

3.3. Fluids summary

(NOTE: all costs given in this chapter are technical costs)

3.3.1 Comments by phase

3.3.1.1 26" x 36" Section

This section was drilled riserless from the seabed at 147 m to 213.5 m with sea water . On every connection the hole was swept with hi-vis pills (minimum 10 m3) . At TD , before the wiper trip , 50 m3 of hi-vis bentonite mud was displaced . On return to bottom the hole was displaced to 1.20 hi-vis bentonite mud . No fill in the hole was observed .

Density	1.03 to 1.20
Funnel viscosity	> 100
Volume built	440 m3
Drilling Mud Cost	88 003 NOK

The 20" x 30" csg was run to 208 m and cemented to sea bed with a 5" DP stinger . The slurry was mixed with sea water and accelerator A7 L . The visualisation of cement return was made by pumping a spacer with red tracer ahead of the cement slurry . The return of spacer at sea bed was monitored with ROV , but no definitive tracer sighting was observed. A total slurry volume of 31 m3 was mixed before displacement with sea water (> 200 % of excess) .

Cement Cost	91 057 NOK
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3.3.1.2 17 1/2" Section

The section was drilled riserless with seawater and a minimum of 10 m3 hi-vis pill on every connection . At TD a hi-vis pill of 30 m3 was pumped and displaced with hi-vis bentonite mud at 1.20 sg before pulling out and running the 13 3/8 casing .

The hole appeared to be in good condition on the trip , with no overpull and drag being encountered .

Density	1.03 to 1.20
Funnel viscosity	> 100
Volume built	802 m3
Drilling Mud Cost	285 714 NOK

3.3.1.4 Testing Phase

The seawater was displaced with a inhibited KCL brine SG 1.03 used for the complete testing operations. The reason for KCl over seawater was simply cost - KCl was on the rig and worked out cheaper than the additives required for seawater.

Testing Product cost	88 077 NOK
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3.3.1.5 P&A Phase

The KCL brine was displaced with inhibited seawater . Cement plugs were set as per programme (see figure 3.2) . To cut the 7" casing and recover it , it was necessary to use OBM due to the same mud in place in annulus. The OBM was displaced with seawater and transfered in mud tanks of supply boat . The oily water was recovered and sent onshore for disposal. (Total volume of wastewater 111 tons) .

Abandon fluid cost	21 008 NOK
Cement cost	108 802 NOK

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WELL : 25/5-5

WIRELINE FORMATION TEST REPORT

Borehole : 25/5-5
Well section N° : 1

Operation N° : 1
Run N° : 3

Table alt : +25.00 m

Operator : Schlumberger

Tool type : MDT

Nb of requested pretest : 13

Number of sampling : 0

Nb of successful pretest : 13

Comments : Due to powering problems sampling was not performed. POOH to check tool.

Test points in well-section No : 1 in Borehole : 25/5-5
Pretest

N°	Depth	Abs altit	Hydro pres.	MW	Final pres.	EqMW
	Comments				Type Quality	
1	2158.86 m	+2132.37 m	271.35 bar	1.277	199.00 bar	.936
					Tmp corrected Very good	
2	2160.54 m	+2134.07 m	270.49 bar	1.272	199.12 bar	.935
					Tmp corrected Very good	
3	2165.05 m	+2138.55 m	270.63 bar	1.270	199.49 bar	.935
					Tmp corrected Very good	
4	2168.28 m	+2141.81 m	270.48 bar	1.268	199.73 bar	.935
					Tmp corrected Very good	
5	2171.59 m	+2145.11 m	270.46 bar	1.266	200.03 bar	.935
					Tmp corrected Very good	
6	2174.04 m	+2147.55 m	270.42 bar	1.264	200.23 bar	.935
					Tmp corrected Very good	

Operation N° : 1 Borehole : 25/5-5
WLINE FORMATION TEST report (next 1)

Run N° : 3

7	2178.57 m	+2152.07 m	270.73 bar	1.263	200.63 bar	.935	Tmp corrected Very good
8	2183.06 m	+2156.48 m	270.96 bar	1.262	201.07 bar	.935	Tmp corrected Very good
9	2189.09 m	+2162.54 m	271.69 bar	1.261	201.67 bar	.935	Tmp corrected Very good
10	2195.13 m	+2168.56 m	272.30 bar	1.261	202.27 bar	.935	Tmp corrected Very good
11	2215.03 m	+2188.36 m	278.68 bar	1.279	204.39 bar	.937	Tmp corrected Very good
12	2245.03 m	+2218.19 m	280.22 bar	1.269	207.71 bar	.939	Tmp corrected Very good
13	2275.06 m	+2248.04 m	284.49 bar	1.271	210.69 bar	.940	Tmp corrected Very good

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WELL : 25/5-5

WIRELINE FORMATION TEST REPORT

Borehole : 25/5-5
Well section N° : 1
Table alt : +25.00 m
Nb of requested pretest : 3
Nb of successful pretest : 3
Comments :

Operation N° : 1
Run N° : 4
Operator : Schlumberger
Tool type : MDT
Number of sampling : 3

Test points in well-section No : 1 in Borehole : 25/5-5
Pretest

N°	Depth	Abs altit	Hydro pres.	MW	Final pres. Type Quality	EqMW
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1	2160.50 m	+2134.08 m			-	
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When sampling 2"3/4 chamber very little flow probably due to plugging

Sampling

Final Pressure :
N° : 1
Comments : In addition attempt to fill two multisampler chamber (450cc) that failed to open

Duration :
Total volume of chamber(s) : 10.40 l
Mud / Filtrate volume :

Shows and fluids

GAS	Volume	300.00 l	Comments
		C1 .74 %	
	C2 .0751 % iC5 .0037 %	C3 .0411 % iC4 .0068 %	nC4 .0113 %

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Printed on : 29/05/96

WELL : 25/5-5

WIRELINE FORMATION TEST REPORT

Borehole : 25/5-5
Well section N° : 1

Operation N° : 1
Run N° : 5

Table alt : +25.00 m

Operator : Schlumberger

Tool type : MDT

Nb of requested pretest : 0

Number of sampling : 0

Nb of successful pretest : 0

Comments

: MISRUN. Quartz gauge not working. Power failure. Not able to restart tool. POOH.

Table 6.2: Well 25/5-5 - Summary of MDT Formation Pressures (Quartz Gauge)

Run	Test No.	Depth m RKB	Depth m MSL	Duration of operation (min)	Formation Pressure (bara)	Comments
1	1	2158.9	2132.4	4:15	199.00	Stabilized
1	2	2160.5	2134.1	3:55	199.12	Stabilized
1	3	2165.1	2138.6	3:28	199.49	Stabilized
1	4	2168.3	2141.8	3:59	199.73	Stabilized
1	5	2171.6	2145.1	3:02	200.03	Stabilized
1	6	2174.0	2147.6	3:30	200.22	Stabilized
1	7	2178.6	2152.1	4:03	200.63	Stabilized
1	8	2183.1	2156.5	3:36	201.07	Stabilized
1	9	2189.1	2162.5	3:27	201.67	Stabilized
1	10	2195.1	2168.6	3:47	202.27	Stabilized
1	11	2215.0	2188.4	3:18	204.39	Stabilized
1	12	2245.0	2218.2	7:00	207.71	Stabilized - Some noise
1	13	2275.1	2248.0	3:15	210.69	Stabilized
1	14	2160.6	2134.1	7:25	199.04	Stabilized - Tool failure
2	15	2160.6	2134.1	24:01	199.18	Stabilized - Probe plugged
2	16	2160.6	2134.1	5:35	199.16	Stabilized - Probe plugged
2	17	2172.1	2145.6	125:27	200.13	Stabilized - 4 Oil samples
2	18	2160.5	2134.1	50:14	199.13	Not Stabilized - Oil sample
2	19	2161.6	2135.1	56:24	199.34	Stabilized - Oil sample

No valid hydrostatic pressures were recorded due to gauge failure

Table 6.3: Well 25/5-5 - Summary of MDT Formation Fluid Sampling

Run	Sample No.	Depth m RKB	Depth m MSL	MDT sampling duration (min)	MDT chamber No.	MDT Chamber volume	Transf. to PVT Bottles No.	Fluid	Comments
1		2160.6	2134.1	-					Tool failure
2		2160.6	2134.1	-					Tool/Bottle failure
2		2160.6	2134.1	-					Tool/Bottle failure
2	S1	2172.1	2145.6	7:43	BA-80012	1 gallon	TS-6202 TS-3405 TS-4714	Oil/Gas Oil/Gas Oil/Gas	Sample sent to GeoQuest for PVTstudy.
	S2			0:57	AA-151	450 cc	TS-6906	Oil/Gas	
	S3			9:52	AA-154	450 cc	TS-5713	Oil/Gas	
	S4			47:17	BB-47	1 gallon	TS-5519 TS-6905 TS-6409	Oil/Gas Oil/Gas Oil/Gas	
2	S5	2160.5	2134.1	14:00	DB-46	2 ³ / ₄ gallon			Sample dumped on rig: Oil: 1.5 litre, Gas: 0.3 Sm ³
2	S6	2161.6	2135.1	33:00	BB-67	1 gallon			Sample dumped on rig: Oil: 1.5 litre, Gas: -

Table 6.4: Well 25/5-5 - Summary of DST Data (DST1)

Date	Time	Choke	P _{wh} (bara)	T _{wh} (°C)	Q _{oil} (Sm ³ /d)	Q _{oil} Corrected (Sm ³ /d)	Q _{gas} (Sm ³ /d)	GOR (Sm ³ /Sm ³)	BSW (%)	P _{bh} (bara)	P _{drawd} (bara)	T _{sep} * (°C)	P _{sep} (Bara)
15.11.95	09:03	Open well for initial flow											
15.11.95	09:03 - 09:32		13.5	6.8					0				
15.11.95	09:32	Shut in well downhole for initial build-up (BU1)											
15.11.95	11:41	Open well for main flow											
15.11.95	11:41 - 16:08	24/64"	15.9	8.6	150.6	150.6	3 155	21.0	0	189.7	7.6	35.4	7.2
15.11.95	16:08 - 20:28	48/64"	12.3	15.8	324.2	322.4	9 225	28.6	0	181.3	16.0	61.8	6.8
15.11.95	20:28 - 21:41	64/64"	11.3	21.9	352.6	353.6	9 398	26.6	0	179.3	18.0	71.5	6.9
15.11.95	21:41 - 23:10	80/64"	10.0	25.0	375.7	379.8	11 757	31.0	0	177.5	19.8	72.0	5.3
16.11.95	23:10 - 04:18	96/64"	8.9	29.1	442.8	428.0	15 578	36.4	0	175.7	21.6	74.1	2.6
16.11.95	04:18 -10:01	96/64"	9.8	29.5	452.2	406.2	13 161	32.4	0	176.8	20.5	77.6	4.9
16.11.95	10:01	Close well for main build-up (BU2)											
17.11.95	21:51	End main build-up											

* High separator temperature due to use of heater

NB !

Due to low well head pressure, the separator pressure was kept low to avoid choking the well. The low separator pressure has probably affected the oil rate estimates, especially at the highest flow rates (separator working far below normal working conditions). The oil flow rates given in the table above are corrected by the use of linear fit (Fig. 6.8).

