

**SPORE COLOUR
DETERMINATION IN
THE 30/9-14 WELL**

**Interval 480m to 3680m,
Norwegian North Sea**

Report No. 7340/Ic

Project No. Ic/21414

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For:
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CHAPTER 3

Results

Table 1 gives the results of spore colouration determination and a summary of the kerogen type in terms of inertinite (non-source), vitrinite (gas-prone) and sapropel (liptinite, oil-prone). More detailed kerogen typing is presented in Table 2. A plot of SCI versus depth is given in Figure 1. Fluorescence in the following notes refers to the response of liptinitic organic matter to incident irradiation by UV/blue light.

Interval 480m to 1990m

Spores, pollen and dinocysts abundant throughout. Fluorescence bright yellow to yellow-orange. Kerogen type humic, non-fluorescent, mainly degraded vitrinitic, occasionally including moderately well preserved, structured vitrinite. Rare cuticle fragments with bright yellow-orange fluorescence.

Interval 2080m to 2190m

Very abundant pale pollen grains with yellow fluorescence. Dinocysts yellow to orange with yellow-orange fluorescence. Kerogen amorphous, orange-brown to very pale with fluorescent inclusions in poorly fluorescent groundmass.

Interval 2280m to 2890m

Sample 2280m-2290m similar to above but also with caving contamination from interval 480m to 1990m. This contamination also seen at 2480m-490m and 2680m-690m. Interval contains only moderately abundant palynomorphs, including pale dinocysts considered to be probably *in situ*. Kerogen type is inertinitic with blocky or irregular fragments and fine, micrinitic material.

Interval 2897m to 3220m

Upper sample dominated by light orange-brown amorphous organic matter, showing bright yellow-orange (groundmass) and bright yellow (palynomorph inclusions) fluorescence. Lower sample (3217m-220m) contains amorphous organic matter but fluorescence less pronounced.

Interval 3317m to 3540m

Kerogen type markedly different from above, comprising large, blocky, well preserved vitrinite and inertinite fragments. Spore colour changes rapidly with depth over interval as spore fluorescence changes from yellow/orange (3317m-220m) to orange/orange-brown (3537m-540m).

Interval 3637m to 3680m

Kerogen type humic, comprising mainly dark orange-brown wispy vitrinite (telinite) fragments. Spores degraded with little fluorescence immediately, but prolonged exposure to UV/blue light (30 minutes) results in patchy yellow-brown fluorescence.

GENERAL DATA			MATURITY DATA		KEROGEN COMPOSITION DATA						
SAMPLE DEPTH (Metres)	SAMPLE TYPE	ANALYSED LITHOLOGY	SPORE COLOUR INDEX	VITR. REFL. R oil av %	% (Visual, from microscopy)			% (Calculated)			
					INERTINITE	VITRINITE	SAPROPEL	INERT	VIT	ALG SAP	WKY SAP
480-490	Ctgs		2.0-2.5		50	40	10				
580-590	Ctgs		2.5-3.0		40	50	10				
680-690	Ctgs		2.5		20	75	5				
780-790	Ctgs		2.5		10	85	5				
880-890	Ctgs		3.0		5	90	5				
980-990	Ctgs		2.5-3.0		5	90	5				
1080-090	Ctgs		2.5-3.0		5	85	10				
1180-190	Ctgs		2.5		5	85	10				
1280-290	Ctgs		3.0-3.5		Mnr	90	10				
1380-390	Ctgs		3.0-3.5		Mnr	90	10				
1480-490	Ctgs		3.0-3.5		10	75	15				
1580-590	Ctgs		3.0-3.5		5	85	10				
1680-690	Ctgs		3.5		5	85	10				
1780-790	Ctgs		3.5		10	70	20				
1880-890	Ctgs		3.5		15	65	20				
1980-990	Ctgs		3.0-3.5		10	65	25				
2080-090	Ctgs		3.5		25	25	50				
2180-190	Ctgs		2.5-3.0		10	10	80				
2280-290	Ctgs		3.0-3.5		40	30	30				
2380-390	Ctgs		3.5		40	40	20				
2480-490	Ctgs		3.5-4.0		40	40	20				
2580-590	Ctgs		3.5-4.0		40	40	20				
2680-690	Ctgs		4.0		50	30	20				
2780-790	Ctgs		3.0		50	30	20				
2887-890	Ctgs		3.5		60	25	15				
2897-990	Ctgs		4.0		5	10	85				
3217-220	Ctgs		4.0-4.5		30	35	35				
3317-320	Ctgs		5.0		30	65	5				
3417-420	Ctgs		6.5		20	75	5				
3537-540	Ctgs		6.0-6.5		30	60	10				
3637-640	Ctgs		7.0		30	55	15				
3677-680	Ctgs		7.0		20	70	10				

MATURITY AND KEROGEN COMPOSITION DATA

TABLE : 1

APPENDIX VII

Peak heights and calculated ratios of
biomarkers.

