

## DAILY MUD PROPERTIES:RHEOLOGY PARAMETERS FOR WELL 35/11-11

Hole section : 0.0			WATER BASED SYSTEM																
Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
1998-04-16 13:00	345	345	SPUD MUD	110.0	1.20		47	32	24	17	0	0	7	6	15.0	8.1	3.5	4.5	
Hole section : 36"			WATER BASED SYSTEM																
Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
1998-04-17	445	445	SPUD MUD	110.0	1.03					0	0								
Hole section : 17 1/2"			WATER BASED SYSTEM																
Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
1998-04-18 23:00	445	445	SPUD MUD	110.0	1.03					0	0								
1998-04-19 23:00	1105	1105	SPUD MUD	110.0	1.03	0.0	47	35	27	22	0	0	11	8	50.0	12.0	11.0	4.0	6.0
1998-04-20 23:00	1253	1253	SPUD MUD	110.0	1.03	0.0	46	35	27	21	0	0	10	8	50.0	11.0	11.5	5.0	6.0
1998-04-21 23:00	1253	1253	SPUD MUD	110.0	1.03	0.0	47	36	26	21	0	0	11	8	50.0	11.0	12.0	5.0	6.0
1998-04-22 23:00	1253	1253	SPUD MUD	110.0	1.03	0.0	47	36	26	21	0	0	11	8	50.0	11.0	12.0	5.0	6.0
1998-04-23 23:00	1253	1253	SPUD MUD	110.0	1.03	0.0	47	36	26	21	0	0	11	8	50.0	11.0	12.0	5.0	6.0
1998-04-24 23:00	1253	1253	SPUD MUD	110.0	1.25	0.0	74	49	36	22	0	0	10	8	50.0	25.0	12.0	4.0	5.0
1998-04-25 23:00	1253	1253	SPUD MUD	95.0	1.25	0.0	74	49	36	22	0	0	10	8	50.0	25.0	12.0	4.0	5.0
Hole section : 12 1/4"			WATER BASED SYSTEM																
Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings								Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]
	MD	TVD					600	300	200	100	60	30	6	3					
1998-04-26 23:00	1258	1258	AQUACOL KCL/POL	90.0	1.25	0.0	74	49	36	22	0	0	10	8	50.0	25.0	11.0	4.0	5.0
1998-04-27 04:30	1891	1891	FRESH WATER	86.0	1.25		72	50	37	25	0	0	10	8	19.0	22.0	14.0	5.0	7.0
1998-04-27 15:00	1891	1891	FRESH WATER	85.0	1.25		78	53	40	26	0	0	11	8	20.0	25.0	14.0	5.0	8.0
1998-04-27 23:00	1891	1891	FRESH WATER	81.0	1.25		82	56	42	27	0	0	10	8	20.0	26.0	14.0	5.0	8.0
1998-04-28 15:00	2177	2177	FRESH WATER	83.0	1.26		0	0	0	0	0	0	0	0	28.0	25.0	14.0	6.0	8.0
1998-04-28 22:30	2177	2177	FRESH WATER	82.0	1.25		81	56	45	31	0	0	9	7	29.0	25.0	15.5	6.0	8.0
1998-04-28 23:00	1953	1953	AQUACOL KCL/POL	81.0	1.25	29.0	87	59	47	30	0	0	8	6	50.0	28.0	15.5	5.0	8.0
1998-04-29 23:00	2222	2222	AQUACOL KCL/POL	82.0	1.25	30.0	87	60	47	32	0	0	10	7	50.0	27.0	16.5	6.0	9.0
1998-04-29 23:20	2267	2267	FRESH WATER	90.0	1.27		90	60	50	34	0	0	10	7	22.0	30.0	14.0	4.5	9.5

## DAILY MUD PROPERTIES:RHEOLOGY PARAMETERS FOR WELL 35/11-11

Hole section : 12 1/4"		WATER BASED SYSTEM																	
Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings							Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]	
	MD	TVD					600	300	200	100	60	30	6						3
1998-04-30 14:00	2505	2505	FRESH WATER	90.0	1.26		0	0	0	0	0	0	0	32.0	30.0	18.5	6.0	10.0	
1998-04-30 22:00	2505	2505	FRESH WATER	89.0	1.26		94	65	52	36	0	0	10	8	33.0	29.0	17.0	5.0	8.0
1998-04-30 23:00	2326	2326	AQUACOL KCL/POL	82.0	1.27	29.0	86	58	46	31	0	0	9	7	50.0	28.0	15.0	5.0	8.0
1998-05-01 04:15	2552	2552	FRESH WATER	90.0	1.26		95	66	53	37	0	0	10	8	34.0	29.0	18.5	5.0	7.5
Hole section : 8 1/2"		WATER BASED SYSTEM																	
Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings							Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]	
	MD	TVD					600	300	200	100	60	30	6						3
1998-05-01 23:00	2552	2552	FRESH WATER	99.0	1.27		100	69	53	38	0	0	10	8	23.0	31.0	18.0	5.0	7.5
1998-05-02 21:00	2570	2570	FRESH WATER	110.0	1.26		99	70	56	38	0	0	11	9	29.0	20.5	5.0	8.0	
1998-05-02 23:00	2570	2570	AQUACOL KCL/POL	90.0	1.26	21.0	99	70	56	38	0	0	11	9	50.0	29.0	20.5	5.0	8.0
1998-05-03 05:20	2605	2605	FRESH WATER	100.0	1.26		93	64	51	35	0	0	10	8	20.0	29.0	17.5	5.0	7.5
1998-05-03 11:30	2605	2605	FRESH WATER	94.0	1.26		93	64	50	35	0	0	10	8	21.0	29.0	17.5	5.0	8.0
1998-05-03 23:00	2605	2605	FRESH WATER	98.0	1.27		93	64	50	34	0	0	10	8	20.0	29.0	17.5	5.0	7.5
1998-05-04 18:00	2636	2635	FRESH WATER	96.0	1.29		0	0	0	0	0	0	0	20.0	29.0	17.0	5.0	7.5	
1998-05-04 22:00	2636	2635	FRESH WATER	95.0	1.29		92	62	50	34	0	0	10	8	20.0	30.0	15.0	5.0	7.5
1998-05-04 23:00	2622	2621	AQUACOL KCL/POL	96.0	1.28	21.0	92	63	49	34	0	0	10	8	50.0	29.0	17.0	5.0	7.5
1998-05-05 04:00	2648	2647	FRESH WATER	100.0	1.28		87	60	46	33	0	0	9	7	20.0	27.0	16.5	4.5	7.0
1998-05-05 17:00	2648	2647	FRESH WATER	109.0	1.28		87	59	46	31	0	0	10	7	17.0	28.0	15.5	4.5	6.5
1998-05-05 23:00	2648	2647	FRESH WATER	105.0	1.28		88	60	46	32	0	0	9	7	19.0	28.0	15.0	4.5	6.5
1998-05-06 16:20	2696	2695	FRESH WATER	92.0	1.27		92	63	50	34	0	0	10	8	21.0	29.0	17.0	5.0	8.0
1998-05-06 23:00	2696	2695	FRESH WATER	96.0	1.27		95	66	52	36	0	0	9	7	29.0	18.5	4.0	7.0	
1998-05-07 10:00	2723	2722	FRESH WATER	91.0	1.27		96	66	53	37	0	0	10	8	19.0	30.0	18.0	4.5	7.0
1998-05-07 23:00	2723	2722	FRESH WATER	100.0	1.27		97	66	53	36	0	0	9	8	24.0	31.0	17.5	4.5	7.0
1998-05-08 23:00	2767	2766	AQUACOL KCL/POL	119.0	1.26	19.0	97	67	54	36	0	0	9	8	50.0	30.0	18.0	4.0	7.0
1998-05-09 23:00	2967	2966	AQUACOL KCL/POL	102.0	1.27	19.0	93	65	52	36	0	0	9	7	50.0	28.0	18.0	4.0	7.0
1998-05-10 23:00	3104	3103	AQUACOL KCL/POL	110.0	1.29	25.0	99	70	56	39	0	0	9	8	50.0	29.0	20.5	4.0	7.0
1998-05-11 23:00	3225	3224	AQUACOL KCL/POL	102.0	1.27	0.0	102	72	57	40	0	0	10	8	50.0	30.0	20.0	4.0	7.0
1998-05-12 23:00	3225	3224	AQUACOL KCL/POL	102.0	1.27	30.0	102	72	57	40	0	0	10	8	50.0	30.0	20.0	4.0	7.0
1998-05-13 23:00	3225	3224	AQUACOL KCL/POL	102.0	1.27	0.0	102	72	57	40	0	0	10	8	50.0	30.0	20.0	4.0	7.0
1998-05-14 23:00	3225	3224	AQUACOL KCL/POL	102.0	1.27	0.0	102	72	57	40	0	0	10	8	50.0	30.0	21.0	4.0	7.0
1998-05-15 23:00	3225	3224	AQUACOL KCL/POL	120.0	1.28	0.0	101	71	58	40	0	0	10	8	50.0	30.0	20.5	4.0	7.0
1998-05-16 23:00	2975	2974	AQUACOL KCL/POL	122.0	1.29	0.0	104	72	59	41	0	0	11	8	50.0	32.0	19.0	4.0	8.0

## DAILY MUD PROPERTIES:RHEOLOGY PARAMETERS FOR WELL 35/11-11

Hole section : 12 1/4"		WATER BASED SYSTEM																	
Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings							Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]	
	MD	TVD					600	300	200	100	60	30	6						3
1998-05-17 23:00	2440	2440	AQUACOL KCL/POL	98.0	1.31	0.0	95	63	49	32	0	0	7	5	50.0	32.0	15.5	4.0	10.0
1998-05-18 23:00	1520	1520	AQUACOL KCL/POL	102.0	1.32	0.0	93	61	47	30	0	0	7	5	50.0	32.0	14.5	4.0	10.0
Hole section : 17 1/2"		WATER BASED SYSTEM																	
Date	Depth [m]		Mud Type	Funnel Visc [sec]	Dens [sg]	Mudtmp Out [DegC]	Fann Readings							Rheo Test [DegC]	PV [mPas]	YP [Pa]	Gel0 [Pa]	Gel10 [Pa]	
	MD	TVD					600	300	200	100	60	30	6						3
1998-05-19 22:00	1145	1145	TEST FLUID		1.33		92	60	49	32	0	0	6	5		32.0	14.0	3.0	8.0
1998-05-20 22:00	450	450	KCL/POLYMER	90.0	1.33		90	58	48	31	0	0	6	5		32.0	13.0	3.0	8.0

**DAILY MUD PROPERTIES : OTHER PARAMETERS FOR WELL 35/11-11**

Hole section : 0.0		WATER BASED SYSTEM																							
Date	Depth [m]		Mud Type	Dens [sg]	Filtrate		Filtcake		HPHT Press/Temp [bar/DegC]	pH	Alcalinity			Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++	Tot hard [mg/l]	Percentage Solid Oil Sand			CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
	MD	TVD			API [ml]	HPHT [ml]	API [mm]	HPHT [mm]			Pm [ml]	Pf [ml]	Mf [ml]							[%]	[%]	[%]			
1998-04-16 13:00	345	345	SPUD MUD	1.20	4.0	1	/							90	65000										

Hole section : 36"		WATER BASED SYSTEM																							
Date	Depth [m]		Mud Type	Dens [sg]	Filtrate		Filtcake		HPHT Press/Temp [bar/DegC]	pH	Alcalinity			Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++	Tot hard [mg/l]	Percentage Solid Oil Sand			CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
	MD	TVD			API [ml]	HPHT [ml]	API [mm]	HPHT [mm]			Pm [ml]	Pf [ml]	Mf [ml]							[%]	[%]	[%]			
1998-04-17	445	445	SPUD MUD	1.03			/																		

Hole section : 17 1/2"		WATER BASED SYSTEM																							
Date	Depth [m]		Mud Type	Dens [sg]	Filtrate		Filtcake		HPHT Press/Temp [bar/DegC]	pH	Alcalinity			Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++	Tot hard [mg/l]	Percentage Solid Oil Sand			CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
	MD	TVD			API [ml]	HPHT [ml]	API [mm]	HPHT [mm]			Pm [ml]	Pf [ml]	Mf [ml]							[%]	[%]	[%]			
1998-04-18 23:00	445	445	SPUD MUD	1.03			/																		
1998-04-19 23:00	1105	1105	SPUD MUD	1.03	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
1998-04-20 23:00	1253	1253	SPUD MUD	1.03	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
1998-04-21 23:00	1253	1253	SPUD MUD	1.03	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
1998-04-22 23:00	1253	1253	SPUD MUD	1.03	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
1998-04-23 23:00	1253	1253	SPUD MUD	1.03	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
1998-04-24 23:00	1253	1253	SPUD MUD	1.25	2.8	9.2	1	1	34/120	8.7	0.0	0.1	0.8	0	0	72000	400	0	400	5.5	0.0	0.1	0	0.0	1
1998-04-25 23:00	1253	1253	SPUD MUD	1.25	2.8	9.2	1	1	34/120	8.7	0.0	0.1	0.8	0	0	72000	400	0	400	5.5	0.0	0.1	0	0.0	1

Hole section : 12 1/4"		WATER BASED SYSTEM																							
Date	Depth [m]		Mud Type	Dens [sg]	Filtrate		Filtcake		HPHT Press/Temp [bar/DegC]	pH	Alcalinity			Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++	Tot hard [mg/l]	Percentage Solid Oil Sand			CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
	MD	TVD			API [ml]	HPHT [ml]	API [mm]	HPHT [mm]			Pm [ml]	Pf [ml]	Mf [ml]							[%]	[%]	[%]			
1998-04-26 23:00	1258	1258	AQUACOL KCL/PK	1.25	2.8	9.2	1	1	34/120	8.7	0.1	0.1	0.8	0	0	72000	400	0	400	11.0	3.5	0.1	0	0.0	1
1998-04-27 04:30	1891	1891	FRESH WATER	1.25	2.0	9.0	1	1	35/100	9.2	0.2	0.1	0.8	165				600	11.5		0.2			14	
1998-04-27 15:00	1891	1891	FRESH WATER	1.25	2.2	9.4	1	1	35/100	9.1	0.2	0.1	0.8	160				620	12.0		0.3			32	
1998-04-27 23:00	1891	1891	FRESH WATER	1.25	2.2	9.4	1	1	35/100	8.6	0.1	0.1	0.7	165	78000	480		480	12.0		0.3			41	
1998-04-28 15:00	2177	2177	FRESH WATER	1.26	2.4	9.4	1	1	35/100	8.2	0.1	0.0	0.6	158				640	7.2		0.3			81	
1998-04-28 22:30	2177	2177	FRESH WATER	1.25	2.4	9.4	1	1	35/100	8.4	0.1	0.0	0.6	162	82000	77000	620	620	12.5		0.3			70	
1998-04-28 23:00	1953	1953	AQUACOL KCL/PK	1.25	2.4	9.2	1	1	34/120	8.6	0.1	0.1	0.7	0	82000	77000	600	0	600	6.1	0.0	0.4	11	2.4	2
1998-04-29 23:00	2222	2222	AQUACOL KCL/PK	1.25	2.4	8.8	1	1	34/120	8.1	0.1	0.0	0.8	0	87000	77500	600	0	600	6.6	0.0	0.2	11	2.4	3
1998-04-29 23:20	2267	2267	FRESH WATER	1.27	2.5	8.9	1	1	35/100	8.1	0.1		0.8	167	87000	77500	650	650	12.5		0.2				43
1998-04-30 14:00	2505	2505	FRESH WATER	1.26	2.4	8.8	1	1	35/100	8.2	0.1	0.0	0.8	169				640	6.9		0.2				82
1998-04-30 22:00	2505	2505	FRESH WATER	1.26	2.4	8.8	1	1	35/100	8.3	0.1	0.0	0.8	168	88000	80000	350	610	13.0		0.2				82

## DAILY MUD PROPERTIES : OTHER PARAMETERS FOR WELL 35/11-11

Hole section : 12 1/4"		WATER BASED SYSTEM																								
Date	Depth [m]		Mud Type	Dens [sg]	Filtrate		Filtcake		HPHT Press/Temp [bar/DegC]	pH	Alcalinity			Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage			CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]	
	MD	TVD			API [ml]	HPHT [ml]	API [mm]	HPHT [mm]			Pm [ml]	Pf [ml]	Mf [ml]							Solid [%]	Oil [%]	Sand [%]				
1998-04-30 23:00	2326	2326	AQUACOL KCL/PC	1.27	2.4	8.8	1	1	34/ 120	8.0	0.1	0.0	0.6	0	88000	80000	600	0	600	7.0	0.0	0.2	11	2.4	3	
1998-05-01 04:15	2552	2552	FRESH WATER	1.26	2.6	9.0	1	1	35/ 100	8.7	0.1	0.1	0.6	167					640	7.0		0.3			84	
Hole section : 8 1/2"		WATER BASED SYSTEM																								
Date	Depth [m]		Mud Type	Dens [sg]	Filtrate		Filtcake		HPHT Press/Temp [bar/DegC]	pH	Alcalinity			Inhib Chem [Kg/m3]	K+ [mg/l]	CL- [mg/l]	Ca++ [mg/l]	Mg++ [mg/l]	Tot hard [mg/l]	Percentage			CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]	
	MD	TVD			API [ml]	HPHT [ml]	API [mm]	HPHT [mm]			Pm [ml]	Pf [ml]	Mf [ml]							Solid [%]	Oil [%]	Sand [%]				
1998-05-01 23:00	2552	2552	FRESH WATER	1.27	2.6	9.0	1	1	35/ 100	8.5	0.1	0.0	0.5	167	87000	80000	520		630	13.5		0.3			92	
1998-05-02 21:00	2570	2570	FRESH WATER	1.26	2.5	9.0	1	1	35/ 100	8.3	0.1	0.0	0.6	167	87000	80000	320	170	600	13.0		0.2			82	
1998-05-02 23:00	2570	2570	AQUACOL KCL/PC	1.26	2.6	9.0	1	1	34/ 120	8.3	0.1	0.0	0.6	0	87000	80000	320	170	600	6.9	0.0	0.2	25	2.4	3	
1998-05-03 05:20	2605	2605	FRESH WATER	1.26	2.7	9.1	1	1	35/ 100	8.3	0.1	0.0	0.6	166					610	7.6		0.3			103	
1998-05-03 11:30	2605	2605	FRESH WATER	1.26	2.6	9.0	1	1	35/ 100	8.3	0.1	0.0	0.6	164					600	7.5		0.2			100	
1998-05-03 23:00	2605	2605	FRESH WATER	1.27	2.6	9.0	1	1	35/ 100	8.3	0.1	0.0	0.6	164	86000	79000	370	158	620	14.0		0.3			114	
1998-05-04 18:00	2636	2635	FRESH WATER	1.29	2.8	9.0	1	1	35/ 100	8.2	0.1	0.0	0.6	163					600	8.5		0.3			106	
1998-05-04 22:00	2636	2635	FRESH WATER	1.29	2.6	9.0	1	1	35/ 100	8.2	0.1	0.0	0.7	164	85000	79000	320	164	620	14.5		0.3			108	
1998-05-04 23:00	2622	2621	AQUACOL KCL/PC	1.28	2.6	9.0	1	1	34/ 120	8.3	0.1	0.0	0.6	0	85000	79000	370	164	640	8.1	0.0	0.3	35	2.4	4	
1998-05-05 04:00	2648	2647	FRESH WATER	1.28	2.5	8.9	1	1	35/ 100	8.2	0.1	0.0	0.6	165					650	8.1		0.3			97	
1998-05-05 17:00	2648	2647	FRESH WATER	1.28	2.6	9.0	1	1	35/ 100	8.2	0.1	0.0	0.6	167					640	8.1		0.3			96	
1998-05-05 23:00	2648	2647	FRESH WATER	1.28	2.5	9.0	1	1	35/ 100	8.2	0.1	0.0	0.6	167	86000	79000	400	170	700	13.5		0.3			70	
1998-05-06 16:20	2696	2695	FRESH WATER	1.27	2.5	8.9	1	1	35/ 100	8.3	0.1	0.1	0.7	168					600	6.9		0.3			57	
1998-05-06 23:00	2696	2695	FRESH WATER	1.27	2.5	8.9	1	1	35/ 100	9.0	1.0	0.2	1.2	164	87000	87000	240	176	400	6.9		0.3			75	
1998-05-07 10:00	2723	2722	FRESH WATER	1.27	2.5	8.8	1	1	35/ 100	8.9	0.9	0.1	1.0	165					450	7.1		0.3			83	
1998-05-07 23:00	2723	2722	FRESH WATER	1.27	2.5	9.0	1	1	35/ 100	8.8	0.8	0.2	0.9	165	86000	87000	240	122	430	6.9		0.3			67	
1998-05-08 23:00	2767	2766	AQUACOL KCL/PC	1.26	2.5	9.0	1	1	34/ 120	8.7	0.8	0.1	0.7	161	85000	82000	280	134	460	7.8	0.0	0.3	34	2.4	123	
1998-05-09 23:00	2967	2966	AQUACOL KCL/PC	1.27	2.6	9.0	1	1	34/ 120	8.3	0.4	0.1	0.9	168	84000	78000	200	109	480	8.1	0.0	0.3	36	2.4	116	
1998-05-10 23:00	3104	3103	AQUACOL KCL/PC	1.29	2.6	9.0	1	1	34/ 120	8.2	0.1	0.1	0.7	169	90000	78000	240	158	460	8.4	0.0	0.3	40	2.4	122	
1998-05-11 23:00	3225	3224	AQUACOL KCL/PC	1.27	2.6	9.0	1	1	34/ 120	8.2	0.1	0.1	0.9	167	88000	80000	320	134	600	8.5	0.0	0.3	34	2.4	138	
1998-05-12 23:00	3225	3224	AQUACOL KCL/PC	1.27	2.6	9.0	1	1	34/ 120	8.2	0.1	0.1	0.9	167	87000	80000	280	109	460	8.5	0.0	0.3	42	2.4	138	
1998-05-13 23:00	3225	3224	AQUACOL KCL/PC	1.27	2.6	9.0	1	1	34/ 120	8.2	0.1	0.1	0.9	167	86000	80000	280	109	460	8.5	0.0	0.3	42	2.4	138	
1998-05-14 23:00	3225	3224	AQUACOL KCL/PC	1.27	2.6	9.0	1	1	34/ 120	8.2	0.1	0.1	0.9	167	86000	80000	280	109	460	8.5	0.0	0.3	42	2.4	138	
1998-05-15 23:00	3225	3224	AQUACOL KCL/PC	1.28	2.6	9.0	1	1	34/ 120	8.1	0.1	0.1	1.0	162	84000	80000	260	109	440	8.7	0.0	0.3	40	2.4	135	
1998-05-16 23:00	2975	2974	AQUACOL KCL/PC	1.29	2.8	9.6	1	1	34/ 120	10.8	1.5	1.0	1.3	158	82000	80000	300	109	480	9.1	0.0	0.3	40	2.4	138	

DAILY MUD PROPERTIES : OTHER PARAMETERS FOR WELL 35/11-11

Hole section : 12 1/4"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Dens [sg]	Filtrate		Filtcake		HPHT		pH	Alcalinity			Inhib Chem	K+	CL-	Ca++	Mg++	Tot hard	Percentage			CEC	ASG	LGS
	MD	TVD			API [ml]	HPHT [ml]	API [mm]	HPHT [mm]	Press [bar]	Temp [DegC]		Pm [ml]	Pf [ml]	Mf [ml]							[mg/l]	[mg/l]	[mg/l]			
1998-05-17 23:00	2440	2440	AQUACOL KCL/PC	1.31	3.6	11.0	1	2	34	120	12.3	17.0	0.3	3.0	0	78000	78000	280	243	680	10.2	0.0	0.3	140	2.4	6
1998-05-18 23:00	1520	1520	AQUACOL KCL/PC	1.32	3.8	12.0	1	2	34	120	12.5	18.0	0.9	3.0	0	78000	78000	280	243	680	10.6	0.0	0.3	140	2.4	6

Hole section : 17 1/2"

WATER BASED SYSTEM

Date	Depth [m]		Mud Type	Dens [sg]	Filtrate		Filtcake		HPHT		pH	Alcalinity			Inhib Chem	K+	CL-	Ca++	Mg++	Tot hard	Percentage			CEC	ASG	LGS
	MD	TVD			API [ml]	HPHT [ml]	API [mm]	HPHT [mm]	Press [bar]	Temp [DegC]		Pm [ml]	Pf [ml]	Mf [ml]							[mg/l]	[mg/l]	[mg/l]			
1998-05-19 22:00	1145	1145	TEST FLUID	1.33	5.0		2		/			18.0	1.0	2.6	145		78000			880	16.0		0.3			5
1998-05-20 22:00	450	450	KCL/POLYMER	1.33	5.6		1		/			10.0	8.0	1.6	135					680						

**TOTAL CONSUMPTION OF MUD ADDITIVES ON WELL 35/11-11**

Section	Product/ Additive	Unit	Total Amount Used
36"	ANTISOL FL30	kg	792.00
	BARITE	kg	32000.00
	GLYDRIL MC	l	192.00
	KCL	kg	10312.00
	XANTHAN GUM	kg	1117.00
17 1/2"	ANTISOL FL30	kg	2196.00
	BARITE	kg	72000.00
	BENTONITE	kg	18000.00
	GLYDRIL MC	l	707.00
	KCL	kg	28594.00
	LIME	kg	20.00
	SODA ASH	kg	100.00
	XANTHAN GUM	kg	2848.00
12 1/4"	AQUAPAC REG/LV	kg	1613.00
	BACL2	l	110.00
	BARITE	kg	34000.00
	BENTONITE	kg	7000.00
	FLOWZAN	kg	24.00
	GLYDRIL MC	l	2144.00
	KCL	kg	23349.00
	LIME	kg	27.00
	SODA ASH	kg	32.00
	XANTHAN GUM	kg	985.00
8 1/2"	AQUAPAC REG/LV	kg	3377.00
	BACL2	l	437.00
	BARITE	kg	94500.00
	FLOWZAN	kg	469.00
	GLYDRIL MC	l	7673.00
	KCL	kg	40284.00
	LIME	kg	188.00
	SODA ASH	kg	198.00



# E&P Division

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Verified	Name <b>Pål Fristad</b>	Org. unit <b>Drilling</b>	Date <b>27/1/99</b>	Signed <b>PK</b>			
Approved	Name <b>Pål Kongsgården</b>	Org. unit <b>G&amp;G / Fram</b>	Date <b>19/2/99</b>	Signed <b>PK</b>			
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Rev./status	Date	Reason for issue	Author	Contr.	Disc. appr.	Proj. appr.	Hydro appr.

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## 2 INTRODUCTION

### 2.2 Analytical methods

A list of all analysed samples is given in Table 2.2. The analytical and preparative methods employed in this study comprised scanning fluorescence measurements, geochemical screening and bitumen characterisation. Screening consisted of Rock Eval pyrolysis. Bitumen characterisation included solvent extraction followed by asphaltene precipitation, preparative group type separation by MPLC<sup>2</sup> and analytical group type separation by TLC-FID<sup>3</sup> (Iatroscan). Rock extracts and the oil samples were further analysed by gas chromatography (GC-FID) of saturated hydrocarbons, analysis of the saturated and aromatic hydrocarbon fractions by gas chromatography-mass spectrometry (GC-MSD<sup>4</sup>) and analysis of stable carbon isotopes (both fractions and gaseous compounds).

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1 All depths in this report are mRKB (drillers) unless otherwise stated  
2 Medium Pressure/Performance Liquid Chromatography  
3 Thin Layer Chromatography with Flame Ionisation Detection  
4 Mass-Selective Detector

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The analytical methods are based upon the guidelines in the Norwegian Industry Guide to Organic Geochemical Analyses (NIGOGA<sup>5</sup>). Major deviations from this guide are accordingly:

- TOC measurement by Rock Eval (no decarbonisation by acid).
- Extract and asphaltene workup by centrifugation (no filtering).
- Internal standard mixture added to the EOM or whole oil, for quality control and quantitative reports.
- GC analysis of SAT and ARO fractions by 5% phenyl methyl-silicone stationary phase.
- GC-MSD detection of the aromatic hydrocarbons (not FID).
- Report of a restricted number of compounds relative to the NIGOGA guide, due to known co-elutions or disputable identities.

Stable carbon isotope analysis of the hydrocarbon fractions was undertaken by IFE (Kjeller, Norway). All other analytical and interpretative work was carried out at the Norsk Hydro E&P Research Center in Bergen, Norway.

**Table 2.1 Stratigraphy of well 35/11-11**

**STRATIGRAPHY, WELL NOR : 35/11-11**



TOP (m)	BOTTOM (m)	Simple Mean							Weighted Mean			
		S1 (kg/t)	S2 (kg/t)	TOC (%)	HI	PI	Tmax	VRo	S1 (kg/t)	S2 (kg/t)	TOC (%)	HI
1466.00	1523.00											
1523.00	1582.00											
1582.00	1624.00											
1624.00	1679.00											
1679.00	1825.00											
1825.00	1914.00											
1914.00	2056.00											
2056.00	2343.00											
2343.00	2449.00											
2449.00	2469.00											
2540.00	2569.00											
2569.00	2616.00											
2616.00	2683.00											
2683.00	2727.00											
3008.00	3077.00											
3077.00	3085.00											
3085.00	3119.00											
3119.00	3177.00											
3177.00	3225.00											

Table 2.2 List of samples analysed

ANALYSIS PROGRAMME, WELL NOR : 35/11-11

Petroleum Geochemistry Group

Research Centre Bergen

23-Oct-1998 10:33



Lithology	Type	RockEval	RE/EXT	Extr	MPLC	Iatr	SatHC	Pyrolyse	Isot	Sat-biom	c5-20hc	Aro-hc	Vitr
	MUD			1		1	1			1		1	
	COCH	1		1		1							
	COCH	1											
	COCH	1											
	COCH	1		1		1							
	COCH	1											
	COCH	1											
	COCH	1		1		1							
	COCH	1											
	COCH	1											
	COCH	1											
	COCH	1											
	COCH	1		1		1							
	COCH	1											
	COCH	1											
	COCH	1	1	1		1	1		1	1		1	
	COCH	1											

**Table 2.2 List of samples analysed**

**ANALYSIS PROGRAMME, WELL NOR : 35/11-11**

**Petroleum Geochemistry Group**

**Research Centre Bergen**

23-Oct-1998 10:33



Depth (m)	Group/Fm.	Lithology	Type	RockEval	RE/EXT	Extr	MPLC	Iatr	SatHC	Pyrolyse	Isot	Sat-biom	c5-20hc	Aro-hc	Vitr
--------------	-----------	-----------	------	----------	--------	------	------	------	-------	----------	------	----------	---------	--------	------

MPLC = Separation

SatGC = Saturated HC

Isot = Isotope data

Vitr = VRO (ave) %

Extr = Extraction

Iatr = Iatrosan

Sat-biom = Biomarker data

RE/EXT = Rock Eval on extracted Seciment

**Table 3.1 Rock Eval data**



**ROCK EVAL SCREENING DATA**

Well	Depth (m)	Lithology	Type	Tmax (C)	S1(kg/t)	S2 (kg/t)	TOC (%)	HI	PI	Analysing Company
NOR : 35/11-11	2552.45		COCH		0.2	0.3	0.1	231	0.38	NORSK HYDRO
NOR : 35/11-11	2554.50		COCH		0.1	0.3	0.1	179	0.24	NORSK HYDRO
NOR : 35/11-11	2557.25		COCH		0.0	0.1	0.1	143	0.29	NORSK HYDRO
NOR : 35/11-11	2560.00		COCH		0.7	1.5	0.9	156	0.33	NORSK HYDRO
NOR : 35/11-11	2562.25		COCH		0.1	0.2	0.1	155	0.29	NORSK HYDRO
NOR : 35/11-11	2565.00		COCH		0.4	0.9	0.5	196	0.28	NORSK HYDRO
NOR : 35/11-11	2566.30		COCH		0.1	0.2	0.1	190	0.30	NORSK HYDRO
NOR : 35/11-11	2568.34		COCH		0.1	0.2	0.1	244	0.21	NORSK HYDRO
NOR : 35/11-11	2586.00		COCH		0.3	0.3	0.1	386	0.51	NORSK HYDRO
NOR : 35/11-11	2588.50		COCH		0.1	0.2	0.0	375	0.44	NORSK HYDRO
NOR : 35/11-11	2593.60		COCH		0.1	0.3	0.1	270	0.29	NORSK HYDRO
NOR : 35/11-11	2598.40		COCH		0.1	0.2	0.1	220	0.27	NORSK HYDRO
NOR : 35/11-11	2606.55		COCH		0.1	0.1	0.1	260	0.28	NORSK HYDRO
NOR : 35/11-11	2611.30		COCH		0.1	0.3	0.1	540	0.29	NORSK HYDRO
NOR : 35/11-11	2616.60		COCH		0.0	0.1	0.0	367	0.21	NORSK HYDRO
NOR : 35/11-11	2697.15		COCH		0.1	0.1	0.2	67	0.33	NORSK HYDRO
NOR : 35/11-11	2697.85		COCH		0.1	0.2	0.2	94	0.29	NORSK HYDRO
NOR : 35/11-11	2705.55		COCH		0.0	0.1	0.1	67	0.27	NORSK HYDRO
NOR : 35/11-11	2707.55		COCH		0.0	0.1	0.1	75	0.31	NORSK HYDRO
NOR : 35/11-11	2710.80		COCH		0.1	0.1	0.0	300	0.33	NORSK HYDRO
NOR : 35/11-11	2712.05		COCH		0.0	0.1	0.0	367	0.21	NORSK HYDRO
NOR : 35/11-11	2723.75		COCH		0.1	0.2	0.0	400	0.30	NORSK HYDRO
NOR : 35/11-11	3085.00		COCH		0.5	0.4	0.1	325	0.56	NORSK HYDRO
NOR : 35/11-11	3100.00		COCH		0.1	0.3	0.1	340	0.28	NORSK HYDRO

**Table 3.2: Rock Eval data, extracted sample**



**ROCK EVAL SCREENING DATA ON EXTRACTED SEDIMENTS, WELL NOR :35/11-11**

27-Oct-1998

14:41

Depth (m)	Lithology	Type	Tmax (C)	S1(kg/t)	S2 (kg/t)	TOC (%)	HI	PI	Analysing Company
3085.00		COCH		0.0	0.1	0.1	110		NORSK HYDRO

**Table 3.3: Extraction and deasphalting data on extracts**



**EXTRACTION/DESPHALTING DATA (SEDIMENTS)**

27-Oct-1998

14:42

Well	Depth (m)	Lithology	Type	Rock (g)	EOM (mg)	ASP (mg)	EOM (%)	ASP (%)	EOM (ppm)	TOC (%)	EOM/TOC (%)	Analysing comp
NOR : 35/11-11	2551.00		MUD	10.3	155.0	3.8	1.50	3.8	15 000			Norsk Hydro
NOR : 35/11-11	2552.45		COCH	20.0	29.0	17.3	0.14	17.3	1 400	0.1	1.1	Norsk Hydro
NOR : 35/11-11	2560.00		COCH	25.6	58.0	32.3	0.23	32.3	2 300	0.9	0.2	Norsk Hydro
NOR : 35/11-11	2586.00		COCH	20.9	26.0	3.6	0.12	3.6	1 200	0.1	1.7	Norsk Hydro
NOR : 35/11-11	2697.15		COCH	42.5	27.0	12.6	0.06	12.6	600	0.2	0.4	Norsk Hydro
NOR : 35/11-11	3085.00		COCH	37.4	120.0	54.5	0.32	54.5	3 200	0.1	2.7	Norsk Hydro



IATROSCAN - Calculated Weight% / SARA

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Table 3.4: Bulk separation data on deasphalted extracts

COMPOSITION OF EXTRACTS/OILS WELL

Well	St.Depth (m)	En.Depth (m)	Type	Lithology	Name	Calculated Weight %			HC TOTA	ASPH%	Non-HC TOTAL	TOT HC /Non-HC	Analysing Company
						SAT	ARO	NSO					
NOR 35/11-11	2551.00	2551.00	MUD			3.1	0.8	92.3	3.9	3.8	96.1	0.0	NORSK HYDRO
NOR 35/11-11	2552.45	2552.45	COCH			6.6	0.0	76.1	6.6	17.3	93.4	0.1	NORSK HYDRO
NOR 35/11-11	2560.00	2560.00	COCH			6.5	2.8	58.4	9.3	32.3	90.7	0.1	NORSK HYDRO
NOR 35/11-11	2586.00	2586.00	COCH			3.1	0.0	93.3	3.1	3.6	96.9	0.0	NORSK HYDRO
NOR 35/11-11	2697.15	2697.15	COCH			7.0	2.2	78.2	9.2	12.6	90.8	0.1	NORSK HYDRO
NOR 35/11-11	3085.00	3085.00	COCH			24.4	7.3	13.8	31.7	54.5	68.3	0.5	NORSK HYDRO

**Table 4.1: Stable carbon isotope data****ISOTOPE ANALYSIS RESULTS ( SEDIMENT SAMPLES)**

:

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Well	St.Depth (m)	En.Depth (m)	Name	Lithology	Type	d13C EXTR	d13C SAT	d13C ARO	d13C POL	d13C ASP	d13C KERO	Analysing Compa
NOR 35/11-11	3085.00	3085.00			COCH		-27.80	-27.40				NORSK HYDRO

## **Appendix I**

### **Gas chromatograms and tabulated results of saturated hydrocarbons**

#	Rt.min.	Signal	Compound	Area	Amount
			FID	ug/mg	
<b>Internal standards (if added):</b>					
1)	13.34	GC1	C12D26	11337551	3.3
6)	25.67	GC1	C16D34	17343044	3.3
11)	35.95	GC1	C20D42	18261777	3.3
19)	44.58	GC1	C24D50	19310121	3.4
28)	55.27	GC1	C30D62	8634468	1.5
2)	10.62	GC1	nC11	6682	
3)	13.88	GC1	nC12	7532	
4)	17.15	GC1	nC13	45780	
5)	20.32	GC1	nC14	157099	
7)	22.26	GC1	iC16	82838	0.0
8)	23.37	GC1	nC15	229518	0.0
9)	26.28	GC1	nC16	181352	0.0
10)	27.64	GC1	iC18	76206	0.0
12)	29.04	GC1	nC17	139141	0.0
13)	29.21	GC1	pristane	137696	0.0
14)	31.68	GC1	nC18	125150	0.0
15)	31.93	GC1	phytane	129647	0.0
16)	34.20	GC1	nC19	136519	0.0
17)	36.61	GC1	nC20	149244	0.0
18)	38.91	GC1	nC21	140475	0.0
20)	41.12	GC1	nC22	148042	0.0
21)	43.23	GC1	nC23	155966	0.0
22)	45.29	GC1	nC24	226678	0.0
23)	47.24	GC1	nC25	292940	0.1
24)	49.13	GC1	nC26	201802	0.0
25)	50.95	GC1	nC27	175595	0.0
26)	52.70	GC1	nC28	196095	0.0
27)	54.42	GC1	nC29	298779	0.1
29)	56.07	GC1	nC30	452656	0.1
30)	57.68	GC1	nC31	258925	0.0
31)	59.20	GC1	nC32	378568	0.1
32)	60.69	GC1	nC33	133296	0.0
33)	62.11	GC1	nC34	478660	0.1
34)	63.80	GC1	nC35	283893	0.0

## Saturated hydrocarbons

GC/FID detection HP-6890

### Compound data and ratios



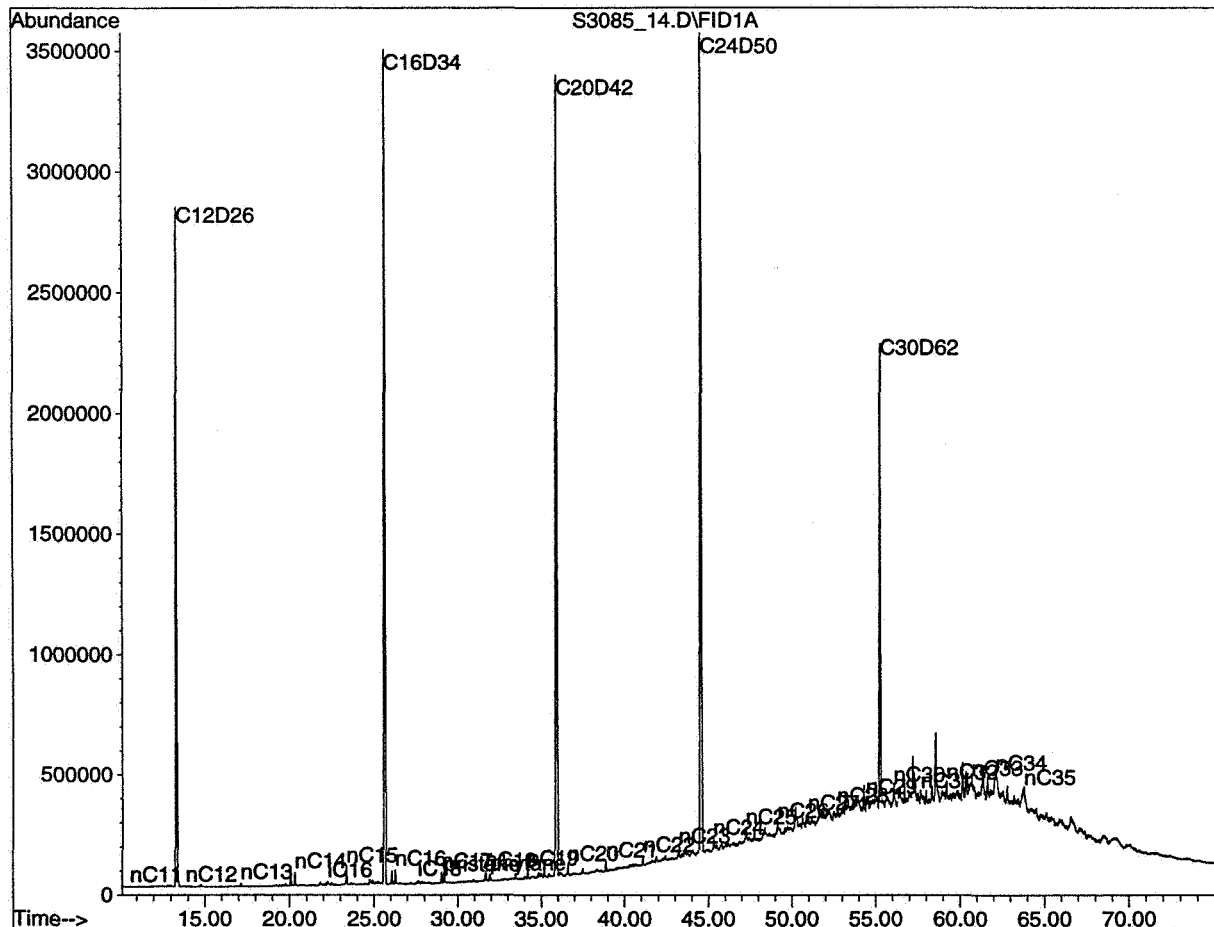
Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: S3085\_14.D  
 Sample name: 35/11-11 3085.0m SAT  
 Data File Path: C:\HPCHEM\1\DATA\ANDY\1\  
 Misc. info.:  
 Vial no.: 11  
 Method: MSD\_S\_D  
 Operator: Andy  
 Date: Thu Sep 17 07:27:57 1998

Response curve  $y = ax$   
 Response factor equally 1.0

Ratios:	Area	Amount
Pr/nC17	0.99	0.99
Ph/nC18	1.04	1.04
(Pr/nC17)/(Ph/nC18)	0.96	0.96
Pr/Ph	1.06	1.06
nC17/(nC17+nC27)	0.44	0.45
CPI-1	0.89	0.89
CPI-2 (2*nC27/(nC26+nC27))	0.93	0.93

Title: Saturated HC (FID) and Biomarkers (MSD)  
Data File: C:\HPCHEM\1\DATA\ANDY1\S3085\_14.D Name: 35/11-11 3085.0m SAT  
Misc:  
Method: MSD\_S\_D .....Operator: Andy  
Date Reported: Wed Sep 23 14:29:32 1998



#	Rt.min.	Signal	Compound	Area	Amount
			FID	ug/mg	
Internal standards (if added):					
1)	13.56	GC1	C12D26	157593009	3.3
6)	25.86	GC1	C16D34	135373555	3.3
11)	36.20	GC1	C20D42	151983527	3.2
19)	44.81	GC1	C24D50	163660580	3.3
28)	55.44	GC1	C30D62	73703571	1.5
2)	10.62	GC1	nC11	189639	
3)	13.92	GC1	nC12	220626	
4)	17.15	GC1	nC13	291490	
5)	20.33	GC1	nC14	579079	
7)	22.26	GC1	iC16	26468	0.0
8)	23.38	GC1	nC15	129443	0.0
9)	26.32	GC1	nC16	560064	0.0
10)	27.65	GC1	iC18	18546	0.0
12)	29.05	GC1	nC17	67955	0.0
13)	29.21	GC1	pristane	40971	0.0
14)	31.50	GC1	nC18	238793	0.0
15)	31.68	GC1	phytane	452853	0.0
16)	34.20	GC1	nC19	57691	0.0
17)	36.66	GC1	nC20	267503	0.0
18)	38.91	GC1	nC21	74463	0.0
20)	41.10	GC1	nC22	165130	0.0
21)	43.23	GC1	nC23	187169	0.0
22)	45.32	GC1	nC24	110320	0.0
23)	47.22	GC1	nC25	97735	0.0
24)	49.10	GC1	nC26	112060	0.0
25)	50.92	GC1	nC27	103440	0.0
26)	52.67	GC1	nC28	93655	0.0
27)	54.39	GC1	nC29	154922	0.0
29)	56.04	GC1	nC30	74304	0.0
30)	57.62	GC1	nC31	62843	0.0
31)	59.15	GC1	nC32	43435	0.0
32)	60.66	GC1	nC33	57076	0.0
33)	62.11	GC1	nC34	42067	0.0
34)	63.68	GC1	nC35	23710	0.0

### Saturated hydrocarbons

GC/FID detection HP-6890

#### Compound data and ratios



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: S2551\_15.D  
Sample name: 35/11-11 mud 2551.0m SAT  
Data File Path: C:\HPCHEM\1\DATA\ANDY\1\  
Misc. info.:  
  
Vial no.: 12  
Method: MSD\_S\_D  
Operator: Andy  
Date: Thu Sep 17 08:56:42 1998

Response curve  $y = ax$   
Response factor equally 1.0

Ratios:	Area	Amount
Pr/nC17	0.60	0.60
Ph/nC18	1.90	1.90
(Pr/nC17)/(Ph/nC18)	0.32	0.32
Pr/Ph	0.09	0.09
nC17/(nC17+nC27)	0.40	0.41
CPI-1	1.18	1.18
CPI-2 (2*nC27/(nC26+nC27))	0.96	0.96