Table 6.5: Well 25/5-5 - Preliminary Test Interpretation Summary (DST1)

	DST 1 Initial Build-up (BU1)	DST 1 Main Build-up (BU2)	
		Layer 1	Layer 2
Average flowrate for BU (Sm ³ /d)	Low flow rate	406.2	-
Flowing height, H (m)		11.0	Not perforated
Permeability, K (mD)		426	3 300
Permeability-thickness, KH (mD-m)		4 686	122 100
Skin, S		-1.75	500
Productivity index (actual) (Sm ³ /D/bar)		19.8	
Wellbore storage (m ³ /bar)		0.001	
Total measured Δp (bar)		20.5	
Distance to barrier (m)		8.7	
Kv/Kh			0.0008
Core data			
Permeability, K (mD) (absolute; arithmetic average)		874	3 462

Table 6.6: Well 25/5-5 - Summary of PVT Samples From DST (DST1)

PVT samples from separator								
Test	Set	Date	Time (from)	Time (to)	Choke	Oil bottle	Gas bottles	Comment
DST1	PVT 1	15.11.95	19:10	19:40	48/64"	TS-4507	2426-A	Standard separator PVT set
DST1	PVT 2	15.11.95	19:55	20:20	48/64"	TS-3903	5030-A	Standard separator PVT set
DST1	PVT 3	16.11.95	05:10	05:40	96/64"	TS-2801	4766-A	Standard separator PVT set
DST1	PVT 4	16.11.95	05:55	06:25	96/64"	TS-5304	4790-A	Standard separator PVT set
DST1	PVT 5	16.11.95	06:45	07:15	96/64"	TS-5316	4785-A	Standard separator PVT set
Bottom hole sampling								
Test	Set	Date	Time		Choke	Oil bottle		Comment
DST1	BHS 1	18.11.95	01:00		16/64"	SRS-27		Sample OK, Process study (France)
	BHS 1	18.11.95	01:00		16/64"	SRS-32		Sample OK
	BHS 1	18.11.95	01:00		16/64"	SRS-35		Sample OK, PVT study (GeoQuest)
	BHS 1	18.11.95	01:00		16/64"	SRS-36		Sample OK, Process study (France)

EP/P/EXP/TIS
96-505 RP/GO

Pau, July 1996

OLJEDIREKTORATET
31 OKT. 1996
Sak/Dok.nr. 95/1998 -14

827-L Norway
WELL 25/5-5

Geochemical study
of the Heimdal reservoir
(core extracts and DST oil)

3/

BA-96-1608-1
11 NOV. 1996
REGISTRERT
OLJEDIREKTORATET

Exploration

Département Genèse et Dynamique Pétrolière

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TABLES

Tab.1 - Well 25/5-5
Results of organic geochemical analysis of reservoir core samples



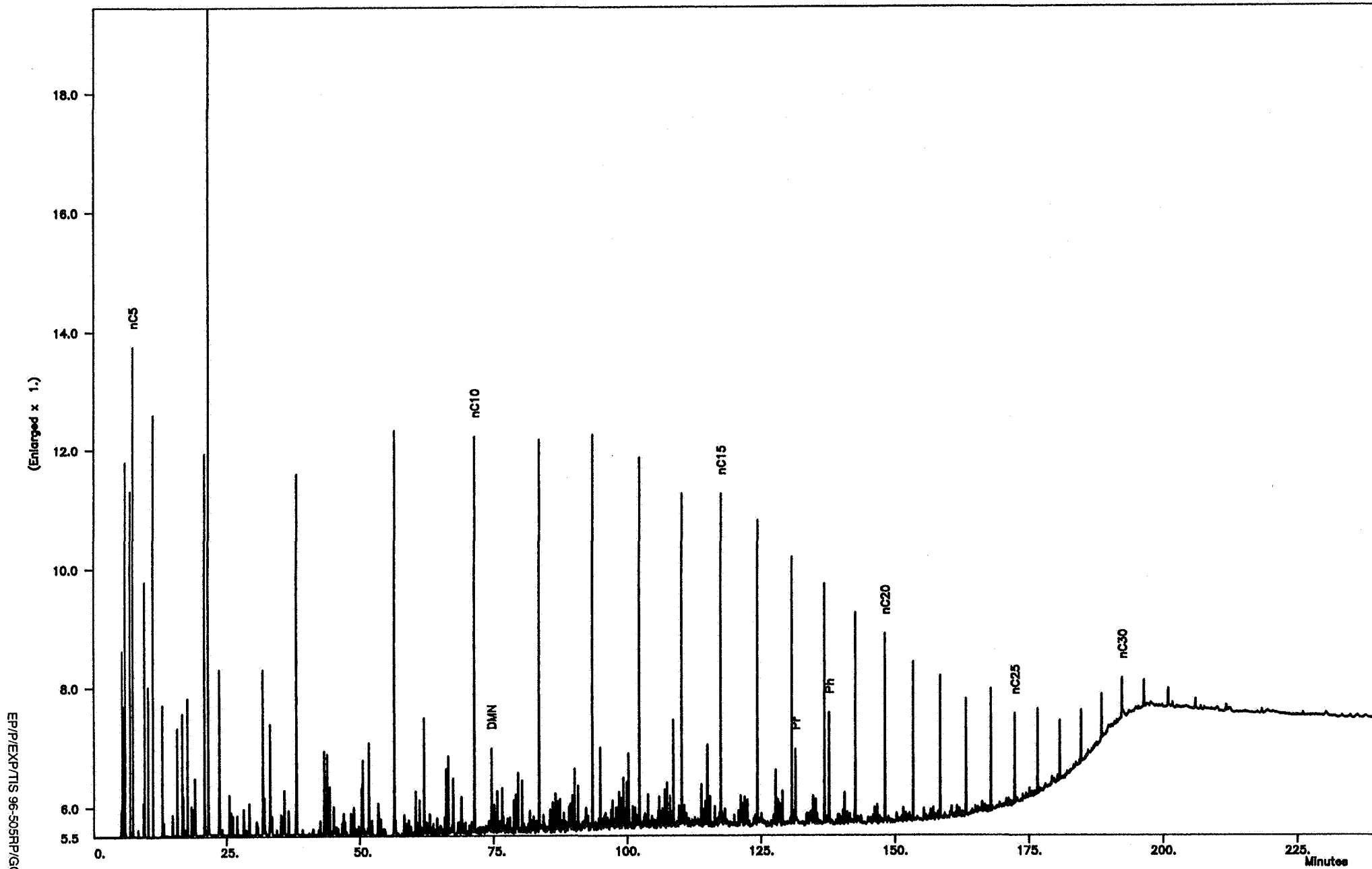
LAB.	SAMP.	DEPTH	TOC	ROCK-EVAL							EXTRACT ANALYSIS							
				REF.			Tmax	S1	S2	S3	PI	HI	OI	EOM	YIELD	SAT	ARO	POL
Nr		(m RKB)	(%)	(°C)	(mg/g)	(mg/g)	(mg/g)				(%)	(%)	(%)	(%)	(%)		(mg/g)	
B80233	K1	2162.80	3.85	416	31.10	11.18	0.19	0.74	290	5	4.3160	112.1	39.2	40.0	20.8	1.0	34.17	
B80234	K1	2164.00	2.17	406	18.34	4.72	0.04	0.80	218	2	2.4490	112.8	44.8	35.6	19.6	1.3	19.69	
B80235	K1	2165.00	3.03	412	26.28	7.16	0.07	0.79	236	2	4.3350	143.1	45.2	36.9	17.9	1.2	35.60	
B80236	K1	2166.00	2.57	410	21.30	6.62	0.05	0.76	258	2	3.4740	135.2	40.1	40.6	19.3	1.0	28.03	
B80237	K1	2167.00	2.72	412	22.41	7.23	0.06	0.76	266	2	4.0230	147.9	42.6	40.5	16.9	1.1	33.43	
B80238	K1	2167.65	3.15	414	26.00	8.80	0.05	0.75	279	2	4.5650	144.9	41.4	38.7	19.9	1.1	36.60	
B80239	K1	2168.35	3.42	414	28.20	9.52	0.06	0.75	278	2	4.5700	133.6	40.8	38.6	20.6	1.1	36.29	
B80240	K1	2169.05	3.43	412	30.36	7.68	0.06	0.80	224	2	5.2120	151.9	46.7	35.8	17.4	1.3	43.04	
B80241	K1	2170.10	1.36	407	12.04	2.28	0.03	0.84	168	2	2.0980	154.2	48.9	33.5	17.6	1.5	17.29	
B80242	K1	2171.00	4.15	418	37.08	8.97	0.07	0.81	216	2	6.2430	150.4	43.5	37.7	18.8	1.2	50.69	
B80243	K1	2171.50	3.18	415	28.56	6.58	0.12	0.81	207	4	4.9000	154.1	47.0	36.3	16.7	1.3	40.83	
B80244	K1	2172.00	2.90	415	25.11	7.01	0.09	0.78	242	3	4.1070	141.6	41.5	39.4	19.1	1.1	33.21	
B80245	K2	2172.65	3.54	416	29.51	9.89	0.14	0.75	279	4	5.7440	162.3	40.9	41.2	17.9	1.0	47.15	
B80246	K2	2173.35	3.16	414	26.40	8.55	0.09	0.76	271	3	4.2380	134.1	38.9	42.4	18.7	0.9	34.44	
B80247	K2	2174.00	1.46	410	12.33	3.20	0.21	0.79	219	14	2.2530	154.3	40.2	41.9	17.9	1.0	18.49	
B80248	K2	2174.35	2.23	408	19.38	5.01	0.20	0.79	225	9	3.2640	146.3	42.8	39.9	17.3	1.1	26.98	
B80249	K2	2175.00	2.29	409	18.86	5.90	0.07	0.76	258	3	3.5800	156.3	41.0	42.5	16.4	1.0	29.92	
B80250	K2	2175.35	1.89	408	16.09	4.26	0.03	0.79	225	2	2.1320	112.8	42.0	40.8	17.1	1.0	17.67	
B80251	K2	2175.65	1.55	410	13.17	3.26	0.02	0.80	210	1	1.7900	115.5	41.9	40.6	17.5	1.0	14.76	
B80252	K2	2176.65	0.49		5.31	0.10	0.20	0.98	20	41	0.6790	138.5	83.8	8.7	7.5	9.6	6.28	
Tmax, S2, S3, HI and OI are only indicative, being significantless (reservoir samples)																		

Results of DST oil and gas analyses

Well	25/5-5	Carbon isotopes		Hydrogen isotopes			
Country	Norway	Delta C (PDB)		Delta D (SMOW)			
Lab reference	B80253	Whole oil	-29.5				
Nature of fluid	Oil	Topped oil	-29.3				
Depth top (m)	2158.5	C15+ saturates	-30.0	C15+ saturates			
Depth bottom (m)	2169.5	C15+ aromatics	-29.1				
Reservoir age	Paleocene	Resins	-28.6				
Reservoir lithology	Sandstone						
Bulk properties of whole oil		Carbon isotope of individual HC (whole oil)					
Specific density	0.8815	Ref	Components	Delta C	Ref	Components	Delta C
API gravity	29.18	1	iC4		37	2MNon	
% Sulphur	1.74	2	nC4	-25.65	38	o-EtTol	
% Residue of distillation	78.92	3	iC5	-29.09	39	3,6DMOct	
Gross composition of whole oil		4	nC5	-30.33	40	IPC10	-29.66
% Distillate	21.08	5	CYPent		41	nC10	-31.00
% "C15+" Saturated HC	29.64	6	2,3DMBut		42	4MC10	-30.46
% "C15+" Aromatic HC	36.41	7	2MPent	-29.40	43	IPC11	-30.17
% Resins	12.19	8	3MPent	-29.70	44	nC11	-30.95
% Asphaltenes	0.68	9	nC6	-32.27	45	4MC11	
Gross composition of oil residue		10	MCP	-26.97	46	IPC12	
% "C15+" Saturated HC	37.56	11	Bz		47	nC12	-30.90
% "C15+" Aromatic HC	46.14	12	CH	-27.58	48	IPC13	-29.88
% Polars	15.45	13	2MHex		49	IPC14	-31.11
% Asphaltenes	0.86	14	3MHex	-30.63	50	nC13	-30.75
Saturates/Aromatics	0.81	15	1,3 trDMCyPent		51	IPC15	-29.74
% Hydrocarbons	83.70	16	1,3 ciDMCyPent		52	nC14	-30.78
% n-alkanes (in saturates)	18.39	17	1,2 trDMCyPent		53	IPC16	-29.22
CPI (C20 to C30)	0.90	18	nC7	-32.42	54	nC15	-30.54
GC ratios on C15-		19	MCH	-28.32	55	nC16	-30.45
nC6/MCP	2.66	20	Tol		56	IPC18	-30.00
nC7/DMCP	6.85	21	2MHept	-30.11	57	nC17	-30.63
nC7/Toluene	10.39	22	3MHept	-30.10	58	Pr	-31.03
GC ratios on C15+		23	1tr2DMCHex		59	nC18	-30.40
Pr/Ph	0.67	24	nC8	-31.77	60	Ph	-31.08
Pr/nC17 (A)	0.47	25	n-PrCyPent		61	nC19	-30.39
Ph/nC18 (B)	0.75	26	1-cis-2 DMCyHex		62	nC20	-30.44
A/B	0.62	27	1,1,3 TMCyHex		63	nC21	-30.48
MNR	0.85	28	EtBz		64	nC22	
DNR		29	p+m-Xyl		65	nC23	
TNR		30	2MOct		66	nC24	
MPI1	0.59	31	3MOct	-31.02	67	nC25	
MPI2	0.92	32	o-Xyl		68	nC26	
MPI3	0.75	33	nC9	-31.09	69	nC27	
MP_P	1.94	34	TeBuCyPent		70	nC28	
MPR	1.01	35	SeBuCyPent		71	nC29	
MDBT11		36	n-PrCyHex		72	nC30	
MDBT13					73	nC31	
Gas gross composition		Gas isotope composition					
% C1	90.32	C1	-49.00	δH C1	na		
% C2	4.29	C2	-29.00				
% C3	1.74	C3	-27.40				
% iC4	0.15	iC4	-28.30				
% nC4	0.27	nC4	-28.20				
% iC5	0.05	iC5	-27.70				
% nC5	0.06	nC5	-29.00				
% CO2	0.37	CO2	-14.50	δO CO2	na		
% N2	2.75						
% H2S	abs						
% C1 (C1-C5)	93.23						
C1/C2+C3	14.98						
iC4/nC4	0.56						
iC5/nC5	0.83						