NORSK HYDRO Research Centre, Bergen _____ Petroleum Geochemistry Group

COMP.#	RT(min)	ION(m/z)	COMPOUND	HEIGHT	SATURATE BIOMARKERS
INT. STANDARD (if added)					
1	38.56	221.00	4D21aa	8	File name (sample):
2	50.01	193.00	2D29ba	7	2967_5.D
3	52.00	221.00	4D27aaR	7	File path:
4	43.96	217.00	24baa	3	F:\HPCHEM\1\DATA\SATVA_3009_S\
DITERPANES					Misc information:
5	33.73	191.00	19/3	13	
6	36.06	191.00	20/3	109	Sample name:
7	38.09	191.00	21/3	178	
11	42.03	191.00	23/3	455	Operator:
13	43.14	191.00	24/3	221	JORUNN K
14	45.38	191.00	25/3	137	Method:
16	46.92	191.00	26/3R	319	MSD_S_B
17	47.15	191.00	26/3S	104	Date analyzed:
20	50.62	191.00	28/3R	128	07/06/93
21	50.86	191.00	28/3S	112	
23	51.65	191.00	29/3R	115	
25	51.93	191.00	29/3S	105	
15	46.92	191.00	24/4	317	
TRITERPANES:					
26	52.79	191.00	27Ts	904	
28	52.99	177.00	25nor28ab	25	
29	53.45	191.00	27Tm	580	
33	53.91	191.00	27b	128	
32	53.81	177.00	25nor29ab	54	
34	54.98	191.00	28ab	118	
36	55.18	177.00	25nor30ab	27	
39	55.68	191.00	29ab	1888	
40	55.78	191.00	29Ts	788	
43	56.46	191.00	29ba	225	
42	56.02	191.00	30D	125	
46	57.02	191.00	30ab	3343	
47	57.36	191.00	30D13	190	
48	57.63	191.00	30ba	386	
51	59.11	191.00	30G	106	
49	58.59	191.00	31abS	1402	
50	58.77	191.00	31abR	1093	
52	59.30	191.00	31ba	206	
53	59.79	191.00	32abS	794	
54	60.07	191.00	32abR	577	
55	61.22	191.00	33abS	990	
56	61.58	191.00	33abR	679	
57	62.70	191.00	34abS	459	
58	63.20	191.00	34abR	321	
59	64.41	191.00	35abS	484	
60	65.09	191.00	35abR	307	

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COMP.#	RT	ION	COMPOUND	HEIGHT	SATURATE BIOMARKERS
STERANES					
8	38.60	217.00	21aa	232	File name (sample):
9	40.25	217.00	21bb	284	2967_5.D
10	40.37	217.00	22aa	164	File path:
12	42.58	217.00	22bb	141	F:\HPCHEM\1\DATA\SAT\A_3009_S\
18	48.84	217.00	27dbS	620	Misc information:
19	49.45	217.00	27dbR	445	
22	51.78	218.00	27bbR	522	Sample name:
24	51.92	218.00	27bbS	424	
27	52.31	217.00	27aaR	670	Operator:
30	53.50	218.00	28bbR	383	JORUNN K
31	53.64	218.00	28bbS	262	Method:
35	54.59	217.00	29aaS	376	MSD_S_B
37	54.89	218.00	29bbR	264	Date analyzed:
38	55.00	218.00	29bbS	364	07/06/93
41	55.59	217.00	29aaR	484	
44	56.05	218.00	30bbR	72	
45	56.10	218.00	30bbS	63	

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TERPANE ratios			SATURATE BIOMARKERS
100*23/3 (191)	%23/3	56	File name (sample): 2967_5.D
23/3+24/3+25/3 (191)			File path: F:\HPCHEM\1\DATA\SAT\A_3009_S
100*24/4 (191)	%24/4	47	Misc information:
24/4+24/3+25/3 (191)			Sample name:
100*20/3 (191)	%20/3	7	Operator: JORUNN K
20/3+21/3+23/3+24/3+25/3+26/3(R+S) (191)			Method: MSD_S_B
100*27Ts (191)	%27Ts	61	Date analyzed: 07/06/93
27Ts+27Tm (191)			
100*28ab (191)	%28ab	3	
28ab+30ab (191)			
100*29Ts (191)	%29Ts	29	
29Ts+29ab (191)			
100*25nor30ab (191)	%25nor30ab	1	
25nor30ab+30ab (191)			
100*29ab (191)	%29ab	36	
29ab+30ab (191)			
100*30ba (191)	%30ba	10	
30ba+30ab (191)			
100*30D (191)	%30D	4	
30D+30ab (191)			
100*30G (191)	%30G	3	
30G+30ab (191)			
100*32abS (191)	%32abS	58	
32abS+32abR (191)			
100*35ab(S+R) (191)	%35ab	50	
SUM 34-35ab(S+R) (191)			
100*(27Ts+27Tm) (191)	%27HOP	10	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*28ab (191)	%28HOP	1	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(29ab+29ba) (191)	%29HOP	14	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(30ab+30ba) (191)	%30HOP	25	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(31ab(S+R)) (191)	%31HOP	17	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(32ab(S+R)) (191)	%32HOP	9	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(33ab(S+R)) (191)	%33HOP	11	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(34ab(S+R)) (191)	%34HOP	5	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(35ab(S+R)) (191)	%35HOP	5	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			