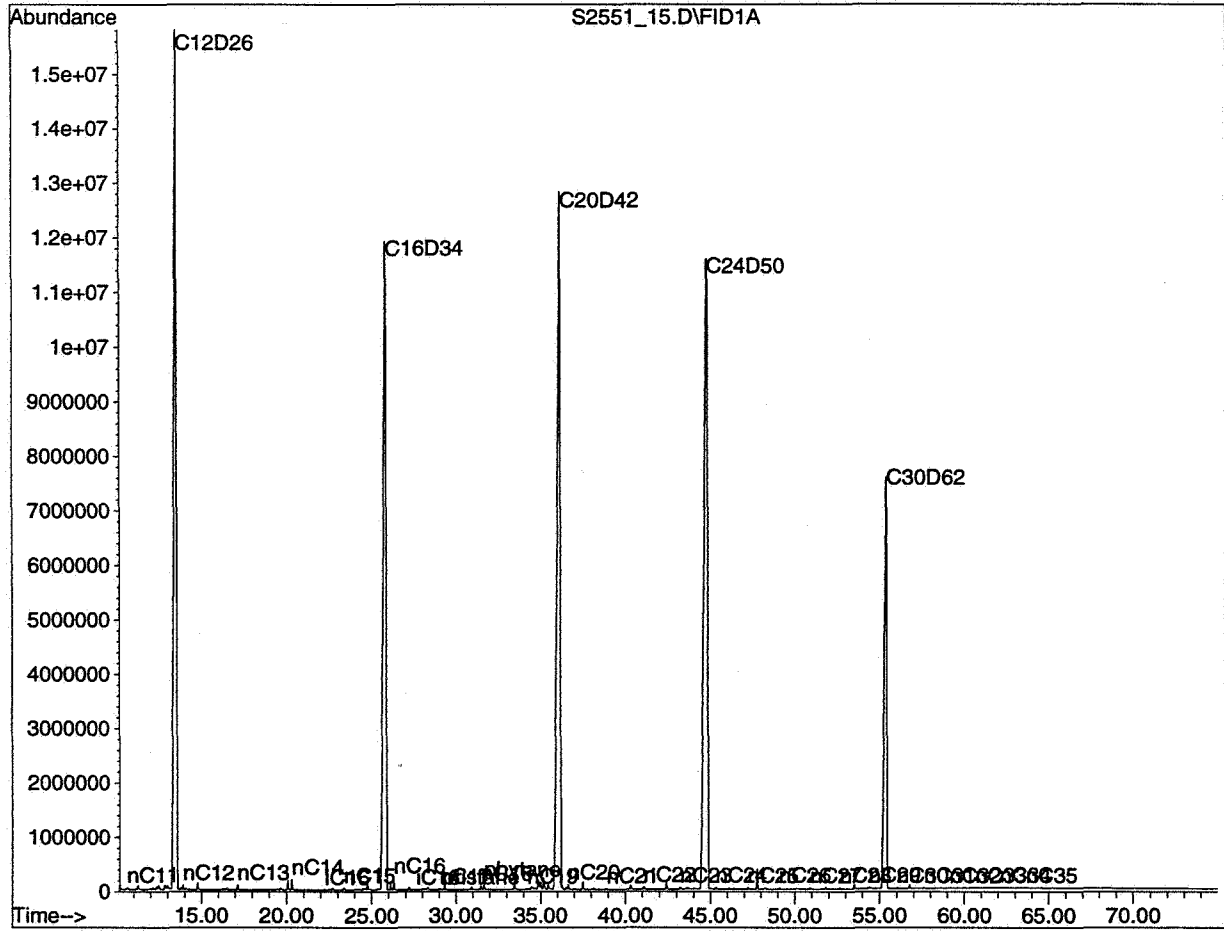
Title: Saturated HC (FID) and Biomarkers (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\S2551\_15.D Name: 35/11-11 mud 2551.0m SAT

Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Wed Sep 23 14:39:21 1998



### Saturated hydrocarbons

GC/FID detection HP-6890

#### Compound data and ratios



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: NSO1\_S13.D  
Sample name: nso1 ref. sample SAT #13  
Data File Path: C:\HPCHEM1\DATA\ANDY1\  
Misc. info.:  
  
Vial no.: 6  
Method: MSD\_S\_D  
Operator: Andy  
Date: Thu Sep 17 05:59:13 1998

Response curve  $y = ax$   
Response factor equally 1.0

Ratios:	Area	Amount
Pr/nC17	0.61	0.61
Ph/nC18	0.49	0.49
(Pr/nC17)/(Ph/nC18)	1.23	1.23
Pr/Ph	1.48	1.48
nC17/(nC17+nC27)	0.78	0.77
CPI-1	1.05	1.05
CPI-2 (2*nC27/(nC26+nC27))	0.92	0.92

#	Rt.min.	Signal	Compound	Area	Amount
		FID			ug/mg
Internal standards (if added):					
1)	13.32	GC1	C12D26	3625732	4.0
6)	25.62	GC1	C16D34	4805210	4.0
11)	35.89	GC1	C20D42	5165735	4.0
19)	44.50	GC1	C24D50	4956985	4.0
28)	55.19	GC1	C30D62	2140888	1.7
2)	10.63	GC1	nC11	5633140	
3)	13.91	GC1	nC12	6962753	
4)	17.19	GC1	nC13	7473047	
5)	20.38	GC1	nC14	7677468	
7)	22.26	GC1	iC16	2676812	2.2
8)	23.43	GC1	nC15	7720582	6.4
9)	26.34	GC1	nC16	6924342	5.8
10)	27.68	GC1	iC18	2093790	1.7
12)	29.10	GC1	nC17	6378006	4.9
13)	29.24	GC1	pristane	3867904	3.0
14)	31.73	GC1	nC18	5312124	4.1
15)	31.96	GC1	phytane	2616575	2.0
16)	34.25	GC1	nC19	4765202	3.7
17)	36.65	GC1	nC20	4230897	3.2
18)	38.94	GC1	nC21	3785573	2.9
20)	41.15	GC1	nC22	3443727	2.8
21)	43.26	GC1	nC23	3182257	2.6
22)	45.30	GC1	nC24	3062928	2.5
23)	47.25	GC1	nC25	2613032	2.1
24)	49.12	GC1	nC26	2152436	1.8
25)	50.95	GC1	nC27	1838247	1.5
26)	52.71	GC1	nC28	1540801	1.3
27)	54.40	GC1	nC29	1451803	1.2
29)	56.04	GC1	nC30	1128842	0.9
30)	57.63	GC1	nC31	1049153	0.9
31)	59.17	GC1	nC32	878201	0.7
32)	60.67	GC1	nC33	716081	0.6
33)	62.13	GC1	nC34	739598	0.6
34)	63.69	GC1	nC35	483096	0.4



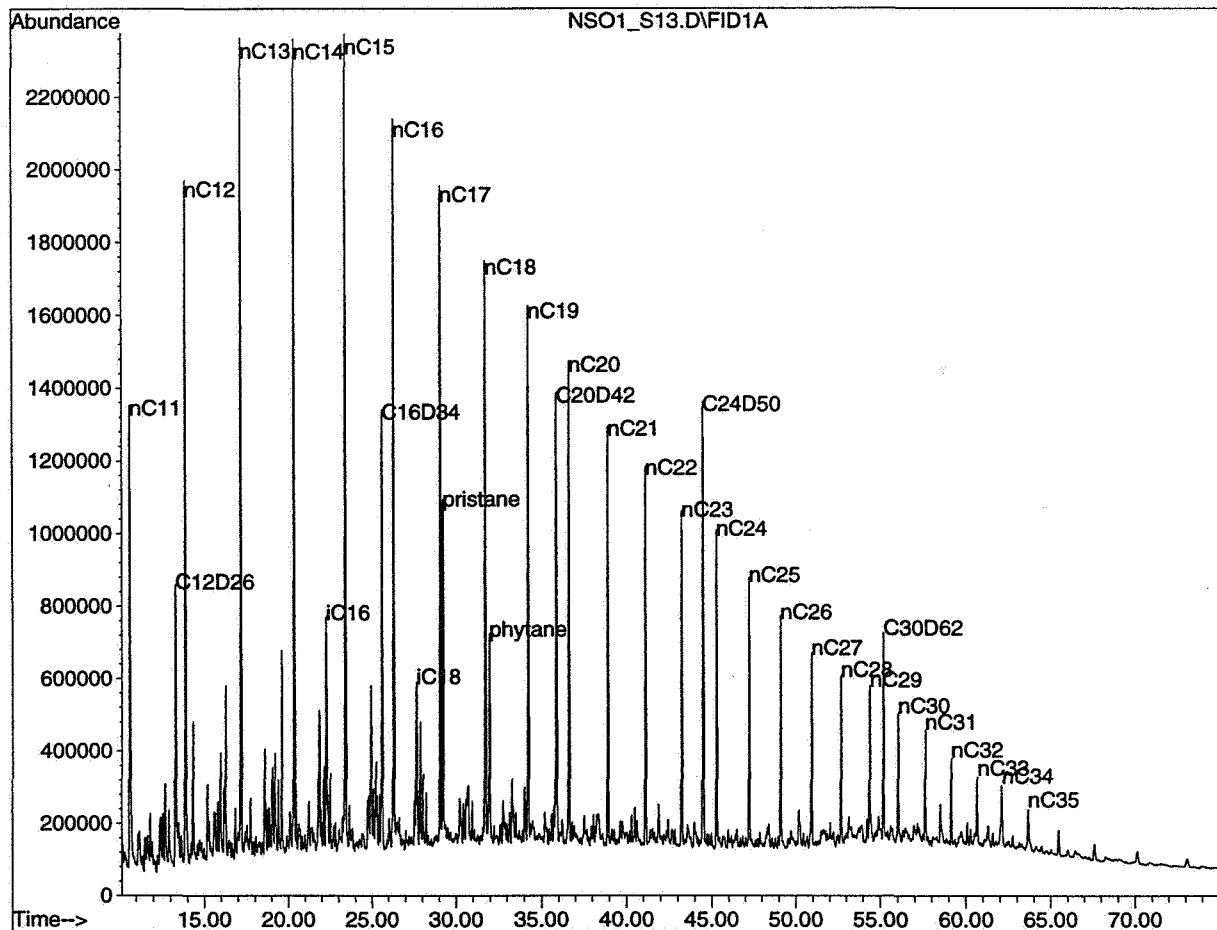
Title: Saturated HC (FID) and Biomarkers (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_S13.D Name: ns01 ref. sample SAT #13

Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Wed Sep 23 14:13:50 1998



**Appendix II**

**Mass chromatograms and tabulated results from the GC-MSD analysis  
of the saturated hydrocarbons**

### Saturated biomarkers

GC/MS detection HP-6890/5973

#### Compound data



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: S3085\_14.D  
Sample name: 35/11-11 3085.0m SAT  
Data File Path: C:\HPCHEM\1\DATA\ANDY1\  
Misc. info.:

Vial no.: 11  
Method: MSD\_S\_D  
Operator: Andy  
Date: Thu Sep 17 07:27:57 1998

Response curve  $y = ax$   
Response factor groups: s1...s3, responses as defined in method

#	Rt.min.	m/z	Rf.	Name	Height	Amount
						ng/mg
Internal standard (if added):						
1)	46.10	217.2		24baa	7920	24
<b>Diterpanes:</b>						
2)	33.73	191.2	s1	19/3	636	1
3)	35.71	191.2	s1	20/3	783	2
4)	37.76	191.2	s1	21/3	1087	2
5)	41.73	191.2	s1	23/3	3500	8
6)	42.86	191.2	s1	24/3	2396	6
7)	45.16	191.2	s1	25/3	1481	3
8)	46.68	191.2	s1	24/4	3688	8
9)	46.79	191.2	s1	26/3R	1207	3
10)	46.93	191.2	s1	26/3S	1303	3
11)	50.47	191.2	s1	28/3R	2117	5
12)	50.71	191.2	s1	28/3S	2108	5
13)	51.51	191.2	s1	29/3R	2468	6
14)	51.80	191.2	s1	29/3S	2294	5
<b>Triterpanes:</b>						
15)	52.67	191.2	s1	27Ts	13150	30
16)	52.91	177.2	s1	25nor28ab	3108	7
17)	53.33	191.2	s1	27Tm	17212	40
18)	53.71	177.2	s1	25nor29ab	15738	36
19)	53.82	191.2	s1	27b	3851	9
20)	54.89	191.2	s1	28ab	3134	7
21)	55.13	177.2	s1	25nor30ab	9640	22
22)	55.62	191.2	s1	29ab	41192	95
23)	55.73	191.2	s1	29Ts	15371	35
24)	55.97	191.2	s1	30D	4908	11
25)	56.41	191.2	s1	29ba	8079	19
26)	56.99	191.2	s2	30ab	66642	99
27)	57.33	191.2	s1	30D13	4315	10
28)	57.61	191.2	s2	30ba	11729	17
29)	58.58	191.2	s1	31abS	25546	59
30)	58.77	191.2	s1	31abR	19978	46
31)	59.12	191.2	s1	30G	4841	11
32)	59.31	191.2	s1	31ba	3939	9
33)	59.82	191.2	s1	32abS	17633	41
34)	60.09	191.2	s1	32abR	12826	29
35)	61.26	191.2	s1	33abS	11374	26
36)	61.63	191.2	s1	33abR	7696	18
37)	62.78	191.2	s1	34abS	7078	16
38)	63.28	191.2	s1	34abR	4023	9
39)	64.50	191.2	s1	35abS	5867	13
40)	65.22	191.2	s1	35abR	3330	8

#	Rt.min.	m/z	Rf.	Name	Height	Amount
						ng/mg
<b>Steranes:</b>						
41)	38.26	217.2	s3	21aa	723	2
42)	39.92	217.2	s3	21bb	1338	4
43)	40.05	217.2	s3	22aa	746	2
44)	42.28	217.2	s3	22bb	845	3
45)	48.64	217.2	s3	27dbS	6191	21
46)	49.27	217.2	s3	27dbR	3424	11
47)	51.63	218.2	s3	27bbR	6710	22
48)	51.78	218.2	s3	27bbS	4881	16
49)	52.19	217.2	s3	27aaR	3701	12
50)	53.39	218.2	s3	28bbR	3612	12
51)	53.54	218.2	s3	28bbS	4139	14
52)	54.52	217.2	s3	29aaS	3943	13
53)	54.82	218.2	s3	29bbR	8097	27
54)	54.93	218.2	s3	29bbS	7316	24
55)	55.53	217.2	s3	29aaR	5324	18
56)	56.00	218.2	s3	30bbR	1399	5
57)	56.04	218.2	s3	30bbS	1148	4

### Saturated biomarkers

GC/MS detection HP-6890/5973

Ratios, from heights and amounts



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: S3085\_14.D  
Sample name: 35/11-11 3085.0m SAT  
Data File Path: C:\HPCHEM\1\DATA\ANDY\1\  
Misc. info.:

Vial no.: 11  
Method: MSD\_S\_D  
Operator: Andy  
Date: Thu Sep 17 07:27:57 1998

### Terpane ratios, heights and amounts

		Height	Amount
100*((sum20-25)/3+26/3(R+S)) /			
((sum20-25)/3+26/3(R+S)+27(Ts+Tm)+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%Tri	4	5
100*20/3/((sum20-25)/3+26/3(R+S))	%20/3	7	7
100*23/3/(23/3+24/3+25/3)	%23/3	47	47
100*24/4/(24/4+24/3+25/3)	%24/4	49	49
100*Ts/(Ts+Tm)	%27Ts	43	43
100*28ab/(28ab+30ab)	%28ab	4	7
100*29Ts/(29Ts+29ab)	%29Ts	27	27
100*25nor30ab/(25nor30ab+30ab)	%25nor30ab	13	18
100*29ab/(29ab+30ab)	%29ab	38	49
100*30ba/(30ba+30ab)	%30ba	15	15
100*30D/(30D+30ab)	%30D	7	10
100*30G/(30G+30ab)	%30G	7	10
100*32abS/(32ab(S+R))	%32abS	58	58
100*35ab(S+R)/(34-35ab(S+R))	%35ab	45	45
100*(27Ts+27Tm)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%27HOP	11	12
100*(28ab)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%28HOP	1	1
100*(29ab+ba)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%29HOP	18	20
100*(30ab+ba)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%30HOP	28	20
100*31ab(S+R)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%31HOP	16	18
100*32ab(S+R)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%32HOP	11	12
100*33ab(S+R)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%33HOP	7	8
100*34ab(S+R)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%34HOP	4	4
100*35ab(S+R)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%35HOP	3	4

### Sterane ratios

100*(21+22)bb/((21+22)bb+(27+28+29+30)bb(R+S))	%Preg	6	6
100*29aaS/29aa(R+S)	%29aaS	43	43
100*29bb(R+S)/(29bb(R+S)+29aa(S+R))	%29bb	62	62
100*27db(S+R)/((27db(S+R)+27bb(R+S))	%27dia	45	45
100*27bb(R+S)/(27+28+29+30)bb(R+S)	%27STER	31	31
100*28bb(R+S)/(27+28+29+30)bb(R+S)	%28STER	21	21
100*29bb(R+S)/(27+28+29+30)bb(R+S)	%29STER	41	41
100*30bb(R+S)/(27+28+29+30)bb(R+S)	%30STER	7	7

Hopanes/Steranes ratio-2 (only bb steranes)	Ho/St2	7	5
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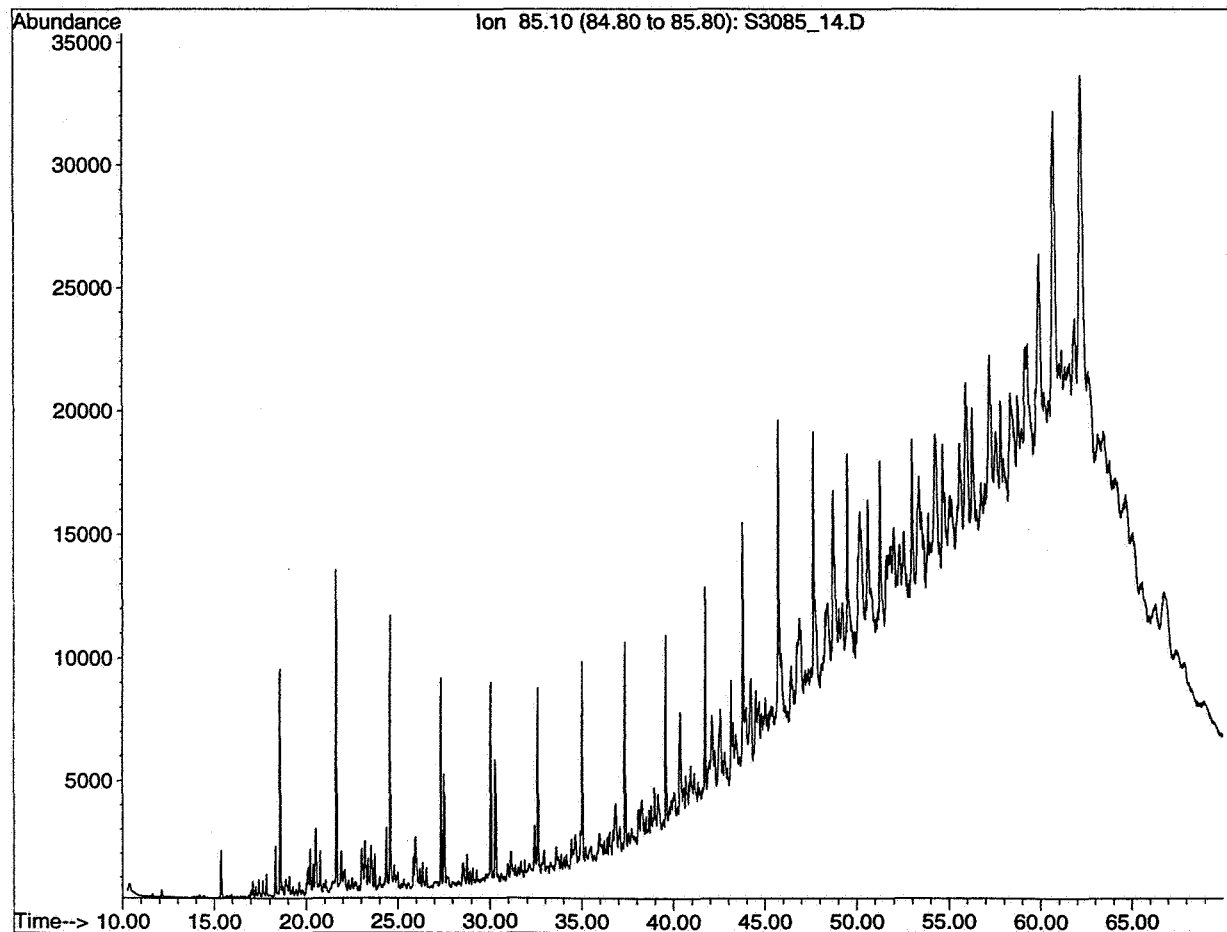
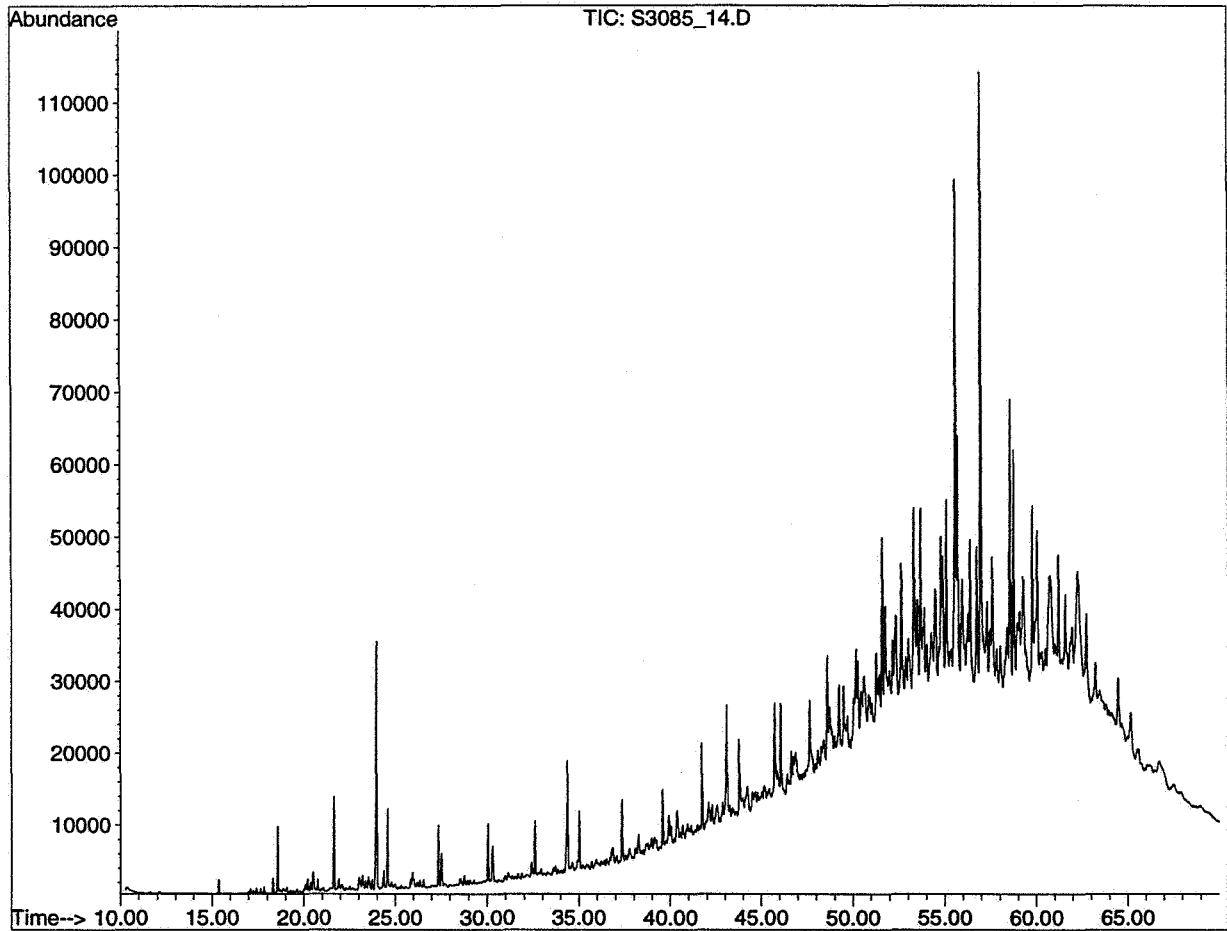
Title: Saturated HC (FID) and Biomarkers (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\S3085\_14.D Name: 35/11-11 3085.0m SAT

Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Thu Sep 24 09:26:33 1998



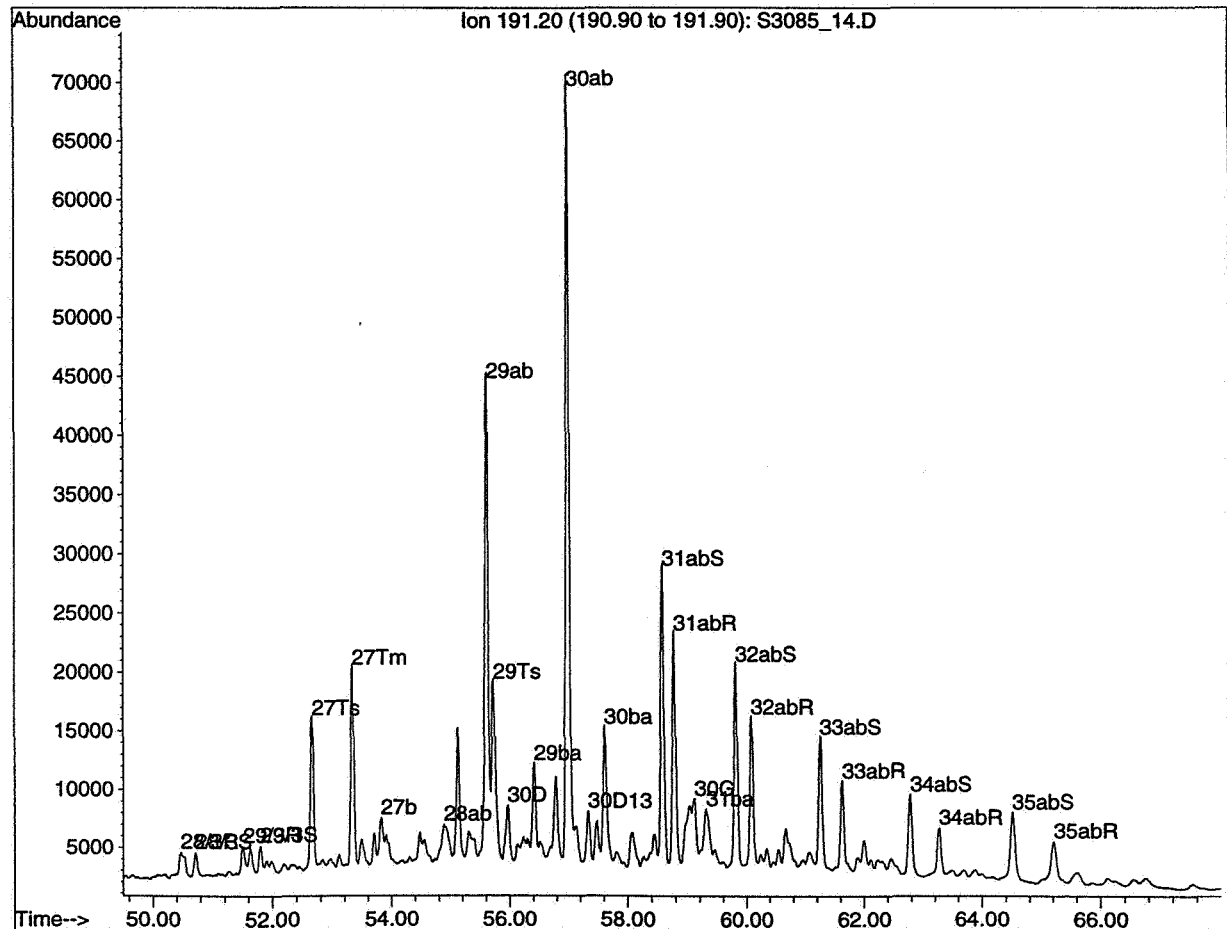
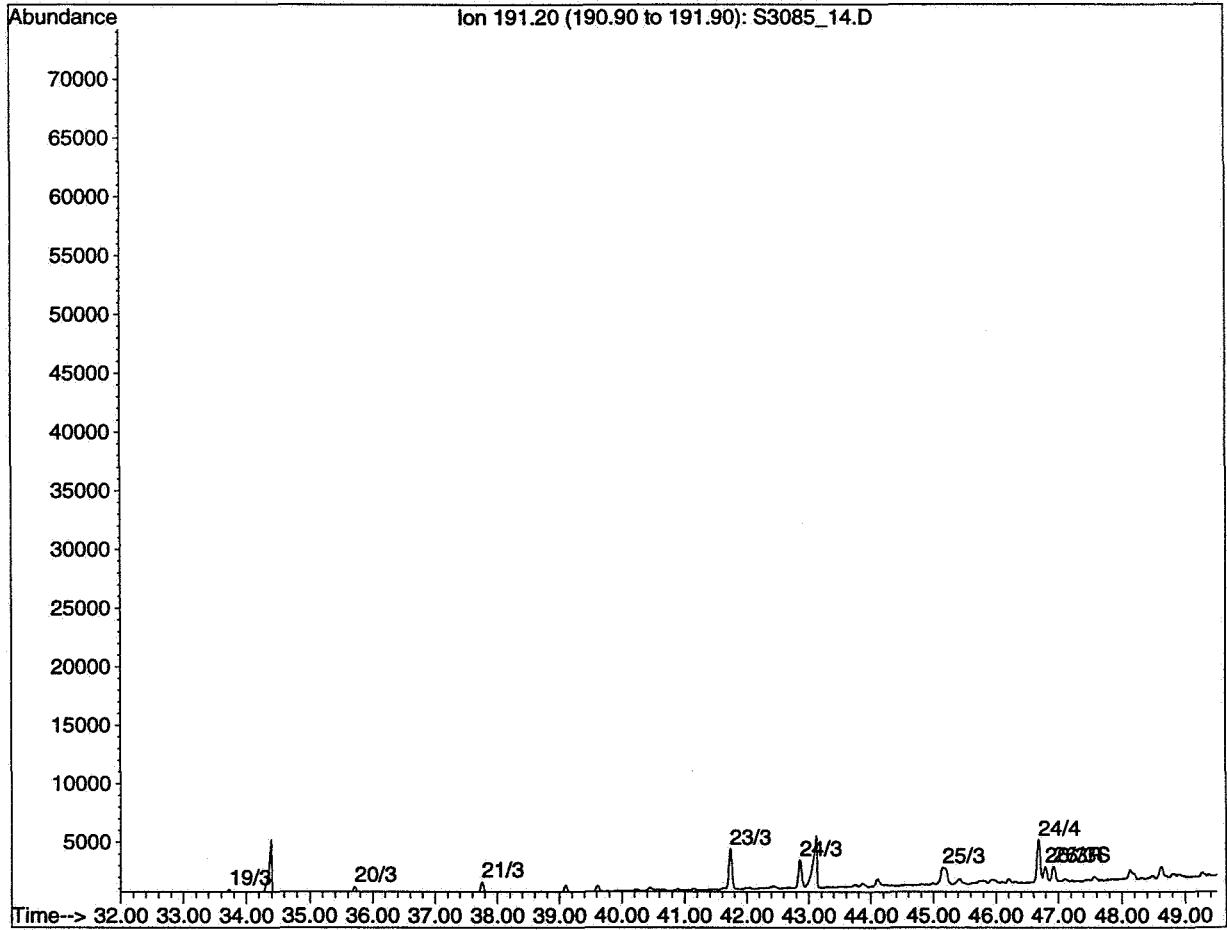
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Data File: C:\HPCHEM\1\DATA\ANDY1\S3085\_14.D Name: 35/11-11 3085.0m SAT

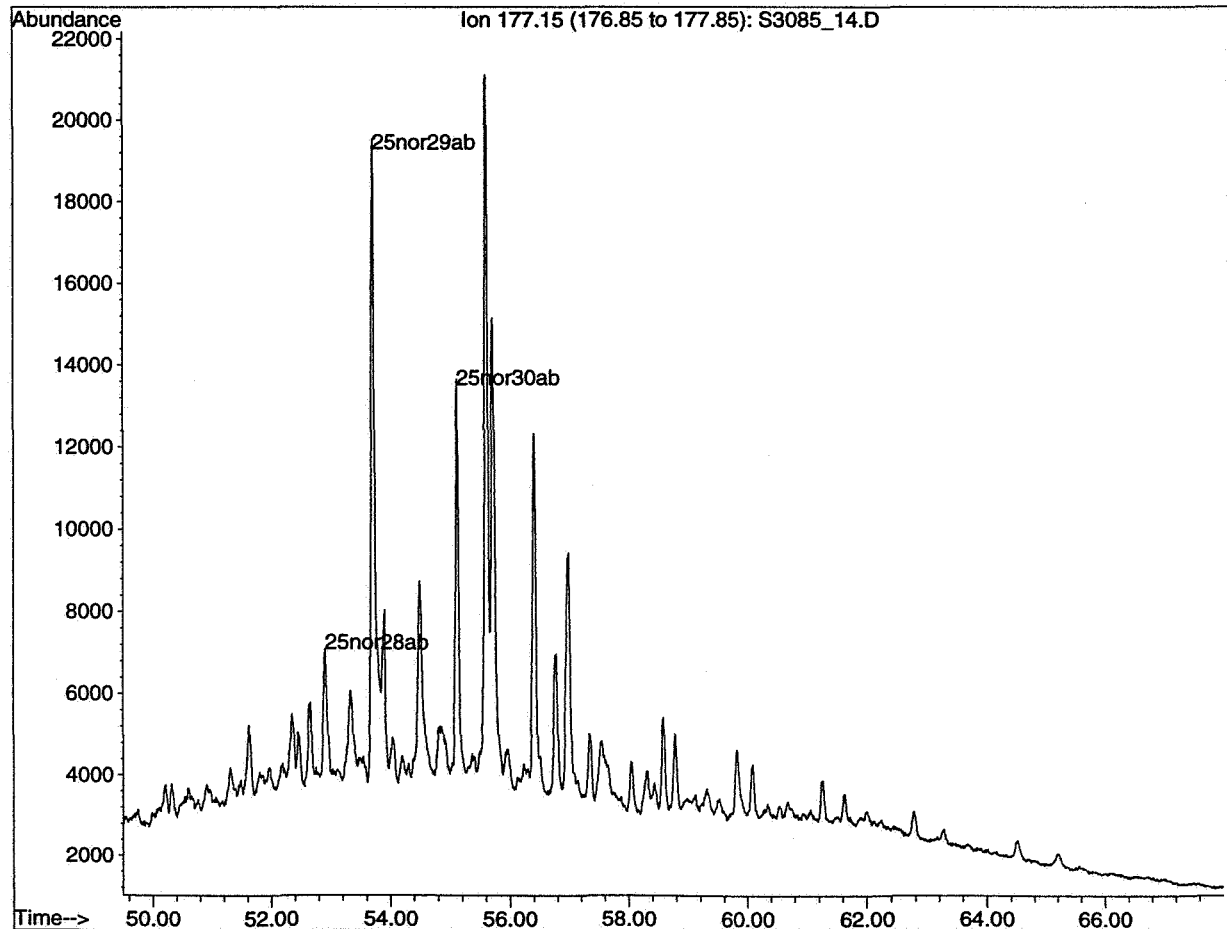
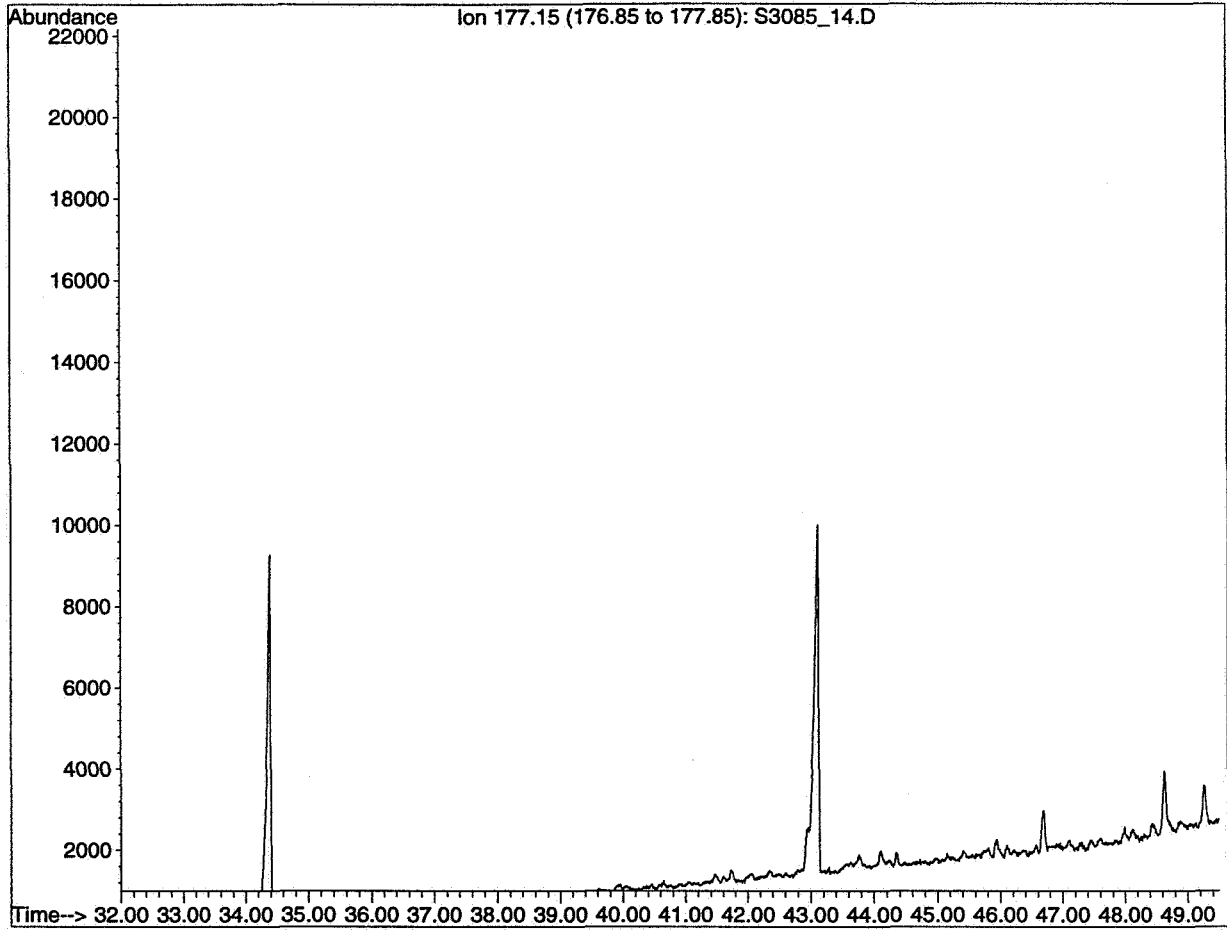
Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Thu Sep 24 09:26:36 1998



Title: Saturated HC (FID) and Biomarkers (MSD)  
Data File: C:\HPCHEM\1\DATA\ANDY1\S3085\_14.D Name: 35/11-11 3085.0m SAT  
Misc:  
Method: MSD\_S\_D .....Operator: Andy  
Date Reported: Thu Sep 24 09:26:50 1998



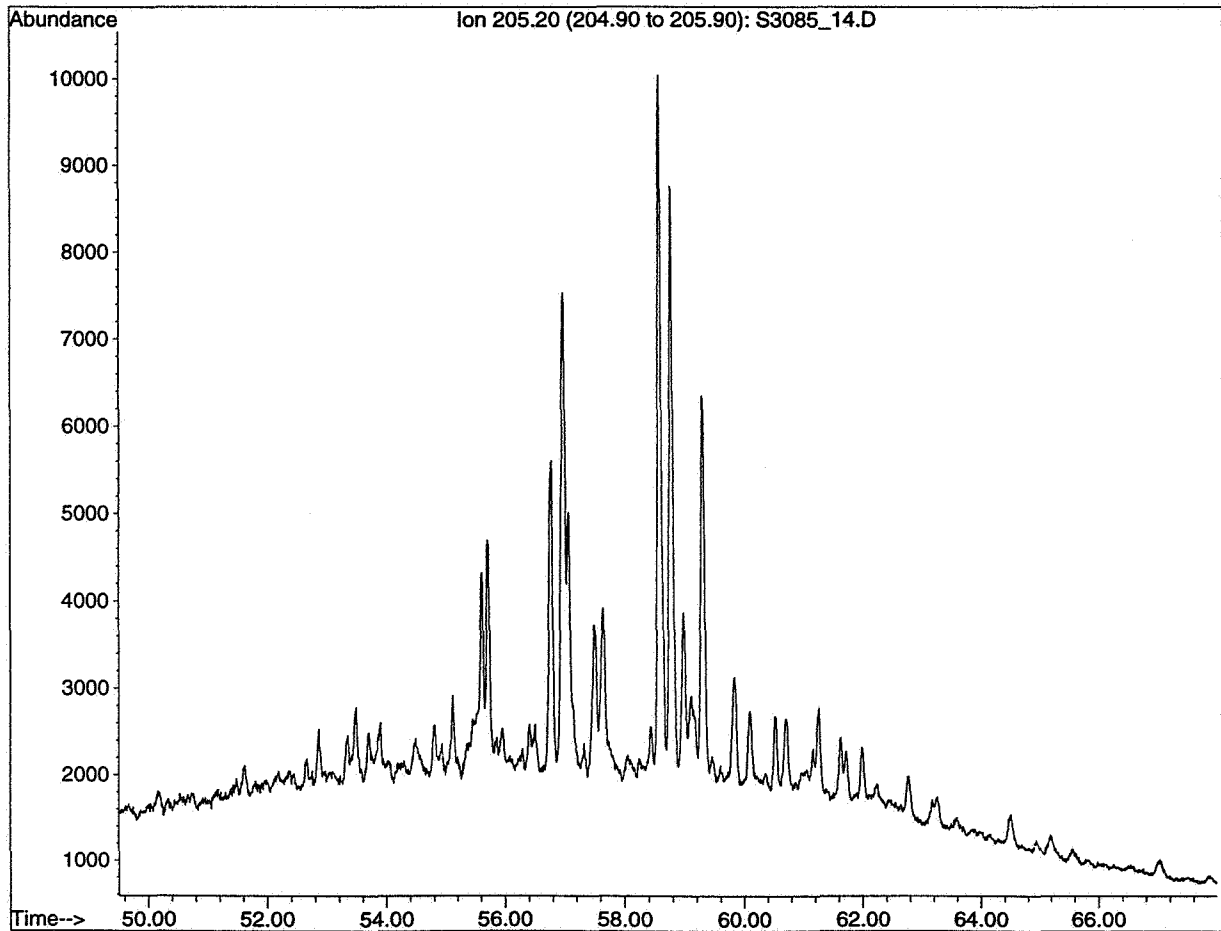
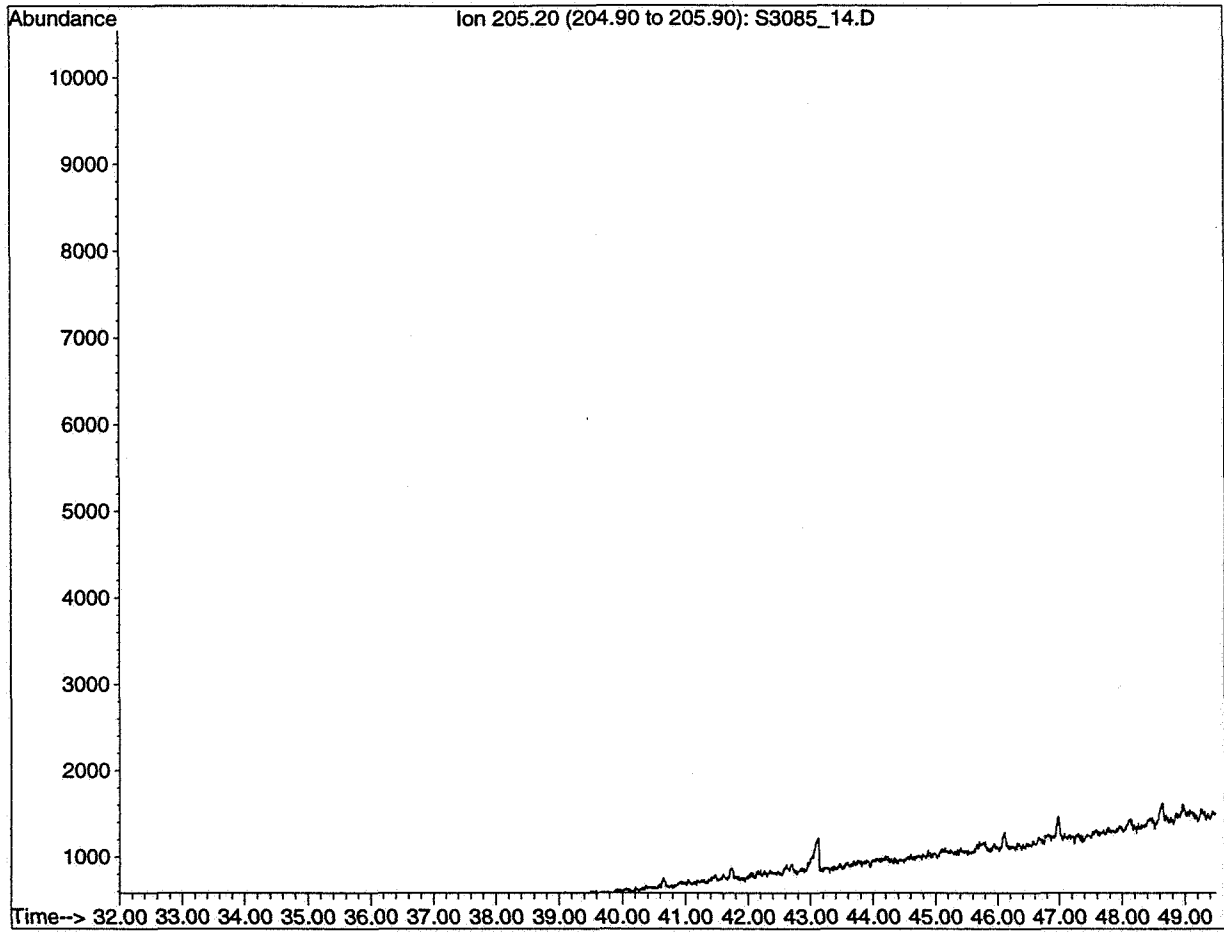
Title: Saturated HC (FID) and Biomarkers (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\S3085\_14.D Name: 35/11-11 3085.0m SAT

Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Thu Sep 24 09:26:57 1998





Title: Saturated HC (FID) and Biomarkers (MSD)

