Visund Project Doc. No.: 21-00-NN-G15-00049

A STUDY OF HYDROCARBON OCCURRENCE IN A CAP-ROCK SEQUENCE FROM WELL 34/8-10S VISUND FIELD, Viking Graben

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A project between
NORSK HYDRO and Univ. of Oslo

Feb. 1994

3 SAMPLE SET

The list of samples analyzed for their gas composition is shown as **Tab. 1.** The cuttings were canned in 1 litre cans which were mostly 50%-70% filled with cuttings and mud, leaving a good head space for collection of gas which leaves the cuttings/mud by degassing. The program for sampling of canned cuttings is shown as **Fig. 2.** In the interval from 1920-2520 m, one sample was selected for this study every 30 m, while 1 sample per 15 m was selected in the interval from 2520-2890 m (totally 46 samples.
The sampled section covers the lower Tertiary, and the Cretaceous.

Also shown in **Tab. 1** are core chips, sidewall cores (SWCs and core plugs which also were analyzed for their gas composition. In this case, the core material was crushed in a gas thigh sling mill, so that the gas which occurs in the porosity could be liberated and analyzed. Thus, samples from the Jurassic cap rock, as well as intra reservoir shales were analyzed together with the samples described above. The purpose of using core material was to test the gas composition of samples which could not possibly have been contaminated by mud, and which represent material well suited also for production of solvent extracts.

Tab. 2. shows the samples which were extracted and analyzed by GC-FID, Iatroscan TLC-FID and GC-MS. **Tab. 3.** shows the samples analyzed for total organic carbon (TOC), and samples analyzed on Rock-Eval. Also included in this table are samples analyzed by Hydro Bergen - Appendix A.

4 METHODS

Analytical

Head space gas from canned cuttings and from crushed core was analyzed on a Varian 3500 GC-FID using a 30m DB-1 column, 0.32 mm I.D., 5.0 μm film, carrier gas: nitrogen, temperature program: isothermal heating at 38°C for 4 minutes.

The cans were equipped with a septa, through which a gas thigh syringe was inserted, and the gas withdrawn. The cans were shaken for 30 seconds before puncturing and gas sampling.

Core extracts for quantitative Iatroscan TLC-FID and GC-FID analyses were prepared by extracting a weighed amount (2-3 grams) of fine crushed bulk sample with DCM:MeOH=93:7 (vol.) using a Soxtech instrument.

For Iatroscan TLC-FID analyses, the method described by Karlsen and Larter (1991) was used.

GC-FID analyses of core extracts were run on a Varian 3500 GC equipped with a 50 m Ultra-2 column, 0.2 mm I.D., 0.33 μm film; carrier gas: nitrogen, temperature program: 90°C (2 min) - 4.5°C/min. - 310°C (30 min.).

GC-MS analyses of inclusion- and core extracts were run on a Fisons MD800 running in SIR mode, equipped with a 60 m DB-5ms column, 0.25 I.D., 0.25 μm film; carrier gas: helium; temperature program: 80°C (10 min.) - 10°C/min. - 180°C (0 min.) - 1.7°C/min. - 310°C (30 min.).

Sample list - gas analyses 34/8-10S				
	crushed in sling mill			headspace
depth (m)	core plugs	core chips	SWCs	canned cuttings
1726.0			X	
1930.0				X
1940.7		X		
1956.0			X	
1960.0				X
1990.0				X
2020.0				X
2050.0				X
2080.0				X
2110.0				X
2140.0				X
2170.0				X
2200.0				X
2230.0				X
2260.0				X
2290.0				X
2320.0				X
2350.0				X
2380.0				X
2410.0				X
2440.0				X
2470.0				X
2500.0				X
2530.0				X
2545.0				X
2560.0				X
2575.0				X
2590.0				X
2605.0				X
2620.0				X
2635.0				X
2650.0				X
2665.0				X
2680.0				X
2695.0				X
2700.0				X
2710.0				X
2725.0				X
2740.0				X
2755.0				X
2770.0				X
2785.0				X
2800.0				X
2815.0				X
2830.0				X
2845.0				X
2860.0				X
2875.0				X
2875.5		X		
2883.5		X		
2890.0				X
2891.0	X			
2893.5		X		
2923.4		X		
3009.6	X			
3024.3	X			

