

BA92-322-1

**REPORT:**

Block 2/7 :  
Brief Report on Geochemical Analyses  
of Mud Hydrocarbons, Well 2/7-27  
and Embla Oil Well 2/7-21S DST 3

**CLIENT(S):**

Phillips Petroleum Norway

**RESPONSIBLE  
SCIENTIST:**

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**AUTHORS:**

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**DATE:** 28.01.92**GEOLAB PROJECT:** 523004

## INTRODUCTION

Two mud filtrate samples and one canned sample of mud from well NOCS 2/7-27 and a sample of Embla oil, well 2/7-21S DST 3, were supplied for analysis.

The aim of the analysis was to determine whether the mud hydrocarbons could be correlated with the Embla oil, and also to compare them with oils from the Eldfisk field which had been analysed earlier for the Block 2/7 project. No analytical program had been determined beforehand, the client requiring a concise response as to whether the mud hydrocarbons could be correlated with either the Embla oil supplied or the Eldfisk oils.

The analyses performed were those of whole-oil/extract gas chromatography, followed by MPLC separation and GC of the saturated and aromatic hydrocarbon fractions. No GC - MS or isotope analyses were performed as these were deemed superfluous to the requirements of the program following the findings of the above analyses.

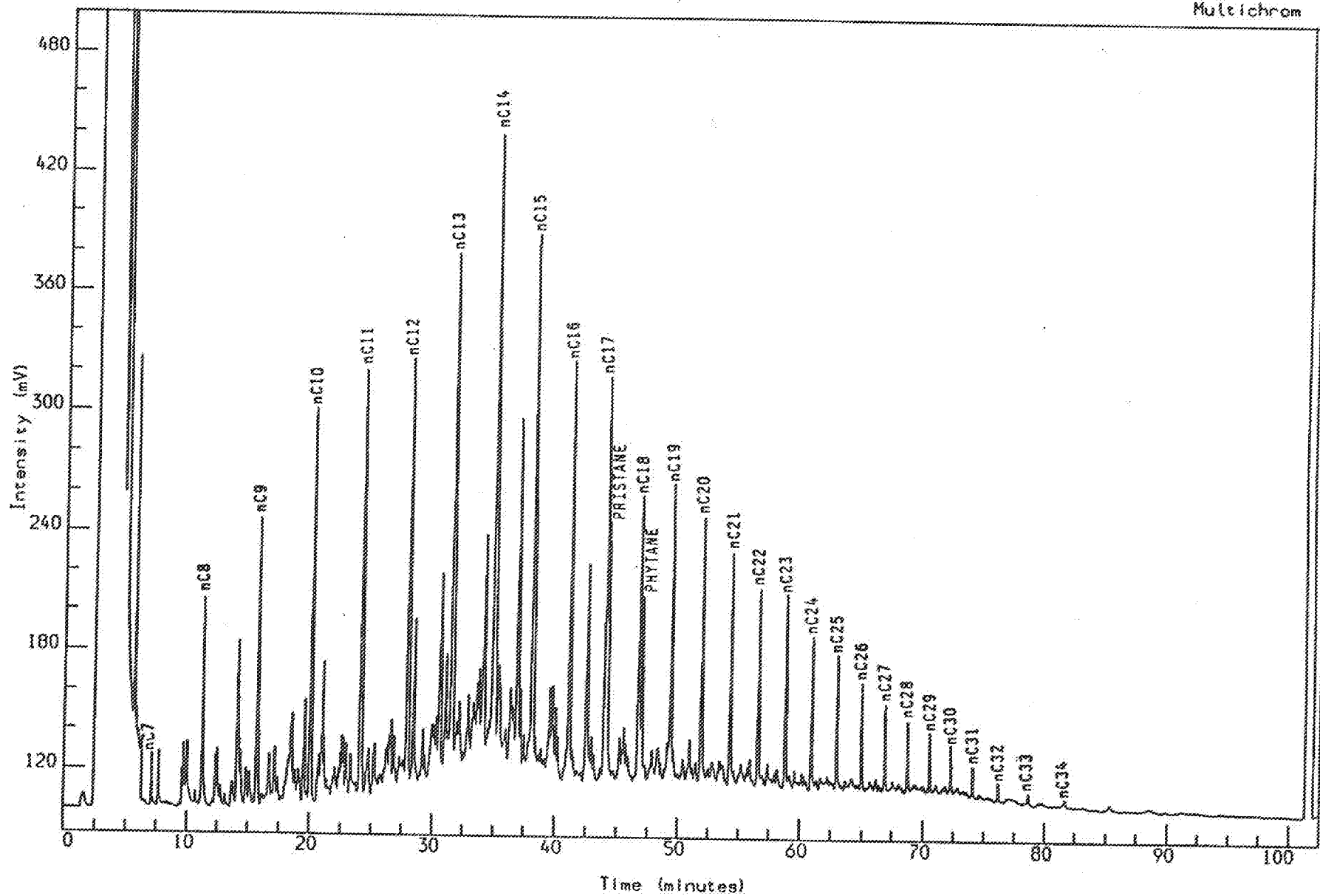
## RESULTS

Both whole oil/extract GC and GC of the saturated and aromatic hydrocarbon fractions show the mud and filtrate hydrocarbons to be very similar to those of the Embla oil supplied, all these being different to the two oils previously analysed from Eldfisk A and B (wells 2/7A-2 and 2/7B-12). The whole oil/extract GC traces are somewhat variable in the light hydrocarbon range, particularly for the mud samples, but this is to be expected, due to varying degrees of evaporation. Otherwise the whole oil/extract chromatographic trace profiles of the mud hydrocarbons and Embla oil are different to those of the Eldfisk oils, most notably in the pristane/ $nC_{17}$  and phytane/ $nC_{18}$  ratios, which reflect either slight source differences or a difference in maturity. The saturated and aromatic hydrocarbon GC traces confirm this difference, particularly regarding the aromatic fractions (e.g. from the 4/1 methyl dibenzothiophene ratios) which show the Embla oil and mud hydrocarbons to be distinctly more mature than the Eldfisk oils.

From this it can be concluded that the mud hydrocarbons are most likely the same as those in the Embla oil supplied (DST 3) and do not represent an Eldfisk type oil.

Analysis Name : [TESTING] 9 WOMUDB.1,1.

Multichrom



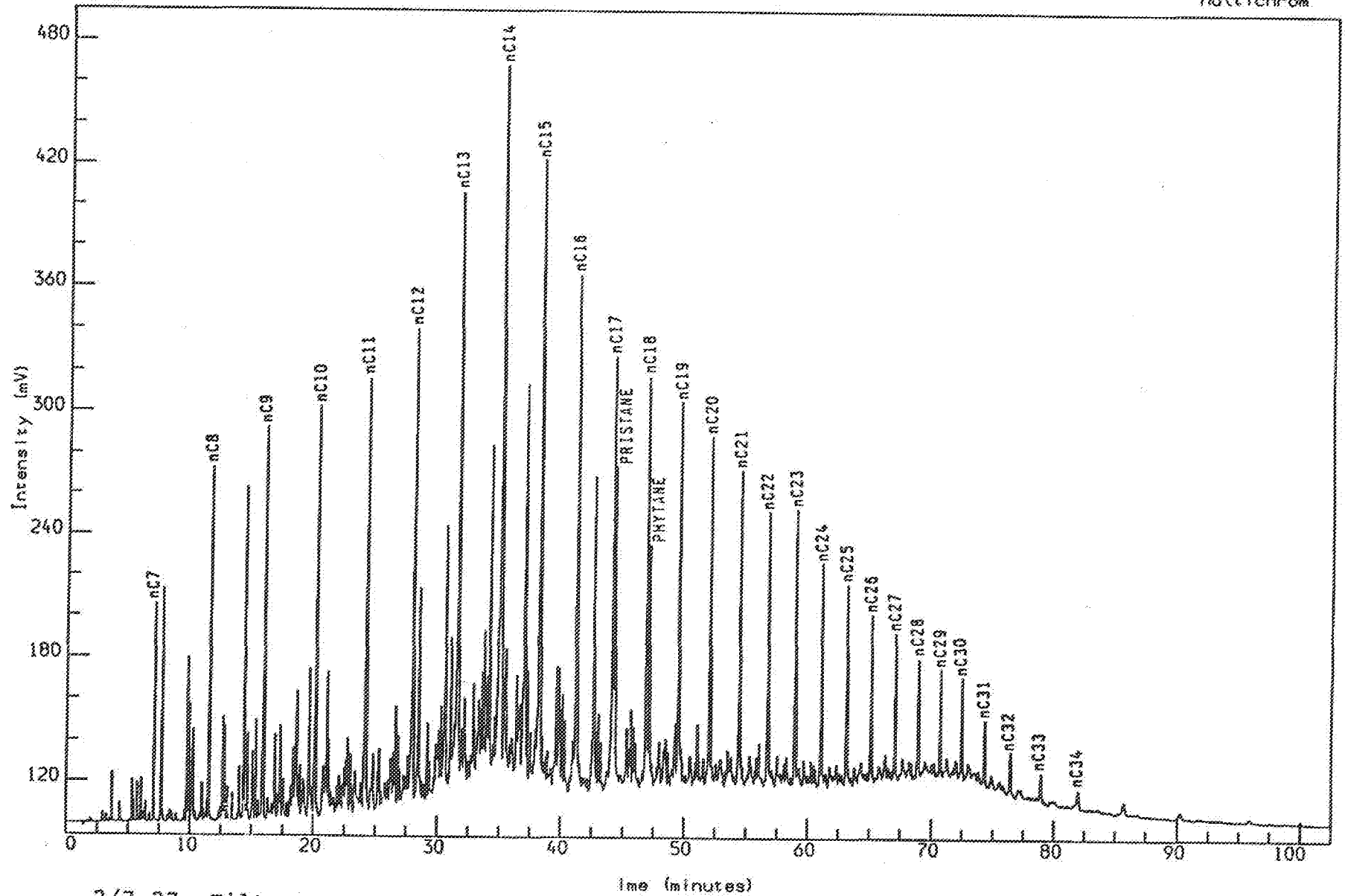
2/7-27 Mud spl.  
Whole Extract (FID)

Reported on 19-DEC-1991 at 09:59

GEOLAB NOR

Analysis Name : [TESTING] 9 W02417A,1,1.

Multichrom



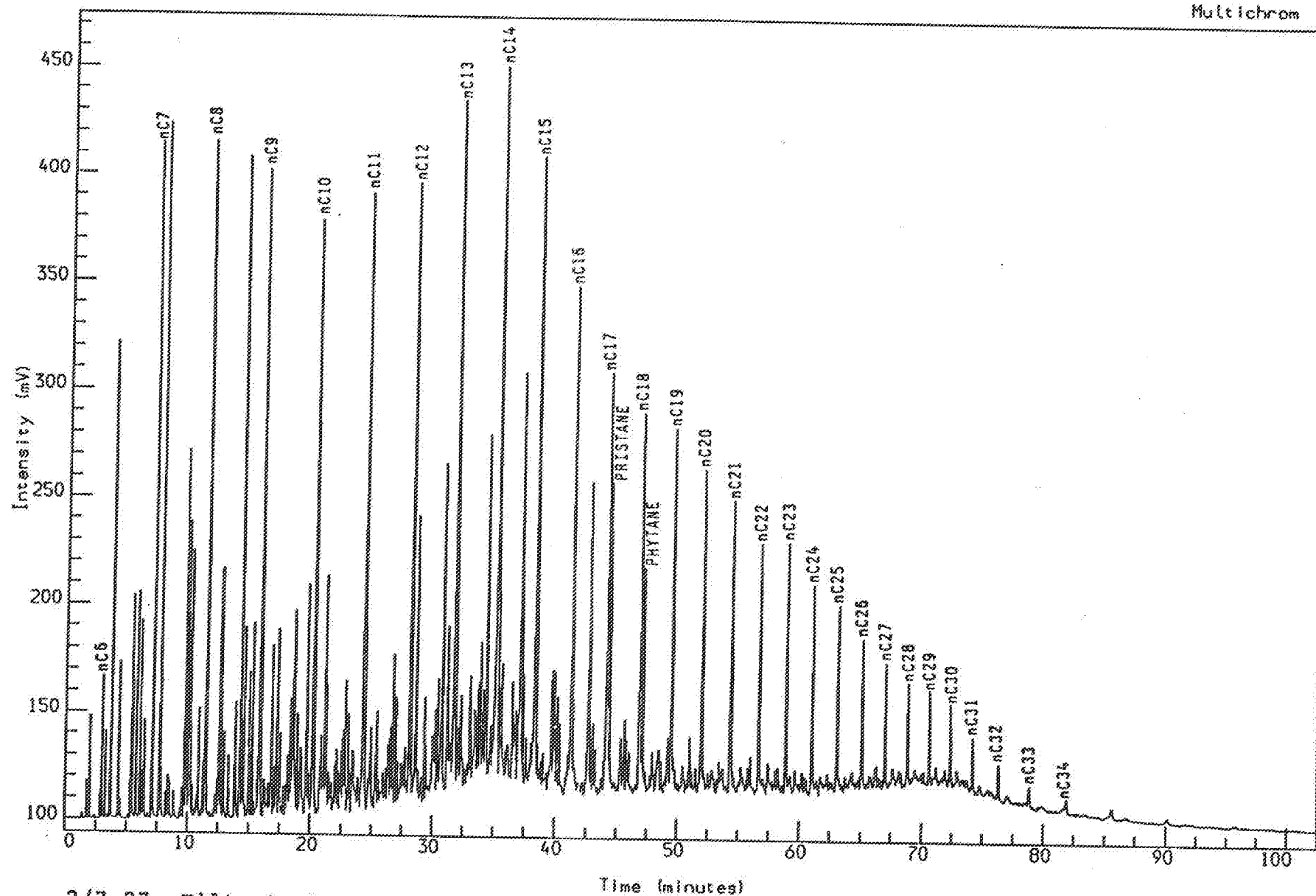
2/7-27 Filtrate A  
Whole Extract (FID)

Reported on 16-DEC-1991 at 10.07

GEOLAB NOR

Analysis Name : [TESTING] 9 W02417B.1.1.