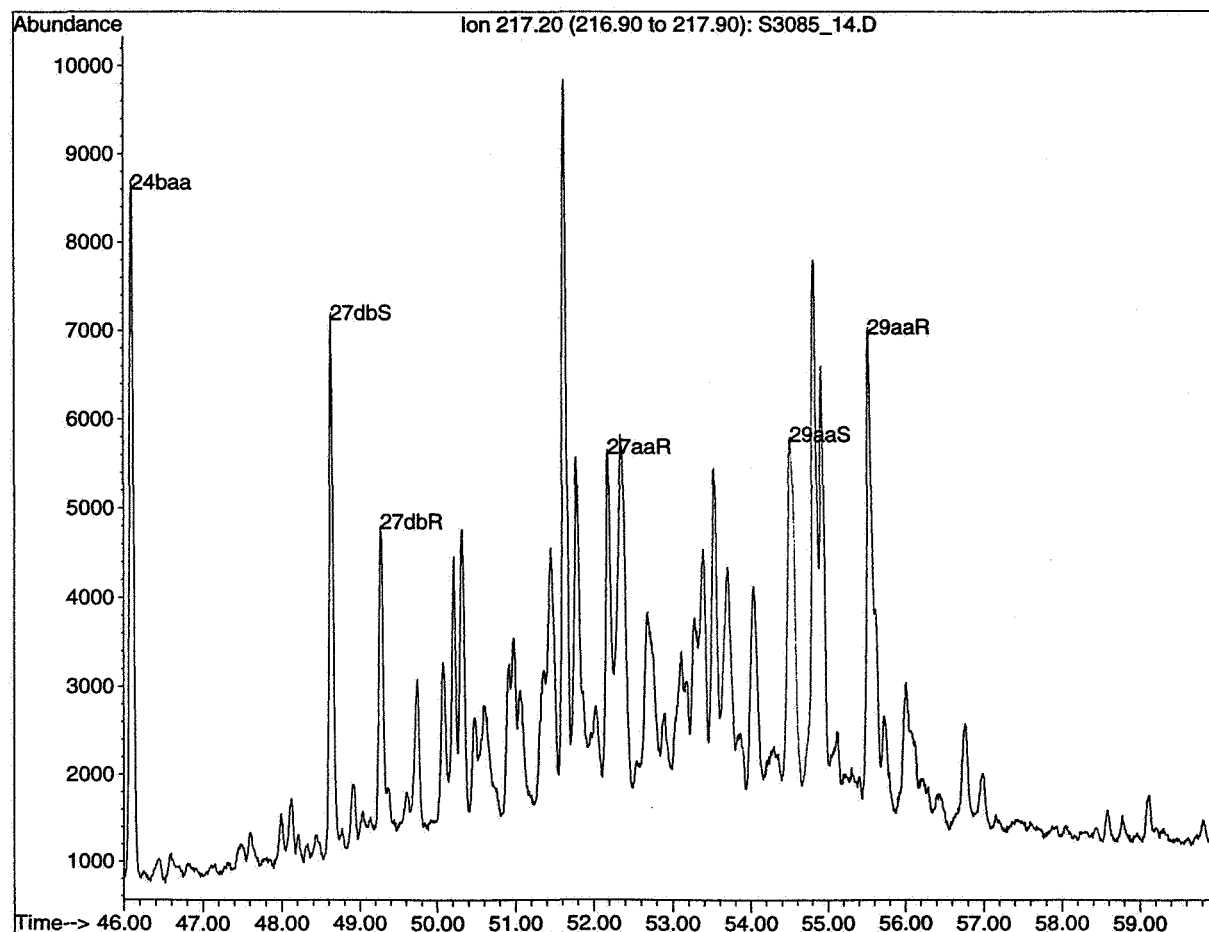
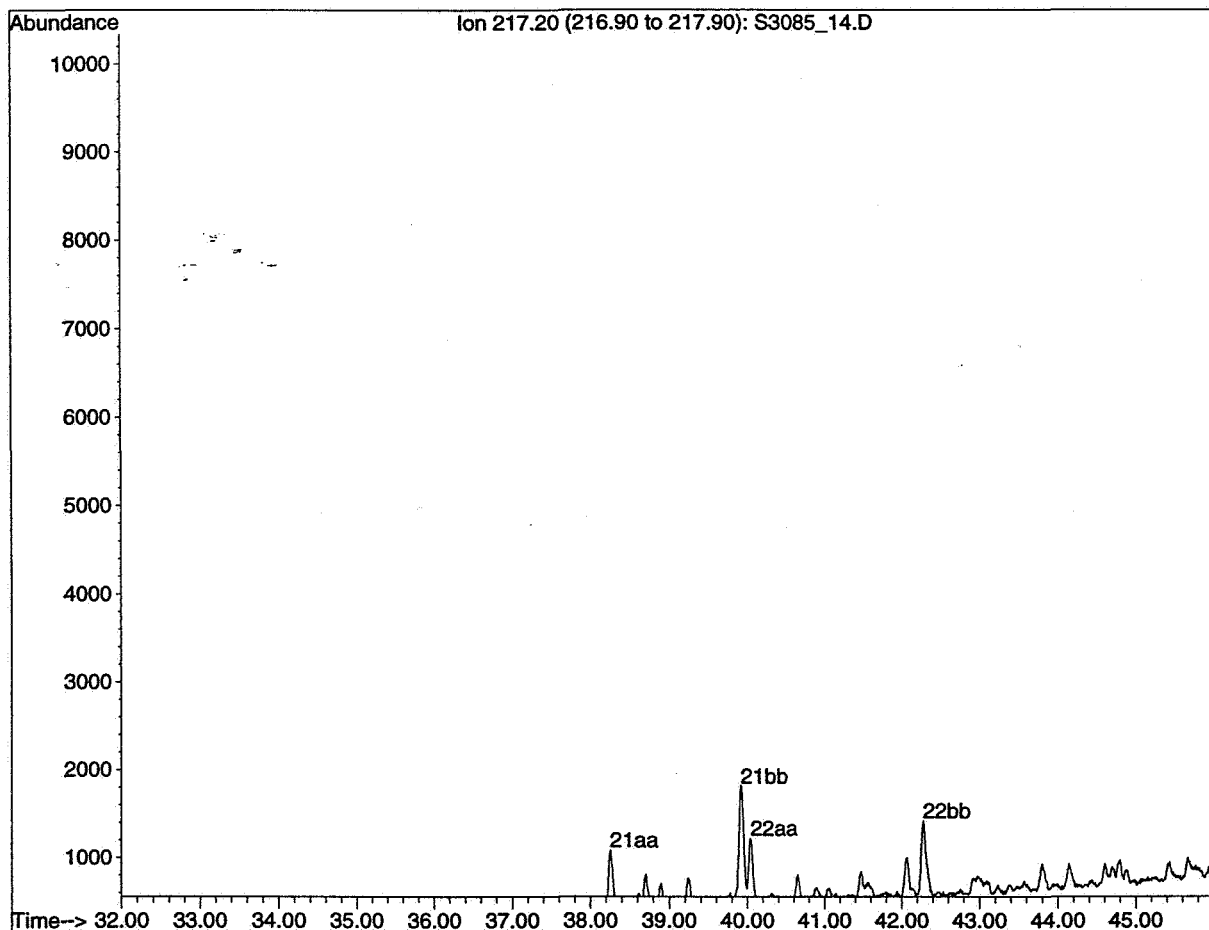
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Misc:

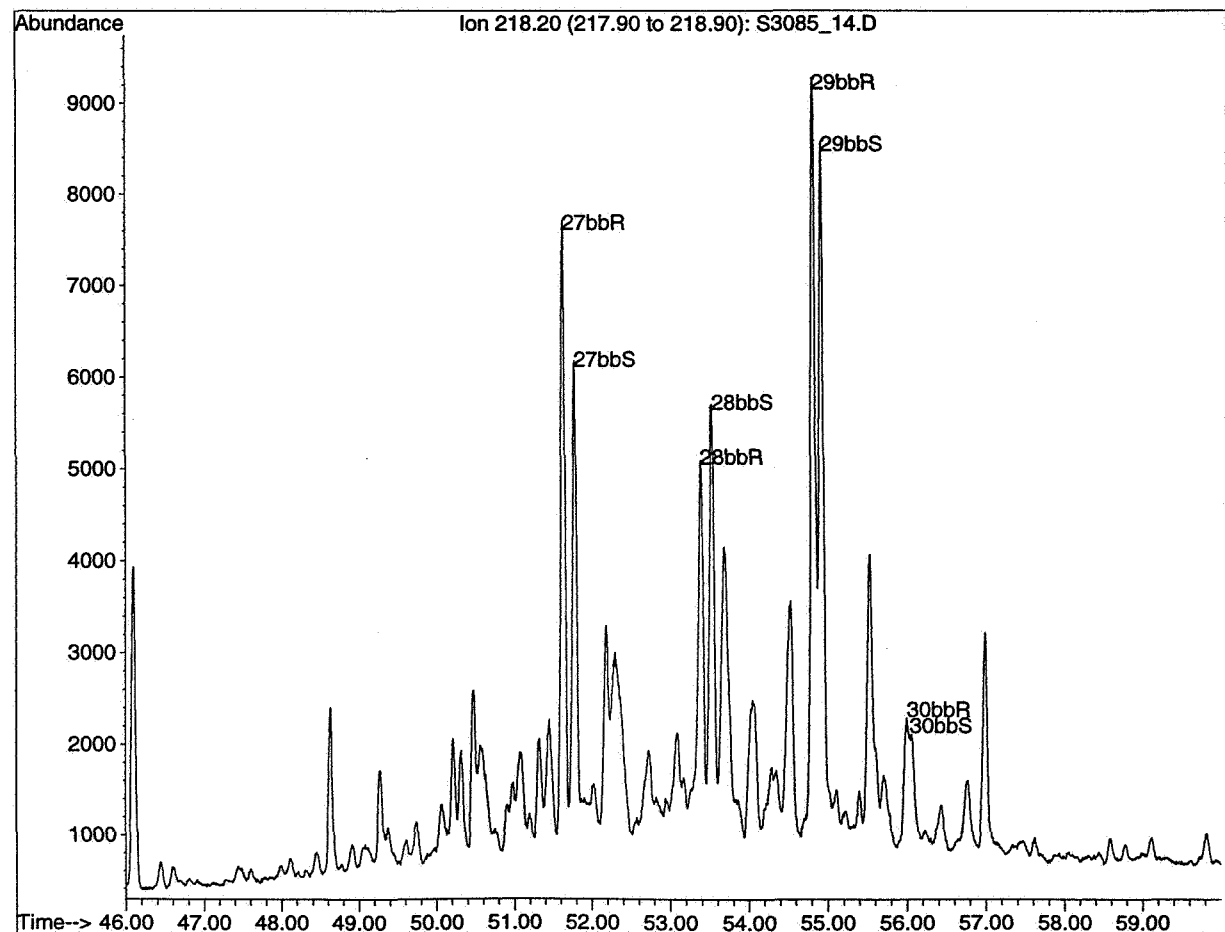
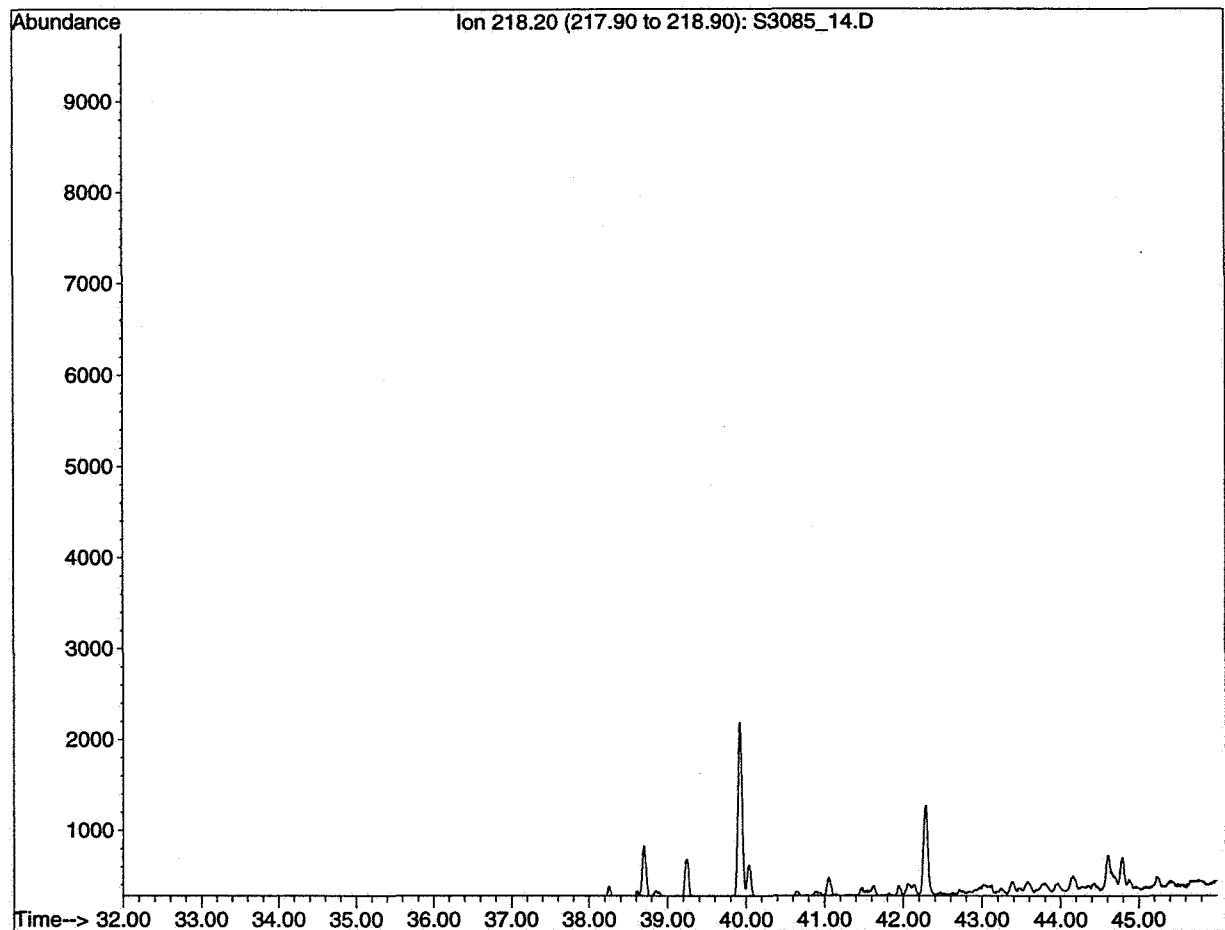
Method: MSD\_S\_D

.....Operator: Andy

Date Reported: Thu Sep 24 09:27:04 1998



Title: Saturated HC (FID) and Biomarkers (MSD)  
Data File: C:\HPCHEM\1\DATA\ANDY1\S3085\_14.D Name: 35/11-11 3085.0m SAT  
Misc:  
Method: MSD\_S\_D .....Operator: Andy  
Date Reported: Thu Sep 24 09:27:13 1998



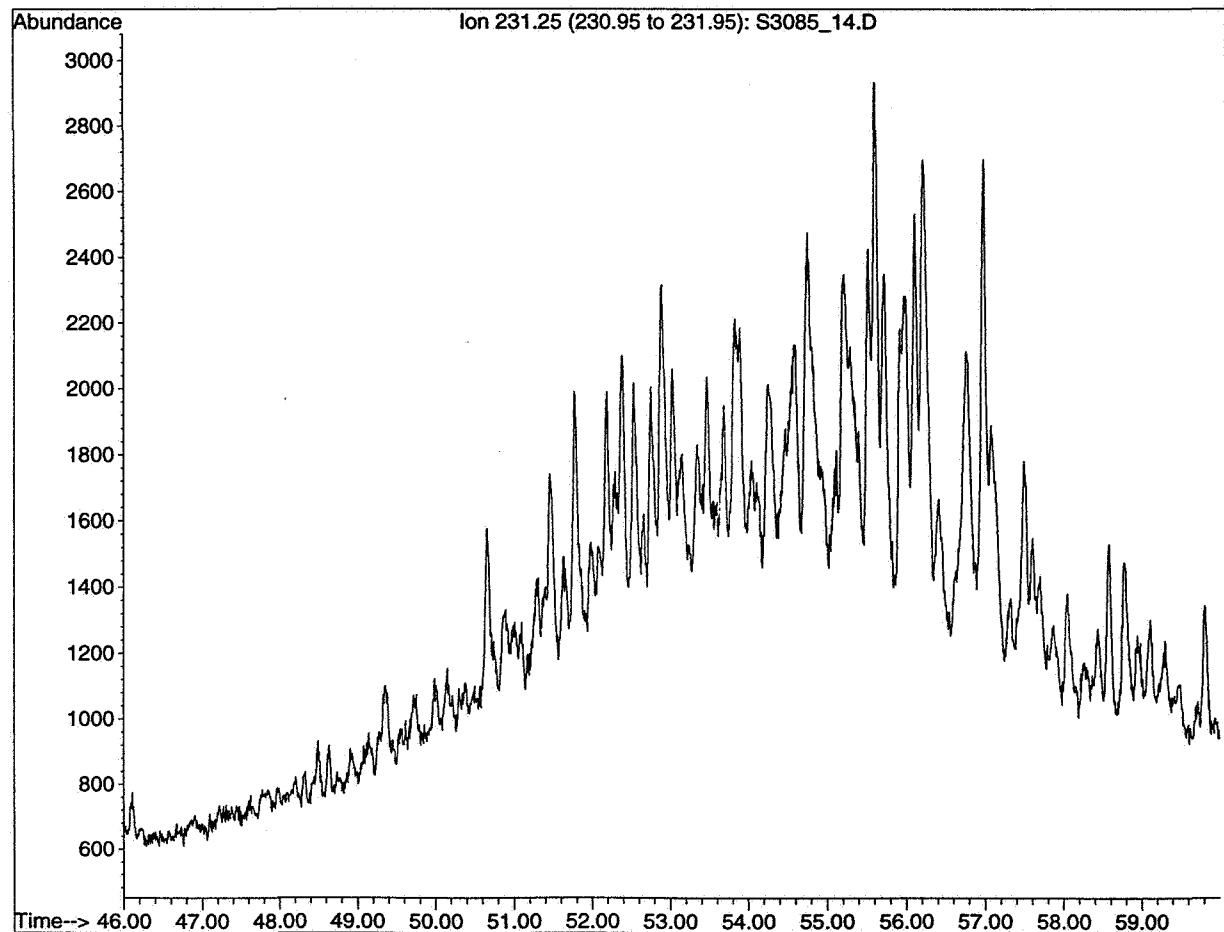
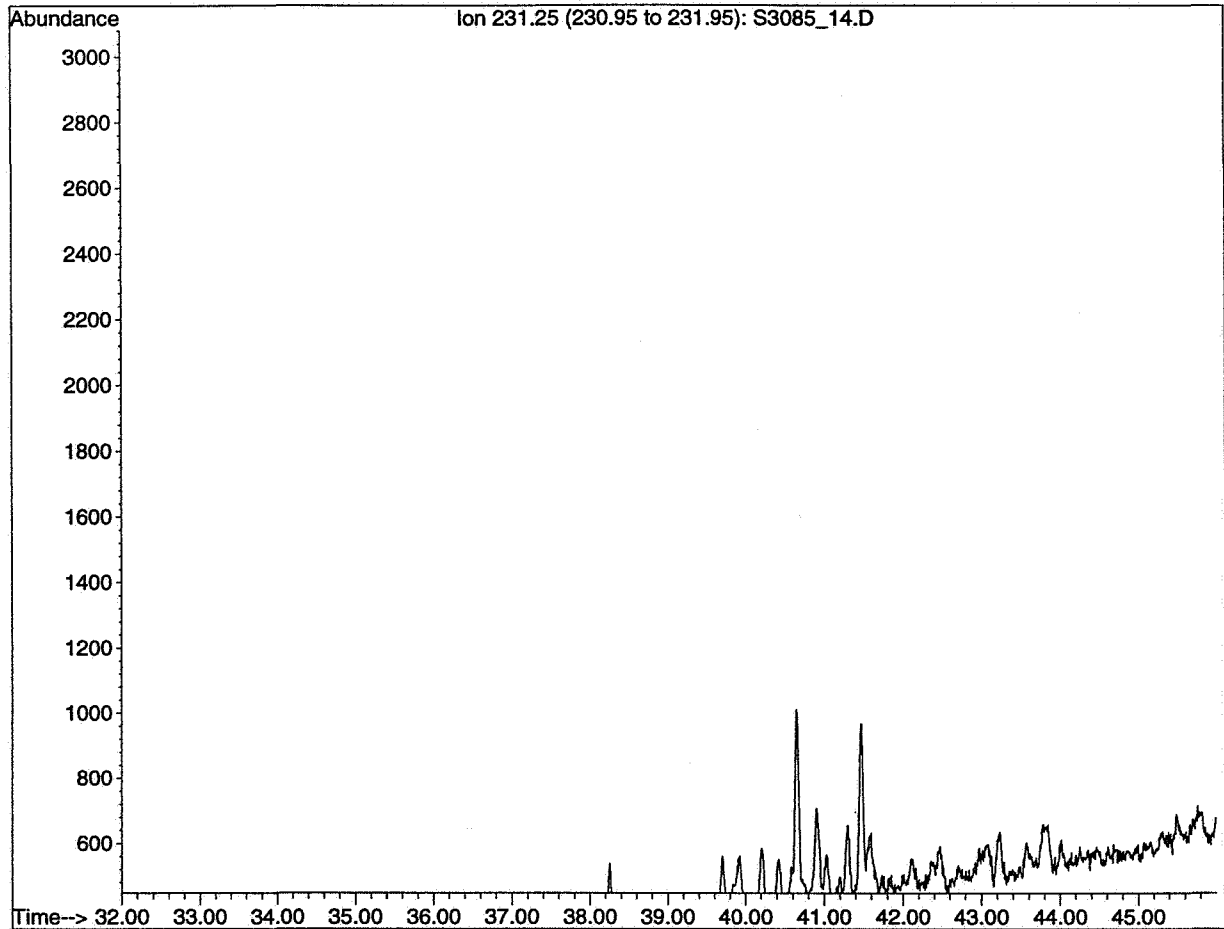
Title: Saturated HC (FID) and Biomarkers (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\S3085\_14.D Name: 35/11-11 3085.0m SAT

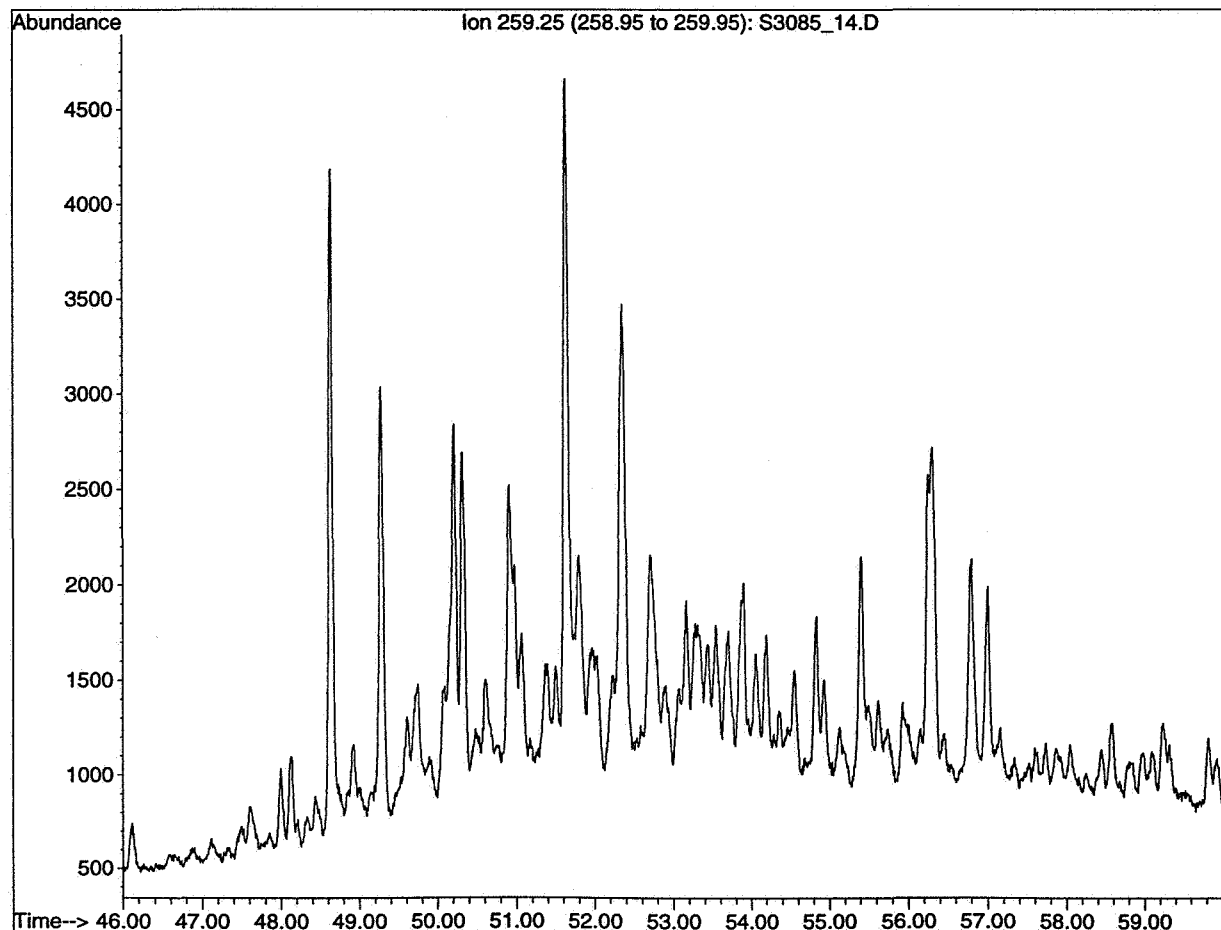
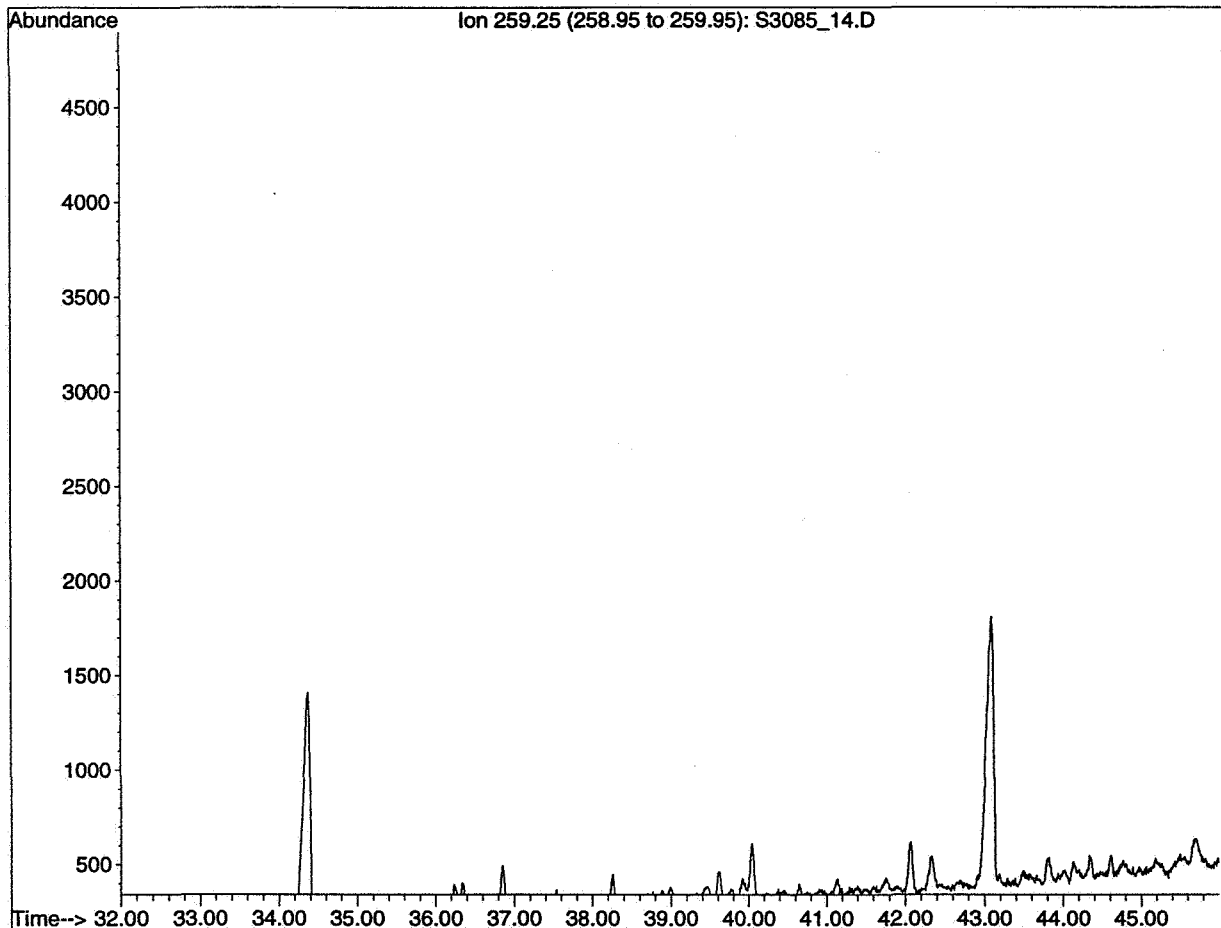
Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Thu Sep 24 09:27:21 1998



Title: Saturated HC (FID) and Biomarkers (MSD)  
Data File: C:\HPCHEM\1\DATA\ANDY1\S3085\_14.D Name: 35/11-11 3085.0m SAT  
Misc:  
Method: MSD\_S\_D .....Operator: Andy  
Date Reported: Thu Sep 24 09:27:29 1998



### Saturated biomarkers

GC/MS detection HP-6890/5973

#### Compound data



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: S2551\_15.D

Sample name: 35/11-11 mud 2551.0m SAT

Data File Path: C:\HPCHEM\1\DATA\ANDY\1\

Misc. info.:

Vial no.: 12

Method: MSD\_S\_D

Operator: Andy

Date: Thu Sep 17 08:56:42 1998

Response curve  $y = ax$

Response factor groups: s1...s3, responses as defined in method

#	Rt.min.	m/z	Rf.	Name	Height	Amount
						ng/mg

Internal standard (if added):

1)	46.14	217.2		24baa	60906	23
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**Diterpanes:**

2)	33.84	191.2	s1	19/3	74	0
3)	35.74	191.2	s1	20/3	28	0
4)	37.78	191.2	s1	21/3	44	0
5)	41.71	191.2	s1	23/3	106	0
6)	42.85	191.2	s1	24/3	44	0
7)	45.20	191.2	s1	25/3	36	0
8)	46.71	191.2	s1	24/4	55	0
9)	46.83	191.2	s1	26/3R	30	0
10)	46.91	191.2	s1	26/3S	28	0
11)	50.40	191.2	s1	28/3R	50	0
12)	50.66	191.2	s1	28/3S	38	0
13)	51.47	191.2	s1	29/3R	48	0
14)	51.76	191.2	s1	29/3S	47	0

**Triterpanes:**

15)	52.61	191.2	s1	27Ts	144	0
16)	52.85	177.2	s1	25nor28ab	118	0
17)	53.28	191.2	s1	27Tm	180	0
18)	53.65	177.2	s1	25nor29ab	52	0
19)	53.76	191.2	s1	27b	154	0
20)	54.86	191.2	s1	28ab	179	0
21)	55.08	177.2	s1	25nor30ab	77	0
22)	55.57	191.2	s1	29ab	532	0
23)	55.68	191.2	s1	29Ts	178	0
24)	55.94	191.2	s1	30D	98	0
25)	56.36	191.2	s1	29ba	109	0
26)	56.94	191.2	s2	30ab	906	0
27)	57.28	191.2	s1	30D13	72	0
28)	57.58	191.2	s2	30ba	115	0
29)	58.53	191.2	s1	31abS	404	0
30)	58.73	191.2	s1	31abR	293	0
31)	58.99	191.2	s1	30G	69	0
32)	59.25	191.2	s1	31ba	71	0
33)	59.75	191.2	s1	32abS	245	0
34)	60.04	191.2	s1	32abR	187	0
35)	61.20	191.2	s1	33abS	217	0
36)	61.55	191.2	s1	33abR	165	0
37)	62.70	191.2	s1	34abS	146	0
38)	63.19	191.2	s1	34abR	92	0
39)	64.41	191.2	s1	35abS	98	0
40)	65.10	191.2	s1	35abR	77	0

#	Rt.min.	m/z	Rf.	Name	Height	Amount
						ng/mg

**Steranes:**

41)	38.27	217.2	s3	21aa	35	0
42)	39.92	217.2	s3	21bb	65	0
43)	40.04	217.2	s3	22aa	28	0
44)	42.26	217.2	s3	22bb	38	0
45)	48.60	217.2	s3	27dbS	173	0
46)	49.24	217.2	s3	27dbR	112	0
47)	51.58	218.2	s3	27bbR	181	0
48)	51.74	218.2	s3	27bbS	126	0
49)	52.14	217.2	s3	27aaR	215	0
50)	53.34	218.2	s3	28bbR	105	0
51)	53.47	218.2	s3	28bbS	131	0
52)	54.47	217.2	s3	29aaS	77	0
53)	54.79	218.2	s3	29bbR	164	0
54)	54.89	218.2	s3	29bbS	149	0
55)	55.49	217.2	s3	29aaR	138	0
56)	55.96	218.2	s3	30bbR	54	0
57)	56.01	218.2	s3	30bbS	44	0

**Saturated biomarkers**

GC/MS detection HP-6890/5973

Ratios, from heights and amounts



Norsk Hydro E&P Research Centre, Bergen, Norway  
 Petroleum Geochemistry Laboratories

Data file name: S2551\_15.D  
 Sample name: 35/11-11 mud 2551.0m SAT  
 Data File Path: C:\HPCHEM\1\DATA\ANDY\1\  
 Misc. info.:

Vial no.: 12  
 Method: MSD\_S\_D  
 Operator: Andy  
 Date: Thu Sep 17 08:56:42 1998

**Terpane ratios, heights and amounts**

	Height	Amount
100*((sum20-25)/3+26/3(R+S) ) /		
((sum20-25)/3+26/3(R+S)+27(Ts+Tm)+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%Tri	7 8
100*20/3/((sum20-25)/3+26/3(R+S))	%20/3	9 9
100*23/3/(23/3+24/3+25/3)	%23/3	57 57
100*24/4/(24/4+24/3+25/3)	%24/4	41 41
100*Ts/(Ts+Tm)	%27Ts	44 44
100*28ab/(28ab+30ab)	%28ab	16 23
100*29Ts/(29Ts+29ab)	%29Ts	25 25
100*25nor30ab/(25nor30ab+30ab)	%25nor30ab	8 12
100*29ab/(29ab+30ab)	%29ab	37 48
100*30ba/(30ba+30ab)	%30ba	11 11
100*30D/(30D+30ab)	%30D	10 14
100*30G/(30G+30ab)	%30G	7 11
100*32abS/(32ab(S+R))	%32abS	57 57
100*35ab(S+R)/(34-35ab(S+R))	%35ab	42 42
100*(27Ts+27Tm)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%27HOP	8 9
100*(28ab)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%28HOP	4 5
100*(29ab+ba)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%29HOP	16 17
100*(30ab+ba)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%30HOP	25 18
100*31ab(S+R)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%31HOP	17 19
100*32ab(S+R)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%32HOP	11 12
100*33ab(S+R)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%33HOP	9 10
100*34ab(S+R)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%34HOP	6 6
100*35ab(S+R)/(27Ts+27Tm+28ab+sum29-30(ab+ba)+sum31-35ab(R+S))	%35HOP	4 5

**Sterane ratios**

100*(21+22)bb/((21+22)bb+(27+28+29+30)bb(R+S))	%Preg	10	10
100*29aaS/29aa(R+S)	%29aaS	36	36
100*29bb(R+S)/(29bb(R+S)+29aa(S+R))	%29bb	59	59
100*27db(S+R)/((27db(S+R)+27bb(R+S))	%27dia	48	48
100*27bb(R+S)/(27+28+29+30)bb(R+S)	%27STER	32	32
100*28bb(R+S)/(27+28+29+30)bb(R+S)	%28STER	25	25
100*29bb(R+S)/(27+28+29+30)bb(R+S)	%29STER	33	33
100*30bb(R+S)/(27+28+29+30)bb(R+S)	%30STER	10	10

**Hopanes/Steranes ratio-2 (only bb steranes)**

Ho/St2	4	3
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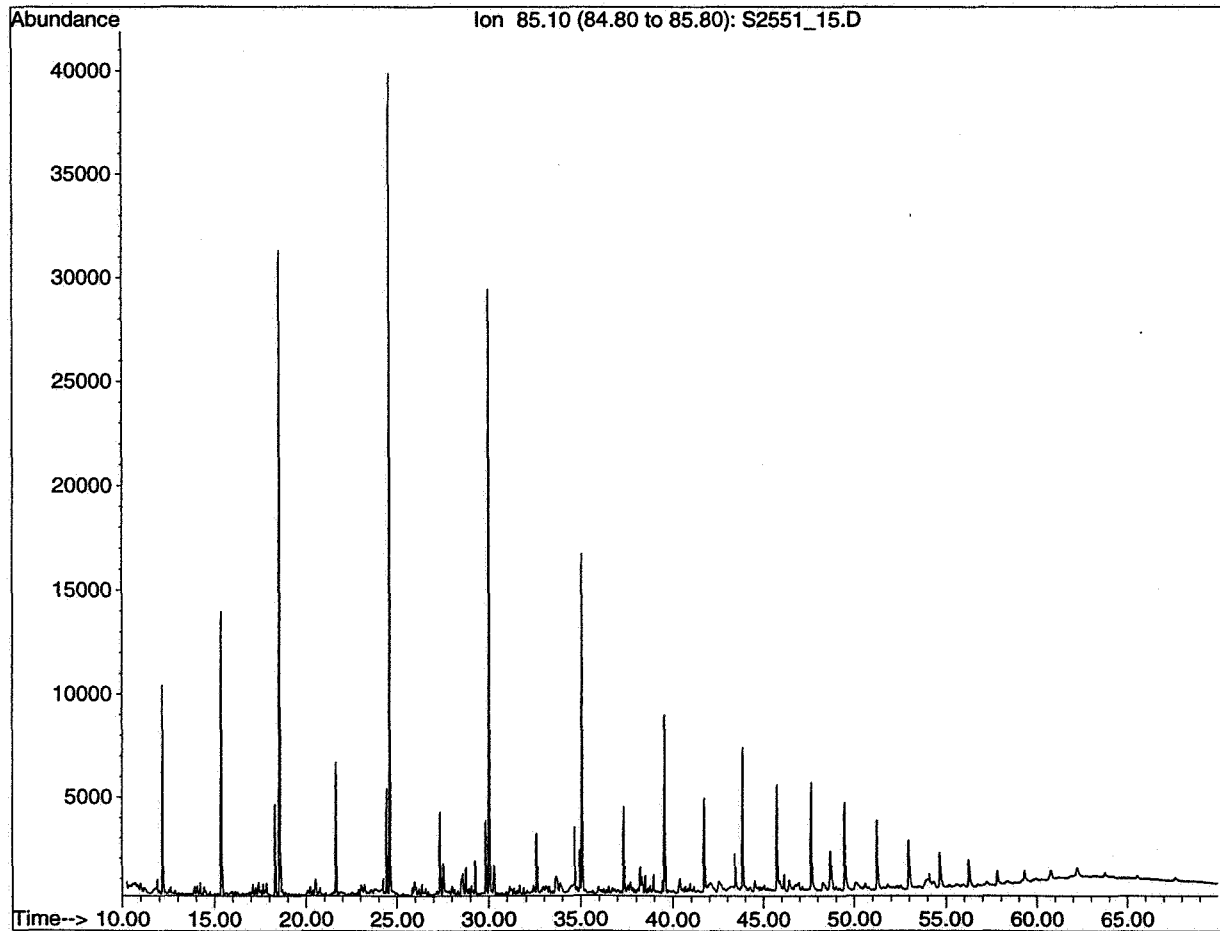
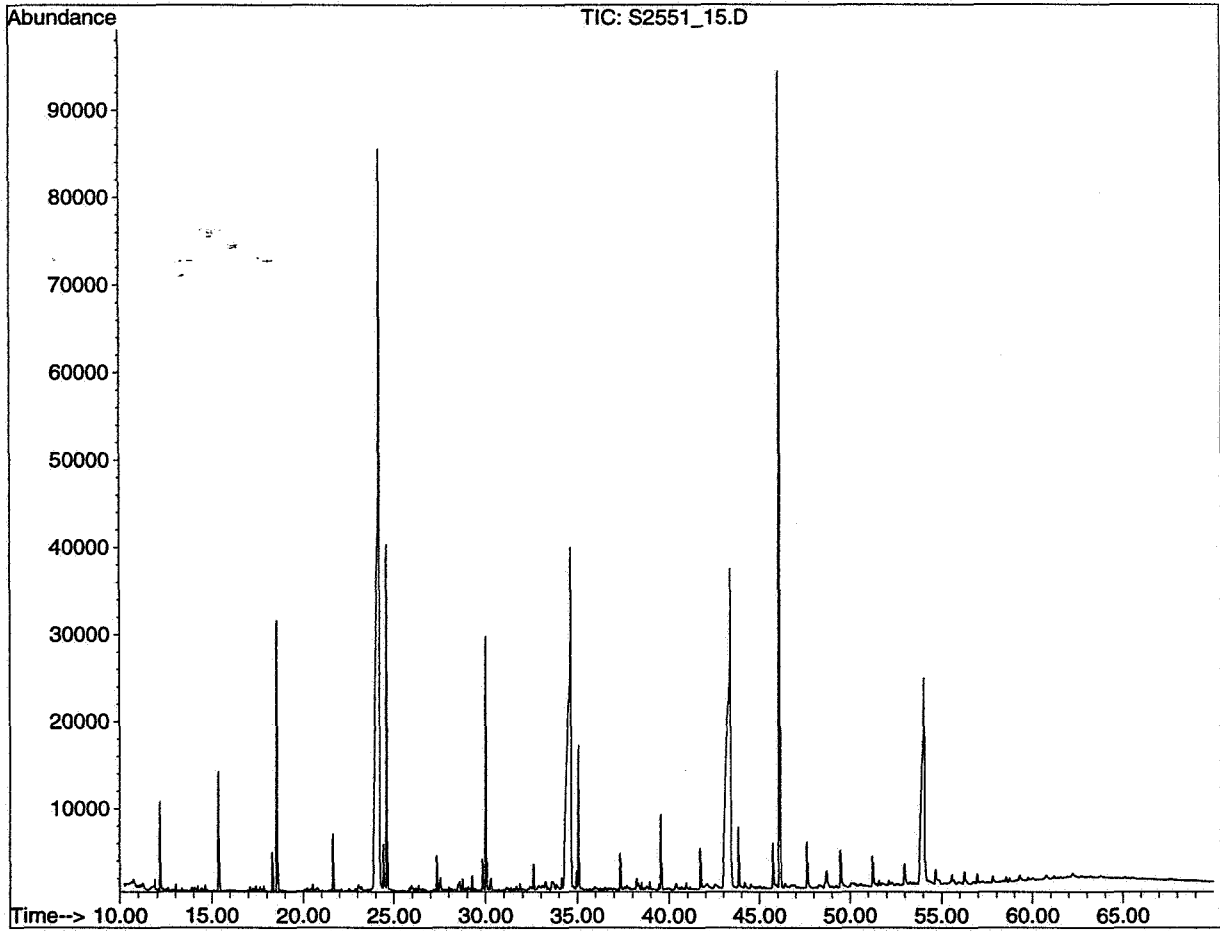
Title: Saturated HC (FID) and Biomarkers (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\S2551\_15.D Name: 35/11-11 mud 2551.0m SAT

Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Thu Sep 24 09:41:50 1998



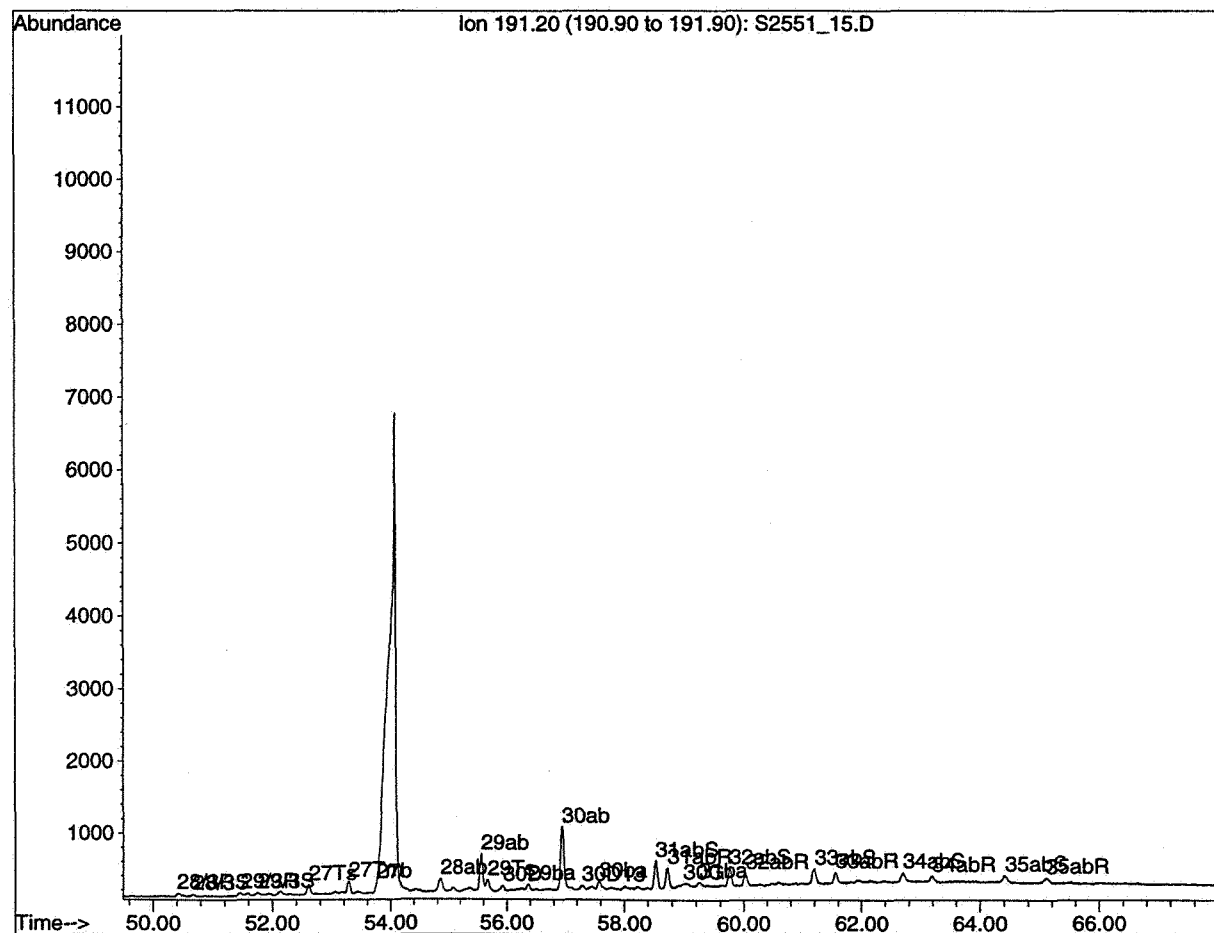
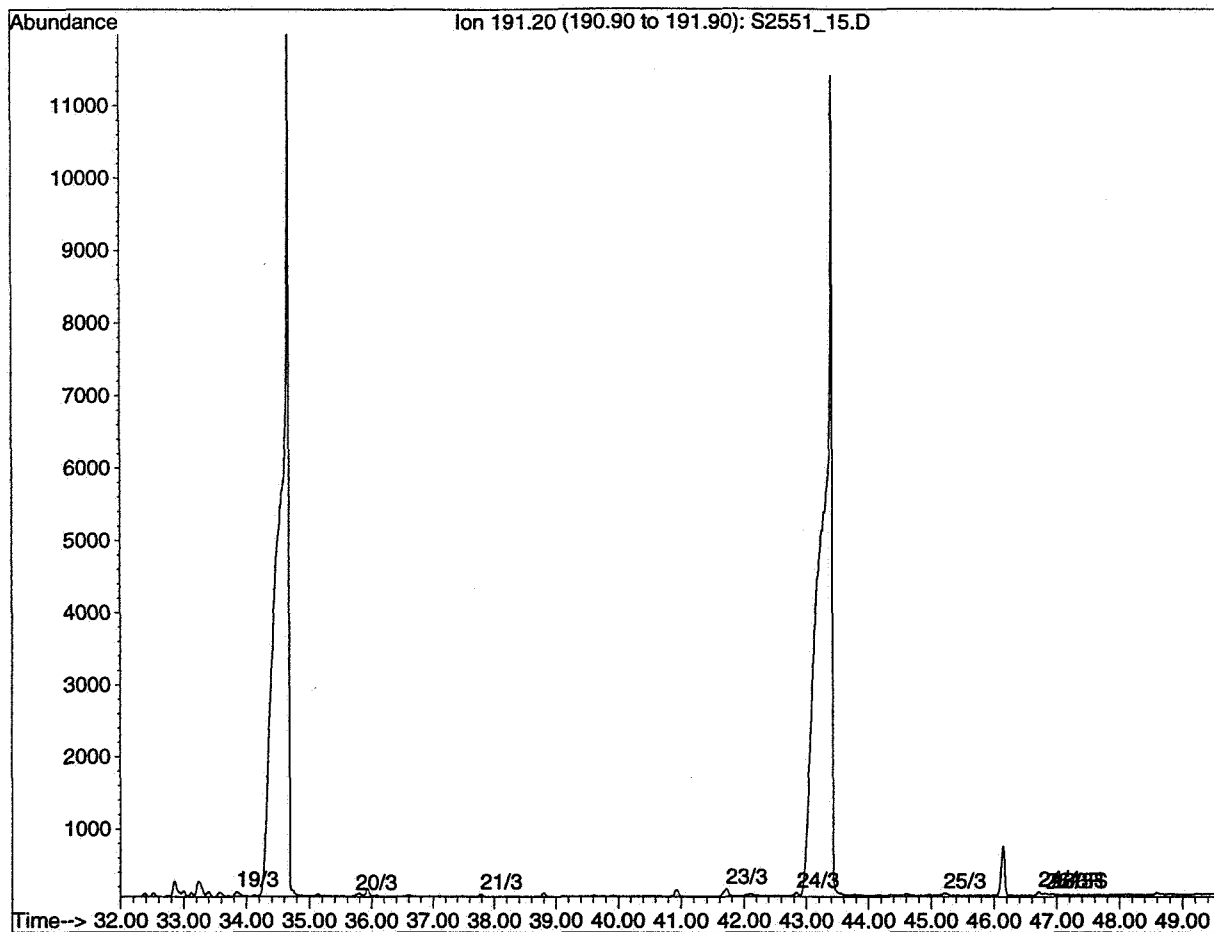
Title: Saturated HC (FID) and Biomarkers (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\S2551\_15.D Name: 35/11-11 mud 2551.0m SAT

Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Thu Sep 24 09:41:53 1998





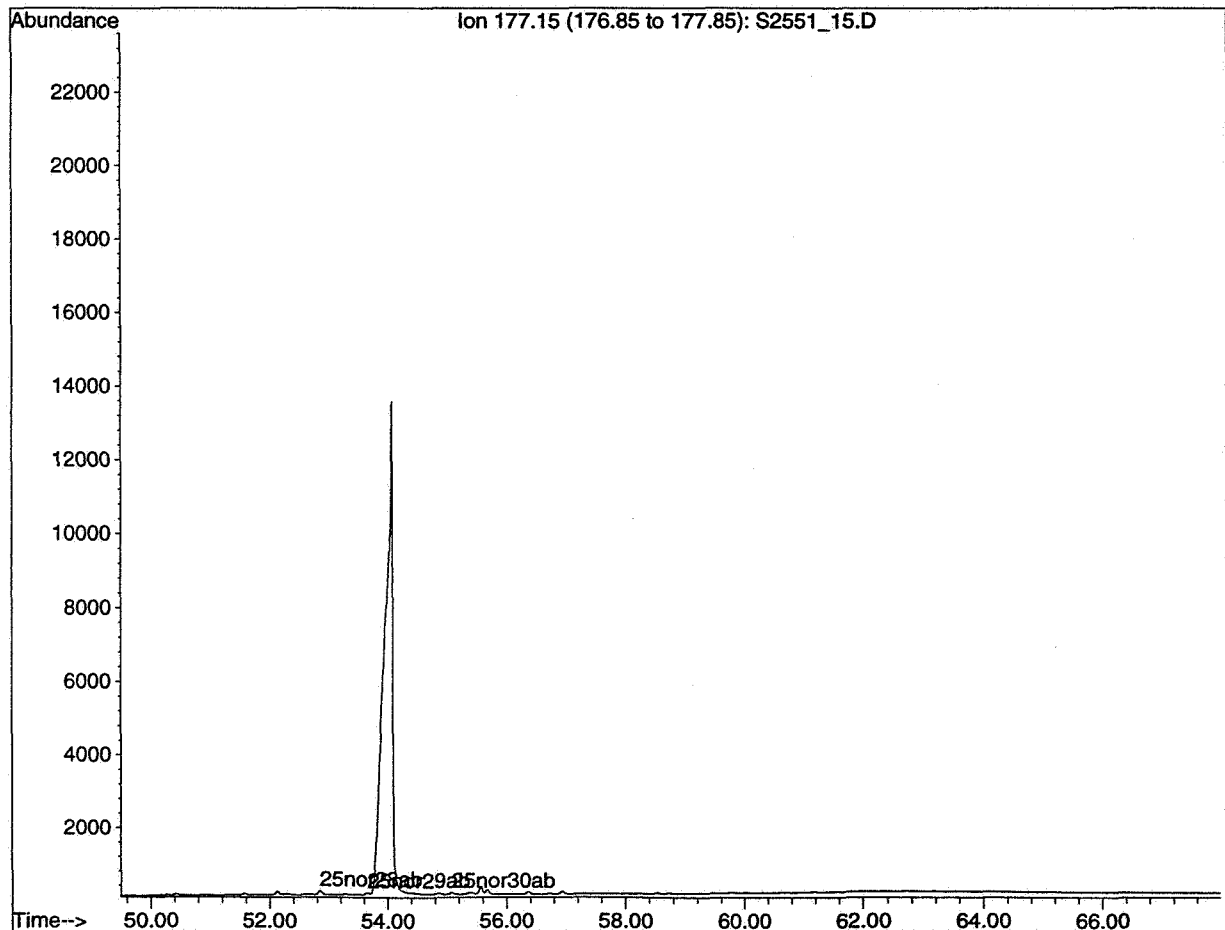
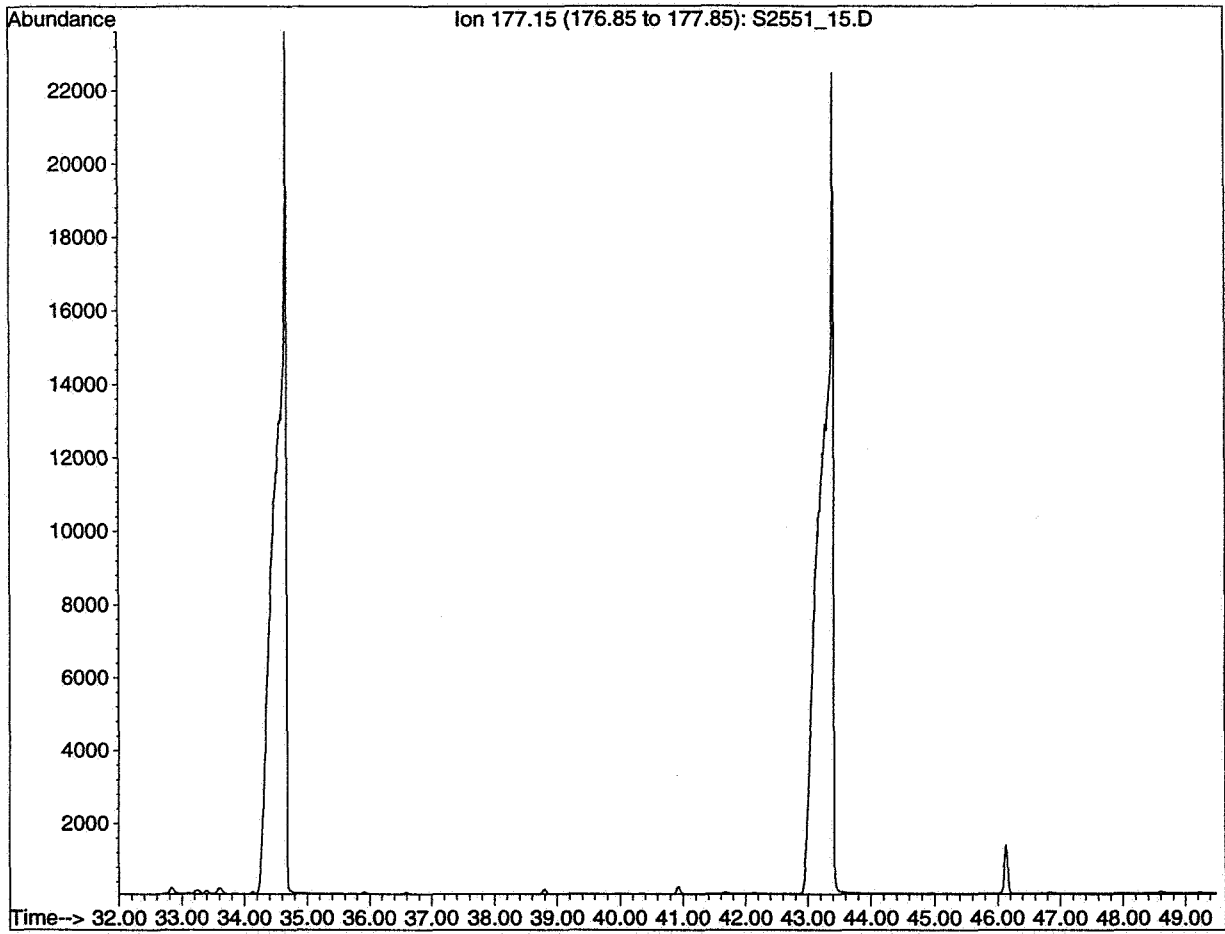
Title: Saturated HC (FID) and Biomarkers (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\S2551\_15.D Name: 35/11-11 mud 2551.0m SAT

Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Thu Sep 24 09:42:08 1998



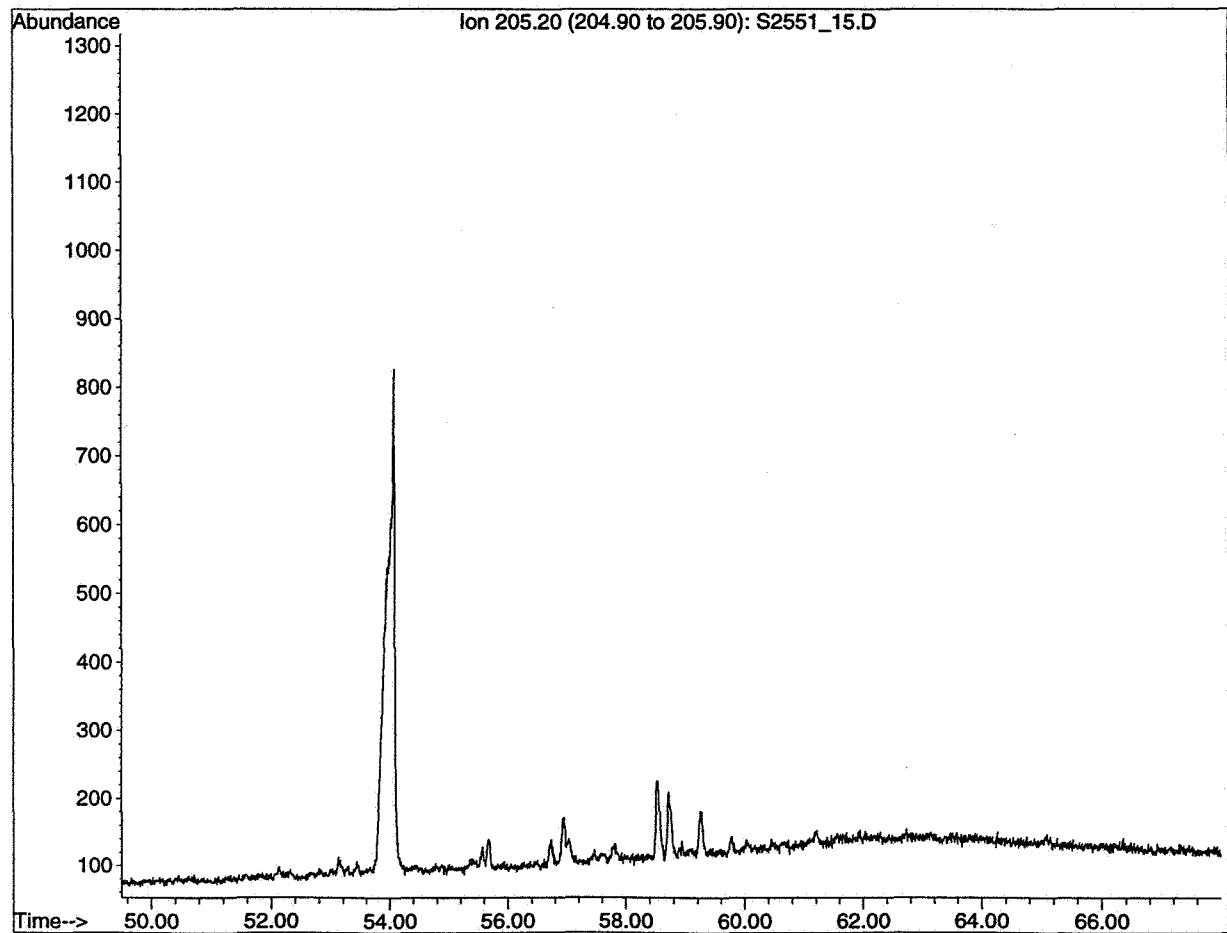
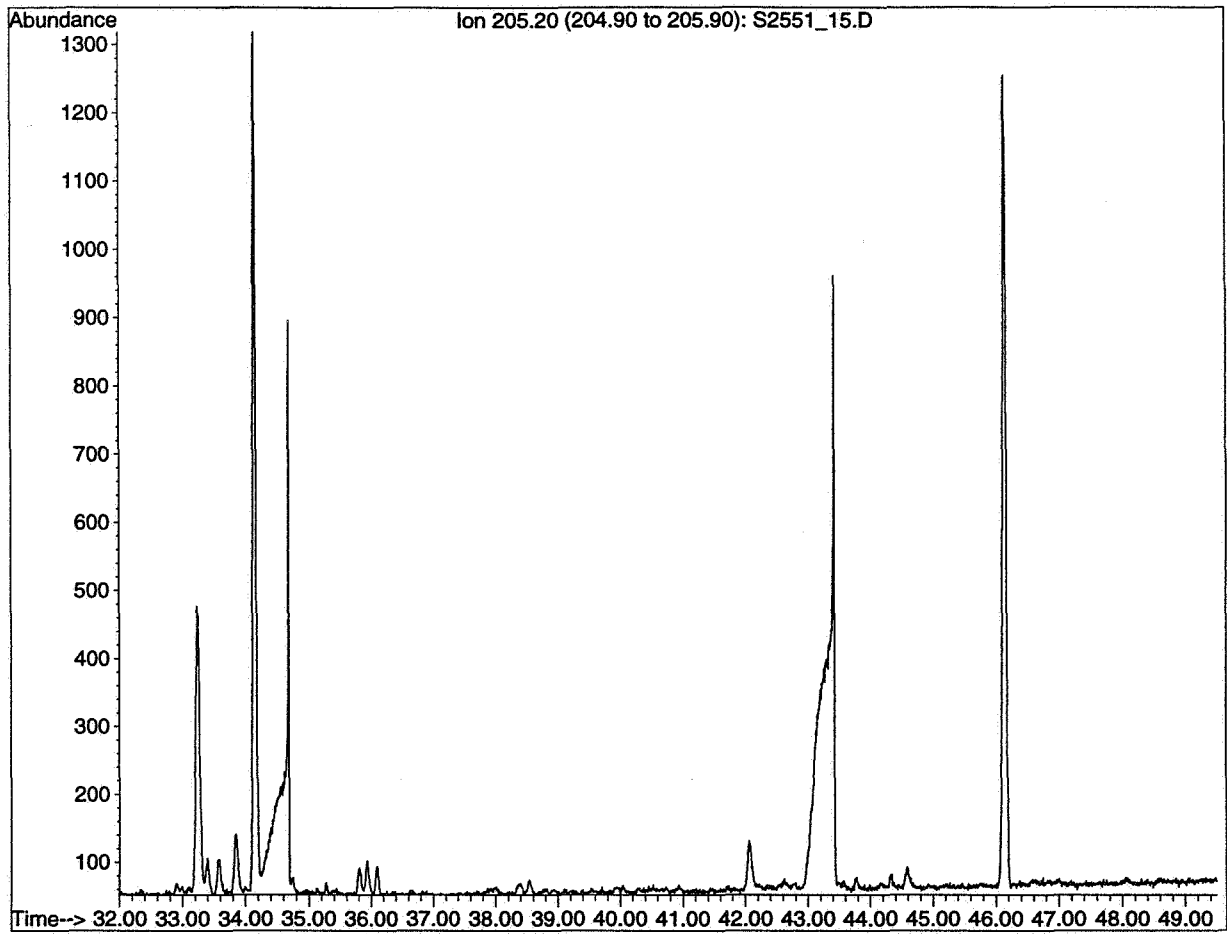
Title: Saturated HC (FID) and Biomarkers (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\S2551\_15.D Name: 35/11-11 mud 2551.0m SAT

Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Thu Sep 24 09:42:16 1998



Title: Saturated HC (FID) and Biomarkers (MSD)

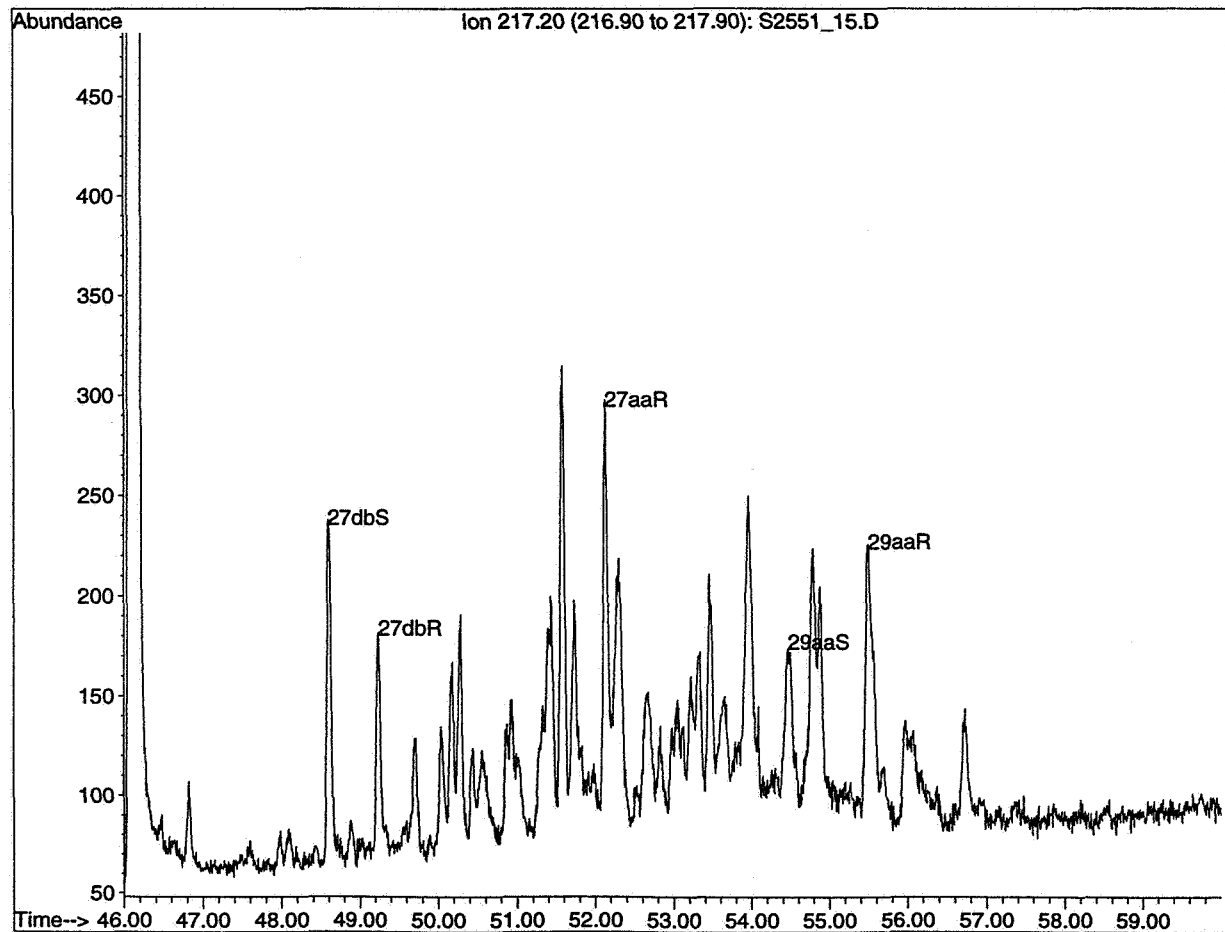
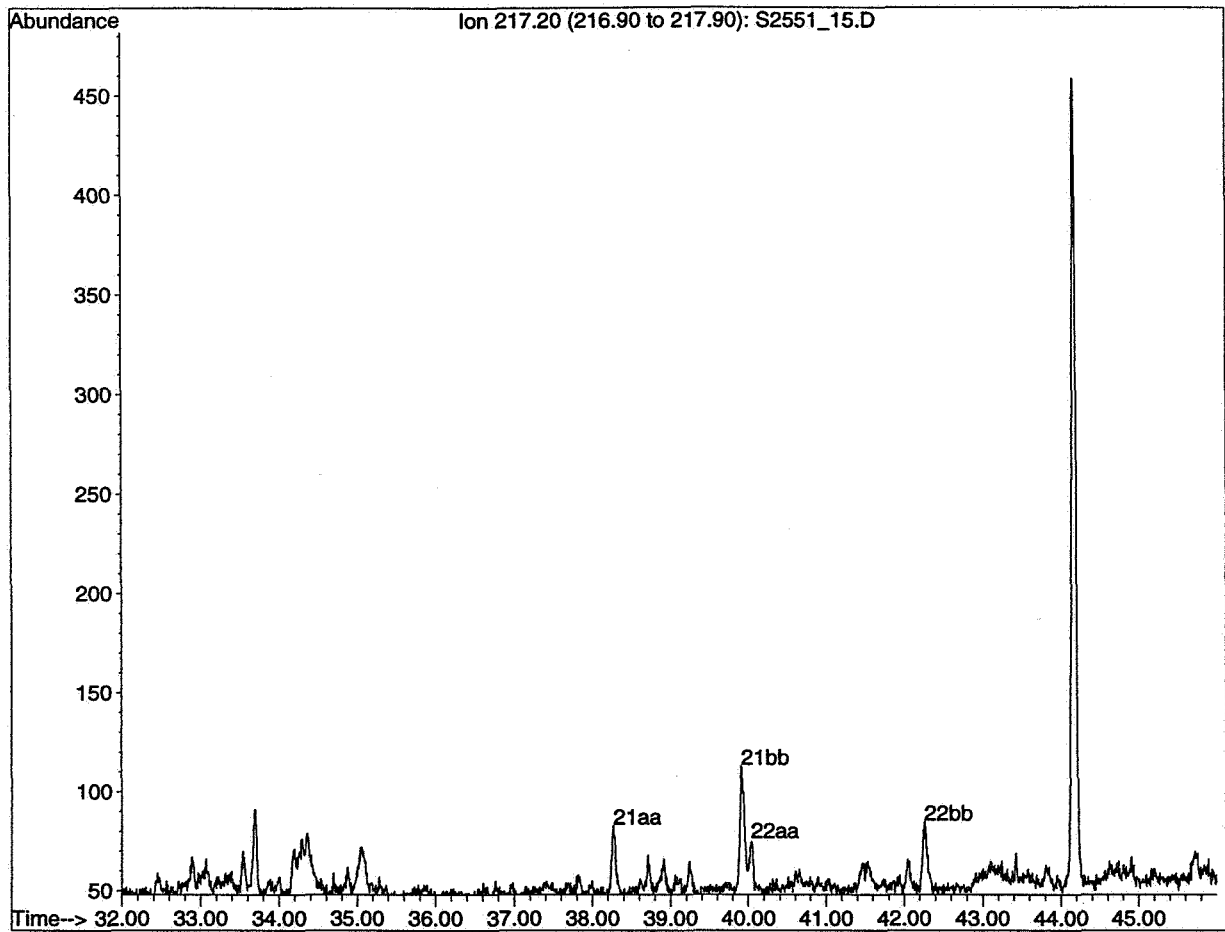
Data File: C:\HPCHEM\1\DATA\ANDY1\S2551\_15.D Name: 35/11-11 mud 2551.0m SAT

Misc:

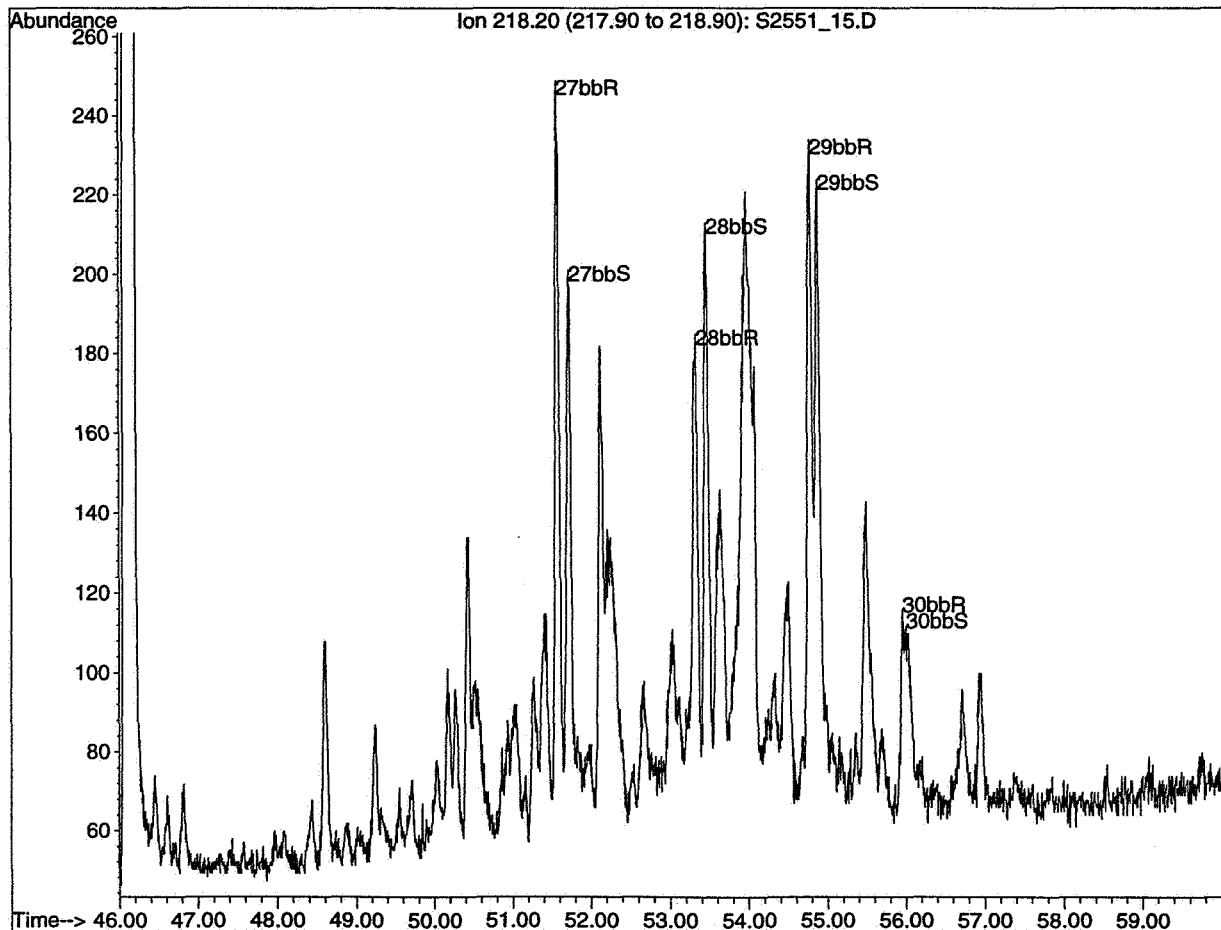
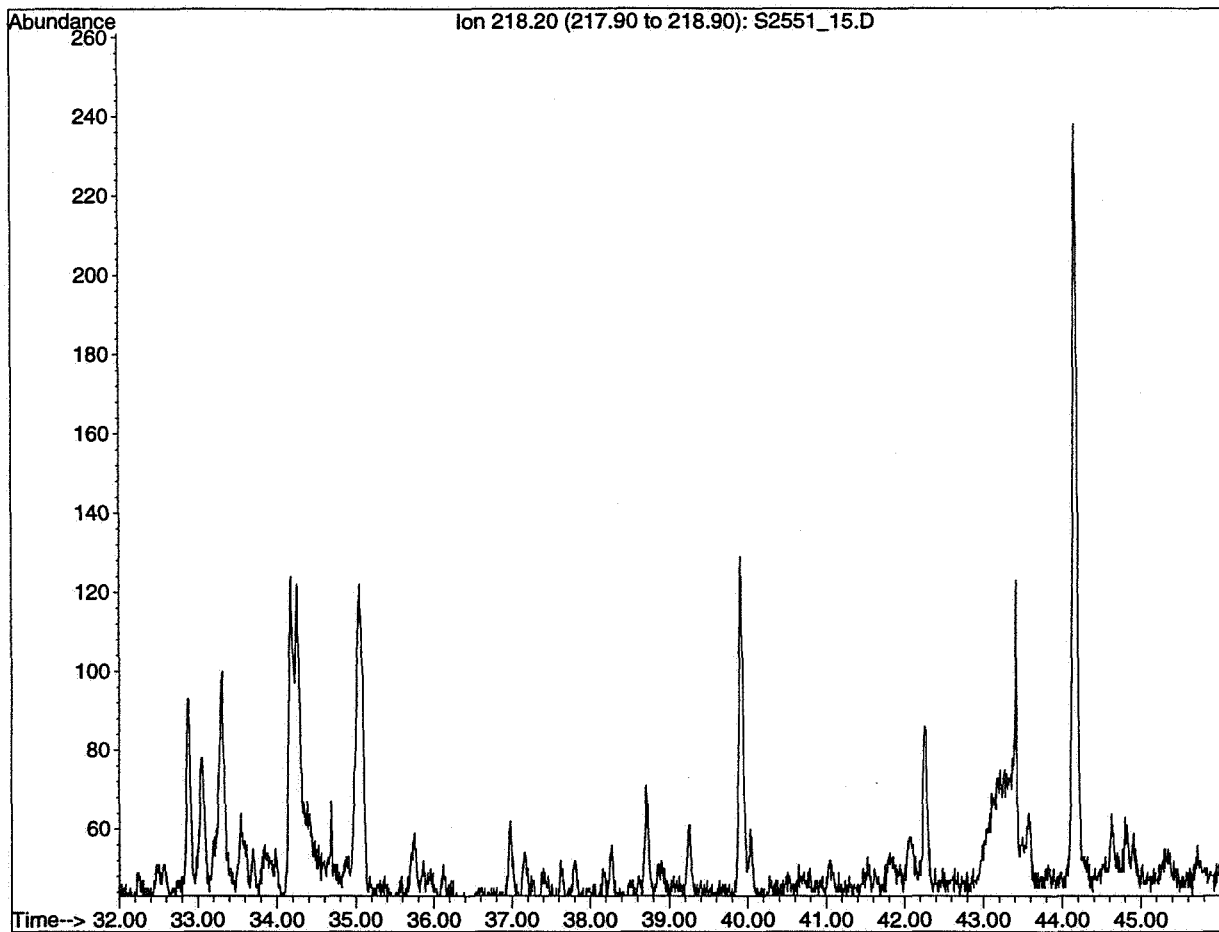
Method: MSD\_S\_D

.....Operator: Andy

Date Reported: Thu Sep 24 09:42:23 1998



Title: Saturated HC (FID) and Biomarkers (MSD)  
Data File: C:\HPCHEM\1\DATA\ANDY1\S2551\_15.D Name: 35/11-11 mud 2551.0m SAT  
Misc:  
Method: MSD\_S\_D .....Operator: Andy  
Date Reported: Thu Sep 24 09:42:32 1998



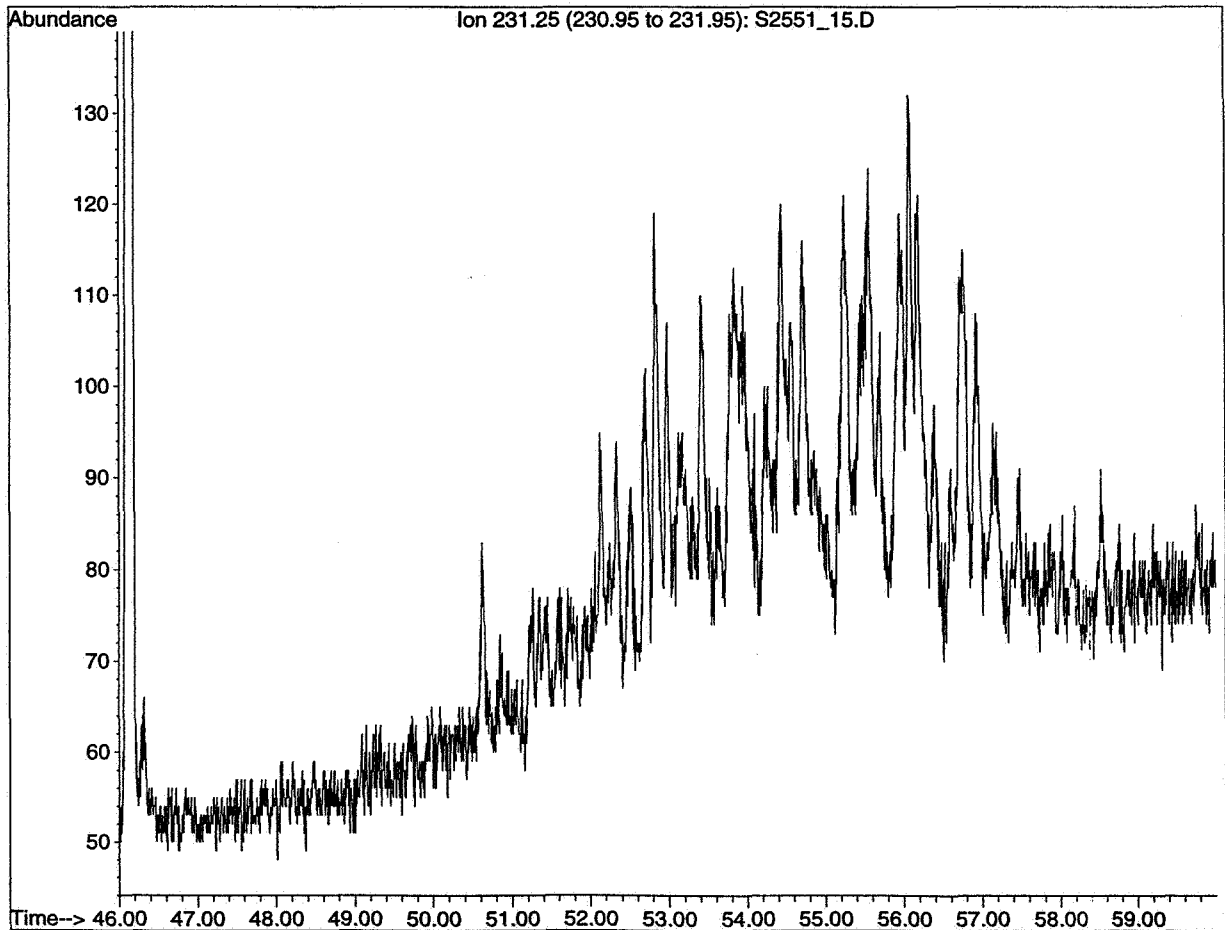
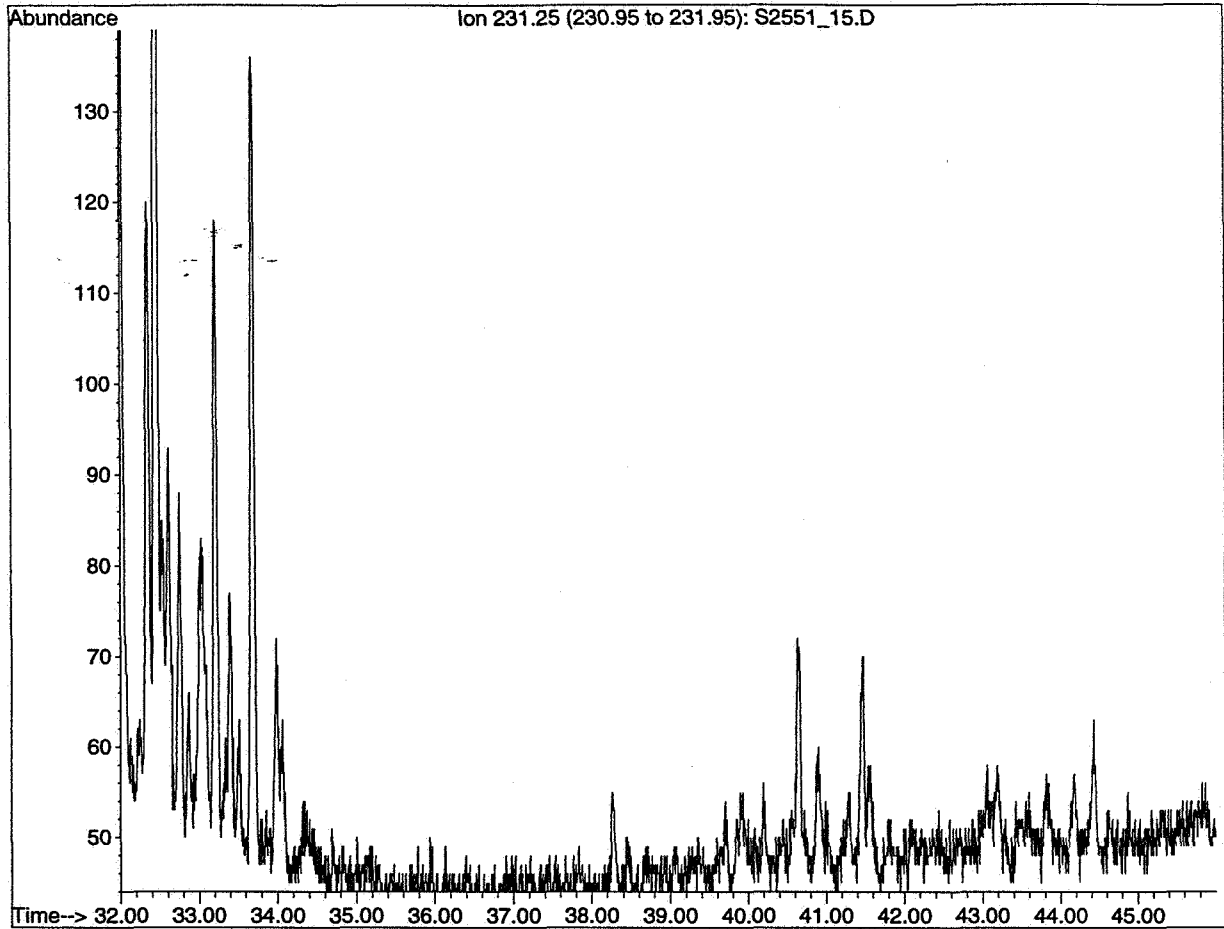
Title: Saturated HC (FID) and Biomarkers (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\S2551\_15.D Name: 35/11-11 mud 2551.0m SAT

Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Thu Sep 24 09:42:41 1998



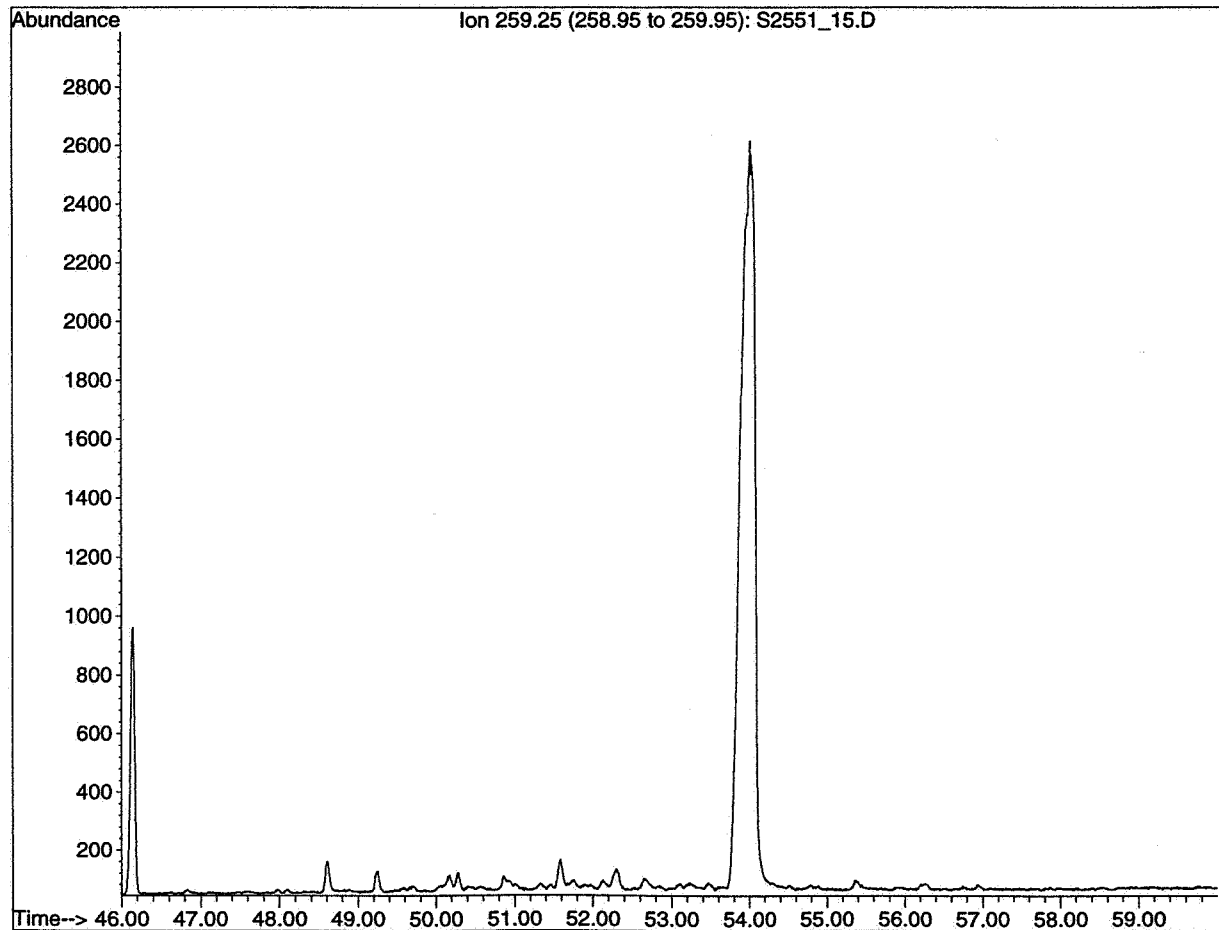
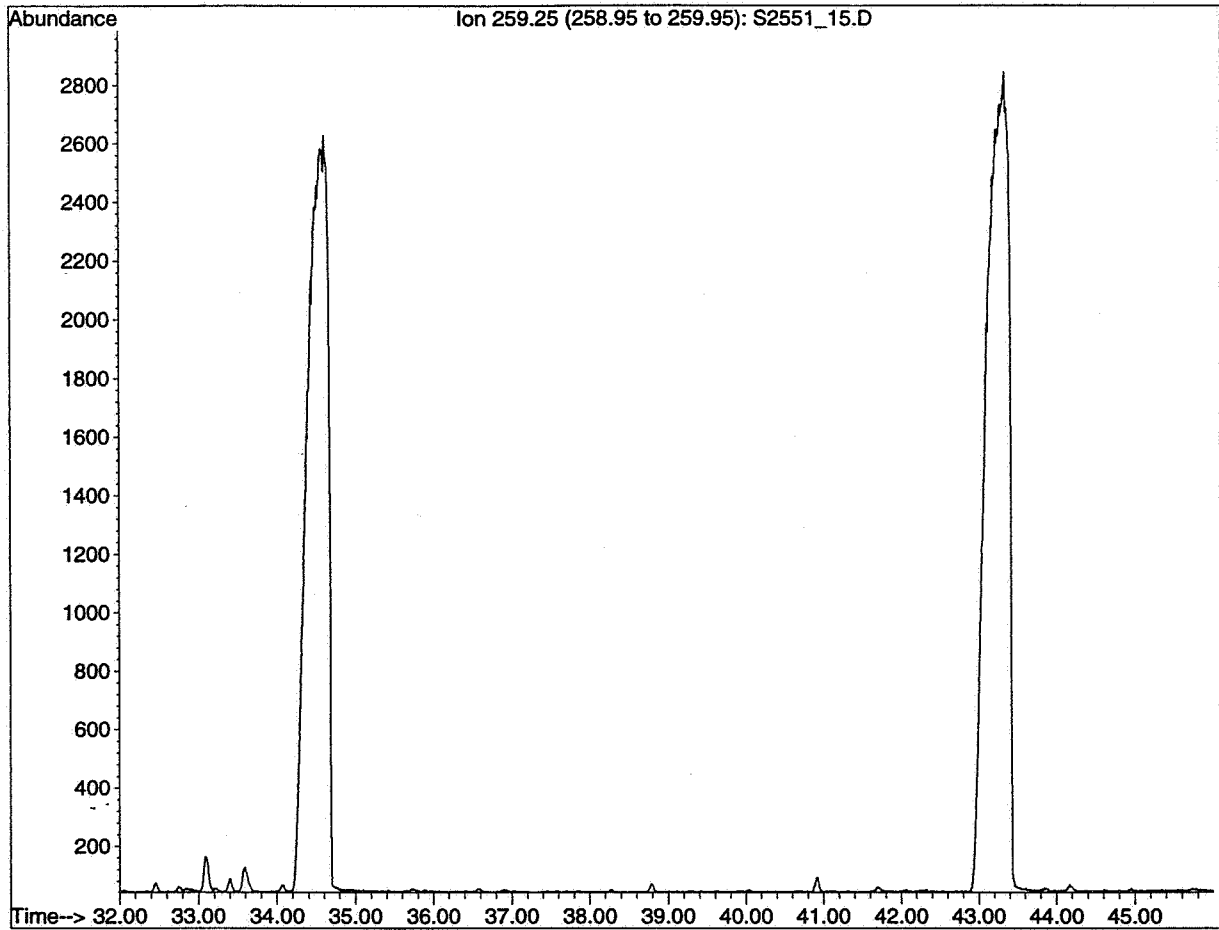
Title: Saturated HC (FID) and Biomarkers (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\S2551\_15.D Name: 35/11-11 mud 2551.0m SAT

Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Thu Sep 24 09:42:48 1998



### Saturated biomarkers

GC/MS detection HP-6890/5973

#### Compound data



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: NSO1\_S13.D  
 Sample name: nso1 ref. sample SAT #13  
 Data File Path: C:\HPCHEM\1\DATA\ANDY\1\  
 Misc. info.:  
 Vial no.: 6  
 Method: MSD\_S\_D  
 Operator: Andy  
 Date: Thu Sep 17 05:59:13 1998

Response curve  $y = ax$   
 Response factor groups: s1...s3, responses as defined in method

#	Rt.min.	m/z	Rf.	Name	Height	Amount
					ng/mg	
<b>Internal standard (if added):</b>						
1)	46.10	217.2		24baa	2152	29
<b>Diterpanes:</b>						
2)	33.75	191.2	s1	19/3	960	10
3)	35.72	191.2	s1	20/3	640	7
4)	37.77	191.2	s1	21/3	1006	10
5)	41.75	191.2	s1	23/3	1658	17
6)	42.86	191.2	s1	24/3	1207	12
7)	45.13	191.2	s1	25/3	683	7
8)	46.68	191.2	s1	24/4	1164	12
9)	46.78	191.2	s1	26/3R	458	5
10)	46.92	191.2	s1	26/3S	470	5
11)	50.46	191.2	s1	28/3R	532	5
12)	50.70	191.2	s1	28/3S	501	5
13)	51.48	191.2	s1	29/3R	801	8
14)	51.78	191.2	s1	29/3S	732	7
<b>Triterpanes:</b>						
15)	52.63	191.2	s1	27Ts	3977	40
16)	52.88	177.2	s1	25nor28ab	3168	32
17)	53.31	191.2	s1	27Tm	3333	34
18)	53.68	177.2	s1	25nor29ab	1741	18
19)	53.79	191.2	s1	27b	978	10
20)	54.87	191.2	s1	28ab	5114	52
21)	55.09	177.2	s1	25nor30ab	1681	17
22)	55.58	191.2	s1	29ab	8954	91
23)	55.68	191.2	s1	29Ts	3977	40
24)	55.93	191.2	s1	30D	2191	22
25)	56.37	191.2	s1	29ba	1851	19
26)	56.95	191.2	s2	30ab	23761	155
27)	57.29	191.2	s1	30D13	1445	15
28)	57.58	191.2	s2	30ba	2413	16
29)	58.54	191.2	s1	31abS	8755	89
30)	58.73	191.2	s1	31abR	6156	63
31)	59.07	191.2	s1	30G	991	10
32)	59.26	191.2	s1	31ba	975	10
33)	59.77	191.2	s1	32abS	5891	60
34)	60.04	191.2	s1	32abR	4067	41
35)	61.21	191.2	s1	33abS	5246	53
36)	61.58	191.2	s1	33abR	3482	35
37)	62.73	191.2	s1	34abS	3077	31
38)	63.22	191.2	s1	34abR	1827	19
39)	64.44	191.2	s1	35abS	2289	23
40)	65.14	191.2	s1	35abR	1472	15