ANNEXES

CHROMATOGRAMME "HUILE TOTALE" / CHROMATOGRAM "TOTAL OIL"



EP/P/EXPT/IS 96-505RP/GO



●NO

25/5-5

HT DST 1

2158.50 2169.50

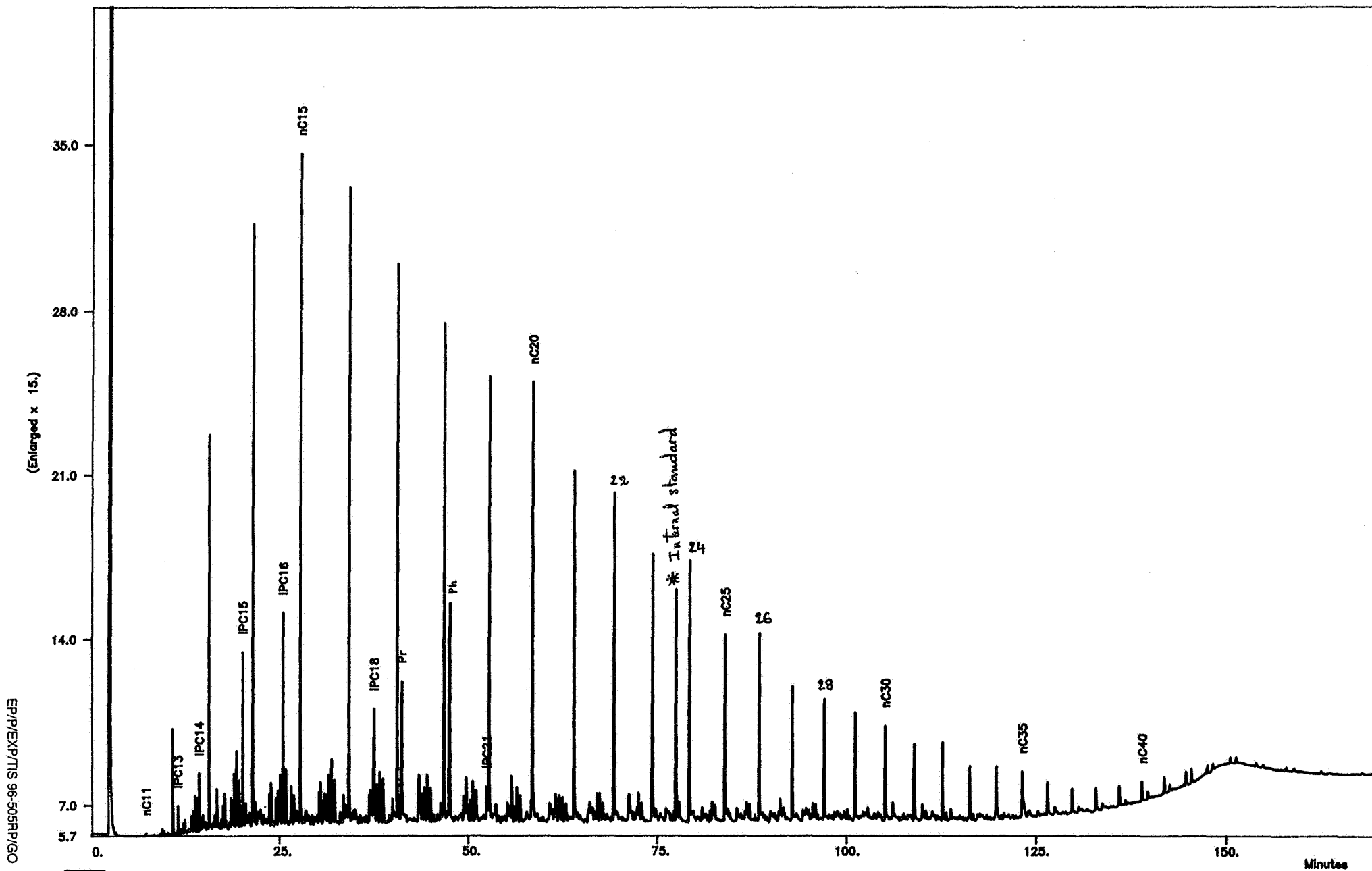
(Lab. Ref. B80253)

elf aquitaine

ID-B80253

Ann. 1

CHROMATOGRAMME "HC SATURES" / CHROMATOGRAM "SATURATED HC"



EP/EXP/TIS 96-505RP/GO



elf aquitaine

NO

25/5-5

HT DST 1

2158.50 2169.50

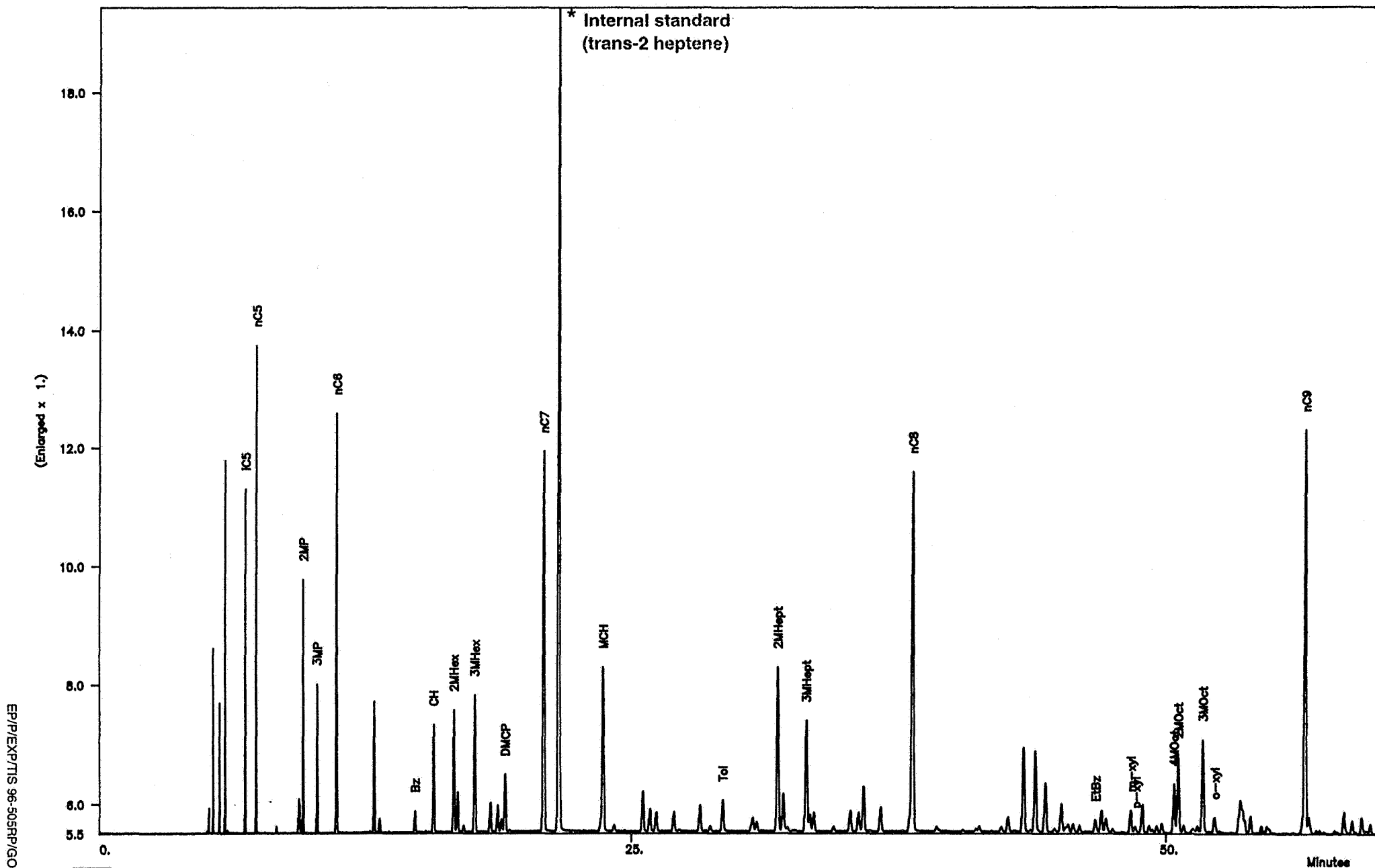
(Lab. Ref. B80253)

ST-B80253

Ann. 2

CHROMATOGRAMME "HUILE TOTALE" / CHROMATOGRAM "TOTAL OIL"

* Internal standard
(trans-2 heptene)



EP/P/EXP/TIS 96-505RP/GO



elf aquitaine

●NO

25/5-5

HT DST 1

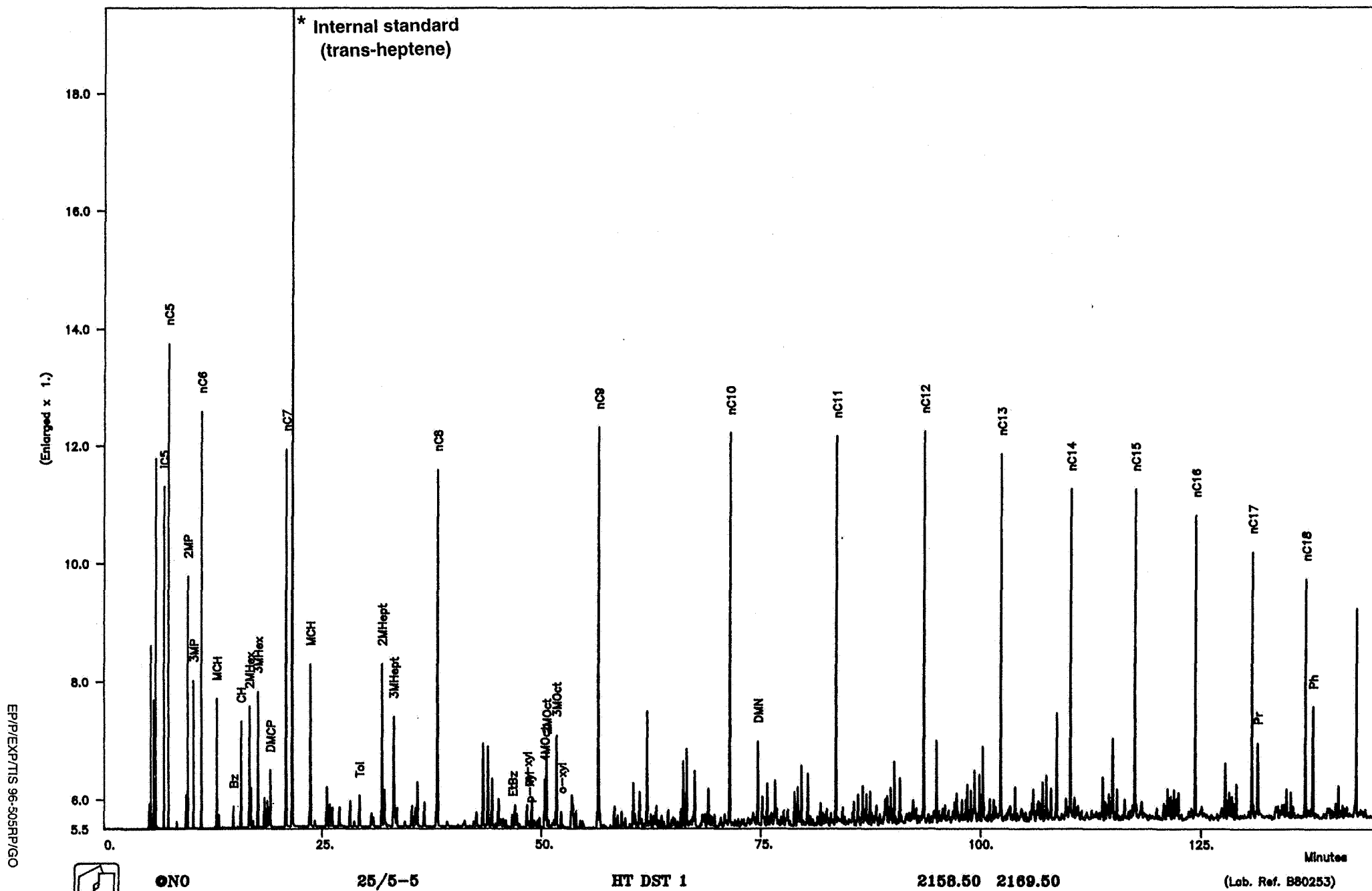
2158.50 2169.50

(Lab. Ref. B80253)