Multichrom



2/7-27 Filtrate B

Whole Extract (FID)

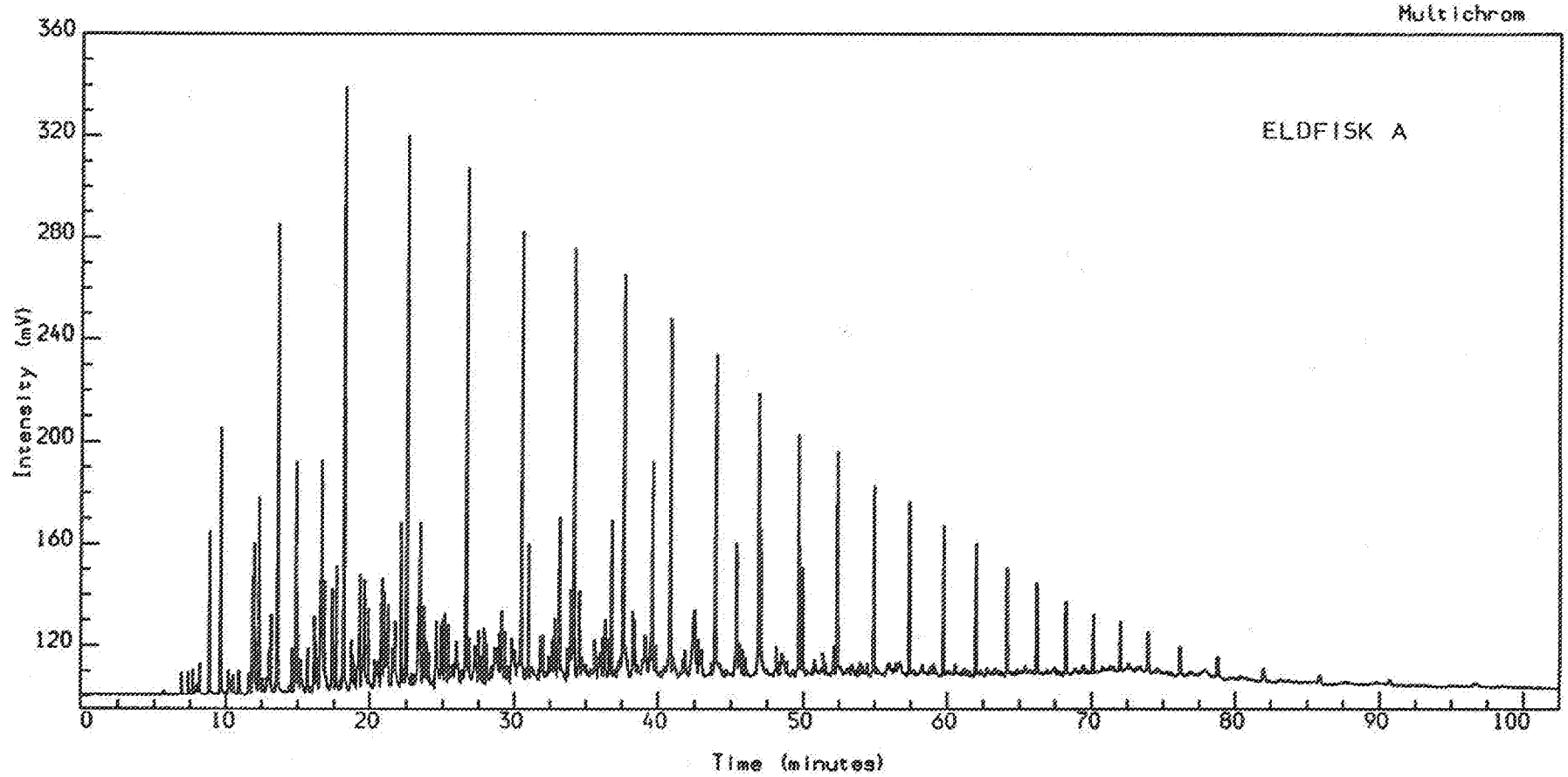
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GEOLAB NOR



Analysis Name : [P2304PHIL] 9 W000427A2.1.1.

2/7-A2 OIL Amount : 1.000



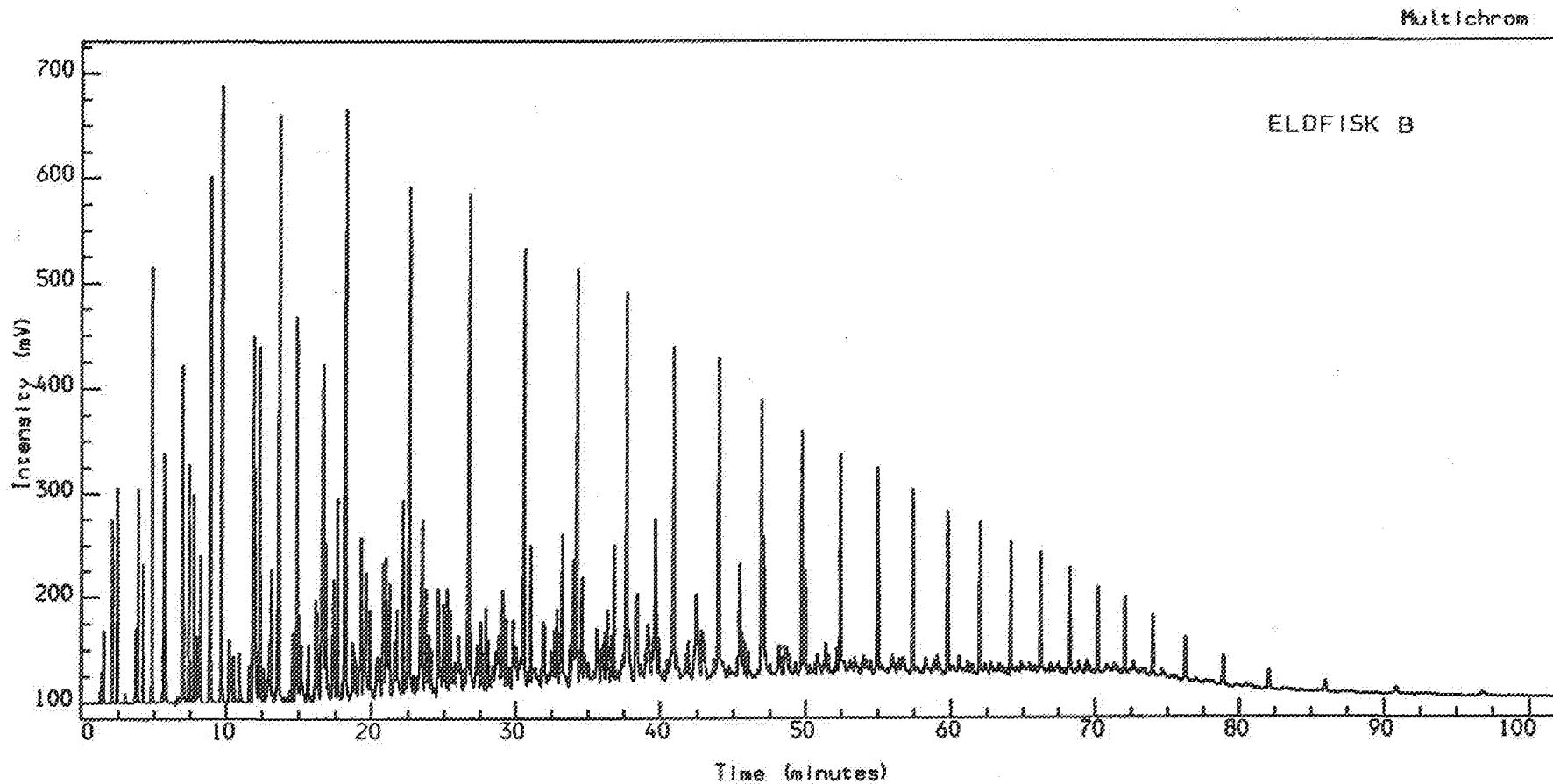
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Channel Title : ARO GC FID  
Lims ID :  
Acquired on 23-NOV-1990 at 12.58  
Reported on 23-NOV-1990 at 14.51

Method : VHOIL  
Calibration : VHOIL  
Run Sequence : VHOIL



Analysis Name : [P2304PHIL] 9 W000427B12.1.1.

2/7-B12 OIL Amount : 1.000



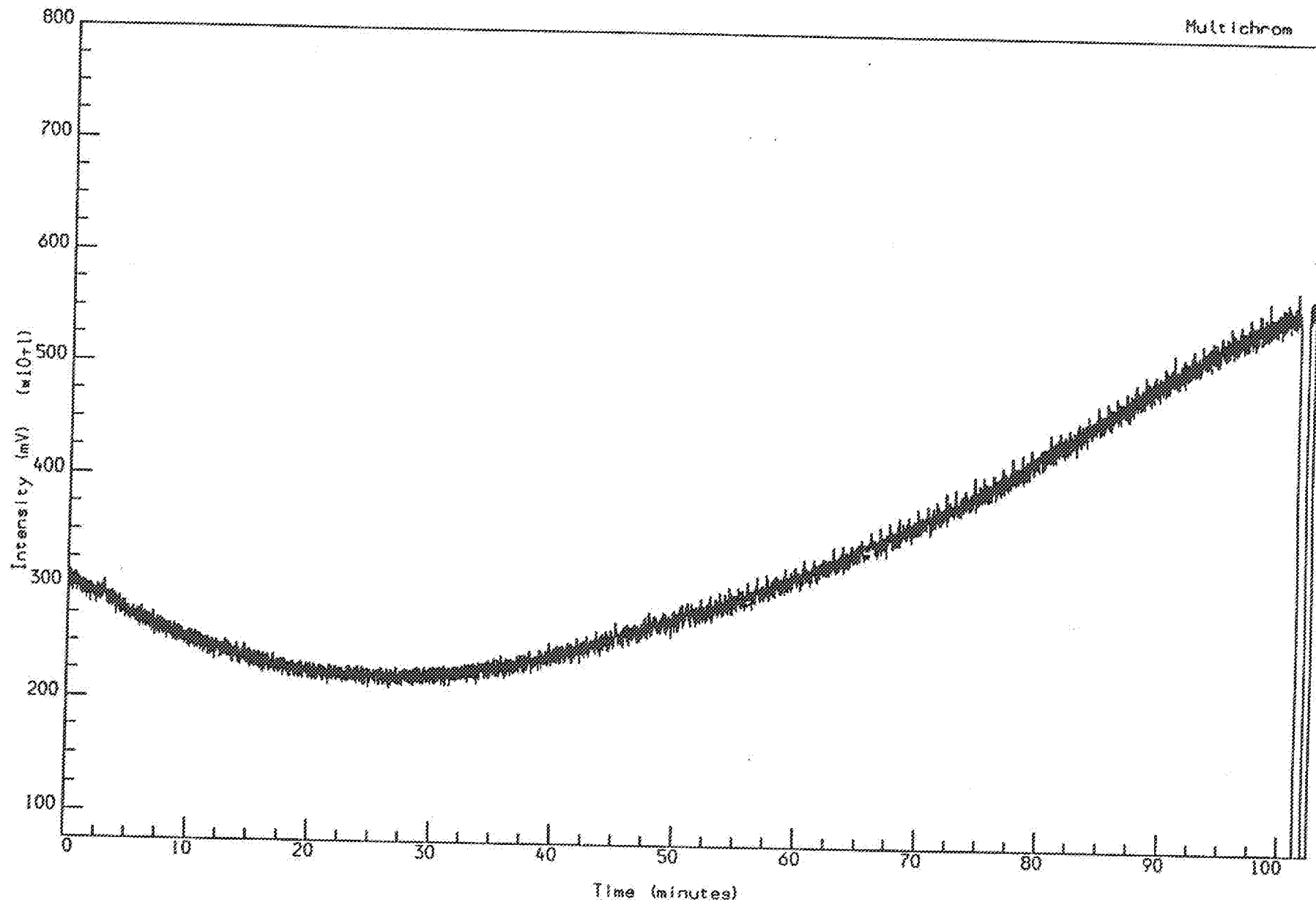
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Channel Title : ARO GC FID  
Lims ID :