#	Rt.min.	m/z	Rf.	Name	Height	Amount
					ng/mg	
<b>Steranes:</b>						
41)	38.27	217.2	s3	21aa	2036	30
42)	39.94	217.2	s3	21bb	2698	40
43)	40.05	217.2	s3	22aa	1689	25
44)	42.29	217.2	s3	22bb	1673	25
45)	48.63	217.2	s3	27dbS	4830	71
46)	49.26	217.2	s3	27dbR	2879	42
47)	51.61	218.2	s3	27bbR	3793	56
48)	51.76	218.2	s3	27bbS	2654	39
49)	52.16	217.2	s3	27aaR	1472	22
50)	53.36	218.2	s3	28bbR	2268	33
51)	53.50	218.2	s3	28bbS	2984	44
52)	54.48	217.2	s3	29aaS	1568	23
53)	54.79	218.2	s3	29bbR	3526	52
54)	54.89	218.2	s3	29bbS	3065	45
55)	55.49	217.2	s3	29aaR	1666	24
56)	55.97	218.2	s3	30bbR	1358	20
57)	56.02	218.2	s3	30bbS	1017	15

## Saturated biomarkers

GC/MS detection HP-6890/5973

Ratios, from heights and amounts



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: NSO1\_S13.D  
Sample name: nso1 ref. sample SAT #13  
Data File Path: C:\HPCHEM\1\DATA\ANDY\1  
Misc. info.:

Vial no.: 6  
Method: MSD\_S\_D  
Operator: Andy  
Date: Thu Sep 17 05:59:13 1998

### Terpane ratios, heights and amounts

	Height	Amount
$100 * ((\text{sum}20-25)/3 + 26/3(R+S)) / ((\text{sum}20-25)/3 + 26/3(R+S) + 27(Ts+Tm) + 28ab + \text{sum}29-30(ab+ba) + \text{sum}31-35ab(R+S))$	%Tri	6 7
$100 * 20/3 / ((\text{sum}20-25)/3 + 26/3(R+S))$	%20/3	10 10
$100 * 23/3 / (23/3 + 24/3 + 25/3)$	%23/3	47 47
$100 * 24/4 / (24/4 + 24/3 + 25/3)$	%24/4	38 38
$100 * Ts / (Ts + Tm)$	%27Ts	54 54
$100 * 28ab / (28ab + 30ab)$	%28ab	18 25
$100 * 29Ts / (29Ts + 29ab)$	%29Ts	31 31
$100 * 25nor30ab / (25nor30ab + 30ab)$	%25nor30ab	7 10
$100 * 29ab / (29ab + 30ab)$	%29ab	27 37
$100 * 30ba / (30ba + 30ab)$	%30ba	9 9
$100 * 30D / (30D + 30ab)$	%30D	8 13
$100 * 30G / (30G + 30ab)$	%30G	4 6
$100 * 32abS / (32ab(S+R))$	%32abS	59 59
$100 * 35ab(S+R) / (34-35ab(S+R))$	%35ab	43 43
$100 * (27Ts + 27Tm) / (27Ts + 27Tm + 28ab + \text{sum}29-30(ab+ba) + \text{sum}31-35ab(R+S))$	%27HOP	8 9
$100 * (28ab) / (27Ts + 27Tm + 28ab + \text{sum}29-30(ab+ba) + \text{sum}31-35ab(R+S))$	%28HOP	6 6
$100 * (29ab + ba) / (27Ts + 27Tm + 28ab + \text{sum}29-30(ab+ba) + \text{sum}31-35ab(R+S))$	%29HOP	12 13
$100 * (30ab + ba) / (27Ts + 27Tm + 28ab + \text{sum}29-30(ab+ba) + \text{sum}31-35ab(R+S))$	%30HOP	29 20
$100 * 31ab(S+R) / (27Ts + 27Tm + 28ab + \text{sum}29-30(ab+ba) + \text{sum}31-35ab(R+S))$	%31HOP	16 18
$100 * 32ab(S+R) / (27Ts + 27Tm + 28ab + \text{sum}29-30(ab+ba) + \text{sum}31-35ab(R+S))$	%32HOP	11 12
$100 * 33ab(S+R) / (27Ts + 27Tm + 28ab + \text{sum}29-30(ab+ba) + \text{sum}31-35ab(R+S))$	%33HOP	10 11
$100 * 34ab(S+R) / (27Ts + 27Tm + 28ab + \text{sum}29-30(ab+ba) + \text{sum}31-35ab(R+S))$	%34HOP	5 6
$100 * 35ab(S+R) / (27Ts + 27Tm + 28ab + \text{sum}29-30(ab+ba) + \text{sum}31-35ab(R+S))$	%35HOP	4 5

### Sterane ratios

$100 * (21+22)bb / ((21+22)bb + (27+28+29+30)bb(R+S))$	%Preq	17 17
$100 * 29aaS / 29aa(R+S)$	%29aaS	48 48
$100 * 29bb(R+S) / (29bb(R+S) + 29aa(S+R))$	%29bb	67 67
$100 * 27db(S+R) / ((27db(S+R) + 27bb(R+S))$	%27dia	54 54
$100 * 27bb(R+S) / (27+28+29+30)bb(R+S)$	%27STER	31 31
$100 * 28bb(R+S) / (27+28+29+30)bb(R+S)$	%28STER	25 25
$100 * 29bb(R+S) / (27+28+29+30)bb(R+S)$	%29STER	32 32
$100 * 30bb(R+S) / (27+28+29+30)bb(R+S)$	%30STER	11 11

### Hopanes/Steranes ratio-2 (only bb steranes)

Ho/St2 4 3



Title: Saturated HC (FID) and Biomarkers (MSD)

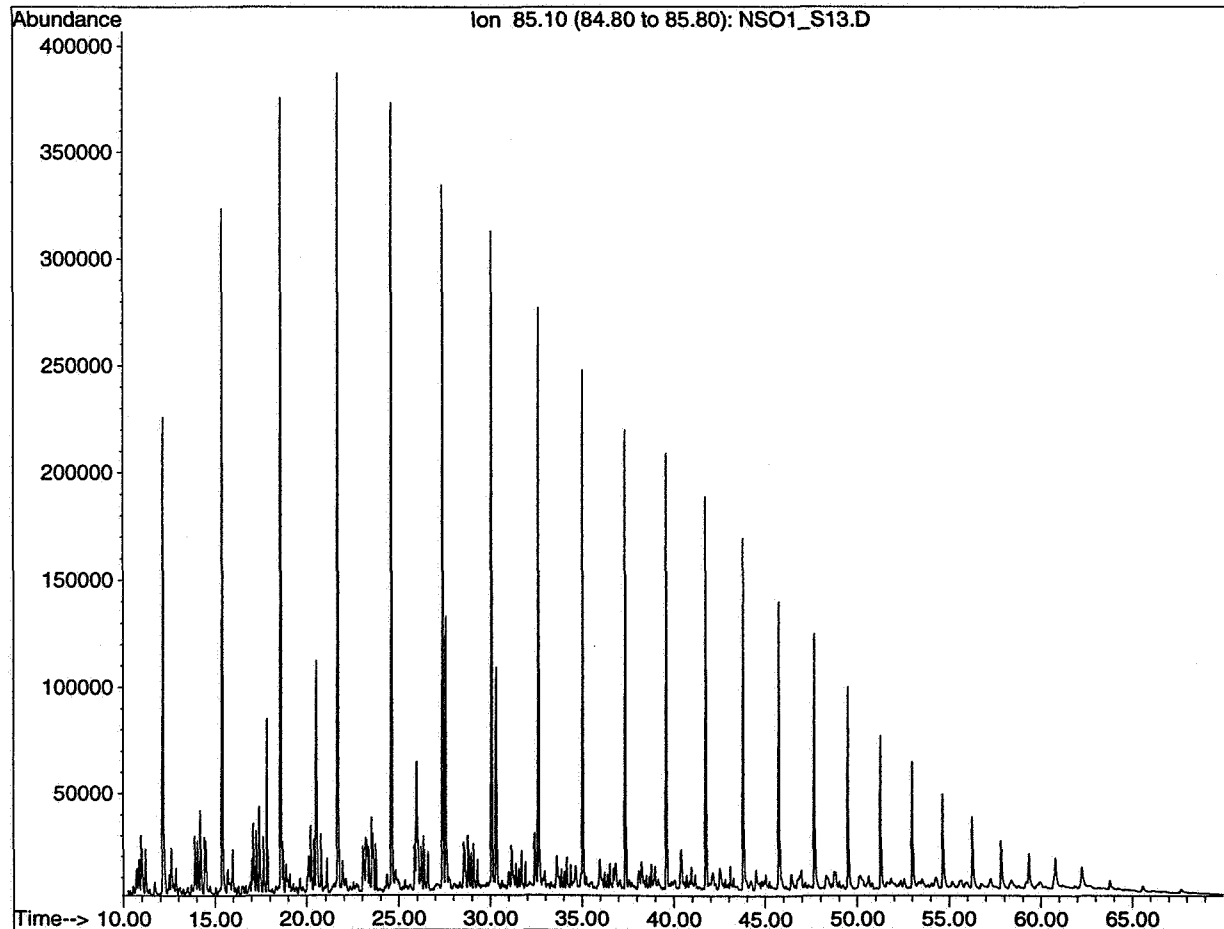
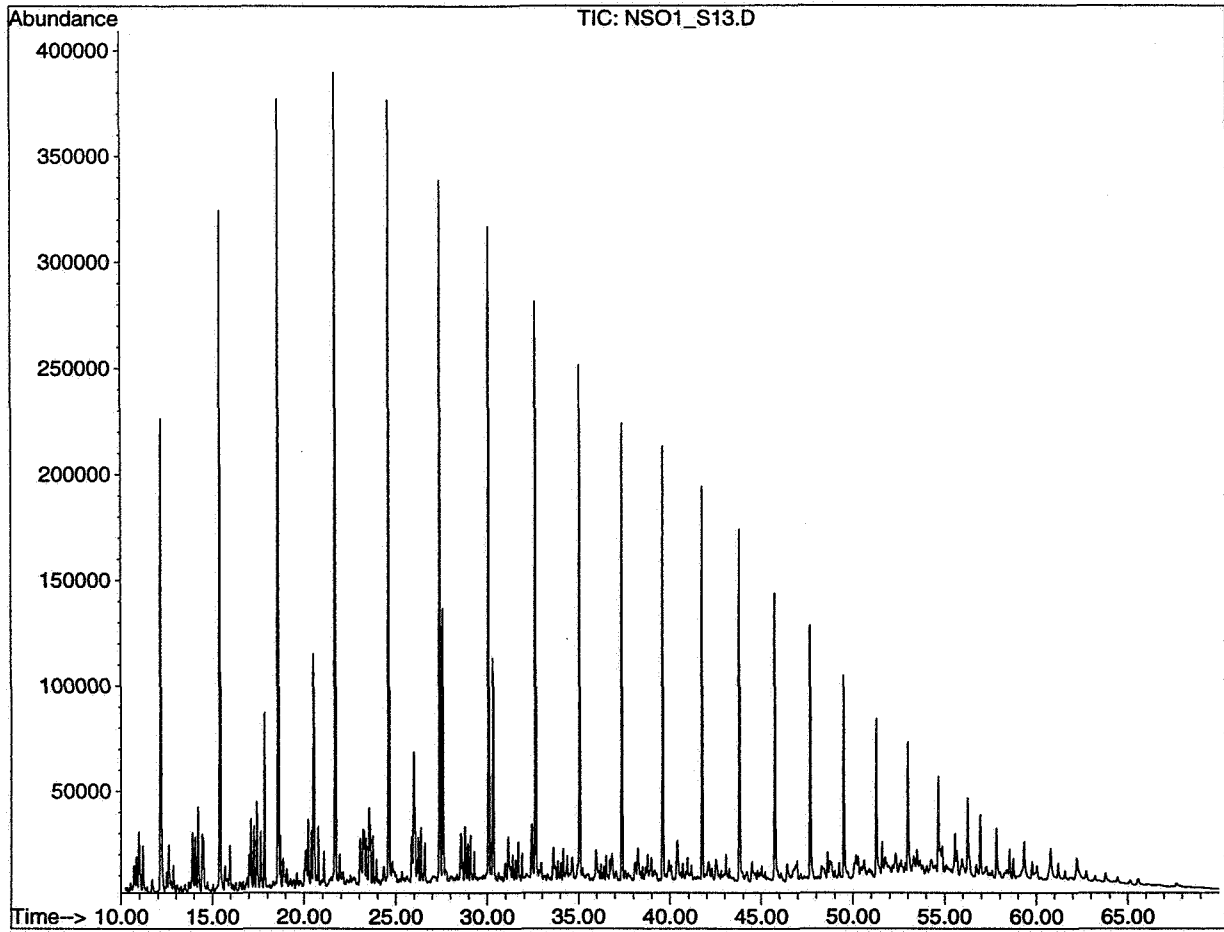
Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_S13.D Name: nsol ref. sample SAT #13

Misc:

Method: MSD\_S\_D

.....Operator: Andy

Date Reported: Thu Sep 24 08:43:26 1998



Title: Saturated HC (FID) and Biomarkers (MSD)

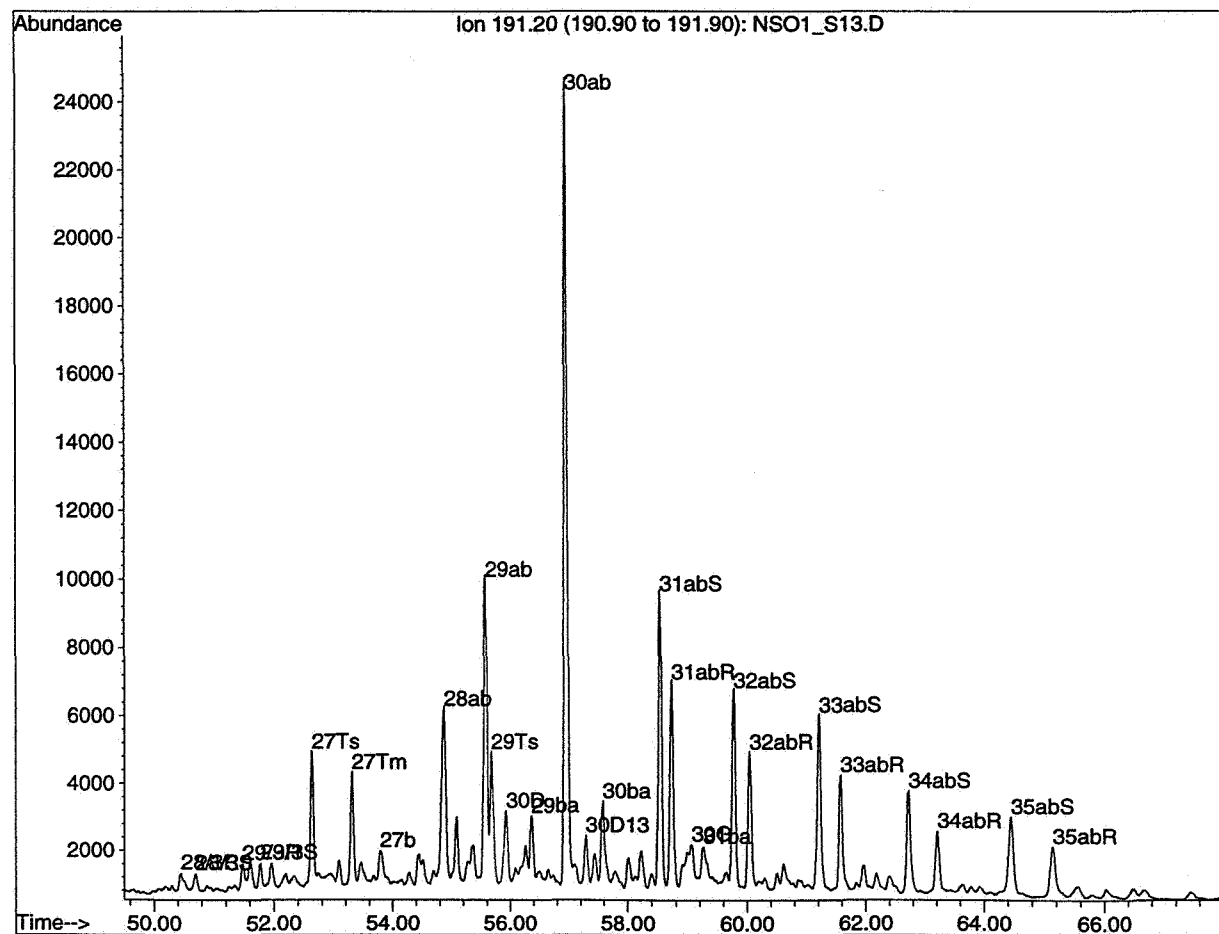
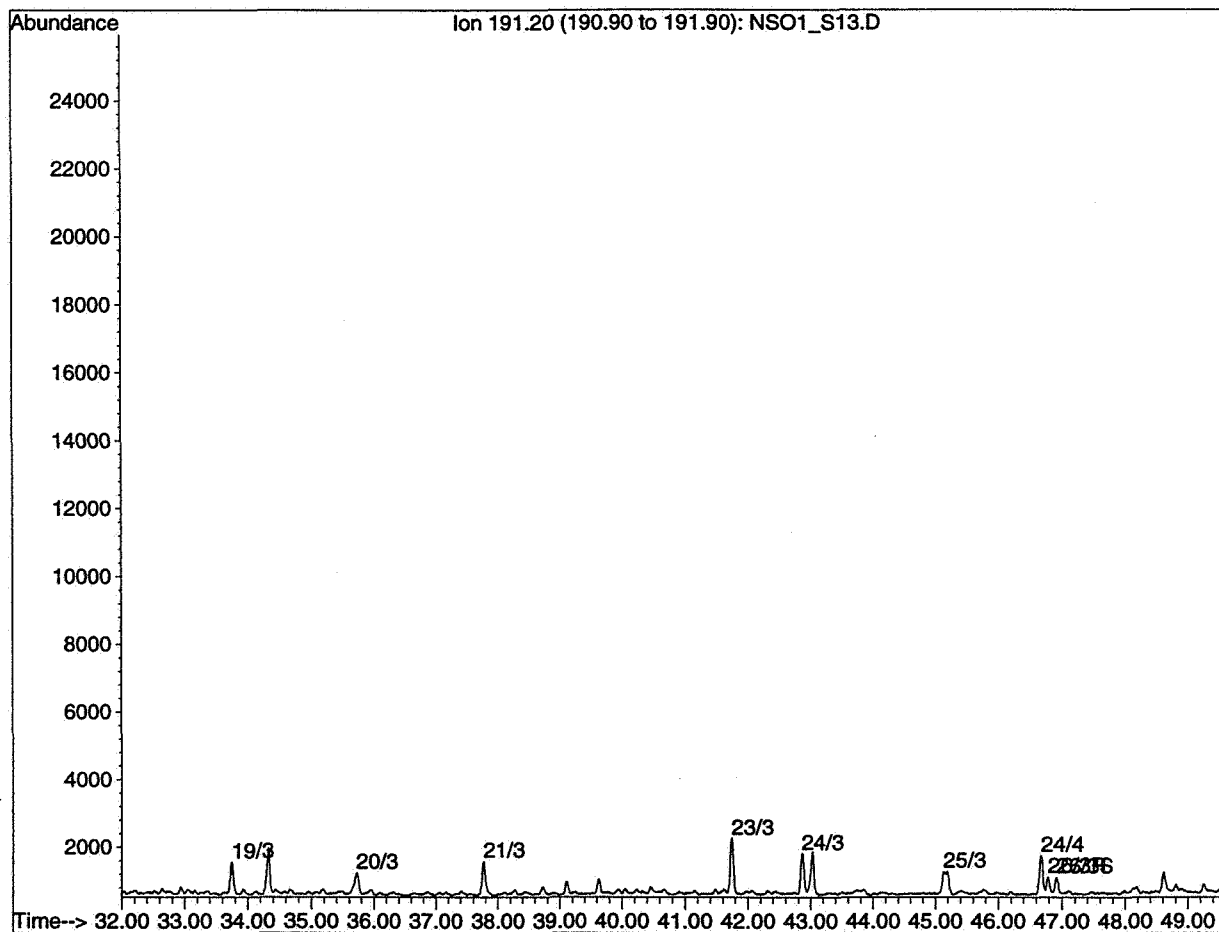
Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_S13.D Name: ns01 ref. sample SAT #13

Misc:

Method: MSD\_S\_D

.....Operator: Andy

Date Reported: Thu Sep 24 08:43:30 1998



Title: Saturated HC (FID) and Biomarkers (MSD)

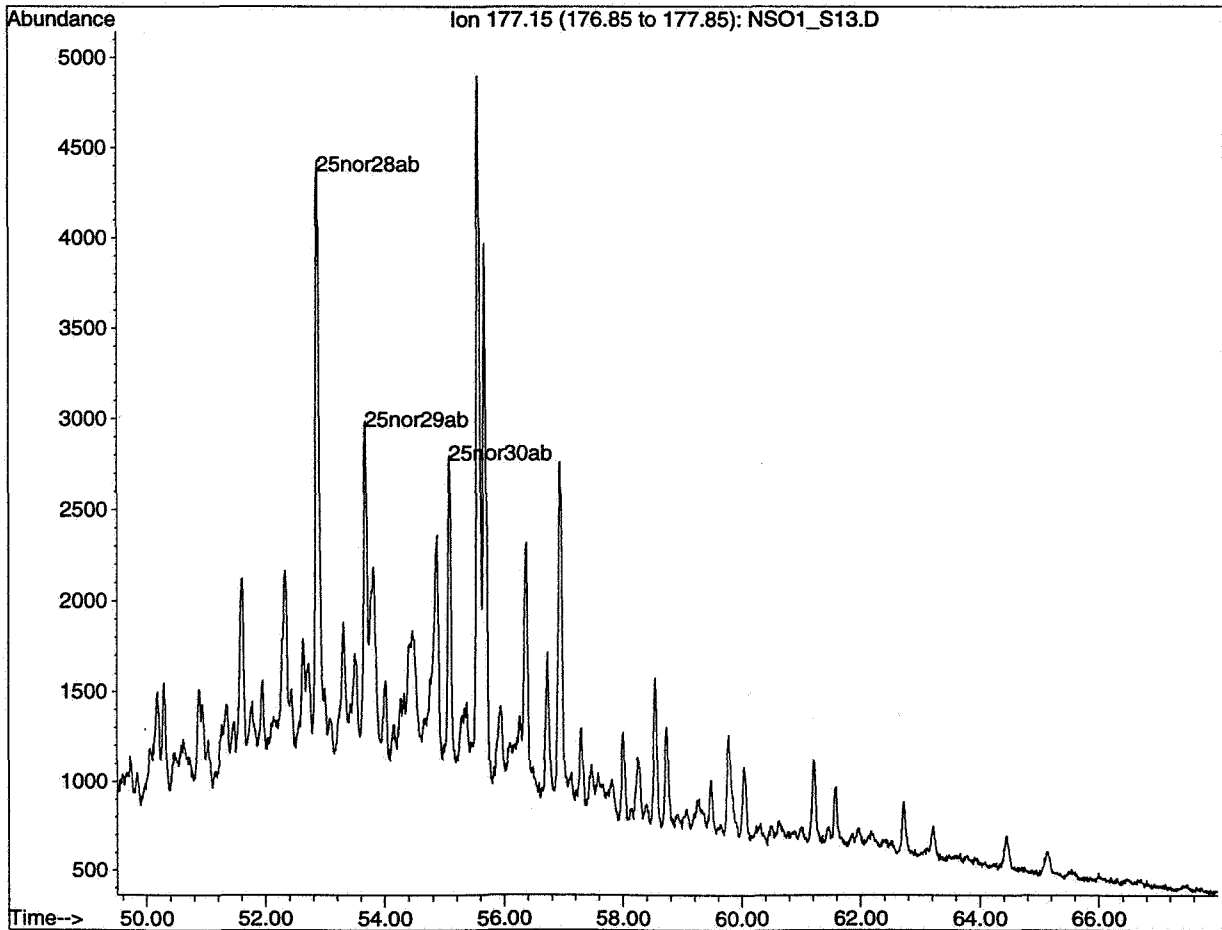
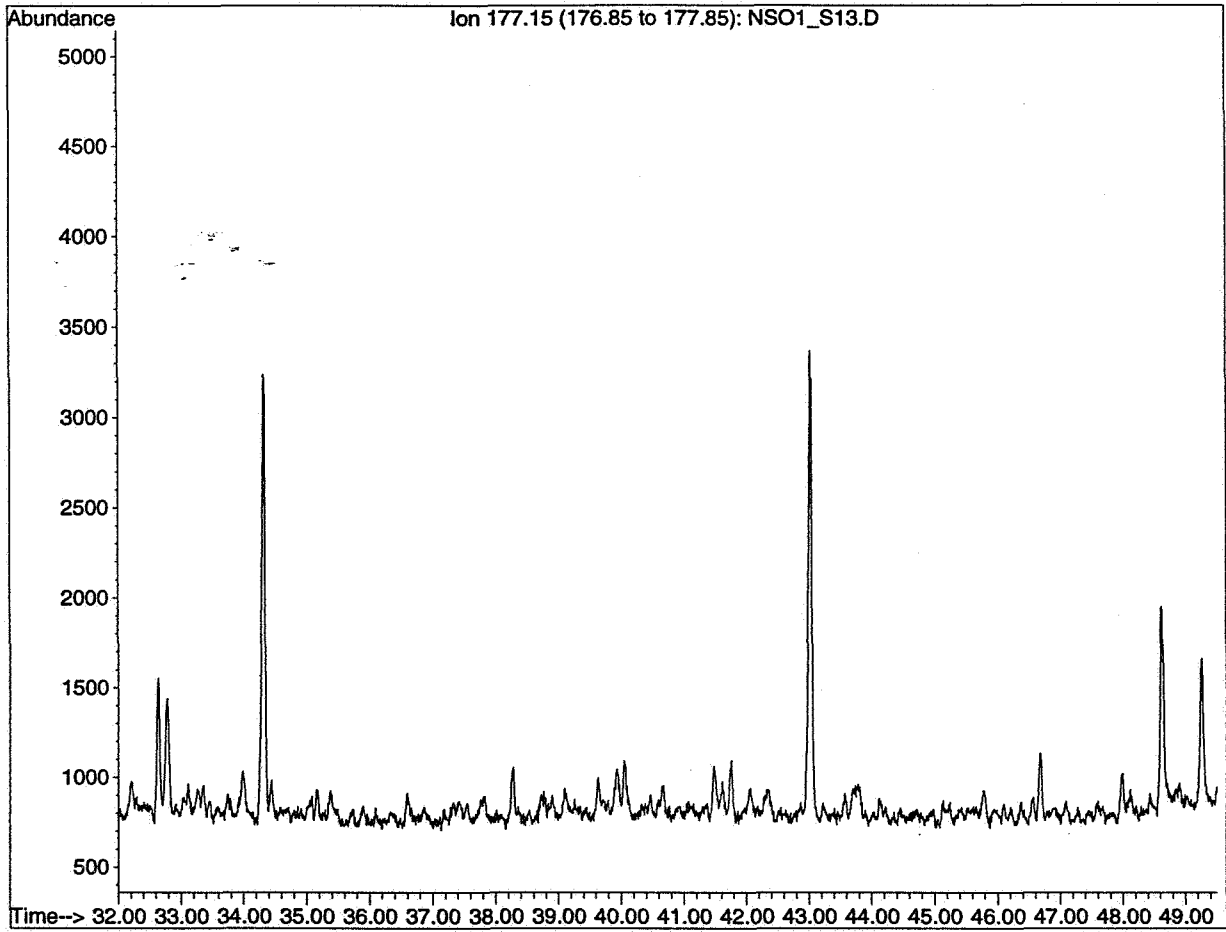
Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_S13.D Name: nsol ref. sample SAT #13

Misc:

Method: MSD\_S\_D

.....Operator: Andy

Date Reported: Thu Sep 24 08:43:44 1998



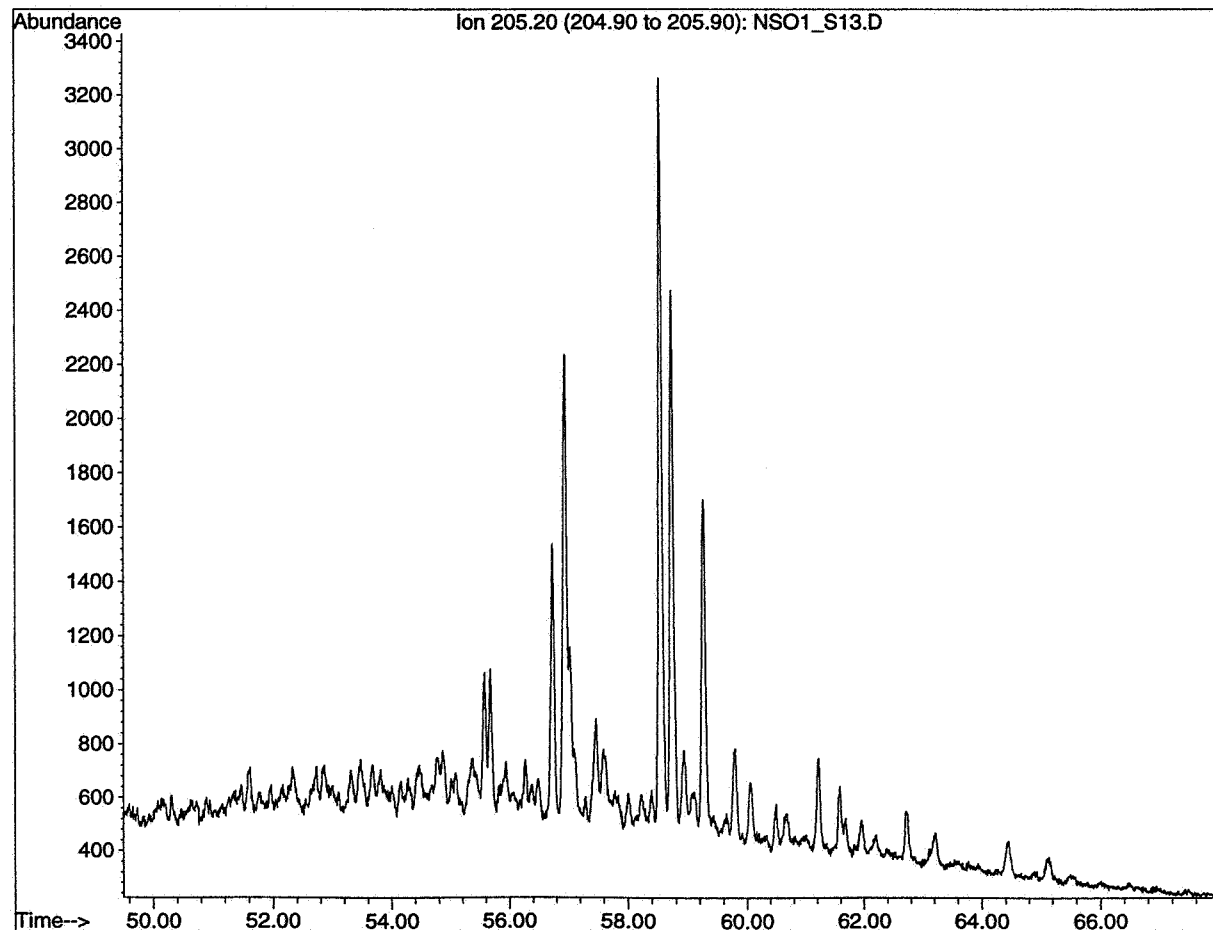
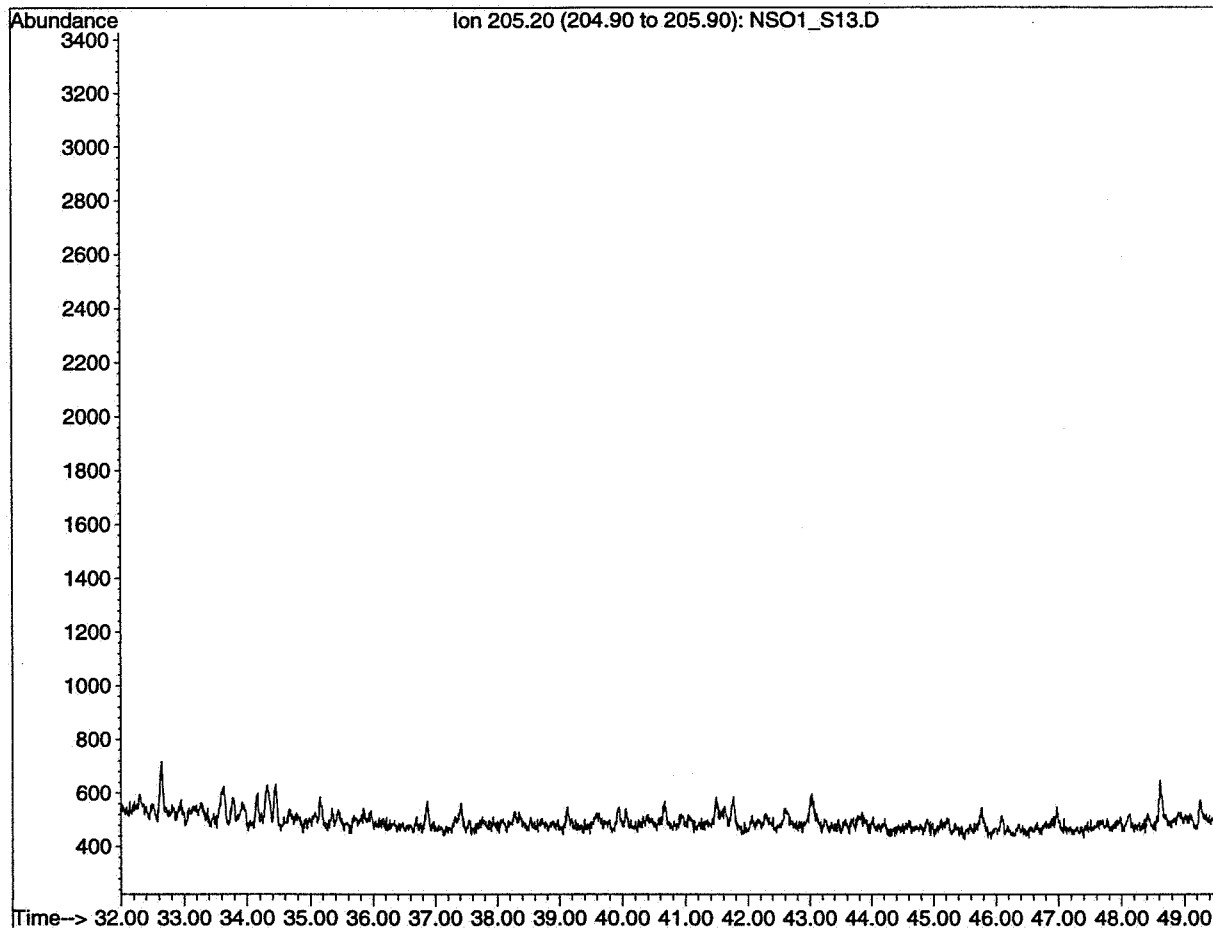
Title: Saturated HC (FID) and Biomarkers (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_S13.D Name: nsol ref. sample SAT #13

Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Thu Sep 24 08:43:52 1998



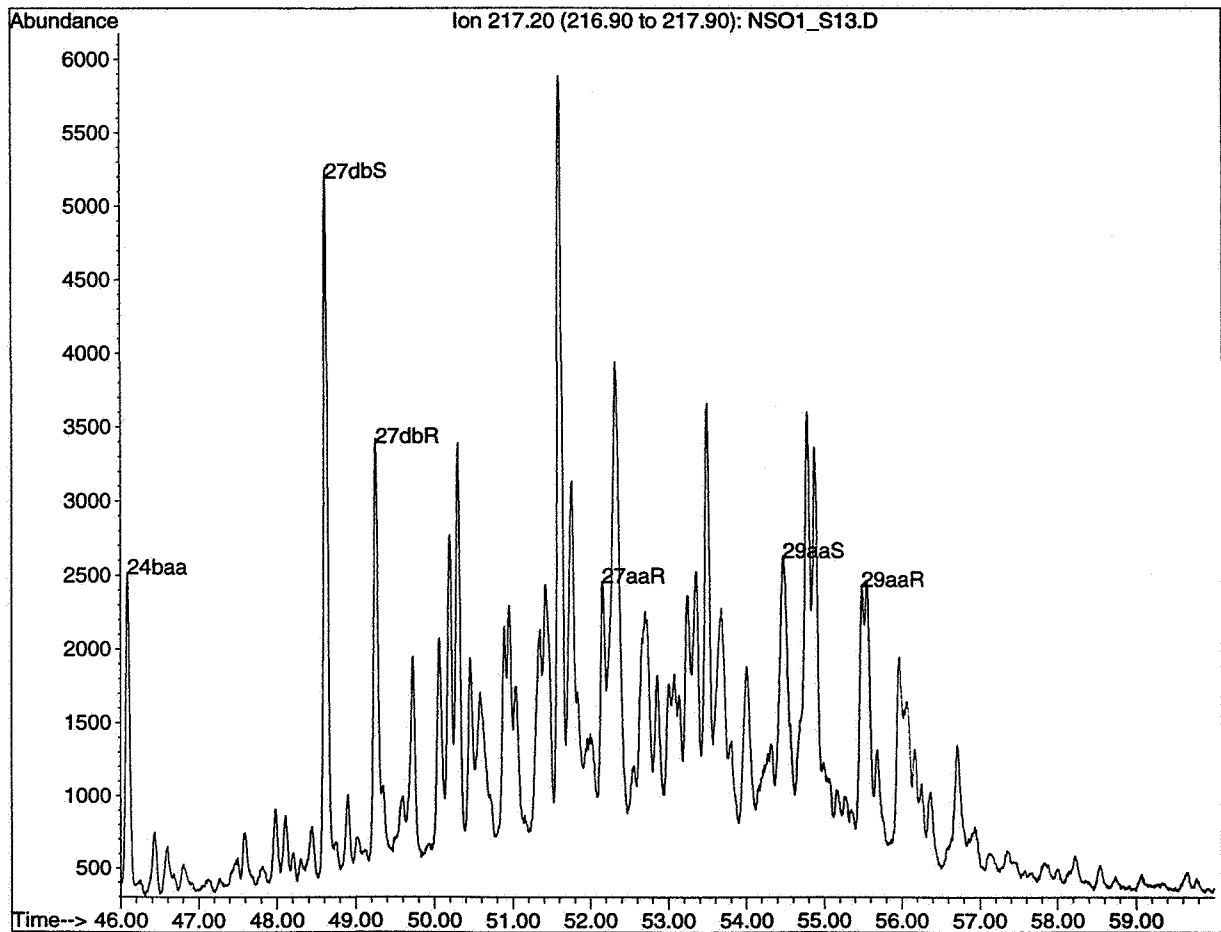
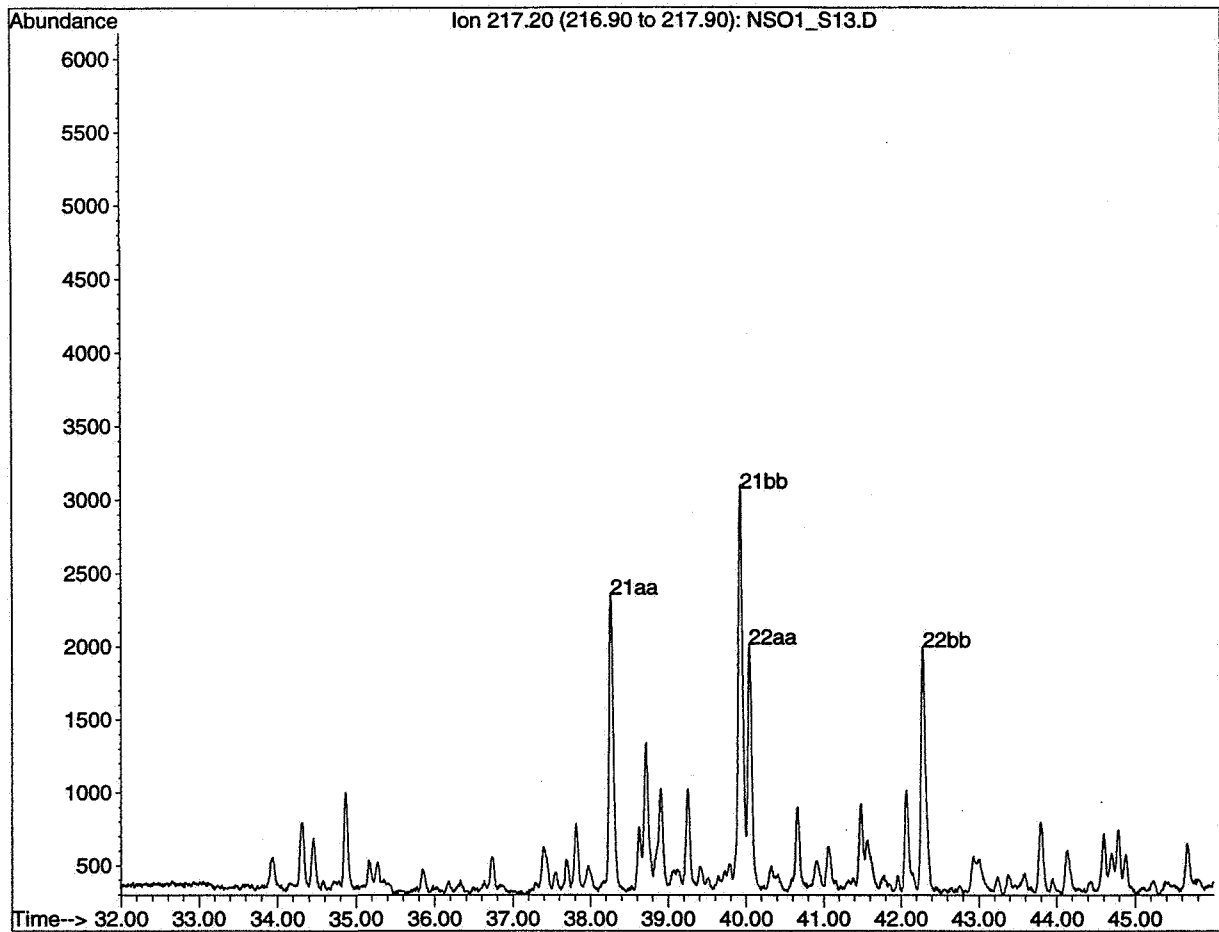
Title: Saturated HC (FID) and Biomarkers (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_S13.D Name: nsol ref. sample SAT #13

Misc:

Method: MSD\_S\_D .....Operator: Andy

Date Reported: Thu Sep 24 08:44:00 1998



Title: Saturated HC (FID) and Biomarkers (MSD)

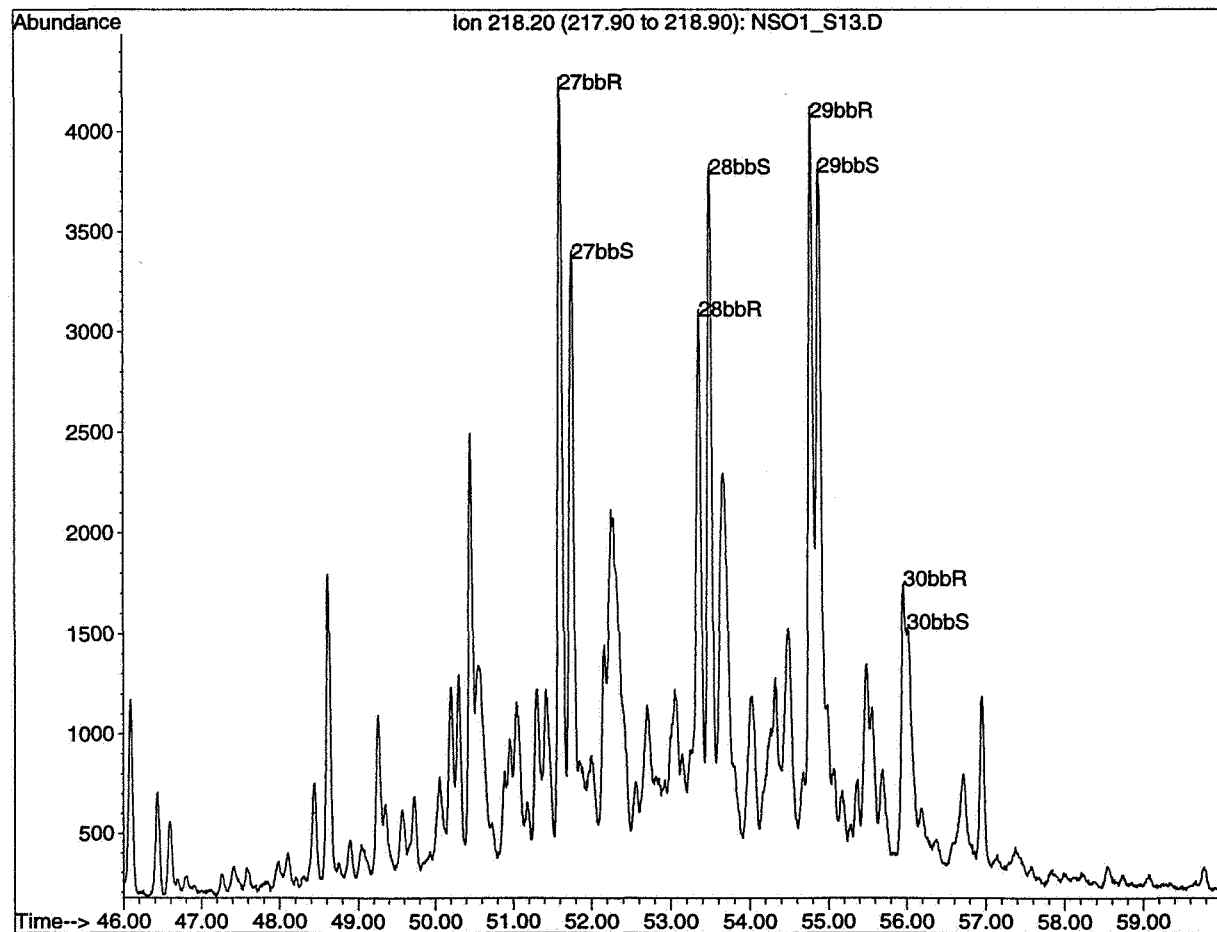
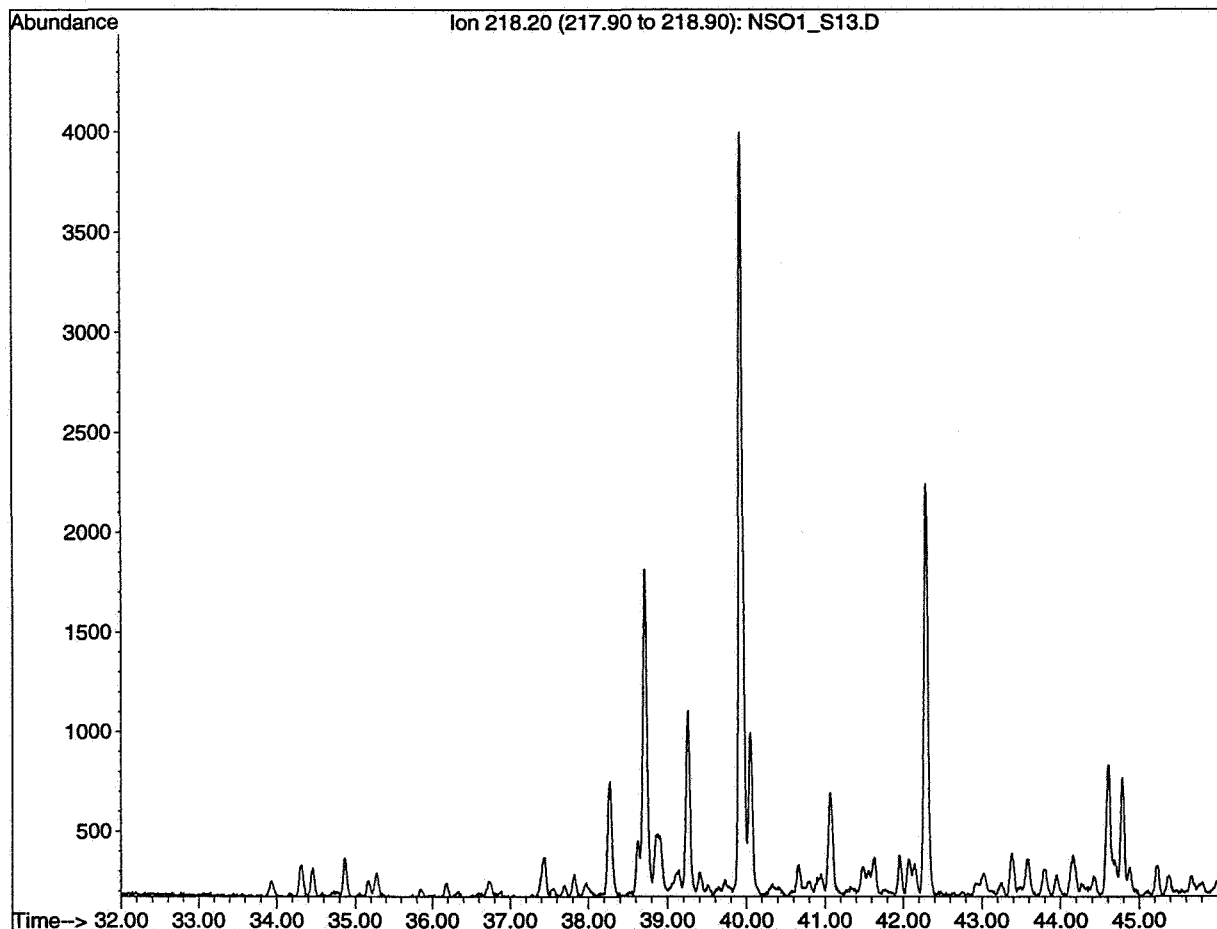
Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_S13.D Name: ns01 ref. sample SAT #13