ID-B80253

Ann. 3

CHROMATOGRAMME "HUILE TOTALE" / CHROMATOGRAM "TOTAL OIL"



EP/EXP/TTIS 96-505RP/GO



elf aquitaine

●NO

25/5-5

HT DST 1

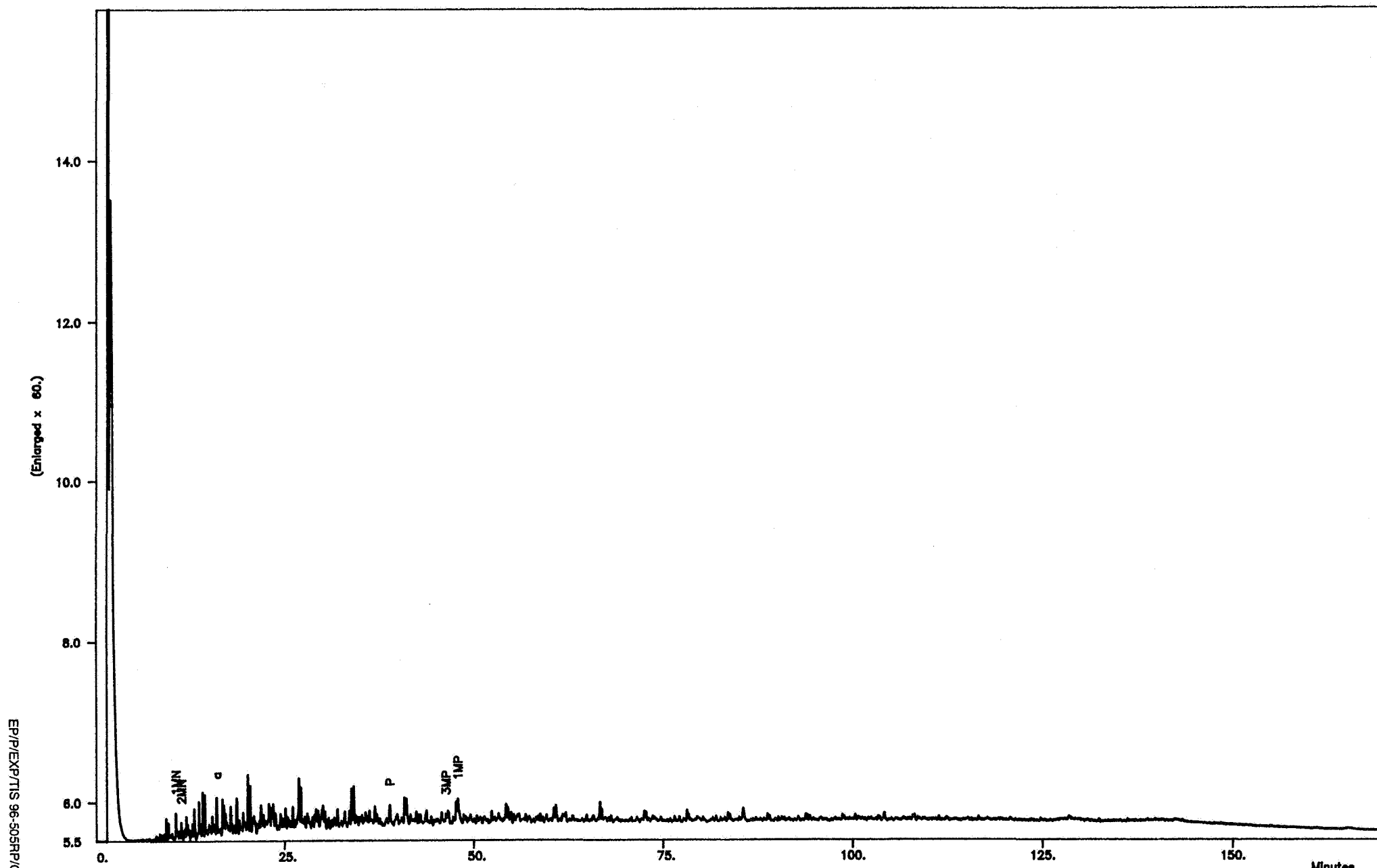
2158.50 2169.50

(Lab. Ref. B80253)

Ann. 4

ID-B80253

CHROMATOGRAMME "HC AROMATIQUES" / CHROMATOGRAM "AROMATIC HC"



EP/P/EXP/TIS 96-505RP/GO



●NO

25/5-5

BT DST 1

2158.50 2169.50

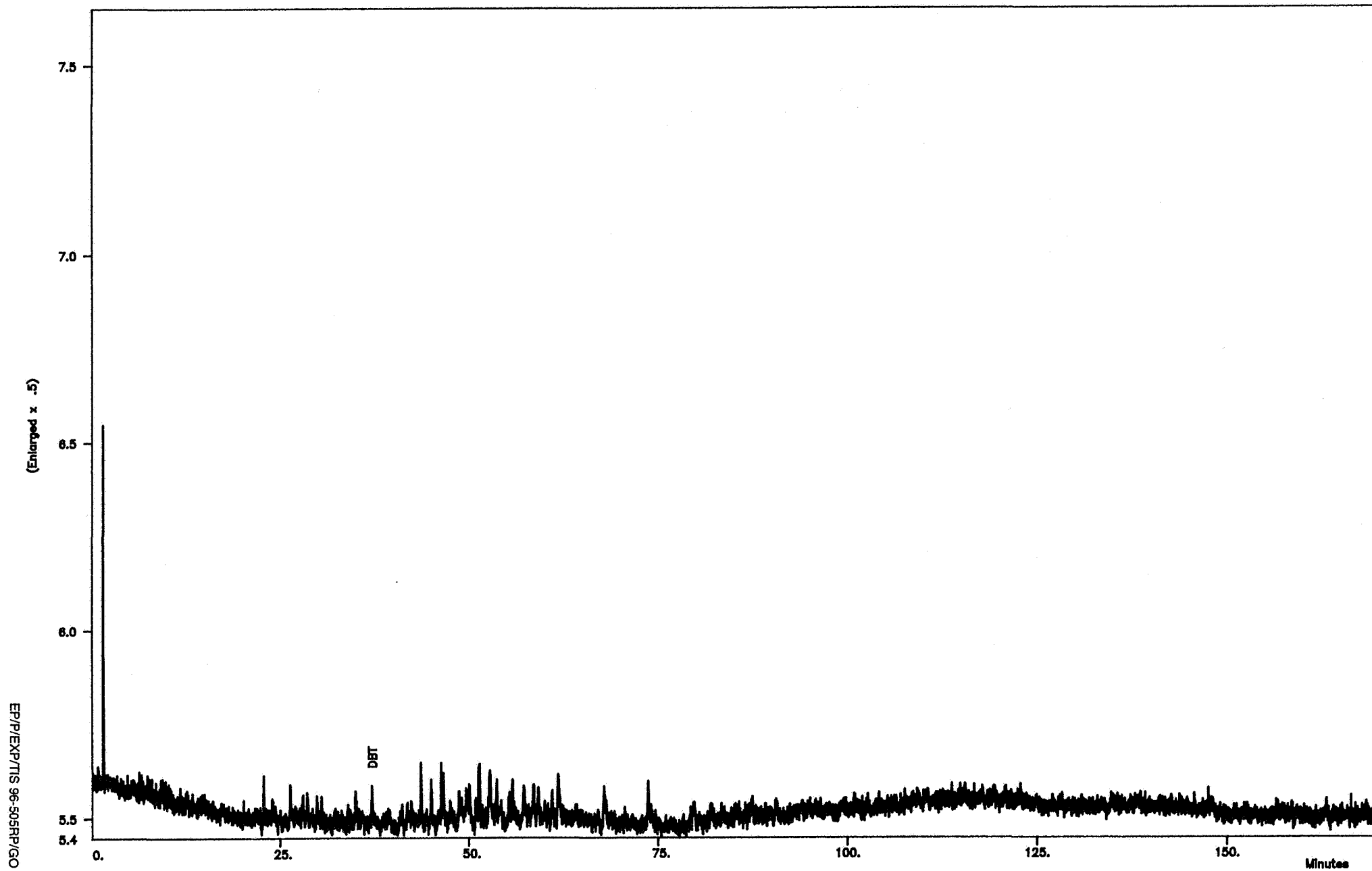
(Lab. Ref. 880253)

elf aquitaine

FI-B80253

Ann. 5

CHROMATOGRAMME "COMPOSES SOUFRES" / CHROMATOGRAM "SULFUR COMPOUNDS"



elf aquitaine

●NO

25/5-5

HT DST 1

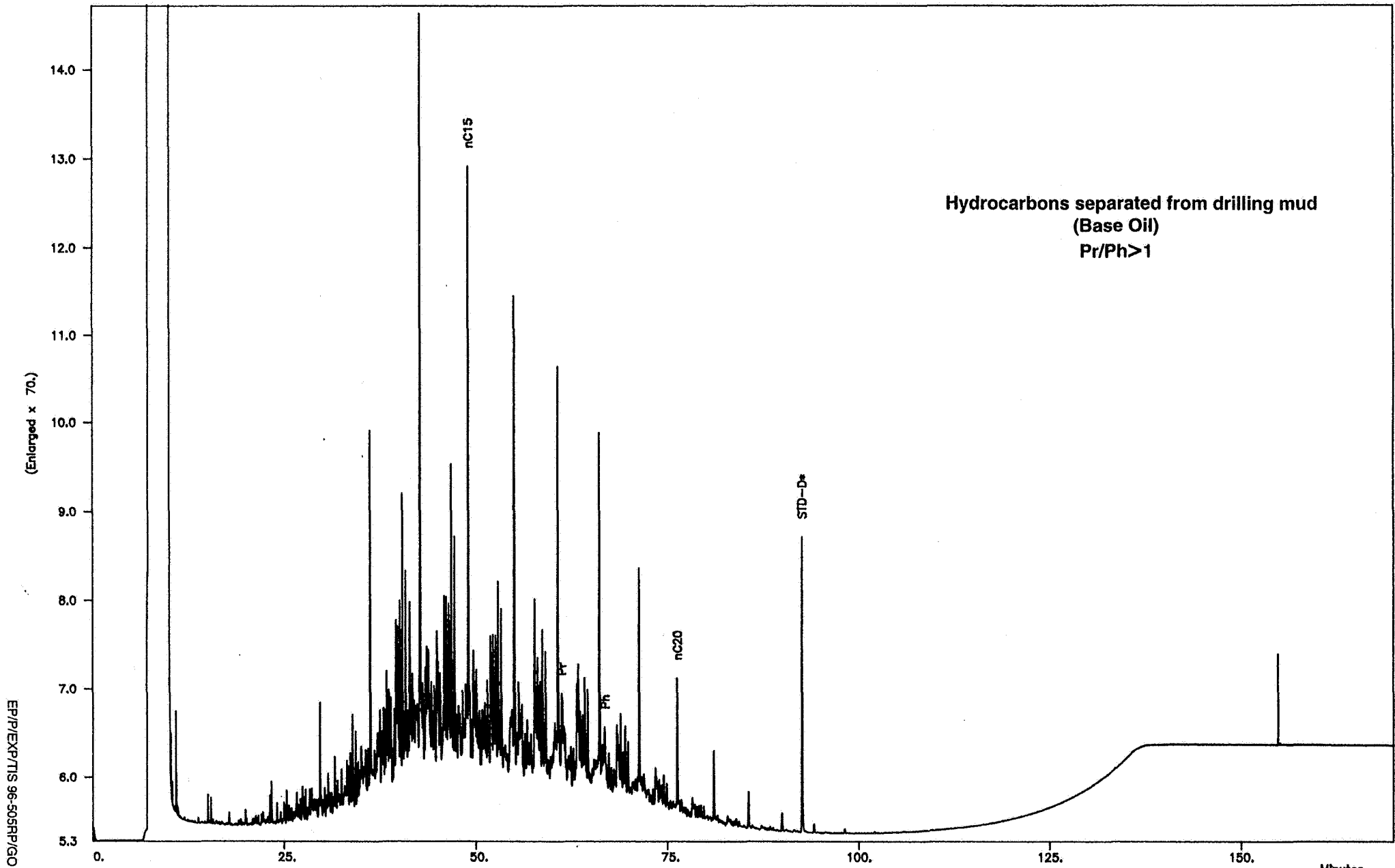
2158.50 2169.50

(Lab. Ref. B80253)