STERANE ratios			SATURATE BIOMARKERS
100 * 29aaS (217) (29aa(S+R) (217))	%29aaS	44	File name (sample): 2967_5.D
100 * 29bb(S+R) (218) (29bb(S+R) (218) + 29aa(S+R) (217))	%29bb	42	File path: F:\HPCHEM\1\DATA\SATA_3009_S
100 * 27bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%27STER	40	Misc information:
100 * 28bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%28STER	27	Sample name:
100 * 29bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%29STER	27	Operator: JORUNN K
100 * 30bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%30STER	6	Method: MSD_S_B
			Date analyzed: 07/06/93

TERPANE-STERANE GROUP ratios		
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	Ho/St2	627
100*(21+22)bb (21+22)bb+27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%Preg	15
100*(20/3+21/3+23/3+24/3+25/3+26/3(R+S)) (191) (20/3+21/3+23/3+24/3+25/3+26/3(R+S)+27(Ts+Tm)+28ab+ SUM 29-30(ab+ba)+SUM 31-35ab(S+R)) (191)	%Tri	9

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COMP.#	RT(min)	ION(m/z)	COMPOUND	HEIGHT	SATURATE BIOMARKERS
INT. STANDARD (if added)					
1	38.53	221.00	4D21aa	7	File name (sample): 2969.D
2	49.98	193.00	2D29ba	17	File path: F:\HPCHEM\1\DATA\SATVA_3009_S\
3	52.00	221.00	4D27aaR	3	Misc information:
4	44.04	217.00	24baa	52	Sample name:
DITERPANES					Operator: JORUNN K
5	33.71	191.00	19/3	14	Method: MSD_S_B
6	36.06	191.00	20/3	82	Date analyzed: 07/06/93
7	38.09	191.00	21/3	145	
11	42.02	191.00	23/3	373	
13	43.12	191.00	24/3	165	
14	45.42	191.00	25/3	118	
16	47.00	191.00	26/3R	59	
17	47.12	191.00	26/3S	71	
20	50.61	191.00	28/3R	87	
21	50.85	191.00	28/3S	84	
23	51.63	191.00	29/3R	86	
25	51.75	191.00	29/3S	272	
15	46.90	191.00	24/4	227	
TRITERPANES:					
26	52.77	191.00	27Ts	479	
28	52.97	177.00	25nor28ab	32	
29	53.43	191.00	27Tm	663	
33	53.89	191.00	27b	102	
32	53.77	177.00	25nor29ab	20	
34	54.96	191.00	28ab	790	
36	55.13	177.00	25nor30ab	22	
39	55.66	191.00	29ab	1789	
40	55.76	191.00	29Ts	615	
43	56.44	191.00	29ba	430	
42	56.00	191.00	30D	176	
46	57.02	191.00	30ab	3343	
47	57.35	191.00	30D13	241	
48	57.63	191.00	30ba	443	
51	59.11	191.00	30G	103	
49	58.59	191.00	31abS	1478	
50	58.77	191.00	31abR	1053	
52	59.30	191.00	31ba	251	
53	59.80	191.00	32abS	869	
54	60.07	191.00	32abR	638	
55	61.21	191.00	33abS	958	
56	61.58	191.00	33abR	670	
57	62.70	191.00	34abS	637	
58	63.20	191.00	34abR	401	
59	64.41	191.00	35abS	626	
60	65.09	191.00	35abR	460	

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COMP.#	RT	ION	COMPOUND	HEIGHT	SATURATE BIOMARKERS
STERANES					
8	38.58	217.00	21aa	337	File name (sample):
9	40.23	217.00	21bb	326	2969.D
10	40.35	217.00	22aa	191	File path:
12	42.56	217.00	22bb	184	F:\HPCHEM\1\DATA\SATA_3009_S\
18	48.80	217.00	27dbS	659	Misc information:
19	49.43	217.00	27dbR	432	
22	51.77	218.00	27bbR	614	Sample name:
24	51.90	218.00	27bbS	466	
27	52.29	217.00	27aaR	954	Operator:
30	53.48	218.00	28bbR	380	JORUNN K
31	53.62	218.00	28bbS	408	Method:
35	54.57	217.00	29aaS	558	MSD_S_B
37	54.88	218.00	29bbR	402	Date analyzed:
38	54.98	218.00	29bbS	558	07/06/93
41	55.58	217.00	29aaR	740	
44	56.04	218.00	30bbR	131	
45	56.09	218.00	30bbS	88	

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TERPANE ratios			SATURATE BIOMARKERS
100*23/3 (191)	%23/3	57	File name (sample): 2969.D
23/3+24/3+25/3 (191)			
100*24/4 (191)	%24/4	45	File path: F:\HPCHEM\1\DATA\SATVA_3009_S
24/4+24/3+25/3 (191)			
100*20/3 (191)	%20/3	8	Misc information:
20/3+21/3+23/3+24/3+25/3+26/3(R+S) (191)			
100*27Ts (191)	%27Ts	42	Sample name:
27Ts+27Tm (191)			
100*28ab (191)	%28ab	19	Operator: JORUNN K
28ab+30ab (191)			
100*29Ts (191)	%29Ts	26	Method: MSD_S_B
29Ts+29ab (191)			
100*25nor30ab (191)	%25nor30ab	1	Date analyzed: 07/06/93
25nor30ab+30ab (191)			
100*29ab (191)	%29ab	35	
29ab+30ab (191)			
100*30ba (191)	%30ba	12	
30ba+30ab (191)			
100*30D (191)	%30D	5	
30D+30ab (191)			
100*30G (191)	%30G	3	
30G+30ab (191)			
100*32abS (191)	%32abS	58	
32abS+32abR (191)			
100*35ab(S+R) (191)	%35ab	51	
SUM 34-35ab(S+R) (191)			
100*(27Ts+27Tm) (191)	%27HOP	7	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*28ab (191)	%28HOP	5	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(29ab+29ba) (191)	%29HOP	14	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(30ab+30ba) (191)	%30HOP	24	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(31ab(S+R)) (191)	%31HOP	16	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(32ab(S+R)) (191)	%32HOP	9	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(33ab(S+R)) (191)	%33HOP	10	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(34ab(S+R)) (191)	%34HOP	6	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(35ab(S+R)) (191)	%35HOP	7	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			

