/nC5	1.125
C1/C1-C4 (%)	86.990
C1/C2-C3	7.659
ISOTOPY**	
d13C C1	-41.3
C2	-28.7
C3	-27.45
C4	-27.45
CO2	-11
dD C1	-207
d18O CO2	+29

* Composition in % volume
** Carbon isotope ratio (d13C) in per mil PDB
Hydrogen isotope ratio (dD) in per mil SMOW
Oxygen isotope ratio (d18O) in per mil SMOW

S N E A (P) — Organic Geochemistry
Computerized GC/MS Analytical Report on Steranes and Terpanes nr. 2175

Sample..... :25/5-3 B28832. ST NO
Well Depth ..... :2367. to 2367. (Meters)
Particuliarities II.. :/
Acquisition File Name :B28832STM Mag tape /
Submitted by..... :KT january 2. , 1991.
Particuliarities I... :CL

STERANES	Areas	TERPANES	Areas
C21 Sterane.....	96934.	C23 tricyclic.....	ns
C22 4-Methyl Sterane	ns	C24 tetracyclic.....	ns
C22 Sterane.....	60114.	Ts.....	91183.
C27 S Diasterane....	478955.	Tm.....	740865.
C27 aa S Sterane....	256933.	29 ab Hopane.....	1356320.
C27 bb R Sterane....	182557.	30 ab Hopane.....	1709660.
C27 bb S Sterane....	182557.	30 ba Hopane.....	752263.
C27 aa R Sterane....	574723.	31 ab S Homohopane..	1082770.
C29 aa S Sterane....	194279.	31 ab R Homohopane..	1173960.
C29 bb R Sterane....	457949.	32 ab S Homohopane..	433120.
C29 bb S Sterane....	242850.	32 ab R Homohopane..	683875.
C29 aa R Sterane....	1047710.	TOTAL TERPANES	16859000.
TOTAL STERANES	11446000.		

OPTIONAL ANALYSIS	Areas	OPTIONAL ANALYSIS	Areas
C30 tricyclic,22 S..	ns	C35 ab S Homohopane.	341936.
C30 tricyclic,22 R..	ns	C35 ab R Homohopane.	569896.
29 Desmethyl Hopane.	ns		
C28 Bisnorhopane....	ns		
C29/5 (RT.> 29 ab)..	nd		
18 a(H) Oleanane....	ns	"X"	159568.
Gammacerane.....	ns	nC31	3014890.
C33 ab S Homohopane.	319140.	C27bb	473382.
C33 ab R Homohopane.	478712.	C28bb	358062.
C35 Hexacyclic.....	ns	C29bb	622721.

RESULTS :

27 bb S / 27 aa R ..	0.31	C29 DHop / C29 Hop .	v. low.
27 aa S / 27 aa R --	0.44	C28 BNHop / C29 Hop-	v. low.
27 S dia / 27 aa R .	0.83	C29/5 / C29 Hop.....	N / A
22 4-Me st / 27 aa R	v. low.	18 aH Olean/C30 Hop.	v. low.
% 20 S C27	36.72	Gammacerane/C30 Hop.	v. low.
% bb C27----------	30.50	30/3(R&S) / C29 Hop-	v. low.
		30/3(R&S) / 23/3....	N / A
29 bb S / 29 aa R...	0.23	2.35Hex/C35Hop(R&S).	v. low.
29 aa S / 29 aa R...	0.18	C35H(R&S)/C33H(R&S).	1.14
27 S dia / 29 aa R..	0.45	29+30Hop/C35 H(R&S).	3.36
22 4-Me st / 29 aa R	v. low.		
% 20 S C29	22.50		
% bb C29 ----------	36.07		
21 st / 22 st	1.61		
22 4-Me st / 22 st--	v. low.		
		X/29H	0.11
29 H / C30 H	0.79	nC31/C30H	1.76
Tm / Ts ----------	8.12	%nC31/100	0.09
23/3 / 24/4	N / A	%ST/100	0.36
% 22 S C31 ----------	47.97	%TT/100	0.53
% 22 S C32	38.77	%27bb/100	0.32
ba / ab ----- X 100 -	44.00	%28bb/100	0.24
		%29bb/100	0.42
23/3 / 21 st	v. low.	27-30H/29ST	2.00
TT / ST ----------	1.47	29bbR/29aaR	0.43

S N E A (P) Organic Geochemistry
Computerized GC/MS Analytical Report on Steranes and Terpanes nr. 2180

Sample..... :25/5-3 B28872. ST NO
Well Depth ..... :2380.00 to 2380.00 (Meters)
Particuliarities II.. :/
Acquisition File Name :B28872STM Mag tape /
Submitted by..... :KT january 2. , 1991.
Particuliarities I... :CL

STERANES	Areas	TERPANES	Areas
C21 Sterane.....	18605.	C23 tricyclic.....	22078.
C22 4-Methyl Sterane	7206.	C24 tetracyclic.....	12343.
C22 Sterane.....	14850.	Ts.....	29309.
C27 S Diasterane....	194763.	Tm.....	131888.
C27 aa S Sterane....	101374.	29 ab Hopane.....	384681.
C27 bb R Sterane....	155044.	30 ab Hopane.....	564200.
C27 bb S Sterane....	47707.	30 ba Hopane.....	131888.
C27 aa R Sterane....	302141.	31 ab S Homohopane..	359035.
C29 aa S Sterane....	46640.	31 ab R Homohopane..	390507.
C29 bb R Sterane....	95400.	32 ab S Homohopane..	175852.
C29 bb S Sterane....	42400.	32 ab R Homohopane..	190507.
C29 aa R Sterane....	279838.	TOTAL TERPANES	5425770.
TOTAL STERANES	3288260.		