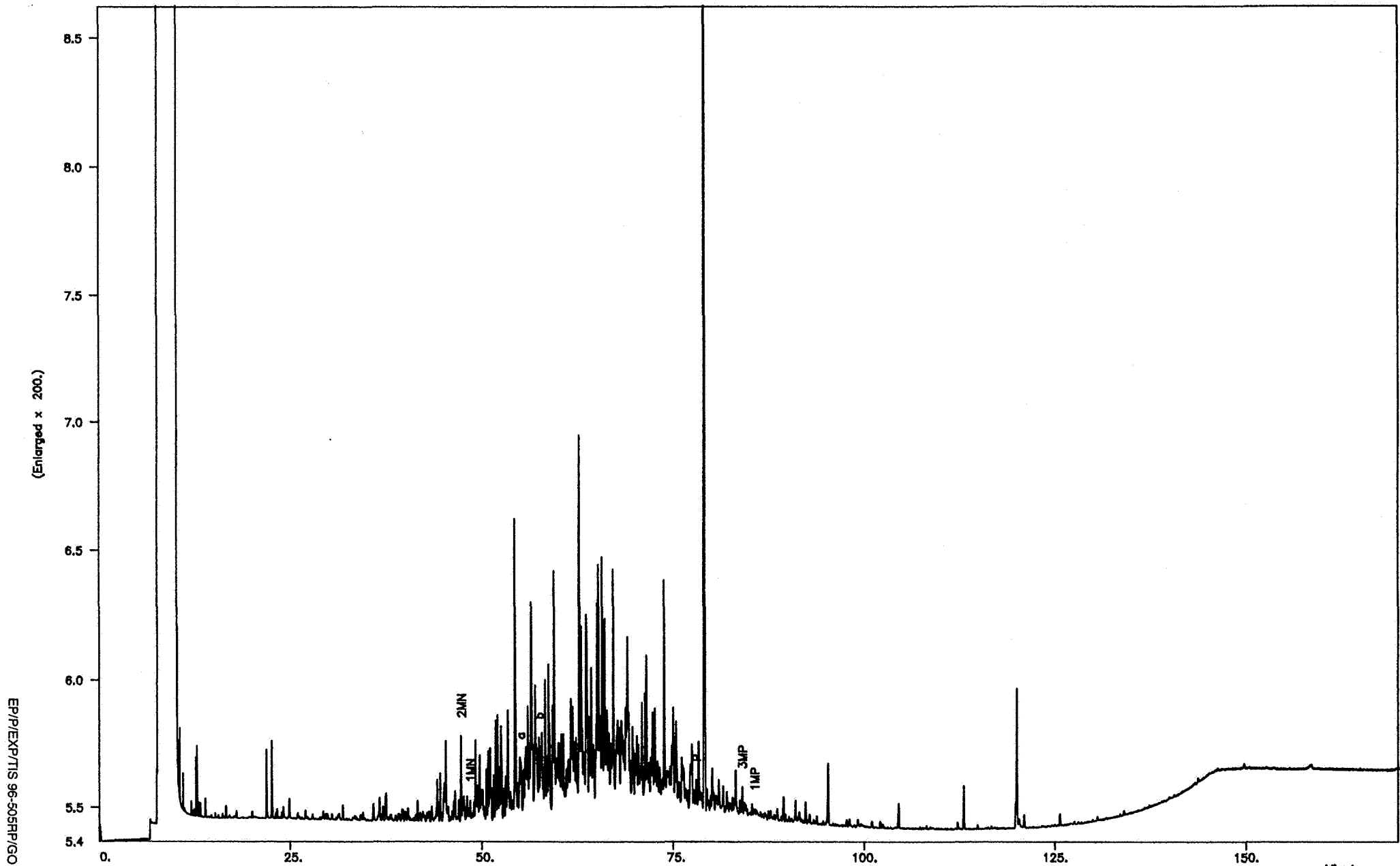
FP-B80253

Ann. 6

CHROMATOGRAMME "HC SATURES" / CHROMATOGRAM "SATURATED HC"



CHROMATOGRAMME "AROMATIQUES TOTAUX" / CHROMATOGRAM "TOTAL AROMATICS"



©NO

25/5-5

B0

2173.00

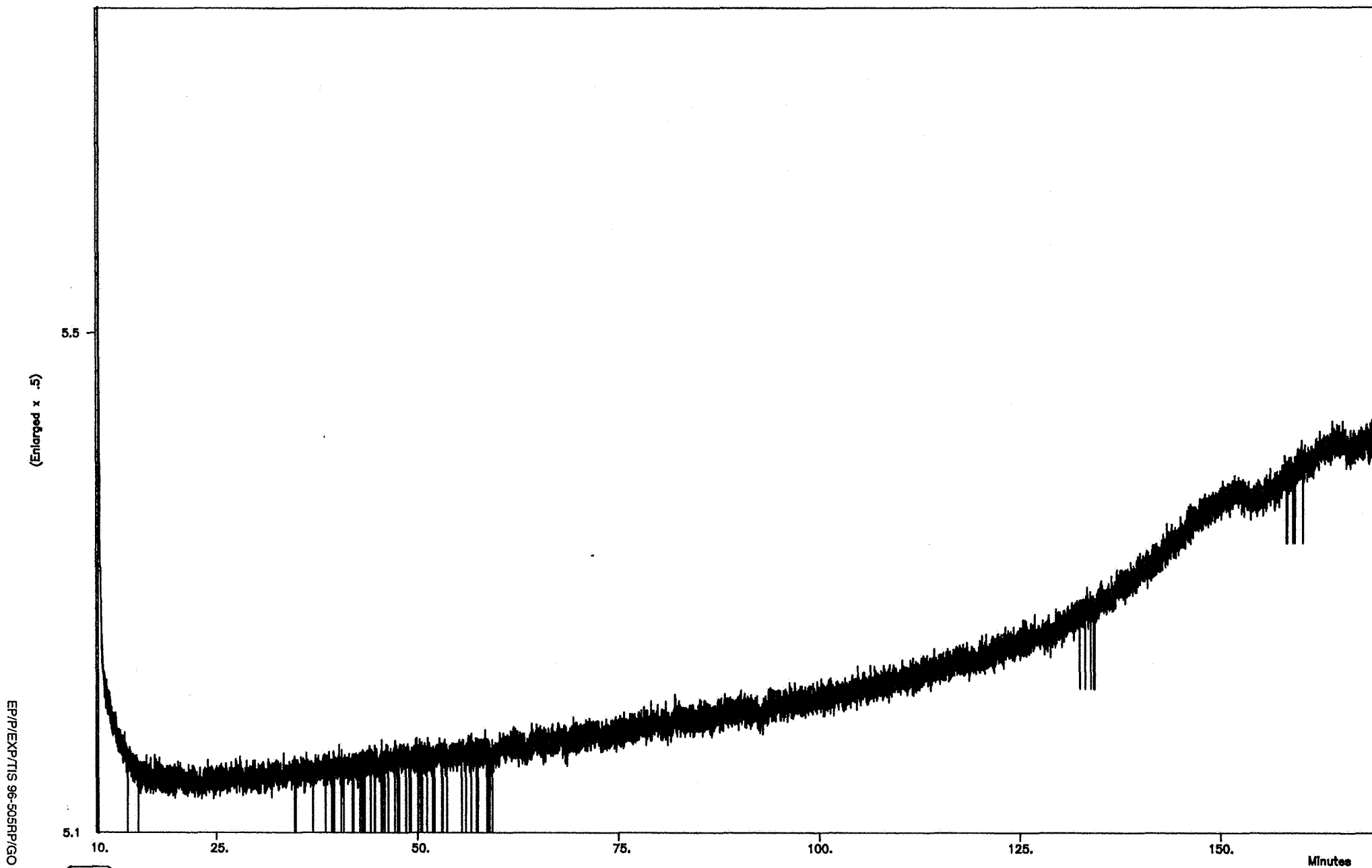
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elf aquitaine

IH-B80910

Ann. 8

CHROMATOGRAMME "COMPOSES SOUFRES" / CHROMATOGRAM "SULFUR COMPOUNDS"



EP/P/EXP/TIS 96-505RP/GO



elf aquitaine

●NO

25/5-5

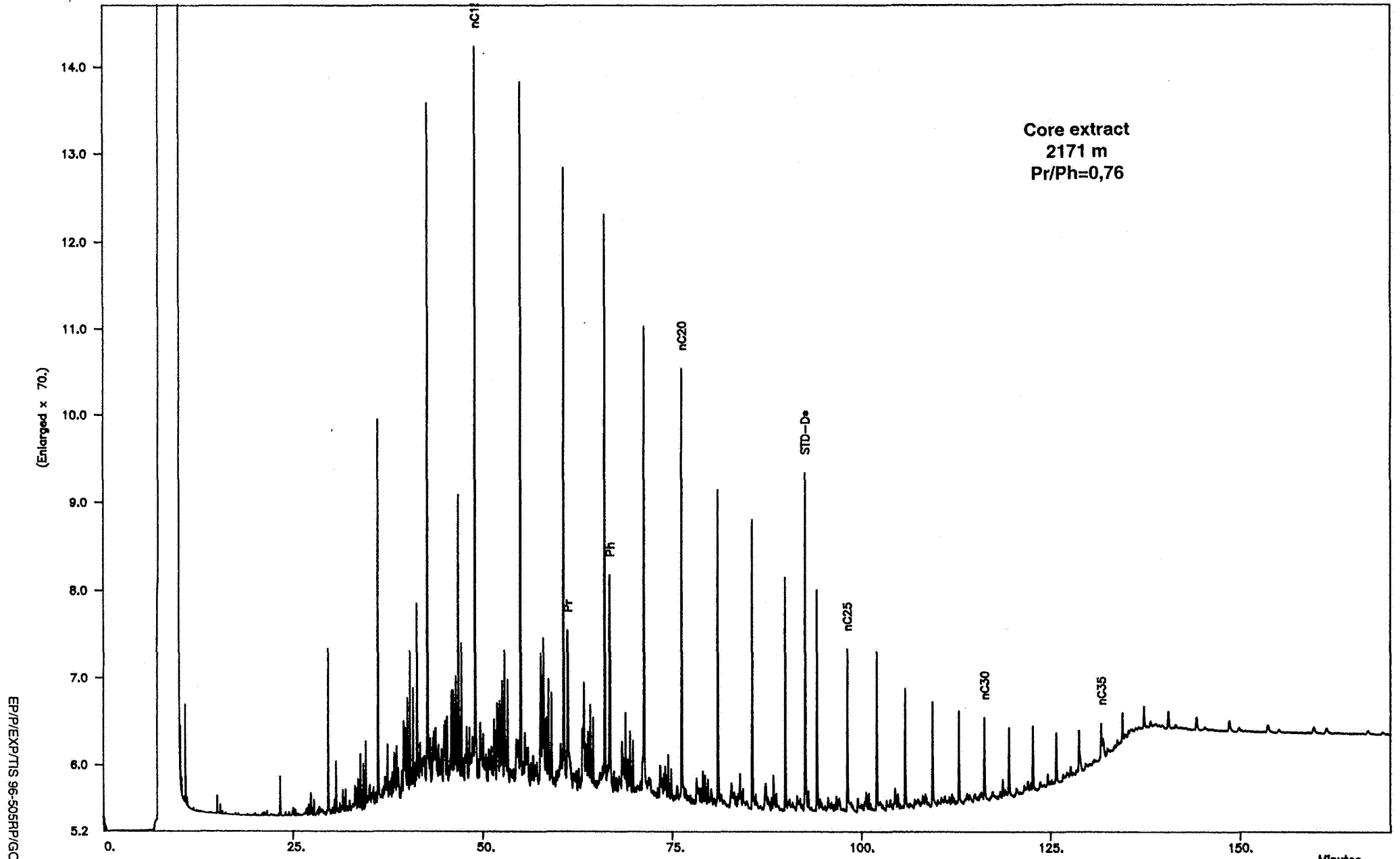
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2173.00

(Lab. Ref. B80910)

PH-B80910

CHROMATOGRAMME "HC SATURES" / CHROMATOGRAM "SATURATED HC"



