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Geochemical investigation of a crude oil sample from
well 206/3-1, United Kingdom

by

J.M.A. Buiskool Toxopeus and F.A.M. de Gier

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CONTENTS

	page
1. Introduction	1
2. Conclusions	1
3. Geochemical parameters	
Summary of the analytical data	2
Bar diagram of normal alkanes & isoprenoids	3
The light fraction	4
GCMS sterane typing	5
GCMS triterpane typing	6
4. Analytical data	
Gas chromatogram of the whole crude	
GCMS data of the aromatic fraction	
Gas chromatogram of the saturated hydrocarbons	
Gross composition	
Gas chromatogram of the light fraction	
Sterane fragmentogram	
Triterpane fragmentogram	
Enlarged part of whole oil gas chromatogram	
Data of enlarged part of gas chromatogram	

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*Geochemical investigation of a crude oil sample from
well 206/3-1, United Kingdom*

1.0 Introduction

A geochemical investigation has been carried out on a crude oil sample from 12137 ft (OMC 6097, RFT-4, Cenomanian/Aptian) in well 206/3-1, United Kingdom (request telex ref. ABX 010774 of 01.02.94). The geochemical parameters are shown on pages 2 to 6, analysis results are presented on the yellow pages.

2.0 Conclusions

1. Contamination

The shape of the whole oil gas chromatogram suggests that the sample represents an artificial fraction, because almost no light and heavy ends are present. The well-file confirms that a considerable amount of diesel filtrate mixed with water was recovered from the tests.
No further interpretation of the data has been carried out.

Summary of the Geochemical Data of the oil sample from well 206/03-01, United Kingdom

Gravity and Gross Composition

API gravity (degrees) :	33.0
Specific Gravity (g/ml) :	0.860
Viscosity (centipoise) :	no data
Gross Composition (W%)	
Weight lost on topping :	15.0
Saturates :	61
Aromatics :	28
Heterocompounds :	10
Rest (High molecular) :	0
Gasoline fraction (%) :	0.3
Sulphur (%) :	0.2
Vanadium (ppm) :	0.0
Nickel (ppm) :	0.0

Saturates Distributions

(Gaschromatography)

Pristane / Phytane :	1.3
Pristane / n-C17 :	0.6
Phytane / n-C18 :	0.5
ACI :	30
Corr. Coeff. :	-0.9787

C-7 Distributions

(Gaschromatography)

C-7 Alkanes (%)	
Normal C-7 :	39
Mono Branched :	44
Poly Branched :	17
C-7 Alkanes / Cyclo Alkanes (%)	
Normal C-7 :	19
Cyclo Alkanes :	51
Branched Alkanes :	30
C-7 Alk. / Cyclo Alk. / Aromatics (%)	
Alkanes :	30
Cyclo Alkanes :	31
Aromatics :	39

Carbon Isotope Ratios

(Mass Spectrometry)

Total Oil (topped) :	-28.6
Saturates :	-29.1
Aromatics :	-27.6

Distribution of Ring Compounds

(Field Ionisation Mass Spectrometry)

C-15 Ring Compounds (%)

1 ring :	no data
2 ring :	
3 ring :	

C-30 Ring Compounds (%)

3 ring :	no data
4 ring :	
5 ring :	

C-29 VR/E :

no data

Sterane and Triterpane Distributions

(Gaschromatography / Mass Spectrometry)

Steranes/Triterpanes (%)

Iso Steranes :	35
Rearranged Steranes :	59
Triterpanes :	6

Steranes (%)

Iso Steranes :	41
Rearranged Steranes :	47
Normal Steranes :	12

Triterpanes (%)

C-30 Hopanes :	100
Oleanane ($\alpha + \beta$) :	0
W + T :	0

Steranes Carbon No. Dist. (%)

C-27 :	68
C-28 :	23
C-29 :	9

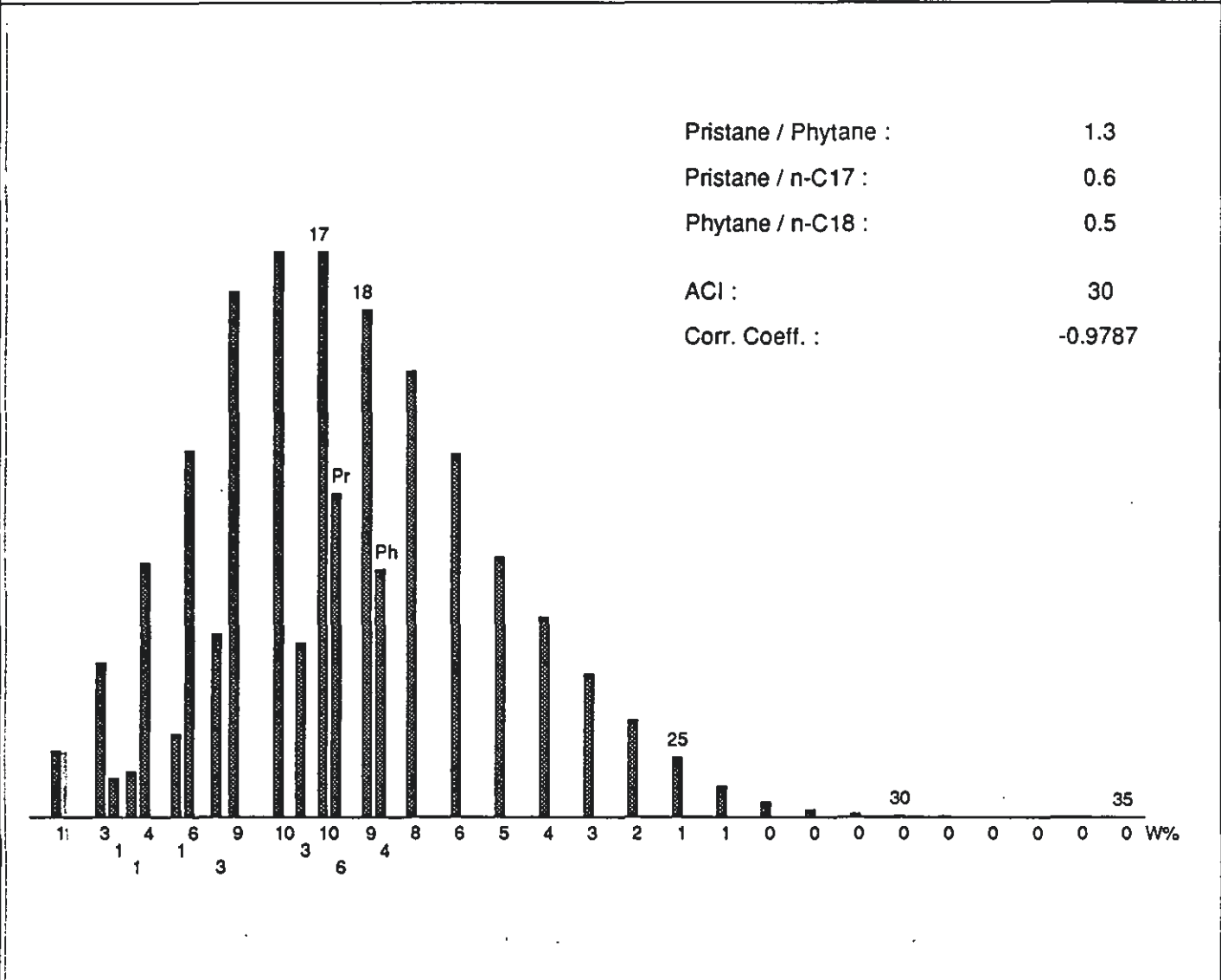
C-29 Sterane Ratios

20S / 20R + 20S :	0.00
Iso / Iso + Normal :	0.62

Triterpane Ratios

TS / TM :	1.67
3R / 3R + 5R :	0.80

Bar diagram of Normal-alkanes & Isoprenoids of the oil sample from well 206/03-01, United Kingdom

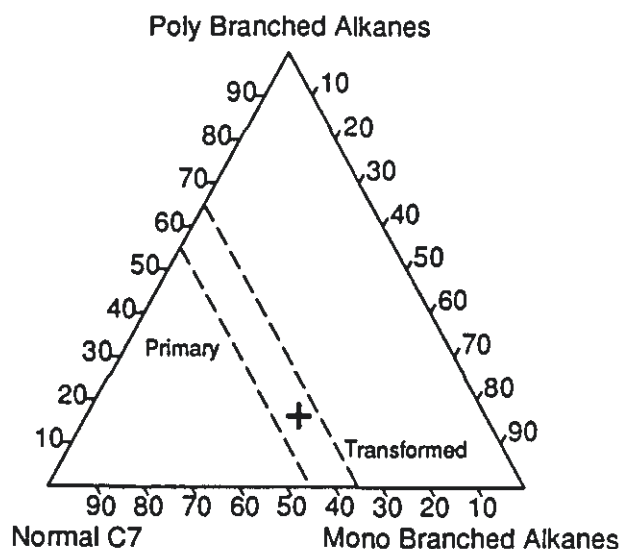


Conclusions based on saturated hydrocarbon fraction :