Method : WHOIL  
Calibration : WHOIL  
Run Sequence : WHOIL

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Reported on 23-NOV-1990 at 10:40



Analysis Name : [TESTING] 10 WOMUDB.1.1.

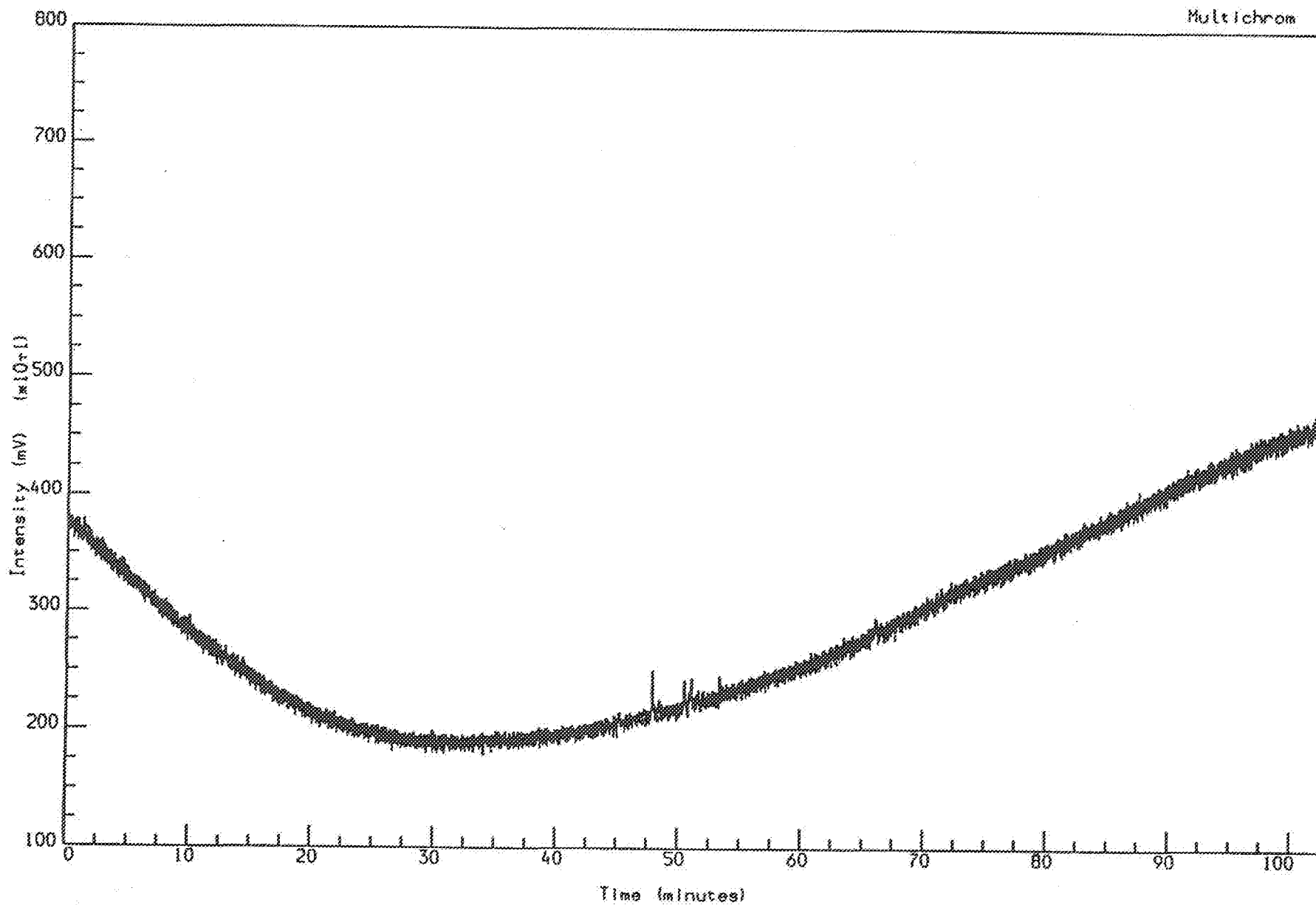


2/7-27 Mud spl.  
Whole Extract (FPD)

Reported on 19-DEC-1991 at 10:01

GEOLAB  NOR

Analysis Name : [TESTING] 10 W02417A,1,1.

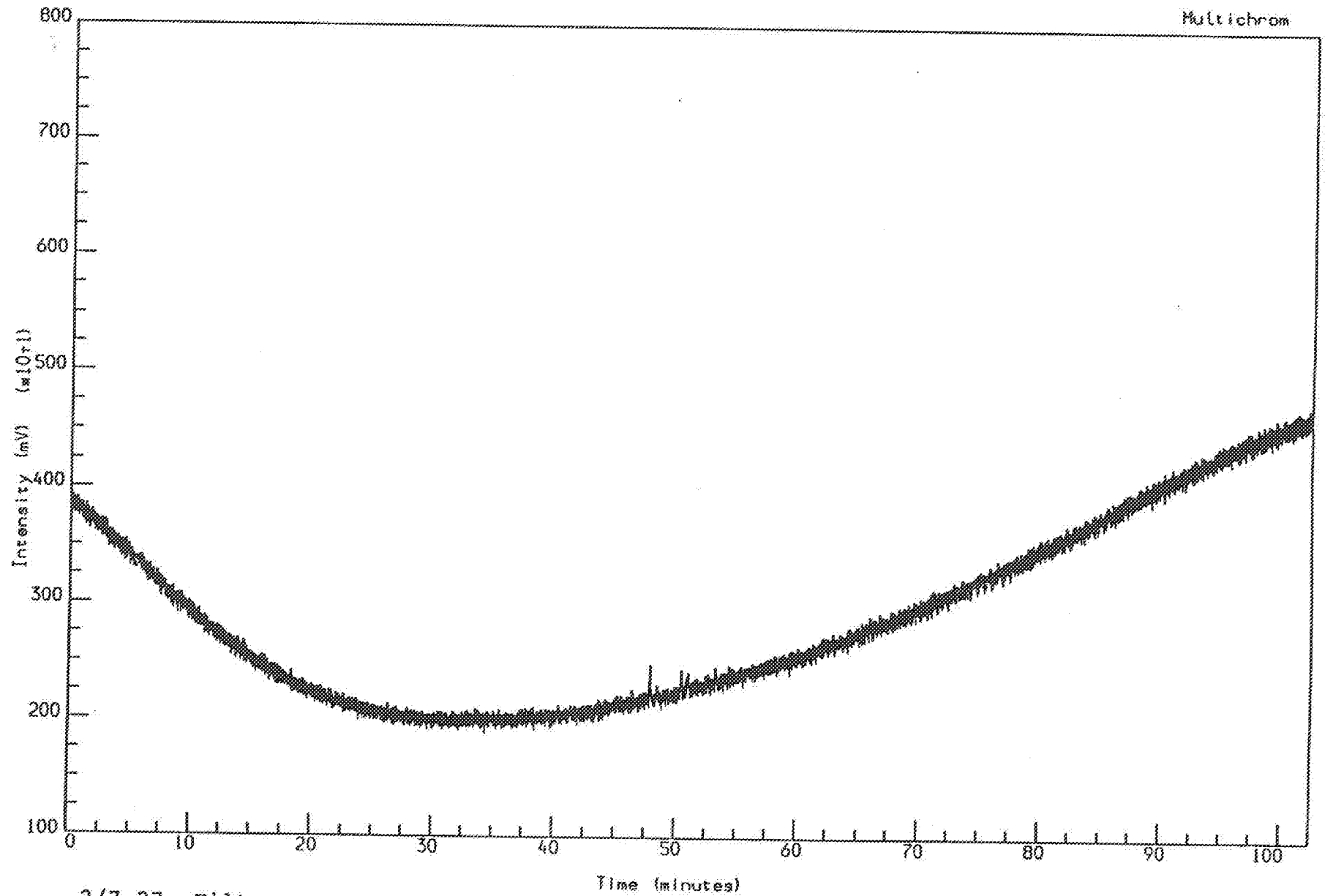


2/7-27 Filtrate A  
Whole Extract (FPD)

Reported on 16-DEC-1991 at 10.13

GEOLAB  NOR

Analysis Name : [TESTING] 10 W02417B.1.1.



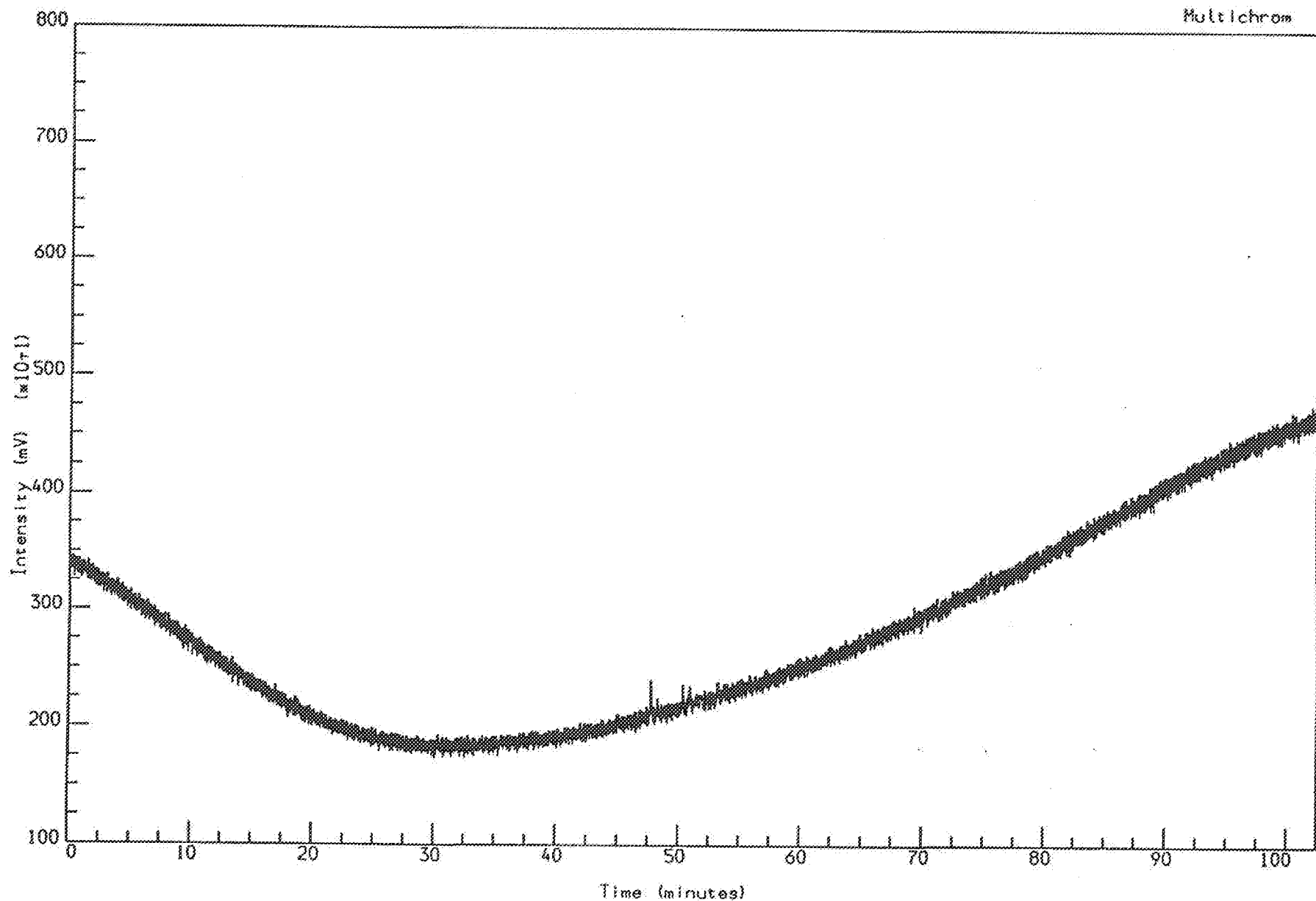
2/7-27 Filtrate B

Whole Extract (FPD)

Reported on 16-DEC-1991 at 10.16

GEOLAB NOR

Analysis Name : [TESTING] 10 W02721,1,1.