EP/P/EXPT/IS 96-50SRP/GO



elf aquitaine

NO

25/5-5

CA

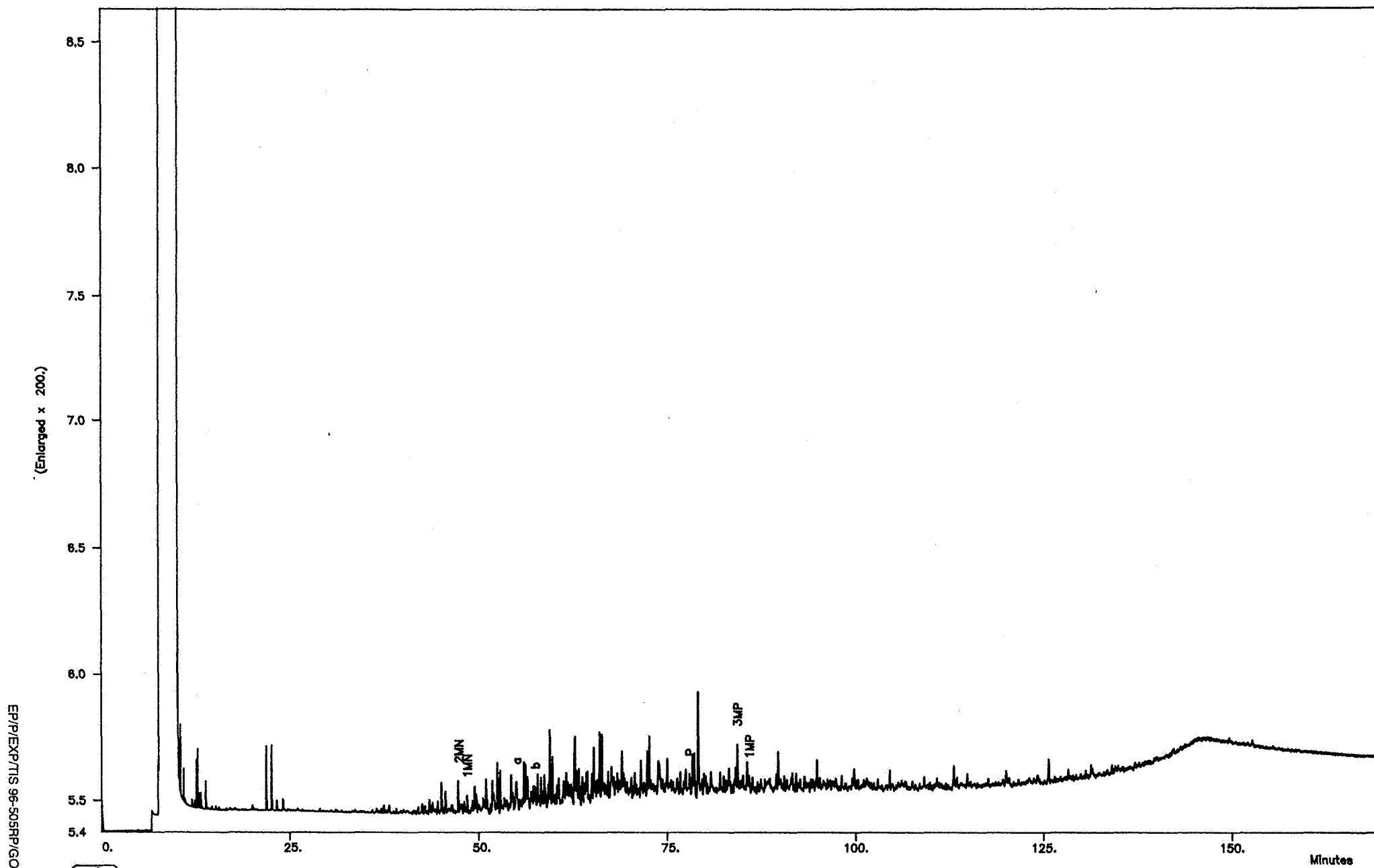
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(Lab. Ref. B80242)

SA-B80242

Ann. 10

CHROMATOGRAMME "HC AROMATIQUES" / CHROMATOGRAM "AROMATIC HC"



EP/P/EXP/TIS 96-505RP/GO



elf aquitaine

⊙NO

25/5-5

CA

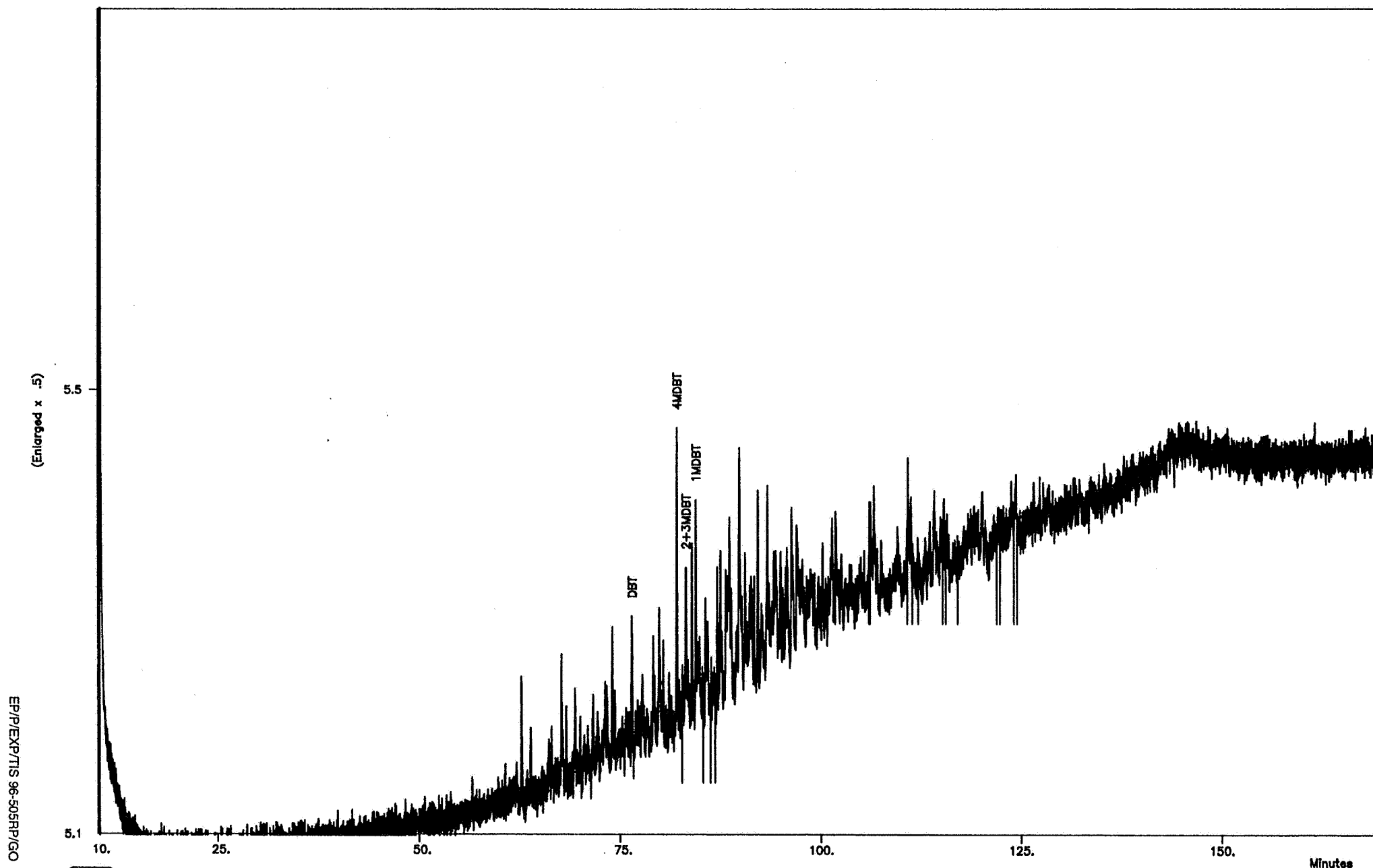
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(Lab. Ref. B80242)

IF-B80242

Ann. 11

CHROMATOGRAMME "COMPOSES SOUFRES" / CHROMATOGRAM "SULFUR COMPOUNDS"



EP/P/EXP/TIS 96-505RP/GO



elf aquitaine

⊙NO

25/5-5

CA

2171.00

(Lab. Ref. B80242)

PF-B80242

Ann. 12

GC/MS Analysis of Saturated Hydrocarbons: Molecular Ratios.

DT P960043 LABUX B80253 (Mark 4413 set 98/18)

25/5-5 (NO) DST1 2 158,50 - 2 169,50 (m) . Submitted by LE TRAN.
Geochemical study.

Steranes

<u>Short chain steranes</u>		<u>Light / heavy steranes</u>		<u>% $\beta\beta$ steranes</u>		<u>Total integrations:</u>	
C21 / C22 :	2.08	(C21 + C22 /	0.80	C27 $\beta\beta$:	35.3 %	m/z 232 :	32.5 %
C22-4m / C22 :	0.39	(C29 $\alpha\alpha$ R+S) :		C28 $\beta\beta$:	29.0 %	m/z 218 :	59.9 %
<u>C27 steranes</u>		<u>C29 steranes</u>		<u>Diasteranes</u>		m/z 259 :	
$\alpha\alpha$ S / $\alpha\alpha$ R :	0.82	$\alpha\alpha$ S / $\alpha\alpha$ R :	0.68	C27 S Dia / C27 $\alpha\alpha$ R :	1.52	7.6 %	
$\beta\beta$ R / $\alpha\alpha$ R :	1.25	$\beta\beta$ R / $\alpha\alpha$ R :	1.52	C27 S Dia / C29 $\alpha\alpha$ R :	1.78		
$\beta\beta$ S / $\alpha\alpha$ R :	1.14	$\beta\beta$ S / $\alpha\alpha$ R :	1.50				
% $\beta\beta$:	56.8 %	% $\beta\beta$:	64.3 %				
% 20S :	46.5 %	% 20S :	46.3 %				

Terpanes

<u>Tricyclic terpanes:</u>		<u>$\beta\alpha$ hopanes:</u>		<u>Methylhopanes</u>		<u>Hexacyclics:</u>	
C23:3 / C24:4	1.44	C30 $\beta\alpha$ / C30 $\alpha\beta$:	0.08	(C30 / C31) 2 α mH :	0.69	C32:6 / C29 $\alpha\alpha$ R :	0.00
C23:3 / C29 $\alpha\beta$:	0.16	<u>C31-C35 hopanes :</u>		(3 β / 2 α) C30 mH :	0.57	C32:6 / C35 $\alpha\beta$:	0.00
C30:3 / C29 $\alpha\beta$:	0.12	% 22S C31 :	62.1 %	2 α mHop / Hop :	0.02	<u>Other terpanes:</u>	
<u>18α(H) Hopanes:</u>		% 22S C32 :	57.0 %	<u>8,14 Secohopanes:</u>		GCRN / C30 $\alpha\beta$:	
Ts / Tm :	0.74	% 22S C33 :	58.4 %	(C29 - C30) /	0.11	"X" / C30 $\alpha\beta$:	0.02
C29:5 / C29 $\alpha\beta$:	0.33	% 22S C34 :	58.1 %	(C29 + C30 $\alpha\beta$) :		OLN / C30 $\alpha\beta$:	0.00
<u>$\alpha\beta$ Hopanes:</u>		% 22S C35 :	59.9 %	<u>25-Norhopanes</u>		BNH / C30 $\alpha\beta$:	
C29 $\alpha\beta$ / C30 $\alpha\beta$:	0.43	C31 / (C31+C32) :	0.58	TNH / BNH :	0.00	<u>Total integration:</u>	
C28 $\alpha\beta$ / C29 $\alpha\beta$:	0.00	C33 / C35 :	1.45	TNH / (Ts+Tm) :	0.00	Residual m/z 191 :	
C28 $\alpha\beta$ / (Ts+Tm) :	0.00	C35 / (C29+C30) :	0.31	nor C29 / C29 $\alpha\beta$:	0.02		

n & branched alkanes

Pr / Ph :	0.56
Pr / nC17 :	0.38
Ph / nC18 :	0.71
A / B :	0.54
CPI 1:	
CPI 2:	
n / (n+iso) alkanes :	

Other ratios

C23:3 / C21St :	0.99
(27-30H) / 29St :	4.78
m/z 191 / m/z 217 :	1.66
Tri / Pentacyclics :	0.08
C32 PCI / C32:6 :	

Quantitative Analysis

	ppm / sat	ppm / EOM-TO
Hopanes		
C29 H		
Tricyclics		
m/z 217		
C29 $\alpha\alpha$ R		
n-alkanes		