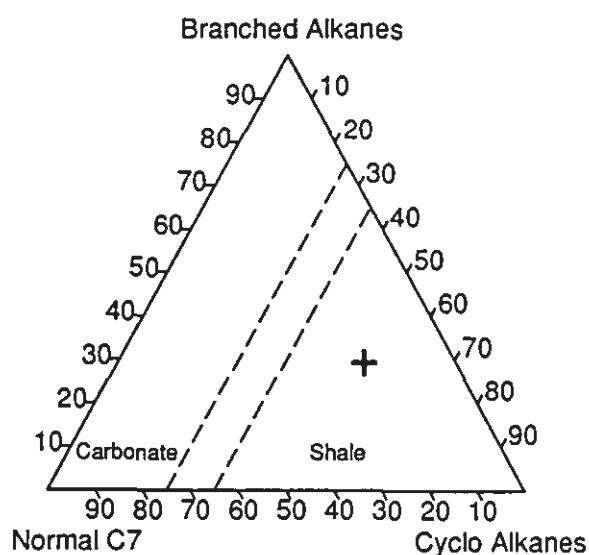
- 1: the saturates show no indication of bacterial degradation
- 2: it is likely that the n-alkane distribution has a mature character

The Light Fraction (< 120 C.) of the oil sample from well 206/03-01, United Kingdom

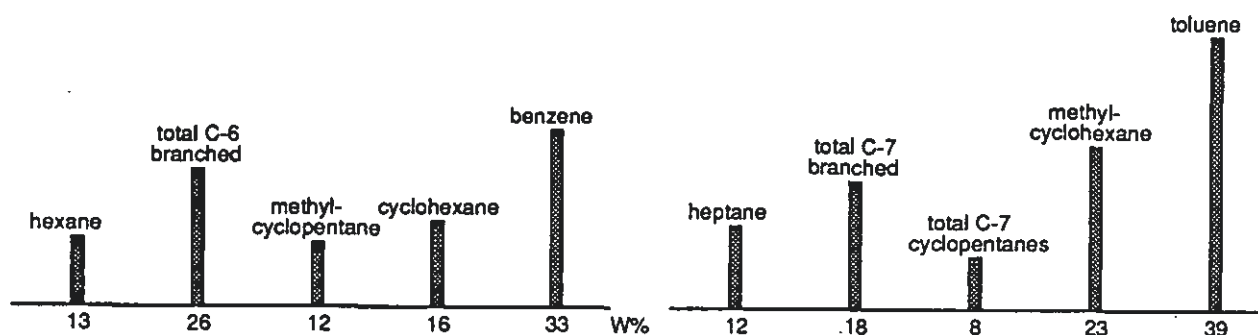
Alkane Distribution



Alkane/Cyclo-alkane Distribution



C-6 and C-7 Distributions



C-7 ALKANES (%)

Normal C-7 :	39
Mono Branched :	44
Poly Branched :	17

C-7 ALKANES / CYCLO ALKANES (%)

Normal C-7 :	19
Cyclo Alkanes :	51
Branched Alkanes :	30

C-7 ALK. / CYCLO ALK. / AROMATICS (%)

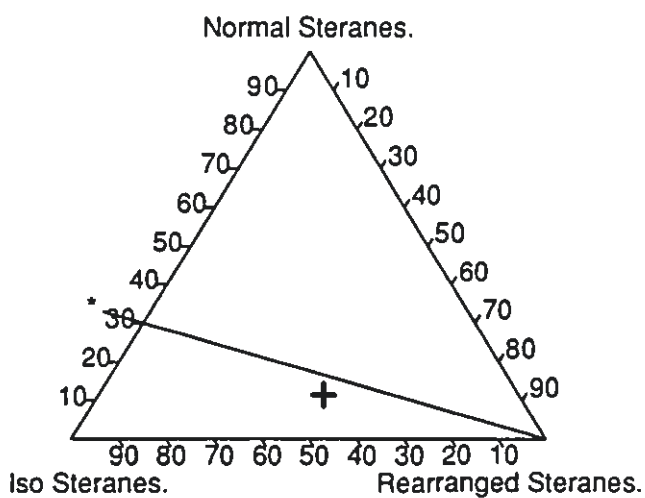
Alkanes :	30
Cyclo Alkanes :	31
Aromatics :	39

Conclusions based on light fraction :

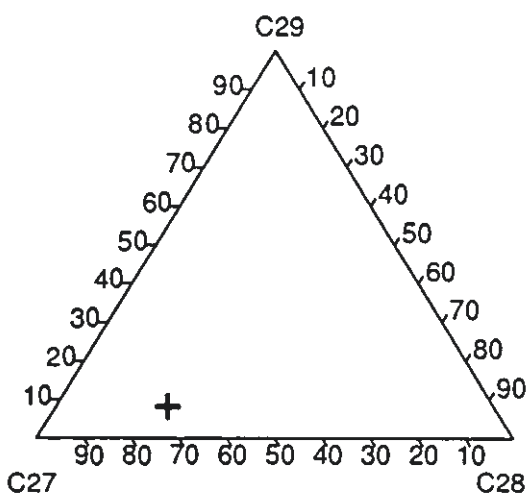
- 1 : it is likely that the light fraction shows indication of severe bacterial degradation
- 2 : it is possible that the light fraction has a highly mature character
- 3 : it is likely that the light fraction indicates a shaly source rock
- 4 : it is possible that the light fraction shows a contribution of landplant matter in the source rock of this oil

GCMS Sterane typing of the oil sample from
well 206/03-01, United Kingdom

Sterane Conversion Diagram

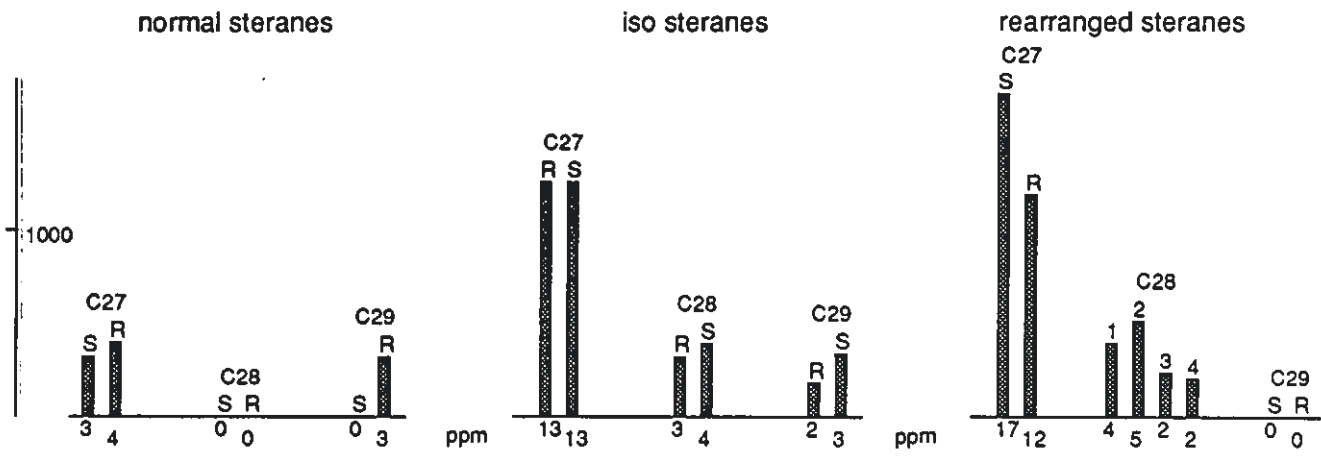


Sterane Typing Diagram



* The line of complete sterane isomerisation
indicating a mature character

Sterane Distribution



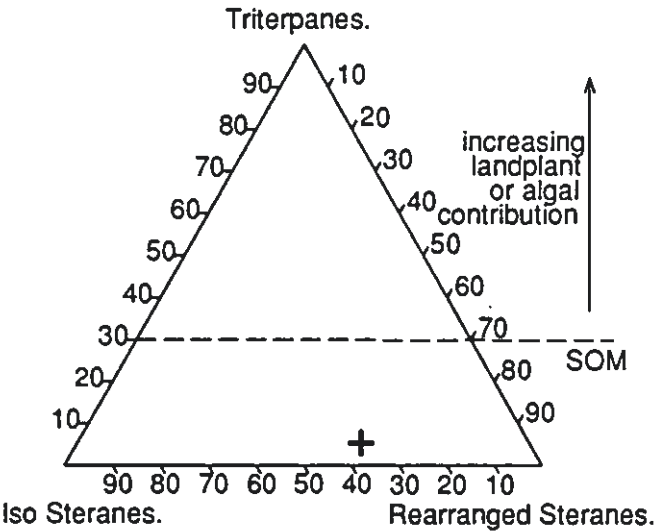
STERANE DISTRIBUTION		
(ppm)		(%)
Iso Steranes :	38	41
Rearranged Steranes :	43	47
Normal Steranes :	10	12
CARBON NUMBER DISTRIBUTION		
C-27 :	62	68
C-28 :	21	23
C-29 :	8	9
C-29 STERANE CONVERSION RATIOS		
20S / 20R + 20S :		0.00
Iso / Iso + Normal :		0.62