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STERANE ratios			SATURATE BIOMARKERS
100 * 29aaS (217) (29aa(S+R) (217))	%29aaS	43	File name (sample): 2969.D
100 * 29bb(S+R) (218) (29bb(S+R) (218) + 29aa(S+R) (217))	%29bb	43	File path: F:\HPCHEM\1\DATA\SATA_3009_S
100 * 27bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%27STER	35	Misc information:
100 * 28bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%28STER	26	Sample name:
100 * 29bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%29STER	32	Operator: JORUNN K
100 * 30bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%30STER	7	Method: MSD_S_B
			Date analyzed: 07/06/93

TERPANE-STERANE GROUP ratios		
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	Ho/St2	524
100*(21+22)bb (21+22)bb+27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%Preg	14
100*(20/3+21/3+23/3+24/3+25/3+26/3(R+S)) (191) (20/3+21/3+23/3+24/3+25/3+26/3(R+S)+27(Ts+Tm)+28ab+ SUM 29-30(ab+ba)+SUM 31-35ab(S+R)) (191)	%Tri	6

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COMP.#	RT(min)	ION(m/z)	COMPOUND	HEIGHT	SATURATE BIOMARKERS
INT. STANDARD (if added)					
1	38.55	221.00	4D21aa	9	File name (sample):
2	50.00	193.00	2D29ba	23	2976_5.D
3	51.99	221.00	4D27aaR	15	File path:
4	43.96	217.00	24baa	22	F:\HPCHEM\1\DATA\SATVA_3009_S\
DITERPANES					Misc information:
5	33.76	191.00	19/3	39	Sample name:
6	36.11	191.00	20/3	285	Operator:
7	38.14	191.00	21/3	438	JORUNN K
11	42.10	191.00	23/3	1195	Method:
13	43.22	191.00	24/3	801	MSD_S_B
14	45.50	191.00	25/3	841	Date analyzed:
16	47.02	191.00	26/3R	914	07/06/93
17	47.02	191.00	26/3S	865	
20	50.78	191.00	28/3R	770	
21	50.78	191.00	28/3S	282	
23	51.49	191.00	29/3R	76	
25	51.85	191.00	29/3S	344	
15	47.02	191.00	24/4	1316	
TRITERPANES:					
26	52.87	191.00	27Ts	2422	
28	53.07	177.00	25nor28ab	704	
29	53.53	191.00	27Tm	4269	
33	53.99	191.00	27b	888	
32	53.72	177.00	25nor29ab	189	
34	55.05	191.00	28ab	794	
36	55.34	177.00	25nor30ab	549	
39	55.76	191.00	29ab	11232	
40	55.87	191.00	29Ts	4234	
43	56.53	191.00	29ba	2144	
42	56.09	191.00	30D	1953	
46	57.11	191.00	30ab	19688	
47	57.43	191.00	30D13	2020	
48	57.70	191.00	30ba	5296	
51	59.17	191.00	30G	2108	
49	58.66	191.00	31abS	10404	
50	58.84	191.00	31abR	7129	
52	59.35	191.00	31ba	2521	
53	59.85	191.00	32abS	6693	
54	60.12	191.00	32abR	4487	
55	61.26	191.00	33abS	5195	
56	61.62	191.00	33abR	3399	
57	62.76	191.00	34abS	4450	
58	63.23	191.00	34abR	3074	
59	64.44	191.00	35abS	2702	
60	65.12	191.00	35abR	1936	

COMP.#	RT	ION	COMPOUND	HEIGHT	SATURATE BIOMARKERS
STERANES					
8	38.63	217.00	21aa	794	File name (sample):
9	40.31	217.00	21bb	646	2976_5.D
10	40.42	217.00	22aa	565	File path:
12	42.42	217.00	22bb	132	F:\HPCHEM\1\DATA\SAT\A_3009_S\
18	48.92	217.00	27dbS	2680	Misc information:
19	49.55	217.00	27dbR	1909	
22	51.87	218.00	27bbR	1839	Sample name:
24	52.02	218.00	27bbS	1332	
27	52.39	217.00	27aaR	2138	Operator:
30	53.57	218.00	28bbR	1016	JORUNN K
31	53.70	218.00	28bbS	1094	Method:
35	54.66	217.00	29aaS	1777	MSD_S_B
37	54.96	218.00	29bbR	1603	Date analyzed:
38	55.07	218.00	29bbS	1517	07/06/93
41	55.66	217.00	29aaR	2163	
44	56.12	218.00	30bbR	332	
45	56.17	218.00	30bbS	451	