2/7-21S Embla oil

Reported on 13-DEC-1991 at 15:23

GEOLAB NOR

Whole oil (FPD)

Table 1a: Weight of EOM and Chromatographic Fraction for well 2/7-27 and Embla oil 2/7-21S DST 3 Page: 1

Depth unit of measure: m

Depth	Typ	Lithology	Rock Extracted (g)	EOM (mg)	Sat (mg)	Aro (mg)	Asph (mg)	NSO (mg)	HC (mg)	Non-HC (mg)	TOC(e) (%)	Sample
2/7-27	Filtrate	A	-	57.2	31.8	6.4	0.6	18.4	38.3	19.0	-	0001-0B
2/7-27	Filtrate	B	-	60.4	35.0	6.2	0.6	18.6	41.2	19.2	-	0002-0B
2/7-21S	Embla oil		-	90.4	45.5	9.1	0.6	35.2	54.7	35.8	-	0003-0B

Table 1b: Composition of material extracted from the rock (%) for well 2/7-27 and  
 Embla oil 2/7-21S DST 3  
 Depth unit of measure: m

Depth	Typ	Lithology	Sat	Aro	Asph	NSO	HC	Non-HC	Sat	HC	Sample
			EOM	EOM	EOM	EOM	EOM	EOM	EOM	Aro	
2/7-27	Filtrate	A	55.59	11.28	1.05	32.08	66.87	33.13	493.02	201.85	0001-0B
2/7-27	Filtrate	B	57.95	10.26	0.99	30.79	68.21	31.79	564.52	214.58	0002-0B
2/7-21S	Embla oil		50.33	10.12	0.66	38.88	60.45	39.55	497.27	152.87	0003-0B

Table 2: Saturated Hydrocarbon Ratios for well 2/7-27 and Embla oil 2/7-21S DST 3

Depth unit of measure: m

Depth	Typ	Lithology	Pristane	Pristane	Pristane + Phytane	Phytane	CPI	Sample
			nC17	Phytane	nC17 + nC18	nC18		
2/7-27	Filtrate	A	0.42	1.37	0.39	0.35	1.12	0001-0B
2/7-27	Filtrate	B	0.48	1.41	0.43	0.39	1.05	0002-0B
2/7-21S	Embla oil		0.46	1.35	0.43	0.39	1.07	0003-0B

Table 3: Aromatic Hydrocarbon Ratios for well 2/7-27 and Embla oil 2/7-21S DST 3

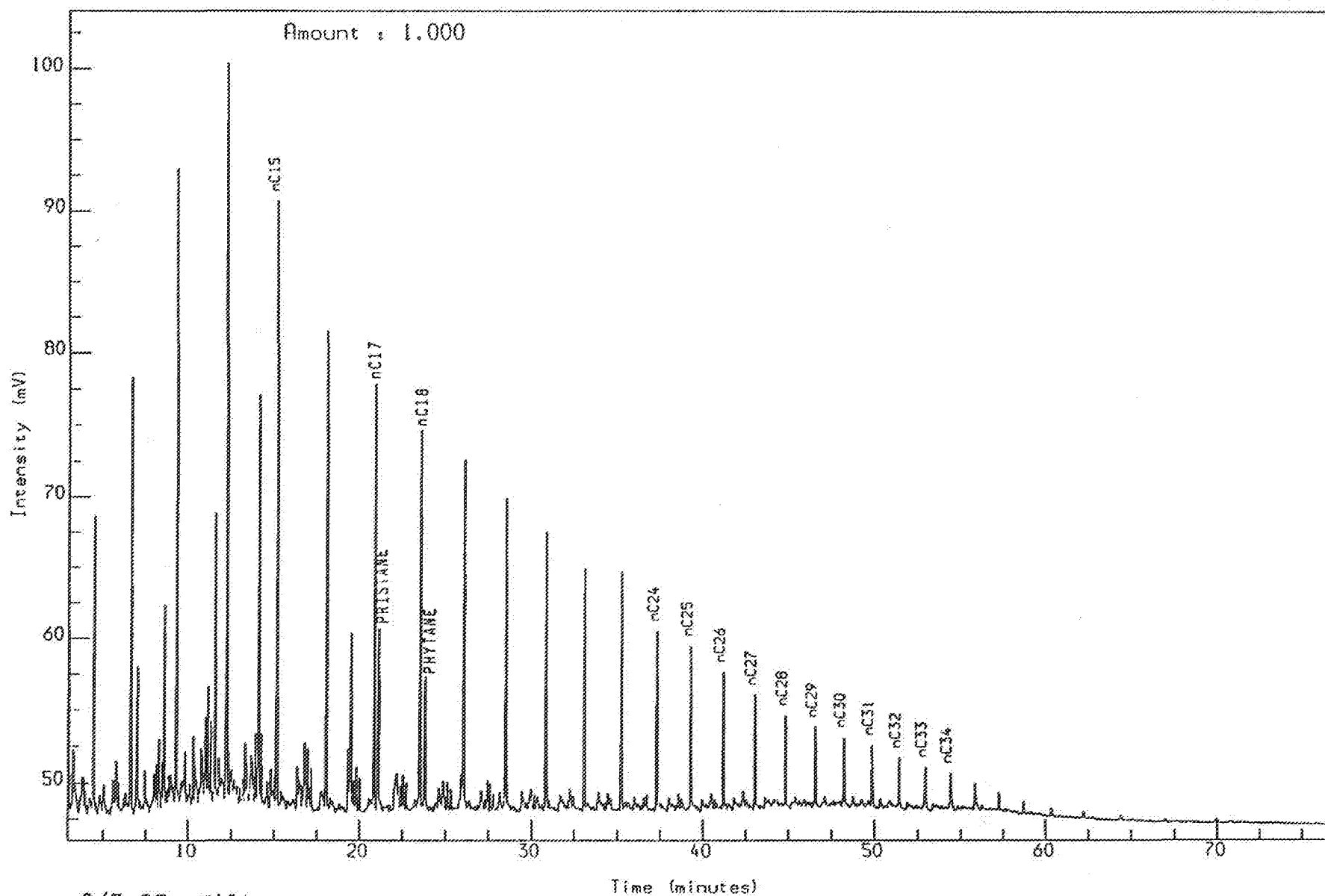
Depth unit of measure: m

Depth	Typ	Lithology	MNR	DMNR	BPhR	2/1MP	MP11	MP12	Rc	DBT/P	4/1MDBT	(3+2) /1MDBT	Sample
2/7-27	Filtrate	A	1.60	1.91	0.30	1.25	1.09	1.24	1.05	-	-	-	0001-0B
2/7-27	Filtrate	B	1.67	3.96	0.28	1.50	1.07	1.22	1.04	-	-	-	0002-0B
2/7-21S	Embla oil		1.51	3.85	0.26	1.21	0.97	1.10	0.98	-	-	-	0003-0B



Analysis Name : [P2304] 11 SA2417A,1,1.

Multichrom



2/7-27 Filtrate A

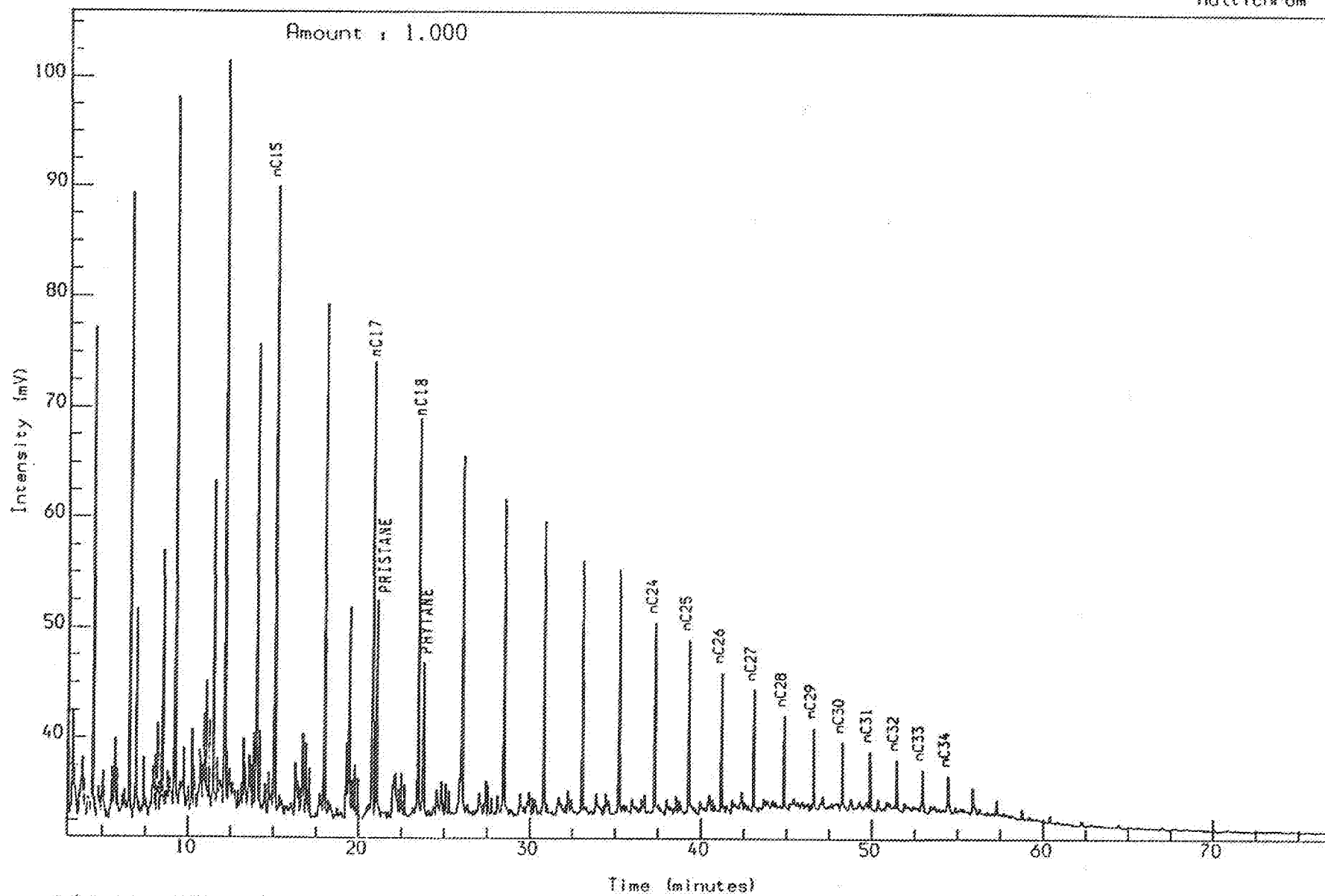
Saturated GC

Reported on 15-JAN-1992 at 17:13

GEOLAB NOR

Analysis Name : [P2304] 11 SA2417B,1,1.