OPTIONAL ANALYSIS	Areas	OPTIONAL ANALYSIS	Areas
C30 tricyclic,22 S..	ns	C35 ab S Homohopane.	131888.
C30 tricyclic,22 R..	ns	C35 ab R Homohopane.	168525.
29 Desmethyl Hopane.	ns		
C28 Bisnorhopane....	ns		
C29/5 (RT.> 29 ab)..	95255.		
18 a(H) Oleanane....	ns	"X"	29309.
Gammacerane.....	ns	nC31	701426.
C33 ab S Homohopane.	117234.	C27bb	152962.
C33 ab R Homohopane.	146543.	C28bb	81091.
C35 Hexacyclic.....	ns	C29bb	143222.

RESULTS :

27 bb S / 27 aa R ..	0.15	C29 DHop / C29 Hop .	v. low.
27 aa S / 27 aa R --	0.33	C28 BNHop / C29 Hop-	v. low.
27 S dia / 27 aa R .	0.64	C29/5 / C29 Hop.....	0.24
22 4-Me st / 27 aa R	0.02	18 aH Olean/C30 Hop.	v. low.
% 20 S C27	24.59	Gammacerane/C30 Hop.	v. low.
% bb C27----------	33.44	30/3(R&S) / C29 Hop-	v. low.
		30/3(R&S) / 23/3....	v. low.
29 bb S / 29 aa R...	0.15	2.35Hex/C35Hop(R&S).	v. low.
29 aa S / 29 aa R...	0.16	C35H(R&S)/C33H(R&S).	1.13
27 S dia / 29 aa R..	0.69	29+30Hop/C35 H(R&S).	3.15
22 4-Me st / 29 aa R	0.02		
% 20 S C29	19.17		
% bb C29 ----------	29.68		
21 st / 22 st	1.25		
22 4-Me st / 22 st--	0.48		
		X/29H	0.07
29 H / C30 H	0.68	nC31/C30H	1.24
Tm / Ts ----------	4.49	%nC31/100	0.07
23/3 / 24/4	1.78	%ST/100	0.34
% 22 S C31 ----------	47.90	%TT/100	0.57
% 22 S C32	47.99	%27bb/100	0.40
ba / ab ----- X 100 -	23.37	%28bb/100	0.21
		%29bb/100	0.37
23/3 / 21 st	1.18	27-30H/29ST	2.39
TT / ST ----------	1.65	29bbR/29aaR	0.34

S N E A (P) — Organic Geochemistry
Computerized GC/MS Analytical Report on Steranes and Terpanes nr. 2058

Sample.....	:25/5-3	B28808.	ST	NO
Well Depth	:2386.00	to 2405.00		(Meters)
Particuliarities II..	:/			
Acquisition File Name	:/	Mag tape /		
Submitted by.....	:KT	july 12. , 1990.		
Particuliarities I...	:HT DST4			

STERANES	Areas	TERPANES	Areas
C21 Sterane.....	nd	C23 tricyclic.....	nd
C22 4-Methyl Sterane	nd	C24 tetracyclic.....	nd
C22 Sterane.....	nd	Ts.....	nd
C27 S Diasterane....	nd	Tm.....	nd
C27 aa S Sterane....	nd	29 ab Hopane.....	378.
C27 bb R Sterane....	nd	30 ab Hopane.....	1273.
C27 bb S Sterane....	nd	30 ba Hopane.....	nd
C27 aa R Sterane....	nd	31 ab S Homohopane..	nd
C29 aa S Sterane....	nd	31 ab R Homohopane..	nd
C29 bb R Sterane....	nd	32 ab S Homohopane..	nd
C29 bb S Sterane....	nd	32 ab R Homohopane..	nd
C29 aa R Sterane....	nd	TOTAL TERPANES	14220.
TOTAL STERANES	2799.		

OPTIONAL ANALYSIS	Areas	OPTIONAL ANALYSIS	Areas
C30 tricyclic,22 S..	nd	C35 ab S Homohopane.	nd
C30 tricyclic,22 R..	nd	C35 ab R Homohopane.	nd
29 Desmethyl Hopane.	nd		
C28 Bisnorhopane....	nd		
C29/5 (RT.> 29 ab)..	nd		
18 a(H) Oleanane....	nd	X(30/5)	nd
Gammacerane.....	nd	nC31	nd
C33 ab S Homohopane.	nd	C27bb	nd
C33 ab R Homohopane.	nd	C28bb	nd
C35 Hexacyclic.....	nd	C29bb	nd

RESULTS :