Conclusions based on steranes :

1 : due to the low concentrations
of the steranes no conclusions
can be reached

GCMS Triterpane typing of the oil sample from
well 206/03-01, United Kingdom

Sterane/Triterpane Diagram



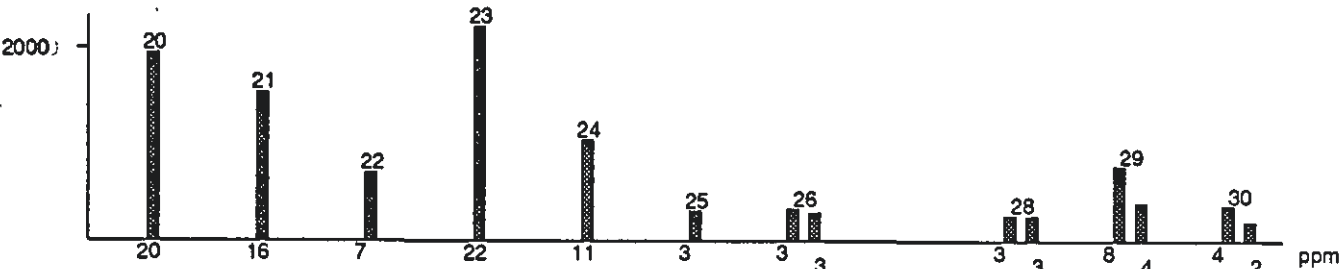
STERANES/TRITERPANES (calculated %)

Iso Steranes :	35
Rearranged Steranes :	59
Triterpanes :	6

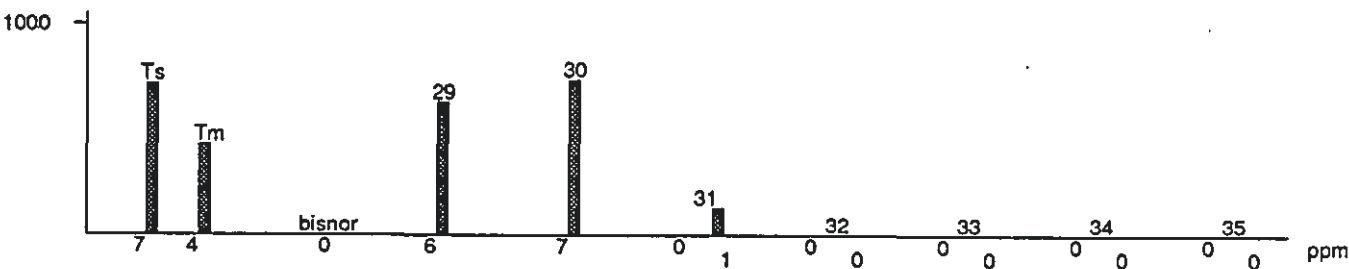
TRITERPANE CONVERSION RATIOS

TS / TM :	1.67
3R / 3R + 5R :	0.80
C30 Hopane (ppm) :	7

Tricyclic Terpanes



Pentacyclic Terpanes



Conclusions based on triterpanes :

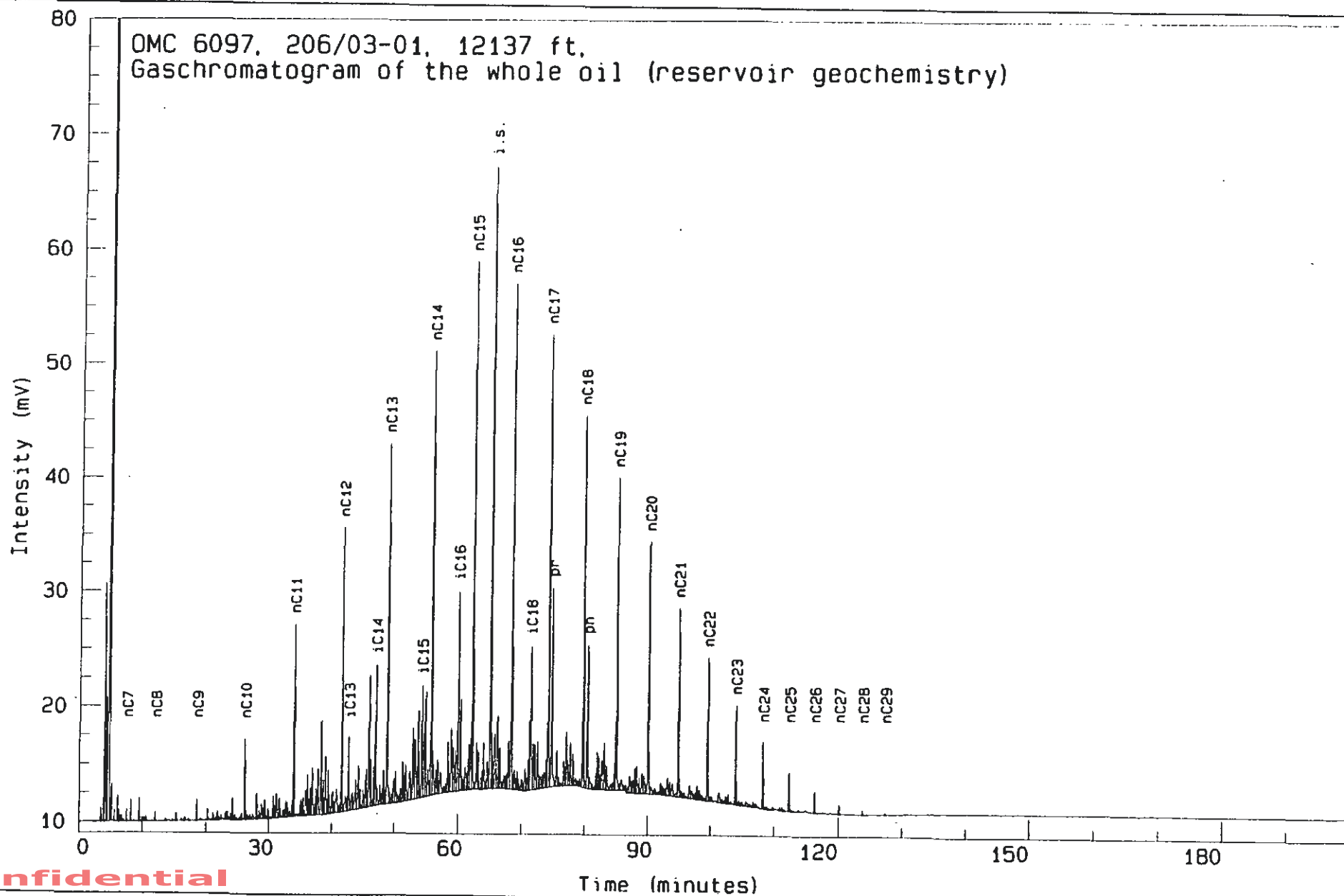
1 : the triterpane distribution indicates a source rock containing predominantly structureless organic matter