Multichrom



2/7-27 Filtrate B

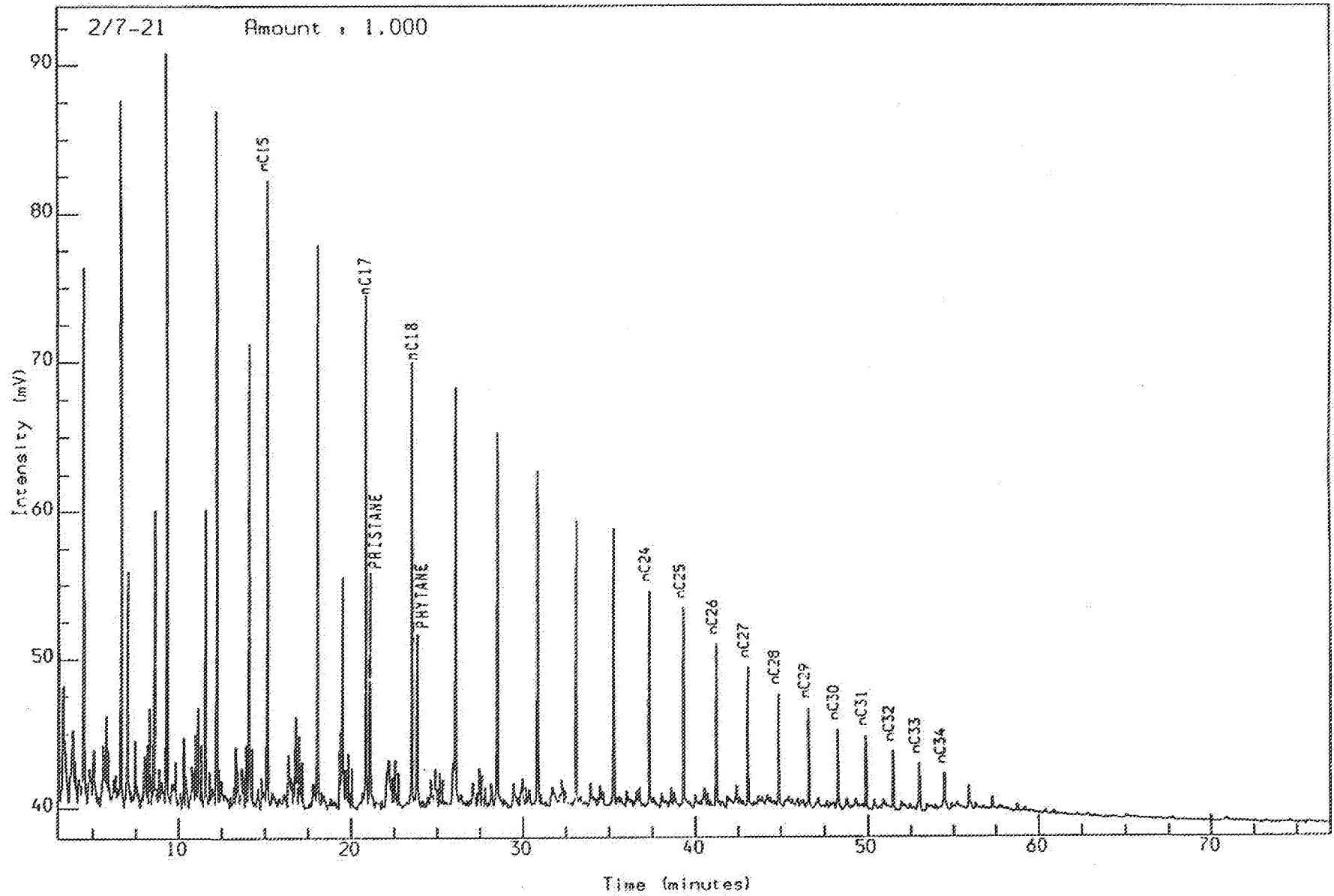
Saturated GC

Reported on 15-JAN-1992 at 17:14

GEOLAB NOR

Analysis Name : [P2304] 11 SA2721,1.1.

Multichrom



2/7-21S Embla oil

Reported on 15-JAN-1992 at 17:16

Saturated GC

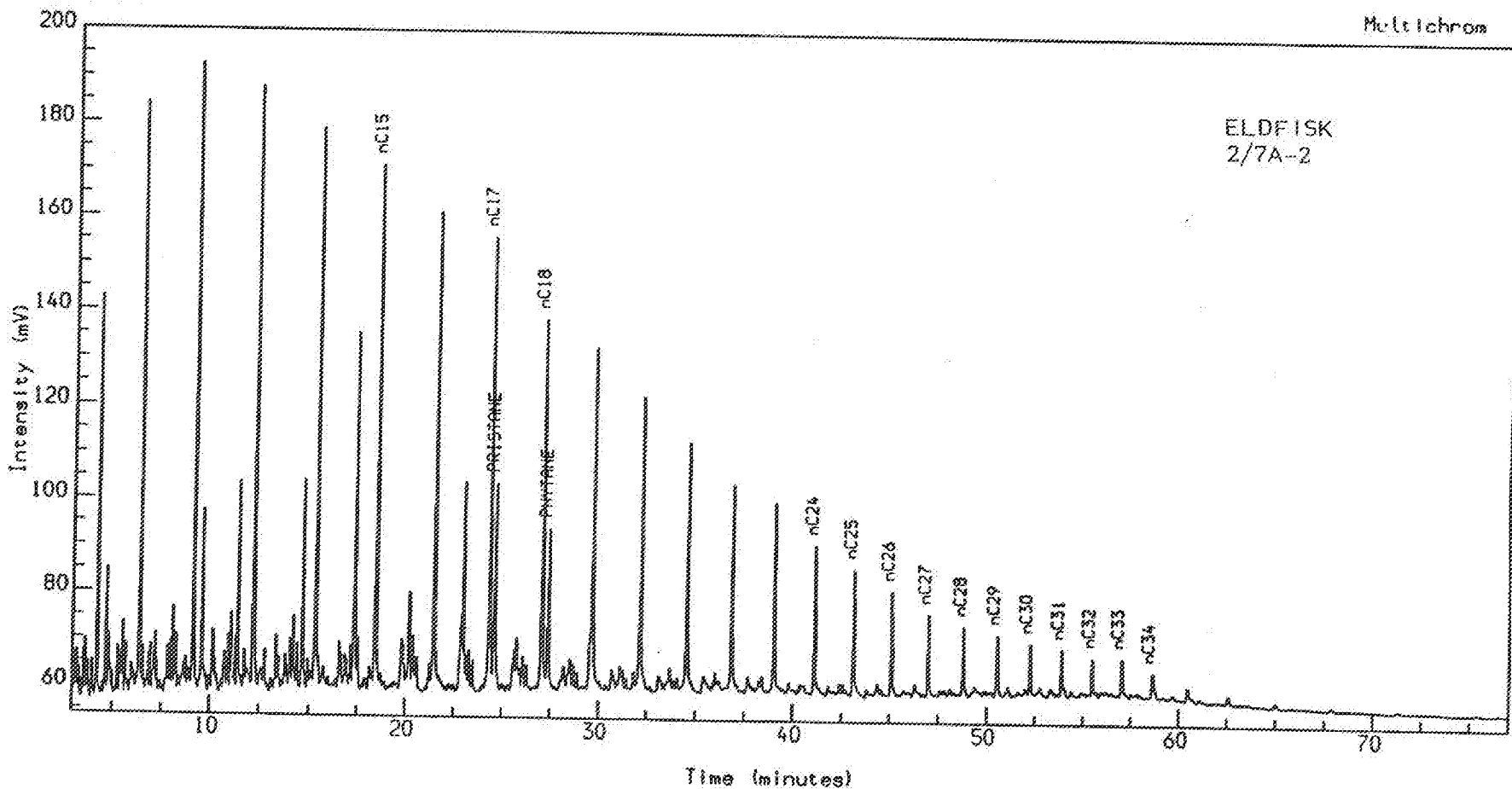
GEOLAB NOR



Analysis Name : [P2304PHIL] 11 SE30427A2,1,1.

2/7 A-2 SAT Amount : 1.000

SATT



Instrument : PE 8320

Channel Title : SAT GC

Lims ID :

Acquired on 14-SEP-1990 at 11:31

Reported on 14-SEP-1990 at 13:05

Method : SATT

Calibration : SATT

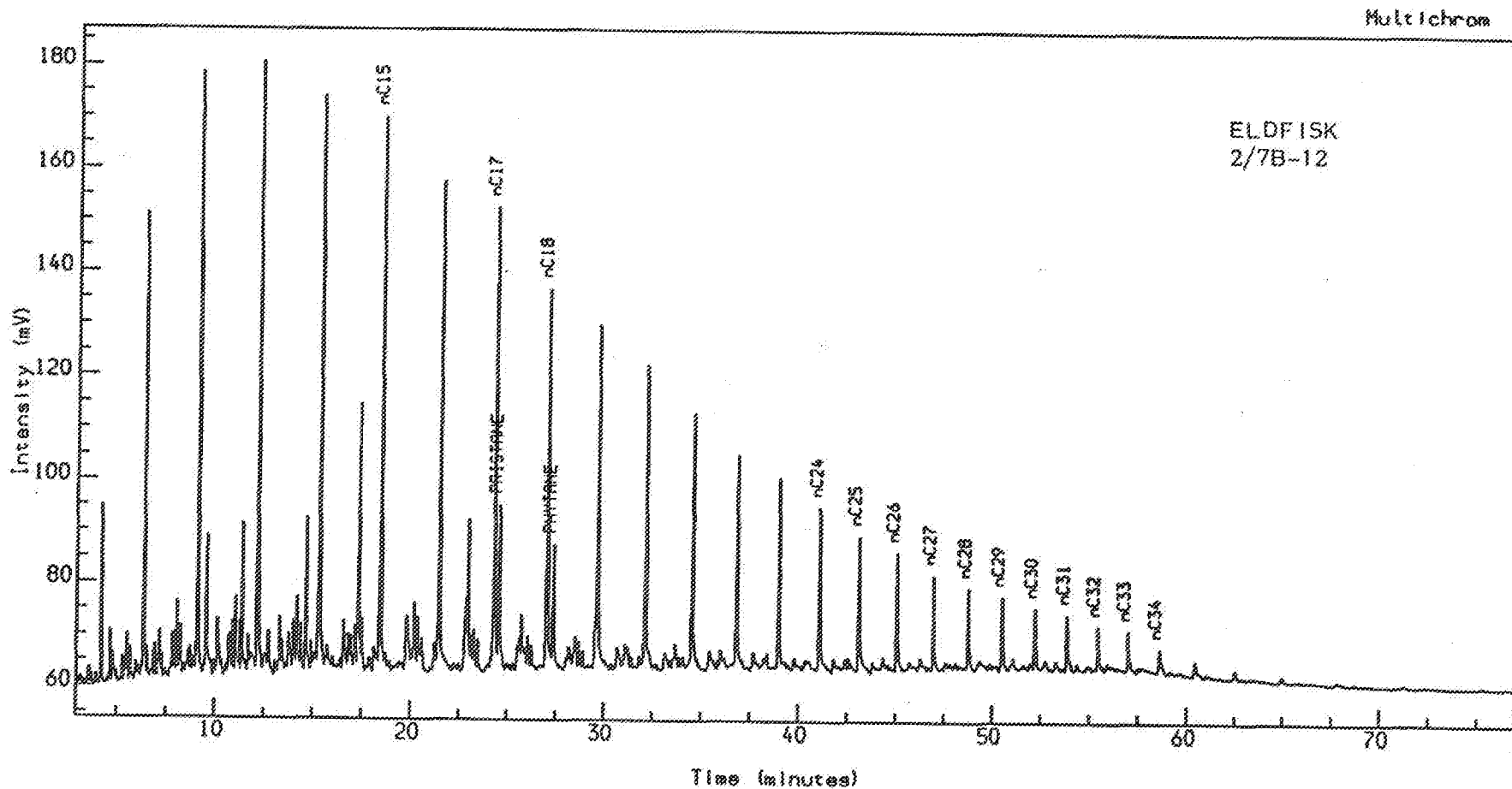
Run Sequence : SATT



Analysis Name : [P2304PHIL] 11 SE30427B12.1.1.