27 bb S / 27 aa R ..	N / A	C29 DHop / C29 Hop .	N / A
27 aa S / 27 aa R --	N / A	C28 BNHop / C29 Hop-	N / A
27 S dia / 27 aa R .	N / A	C29/5 / C29 Hop.....	N / A
22 4-Me st / 27 aa R	N / A	18 aH Olean/C30 Hop.	N / A
% 20 S C27	N / A	Gammacerane/C30 Hop.	N / A
% bb C27----------	N / A	30/3(R&S) / C29 Hop-	N / A
		30/3(R&S) / 23/3....	N / A
29 bb S / 29 aa R...	N / A	2.35Hex/C35Hop(R&S).	N / A
29 aa S / 29 aa R...	N / A	C35H(R&S)/C33H(R&S).	N / A
27 S dia / 29 aa R..	N / A	29+30Hop/C35 H(R&S).	N / A
22 4-Me st / 29 aa R	N / A		
% 20 S C29	N / A		
% bb C29 ----------	N / A		
21 st / 22 st	N / A		
22 4-Me st / 22 st--	N / A		
		X/29H	
29 H / C30 H	0.29	nC31/C30H	
Tm / Ts ----------	N / A	%NC31/100	
23/3 / 24/4	N / A	%ST/100	
% 22 S C31 ----------	N / A	%TT/100	
% 22 S C32	N / A	%27ST/100	
ba / ab ----- X 100 -	N / A	%28/100	
		%29/100	
23/3 / 21 st	N / A	27-30H/29ST	
TT / ST ----------	5.07	29bbR/29aaR	

S N E A (P) — Organic Geochemistry
Computerized GC/MS Analytical Report on Steranes and Terpanes nr. 2181

Sample	:25/5-3	B28875. ST NO	
Well Depth	:2428.70	to 2428.70 (Meters)	
Particuliarities II	:/		
Acquisition File Name	:B28875STM	Mag tape /	
Submitted by	:KT	january 2. , 1991.	
Particuliarities I	:CL		

STERANES	Areas	TERPANES	Areas
C21 Sterane	6144.	C23 tricyclic	6542.
C22 4-Methyl Sterane	1209.	C24 tetracyclic	5029.
C22 Sterane	4231.	Ts	8157.
C27 S Diasterane	27936.	Tm	18353.
C27 aa S Sterane	8987.	29 ab Hopane	34667.
C27 bb R Sterane	11795.	30 ab Hopane	60453.
C27 bb S Sterane	11795.	30 ba Hopane	18353.
C27 aa R Sterane	8987.	31 ab S Homohopane	30588.
C29 aa S Sterane	5171.	31 ab R Homohopane	26510.
C29 bb R Sterane	10813.	32 ab S Homohopane	16313.
C29 bb S Sterane	7992.	32 ab R Homohopane	20392.
C29 aa R Sterane	13634.	TOTAL TERPANES	503783.
TOTAL STERANES	396917.		

OPTIONAL ANALYSIS	Areas	OPTIONAL ANALYSIS	Areas
C30 tricyclic,22 S	ns	C35 ab S Homohopane	5098.
C30 tricyclic,22 R	ns	C35 ab R Homohopane	5098.
29 Desmethyl Hopane	ns		
C28 Bisnorhopane	13255.		
C29/5 (RT.> 29 ab)	9176.		
18 a(H) Oleanane	ns	"X"	6117.
Gammacerane	ns	nC31	252446.
C33 ab S Homohopane	7137.	C27bb	19000.
C33 ab R Homohopane	10196.	C28bb	14666.
C35 Hexacyclic	ns	C29bb	23151.

RESULTS :

27 bb S / 27 aa R	1.31	C29 DHop / C29 Hop	v. low.
27 aa S / 27 aa R	0.99	C28 BNHop / C29 Hop	0.38
27 S dia / 27 aa R	3.10	C29/5 / C29 Hop	0.26
22 4-Me st / 27 aa R	0.13	18 aH Olean/C30 Hop	v. low.
% 20 S C27	50.00	Gammacerane/C30 Hop	v. low.
% bb C27	56.75	30/3(R&S) / C29 Hop	v. low.
		30/3(R&S) / 23/3	v. low.
29 bb S / 29 aa R	0.58	2.35Hex/C35Hop(R&S)	v. low.
29 aa S / 29 aa R	0.37	C35H(R&S)/C33H(R&S)	0.58
27 S dia / 29 aa R	2.04	29+30Hop/C35 H(R&S)	9.32
22 4-Me st / 29 aa R	0.08		
% 20 S C29	34.99		
% bb C29	50.00		
21 st / 22 st	1.45		
22 4-Me st / 22 st	0.28		
		X/29H	0.17
29 H / C30 H	0.57	nC31/C30H	4.17
Tm / Ts	2.24	%nC31/100	0.21
23/3 / 24/4	1.30	%ST/100	0.34
% 22 S C31	53.57	%TT/100	0.43
% 22 S C32	44.44	%27bb/100	0.33
ba / ab ----- X 100	30.35	%28bb/100	0.25
		%29bb/100	0.40
23/3 / 21 st	1.06	27-30H/29ST	3.23
TT / ST	1.26	29bbR/29aaR	0.79

S N E A (P) Organic Geochemistry
Computerized GC/MS Analytical Report on Steranes and Terpanes nr. 2186