ANALYTICAL DATA
well 206/03-01, United Kingdom

10909915

Gas chromatogram of the whole oil sample from well 206/03-01, United Kingdom

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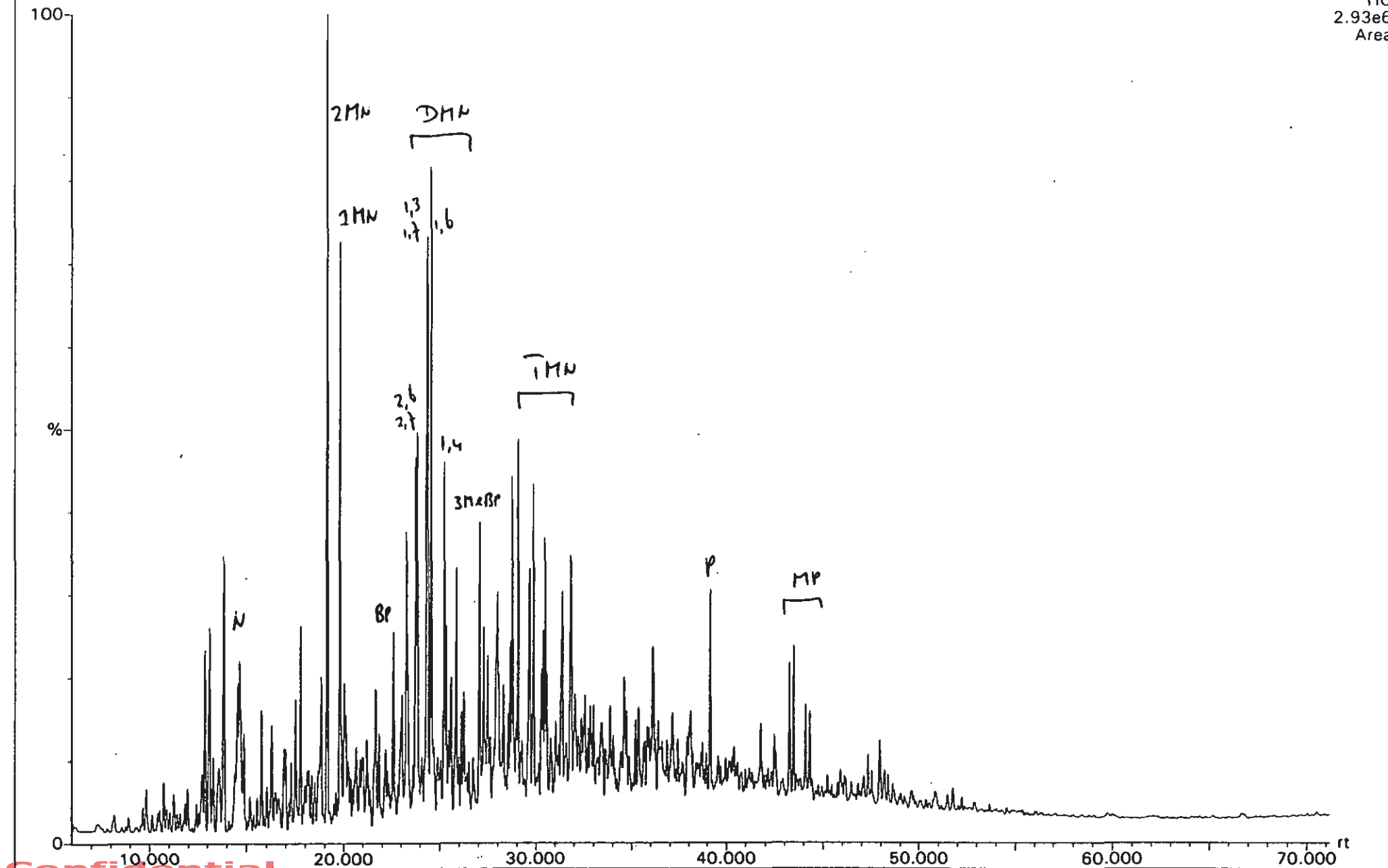
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K.S.E.P.L.
08-Jun-1994 17:55:25
1660641

u.k. 206/03-01 12137 ft omc 6097

MD-800
RON
Scan EI +
TIC
2.93e6
Area



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GCMS data of the aromatic fraction well 206/03-01, United Kingdom

Report of sample: u.k. 206/03-01 12137 ft omc 6097

Acquired at : 08-Jun-1994

Standard used for calculations: PDP
Discrimination factor : 1.70

I) NAPHTHALENES

a) Concentrations (ppm)

2-MN
1-MN
2,6+2,7-DMN
1,6-DMN
1,5-DMN
1,3,5+1,4,6-TMN
2,3,6-TMN
1,2,5-TMN
C4-NAPH
THN
CAD

Total Naphthalenes

b) Parameters

2-MN/1-MN (MNR) 1.46
2,6+2,7-DMN/1,5-DMN (DNR-1) 2.51
2,3,6-TMN/1,3,5+1,4,6-TMN (TNR-1) 0.79
2,3,6-TMN/1,2,5-TMN (TNR-2) 2.03
2,3,6-TMN/THN 20.21
2,3,6-TMN/Cadelene 73.13

b) Parameters

3836 4-MDBT/2+3-MDBT 1.54
2624 4-MDBT/1-MDBT 3.73
2554 2+3-MDBT/1-MDBT 2.43
2198 4-MDBT/DBT 1.06
1017 2+3-MDBT/DBT 0.69
1065 1-MDBT/DBT 0.28

IV) BIPHENYLS

123 a) Concentrations (ppm)
42 BP 950
12 2-MBP 105
14730 3-MBP 806
4-MBP 306
Total Biphenyls 2167

b) Parameters

2.51 3-MBP/BP 0.85
0.79 3-MBP/4-MBP 2.63
2.03 3-MBP/2-MBP 7.67

II) PHENANTHRENES

a) Concentrations (ppm)

P
3-MP
2-MP
9-MP
1-MP
Total Phenantrenes

b) Parameters

2-MP/1-MP 1.75
1.5*(2+3-MP/(P+1+9-MP)) (MPI-1) 0.86
3*(2-MP/(P+1+9-MP)) (MPI-2) 0.94
2+3-MP/1+9-MP 1.50
2+3-MP/1+9+2+3-MP 0.60

V) DIBENZOFURANS

a) Concentrations (ppm)

DBF 245
1308 4-MDBF 242
547 2+3-MDBF 237
663 1-MDBF 124
429 Total Dibenzofurans 848
379

b) Parameters

3326 4-MDBF/2+3-MDBF 1.02
4-MDBF/1-MDBF 1.96
1.75 2+3-MDBF/1-MDBF 1.91
0.86 4-MDBF/DBF 0.99
0.94 2+3-MDBF/DBF 0.97
1.50 1-MDBF/DBF 0.51
0.60

III) DIBENZOTHIOPHENES

a) Concentrations (ppm)

DBT 267
4-MDBT 282
2+3-MDBT 184
1-MDBT 76
Total Dibenzothiophenes 808

VI) OVERALL RATIOS

Biphenyls/NAPH* 0.40
Dibenzothiophenes/NAP 0.15
Dibenzofurans/NAPH* 0.15

MN = methylnaphthalene
DMN = dimethylnaphthalene
TMN = trimethylnaphthalene
THN = tetrahyronaphthalene
DBF = methyldibenzofuran
MDBF = methyldibenzofuran

P = phenantrene
MP = methylphenanthrene
DBT = dibenzothiophene
MDBT = methyldibenzothiophene
BP = biphenyl
MBP = methylbiphenyl

NAPH* = 2,6+2,7-DMN + 1,5-DMN + 1,4,6+1,3,5-TMN + 2,3,6-TMN

GCMS data of the aromatic fraction well 206/03-01, United Kingdom

VII) Misc. NAPHTHALENES

a) Concentrations (ppm)

2,6-DMN	1307	4,5-DMP	45
2,7-DMN	1247	2,6+3,6-DMP	93
1,3+1,7-DMN	2933	3,5-DMP	164
1,6-DMN	2198	2,7-DMP	108
1,4-DMN	n.d.	3,9-DMP	369
2,3-DMN	549	1,6+2,5+2,9-DMP	169
1,5-DMN	1017	1,7-DMP	129
1,2-DMN	571	1,9+4,9-DMP	69
1,4+2,3-DMN	549	1,5-DMP	n.d.
		1,8-DMP	29
		1,2-DMP	24
		9,10-DMP	n.d.
1,3,7-TMN	1042	1,2,6-TMP	17
1,3,6-TMN	1222	1,2,5-TMP	7
1,3,5+1,4,6-TMN	1065	1,2,9-TMP	n.d.
2,3,6-TMN	844	1,2,7-TMP	n.d.
1,2,7-TMN	113	1,2,8-TMP	11
1,6,7-TMN	576		
1,2,6-TMN	483		
1,2,4-TMN	121		
1,2,5-TMN	416		
1,3,5,7-TeMN	190		
1,3,6,7-TeMN	339		
1,2,4,7-TeMN	250		
1,2,5,7-TeMN	142		
2,3,6,7-TeMN	111		
1,2,6,7-TeMN	68		
1,2,5,6-TeMN (C4-NAPH)	123		