Misc:

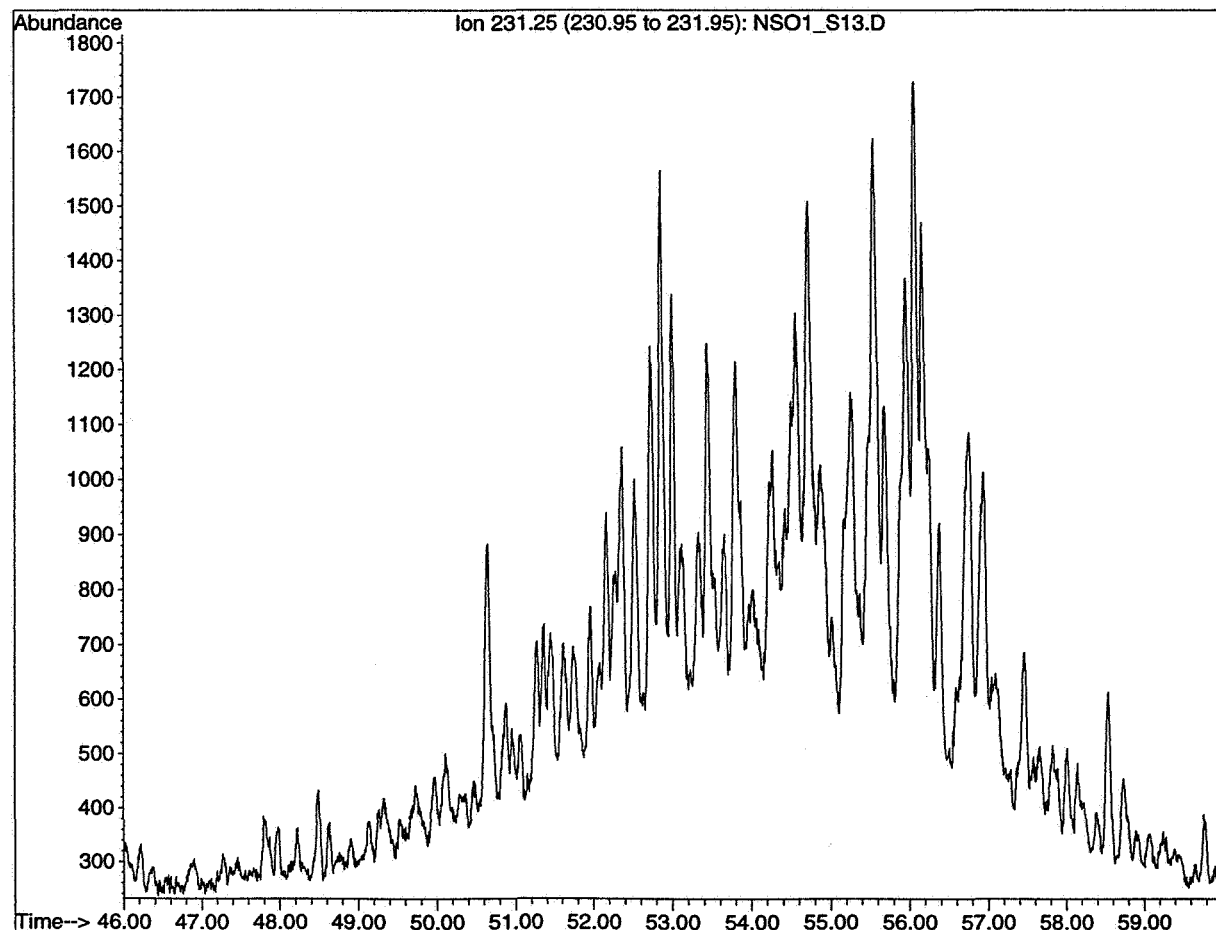
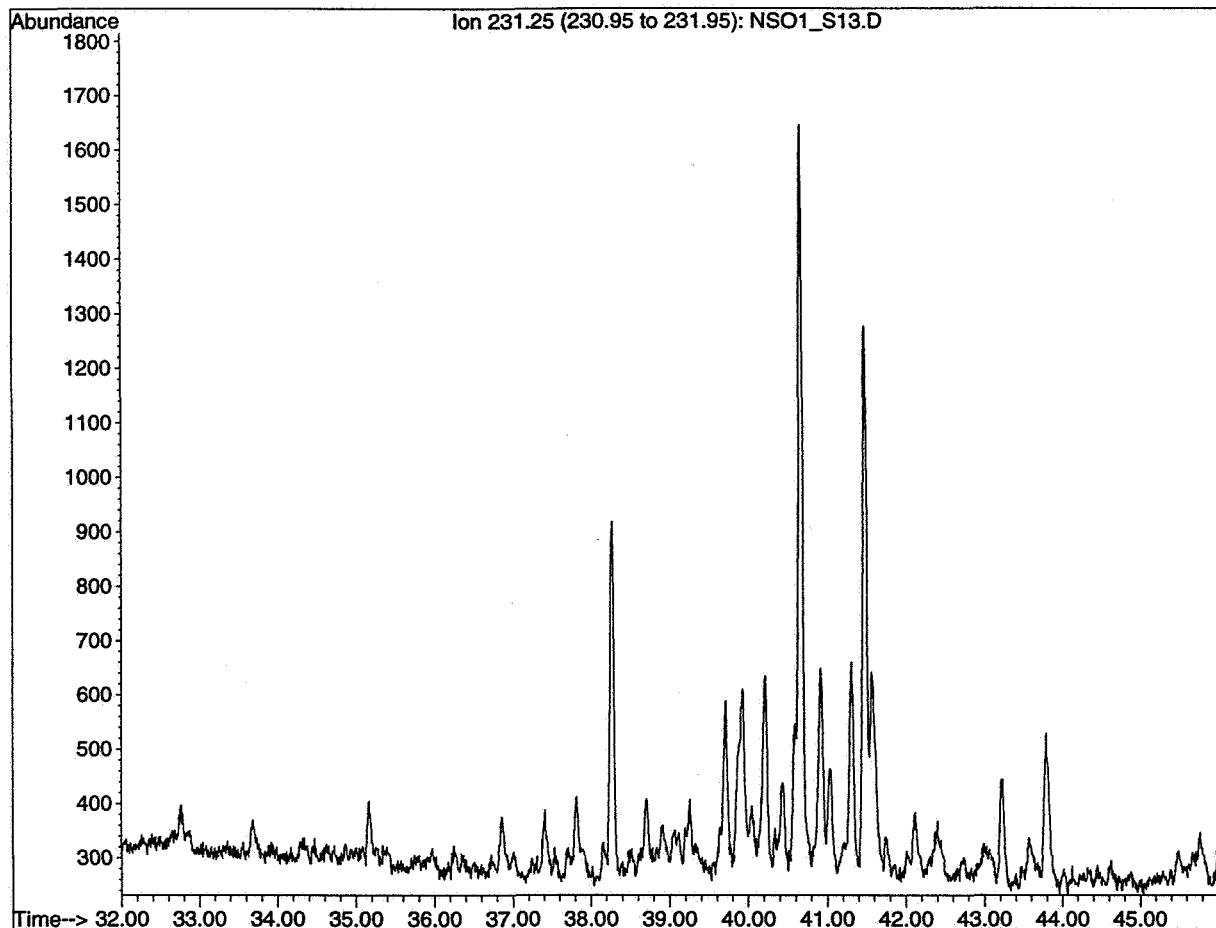
Method: MSD\_S\_D

.....Operator: Andy

Date Reported: Thu Sep 24 08:44:09 1998



Title: Saturated HC (FID) and Biomarkers (MSD)  
Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_S13.D Name: ns01 ref. sample SAT #13  
Misc:  
Method: MSD\_S\_D .....Operator: Andy  
Date Reported: Thu Sep 24 08:44:17 1998



Title: Saturated HC (FID) and Biomarkers (MSD)

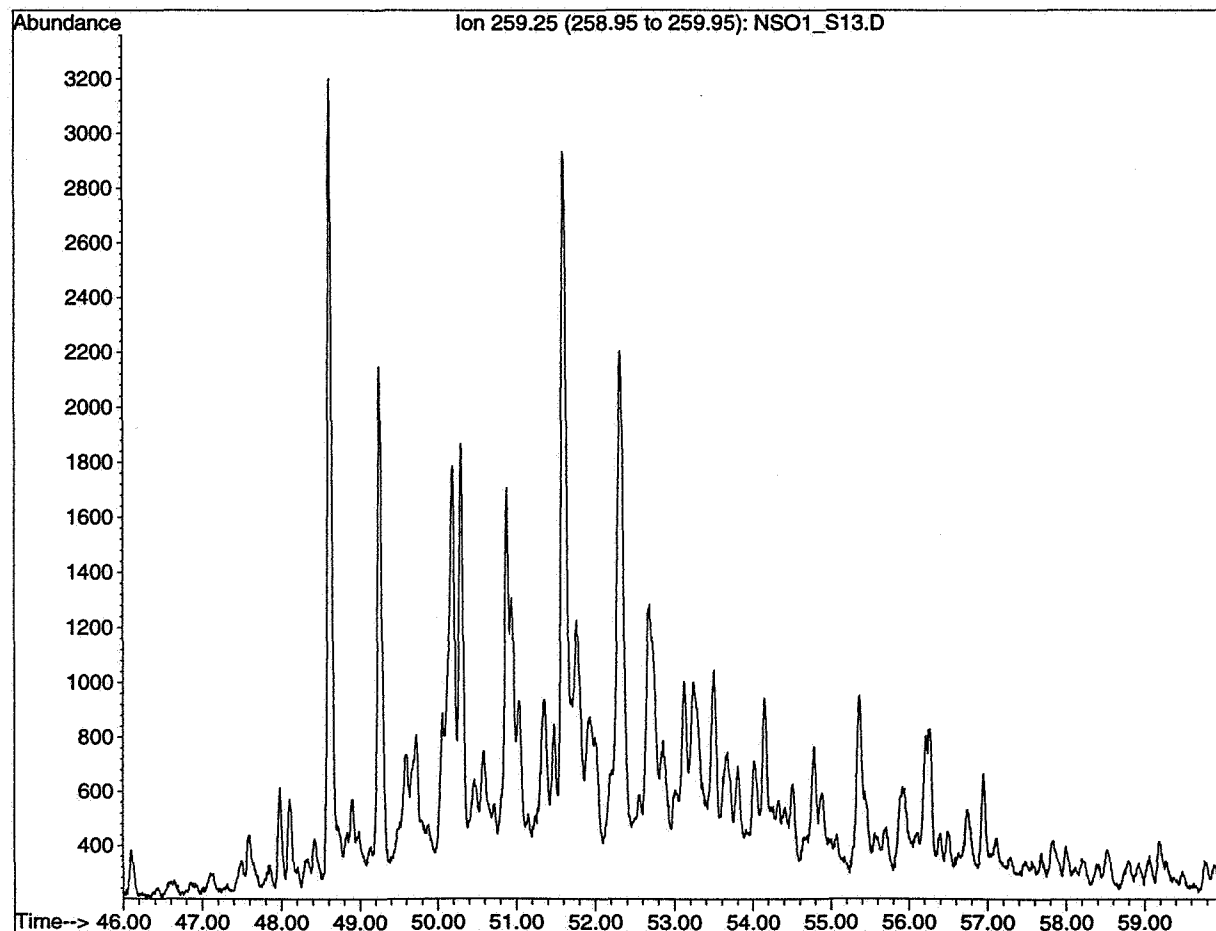
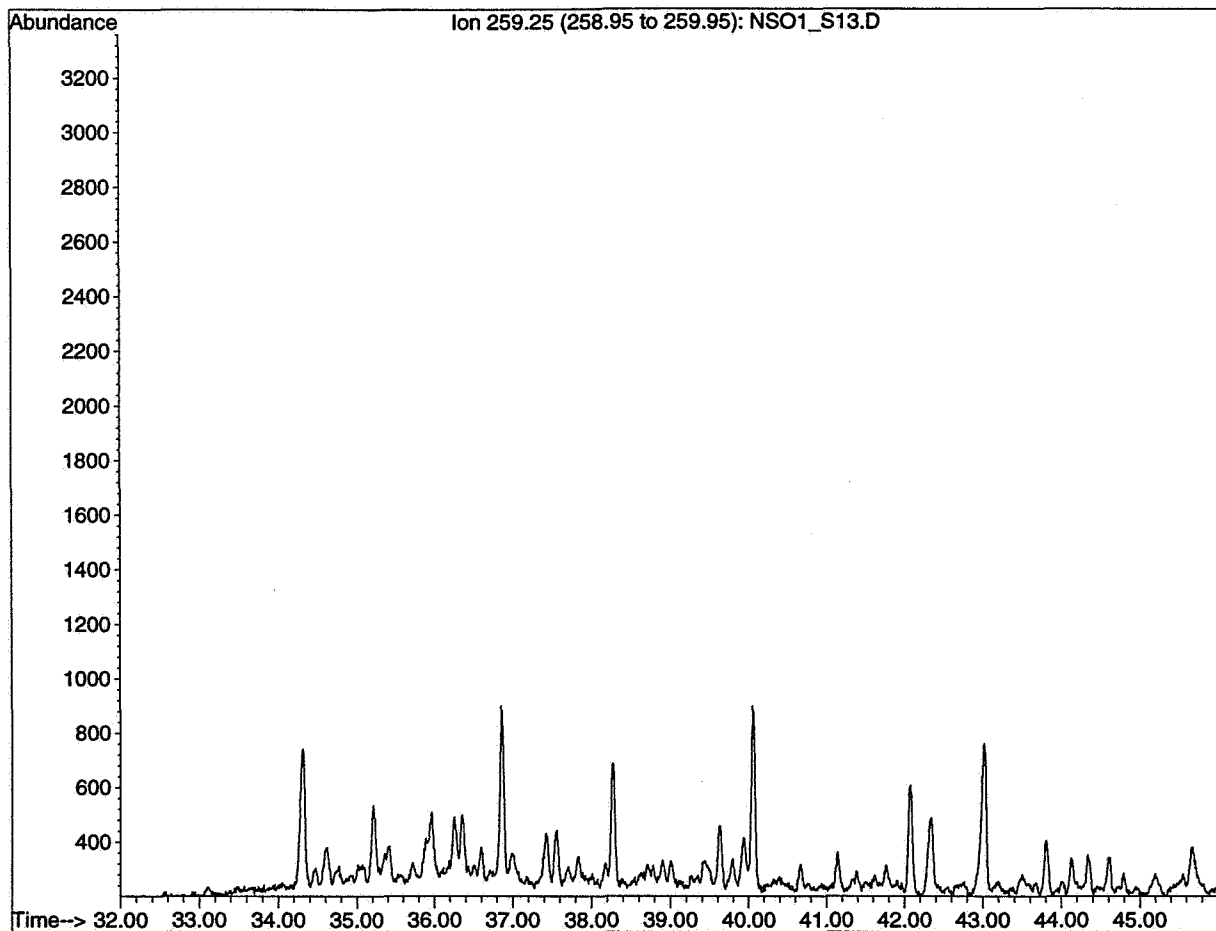
Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_S13.D Name: ns01 ref. sample SAT #13

Misc:

Method: MSD\_S\_D

.....Operator: Andy

Date Reported: Thu Sep 24 08:44:24 1998





**Appendix III**

**Mass chromatograms and tabulated results from the GC-MSD analysis  
of the aromatic hydrocarbons**

#	Rt.min.	m/z	Rf.	Name	Height	Amount
					ng/mg	
<b>Internal standard (if added):</b>						
14)	11.49	136		d8N	53047	43
16)	20.92	164		d10BP	67609	42
59)	29.29	188		d10P	140073	43
79)	44.78	240		d12C	92559	43
<b>Aryl isoprenoids:</b>						
1)	20.59	133	0	C13AI	77	
2)	22.40	133	0	C14AI	217	
3)	26.75	133	0	C15AI	560	
4)	29.01	133	0	C16AI	123	
5)	31.04	133	0	C17AI	261	
6)	33.95	133	0	C18AI	1068	
7)	34.98	133	0	C19AI	866	
8)	38.08	133	0	C20AI	1075	
9)	40.00	133	0	C21AI	636	
10)	43.02	133	0	C22AI	197	
11)	44.99	133	0	C23AI	162	
12)	55.97	133	0	C30AI	1255	
13)	56.99	133	0	C31AI	255	
<b>Naphthalenes:</b>						
15)	11.58	128	a1	N	2170	2
17)	15.15	142	a2	2-MN	3947	2
18)	15.69	142	a2	1-MN	3073	2
19)	18.31	156	a3	2-EN	628	0
20)	18.43	156	a3	1-EN	394	0
21)	18.64	156	a3	2.6+2.7-DMN	1994	1
22)	19.11	156	a3	1.3+1.7-DMN	4055	2
23)	19.22	156	a3	1.6-DMN	3280	2
24)	19.71	156	a3	2.3+1.4-DMN	1863	1
25)	19.81	156	a3	1.5-DMN	877	0
26)	20.18	156	a3	1.2-DMN	1023	1
27)	21.87	170	a4	C3-N-1	430	0
28)	22.24	170	a4	C3-N-2	494	0
29)	22.36	170	a4	1.3.7-TMN	1647	1
30)	22.49	170	a4	1.3.6-TMN	2431	1
31)	22.97	170	a4	1.3.5+1.4.6-TMN	2557	1
32)	23.05	170	a4	2.3.6-TMN	1571	1
33)	23.47	170	a4	1.6.7+1.2.7-TMN	1671	1
34)	23.52	170	a4	1.2.6-TMN	1191	1
35)	23.95	170	a4	1.2.4-TMN	383	0
36)	24.15	170	a4	1.2.5-TMN	2331	1
<b>Biphenyls:</b>						
37)	17.87	154	a5	BP	1877	1
38)	21.15	168	a5	3-MBP	3076	1
39)	21.40	168	a5	4-MBP	1462	1
40)	21.47	182	a4	2.3'-DMBP	311	0
41)	21.67	182	a4	2.5'-DMBP	235	0
42)	21.84	182	a4	2.4+2.4'-DMBP	596	0
43)	22.46	182	a4	2.3'-DMBP	273	0
44)	23.83	182	a4	3-EBP	814	0
45)	24.16	182	a4	3.5'-DMBP	1296	1
46)	24.27	182	a4	3.3'-DMBP	2939	2
47)	24.38	182	a4	4-EBP	482	0
48)	24.56	182	a4	3.4'-DMBP	3730	2
49)	24.78	182	a4	4.4'-DMBP	1276	1
50)	25.32	182	a4	3.4'-DMBP	1401	1

**Aromatic hydrocarbons**  
GC/MS detection HP-6890/5973  
**Compound data**



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: A3085\_35.D  
Sample name: 35/11-11 3085.0m ARO  
Data File Path: C:\HPCHEM\1\DATA\ANDY1\  
Misc. info.:  
Vial no.: 29  
Method: MSD\_A\_D  
Operator: Andy  
Date: Fri Sep 18 11:33:43 1998  
Response curve: y = ax+b  
Response factor groups: a1...a11, responses as defined in method

#	Rt.min.	m/z	Rf.	Name	Height	Amount
					ng/mg	
<b>Dibenzofuranes:</b>						
51)	22.03	168	a5	DBF	1944	1
52)	25.11	182	a4	MDBF-1	2382	1
53)	25.46	182	a4	MDBF-2	2076	1
54)	25.77	182	a4	MDBF-3	1252	1
<b>Fluorenes:</b>						
55)	23.99	166	a6	F	2830	1
56)	27.19	180	a6	C1-F-1	1351	1
57)	27.43	180	a6	C1-F-2	4134	2
58)	27.74	180	a6	1-MF	1015	0
<b>Dibenzothiophenes:</b>						
60)	28.68	184	a7	DBT	1562	0
61)	31.29	198	a7	4-MDBT	5503	0
62)	31.82	198	a7	3+2-MDBT	801	0
63)	32.39	198	a7	1-MDBT	1731	0
<b>Phenanthrenes:</b>						
64)	29.39	178	a8	P	17793	5
65)	32.34	192	a9	3-MP	5615	2
66)	32.47	192	a9	2-MP	6330	2
67)	32.95	192	a9	9-MP	8526	3
68)	33.07	192	a9	1-MP	6193	2
69)	35.13	206	a10	2EP+9EP+3.6-DMP	1481	0
70)	35.40	206	a10	1EP	2025	1
71)	35.52	206	a10	2.6+2.7+3.5-DMP	1398	0
72)	35.80	206	a10	1.3+2.10+3.9+3.10-DMP	13528	4
73)	35.90	206	a10	1.6+2.5+2.9-DMP	7004	2
74)	36.03	206	a10	1.7-DMP	4132	1
75)	36.17	206	a10	2.3-DMP	1763	1
76)	36.28	206	a10	1.9+4.9+4.10-DMP	2725	1
77)	36.59	206	a10	1.8-DMP	1153	0
<b>Retene:</b>						
78)	39.90	219	a8	Retene	4466	1
<b>Triaromatic steroids:</b>						
80)	44.38	231	a11	20TA	2178	0
81)	46.26	231	a11	21TA	1810	0
82)	53.26	231	a11	S26TA	3349	0
83)	54.47	231	a11	R26TA/S27TA	10666	1
84)	55.45	231	a11	S28TA	7668	1
85)	55.96	231	a11	R27TA	5260	1
86)	57.18	231	a11	R28TA	8025	1

### Aromatic hydrocarbons

GC/MS detection HP-6890/5973

Ratios, from heights and amounts



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: A3085\_35.D  
Sample name: 35/11-11 3085.0m ARO  
Data File Path: C:\HPCHEM\1\DATA\ANDY\1\  
Misc. info.:

Vial no.: 29  
Method: MSD\_A\_D  
Operator: Andy  
Date: Fri Sep 18 11:33:43 1998

Aromatic HC ratios, heights and amounts		Height	Amount
Naphthalene	Naphthalene	2170	2
C1 Naphthanes	Sum C1 Naphthanes	7020	4
C2 Naphthanes	Sum C2 Naphthanes	14114	8
C3 Naphthanes	Sum C3 Naphthanes	14706	8
Phenanthrene	Phenanthrene	17793	5
C1 Phenanthrenes	Sum C1 Phenanthrenes	26664	8
C2 Phenanthrenes	Sum C2 Phenanthrenes	35209	10
3/2*(3MP+2MP)/(P+9MP+1MP)	MPI1	0.6	0.6
(3MP+2MP)/(3MP+2MP+9MP+1MP)	F1	0.4	0.4
2MP/(3MP+2MP+9MP+1MP)	F2	0.2	0.2
(2.6+2.7)DMN/1.5DMN	DNR	2.3	2.3
100*20TA/(20TA+S28TA+R28TA)	%-TAS'n	12.2	12.2
DBT/P	DBT/P	0.1	0.0
F/P	F/P	0.2	0.3
BP/1.6DMN	BP/1.6DMN	0.6	0.4
2MN/1MN	2MN/1MN	1.3	1.3
2EN/1EN	2EN/1EN	1.6	1.6
4MDBT/1MDBT	4MDBT/1MDBT	3.2	3.2

Title: ARO HC (MSD)

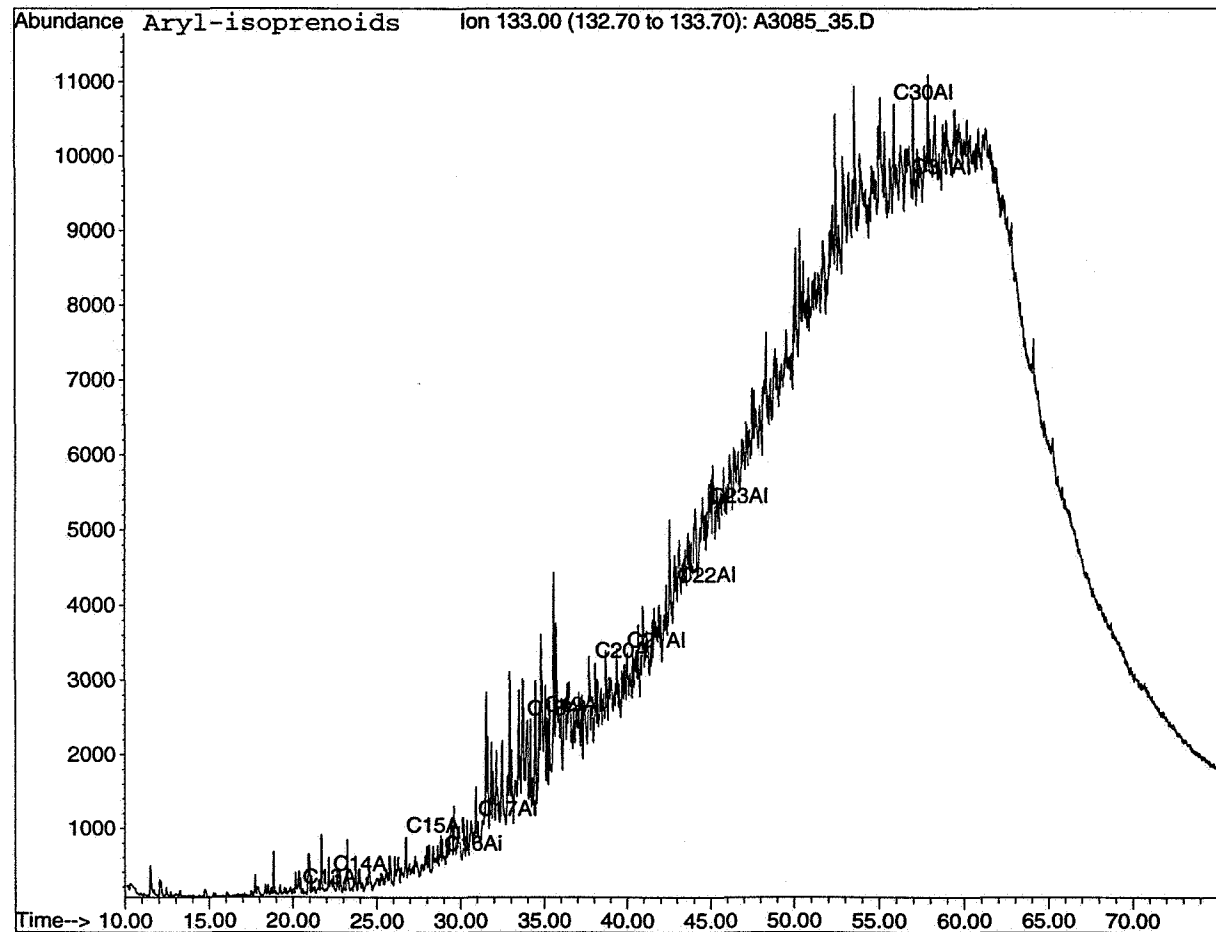
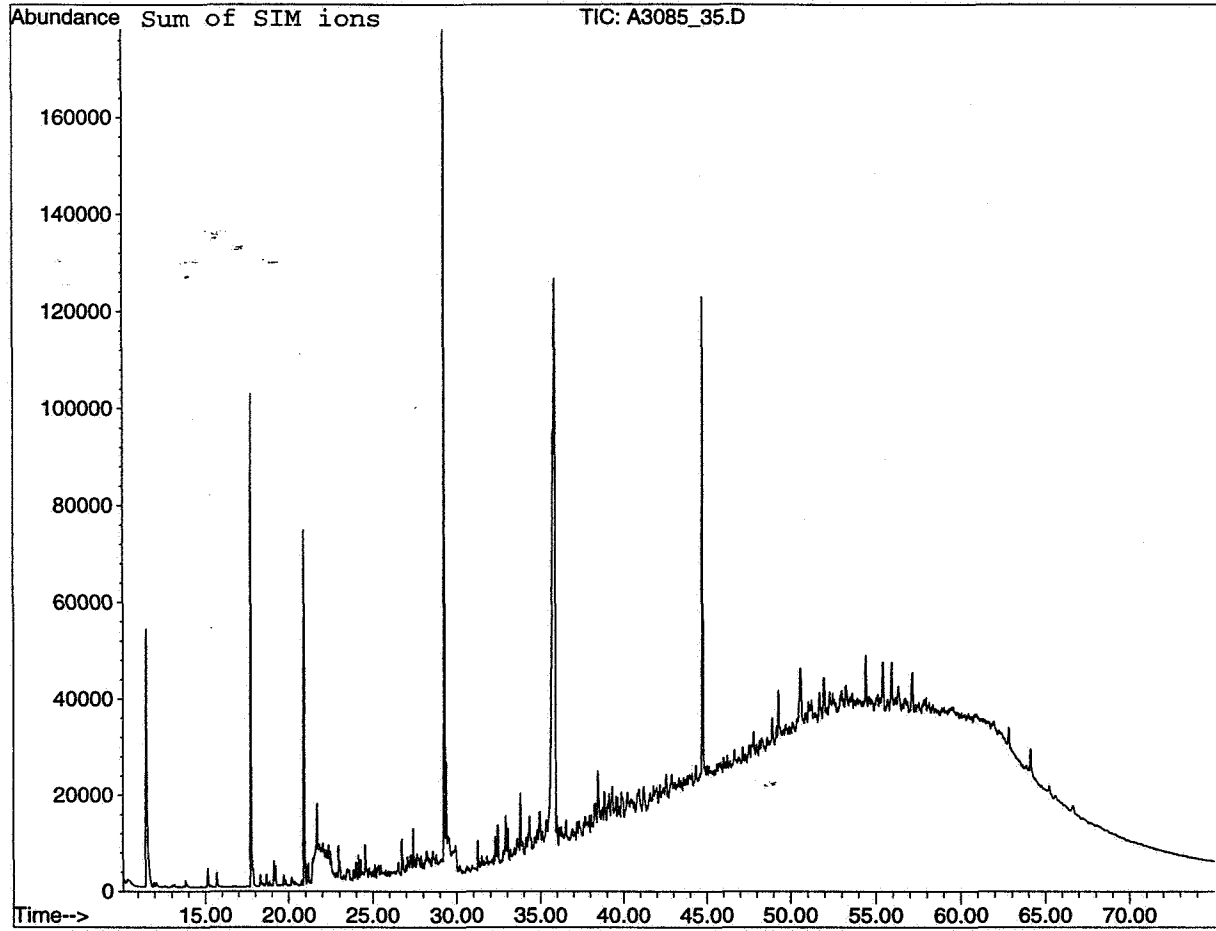
Data File: C:\HPCHEM\1\DATA\ANDY1\A3085\_35.D Name: 35/11-11 3085.0m ARO

Misc:

Method: MSD\_A\_D

.....Operator: Andy

Date Reported: Thu Sep 24 10:32:53 1998



Title: ARO HC (MSD)

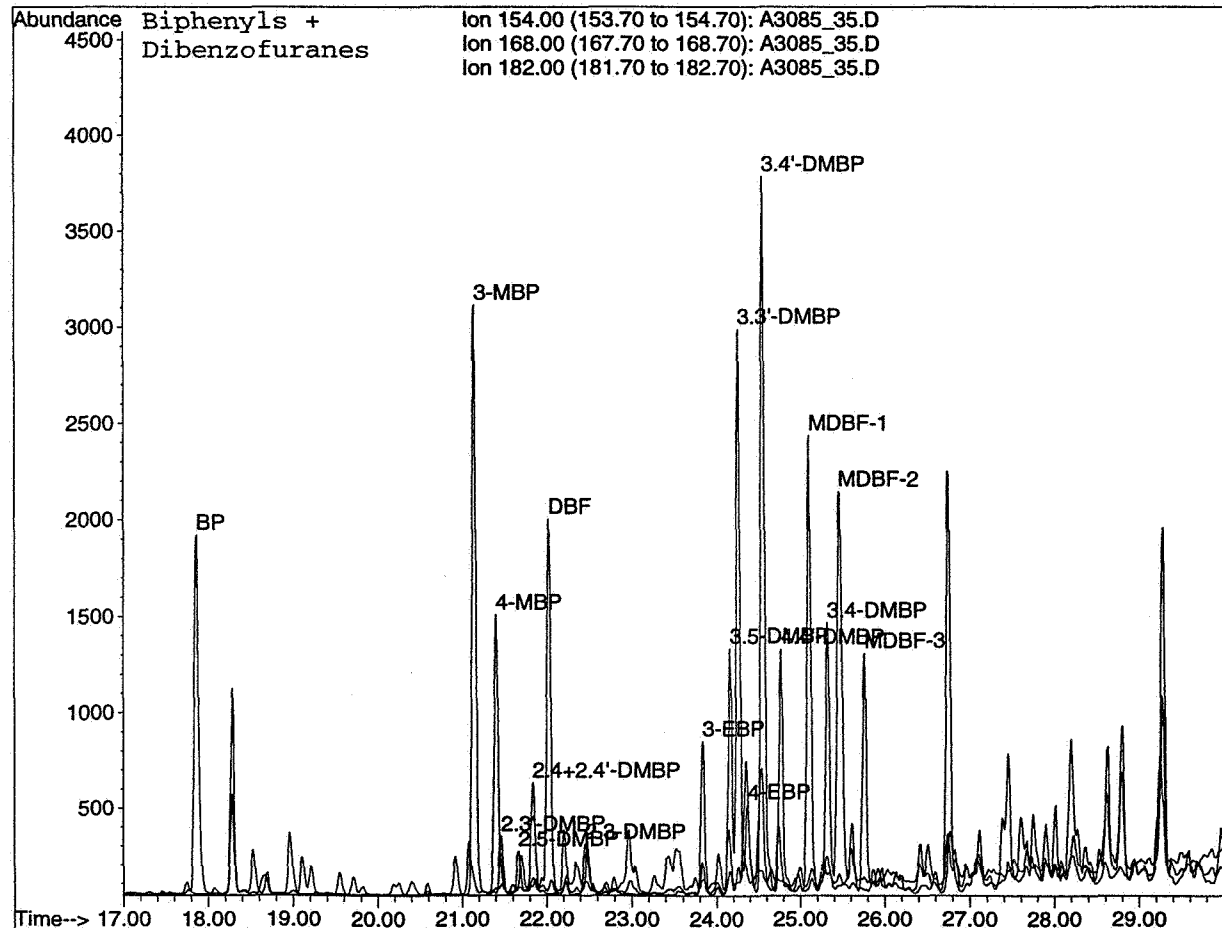
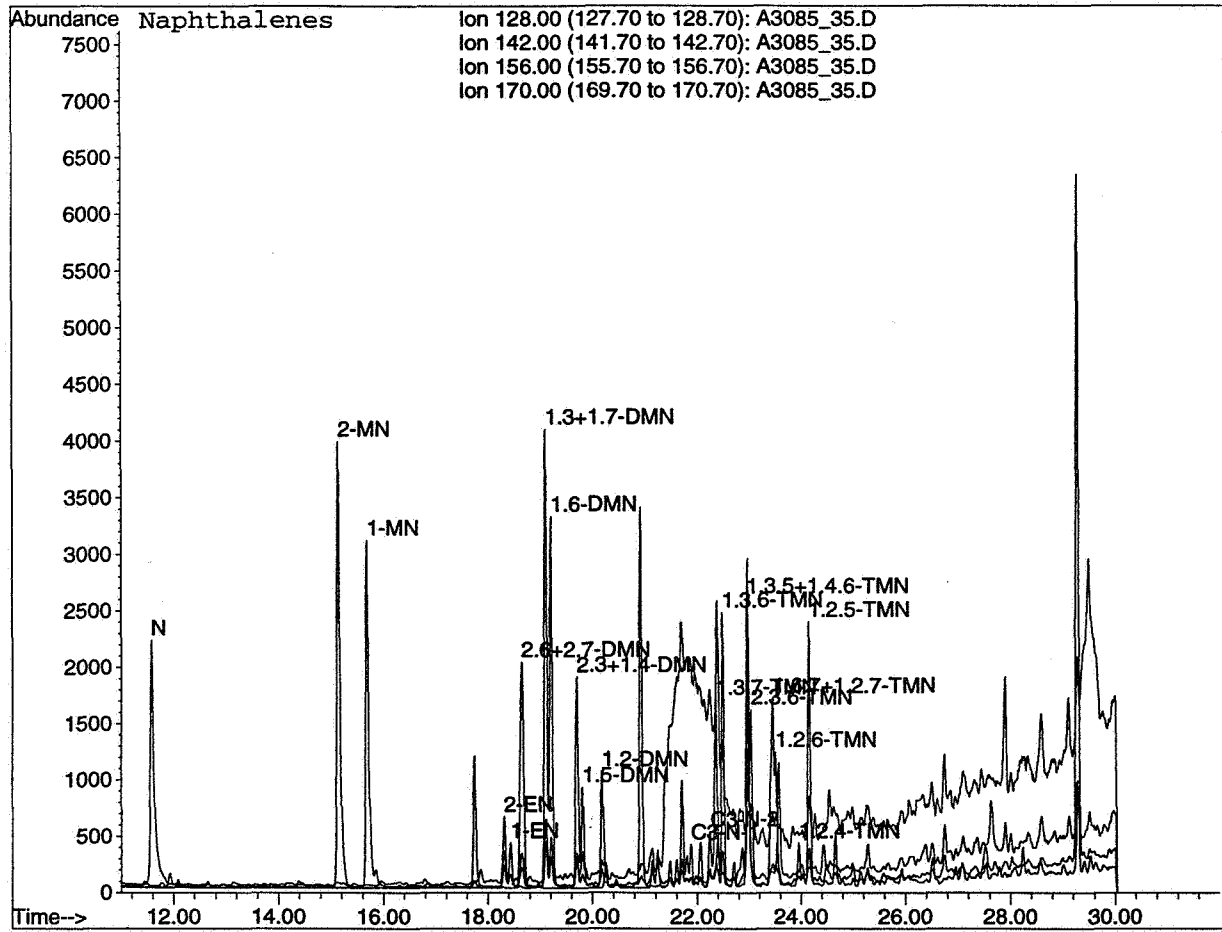
Data File: C:\HPCHEM\1\DATA\ANDY1\A3085\_35.D Name: 35/11-11 3085.0m ARO

Misc:

Method: MSD\_A\_D

.....Operator: Andy

Date Reported: Thu Sep 24 10:32:59 1998



Title: ARO HC (MSD)

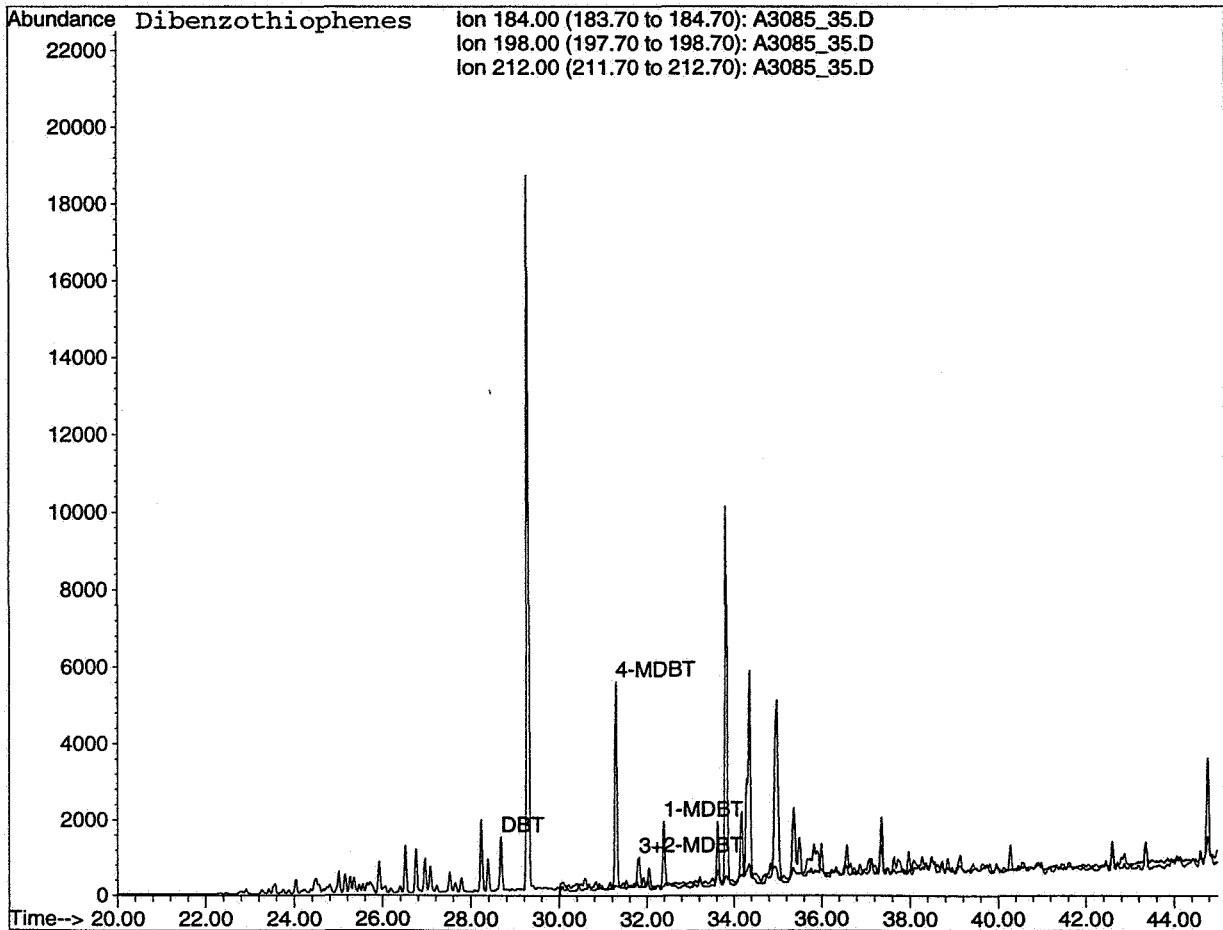
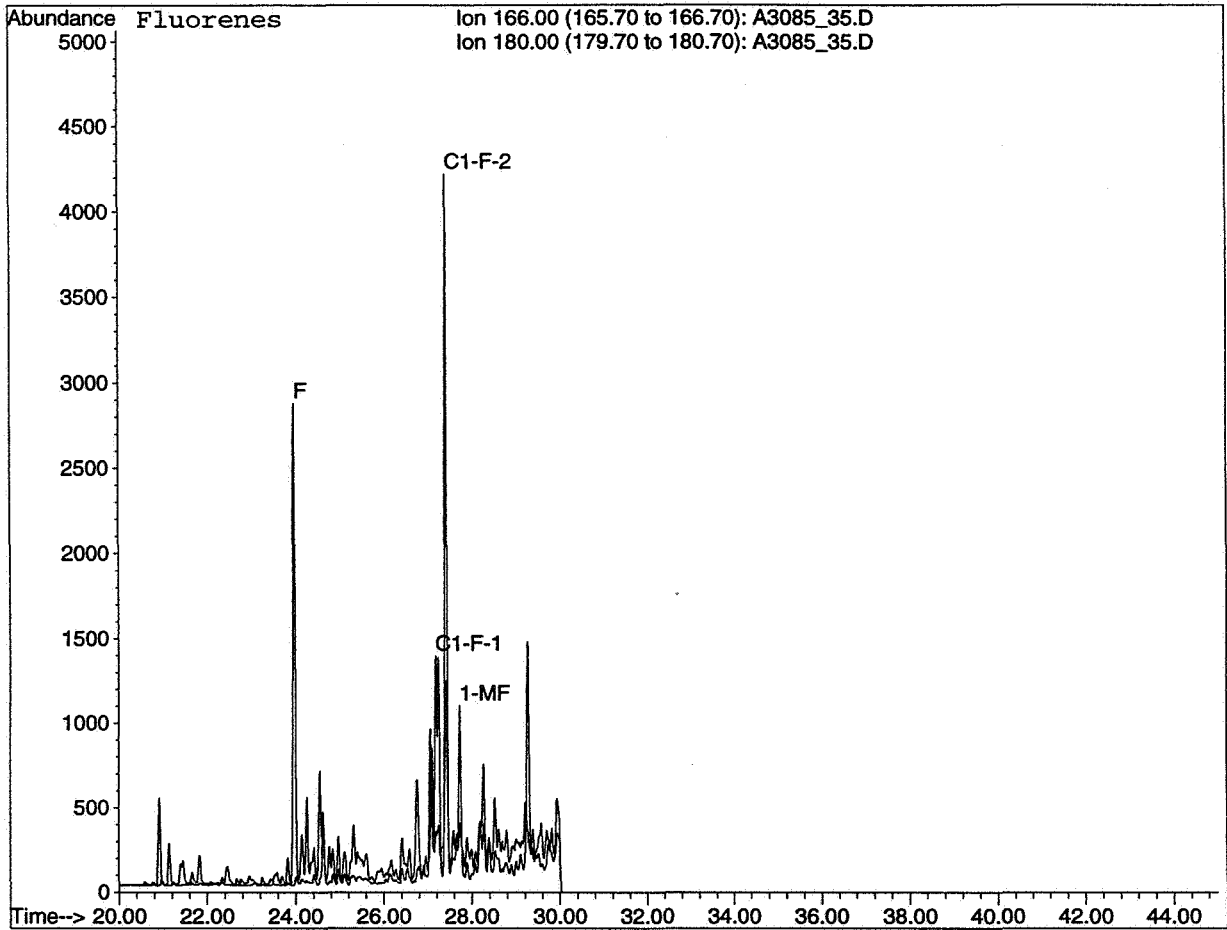
Data File: C:\HPCHEM\1\DATA\ANDY1\A3085\_35.D Name: 35/11-11 3085.0m ARO

Misc:

Method: MSD\_A\_D

.....Operator: Andy

Date Reported: Thu Sep 24 10:33:31 1998



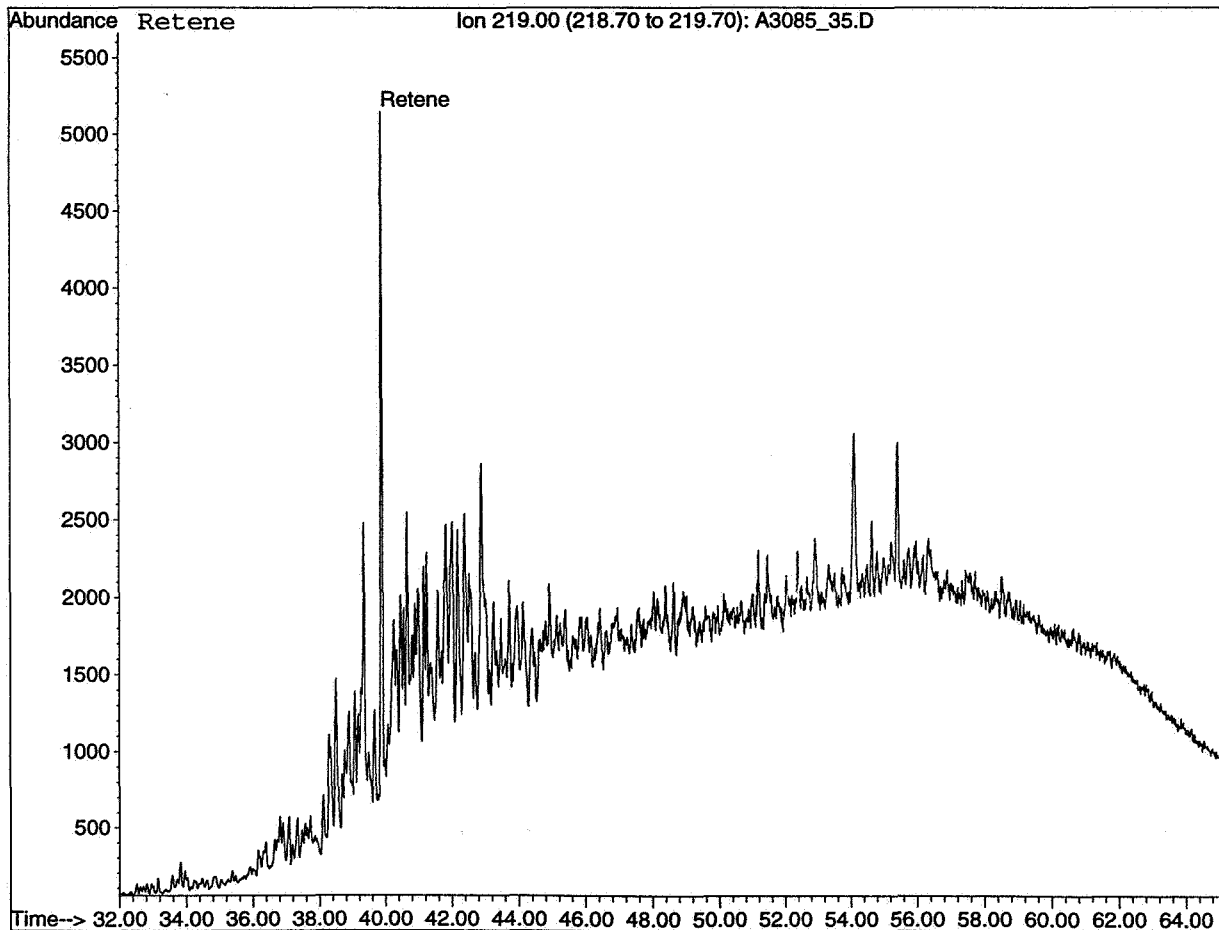
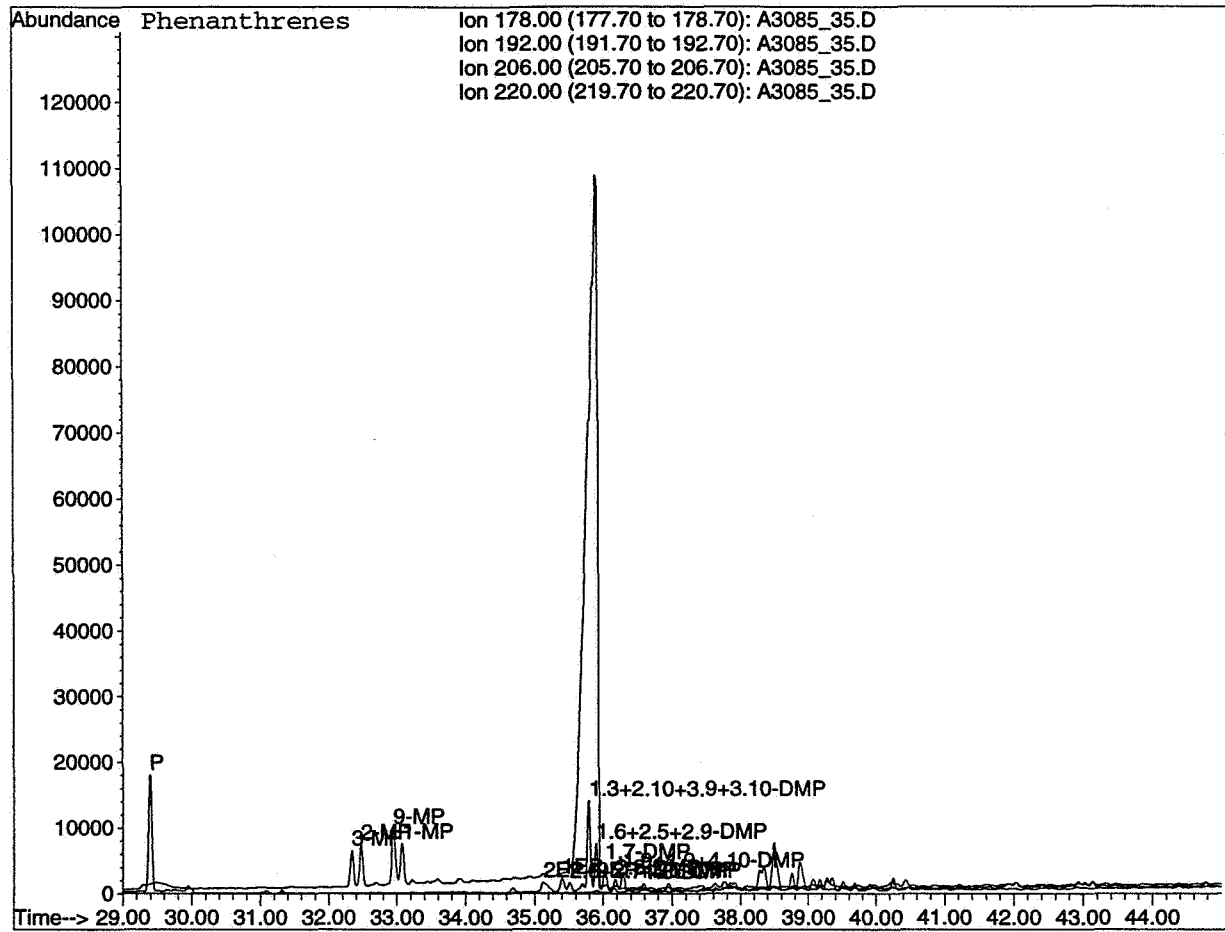
Title: ARO HC (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\A3085\_35.D Name: 35/11-11 3085.0m ARO

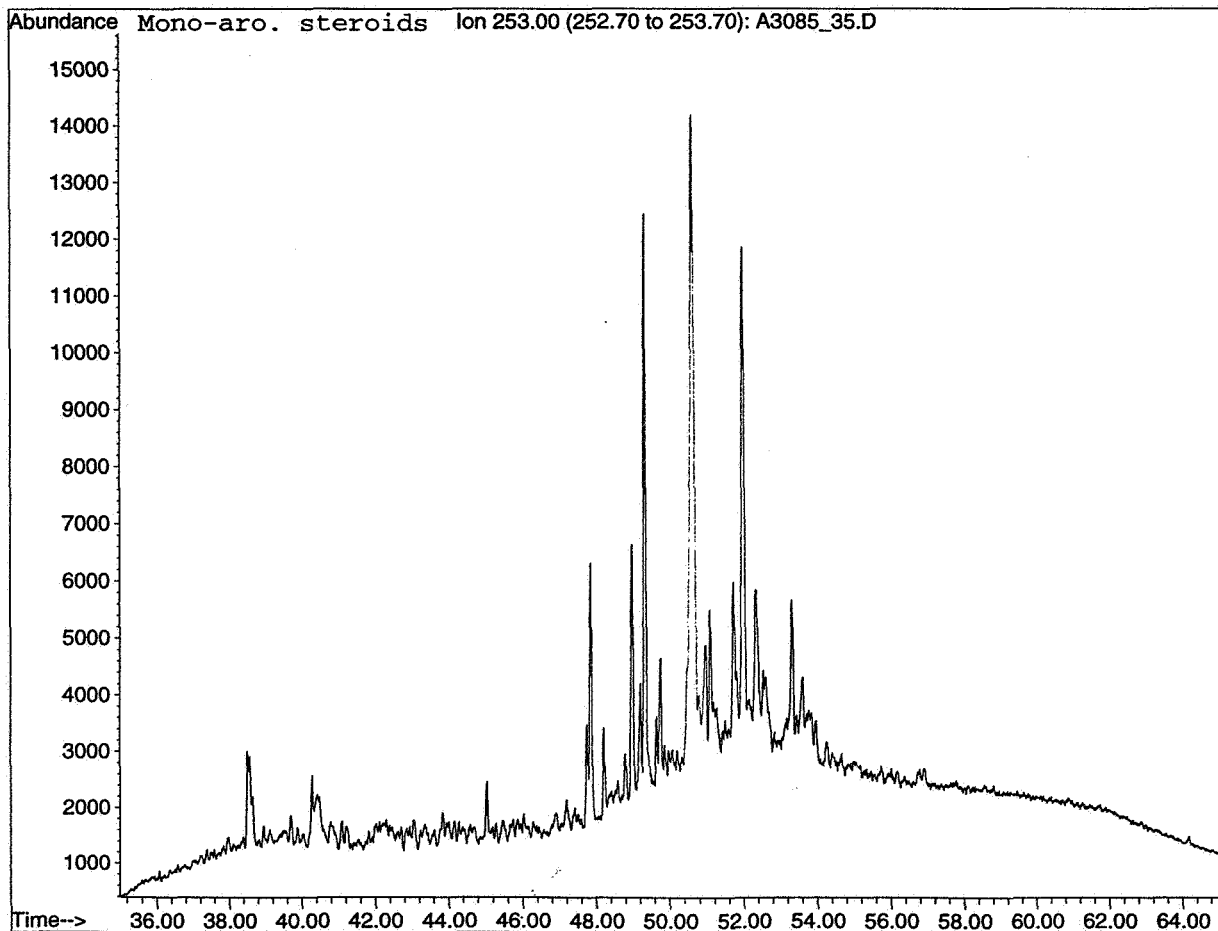
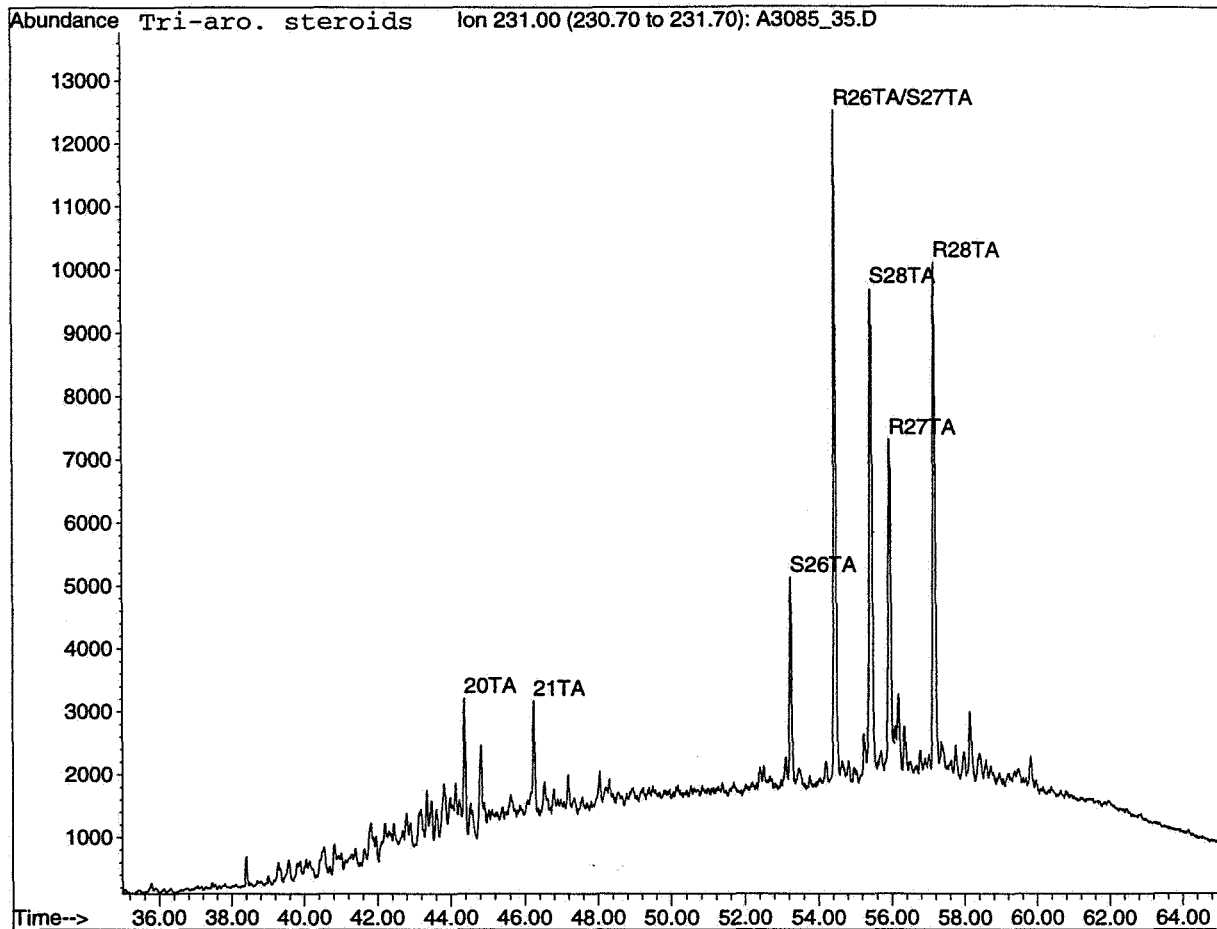
Misc:

Method: MSD\_A\_D .....Operator: Andy

Date Reported: Thu Sep 24 10:33:52 1998



Title: ARO HC (MSD)  
Data File: C:\HPCHEM\1\DATA\ANDY1\A3085\_35.D Name: 35/11-11 3085.0m ARO  
Misc:  
Method: MSD\_A\_D .....Operator: Andy  
Date Reported: Thu Sep 24 10:34:14 1998





#	Rt.min.	m/z	Rf.	Name	Height	Amount
						ng/mg
Internal standard (if added):						
14)	11.50	136		d3N	61215	42
16)	20.92	164		d10BP	71887	40
59)	29.28	188		d10P	138923	42
79)	44.72	240		d12C	102781	42

#### Aryl isoprenoids:

1)	20.59	133	0	C13AI	19	
2)	22.41	133	0	C14AI	16	
3)	26.69	133	0	C15AI	17	
4)	29.01	133	0	C16AI	14	
5)	30.97	133	0	C17AI	5	
6)	34.09	133	0	C18AI	46	
7)	35.00	133	0	C19AI	8	
8)	37.96	133	0	C20AI	6	
9)	39.97	133	0	C21AI	17	
10)	43.01	133	0	C22AI	7	
11)	45.00	133	0	C23AI	8	
12)	55.97	133	0	C30AI	16	
13)	56.98	133	0	C31AI	13	

#### Naphthalenes:

15)	11.58	128	a1	N	4399	3
17)	15.14	142	a2	2-MN	5480	3
18)	15.69	142	a2	1-MN	4202	2
19)	18.31	156	a3	2-EN	453	0
20)	18.43	156	a3	1-EN	337	0
21)	18.64	156	a3	2.6+2.7-DMN	1292	1
22)	19.11	156	a3	1.3+1.7-DMN	2230	1
23)	19.20	156	a3	1.6-DMN	1749	1
24)	19.71	156	a3	2.3+1.4-DMN	1088	1
25)	19.81	156	a3	1.5-DMN	523	0
26)	20.19	156	a3	1.2-DMN	555	0
27)	21.87	170	a4	C3-N-1	121	0
28)	22.23	170	a4	C3-N-2	177	0
29)	22.34	170	a4	1.3.7-TMN	324	0
30)	22.48	170	a4	1.3.6-TMN	569	0
31)	22.97	170	a4	1.3.5+1.4.6-TMN	494	0
32)	23.04	170	a4	2.3.6-TMN	326	0
33)	23.45	170	a4	1.6.7+1.2.7-TMN	309	0
34)	23.51	170	a4	1.2.6-TMN	235	0
35)	23.95	170	a4	1.2.4-TMN	92	0
36)	24.15	170	a4	1.2.5-TMN	386	0

#### Biphenyls:

37)	17.87	154	a5	BP	1066	0
38)	21.15	168	a5	3-MBP	684	0
39)	21.40	168	a5	4-MBP	268	0
40)	21.47	182	a4	2.3'-DMBP	26	0
41)	21.66	182	a4	2.5-DMBP	11	0
42)	21.83	182	a4	2.4+2.4'-DMBP	25	0
43)	22.45	182	a4	2.3-DMBP	136	0
44)	23.83	182	a4	3-EBP	58	0
45)	24.16	182	a4	3.5-DMBP	59	0
46)	24.26	182	a4	3.3'-DMBP	190	0
47)	24.37	182	a4	4-EBP	23	0
48)	24.56	182	a4	3.4'-DMBP	191	0
49)	24.77	182	a4	4.4'-DMBP	52	0
50)	25.32	182	a4	3.4-DMBP	62	0

## Aromatic hydrocarbons

GC/MS detection HP-6890/5973

### Compound data



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: A2551\_36.D  
Sample name: 35/11-11 mud 2551.0m ARO  
Data File Path: C:\HPCHEM\1\DATA\ANDY\1\  
Misc. info.:  
  
Vial no.: 30  
Method: MSD\_A\_D  
Operator: Andy  
Date: Fri Sep 18 13:02:23 1998

Response curve: y = ax+b  
Response factor groups: a1...a11, responses as defined in method

#	Rt.min.	m/z	Rf.	Name	Height	Amount
						ng/mg
<b>Dibenzofuranes:</b>						
51)	22.03	168	a5	DBF	611	0
52)	25.10	182	a4	MDBF-1	258	0
53)	25.47	182	a4	MDBF-2	231	0
54)	25.77	182	a4	MDBF-3	147	0
<b>Fluorenes:</b>						
55)	23.98	166	a6	F	511	0
56)	27.19	180	a6	C1-F-1	61	0
57)	27.43	180	a6	C1-F-2	235	0
58)	27.74	180	a6	1-MF	49	0
<b>Dibenzothiophenes:</b>						
60)	28.67	184	a7	DBT	368	0
61)	31.28	198	a7	4-MDBT	222	0
62)	31.81	198	a7	3+2-MDBT	90	0
63)	32.38	198	a7	1-MDBT	171	0
<b>Phenanthrenes:</b>						
64)	29.39	178	a8	P	3717	1
65)	32.33	192	a9	3-MP	495	0
66)	32.46	192	a9	2-MP	579	0
67)	32.94	192	a9	9-MP	808	0
68)	33.07	192	a9	1-MP	640	0
69)	35.04	206	a10	2EP+9EP+3.6-DMP	123	0
70)	35.27	206	a10	1EP	116	0
71)	35.36	206	a10	2.6+2.7+3.5-DMP	94	0
72)	35.70	206	a10	1.3+2.10+3.9+3.10-DMP	481	0
73)	35.85	206	a10	1.6+2.5+2.9-DMP	318	0
74)	35.99	206	a10	1.7-DMP	332	0
75)	36.15	206	a10	2.3-DMP	80	0
76)	36.25	206	a10	1.9+4.9+4.10-DMP	147	0
77)	36.55	206	a10	1.8-DMP	86	0
<b>Retene:</b>						
78)	39.86	219	a8	Retene	402	0
<b>Triaromatic steroids:</b>						
80)	44.33	231	a11	20TA	61	0
81)	46.20	231	a11	21TA	54	0
82)	53.15	231	a11	S26TA	51	0
83)	54.35	231	a11	R26TA/S27TA	146	0
84)	55.36	231	a11	S28TA	64	0
85)	55.87	231	a11	R27TA	83	0
86)	57.08	231	a11	R28TA	62	0

**Aromatic hydrocarbons**

GC/MS detection HP-6890/5973

Ratios, from heights and amounts


 Norsk Hydro E&P Research Centre, Bergen, Norway  
 Petroleum Geochemistry Laboratories

 Data file name: A2551\_36.D  
 Sample name: 35/11-11 mud 2551.0m ARO  
 Data File Path: C:\HPCHEM\1\DATA\ANDY1\  
 Misc. info.:

 Vial no.: 30  
 Method: MSD\_A\_D  
 Operator: Andy  
 Date: Fri Sep 18 13:02:23 1998
**Aromatic HC ratios, heights and amounts**

		Height	Amount
Naphthalene	Naphthalene	4399	3
C1 Naphthanes	Sum C1 Naphthanes	9682	5
C2 Naphthanes	Sum C2 Naphthanes	8227	4
C3 Naphthanes	Sum C3 Naphthanes	3033	2
Phenanthrene	Phenanthrene	3717	1
C1 Phenanthrenes	Sum C1 Phenanthrenes	2522	1
C2 Phenanthrenes	Sum C2 Phenanthrenes	1777	1
$3/2 \cdot (3MP+2MP)/(P+9MP+1MP)$	MPI1	0.3	0.3
$(3MP+2MP)/(3MP+2MP+9MP+1MP)$	F1	0.4	0.4
$2MP/(3MP+2MP+9MP+1MP)$	F2	0.2	0.2
$(2.6+2.7)DMN/1.5DMN$	DNR	2.5	2.5
$100 \cdot 20TA/(20TA+S28TA+R28TA)$	%-TAS'n	32.6	32.6
DBT/P	DBT/P	0.1	0.0
F/P	F/P	0.1	0.2
BP/1.6DMN	BP/1.6DMN	0.6	0.4
2MN/1MN	2MN/1MN	1.3	1.3
2EN/1EN	2EN/1EN	1.3	1.3
4MDBT/1MDBT	4MDBT/1MDBT	1.3	1.3

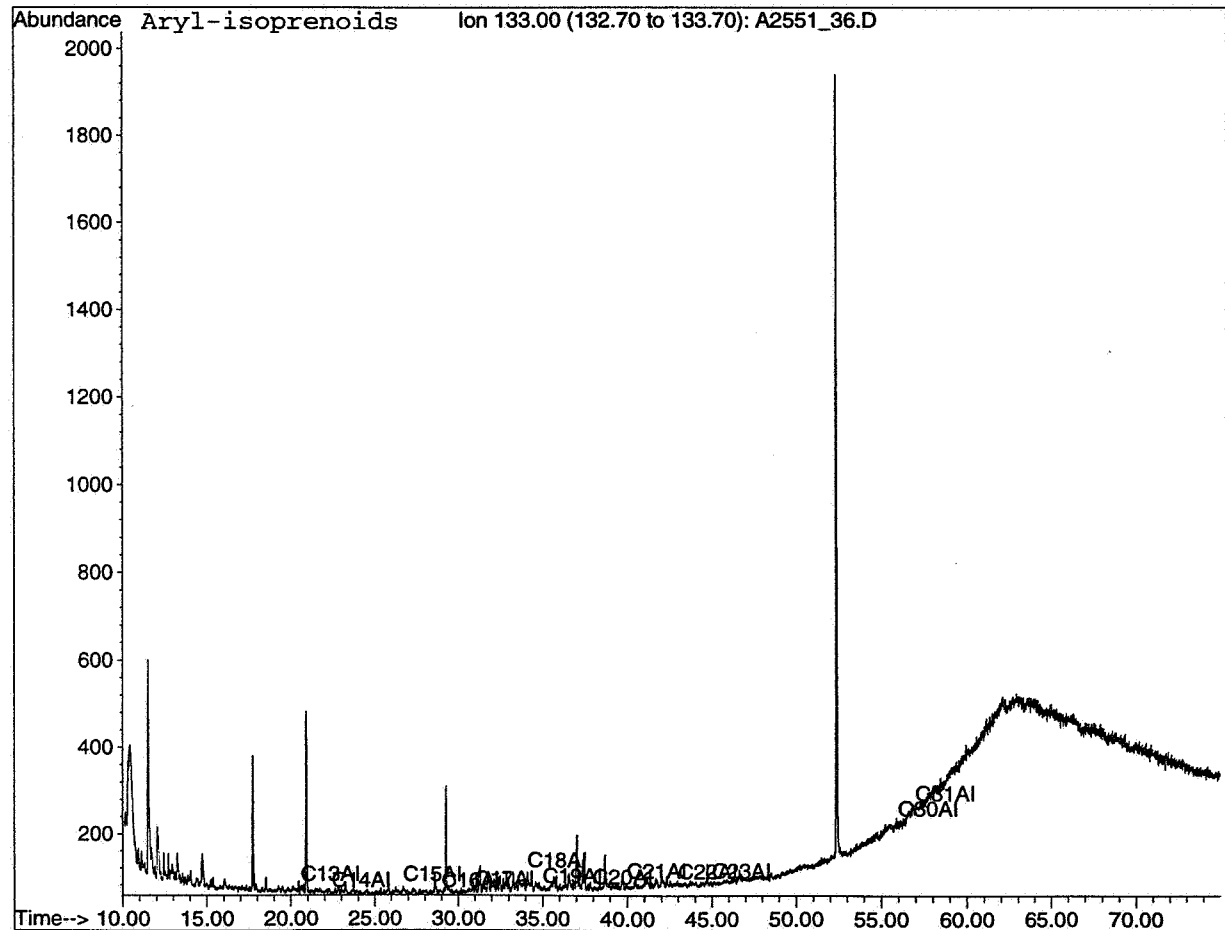
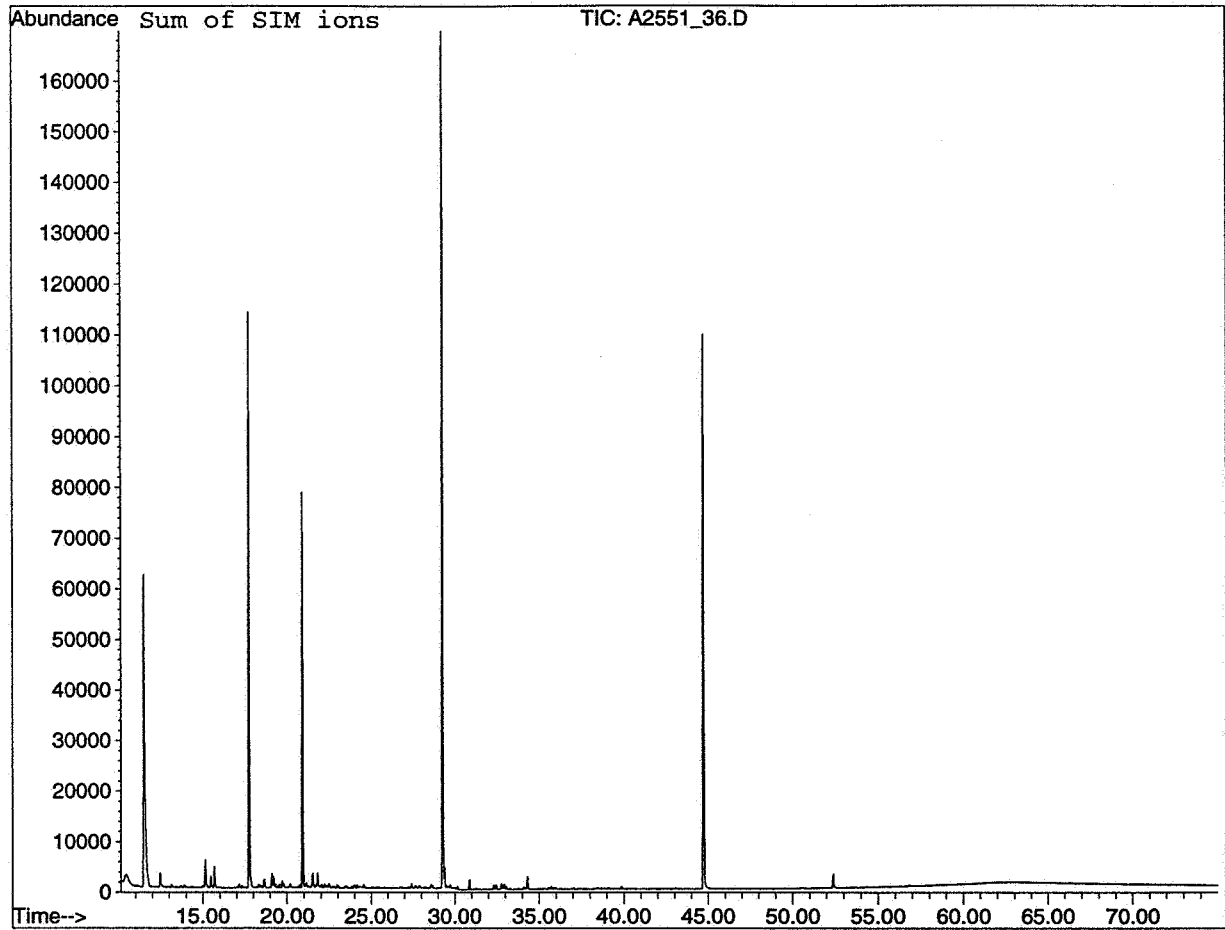
Title: ARO HC (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\A2551\_36.D Name: 35/11-11 mud 2551.0m ARO

Misc:

Method: MSD\_A\_D .....Operator: Andy

Date Reported: Thu Sep 24 11:21:10 1998



Title: ARO HC (MSD)

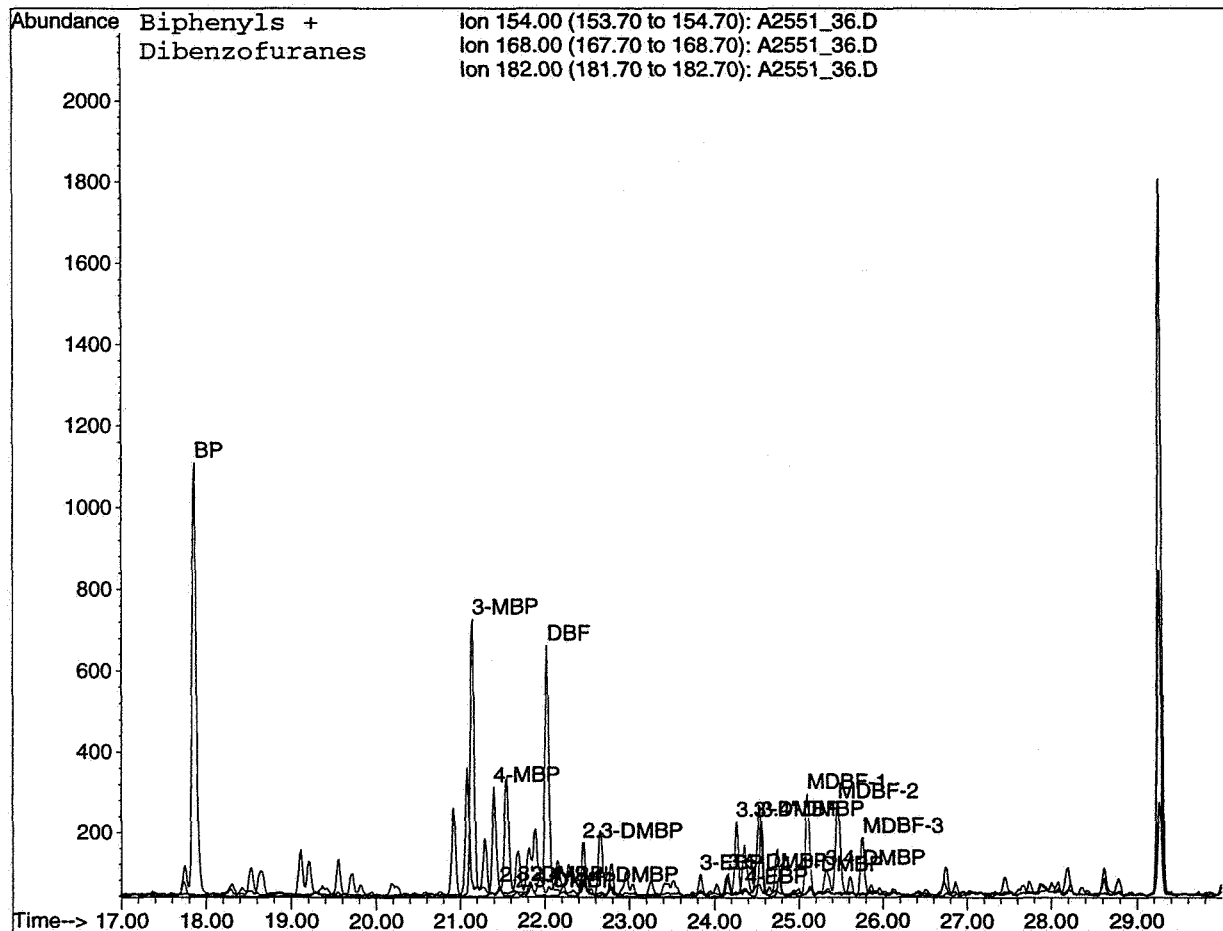
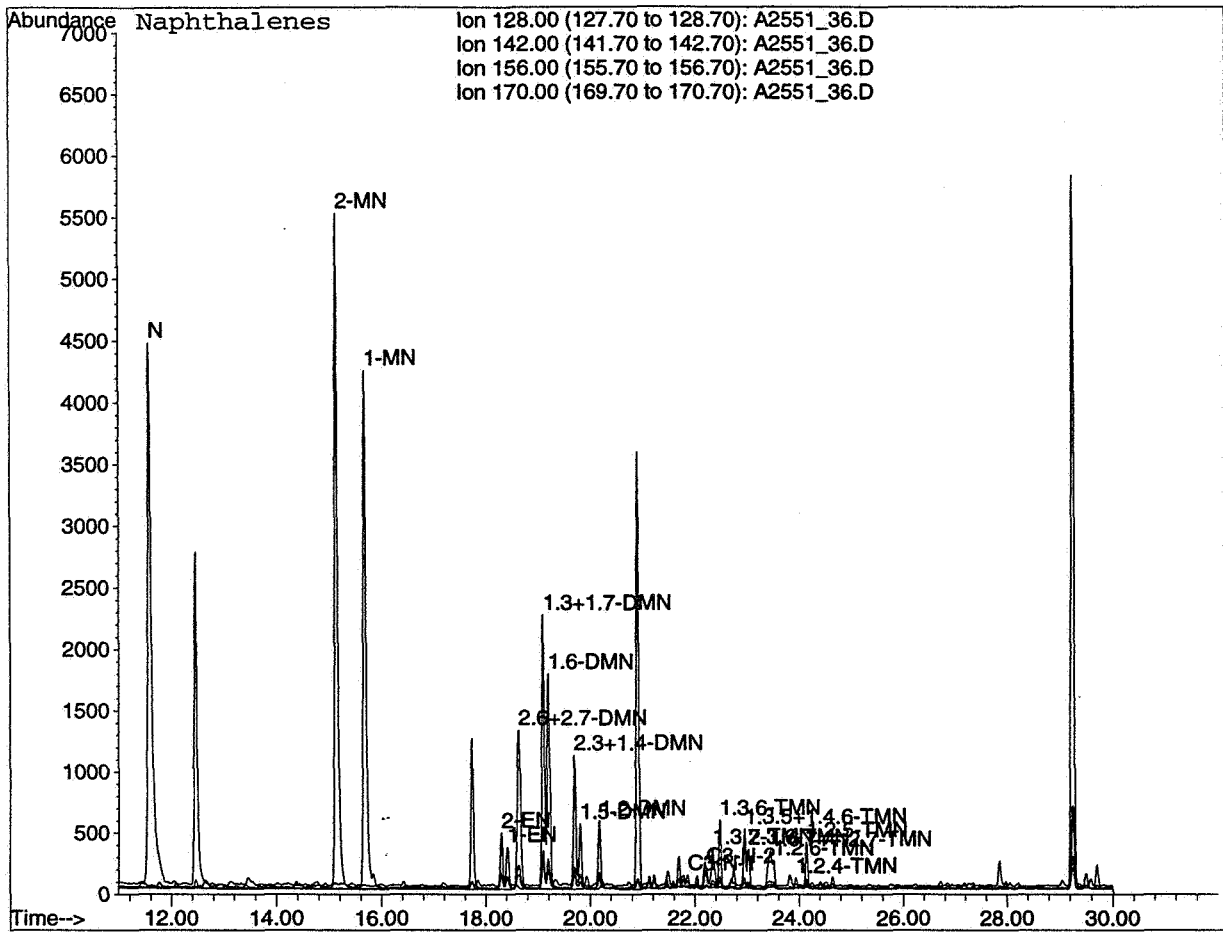
Data File: C:\HPCHEM\1\DATA\ANDY1\A2551\_36.D Name: 35/11-11 mud 2551.0m ARO

Misc:

Method: MSD\_A\_D

.....Operator: Andy

Date Reported: Thu Sep 24 11:21:17 1998



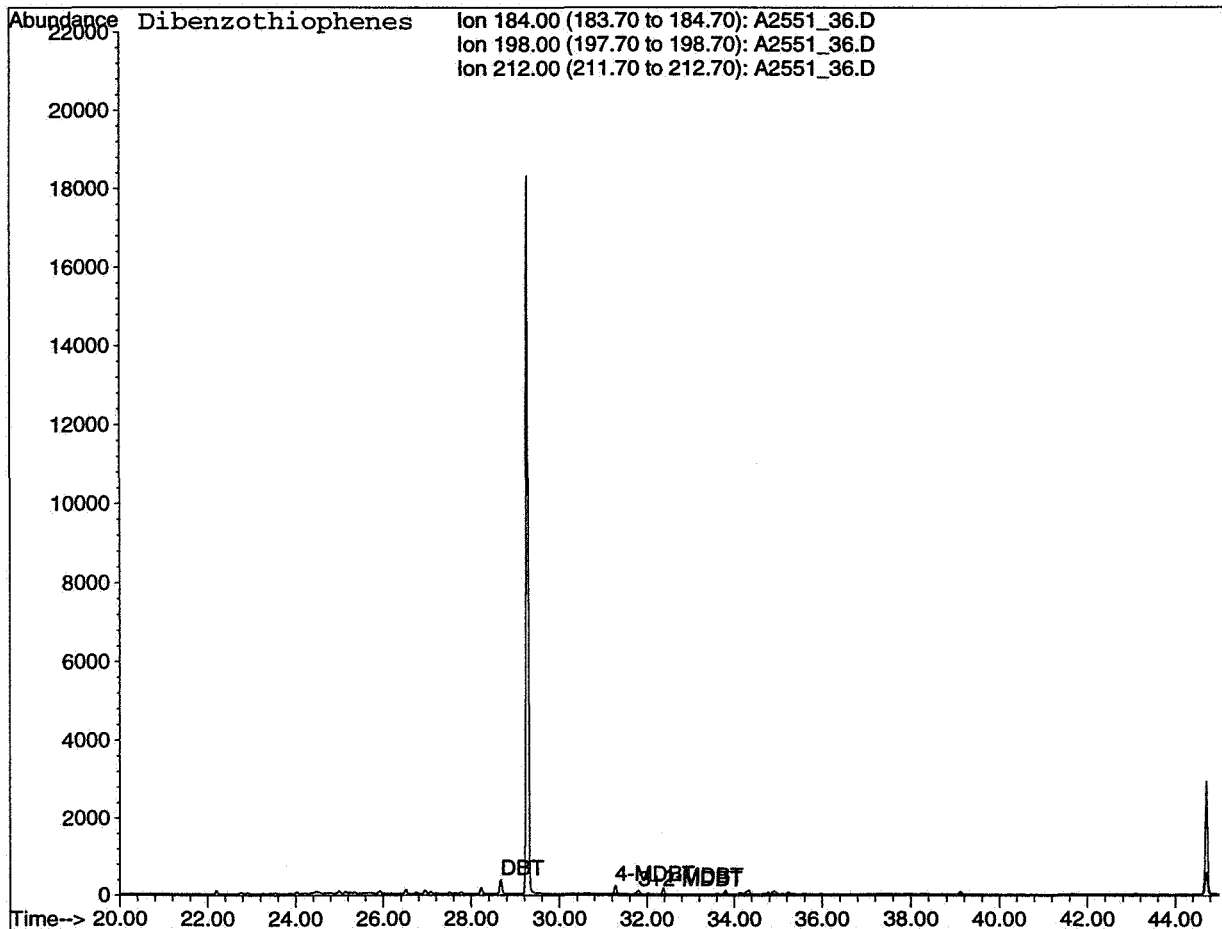
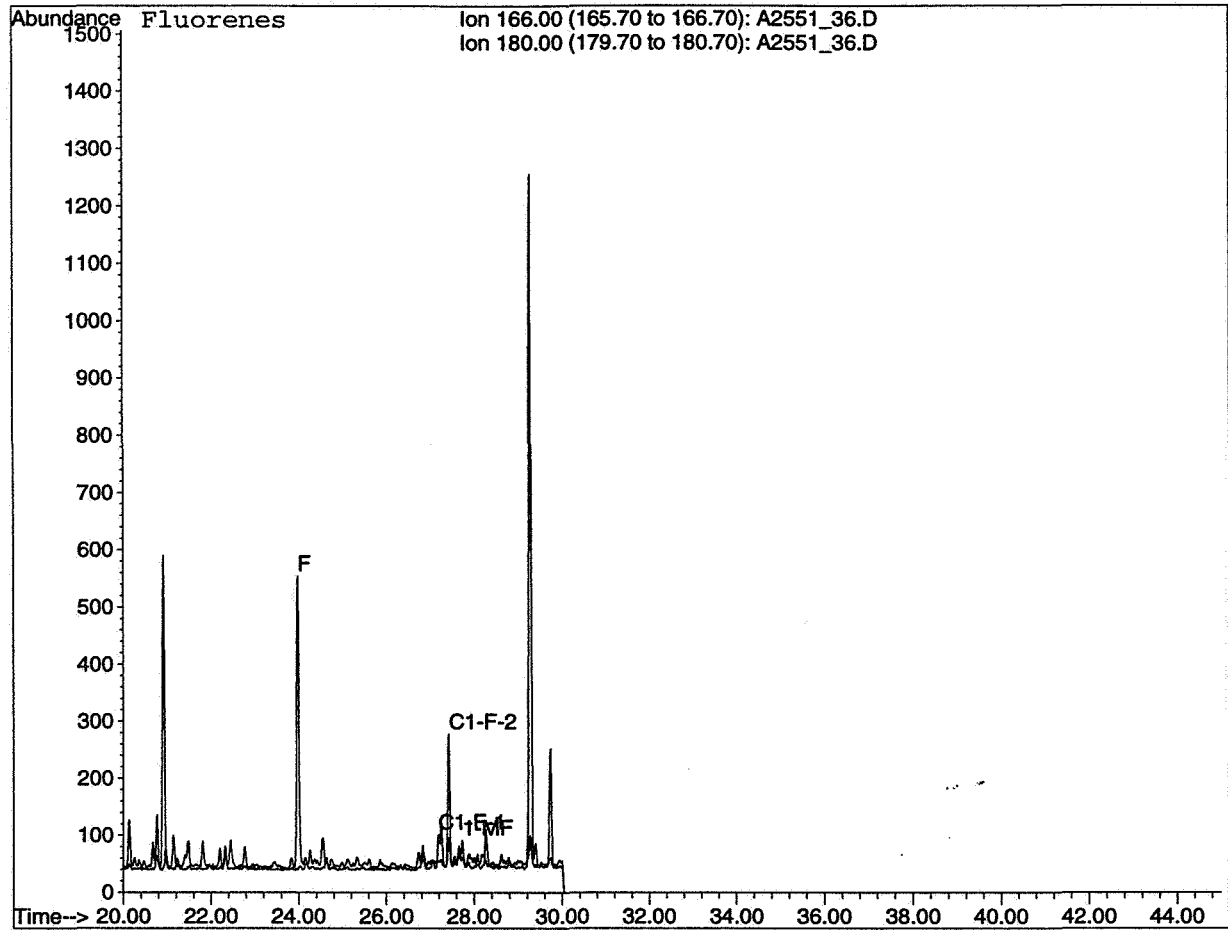
Title: ARO HC (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\A2551\_36.D Name: 35/11-11 mud 2551.0m ARO

Misc:

Method: MSD\_A\_D .....Operator: Andy

Date Reported: Thu Sep 24 11:21:48 1998



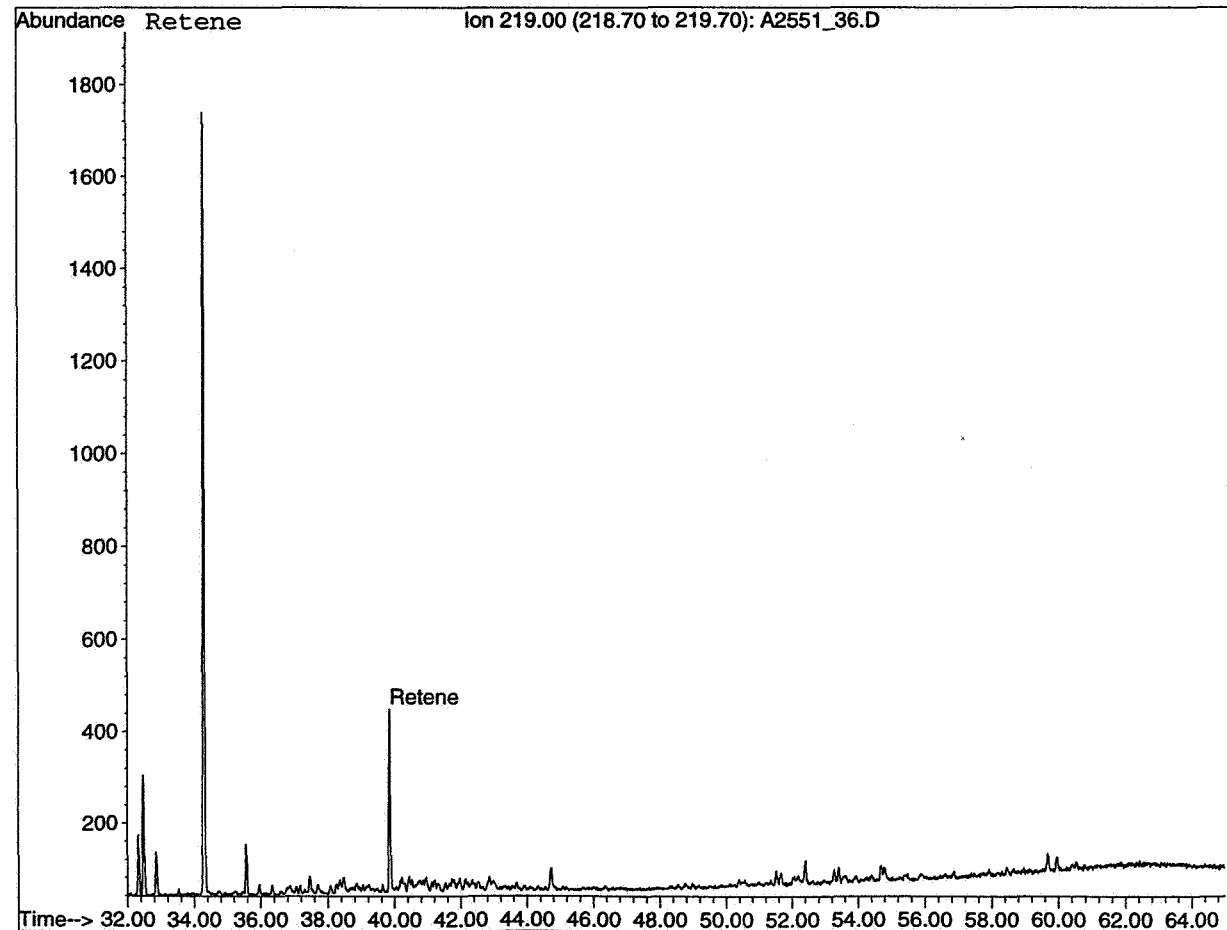
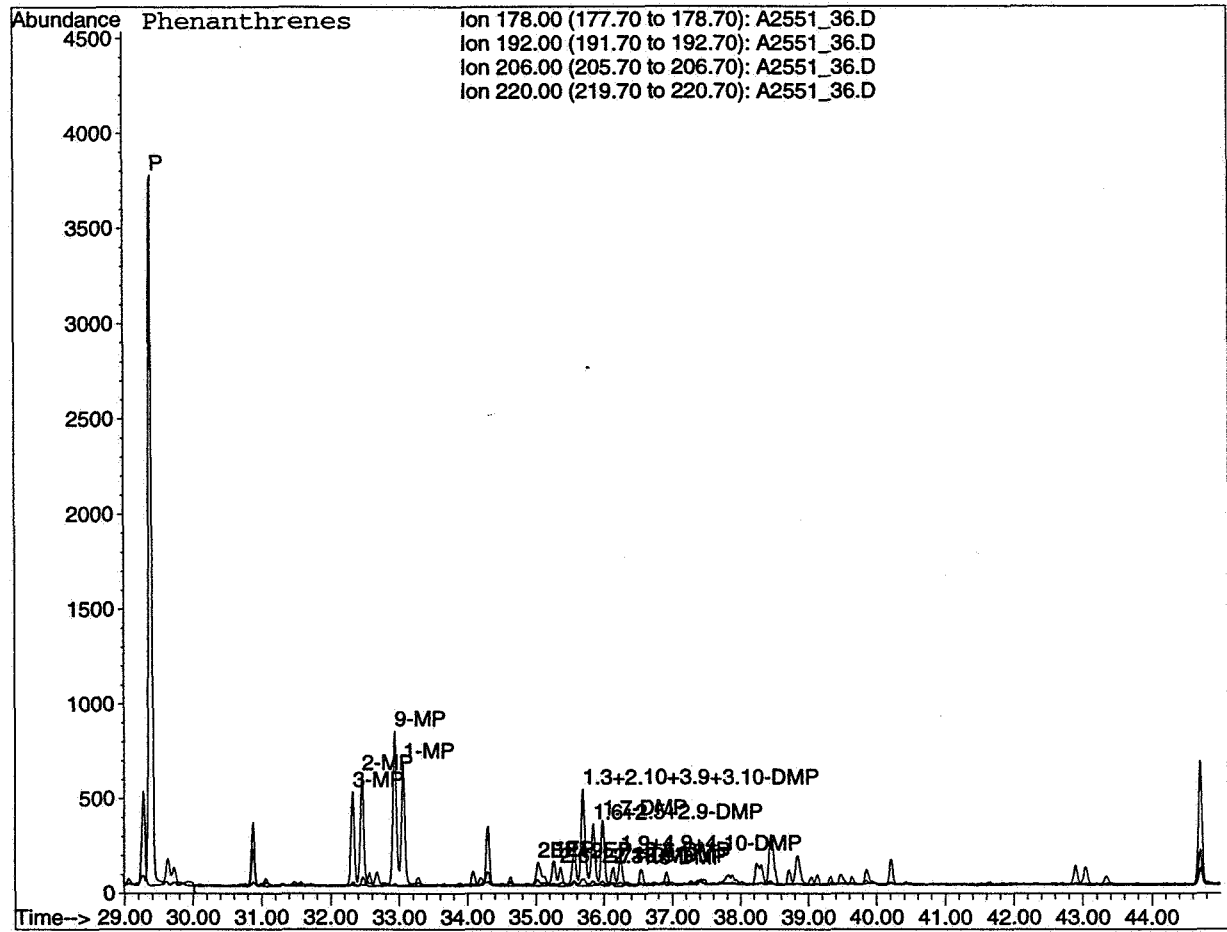
Title: ARO HC (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\A2551\_36.D Name: 35/11-11 mud 2551.0m ARO