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TERPANE ratios			SATURATE BIOMARKERS
100*23/3 (191)	%23/3	42	File name (sample): 2976_5.D
23/3+24/3+25/3 (191)			
100*24/4 (191)	%24/4	44	File path: F:\HPCHEM\1\DATA\SATVA_3009_S
24/4+24/3+25/3 (191)			
100*20/3 (191)	%20/3	5	Misc information:
20/3+21/3+23/3+24/3+25/3+26/3(R+S) (191)			
100*27Ts (191)	%27Ts	36	Sample name:
27Ts+27Tm (191)			
100*28ab (191)	%28ab	4	Operator: JORUNN K
28ab+30ab (191)			
100*29Ts (191)	%29Ts	27	Method: MSD_S_B
29Ts+29ab (191)			
100*25nor30ab (191)	%25nor30ab	3	Date analyzed: 07/06/93
25nor30ab+30ab (191)			
100*29ab (191)	%29ab	36	
29ab+30ab (191)			
100*30ba (191)	%30ba	21	
30ba+30ab (191)			
100*30D (191)	%30D	9	
30D+30ab (191)			
100*30G (191)	%30G	10	
30G+30ab (191)			
100*32abS (191)	%32abS	60	
32abS+32abR (191)			
100*35ab(S+R) (191)	%35ab	38	
SUM 34-35ab(S+R) (191)			
100*(27Ts+27Tm) (191)	%27HOP	7	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*28ab (191)	%28HOP	1	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(29ab+29ba) (191)	%29HOP	14	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(30ab+30ba) (191)	%30HOP	26	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(31ab(S+R)) (191)	%31HOP	18	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(32ab(S+R)) (191)	%32HOP	11	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(33ab(S+R)) (191)	%33HOP	9	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(34ab(S+R)) (191)	%34HOP	8	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(35ab(S+R)) (191)	%35HOP	5	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			

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STERANE ratios			SATURATE BIOMARKERS
100 * 29aaS (217) (29aa(S+R) (217))	%29aaS	45	File name (sample): 2976_5.D
100 * 29bb(S+R) (218) (29bb(S+R) (218) + 29aa(S+R) (217))	%29bb	44	File path: F:\HPCHEM\1\DATA\SATA_3009_S
100 * 27bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%27STER	35	Misc information:
100 * 28bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%28STER	23	Sample name:
100 * 29bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%29STER	34	Operator: JORUNN K
100 * 30bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%30STER	9	Method: MSD_S_B
			Date analyzed: 07/06/93

TERPANE-STERANE GROUP ratios		
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	Ho/St2	1065
100*(21+22)bb (21+22)bb+27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%Preg	8
100*(20/3+21/3+23/3+24/3+25/3+26/3(R+S)) (191) (20/3+21/3+23/3+24/3+25/3+26/3(R+S)+27(Ts+Tm)+28ab+ SUM 29-30(ab+ba)+SUM 31-35ab(S+R)) (191)	%Tri	5

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COMP.#	RT(min)	ION(m/z)	COMPOUND	HEIGHT	SATURATE BIOMARKERS
INT. STANDARD (if added)					
1	38.56	221.00	4D21aa	7	File name (sample):
2	50.00	193.00	2D29ba	19	2989_5.D
3	52.04	221.00	4D27aaR	6	File path:
4	43.94	217.00	24baa	7	F:\HPCHEM\1\DATA\SATA_3009_S\
DITERPANES					Misc information:
5	33.73	191.00	19/3	30	Sample name:
6	36.08	191.00	20/3	178	Operator:
7	38.09	191.00	21/3	339	JORUNN K
11	42.03	191.00	23/3	641	Method:
13	43.14	191.00	24/3	290	MSD_S_B
14	45.40	191.00	25/3	181	Date analyzed:
16	47.02	191.00	26/3R	97	07/06/93
17	47.15	191.00	26/3S	113	
20	50.62	191.00	28/3R	122	
21	50.86	191.00	28/3S	117	
23	51.66	191.00	29/3R	120	
25	51.78	191.00	29/3S	360	
15	46.92	191.00	24/4	537	
TRITERPANES:					
26	52.80	191.00	27Ts	1787	
28	53.01	177.00	25nor28ab	129	
29	53.47	191.00	27Tm	2215	
33	53.94	191.00	27b	254	
32	53.65	177.00	25nor29ab	115	
34	54.91	191.00	28ab	103	
36	55.17	177.00	25nor30ab	69	
39	55.71	191.00	29ab	8043	
40	55.81	191.00	29Ts	3122	
43	56.48	191.00	29ba	1487	
42	56.04	191.00	30D	713	
46	57.06	191.00	30ab	12277	
47	57.38	191.00	30D13	1354	
48	57.65	191.00	30ba	2256	
51	59.13	191.00	30G	1513	
49	58.60	191.00	31abS	7127	
50	58.81	191.00	31abR	5597	
52	59.32	191.00	31ba	1502	
53	59.83	191.00	32abS	3928	
54	60.08	191.00	32abR	2323	
55	61.22	191.00	33abS	2718	
56	61.60	191.00	33abR	2067	
57	62.72	191.00	34abS	2328	
58	63.21	191.00	34abR	1544	
59	64.42	191.00	35abS	1098	
60	65.10	191.00	35abR	872	