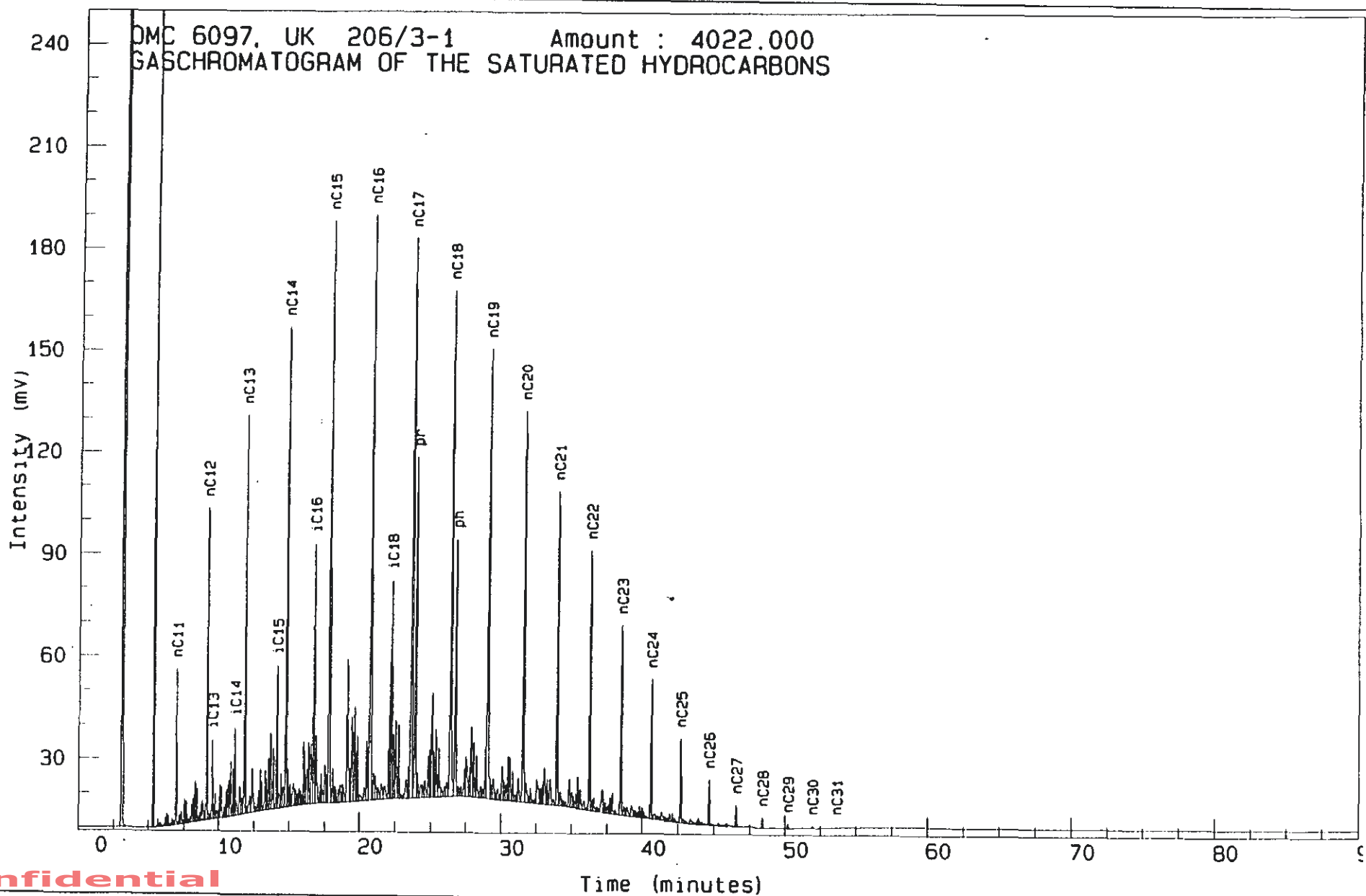
b) Parameters

1,2,5-TMN/1,3,6-TMN 0.34

1,2,7-TMN/1,3,7-TMN 0.11

The assignment of some of these peaks is tentative

Gas chromatogram of the saturated hydrocarbons of the oil sample from
well 206/03-01, United Kingdom



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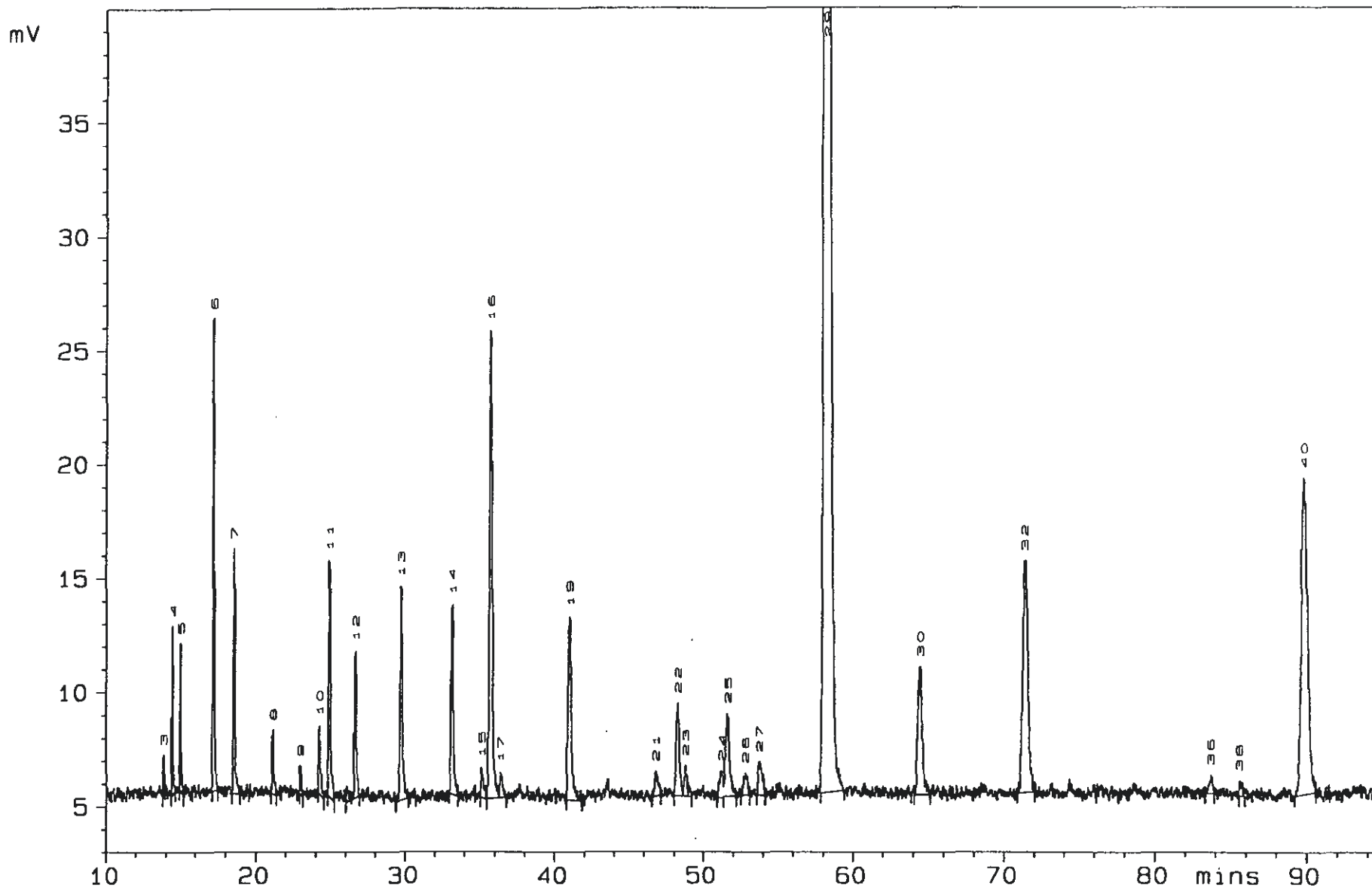
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Gas chromatogram of the light fraction (< 120 C.) of the oil sample from
well 206/03-01, United Kingdom

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Gas chromatographic hydrocarbons analysis (< 120 C.) well 206/03-01, United Kingdom