Misc:

Method: MSD\_A\_D .....Operator: Andy

Date Reported: Thu Sep 24 11:22:09 1998



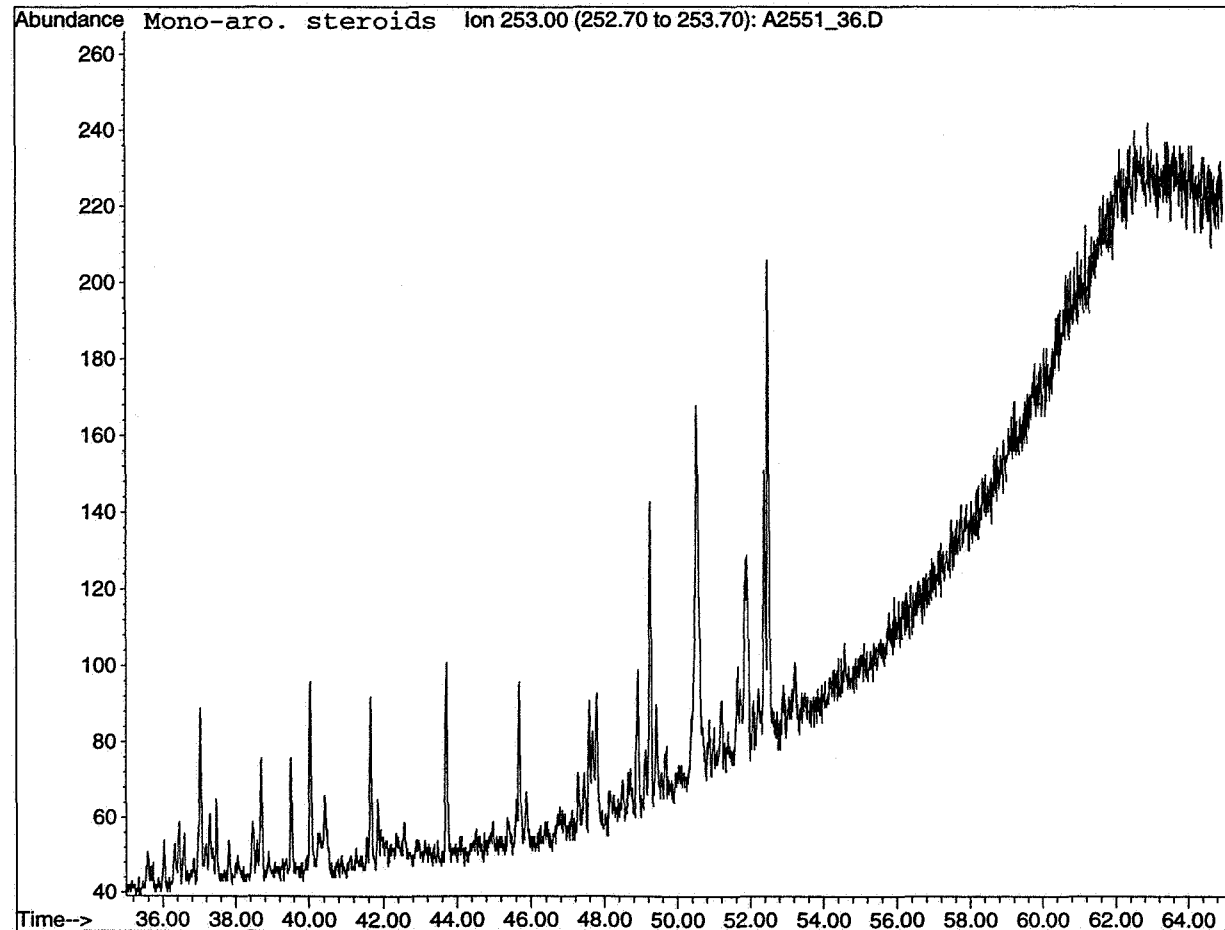
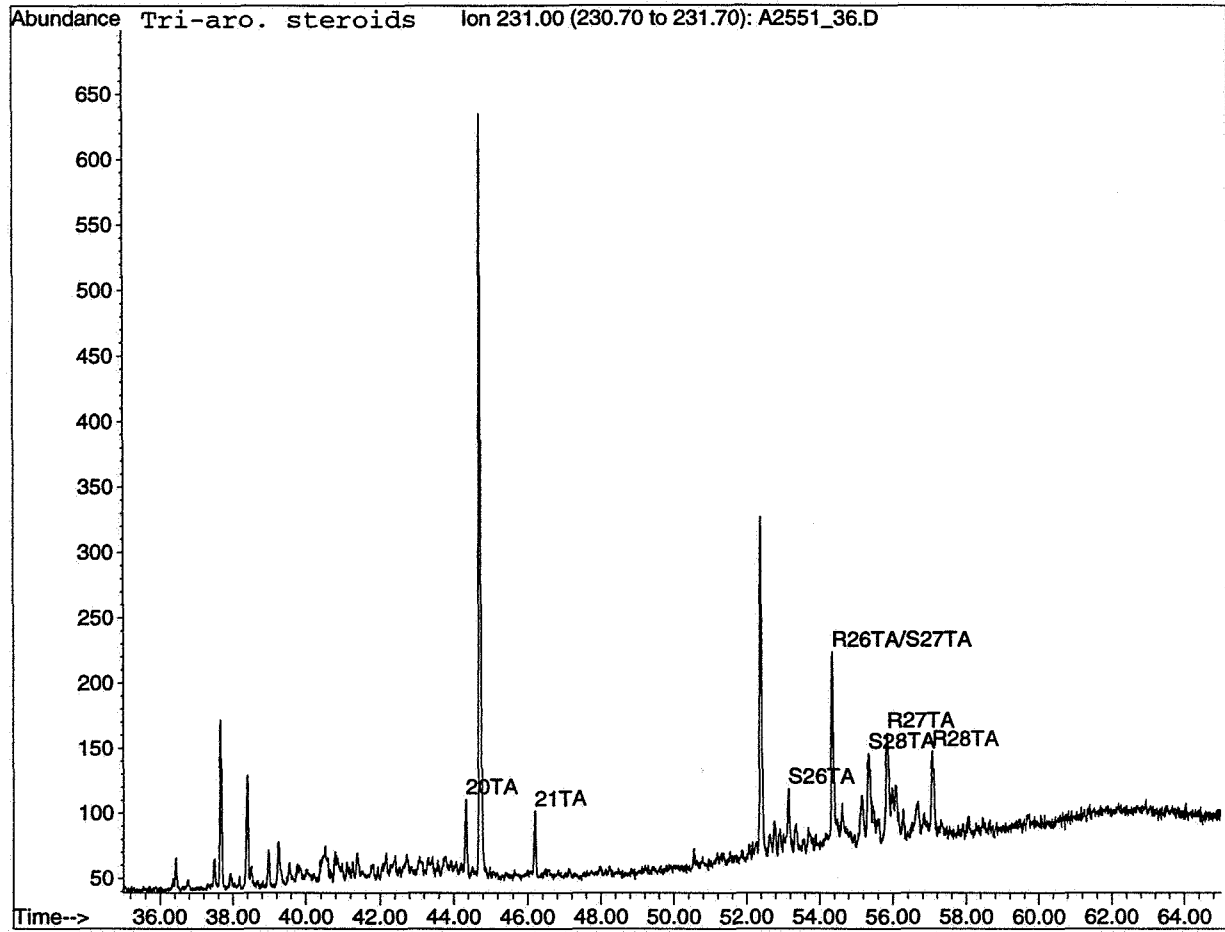
Title: ARO HC (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\A2551\_36.D Name: 35/11-11 mud 2551.0m ARO

Misc:

Method: MSD\_A\_D .....Operator: Andy

Date Reported: Thu Sep 24 11:22:31 1998



#	Rt.min.	m/z	Rf.	Name	Height	Amount
						ng/mg
Internal standard (if added):						
14)	11.51	136		d8N	14003	52
16)	20.93	164		d10BP	18371	50
59)	29.80	188		d10P	36314	52
79)	44.78	240		d12C	25265	52

#### Aryl isoprenoids:

1)	20.47	133	0	C13AI	11918	
2)	22.32	133	0	C14AI	6704	
3)	26.67	133	0	C15AI	2990	
4)	29.04	133	0	C16AI	2778	
5)	30.97	133	0	C17AI	832	
6)	33.96	133	0	C18AI	2531	
7)	34.94	133	0	C19AI	779	
8)	37.92	133	0	C20AI	1112	
9)	40.01	133	0	C21AI	734	
10)	42.94	133	0	C22AI	1235	
11)	44.98	133	0	C23AI	981	
12)	56.06	133	0	C30AI	289	
13)	56.97	133	0	C31AI	196	

#### Naphthalenes:

15)	11.59	128	a1	N	296250	1005
17)	15.18	142	a2	2-MN	491560	1270
18)	15.72	142	a2	1-MN	390829	1010
19)	18.34	156	a3	2-EN	51401	125
20)	18.45	156	a3	1-EN	25502	62
21)	18.69	156	a3	2.6+2.7-DMN	254051	616
22)	19.15	156	a3	1.3+1.7-DMN	349461	847
23)	19.25	156	a3	1.6-DMN	308815	749
24)	19.75	156	a3	2.3+1.4-DMN	141928	344
25)	19.85	156	a3	1.5-DMN	92258	224
26)	20.21	156	a3	1.2-DMN	55985	136
27)	21.90	170	a4	C3-N-1	29880	74
28)	22.27	170	a4	C3-N-2	30542	75
29)	22.39	170	a4	1.3.7-TMN	129837	320
30)	22.53	170	a4	1.3.6-TMN	202163	498
31)	23.01	170	a4	1.3.5+1.4.6-TMN	169840	419
32)	23.08	170	a4	2.3.6-TMN	128659	317
33)	23.50	170	a4	1.6.7+1.2.7-TMN	99178	244
34)	23.55	170	a4	1.2.6-TMN	68167	168
35)	23.98	170	a4	1.2.4-TMN	20369	50
36)	24.19	170	a4	1.2.5-TMN	71086	175

#### Biphenyls:

37)	17.88	154	a5	BP	149877	254
38)	21.17	168	a5	3-MBP	156680	266
39)	21.43	168	a5	4-MBP	55626	94
40)	21.49	182	a4	2.3'-DMBP	6255	15
41)	21.69	182	a4	2.5'-DMBP	3120	8
42)	21.86	182	a4	2.4+2.4'-DMBP	6081	15
43)	22.48	182	a4	2.3-DMBP	12182	30
44)	23.87	182	a4	3-EBP	15476	38
45)	24.19	182	a4	3.5-DMBP	22646	56
46)	24.30	182	a4	3.3'-DMBP	59429	146
47)	24.40	182	a4	4-EBP	5659	14
48)	24.58	182	a4	3.4'-DMBP	44865	111
49)	24.80	182	a4	4.4'-DMBP	9390	23
50)	25.36	182	a4	3.4-DMBP	24695	61

## Aromatic hydrocarbons

GC/MS detection HP-6890/5973

### Compound data



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: NSO1\_34A.D  
Sample name: nso1 ref.sample ARO#34  
Data File Path: C:\HPCHEM\1\DATA\ANDY1\  
Misc. info.:  
  
Vial no.: 1  
Method: MSD\_A\_D  
Operator: Andy  
Date: Fri Sep 18 10:05:03 1998

Response curve: y = ax+b  
Response factor groups: a1...a11, responses as defined in method

#	Rt.min.	m/z	Rf.	Name	Height	Amount
						ng/mg
<b>Dibenzofuranes:</b>						
51)	22.05	168	a5	DBF	38104	65
52)	25.13	182	a4	MDBF-1	46853	115
53)	25.50	182	a4	MDBF-2	33377	82
54)	25.79	182	a4	MDBF-3	26090	64
<b>Fluorenes:</b>						
55)	24.01	166	a6	F	58818	121
56)	27.23	180	a6	C1-F-1	22033	45
57)	27.48	180	a6	C1-F-2	85371	176
58)	27.78	180	a6	1-MF	15453	32
<b>Dibenzothiophenes:</b>						
60)	28.70	184	a7	DBT	46319	19
61)	31.33	198	a7	4-MDBT	58129	24
62)	31.83	198	a7	3+2-MDBT	18409	8
63)	32.43	198	a7	1-MDBT	18567	8
<b>Phenanthrenes:</b>						
64)	29.44	178	a8	P	211443	253
65)	32.37	192	a9	3-MP	83877	118
66)	32.52	192	a9	2-MP	94004	132
67)	33.00	192	a9	9-MP	135840	191
68)	33.12	192	a9	1-MP	106720	150
69)	35.09	206	a10	2EP+9EP+3.6-DMP	20952	28
70)	35.32	206	a10	1EP	26412	36
71)	35.42	206	a10	2.6+2.7+3.5-DMP	14834	20
72)	35.76	206	a10	1.3+2.10+3.9+3.10-DMP	109423	147
73)	35.91	206	a10	1.6+2.5+2.9-DMP	60857	82
74)	36.05	206	a10	1.7-DMP	61037	82
75)	36.19	206	a10	2.3-DMP	17210	23
76)	36.30	206	a10	1.9+4.9+4.10-DMP	35176	47
77)	36.61	206	a10	1.8-DMP	15159	20
<b>Retene:</b>						
78)	39.92	219	a8	Retene	62857	75
<b>Triaromatic steroids:</b>						
80)	44.39	231	a11	20TA	10526	5
81)	46.24	231	a11	21TA	11713	5
82)	53.22	231	a11	S26TA	11011	5
83)	54.42	231	a11	R26TA/S27TA	31902	14
84)	55.41	231	a11	S28TA	16797	7
85)	55.91	231	a11	R27TA	14868	7
86)	57.14	231	a11	R28TA	17740	8



**Aromatic hydrocarbons**

GC/MS detection HP-6890/5973

Ratios, from heights and amounts


 Norsk Hydro E&P Research Centre, Bergen, Norway  
 Petroleum Geochemistry Laboratories

 Data file name: NSO1\_34A.D  
 Sample name: nso1 ref.sample ARO#34  
 Data File Path: C:\HPCHEM\1\DATA\ANDY1\  
 Misc. info.:

 Vial no.: 1  
 Method: MSD\_A\_D  
 Operator: Andy  
 Date: Fri Sep 18 10:05:03 1998

Aromatic HC ratios, heights and amounts		Height	Amount
Naphthalene	Naphthalene	296250	1005
C1 Naphthanes	Sum C1 Naphthanes	882389	2281
C2 Naphthanes	Sum C2 Naphthanes	1279401	3101
C3 Naphthanes	Sum C3 Naphthanes	949721	2341
Phenanthrene	Phenanthrene	211443	253
C1 Phenanthrenes	Sum C1 Phenanthrenes	420441	591
C2 Phenanthrenes	Sum C2 Phenanthrenes	361060	486
3/2*(3MP+2MP)/(P+9MP+1MP)	MPI1	0.6	0.6
(3MP+2MP)/(3MP+2MP+9MP+1MP)	F1	0.4	0.4
2MP/(3MP+2MP+9MP+1MP)	F2	0.2	0.2
(2.6+2.7)DMN/1.5DMN	DNR	2.8	2.8
100*20TA/(20TA+S28TA+R28TA)	%-TAS'n	23.4	23.4
DBT/P	DBT/P	0.2	0.1
F/P	F/P	0.3	0.5
BP/1.6DMN	BP/1.6DMN	0.5	0.3
2MN/1MN	2MN/1MN	1.3	1.3
2EN/1EN	2EN/1EN	2.0	2.0
4MDBT/1MDBT	4MDBT/1MDBT	3.1	3.1

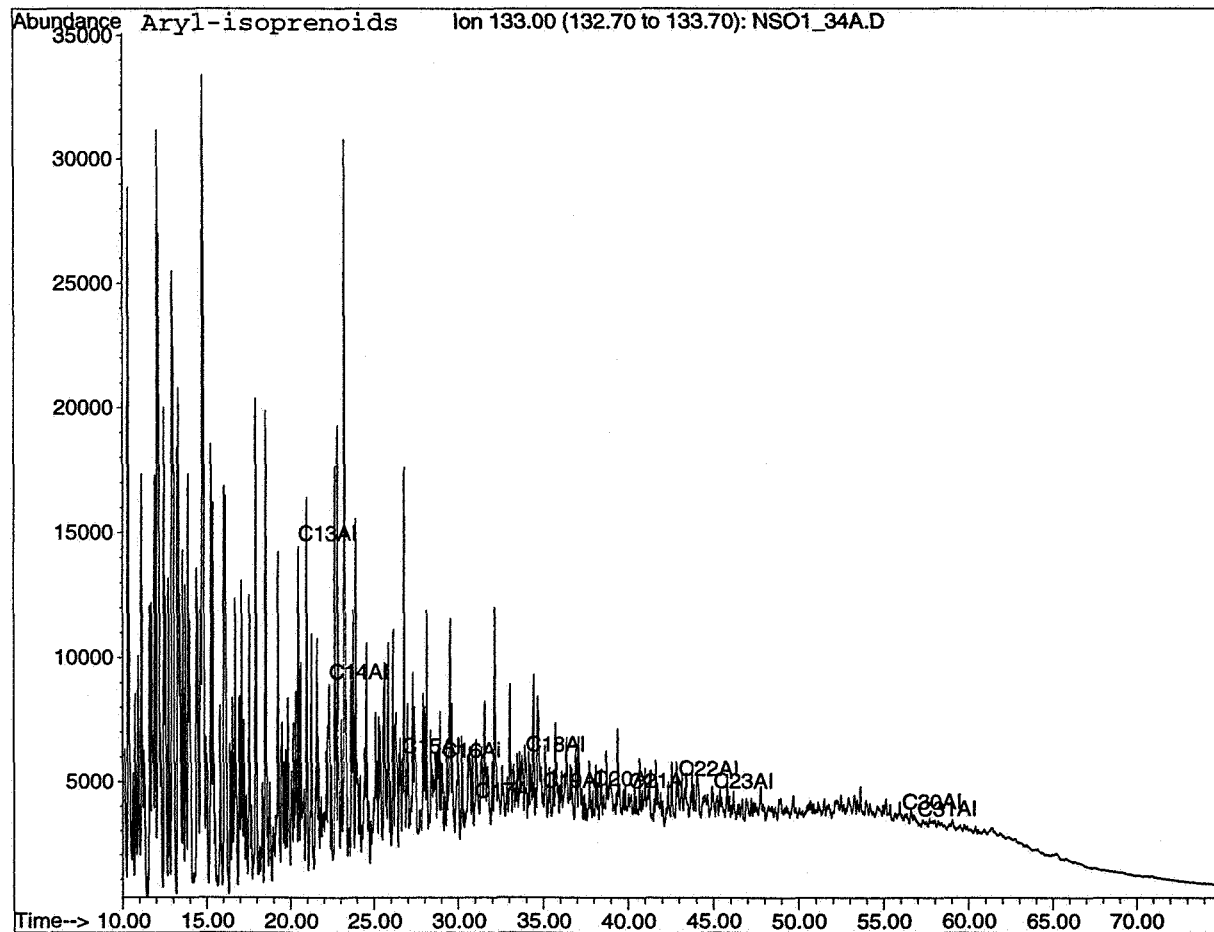
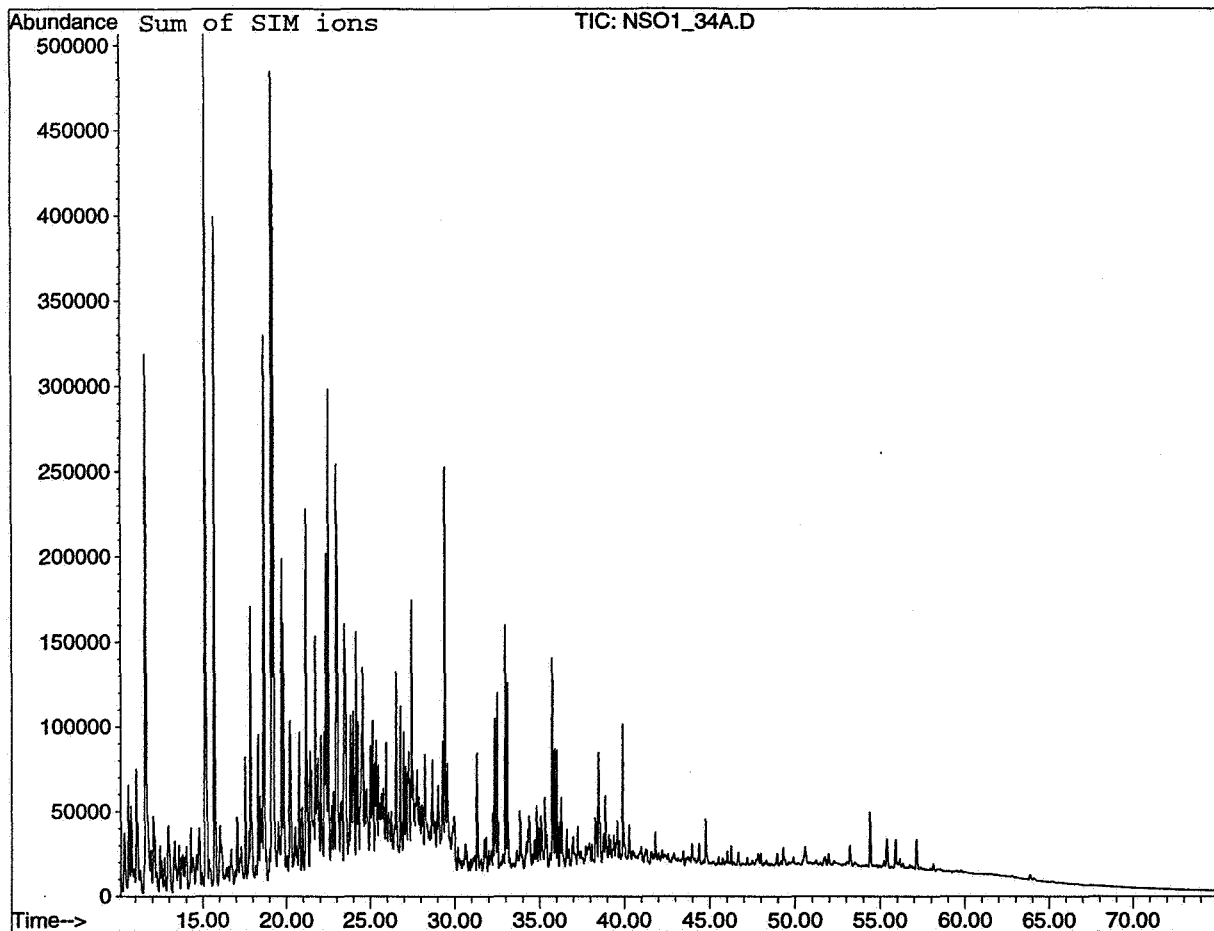
Title: ARO HC (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_34A.D Name: ns01 ref.sample ARO#34

Misc:

Method: MSD\_A\_D .....Operator: Andy

Date Reported: Thu Sep 24 10:22:15 1998



Title: ARO HC (MSD)

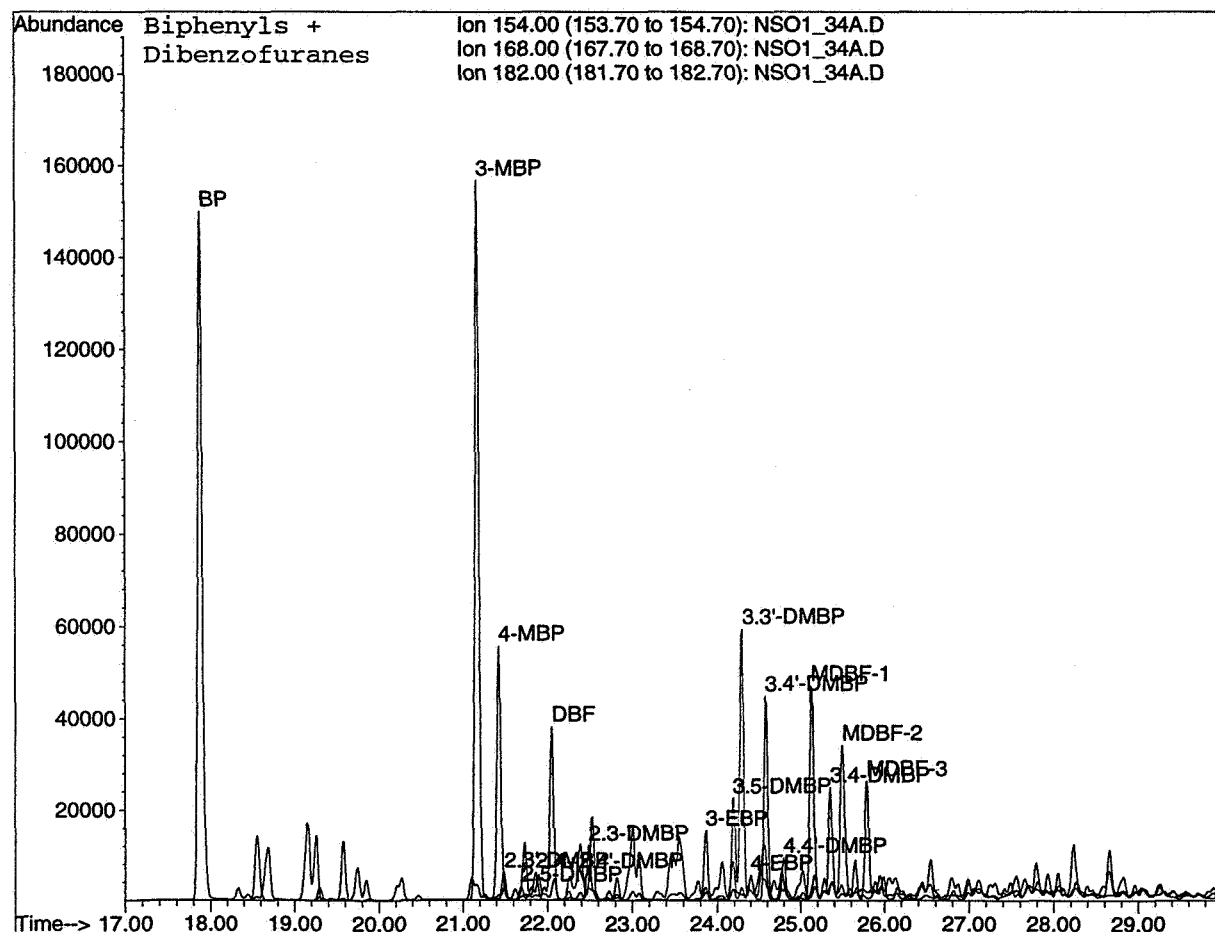
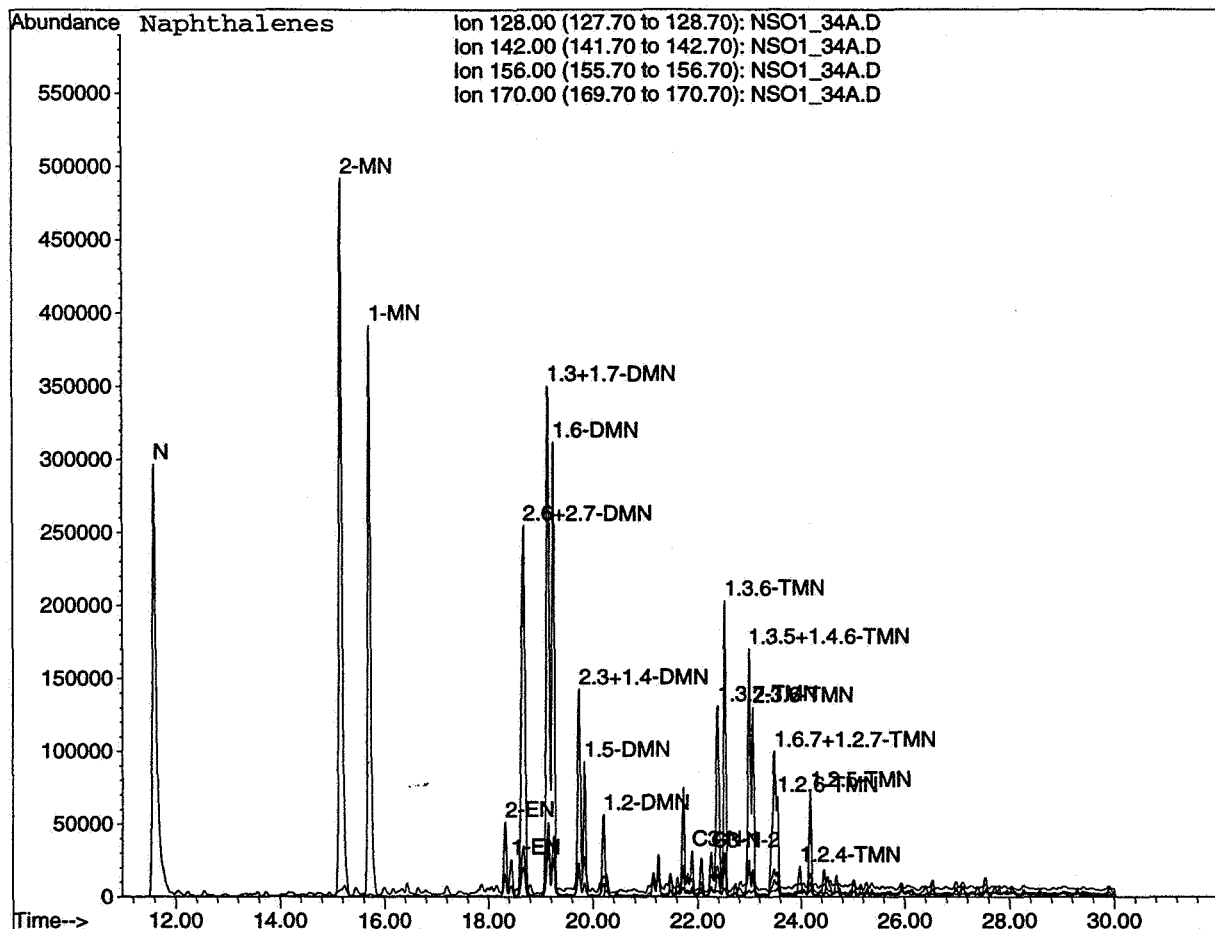
Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_34A.D Name: ns01 ref.sample ARO#34

Misc:

Method: MSD\_A\_D

.....Operator: Andy

Date Reported: Thu Sep 24 10:22:22 1998



Title: ARO HC (MSD)

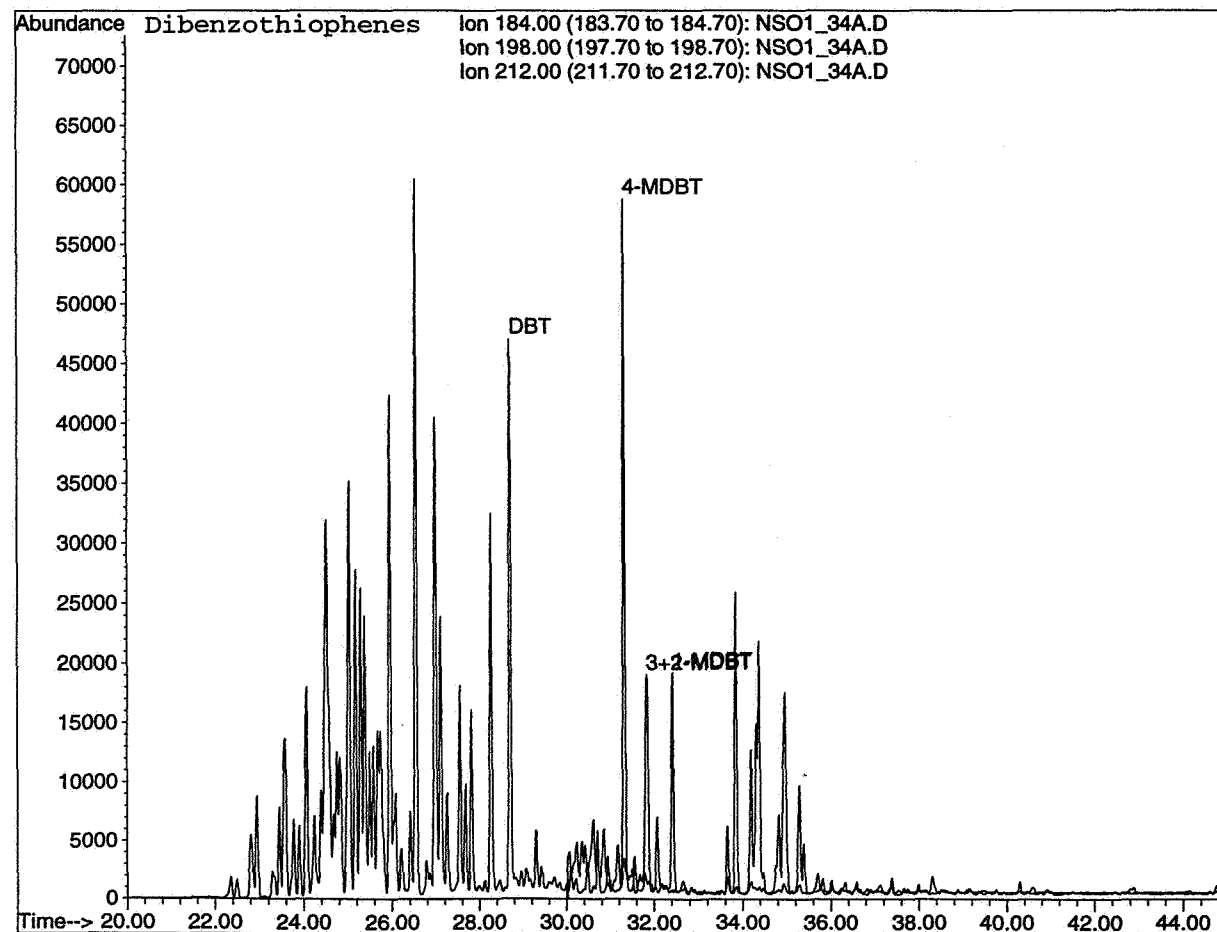
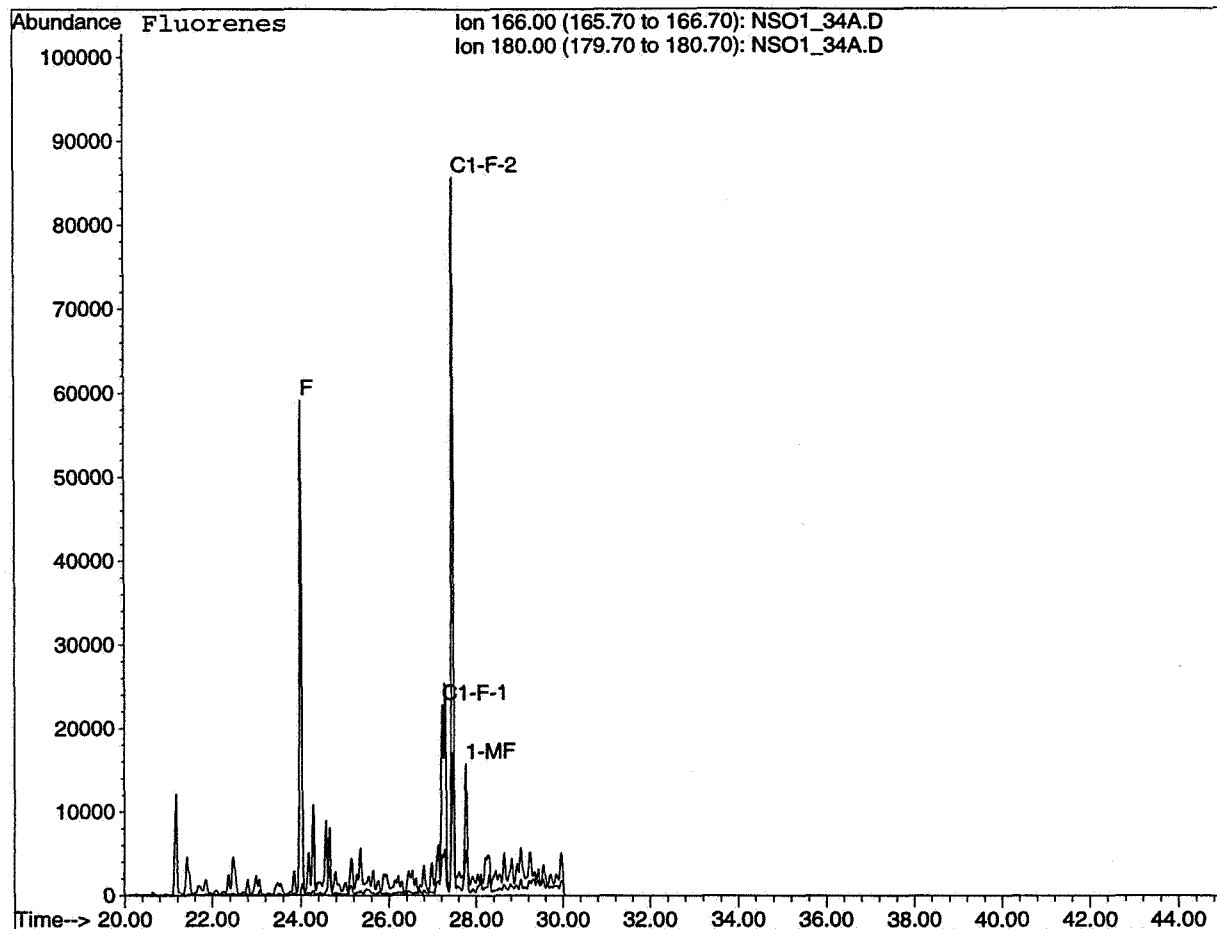
Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_34A.D Name: nso1 ref.sample ARO#34

Misc:

Method: MSD\_A\_D

.....Operator: Andy

Date Reported: Thu Sep 24 10:22:54 1998



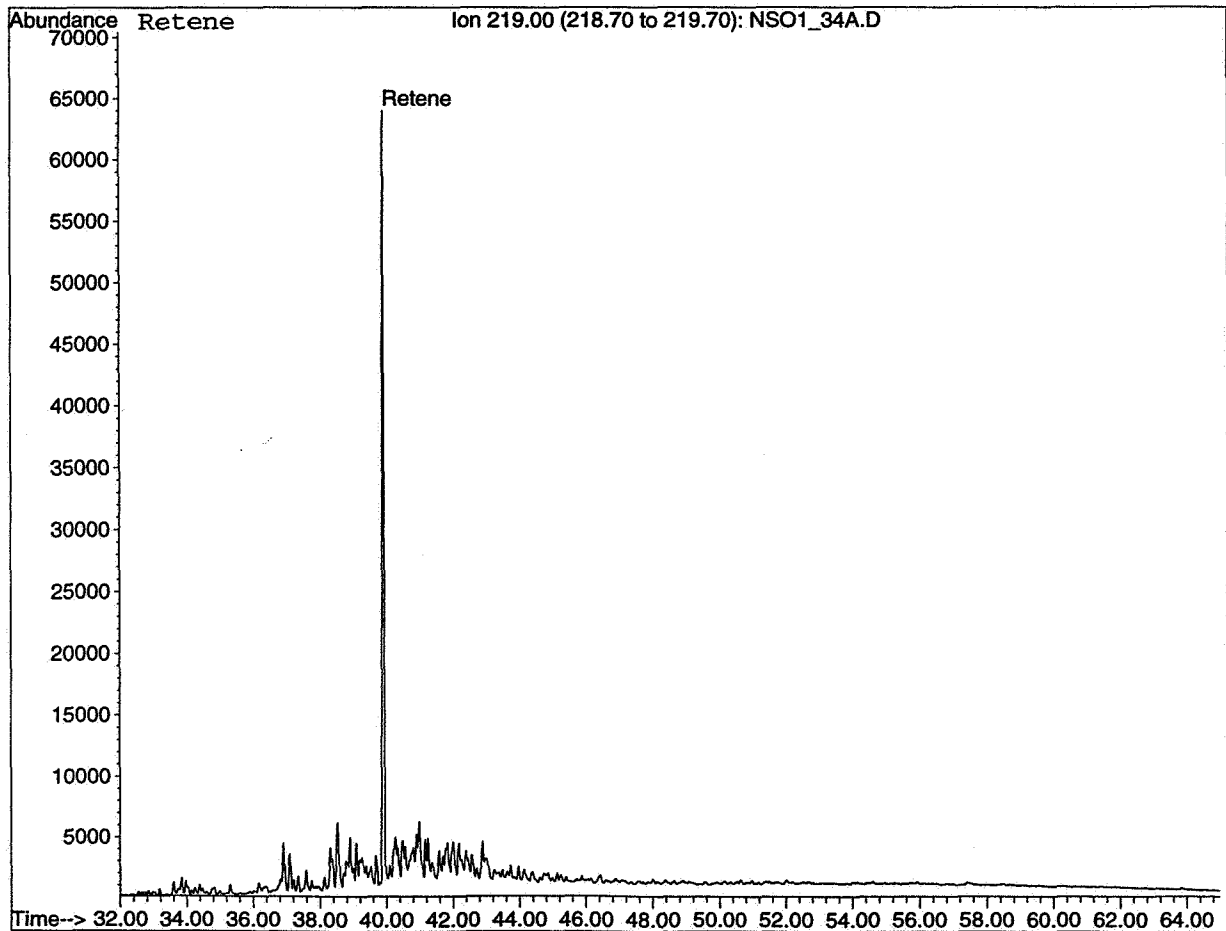
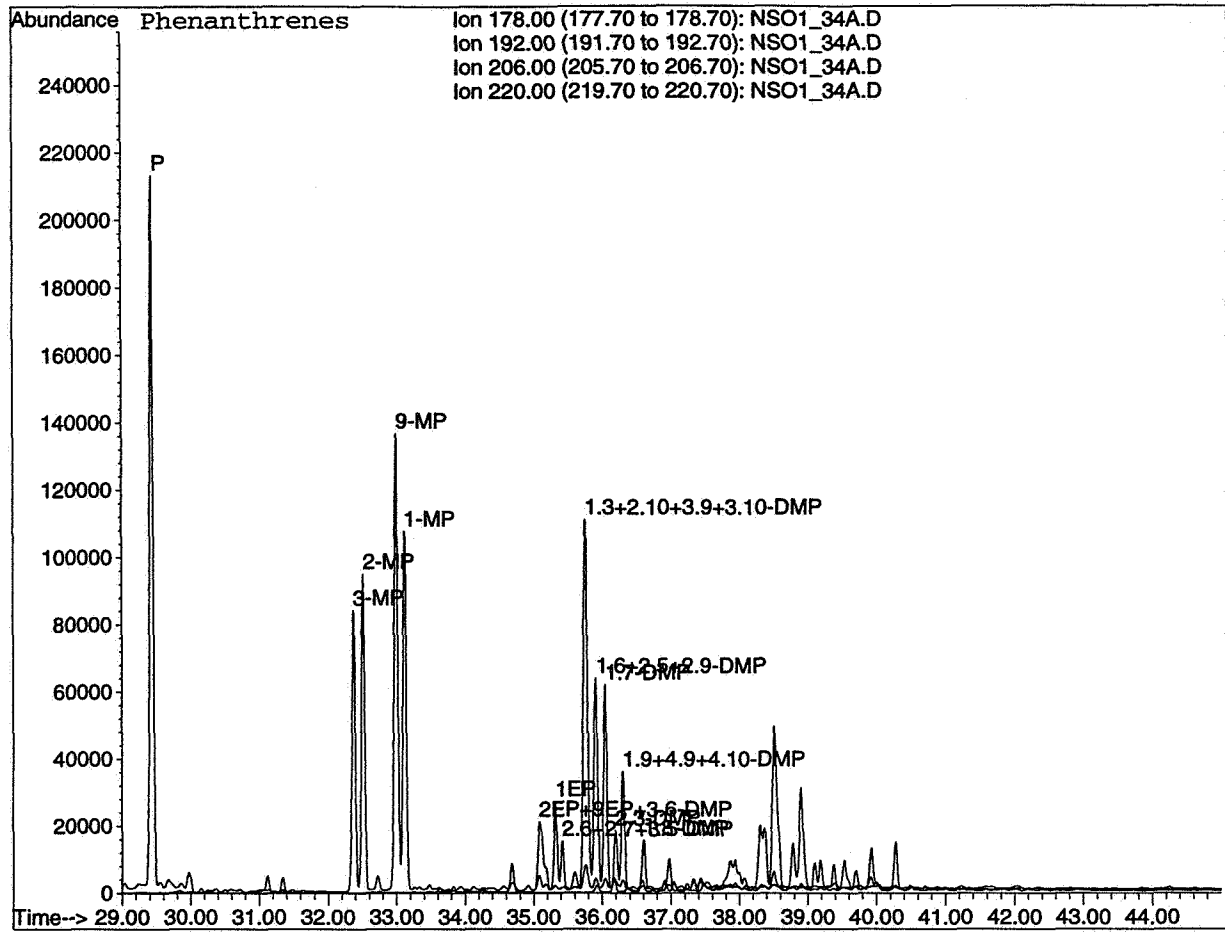
Title: ARO HC (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_34A.D Name: ns01 ref.sample ARO#34

Misc:

Method: MSD\_A\_D .....Operator: Andy

Date Reported: Thu Sep 24 10:23:14 1998



Title: ARO HC (MSD)

Data File: C:\HPCHEM\1\DATA\ANDY1\NSO1\_34A.D Name: nso1 ref.sample ARO#34

Misc:

Method: MSD\_A\_D .....Operator: Andy

Date Reported: Thu Sep 24 10:23:36 1998