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COMP.#	RT	ION	COMPOUND	HEIGHT	SATURATE BIOMARKERS
STERANES					
8	38.60	217.00	21aa	472	File name (sample):
9	40.25	217.00	21bb	454	2989_5.D
10	40.37	217.00	22aa	330	File path:
12	42.59	217.00	22bb	272	F:\HPCHEM\1\DATA\SATA_3009_S\
18	48.84	217.00	27dbS	1798	Misc information:
19	49.47	217.00	27dbR	1209	
22	51.78	218.00	27bbR	1925	Sample name:
24	51.93	218.00	27bbS	1513	
27	52.33	217.00	27aaR	2718	Operator:
30	53.52	218.00	28bbR	952	JORUNN K
31	53.64	218.00	28bbS	735	Method:
35	54.61	217.00	29aaS	2442	MSD_S_B
37	54.91	218.00	29bbR	1942	Date analyzed:
38	55.01	218.00	29bbS	1909	07/06/93
41	55.61	217.00	29aaR	3564	
44	56.07	218.00	30bbR	315	
45	56.15	218.00	30bbS	360	

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TERPANE ratios			SATURATE BIOMARKERS
100*23/3 (191)	%23/3	58	File name (sample): 2989_5.D
23/3+24/3+25/3 (191)			
100*24/4 (191)	%24/4	53	File path: F:\HPCHEM\1\DATA\SATVA_3009_S
24/4+24/3+25/3 (191)			
100*20/3 (191)	%20/3	10	Misc information:
20/3+21/3+23/3+24/3+25/3+26/3(R+S) (191)			
100*27Ts (191)	%27Ts	45	Sample name:
27Ts+27Tm (191)			
100*28ab (191)	%28ab	1	Operator: JORUNN K
28ab+30ab (191)			
100*29Ts (191)	%29Ts	28	Method: MSD_S_B
29Ts+29ab (191)			
100*25nor30ab (191)	%25nor30ab	1	Date analyzed: 07/06/93
25nor30ab+30ab (191)			
100*29ab (191)	%29ab	40	
29ab+30ab (191)			
100*30ba (191)	%30ba	16	
30ba+30ab (191)			
100*30D (191)	%30D	5	
30D+30ab (191)			
100*30G (191)	%30G	11	
30G+30ab (191)			
100*32abS (191)	%32abS	63	
32abS+32abR (191)			
100*35ab(S+R) (191)	%35ab	34	
SUM 34-35ab(S+R) (191)			
100*(27Ts+27Tm) (191)	%27HOP	7	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*28ab (191)	%28HOP	0	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(29ab+29ba) (191)	%29HOP	16	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(30ab+30ba) (191)	%30HOP	25	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(31ab(S+R)) (191)	%31HOP	21	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(32ab(S+R)) (191)	%32HOP	11	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(33ab(S+R)) (191)	%33HOP	8	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(34ab(S+R)) (191)	%34HOP	7	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(35ab(S+R)) (191)	%35HOP	3	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			

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STERANE ratios			SATURATE BIOMARKERS
100 * 29aaS (217) (29aa(S+R) (217))	%29aaS	41	File name (sample): 2989_5.D
100 * 29bb(S+R) (218) (29bb(S+R) (218) + 29aa(S+R) (217))	%29bb	39	File path: F:\HPCHEM\1\DATA\SAT\A_3009_S
100 * 27bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%27STER	36	Misc information:
100 * 28bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%28STER	17	Sample name:
100 * 29bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%29STER	40	Operator: JORUNN K
100 * 30bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%30STER	7	Method: MSD_S_B
			Date analyzed: 07/06/93

TERPANE-STERANE GROUP ratios		
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	Ho/St2	614
100*(21+22)bb (21+22)bb+27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%Preg	7
100*(20/3+21/3+23/3+24/3+25/3+26/3(R+S)) (191) (20/3+21/3+23/3+24/3+25/3+26/3(R+S))+27(Ts+Tm)+28ab+ SUM 29-30(ab+ba)+SUM 31-35ab(S+R)) (191)	%Tri	3

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COMP.#	RT(min)	ION(m/z)	COMPOUND	HEIGHT	SATURATE BIOMARKERS
INT. STANDARD (if added)					
1	40.21	221.00	4D21aa	4	File name (sample):
2	56.42	193.00	2D29ba	3	3074.D
3	52.19	221.00	4D27aaR	3	File path:
4	46.16	217.00	24baa	4	C:\HPCHEM\1\DATA\SAT\B300914S\
DITERPANES					Misc information:
5	34.11	191.00	19/3	39	Sample name:
6	36.07	191.00	20/3	63	30/9-14
7	38.10	191.00	21/3	128	Operator:
11	42.07	191.00	23/3	406	JORUNN
13	43.18	191.00	24/3	199	Method:
14	45.46	191.00	25/3	108	MSD_S_B
16	47.06	191.00	26/3R	66	Date analyzed:
17	47.20	191.00	26/3S	58	08/12/93
20	50.66	191.00	28/3R	42	
21	50.90	191.00	28/3S	40	
23	51.66	191.00	29/3R	42	
25	51.95	191.00	29/3S	48	
15	46.96	191.00	24/4	254	
TRITERPANES:					
26	52.82	191.00	27Ts	194	
28	53.03	177.00	25nor28ab	19	
29	53.47	191.00	27Tm	79	
33	53.93	191.00	27b	44	
32	53.76	177.00	25nor29ab	1	
34	54.99	191.00	28ab	23	
36	55.12	177.00	25nor30ab	4	
39	55.69	191.00	29ab	315	
40	55.79	191.00	29Ts	93	
43	56.47	191.00	29ba	27	
42	56.03	191.00	30D	18	
46	57.03	191.00	30ab	263	
47	57.36	191.00	30D13	12	
48	57.65	191.00	30ba	20	
51	59.11	191.00	30G	18	
49	58.60	191.00	31abS	118	
50	58.79	191.00	31abR	90	
52	59.21	191.00	31ba	2	
53	59.81	191.00	32abS	65	
54	60.06	191.00	32abR	44	
55	61.22	191.00	33abS	38	
56	61.58	191.00	33abR	27	
57	62.71	191.00	34abS	20	
58	63.20	191.00	34abR	13	
59	64.41	191.00	35abS	16	
60	65.09	191.00	35abR	10	