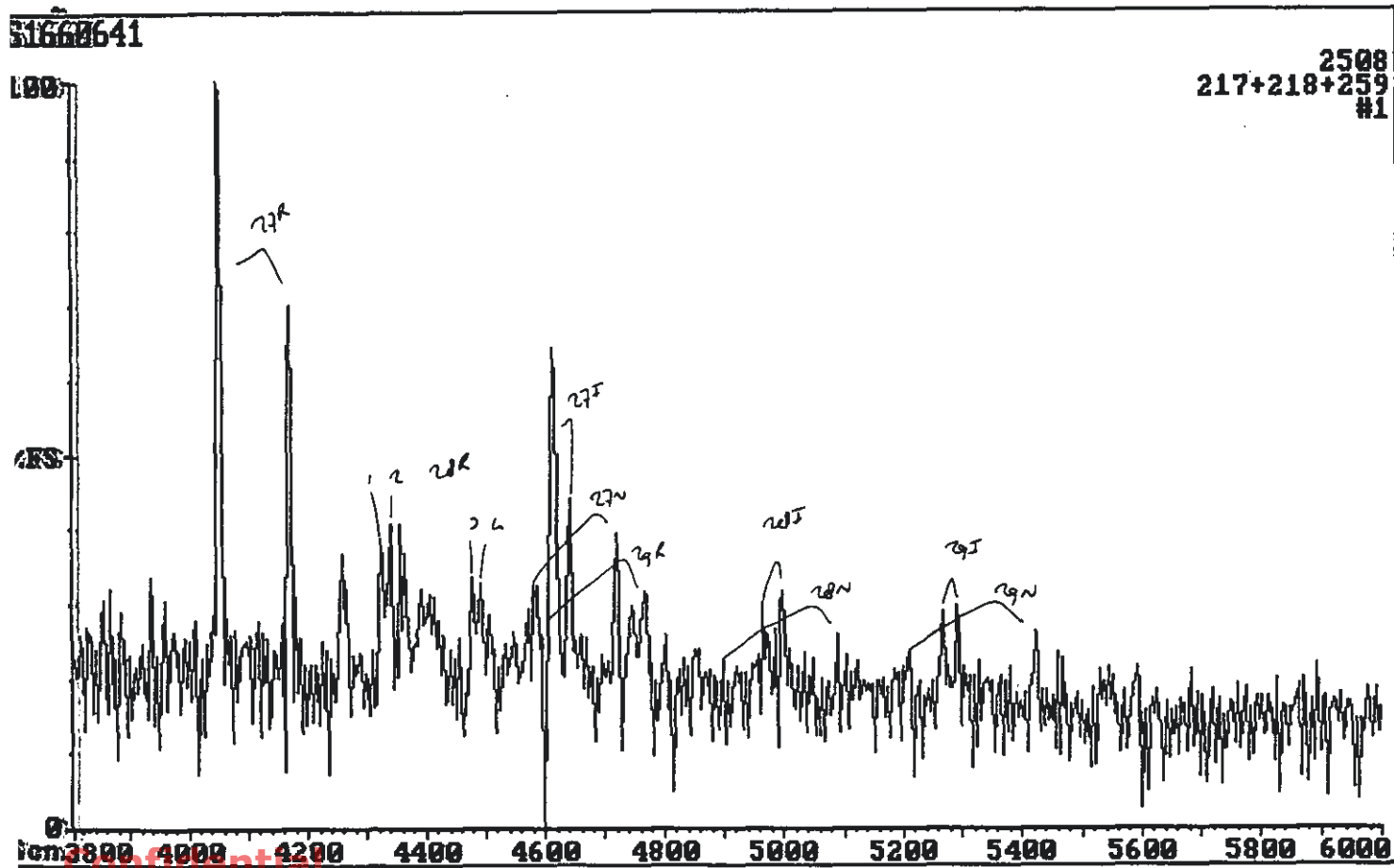
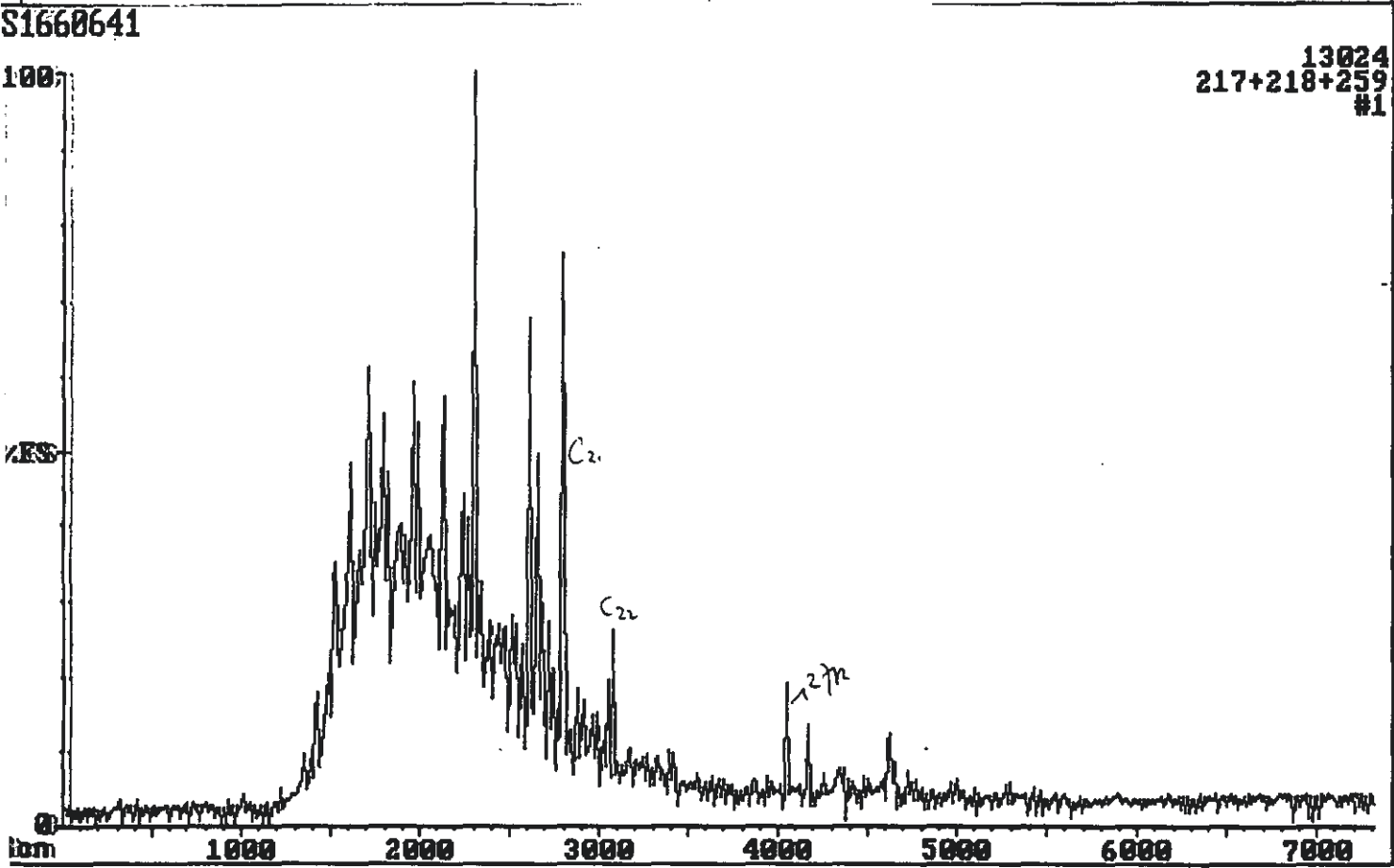
GAS CHROMATOGRAPHICS ANALYSIS OF THE FRACTION BOILING BELOW 120 DEGREES CENTIGRADE