2/7-B12 SAT Amount : 1.000

SATT



Instrument : PE 8320

Channel Title : SAT GC

Lims ID :

Acquired on 14-SEP-1990 at 08:42

Reported on 14-SEP-1990 at 10:11

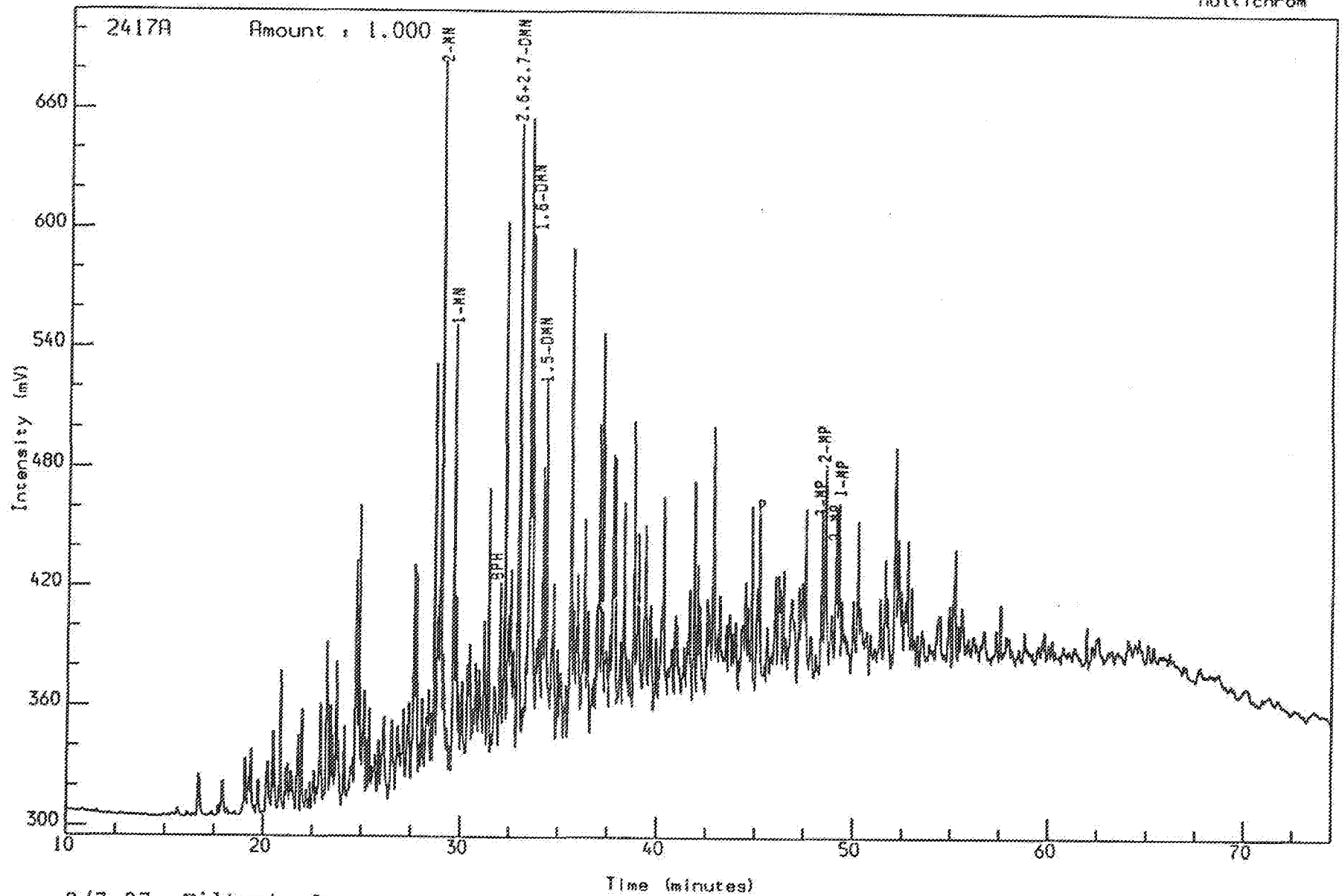
Method : SATT

Calibration : SATT

Run Sequence : SATT

Analysis Name : [P2304] 29 AR2417.3.1.

Multichrom



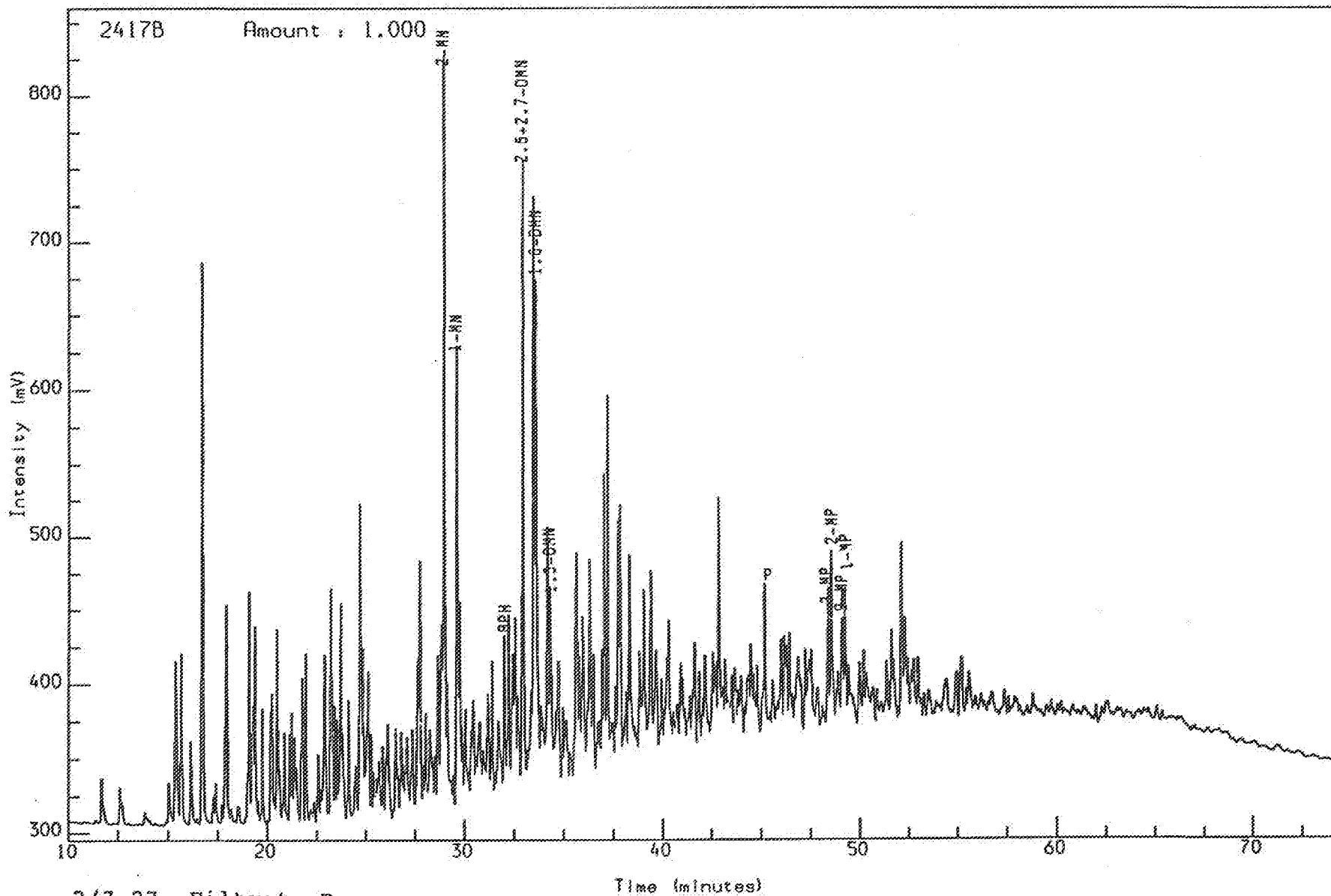
2/7-27 Filtrate A  
Aromatic GC (FID)

Reported on 9-JAN-1992 at 09:03

GEOLAB NOR

Analysis Name : [P2304] 29 AR2417.4.1.

Multichrom



2/7-27 Filtrate B

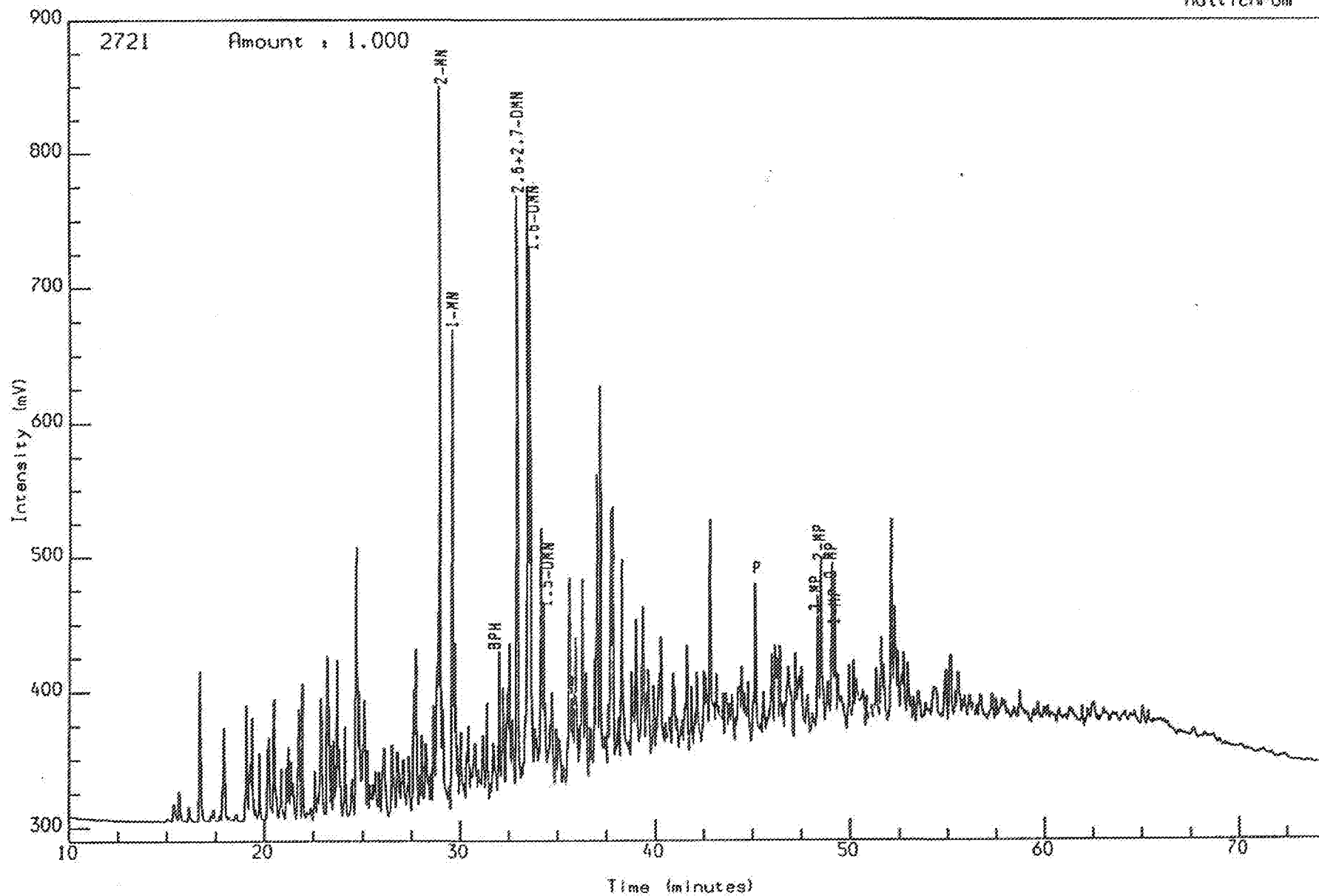
Aromatic GC (FID)

Reported on 10-JAN-1992 at 08:32

GEOLAB NOR

Analysis Name : [P2304] 29 AR2417,5,1.