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COMP.#	RT	ION	COMPOUND	HEIGHT	SATURATE BIOMARKERS
STERANES					
8	38.59	217.00	21aa	90	File name (sample):
9	40.26	217.00	21bb	134	3074.D
10	40.38	217.00	22aa	77	File path:
12	42.61	217.00	22bb	70	C:\HPCHEM\1\DATA\SAT\B300914S\
18	48.87	217.00	27dbS	296	Misc information:
19	49.50	217.00	27dbR	171	
22	51.80	218.00	27bbR	158	Sample name:
24	51.95	218.00	27bbS	106	30/9-14
27	52.35	217.00	27aaR	55	Operator:
30	53.52	218.00	28bbR	55	JORUNN
31	53.66	218.00	28bbS	72	Method:
35	54.61	217.00	29aaS	30	MSD_S_B
37	54.90	218.00	29bbR	71	Date analyzed:
38	55.00	218.00	29bbS	64	08/12/93
41	55.60	217.00	29aaR	31	
44	56.11	218.00	30bbR	12	
45	56.11	218.00	30bbS	12	

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TERPANE ratios			SATURATE BIOMARKERS
100*23/3 (191)	%23/3	57	File name (sample): 3074.D
23/3+24/3+25/3 (191)			File path: C:\HPCHEM\1\DATA\SAT\B300914S
100*24/4 (191)	%24/4	45	Misc information:
24/4+24/3+25/3 (191)			Sample name: 30/9-14
100*20/3 (191)	%20/3	6	Operator: JORUNN
20/3+21/3+23/3+24/3+25/3+26/3(R+S) (191)			Method: MSD_S_B
100*27Ts (191)	%27Ts	71	Date analyzed: 08/12/93
27Ts+27Tm (191)			
100*28ab (191)	%28ab	8	
28ab+30ab (191)			
100*29Ts (191)	%29Ts	23	
29Ts+29ab (191)			
100*25nor30ab (191)	%25nor30ab	1	
25nor30ab+30ab (191)			
100*29ab (191)	%29ab	54	
29ab+30ab (191)			
100*30ba (191)	%30ba	7	
30ba+30ab (191)			
100*30D (191)	%30D	6	
30D+30ab (191)			
100*30G (191)	%30G	6	
30G+30ab (191)			
100*32abS (191)	%32abS	60	
32abS+32abR (191)			
100*35ab(S+R) (191)	%35ab	44	
SUM 34-35ab(S+R) (191)			
100*(27Ts+27Tm) (191)	%27HOP	20	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*28ab (191)	%28HOP	2	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(29ab+29ba) (191)	%29HOP	25	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(30ab+30ba) (191)	%30HOP	21	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(31ab(S+R)) (191)	%31HOP	15	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(32ab(S+R)) (191)	%32HOP	8	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(33ab(S+R)) (191)	%33HOP	5	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(34ab(S+R)) (191)	%34HOP	2	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(35ab(S+R)) (191)	%35HOP	2	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			

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STERANE ratios			SATURATE BIOMARKERS
100 * 29aaS (217) (29aa(S+R) (217))	%29aaS	49	File name (sample): 3074.D
100 * 29bb(S+R) (218) (29bb(S+R) (218) + 29aa(S+R) (217))	%29bb	69	File path: C:\HPCHEM\1\DATA\SAT\B300914S
100 * 27bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%27STER	48	Misc information:
100 * 28bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%28STER	23	Sample name: 30/9-14
100 * 29bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%29STER	25	Operator: JORUNN
100 * 30bb(S+R) (218) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%30STER	4	Method: MSD_S_B
			Date analyzed: 08/12/93

TERPANE-STERANE GROUP ratios		
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191) 27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	Ho/St2	248
100*(21+22)bb (21+22)bb+27bb(S+R)+28bb(S+R)+29bb(S+R)+30bb(S+R) (218)	%Preg	27
100*(20/3+21/3+23/3+24/3+25/3+26/3(R+S)) (191) (20/3+21/3+23/3+24/3+25/3+26/3(R+S)+27(Ts+Tm)+28ab+ SUM 29-30(ab+ba)+SUM 31-35ab(S+R)) (191)	%Tri	43