Tab. 1

Sample list - extract analyses 34/8-10S					
Depth (m)	GC-FID	GC-MS	Iatroscan TLC-FID	Sample type	Lithology
1478.0	X	X		SWC	shale
1726.0	X	X	X	SWC	shale
1929.5	X	X		core	shale
1930.0			X	cuttings	carbonate cont. mudstone
1936.6	X	X	X	core	shale
1940.7	X	X	X	core	shale
1948.0	X	X	X	SWC	shale
1950.0	X	X		SWC	sandstone
1952.0	X	X	X	SWC	sandstone
1956.0	X	X	X	SWC	sandstone
1961.0	X	X		SWC	sandstone
1962.0	X	X		SWC	sandstone
1964.0	X	X		SWC	sandstone
1969.0	X	X		SWC	sandstone
1999.0	X	X		SWC	shale
2020.0	X		X	cuttings	carbonate cont. mudstone
2050.0	X		X	cuttings	carbonate cont. mudstone
2110.0	X		X	cuttings	carbonate cont. mudstone
2230.0	X		X	cuttings	carbonate cont. mudstone
2240.0	X	X		SWC	shale
2320.0	X		X	cuttings	carbonate cont. mudstone
2410.0	X		X	cuttings	carbonate cont. mudstone
2500.0	X		X	cuttings	carbonate cont. mudstone
2620.0	X		X	cuttings	carbonate cont. mudstone
2695.0	X		X	cuttings	carbonate cont. mudstone
2710.0	X		X	cuttings	carbonate cont. mudstone
2830.0	X		X	cuttings	carbonate cont. mudstone
2875.5	X	X	X	core	shale
2886.0	X	X	X	core plug	sandstone
2891.0	X	X	X	core plug	sandstone
2893.5	X	X		core	shale
2914.5	X	X		core	shale
2923.4	X	X	X	core	shale
3001.0	X	X	X	core plug	sandstone
3009.6	X	X	X	core plug	sandstone
3024.3	X	X	X	core plug	sandstone
3045.0	X	X	X	core plug	sandstone
3066.0	X	X	X	core plug	sandstone
3081.9	X	X	X	core	sandstone
3095.4	X	X	X	core	sandstone
3108.0	X	X	X	core plug	sandstone
3274.1	X	X	X	core plug	sandstone
3274.5	X	X	X	core	sandstone