Multichrom



2/7-21S Embla oil

Aromatic GC (FID)

Reported on 10-JAN-1992 at 08:34

GEOLAB NOR



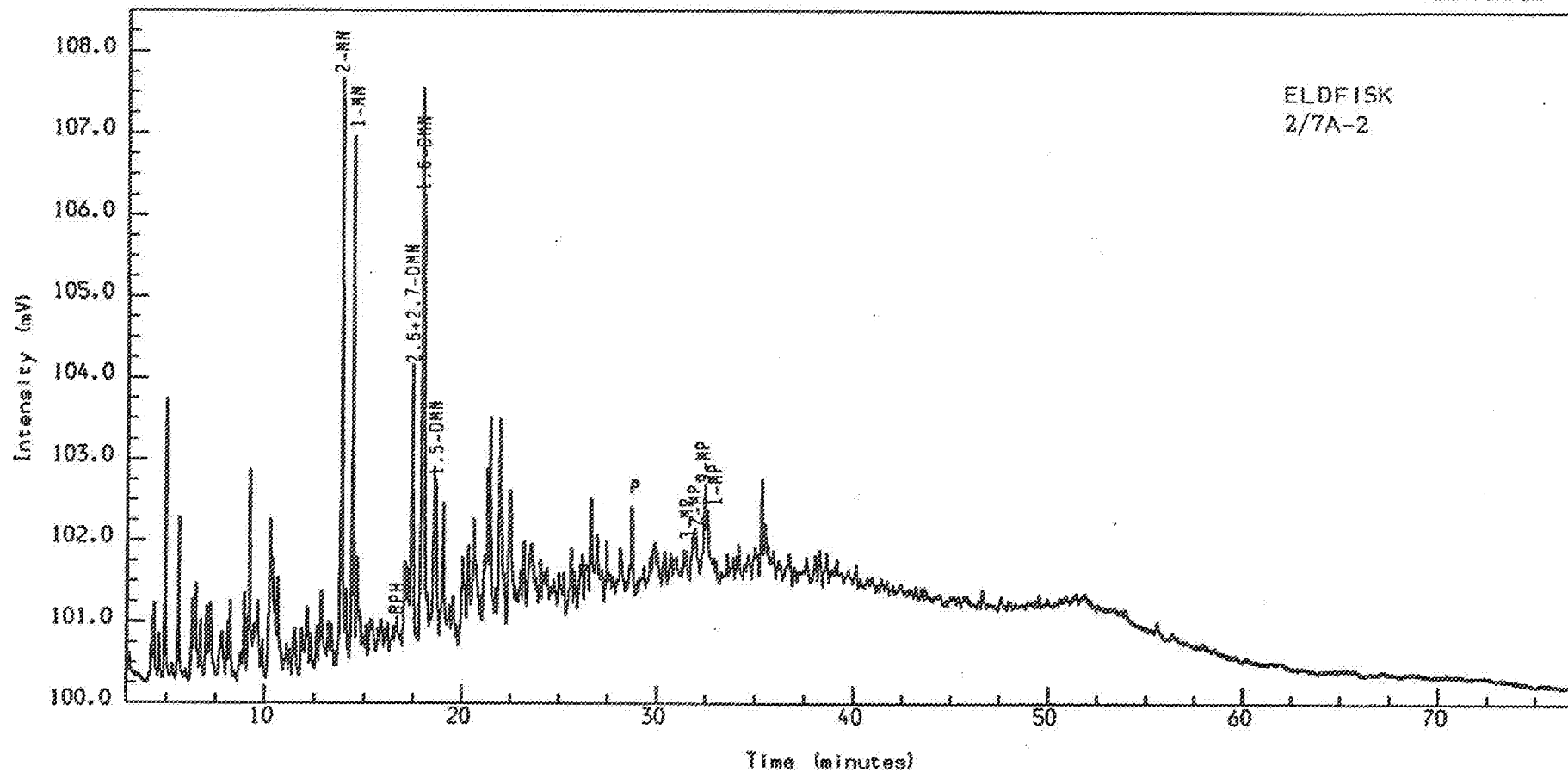


Analysis Name : [P2304PHIL] 9 AE30427A2.1.1.

2/7 A-2 ARO Amount : 1.000

AROMATIC GC

Multichrom



Instrument : PE 2000  
 Channel Title : ARO GC FID  
 Lims ID :

Method : ARO  
 Calibration : ARO  
 Run Sequence : ARO

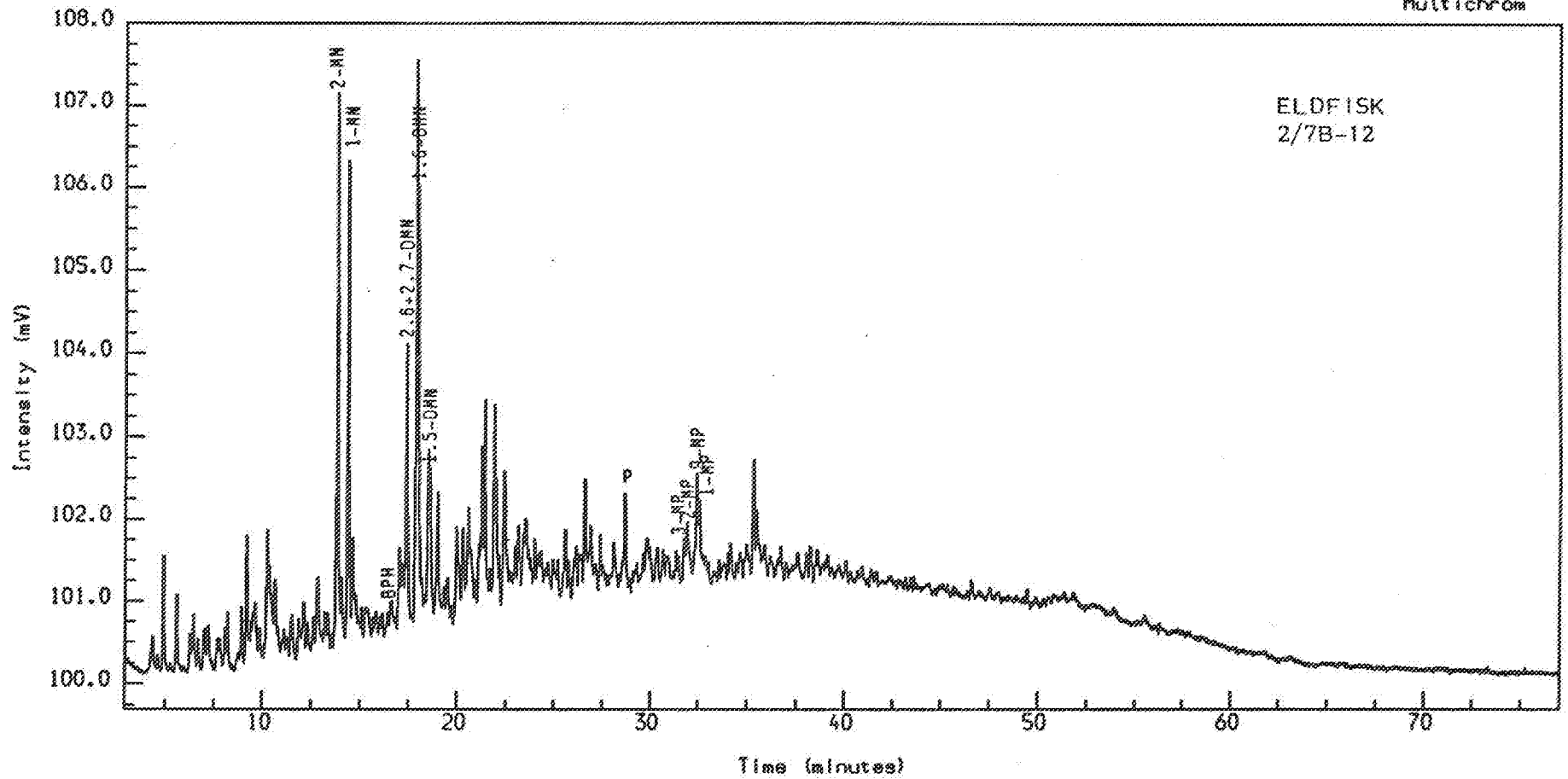
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 Reported on 14-SEP-1990 at 12:56



Analysis Name : [P2304PHIL] 9 AE30427B12,1,1.

2/7-B12 ARO Amount : 1.000

AROMATIC GC



Instrument : PE 2000

Channel Title : ARO GC FID

Lims ID :

Acquired on 14-SEP-1990 at 08.41

Reported on 14-SEP-1990 at 10.13

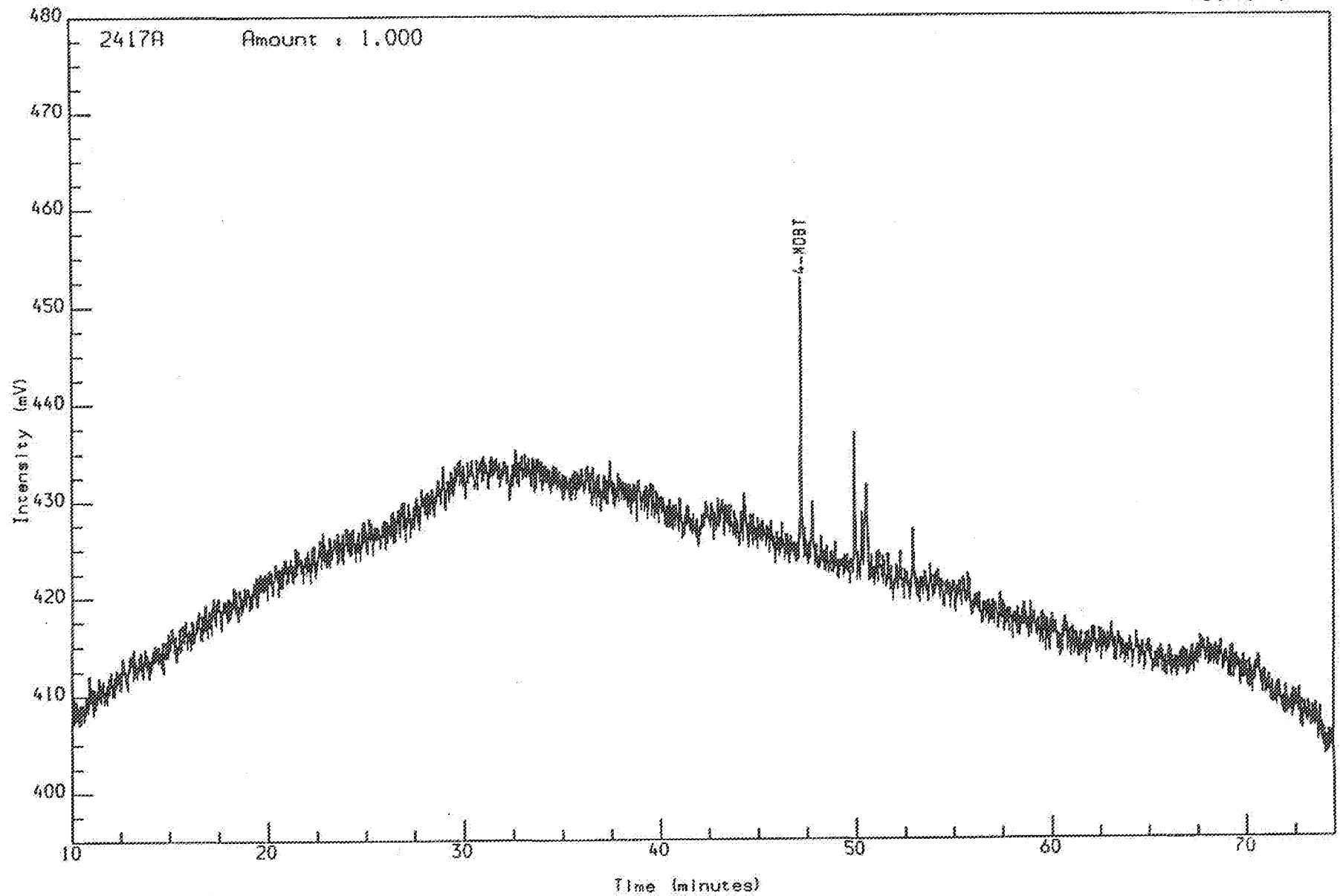
Method : ARO

Calibration : ARO

Run Sequence : ARO

Analysis Name : [P2304] 30 AR2417.3.1.