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COMP.#	RT(min)	ION(m/z)	COMPOUND	HEIGHT	SATURATE BIOMARKERS
INT. STANDARD (if added)					
1	40.19	221.00	4D21aa	1	File name (sample):
2	56.39	193.00	2D29ba	3	3079_4.D
3	52.15	221.00	4D27aaR	5	File path:
4	46.13	217.00	24baa	4	C:\HPCHEM\1\DATA\SATVA_STD_S\
DITERPANES					Misc information:
5	34.00	191.00	19/3	48	Sample name:
6	35.94	191.00	20/3	42	
7	37.96	191.00	21/3	68	Operator:
11	41.91	191.00	23/3	176	JORUNN
13	43.01	191.00	24/3	102	Method:
14	45.27	191.00	25/3	51	MSD_S_B
16	46.88	191.00	26/3R	33	Date analyzed:
17	47.02	191.00	26/3S	38	08/31/93
20	50.55	191.00	28/3R	27	
21	50.74	191.00	28/3S	29	
23	51.52	191.00	29/3R	44	
25	51.80	191.00	29/3S	38	
15	46.78	191.00	24/4	130	
TRITERPANES:					
26	52.64	191.00	27Ts	171	
28	52.88	177.00	25nor28ab	27	
29	53.32	191.00	27Tm	105	
33	53.79	191.00	27b	39	
32	53.76	177.00	25nor29ab	5	
34	54.86	191.00	28ab	103	
36	55.05	177.00	25nor30ab	4	
39	55.54	191.00	29ab	360	
40	55.64	191.00	29Ts	117	
43	56.33	191.00	29ba	49	
42	55.90	191.00	30D	77	
46	56.90	191.00	30ab	603	
47	57.23	191.00	30D13	28	
48	57.50	191.00	30ba	50	
51	58.98	191.00	30G	30	
49	58.47	191.00	31abS	284	
50	58.66	191.00	31abR	199	
52	59.20	191.00	31ba	35	
53	59.68	191.00	32abS	190	
54	59.95	191.00	32abR	126	
55	61.11	191.00	33abS	125	
56	61.46	191.00	33abR	93	
57	62.59	191.00	34abS	75	
58	63.06	191.00	34abR	42	
59	64.25	191.00	35abS	59	
60	64.93	191.00	35abR	31	

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COMP.#	RT	ION	COMPOUND	HEIGHT	SATURATE BIOMARKERS
STERANES					
8	38.47	217.00	21aa	85	File name (sample):
9	40.12	217.00	21bb	115	3079_4.D
10	40.24	217.00	22aa	79	File path:
12	42.45	217.00	22bb	69	C:\HPCHEM\1\DATA\SATVA_STD_S\
18	48.70	217.00	27dbS	254	Misc information:
19	49.33	217.00	27dbR	140	
22	51.64	218.00	27bbR	233	Sample name:
24	51.80	218.00	27bbS	156	
27	52.18	217.00	27aaR	90	Operator:
30	53.37	218.00	28bbR	128	JORUNN
31	53.51	218.00	28bbS	166	Method:
35	54.47	217.00	29aaS	84	MSD_S_B
37	54.76	218.00	29bbR	186	Date analyzed:
38	54.86	218.00	29bbS	173	08/31/93
41	55.47	217.00	29aaR	93	
44	55.93	218.00	30bbR	61	
45	55.98	218.00	30bbS	48	

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TERPANE ratios			SATURATE BIOMARKERS
100*23/3 (191)	%23/3	53	File name (sample): 3079_4.D
23/3+24/3+25/3 (191)			
100*24/4 (191)	%24/4	46	File path: C:\HPCHEM\1\DATA\SATVA_STD_S
24/4+24/3+25/3 (191)			
100*20/3 (191)	%20/3	8	Misc information:
20/3+21/3+23/3+24/3+25/3+26/3(R+S) (191)			
100*27Ts (191)	%27Ts	62	Sample name:
27Ts+27Tm (191)			
100*28ab (191)	%28ab	15	Operator: JORUNN
28ab+30ab (191)			
100*29Ts (191)	%29Ts	25	Method: MSD_S_B
29Ts+29ab (191)			
100*25nor30ab (191)	%25nor30ab	1	Date analyzed: 08/31/93
25nor30ab+30ab (191)			
100*29ab (191)	%29ab	37	
29ab+30ab (191)			
100*30ba (191)	%30ba	8	
30ba+30ab (191)			
100*30D (191)	%30D	11	
30D+30ab (191)			
100*30G (191)	%30G	5	
30G+30ab (191)			
100*32abS (191)	%32abS	60	
32abS+32abR (191)			
100*35ab(S+R) (191)	%35ab	43	
SUM 34-35ab(S+R) (191)			
100*(27Ts+27Tm) (191)	%27HOP	10	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*28ab (191)	%28HOP	4	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(29ab+29ba) (191)	%29HOP	15	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(30ab+30ba) (191)	%30HOP	24	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(31ab(S+R)) (191)	%31HOP	18	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(32ab(S+R)) (191)	%32HOP	12	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(33ab(S+R)) (191)	%33HOP	8	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(34ab(S+R)) (191)	%34HOP	4	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			
100*(35ab(S+R)) (191)	%35HOP	3	
27(Ts+Tm)+28ab+SUM 29-30(ab+ba)+SUM 31-35ab(S+R) (191)			