Sample..... :25/5-3 B29286. ST NO
Well Depth ..... :2430. to 2430. (Meters)
Particuliarities II.. :/
Acquisition File Name :B29286STM Mag tape /
Submitted by..... :KT january 2. , 1991.
Particuliarities I... :ND

S T E R A N E S	Areas	T E R P A N E S	Areas
C21 Sterane.....	96679.	C23 tricyclic.....	nd
C22 4-Methyl Sterane	nd	C24 tetracyclic.....	nd
C22 Sterane.....	16177.	Ts.....	ns
C27 S Diasterane....	41536.	Tm.....	1377260.
C27 aa S Sterane....	196799.	29 ab Hopane.....	1220350.
C27 bb R Sterane....	144318.	30 ab Hopane.....	2719690.
C27 bb S Sterane....	144318.	30 ba Hopane.....	1429560.
C27 aa R Sterane....	229600.	31 ab S Homohopane..	1795680.
C29 aa S Sterane....	128072.	31 ab R Homohopane..	1795680.
C29 bb R Sterane....	617086.	32 ab S Homohopane..	714796.
C29 bb S Sterane....	413330.	32 ab R Homohopane..	1133180.
C29 aa R Sterane....	791734.	TOTAL TERPANES	23861300.
TOTAL STERANES	10172300.		

OPTIONAL ANALYSIS	Areas	OPTIONAL ANALYSIS	Areas
C30 tricyclic,22 S..	ns	C35 ab S Homohopane.	ns
C30 tricyclic,22 R..	ns	C35 ab R Homohopane.	ns
29 Desmethyl Hopane.	72745.		
C28 Bisnorhopane....	139468.		
C29/5 (RT.> 29 ab)..	nd		
18 a(H) Oleanane....	ns	"X"	244075.
Gammacerane.....	ns	nC31	3375910.
C33 ab S Homohopane.	226640.	C27bb	352537.
C33 ab R Homohopane.	505587.	C28bb	335896.
C35 Hexacyclic.....	ns	C29bb	1402480.

RESULTS :

27 bb S / 27 aa R ..	0.62	C29 DHop / C29 Hop .	0.05
27 aa S / 27 aa R --	0.85	C28 BNHop / C29 Hop-	0.11
27 S dia / 27 aa R .	0.18	C29/5 / C29 Hop.....	N / A
22 4-Me st / 27 aa R	N / A	18 aH Olean/C30 Hop.	v. low.
% 20 S C27	47.70	Gammacerane/C30 Hop.	v. low.
% bb C27----------	40.36	30/3(R&S) / C29 Hop-	v. low.
		30/3(R&S) / 23/3....	N / A
29 bb S / 29 aa R...	0.52	2.35Hex/C35Hop(R&S).	N / A
29 aa S / 29 aa R...	0.16	C35H(R&S)/C33H(R&S).	v. low.
27 S dia / 29 aa R..	0.05	29+30Hop/C35 H(R&S).	> 100
22 4-Me st / 29 aa R	N / A		
% 20 S C29	27.76		
% bb C29 ----------	52.83		
21 st / 22 st	5.97		
22 4-Me st / 22 st--	N / A		
		X/29H	0.20
29 H / C30 H	0.44	nC31/C30H	1.24
Tm / Ts ----------	> 100	%nC31/100	0.09
23/3 / 24/4	N / A	%ST/100	0.27
% 22 S C31 ----------	50.00	%TT/100	0.63
% 22 S C32	38.67	%27bb/100	0.16
ba / ab ----- X 100 -	52.56	%28bb/100	0.16
		%29bb/100	0.67
23/3 / 21 st	N / A	27-30H/29ST	2.72
TT / ST ----------	2.34	29bbR/29aaR	0.77

S N E A (P) — Organic Geochemistry
Computerized GC/MS Analytical Report on Steranes and Terpanes nr. 2182

Sample	:25/5-3	B28876. ST NO	
Well Depth	:2439.50	to 2439.50	(Meters)
Particuliarities II.	:/		
Acquisition File Name	:B28876STM	Mag tape /	
Submitted by	:KT	january 2. , 1991.	
Particuliarities I...	:CL		

STERANES	Areas	TERPANES	Areas
C21 Sterane	20388.	C23 tricyclic	22023.
C22 4-Methyl Sterane	ns	C24 tetracyclic	38035.
C22 Sterane	6796.	Ts	ns
C27 S Diasterane	75982.	Tm	299688.
C27 aa S Sterane	46982.	29 ab Hopane	421785.
C27 bb R Sterane	46982.	30 ab Hopane	860221.
C27 bb S Sterane	46982.	30 ba Hopane	399585.
C27 aa R Sterane	77186.	31 ab S Homohopane	482833.
C29 aa S Sterane	28872.	31 ab R Homohopane	643778.
C29 bb R Sterane	119530.	32 ab S Homohopane	188692.
C29 bb S Sterane	60632.	32 ab R Homohopane	366286.
C29 aa R Sterane	219429.	TOTAL TERPANES	7417370.
TOTAL STERANES	3049660.		