Sample: s166064/1

COMPONENT No.	Name	RET.TIME (min)	HEIGHT (uV)	AREA (uVs)
1	methane	0.00	0	0
2	ethane	0.00	0	0
3	propane	13.87	1667	7845
4	i-butane	14.46	7387	35374
5	n-butane	15.01	6508	31868
6	i-pentane	17.23	20725	119198
7	n-pentane	18.58	10757	71334
8	2,2-dimethylbutane	21.14	2833	20579
9	cyclopentane	23.00	1301	9019
10	2,3-dimethylbutane	24.26	3022	26751
11	2-methylpentane	24.92	10385	88974
12	3-methylpentane	26.69	6407	62861
13	n-hexane	29.73	9342	99314
14	methylcyclopentane	33.19	8320	93283
15	2,2-dimethylpentane	35.16	1331	14618
16	benzene	35.74	20503	256362
17	2,4-dimethylpentane	36.42	1117	14766
18	2,2,3-trimethylbutane	0.00	0	0
19	cyclohexane	41.02	8039	124404
20	3,3-dimethylpentane	0.00	0	0
21	1,1-dimethylcyclopentane	46.79	1104	15712
22	2-methylhexane	48.27	4065	64661
23	2,3-dimethylpentane	48.82	1359	21672
24	1-c-3-dimethylcyclopentane	51.25	1180	16478
25	3-methylhexane	51.66	3639	69578
26	1-tr-3-dimethylcyclopentane	52.85	977	16849
27	1-tr-2-dimethylcyclopentane	53.77	1473	27855
28	3-ethylpentane	0.00	0	0
29	reference peak	58.36	262548	5007487
30	n-heptane	64.47	5602	119490
31	1-c-2-dimethylcyclopentane	0.00	0	0
32	methylcyclohexane	71.40	10142	235883
33	1,1,3-trimethylcyclopentane	0.00	0	0
34	2,2-dimethylhexane	0.00	0	0
35	ethylcyclopentane	0.00	0	0
36	2,5-dimethylhexane	0.00	0	0
37	not present	83.71	832	12042
38	2,2,3-trimethylpentane	0.00	0	0
39	1-tr-2-c-4-trimethylcyclopentane	85.59	702	9868
40	toluene	0.00	0	0
		89.93	13808	393567
total area excluding i.s.:				2080203

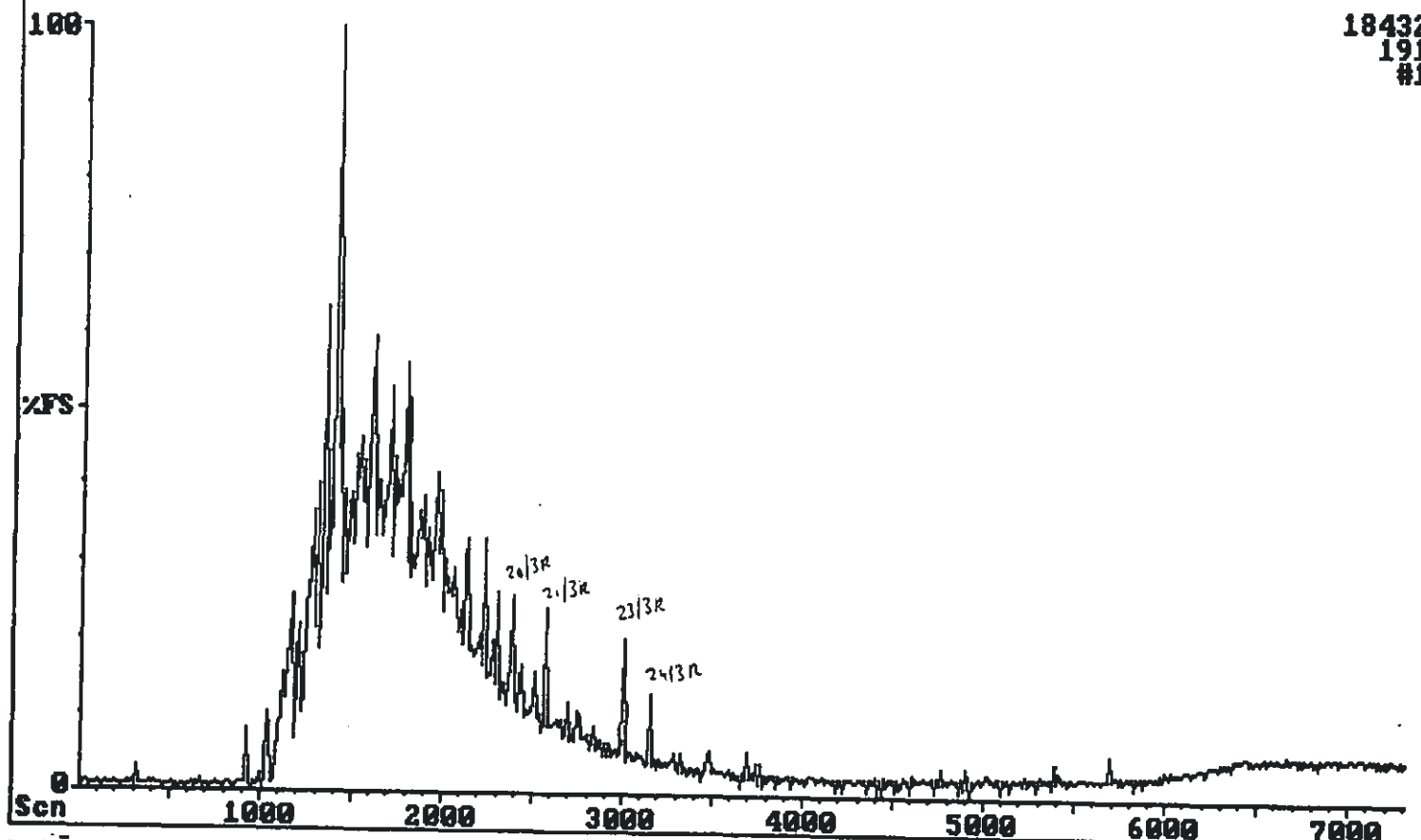
Weight percentage internal standard: 0.66
Weight percentage C7 fraction : 0.27

Sterane Fragmentograms of the oil sample from
well 206/03-01, United Kingdom

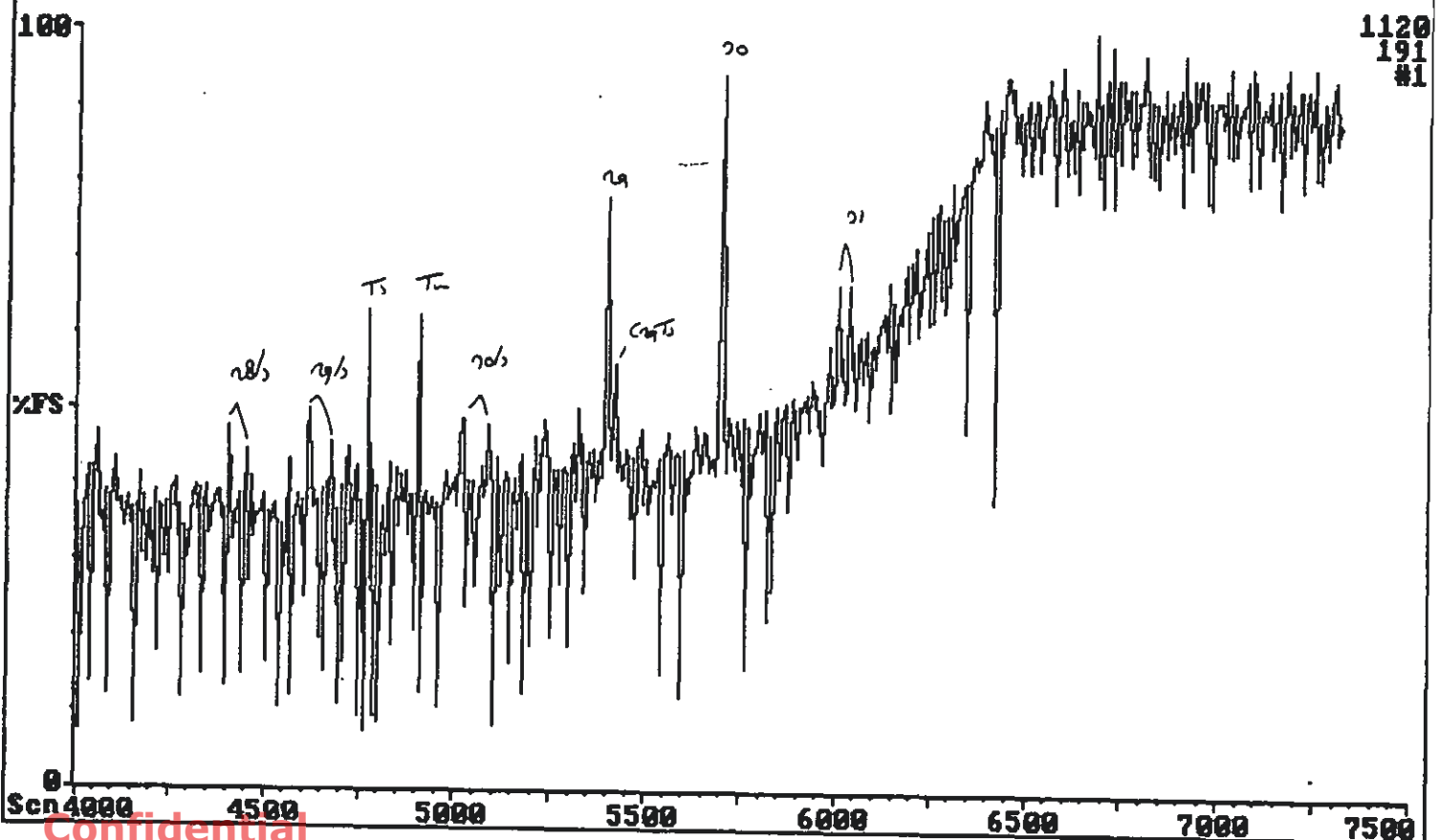


*Triterpane Fragmentograms of the oil sample from
well 206/03-01, United Kingdom*