Comments

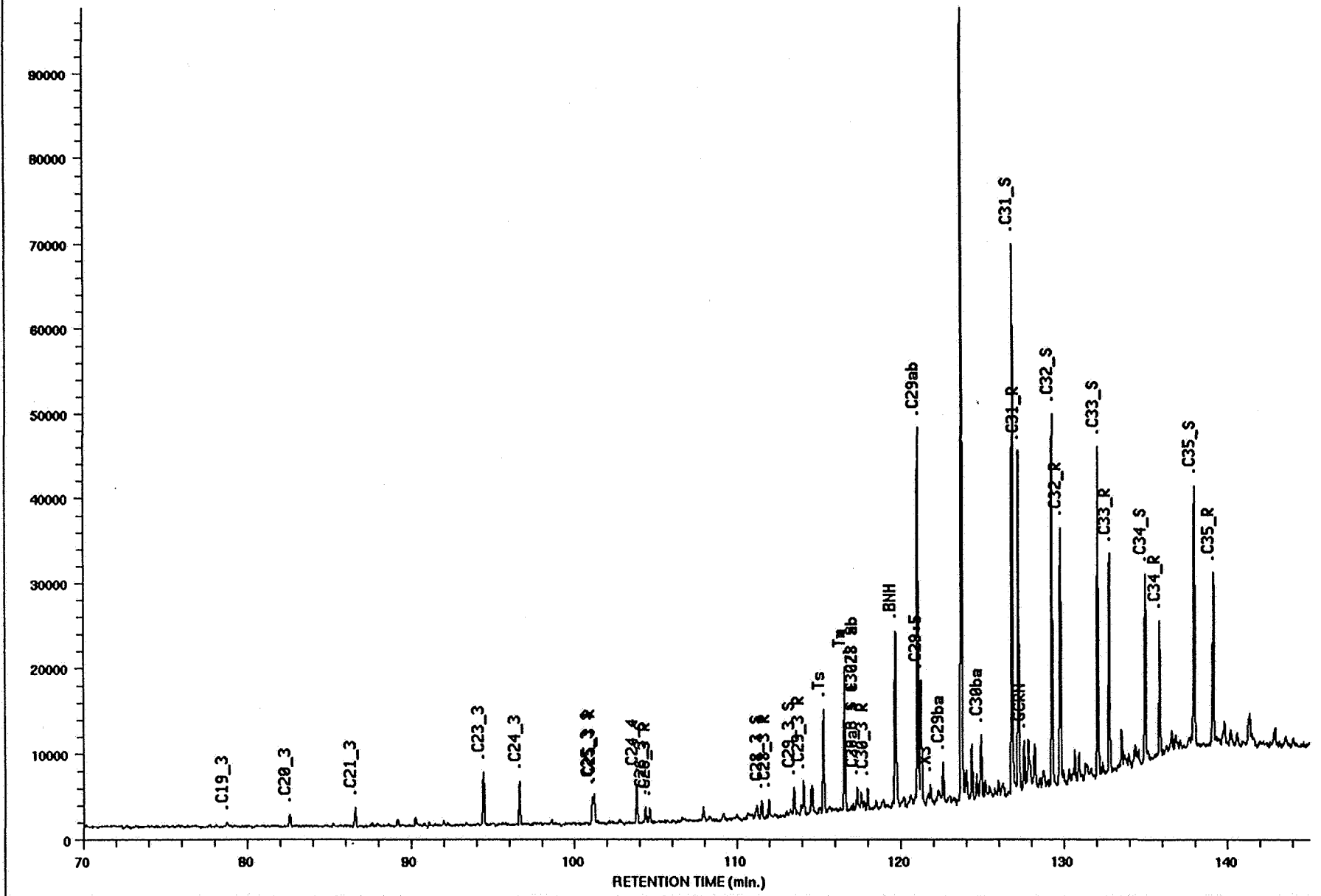
Comments	
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Edited 04/18/96

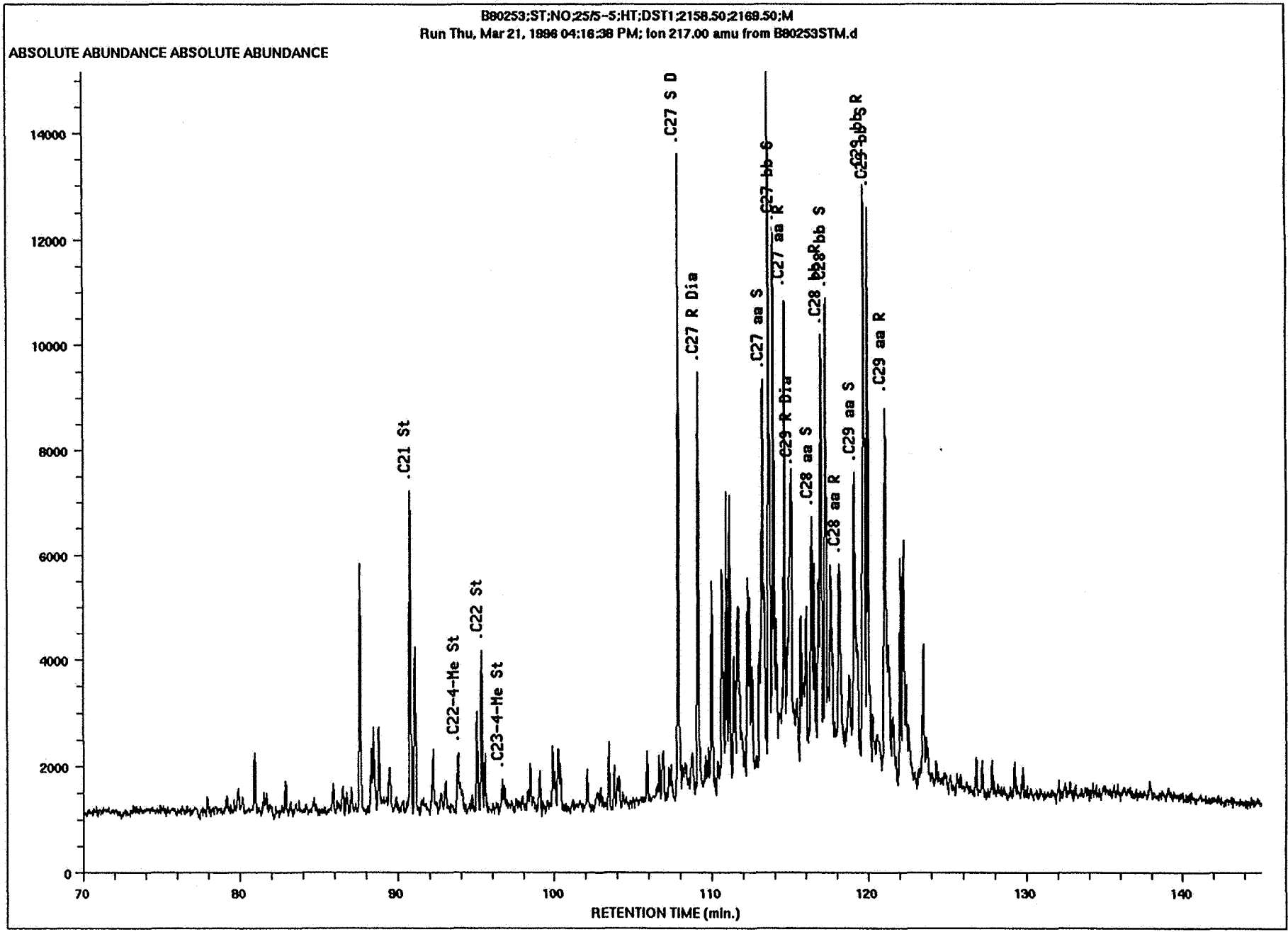
EP/P/EXP/TIS 96-505RP/GO

B80253;ST:NO;25/5-5;HT;DST1;2158.50;2169.50;M
Run Thu, Mar 21, 1996 04:18:38 PM; Ion 181.00 amu from B80253STM.d