Tab. 2

Iatroscan TLC-FID-, TOC-, and Rock-Eval data, well 34/8-10S													
		Iatroscan TLC-FID data			TOC	Rock-Eval data							
Depth (m)	Sample type	saturates (%)	aromatics (%)	polars (%)	(%)	Tmax (°C)	S1 (mg HCs/g rock)	S2 (mg HCs/g rock	S3 (mg CO2/g rock)	PI	HI (mg HCs/g TOC)	OI (mg CO2/g TOC)
1478.0	SWC				0.19	357	0.20	0.31	0.47	0.39	163	247
1726.0	SWC	3.8	3.3	92.9	1.76	416	0.12	0.62	0.81	0.16	35	46
1929.5	core				0.33	342	0.17	0.22	0.58	0.44	67	176
1930.0	cuttings	13.0	2.8	84.3	1.06	369	1.09	3.52	4.63	0.24	332	437
1936.6	core	6.4	1.3	91.3								
1940.7	core	4.9	0.7	94.4								
1948.0	SWC	9.9	4.5	85.6	0.29	348	0.25	0.28	0.80	0.47	97	207
1950.0	SWC	2.7	0.2	97.1	0.09	340	0.71	0.56	1.30	0.56	622	1444
1952.0	SWC	10.0	1.1	88.9	0.11	343	0.69	0.57	1.18	0.55	518	1073
1956.0	SWC	7.6	4.2	88.2	0.15	339	0.54	0.51	1.07	0.51	340	713
1961.0	SWC	2.4	0.8	96.8	0.83	344	0.79	0.92	1.06	0.46	111	128
1962.0	SWC				0.22	350	0.79	0.89	1.41	0.47	405	641
1964.0	SWC	2.5	0.3	97.2	0.20	347	0.66	0.78	1.19	0.46	390	595
1969.0	SWC	2.4	0.0	97.6	0.05	341	0.60	0.50	0.91	0.55	1000	1820
1999.0	SWC	6.9	0.0	93.1	0.39	359	0.17	0.18	1.41	0.49	46	362
2020.0	cuttings	11.0	3.2	85.8	0.52	362	0.42	1.08	2.75	0.28	208	529
2050.0	cuttings	4.9	1.6	93.5	0.53	362	0.58	1.47	2.48	0.28	277	468
2110.0	cuttings	10.2	4.3	85.5	0.78	363	0.64	1.73	2.71	0.27	222	347
2230.0	cuttings	9.1	4.5	86.5	0.81	365	0.71	2.00	2.81	0.26	247	347
2240.0	SWC	9.4	0.0	90.6	0.43	396	0.22	0.16	1.54	0.58	37	358
2320.0	cuttings	21.5	6.7	71.8	0.68	362	0.55	1.58	2.07	0.26	232	304
2410.0	cuttings	3.9	1.4	94.7	0.96	372	0.47	1.46	1.89	0.24	152	197
2500.0	cuttings	13.7	5.6	80.7	1.10	373	1.05	2.24	2.42	0.32	204	220
2620.0	cuttings	15.9	34.0	50.1	1.00	378	0.95	1.39	2.46	0.41	139	246
2695.0	cuttings	25.7	12.1	62.2	0.89	373	0.55	1.20	2.65	0.31	135	287
2710.0	cuttings	2.0	83.4	14.6	0.62	359	0.14	0.45	1.15	0.24	73	185
2830.0	cuttings	3.0	3.0	94.0	0.82	371	0.41	1.06	2.07	0.28	129	252
2875.5	core	21.6	7.6	70.8								
2883.5	core											
2886.0	core plug											
2891.0	core plug	65.3	25.3	9.4								
2893.5	core				1.65	438	0.42	2.42	1.06	0.15	147	64
2914.5	core	23.5	22.7	53.8	1.95	444	0.58	2.27	1.52	0.20	116	78
2923.4	core	13.8	32.7	53.5								
3001.0	core plug	51.8	21.1	17.2								
3009.6	core plug	69.2	19.8	11.1								
3024.3	core plug	22.0	32.4	45.6								
3045.0	core plug											
3066.0	core plug	54.8	25.5	19.7								
3081.9	core	68.1	19.0	13.0								
3095.4	core	62.3	22.8	14.9								
3108.0	core plug	67.2	24.1	8.8								
3274.1	core plug	68.3	22.0	9.7								
3274.5	core	62.8	26.2	11.1								