OPTIONAL ANALYSIS	Areas	OPTIONAL ANALYSIS	Areas
C30 tricyclic,22 S	ns	C35 ab S Homohopane	38848.
C30 tricyclic,22 R	ns	C35 ab R Homohopane	83247.
29 Desmethyl Hopane	ns		
C28 Bisnorhopane	55498.		
C29/5 (RT.> 29 ab)	nd		
18 a(H) Oleanane	ns	"X"	83247.
Gammacerane	ns	nC31	1074370.
C33 ab S Homohopane	77697.	C27bb	50000.
C33 ab R Homohopane	183142.	C28bb	84756.
C35 Hexacyclic	ns	C29bb	214095.

RESULTS :

27 bb S / 27 aa R	0.60	C29 DHop / C29 Hop	v.low.
27 aa S / 27 aa R	0.60	C28 BNHop / C29 Hop	0.13
27 S dia / 27 aa R	0.98	C29/5 / C29 Hop	N / A
22 4-Me st / 27 aa R	v.low.	18 aH Olean/C30 Hop	v.low.
% 20 S C27	43.07	Gammacerane/C30 Hop	v.low.
% bb C27	43.07	30/3(R&S) / C29 Hop	v.low.
		30/3(R&S) / 23/3	v.low.
29 bb S / 29 aa R	0.27	2.35Hex/C35Hop(R&S)	v.low.
29 aa S / 29 aa R	0.13	C35H(R&S)/C33H(R&S)	0.46
27 S dia / 29 aa R	0.34	29+30Hop/C35 H(R&S)	10.50
22 4-Me st / 29 aa R	v.low.		
% 20 S C29	20.88		
% bb C29	42.04		
21 st / 22 st	2.99		
22 4-Me st / 22 st	v.low.		
		X/29H	0.19
29 H / C30 H	0.49	nC31/C30H	1.24
Tm / Ts	> 100	%nC31/100	0.09
23/3 / 24/4	0.57	%ST/100	0.26
% 22 S C31	42.85	%TT/100	0.64
% 22 S C32	33.99	%27bb/100	0.14
ba / ab ----- X 100	46.45	%28bb/100	0.24
		%29bb/100	0.61
23/3 / 21 st	1.08	27-30H/29ST	3.69
TT / ST	2.43	29bbR/29aaR	0.54

S N E A (P) — Organic Geochemistry
Computerized GC/MS Analytical Report on Steranes and Terpanes nr. 2183

Sample..... :25/5-3 B28877. ST ND
Well Depth ..... :2460. to 2460. (Meters)
Particuliarities II.. :/
Acquisition File Name :B28877STM Mag tape /
Submitted by..... :KT january 2. , 1991.
Particuliarities I... :CL

S T E R A N E S	Areas	T E R P A N E S	Areas
C21 Sterane.....	87272.	C23 tricyclic.....	60832.
C22 4-Methyl Sterane	21737.	C24 tetracyclic.....	45430.
C22 Sterane.....	52084.	Ts.....	73230.
C27 S Diasterane....	539546.	Tm.....	341738.
C27 aa S Sterane....	251353.	29 ab Hopane.....	793327.
C27 bb R Sterane....	188515.	30 ab Hopane.....	1879540.
C27 bb S Sterane....	188515.	30 ba Hopane.....	585840.
C27 aa R Sterane....	738359.	31 ab S Homohopane..	817737.
C29 aa S Sterane....	188345.	31 ab R Homohopane..	976403.
C29 bb R Sterane....	391761.	32 ab S Homohopane..	292918.
C29 bb S Sterane....	195878.	32 ab R Homohopane..	488199.
C29 aa R Sterane....	1160180.	TOTAL TERPANES	13869600.
TOTAL STERANES	12077200.		

OPTIONAL ANALYSIS	Areas	OPTIONAL ANALYSIS	Areas
C30 tricyclic,22 S..	ns	C35 ab S Homohopane.	122046.
C30 tricyclic,22 R..	ns	C35 ab R Homohopane.	219687.
29 Desmethyl Hopane.	ns		
C28 Bisnorhopane....	74374.		
C29/5 (RT.> 29 ab)..	280713.		
18 a(H) Oleanane....	ns	"X"	219687.
Gammacerane.....	ns	nC31	1736820.
C33 ab S Homohopane.	195277.	C27bb	299999.
C33 ab R Homohopane.	366148.	C28bb	300050.
C35 Hexacyclic.....	ns	C29bb	642866.

RESULTS :