ABSOLUTE ABUNDANCE ABSOLUTE ABUNDANCE

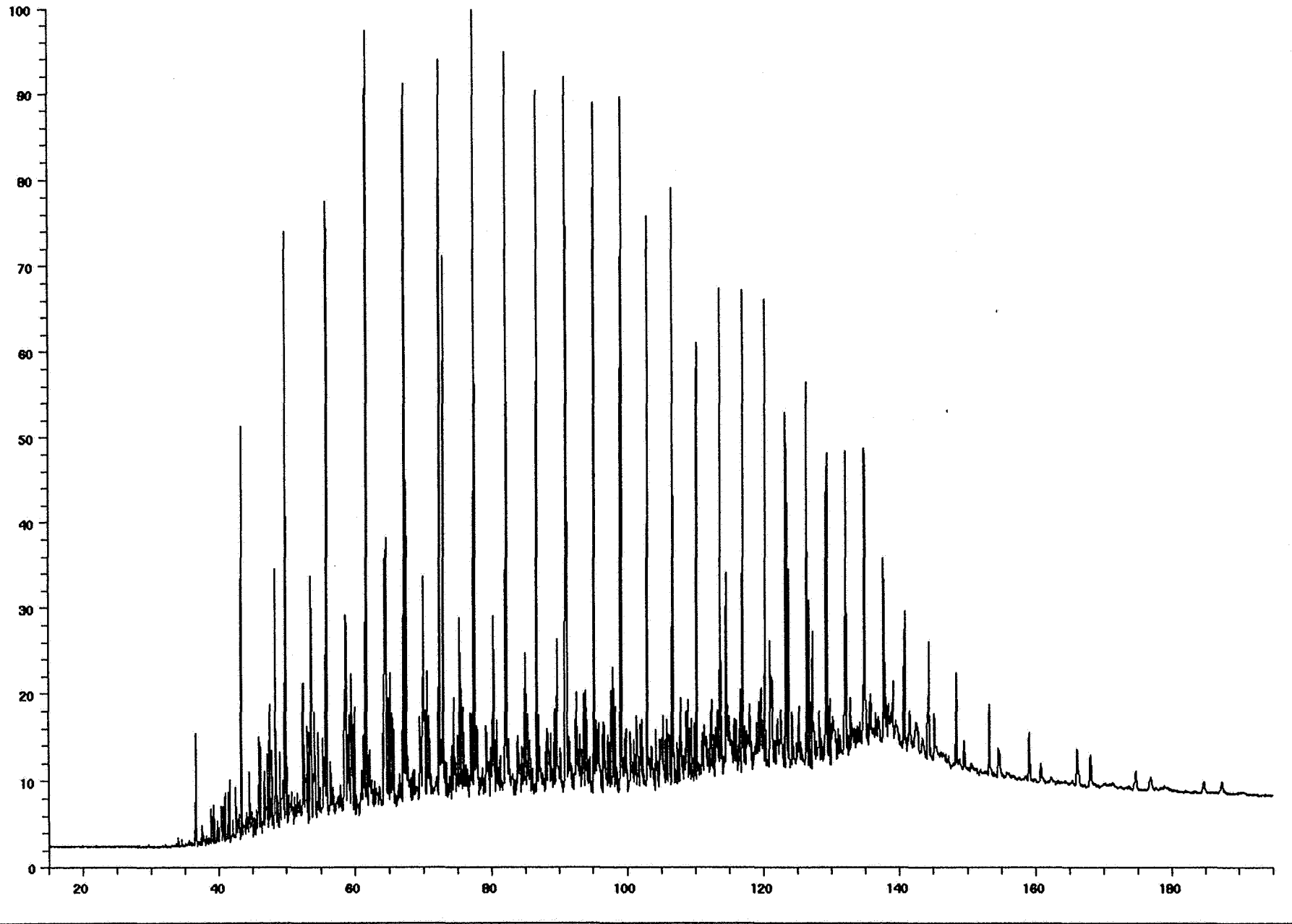


EP/EXP/TIS 96-505RP/GO

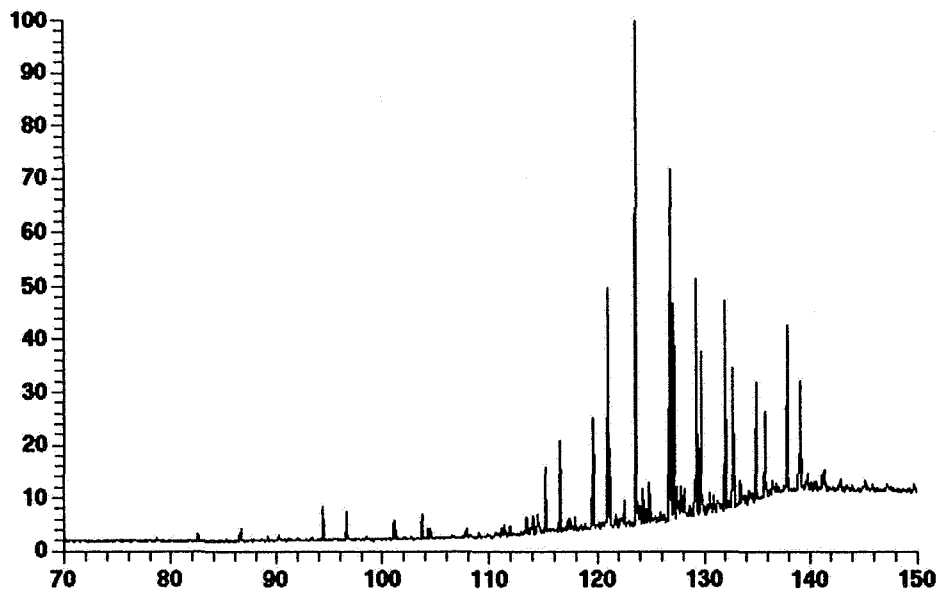


TIC of B80253STM.d SUBTRACTED; B80253;ST;NO;25/5-5;HT;DST1;2158.50;2169.50;M

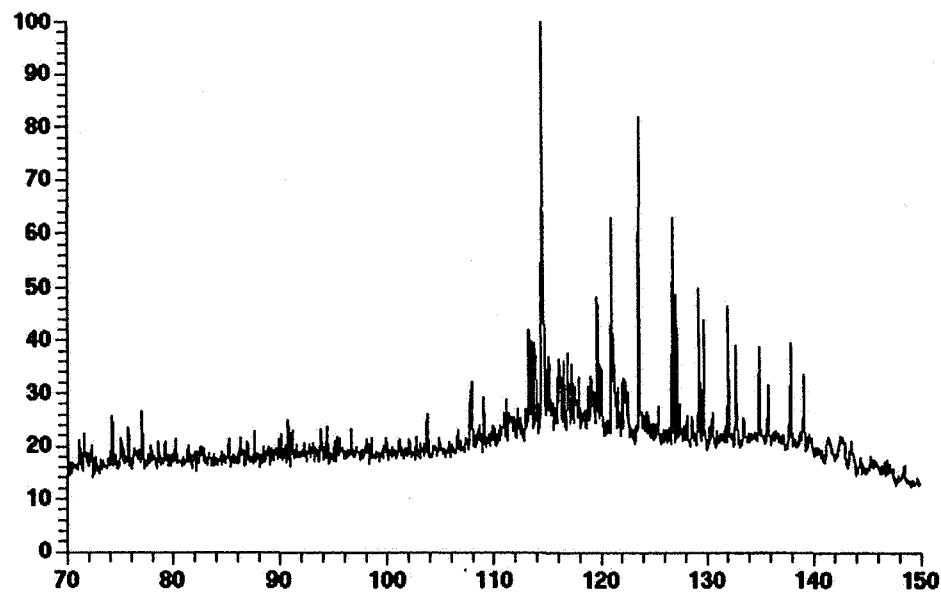
100% - 680909



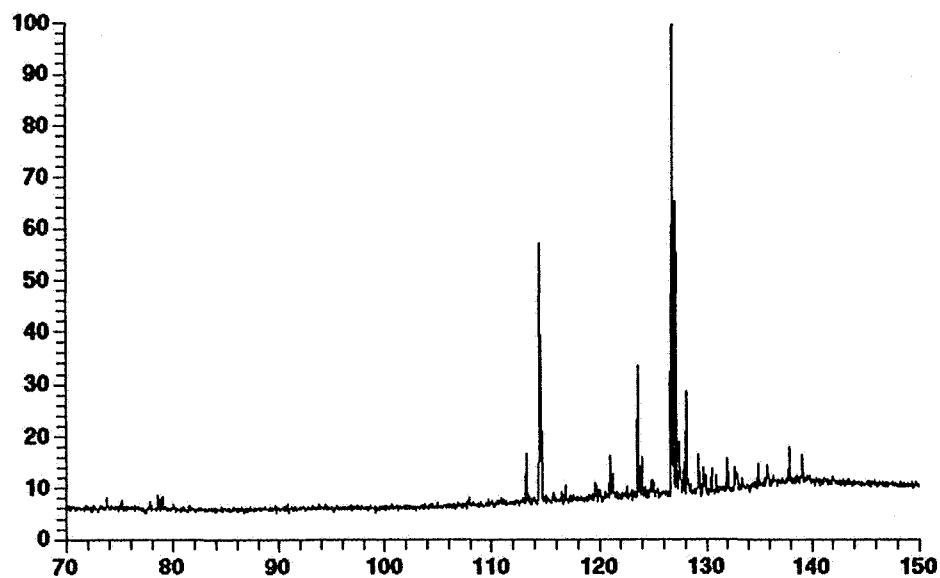
Ion 191.00 amu from B80253STM.d; B80253;ST;NO;25/5-5;HT;DST1;2158.50;2169.50;M
100% = 97688



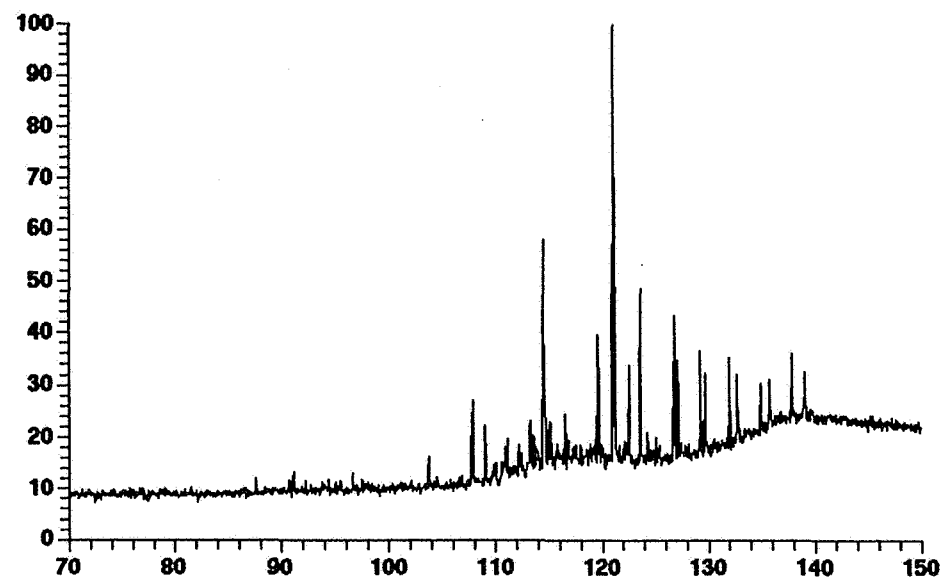
Ion 123.00 amu from B80253STM.d; B80253;ST;NO;25/5-5;HT;DST1;2158.50;2169.50;M
100% = 27664



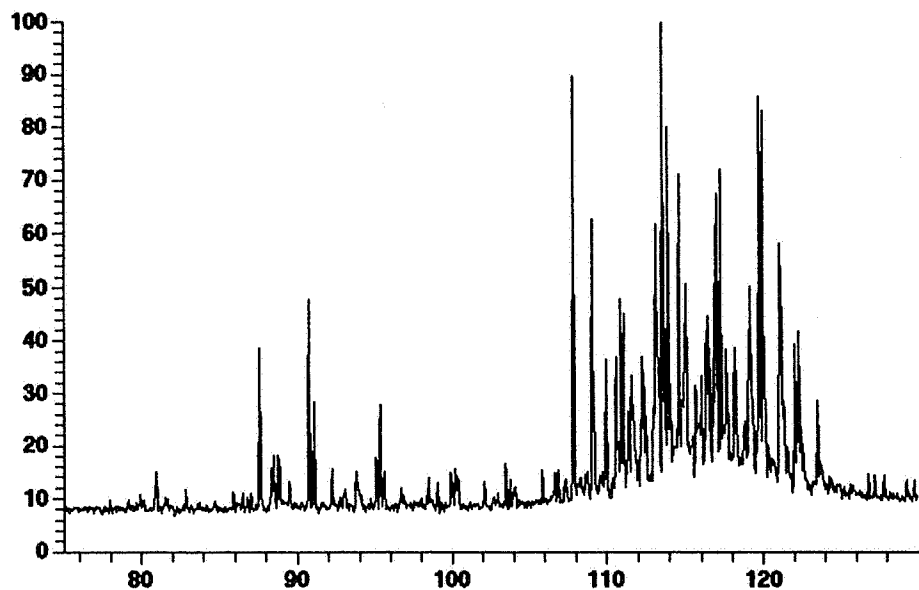
Ion 205.00 amu from B80253STM.d; B80253;ST;NO;25/5-5;HT;DST1;2158.50;2169.50;M
100% = 22928



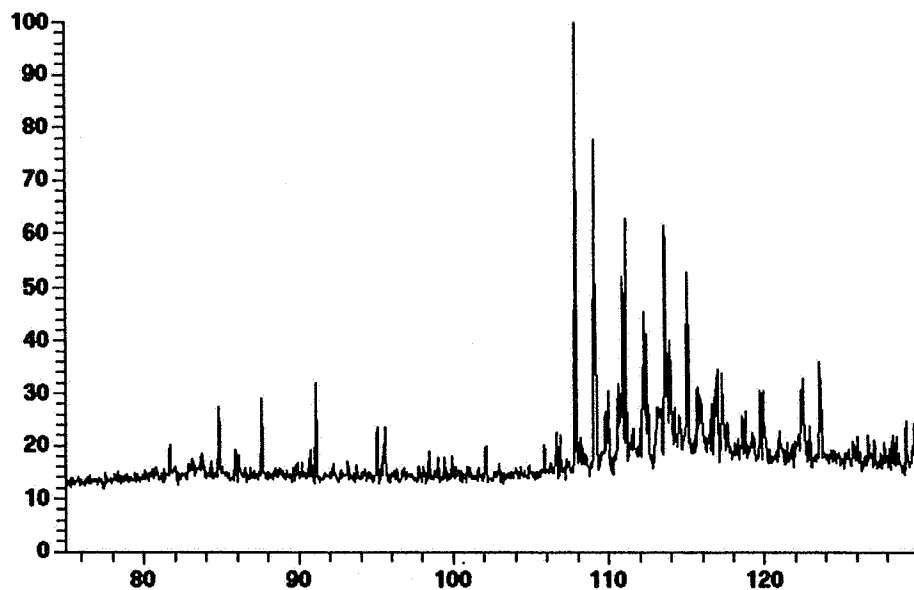
Ion 177.00 amu from B80253STM.d; B80253;ST;NO;25/5-5;HT;DST1;2158.50;2169.50;M
100% = 18696



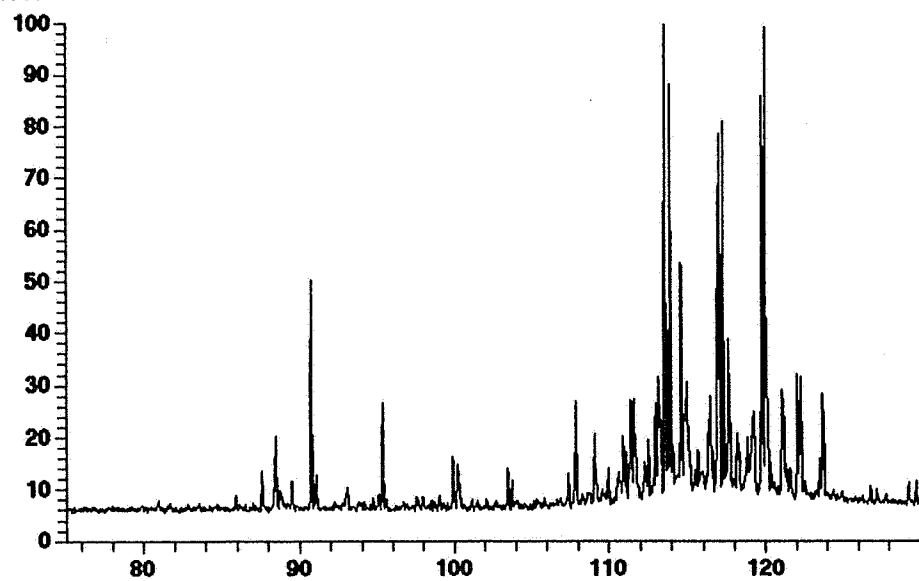
Ion 217.00 amu from B80253STM.d; B80253;ST;NO;25/5-5;HT;DST1;2158.50;2169.50;M
100% = 15163



Ion 259.00 amu from B80253STM.d; B80253;ST;NO;25/5-5;HT;DST1;2158.50;2169.50;M
100% = 7784



Ion 218.00 amu from B80253STM.d; B80253;ST;NO;25/5-5;HT;DST1;2158.50;2169.50;M
100% = 16584



Ion 231.00 amu from B80253STM.d; B80253;ST;NO;25/5-5;HT;DST1;2158.50;2169.50;M
100% = 5311