Tab. 3

Composition of headspace gas from canned cuttings, well 34/8-10S										
								C1/	C1/SUM	
depth (m)	%C1	%C2	%C3	%i-C4	%n-C4	%C2+	C2/C3	(C2+C3)	(C2-C4)	i-C4/n-C
1930.0	79.5	13.1	5.1	1.0	1.3	20.5	2.6	4.4	3.9	0.77
1960.0	44.2	10.1	21.4	8.5	15.8	55.8	0.5	1.4	0.8	0.54
1990.0	69.4	12.3	11.3	2.4	4.6	30.6	1.1	2.9	2.3	0.52
2020.0	83.5	7.5	5.3	1.1	2.6	16.5	1.4	6.5	5.1	0.42
2050.0	70.2	8.4	10.7	3.9	6.8	29.8	0.8	3.7	2.4	0.57
2080.0	67.8	10.1	12.2	3.7	6.2	32.2	0.8	3.0	2.1	0.60
2110.0	74.1	11.9	8.8	2.0	3.2	25.9	1.4	3.6	2.9	0.63
2140.0	75.4	9.8	10.1	1.9	2.8	24.6	1.0	3.8	3.1	0.68
2170.0	82.4	8.6	5.6	1.0	2.4	17.6	1.5	5.8	4.7	0.42
2200.0	74.3	12.1	8.7	1.9	3.0	25.7	1.4	3.6	2.9	0.63
2230.0	75.2	12.1	8.2	1.8	2.7	24.8	1.5	3.7	3.0	0.67
2260.0	65.4	17.1	11.5	2.3	3.7	34.6	1.5	2.3	1.9	0.62
2290.0	55.6	12.0	17.3	5.7	9.4	44.4	0.7	1.9	1.3	0.61
2320.0	60.4	12.1	16.9	4.3	6.3	39.6	0.7	2.1	1.5	0.68
2350.0	58.7	14.5	16.1	3.8	6.9	41.3	0.9	1.9	1.4	0.55
2380.0	76.2	8.8	9.8	1.9	3.3	23.8	0.9	4.1	3.2	0.58
2410.0	67.9	12.9	12.5	2.2	4.5	32.1	1.0	2.7	2.1	0.49
2440.0	51.1	18.9	19.9	3.4	6.7	48.9	0.9	1.3	1.0	0.51
2470.0	67.4	13.3	12.8	2.2	4.3	32.6	1.0	2.6	2.1	0.51
2500.0	52.9	15.1	24.0	2.9	5.1	47.1	0.6	1.4	1.1	0.57
2530.0	44.3	16.5	29.6	3.5	6.1	55.7	0.6	1.0	0.8	0.57
2545.0	60.2	15.5	16.5	2.9	4.9	39.8	0.9	1.9	1.5	0.59
2560.0	83.6	7.3	6.4	0.9	1.8	16.4	1.1	6.1	5.1	0.50
2575.0	33.5	20.5	31.9	5.4	8.7	66.5	0.6	0.6	0.5	0.62
2590.0	36.5	21.4	29.7	5.0	7.4	63.5	0.7	0.7	0.6	0.68
2605.0	49.2	23.4	21.0	2.8	3.6	50.8	1.1	1.1	1.0	0.78
2620.0	41.5	27.1	23.8	3.6	4.0	58.5	1.1	0.8	0.7	0.90
2635.0	40.2	14.2	32.7	4.6	8.2	59.8	0.4	0.9	0.7	0.56
2650.0	33.2	16.2	35.6	6.1	8.9	66.8	0.5	0.6	0.5	0.69
2665.0	29.6	21.5	39.2	4.2	5.5	70.4	0.5	0.5	0.4	0.76
2680.0	46.7	24.3	21.6	3.5	3.9	53.3	1.1	1.0	0.9	0.90
2695.0	33.8	24.2	30.1	5.1	6.8	66.2	0.8	0.6	0.5	0.75
2700.0	90.8	4.3	3.5	0.5	0.9	9.2	1.2	11.6	9.9	0.56
2710.0	65.2	15.7	13.9	2.3	2.9	34.8	1.1	2.2	1.9	0.79
2725.0	46.1	22.0	22.9	4.1	4.9	53.9	1.0	1.0	0.9	0.84
2740.0	34.4	26.8	28.3	4.5	6.0	65.6	0.9	0.6	0.5	0.75
2755.0	36.2	24.4	28.8	4.4	6.2	63.8	0.8	0.7	0.6	0.71
2770.0	33.1	30.3	27.8	3.8	5.0	66.9	1.1	0.6	0.5	0.76
2785.0	37.2	28.5	26.0	3.3	5.0	62.8	1.1	0.7	0.6	0.66
2800.0	47.4	20.3	22.9	3.5	5.9	52.6	0.9	1.1	0.9	0.59
2815.0	43.7	20.4	27.8	2.8	5.3	56.3	0.7	0.9	0.8	0.53
2830.0	19.0	20.4	41.6	6.3	12.7	81.0	0.5	0.3	0.2	0.50
2845.0	38.2	18.1	30.1	3.9	9.7	61.8	0.6	0.8	0.6	0.40
2860.0	45.3	16.2	26.5	3.4	8.6	54.7	0.6	1.1	0.8	0.40
2875.0	24.5	10.4	39.0	6.5	19.6	75.5	0.3	0.5	0.3	0.33
2890.0	14.8	19.8	43.4	6.9	15.1	85.2	0.5	0.2	0.2	0.46