27 bb S / 27 aa R ..	0.25	C29 DHop / C29 Hop .	v. low.
27 aa S / 27 aa R --	0.34	C28 BNHop / C29 Hop-	0.09
27 S dia / 27 aa R .	0.73	C29/5 / C29 Hop.....	0.35
22 4-Me st / 27 aa R	0.02	18 aH Olean/C30 Hop.	v. low.
% 20 S C27	32.18	Gammacerane/C30 Hop.	v. low.
% bb C27----------	27.58	30/3(R&S) / C29 Hop-	v. low.
		30/3(R&S) / 23/3....	v. low.
29 bb S / 29 aa R...	0.16	2.35Hex/C35Hop(R&S).	v. low.
29 aa S / 29 aa R...	0.16	C35H(R&S)/C33H(R&S).	0.60
27 S dia / 29 aa R..	0.46	29+30Hop/C35 H(R&S).	7.82
22 4-Me st / 29 aa R	0.01		
% 20 S C29	19.84		
% bb C29 ----------	30.35		
21 st / 22 st	1.67		
22 4-Me st / 22 st--	0.41		
		X/29H	0.27
29 H / C30 H	0.42	nC31/C30H	0.92
Tm / Ts ----------	4.66	%nC31/100	0.06
23/3 / 24/4	1.33	%ST/100	0.43
% 22 S C31 ----------	45.57	%TT/100	0.50
% 22 S C32	37.49	%27bb/100	0.24
ba / ab ----- X 100 -	31.16	%28bb/100	0.24
		%29bb/100	0.51
23/3 / 21 st	0.69	27-30H/29ST	1.59
TT / ST ----------	1.14	29bbR/29aaR	0.33

S N E A (P) Organic Geochemistry
Computerized GC/MS Analytical Report on Steranes and Terpanes nr. 2184

Sample. . . . . :25/5-3 B28878. ST NO
Well Depth . . . . . :2476. to 2476. (Meters)
Particuliarities II. . :/
Acquisition File Name :B28878STM Mag tape /
Submitted by. . . . . :KT january 2. , 1991.
Particuliarities I. . . :CL

S T E R A N E S	Areas	T E R P A N E S	Areas
C21 Sterane.	72854.	C23 tricyclic.	50221.
C22 4-Methyl Sterane	16000.	C24 tetracyclic.	62851.
C22 Sterane.	36710.	Ts.	62887.
C27 S Diasterane. . . .	399492.	Tm.	628874.
C27 aa S Sterane. . . .	224895.	29 ab Hopane.	1003180.
C27 bb R Sterane. . . .	149928.	30 ab Hopane.	2305840.
C27 bb S Sterane. . . .	149928.	30 ba Hopane.	868445.
C27 aa R Sterane. . . .	629710.	31 ab S Homohopane. .	1167880.
C29 aa S Sterane. . . .	163906.	31 ab R Homohopane. .	1227770.
C29 bb R Sterane. . . .	277382.	32 ab S Homohopane. .	419248.
C29 bb S Sterane. . . .	126081.	32 ab R Homohopane. .	554007.
C29 aa R Sterane. . . .	964543.	TOTAL TERPANES	15734300.
TOTAL STERANES	11667500.		

OPTIONAL ANALYSIS	Areas	OPTIONAL ANALYSIS	Areas
C30 tricyclic,22 S. .	ns	C35 ab S Homohopane.	119783.
C30 tricyclic,22 R. .	ns	C35 ab R Homohopane.	149729.
29 Desmethyl Hopane.	ns		
C28 Bisnorhopane. . . .	ns		
C29/5 (RT.> 29 ab). .	239569.		
18 a(H) Oleanane. . . .	ns	"X"	209622.
Gammacerane.	ns	nC31	2534230.
C33 ab S Homohopane.	209622.	C27bb	299999.
C33 ab R Homohopane.	359355.	C28bb	304310.
C35 Hexacyclic.	ns	C29bb	442345.

RESULTS :

27 bb S / 27 aa R . .	0.23	C29 DHop / C29 Hop .	v. low.
27 aa S / 27 aa R --	0.35	C28 BNHop / C29 Hop-	v. low.
27 S dia / 27 aa R .	0.63	C29/5 / C29 Hop. . . .	0.23
22 4-Me st / 27 aa R	0.02	18 aH Olean/C30 Hop.	v. low.
% 20 S C27	32.46	Gammacerane/C30 Hop.	v. low.
% bb C27----------	25.97	30/3(R&S) / C29 Hop-	v. low.
		30/3(R&S) / 23/3. . .	v. low.
29 bb S / 29 aa R. . .	0.13	2.35Hex/C35Hop(R&S).	v. low.
29 aa S / 29 aa R. . .	0.16	C35H(R&S)/C33H(R&S).	0.47
27 S dia / 29 aa R. .	0.41	29+30Hop/C35 H(R&S).	12.27
22 4-Me st / 29 aa R	0.01		
% 20 S C29	18.92		
% bb C29 ----------	26.33		
21 st / 22 st	1.98		
22 4-Me st / 22 st--	0.43		
		X/29H	0.20
29 H / C30 H	0.43	nC31/C30H	1.09
Tm / Ts ----------	10.00	%nC31/100	0.08
23/3 / 24/4	0.79	%ST/100	0.38
% 22 S C31 ----------	48.75	%TT/100	0.52
% 22 S C32	43.07	%27bb/100	0.28
ba / ab ----- X 100 -	37.66	%28bb/100	0.29
		%29bb/100	0.42
23/3 / 21 st	0.68	27-30H/29ST	2.61
TT / ST ----------	1.34	29bbR/29aaR	0.28

EP/S/EXP/Lab.91/135RP

S N E A (P) — Organic Geochemistry
Computerized GC/MS Analytical Report on Steranes and Terpanes nr. 2185

Sample..... :25/5-3 B28893. ST NO
Well Depth ..... :2660. to 2660. (Meters)
Particuliarities II.. :/
Acquisition File Name :B28893STM Mag tape /
Submitted by..... :KT january 2. , 1991.
Particuliarities I... :DE