S1660641

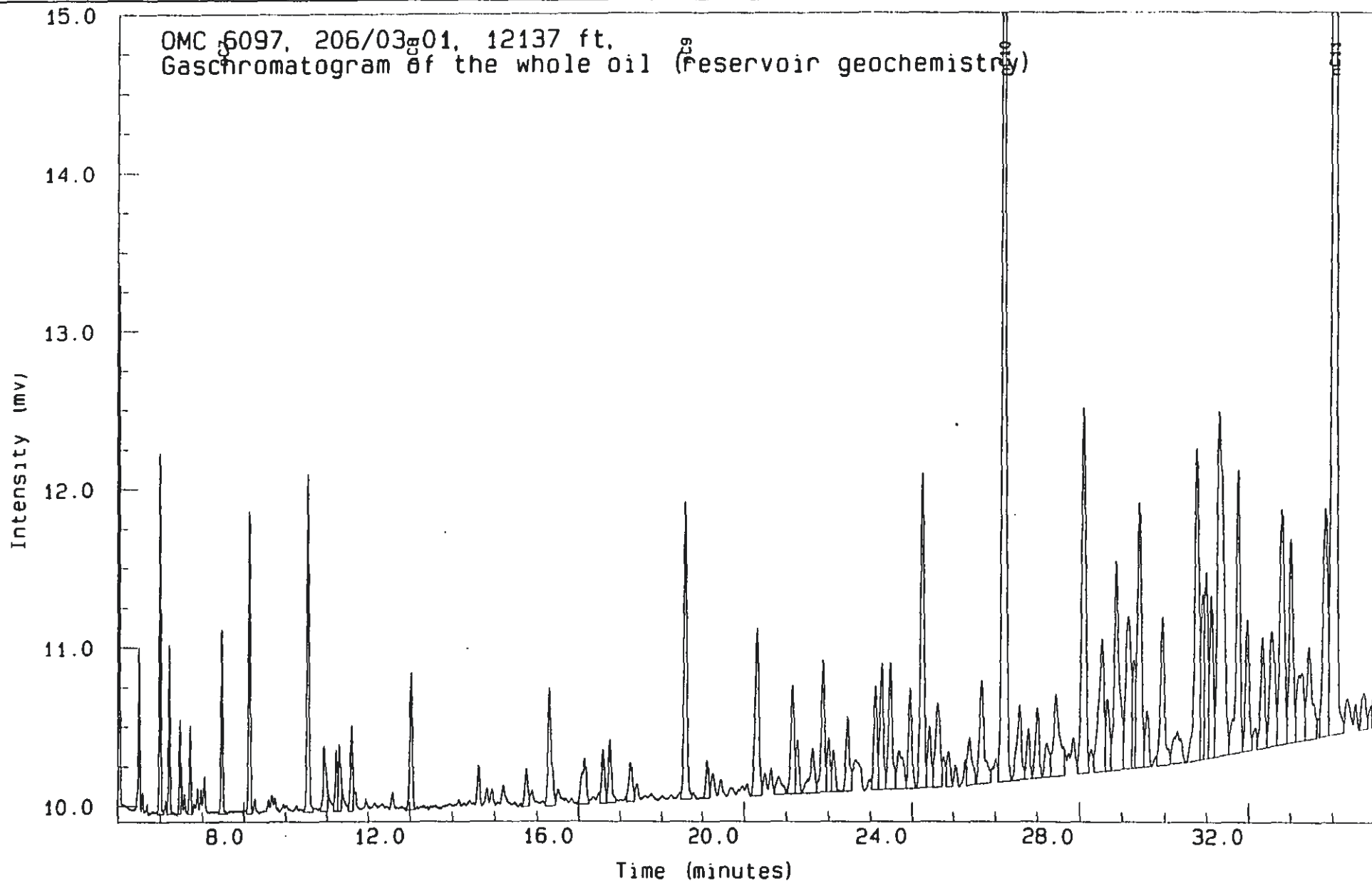


S1660641



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Enlarged part of the whole oil gas chromatogram from well 206/03-01, United Kingdom



Data for the enlarged part of the whole oil gas chromatogram from well 206/03-01, United Kingdom

Injection Report

Acquired on 10-FEB-1994 at 11:37

Sample Name : OMC 6097, 206/03-01, 12137 ft,
 Sample Id : S166064/1
 Sample Type : Sample Amount=0.00000
 Bottle No : 6

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	Peak name
------	---------	---------	----------	-----------

1	3.923	20812	42334	
2	4.219	10958	49885	
3	4.565	988388	11807618	
4	6.000	2268	5174	
5	6.224	1055	2410	
6	6.475	594	1314	
7	6.712	555	1375	
8	7.472	1154	3110	nC7
9	8.133	1898	5534	
10	9.541	2122	7208	
11	9.936	388	1922	
12	10.227	347	1372	
13	10.296	387	1580	
14	10.589	512	2001	
15	12.016	866	3451	nC8
16	14.733	236	1220	
17	15.291	788	4340	
18	16.141	339	2210	
19	16.579	347	1763	
20	16.744	367	2128	
21	17.253	217	1672	
22	18.568	1904	9376	nC9
23	19.115	235	1172	
24	20.296	1056	6536	
25	20.816	172	1144	
26	21.139	680	3949	
27	21.264	335	1795	
28	21.621	276	2298	
29	21.861	826	4775	
30	22.003	334	1788	
31	22.125	253	1394	
32	22.448	410	2765	
33	23.109	675	3692	
34	23.259	820	4643	
35	23.467	831	5086	
36	23.677	226	2487	
37	23.947	627	3658	
38	24.245	1989	11855	
39	24.424	388	2376	
40	24.621	533	4345	
41	24.885	229	1310	
42	25.389	366	2394	
43	25.667	601	5175	
44	26.195	7034	42134	nC10
45	26.581	464	3686	

Peak	RT mins	Hght uV	Area uVs	Peak name
46	26.784	307	1751	
47	27.003	438	2839	
48	27.235	170	1675	
49	27.445	534	5334	
50	28.085	2305	15718	
51	28.517	850	7336	
52	28.637	475	2729	
53	28.845	1346	10959	
54	29.125	1002	8619	
55	29.267	726	3059	
56	29.395	1721	11695	
57	29.581	353	2100	
58	29.933	893	6493	
59	30.299	187	2656	
60	30.757	1958	14307	
61	30.901	1025	4997	
62	30.979	1162	6872	
63	31.104	1064	5958	
64	31.288	2207	22350	
65	31.739	1737	12060	
66	31.955	840	5039	
67	32.323	697	4849	
68	32.536	774	6569	
69	32.789	1459	11873	
70	33.008	1255	8355	
71	33.253	450	4940	
72	33.429	596	5231	
73	33.819	1510	11413	
74	34.024	16693	100430	nC11
75	34.715	194	1838	
76	35.051	1251	6444	
77	35.133	1497	10378	
78	35.275	432	2367	
79	35.485	1626	12967	
80	35.656	386	2570	
81	35.853	2220	21235	
82	36.157	3581	27192	
83	36.283	1511	7856	
84	36.539	2375	15019	
85	36.693	2425	16045	
86	36.899	4131	35774	
87	37.331	1010	8332	
88	37.504	2335	18163	
89	37.797	4009	37708	
90	38.301	8221	67517	
91	38.640	3021	19021	
92	38.976	5060	42472	
93	39.171	1190	6320	
94	39.288	1358	8195	
95	39.435	3843	26109	
96	39.624	1746	12140	
97	39.771	634	5314	
98	40.000	1674	12435	
99	40.160	1951	13912	
100	40.336	1063	6999	
101	40.496	901	6108	
102	40.768	2061	29691	
103	41.061	711	5543	