Tab. 4

Composition of gas from samples crushed in sling mill, well 34/8-10S										
depth (m)	%C1	%C2	%C3	%i-C4	%n-C4	%C2+	C2/C3	C1/ (C2+C3)	C1/SUM (C2-C4)	i-C4/n-C4
1726.0	100.0	0.0	0.0	0.0	0.0	0.0				
1940.7	79.7	6.9	7.3	2.5	3.6	20.3	0.9	5.6	3.9	0.69
1956.0	78.9	3.8	7.3	4.2	5.9	21.1	0.5	7.1	3.7	0.72
2875.5	83.0	4.3	4.7	4.0	4.0	17.0	0.9	9.2	4.9	1.00
2883.5	71.2	5.7	9.0	6.1	8.0	28.8	0.6	4.9	2.5	0.77
2891.0	74.3	11.4	9.3	1.4	3.5	25.7	1.2	3.6	2.9	0.40
2893.5	67.3	5.1	9.8	7.8	10.0	32.7	0.5	4.5	2.1	0.78
2923.4	49.9	4.2	20.4	10.5	15.0	50.1	0.2	2.0	1.0	0.69
3009.6	78.4	8.4	7.6	1.9	3.6	21.6	1.1	4.9	3.6	0.53
3024.3	44.2	2.9	12.0	8.1	32.8	55.8	0.2	3.0	0.8	0.25

Tab. 5

Gas composition - Visund Field

Well	Sample ID	Sample type	Depth (m)		%C1	%C2	%C3	%i-C4	%n-C4	%C2+	C2/C3	C1/ (C2+C3)	C1/SUM (C2-C4)	i-C4/n-C4	C1d13C	C1d2H	C2d13C	C3d13C	i-C4d13C	n-C4d13C
34/8-10S	1960m	canned cuttings	1960.0		44.2	10.1	21.4	8.5	15.8	55.8	0.47	1.40	0.79	0.54	-40.6	nd	-28.4	-27.7	-27.8	-28.0
34/8-10S	2080m	canned cuttings	2080.0		67.8	10.1	12.2	3.7	6.2	32.2	0.83	3.04	2.11	0.60	-40.7	-208	-28.2	-25.8	-27.5	-26.9
34/8-10S	2470m	canned cuttings	2470.0		67.4	13.3	12.8	2.2	4.3	32.6	1.04	2.58	2.07	0.51	-39.5	-256	-27.7	-28.3	-31.5	-28.9
average cuttings sample					59.8	11.2	15.5	4.8	8.8	40.2	0.78	2.34	1.66	0.55	-40.3	-232	-28.1	-27.3	-28.9	-27.9