S T E R A N E S	Areas	T E R P A N E S	Areas
C21 Sterane.....	24120.	C23 tricyclic.....	nd
C22 4-Methyl Sterane	nd	C24 tetracyclic.....	nd
C22 Sterane.....	8775.	Ts.....	ns
C27 S Diasterane....	51835.	Tm.....	2915680.
C27 aa S Sterane....	79466.	29 ab Hopane.....	3993220.
C27 bb R Sterane....	63573.	30 ab Hopane.....	5007380.
C27 bb S Sterane....	63573.	30 ba Hopane.....	2281830.
C27 aa R Sterane....	63573.	31 ab S Homohopane..	3105830.
C29 aa S Sterane....	104346.	31 ab R Homohopane..	2725520.
C29 bb R Sterane....	191305.	32 ab S Homohopane..	1457820.
C29 bb S Sterane....	104346.	32 ab R Homohopane..	1267660.
C29 aa R Sterane....	440585.	TOTAL TERPANES	41199800.
TOTAL STERANES	4448520.		

OPTIONAL ANALYSIS	Areas	OPTIONAL ANALYSIS	Areas
C30 tricyclic,22 S..	ns	C35 ab S Homohopane.	ns
C30 tricyclic,22 R..	ns	C35 ab R Homohopane.	ns
29 Desmethyl Hopane.	ns		
C28 Bisnorhopane....	190152.		
C29/5 (RT.> 29 ab)..	ns		
18 a(H) Oleanane....	ns	"X"	443692.
Gammacerane.....	ns	nC31	5227420.
C33 ab S Homohopane.	443692.	C27bb	80000.
C33 ab R Homohopane.	443692.	C28bb	137142.
C35 Hexacyclic.....	ns	C29bb	375728.

RESULTS :

27 bb S / 27 aa R ..	0.99	C29 DHop / C29 Hop .	v. low.
27 aa S / 27 aa R --	1.24	C28 BNHop / C29 Hop-	0.04
27 S dia / 27 aa R .	0.81	C29/5 / C29 Hop.....	v. low.
22 4-Me st / 27 aa R	N / A	18 aH Olean/C30 Hop.	v. low.
% 20 S C27	52.94	Gammacerane/C30 Hop.	v. low.
% bb C27----------	47.05	30/3(R&S) / C29 Hop-	v. low.
		30/3(R&S) / 23/3....	N / A
29 bb S / 29 aa R...	0.23	2.35Hex/C35Hop(R&S).	N / A
29 aa S / 29 aa R...	0.23	C35H(R&S)/C33H(R&S).	v. low.
27 S dia / 29 aa R..	0.11	29+30Hop/C35 H(R&S).	> 100
22 4-Me st / 29 aa R	N / A		
% 20 S C29	24.82		
% bb C29 ----------	35.17		
21 st / 22 st	2.74		
22 4-Me st / 22 st--	N / A		
		X/29H	0.11
29 H / C30 H	0.79	nC31/C30H	1.04
Tm / Ts ----------	> 100	%nC31/100	0.10
23/3 / 24/4	N / A	%ST/100	0.08
% 22 S C31 ----------	53.26	%TT/100	0.80
% 22 S C32	53.48	%27bb/100	0.13
ba / ab ----- X 100 -	45.56	%28bb/100	0.23
		%29bb/100	0.63
23/3 / 21 st	N / A	27-30H/29ST	14.17
TT / ST ----------	9.26	29bbR/29aaR	0.43

SNEA(P) ORGANIC GEOCHEMISTRY
Computerized GC / MS Analytical Report on Steranes and Terpanes

SIMPLIFIED MOLECULAR PARAMETERS EXPLANATION CHART

C 29 STERANES RATIOS

29 bb S / 29 aa R	5 ALPHA(H),14 BETA(H),17 BETA(H)-20S-24 ethylCHOLESTANE / 5 ALPHA(H),14 ALPHA(H),17 ALPHA(H)-20R-24 ethylCHOLESTANE	+
29 aa S / 29 aa R	5 ALPHA(H),14 ALPHA(H),17 ALPHA(H)-20S-24 ethylCHOLESTANE/ 5 ALPHA(H),14 ALPHA(H),17 ALPHA(H)-20R-24 ethylCHOLESTANE	+
27 S dia/ 29 aa R	C 27 (20 S) Rearranged Sterane (Diasterane) / 5 ALPHA(H),14 ALPHA(H),17 ALPHA(H)-20R-24 ethylCHOLESTANE	+
22 4 Me / 29 aa R	5 ALPHA(H),14 BETA(H)-methyl-4 ALPHA PREGNANE / 5 ALPHA(H),14 ALPHA(H),17 ALPHA(H)-20R-24 ethylCHOLESTANE	+
% 20 S / C 29	%[14 ALPHA(H),17 ALPHA(H)-20S + 14 BETA(H),17 BETA(H)-20S]/ 14 ALPHA(H),17 ALPHA(H)(20S+R)+14 BETA(H),17 BETA(H)(20S+R) -24 ethylCHOLESTANE	+
% bb / C 29	% [14 BETA(H),17 BETA(H)(20S + 20R)-24 ethylCHOLESTANE] / 14 ALPHA(H),17 ALPHA(H)(20S+R)+14 BETA(H),17 BETA(H)(20S+R) -24 ethylCHOLESTANE	+