Tab. 6

	BIOMARKER PARAMETERS, CORE EXTRACTS - VISUND FIELD																											
SAMPLE NR.	**WELL**	**SAMPLE ID**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**26**
1	34/8-1	2866.3 TXT		0.71	0.85	0.92	1.49	0.22	1.54	0.59	0.51	45	28	27	0.91	0.43	0.76	0.66	0.38	3.65	0.82	0.79	0.68	0.78	0.71	8.54	0.27	0.42
2	34/8-1	2825.3 TXT		0.62	0.78	0.89	1.68	0.24	1.86	0.61	0.48	44	27	29	0.84	0.59	0.88	0.67	0.42	4.06	0.89	0.80	0.77	0.81	0.72	8.65	0.22	0.35
3	34/8-1	2878.3 TXT		0.71	0.85	0.92	1.21	0.17	1.67	0.60	0.51	42	29	30	0.81	0.65	0.75	0.62	0.37	3.71	0.81	0.77	0.66	0.78	0.68	9.29	0.30	0.42
4	34/8-3A	3045.9 TXT		0.68	0.82	0.91	1.32	0.17	1.71	0.59	0.47	41	28	31	0.80	0.70	0.91	0.60	0.43	4.86	0.91	0.76	0.80	0.86	0.68	9.02	0.24	0.40
5	34/8-3A	3086.8 TXT		0.65	0.86	0.93	2.21	0.30	1.08	0.59	0.48	44	29	27	0.82	0.63	0.90	0.69	0.43	4.85	0.90	0.82	0.79	0.86	0.73	8.59	0.25	0.43
6	34/8-3A	3106.7 TXT		0.75	0.87	0.93	2.59	0.32	1.09	0.59	0.51	44	30	26	0.88	0.54	0.87	0.64	0.42	5.04	0.88	0.79	0.77	0.88	0.75	8.47	0.23	0.45
7	34/8-3A	3131.9 TXT		0.65	0.77	0.91	1.34	0.17	0.91	0.57	0.46	39	29	32	0.74	0.69	0.95	0.65	0.43	3.84	0.93	0.79	0.79	0.79	0.56	10.41	0.36	0.35
8	34/8-4A	3089.5 TXT		0.70	0.86	0.92	1.55	0.20	1.21	0.58	0.48	41	29	30	0.76	0.71	0.66	0.31	0.33	3.47	0.75	0.58	0.57	0.76	0.68	9.89	0.36	0.39
9	34/8-4A	3249.5 TXT		0.74	0.86	0.93	3.40	0.42	0.97	0.58	0.53	45	30	25	0.91	0.48	0.55	0.24	0.28	3.50	0.66	0.54	0.47	0.77	0.79	7.16	0.33	0.44
10	34/8-4A	3329.5 TXT		0.75	0.86	0.92	2.16	0.27	1.28	0.59	0.51	43	30	27	0.89	0.56	0.55	0.24	0.29	3.41	0.67	0.55	0.49	0.76	0.75	8.29	0.32	0.42
11	34/8-4S	3009.6 TXT		0.69	0.85	0.92	3.46	0.38	0.81	0.57	0.48	45	28	27	0.88	0.59	0.56	0.22	0.28	3.50	0.67	0.53	0.47	0.77	0.76	7.61	0.34	0.41
12	34/8-4S	3078.4 TXT		0.60	0.87	0.92	3.28	0.41	0.81	0.57	0.47	40	35	25	0.87	0.66	0.52	0.19	0.26	3.41	0.64	0.51	0.43	0.76	0.74	7.47	0.33	0.41
13	34/8-4S	3135.5 TXT		0.73	0.85	0.92	1.68	0.23	1.35	0.59	0.48	42	29	28	0.88	0.61	0.50	0.22	0.26	3.60	0.62	0.53	0.42	0.77	0.72	8.76	0.31	0.41
14	34/8-4S	3204.9 TXT		0.71	0.88	0.91	1.37	0.18	1.45	0.60	0.51	40	28	32	0.82	0.75	0.54	0.23	0.27	3.00	0.65	0.54	0.43	0.73	0.67	9.88	0.33	0.39
15	34/8-4S	3229.5 TXT		0.74	0.88	0.92	1.48	0.22	1.37	0.57	0.51	40	30	30	0.86	0.80	0.48	0.18	0.25	3.34	0.60	0.51	0.39	0.75	0.64	9.05	0.32	0.40
16	34/8-8	2925.5 TXT		0.77	0.86	0.93	3.85	0.49	0.92	0.57	0.54	48	30	22	0.91	0.45	0.88	0.61	0.43	4.88	0.89	0.77	0.81	0.87	0.80	6.73	0.25	0.46
17	34/8-8	3008.2 TXT		0.63	0.79	0.90	0.95	0.13	1.16	0.56	0.47	38	27	35	0.68	0.70	1.02	0.59	0.44	3.82	0.96	0.75	0.81	0.79	0.51	11.15	0.33	0.34
18	34/8-10S	2886.0 TXT		0.73	0.86	0.92	1.60	0.20	1.33	0.59	0.47	44	27	29	0.83	0.24	0.79		0.39	5.04	0.84		0.71	0.88	0.68		0.26	0.67
19	34/8-10S	2891.0 TXT		0.71	0.91	0.94	0.93	0.15	1.38	0.60	0.45	41	29	30	0.77	0.36	0.86		0.40	4.20	0.88		0.73	0.82	0.62		0.40	0.65
20	34/8-10S	3001.0 TXT		0.72	0.84	0.92	1.23	0.15	1.28	0.60	0.45	40	30	30	0.79	0.31	0.67		0.32	3.94	0.76		0.55	0.80	0.64		0.32	0.69
21	34/8-10S	3009.6 TXT		0.67	0.85	0.90	0.95	0.12	1.53	0.59	0.45	38	31	31	0.74	0.37	0.64		0.32	3.94	0.74		0.55	0.80	0.60		0.30	0.65
22	34/8-10S	3045.0 TXT		0.70	0.85	0.91	0.93	0.14	1.51	0.61	0.44	39	30	32	0.78	0.34	0.64		0.32	3.50	0.74		0.55	0.77	0.60		0.32	0.64
23	34/8-10S	3066.0 TXT		0.59	0.82	0.90	0.66	0.08	1.79	0.61	0.44	35	29	35	0.75	0.35	0.63		0.32	3.76	0.73		0.55	0.78	0.55		0.34	0.62
24	34/8-10S	3081.9 TXT		0.69	0.84	0.91	0.79	0.15	1.71	0.62	0.44	37	29	34	0.70	0.48	0.62		0.32	3.32	0.72		0.55	0.75	0.58		0.31	0.57
25	34/8-10S	3095.4 TXT		0.60	0.85	0.91	0.76	0.10	1.62	0.59	0.44	37	30	33	0.71	0.47	0.66		0.33	3.68	0.75		0.57	0.78	0.57		0.33	0.63
26	34/8-10S	3108.0 TXT		0.68	0.85	0.92	0.93	0.12	1.52	0.58	0.46	38	28	34	0.72	0.45	0.72		0.34	3.94	0.79		0.60	0.80	0.59		0.29	0.63
27	34/8-10S	3274.1 TXT		0.70	0.90	0.86	0.74	0.11	1.61	0.61	0.44	38	28	34	0.71	0.48	0.63		0.32	3.32	0.73		0.56	0.75	0.57		0.36	0.64
28	34/8-10S	3274.5 TXT		0.76	0.84	0.93	1.61	0.19	1.20	0.57	0.46	44	26	29	0.81	0.35	0.70		0.33	3.88	0.78		0.57	0.79	0.67		0.33	0.74