C 27 STERANES RATIOS

27 bb S / 27 aa R	5 ALPHA(H),14 BETA(H),17 BETA(H)-20S- CHOLESTANE / 5 ALPHA(H),14 ALPHA(H),17 ALPHA(H)-20R- CHOLESTANE	+
27 aa S / 27 aa R	5 ALPHA(H),14 ALPHA(H),17 ALPHA(H)-20S- CHOLESTANE / 5 ALPHA(H),14 ALPHA(H),17 ALPHA(H)-20R- CHOLESTANE	+
27 S dia/ 27 aa R	C 27 (20 S) Rearranged Sterane (Diasterane) / 5 ALPHA(H),14 ALPHA(H),17 ALPHA(H)-20R- CHOLESTANE	+
22 4 Me / 27 aa R	5 ALPHA(H),14 BETA(H)-methyl-4 ALPHA PREGNANE / 5 ALPHA(H),14 ALPHA(H),17 ALPHA(H)-20R- CHOLESTANE	+
% 20 S / C 27	%[14 ALPHA(H),17 ALPHA(H)-20S + 14 BETA(H),17 BETA(H)-20S]/ 14 ALPHA(H),17 ALPHA(H)(20S+R)+14 BETA(H),17 BETA(H)(20S+R) - CHOLESTANE	+
% bb / C 27	% [14 BETA(H),17 BETA(H)(20S + 20R)- CHOLESTANE] / 14 ALPHA(H),17 ALPHA(H)(20S+R)+14 BETA(H),17 BETA(H)(20S+R) - CHOLESTANE	+

SHORT-CHAIN STERANES RATIOS

21 st / 22 st	5 ALPHA(H),14 BETA(H),17 BETA(H) PREGNANE / 5 ALPHA(H),14 BETA(H),17 BETA(H)-methyl 20 PREGNANE	+
22 4 Me / 22 st	5 ALPHA(H),14 BETA(H),17 BETA(H)-methyl-4 ALPHA PREGNANE / 5 ALPHA(H),14 BETA(H),17 BETA(H)-methyl 20 PREGNANE	+

TERPANES RATIOS

C 29 H / C 30 H	17 ALPHA(H),21 BETA(H) NORHOPANE (C 29) / 17 ALPHA(H),21 BETA(H) HOPANE (C 30)	+
Tm / Ts	18 ALPHA(H)-22,29,30 TRISNORNEOHOPANE (C 27, "maturable")/ 17 ALPHA(H)-22,29,30 TRISNORHOPANE (C 27, "stable")	-
23/3 / 24/4	Tricyclic Terpane(C23) / Tetracyclic Terpane(C24)	
% 22 S / C 31	% 17 ALPHA(H),21 BETA(H)-22S-30 HOMOHOPANE / 17 ALPHA(H),21 BETA(H)-(22R+22S)-30 HOMOHOPANE	+
% 22 S / C 32	% 17 ALPHA(H),21 BETA(H)-22S-30,31 BISHOMOHOPANE / 17 ALPHA(H),21 BETA(H)-(22R+22S)-30,31 BISHOMOHOPANE	+
ba / ab C 30	17 BETA(H),21 ALPHA(H) MORETANE (C 30) / 17 ALPHA(H),21 BETA(H) HOPANE (C 30)	-

TERPANES / STERANES RATIOS

23/3 / 21st	Tricyclic Terpane (C 23) / 5 ALPHA(H),14 BETA(H),17 BETA(H) PREGNANE
TT / ST	Integration of m/z 191 between Ts and C35(22R) HOPANE / Integration of m/z 217 between 27S dia and C29aaR STERANE

(+) Value increasing with maturity . (-) Value decreasing with maturity.
Some parameters are source-dependant

OPTIONAL PARAMETERS

29DH/29H	C29 DESMETHYL HOPANE / C 29 HOPANE	B
28BNH/29H	C28 24,28,30 BISNORHOPANE / C29 HOPANE	D
29/5 / 29H	C29 PENTACYCLANE (UNKNOWN STRUCTURE) / C 29 HOPANE	E
OLN/30H	18 ALPHA(H) OLEANANE / C 30 HOPANE	A
GCRN/30H	GAMMACERANE / C30 HOPANE	Z
30/3 / 29H	C30 TRICYCLIC TERPANES / C29 HOPANE	E
30/3 / 23/3	C30 TRICYCLIC TERPANES / C23 TRICYCLIC TERPANE	E
35/6 /35H	C35 HEXACYCLIC TERPANES / C35 HOPANES	HS
35H / 33H	C35 HOPANES / C33 HOPANES	HS
29+30/35H	C29 + C30 HOPANES / C 35 HOPANES	E

A : ANGIOSPERMS INDICATOR
B : BIO OR PALEOBIODEGRADATION INDICATOR
E : ENVIRONMENTAL DEPENDANCE
HS: HYPERSALINE ENVIRONMENT INDICATORS
Z : ZOOPLANCTON / LACUSTRINE