Tab. 7

34/8-10S

1: Ts/(Ts+Tm) (SEIFERT and MOLDOWAN, 1978)
2: diahopane/(diahopane + normorethane) (CORNFORD et al., 1986)
3: C30 aß-hopane/(C30 aß-hopane + C30-morethane), (MACKENZIE et al., 1985)
4: C23-C29 tricyclic terpanes/C30 aß-hopane (modified from MELLO et al., 1988)
5: C24-tetracyclic terpane/C30 aß-hopane (MELLO et al., 1988)
6: hopane/sterane (MACKENZIE et al., 1984)
7: ßß/(ßß+aa) of C29 (20R+20S) sterane isomers (MACKENZIE et al., 1980)
8: 20S/(20S+20R) of C29 aa-sterane isomers (MACKENZIE, 1984)
9: % C27 of C27+C28+C29 ßß-steranes
10: % C28 of C27+C28+C29 ßß-steranes
11: % C29 of C27+C28+C29 ßß-steranes — (MACKENZIE et al., 1985)
12: C20/(C20+C28) triaromatic steroids (TA)
13: C28 TA/(C28 TA+C29 MA)
14: Methylphenanthrene ratio, MPR (RADKE et al., 1982b)
15: Methylphenanthrene index 1, MPI1 (RADKE et al., 1982a) — Based on m/z 178 and m/z 192 fragmentograms (cf. MACKENZIE, et al. 1985)
16: Methylphenanthrene distribution fraction, MPDF (F1) (KVALHEIM et al., 1987)
17: Methyldibenzothiophene ratio, MDR (RADKE, 1988) Based on m/z 198 fragmentogram
18: Calculated vitrinite reflectance, %Rm = 1.10*log MPR + 0.95 (RADKE, 1988)
19: Calculated vitrinite reflectance, %Rc = 0.60*MPI1 + 0.40 (RADKE and WELTE, 1983)
20: Calculated vitrinite reflectance, %Ro = 2.242*F1 - 0.166 (KVALHEIM et al., 1987)
21: Calculated vitrinite reflectance, %Rm = 0.073*MDR + 0.51 (RADKE, 1988)
22: C27 20R+S diasteranes/(C27 20R+S diasteranes + C29 aa+ßß 20S+R steranes)
23: C30 ßß 20S sterane/SUM(C27-C30) ßß 20S steranes
24: bisnorhopane/(bisnorhopane + norhopane)
25: 29Ts/(29Ts+norhopane)

Tab. 7