Multichrom



2/7-27 Filtrate A

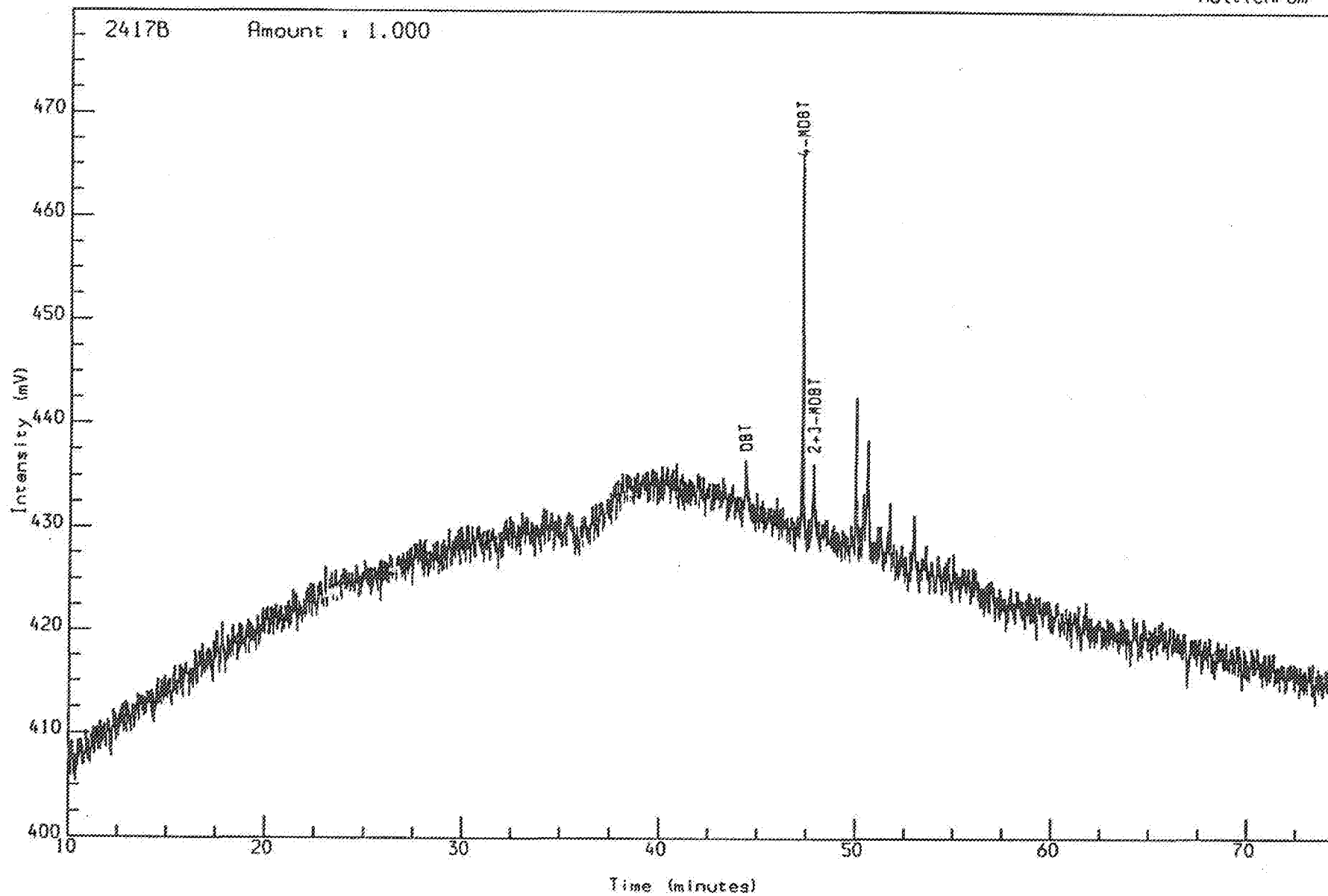
Aromatic GC (FPD)

Reported on 10-JAN-1992 at 08:39

GEOLAB NOR

Analysis Name : [P2304] 30 AR2417.4.1.

Multichrom



2/7-27 Filtrate B

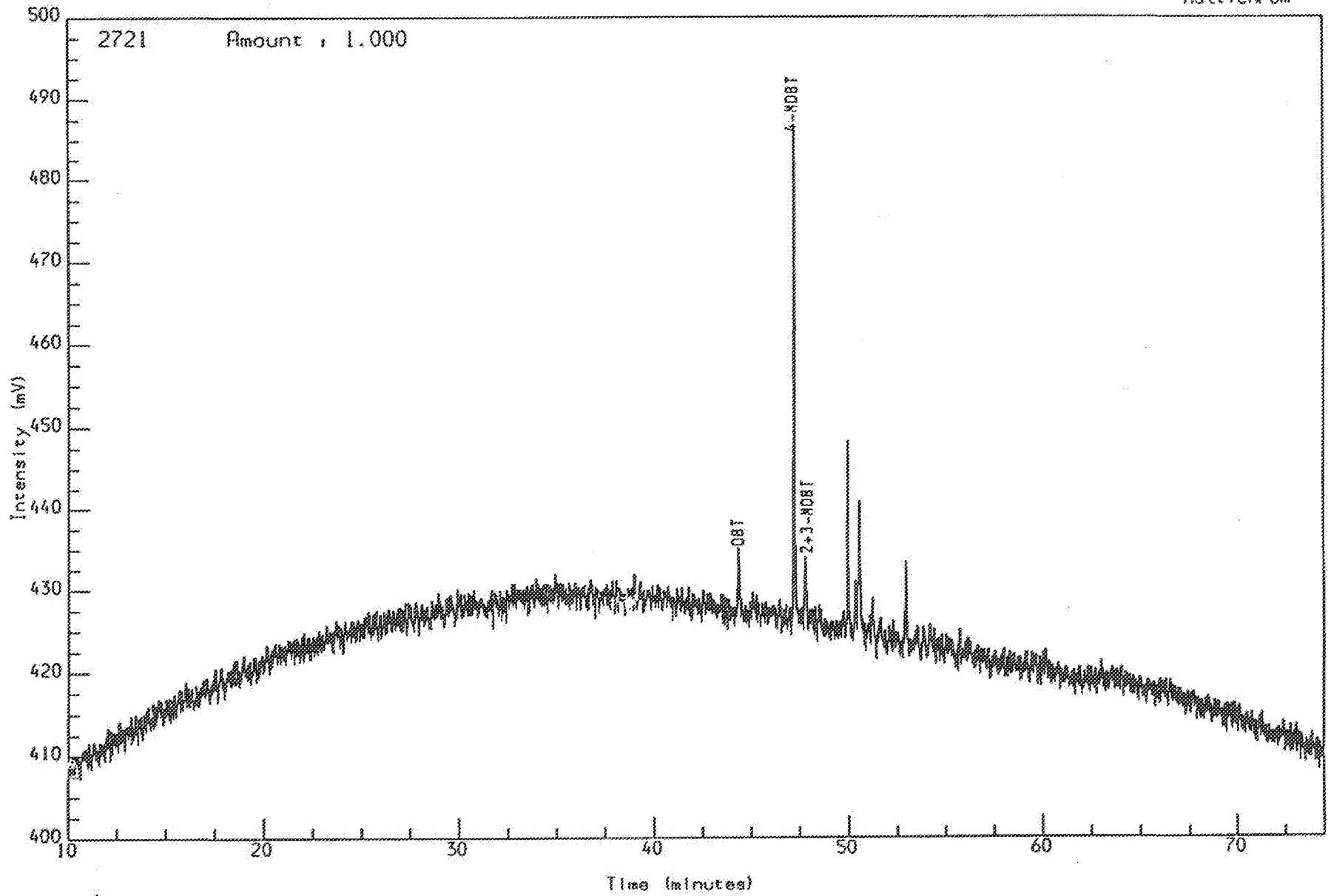
Reported on 10-JAN-1992 at 08:41

Aromatic GC (FPD)

GEOLAB NOR

Analysis Name : [P2304] 30 AR2417,5,1.

Multichrom



2721 Amount : 1.000

2/7-21S Embla oil

Aromatic GC (FPD)

Reported on 10-JAN-1992 at 08:50

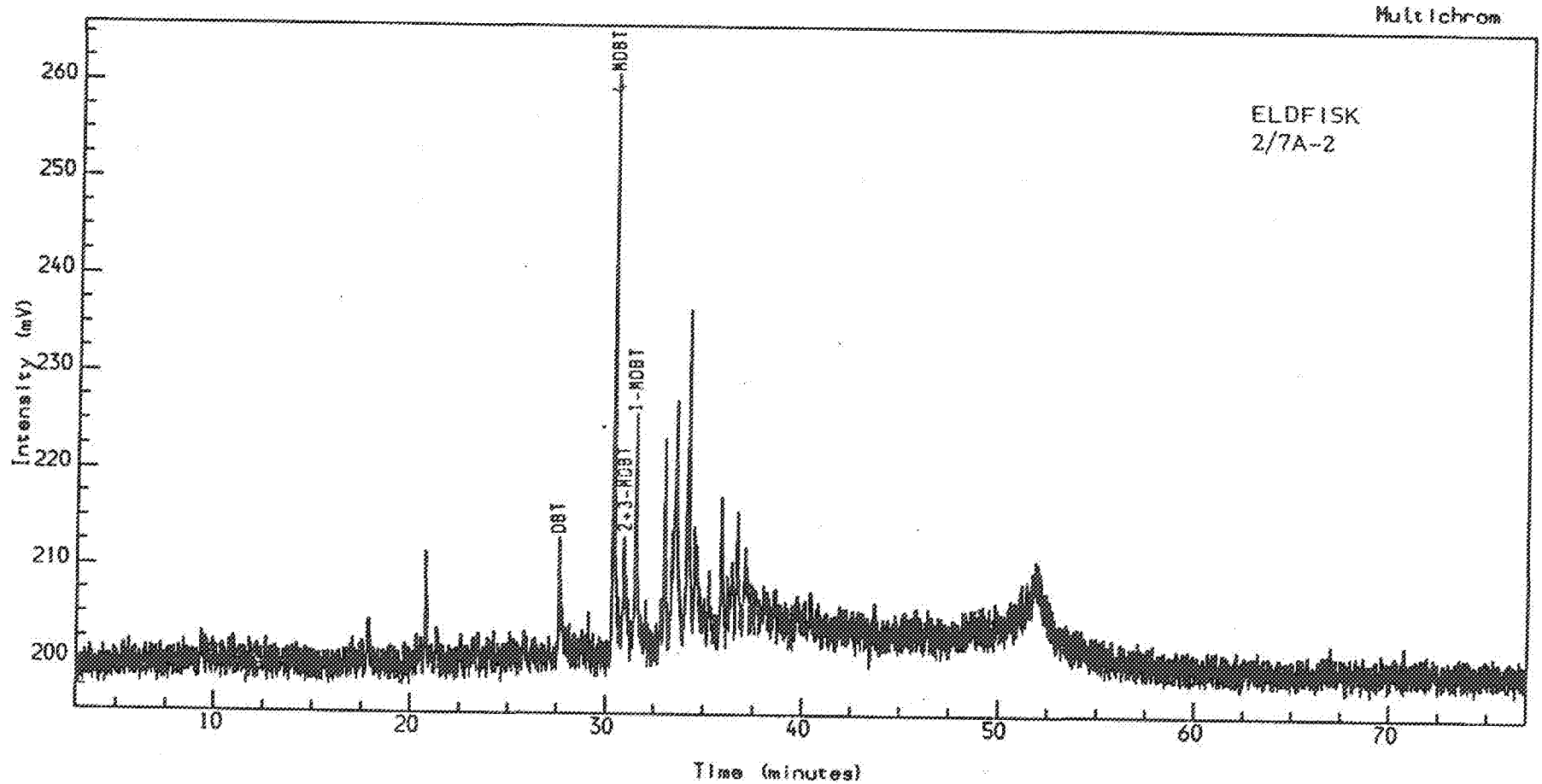
GEOLAB NOR



Analysis Name : [P2304PHIL] 10 AE30427A2,1,1.

2/7 A-2 ARO Amount : 1.000

AROMATIC GC



Instrument : PE 2000

Method : ARO

Channel Title : ARO GC FPD

Calibration : ARO

Lims ID :

Run Sequence : ARO

Acquired on 14-SEP-1990 at 11:31

Reported on 25-SEP-1990 at 15:22

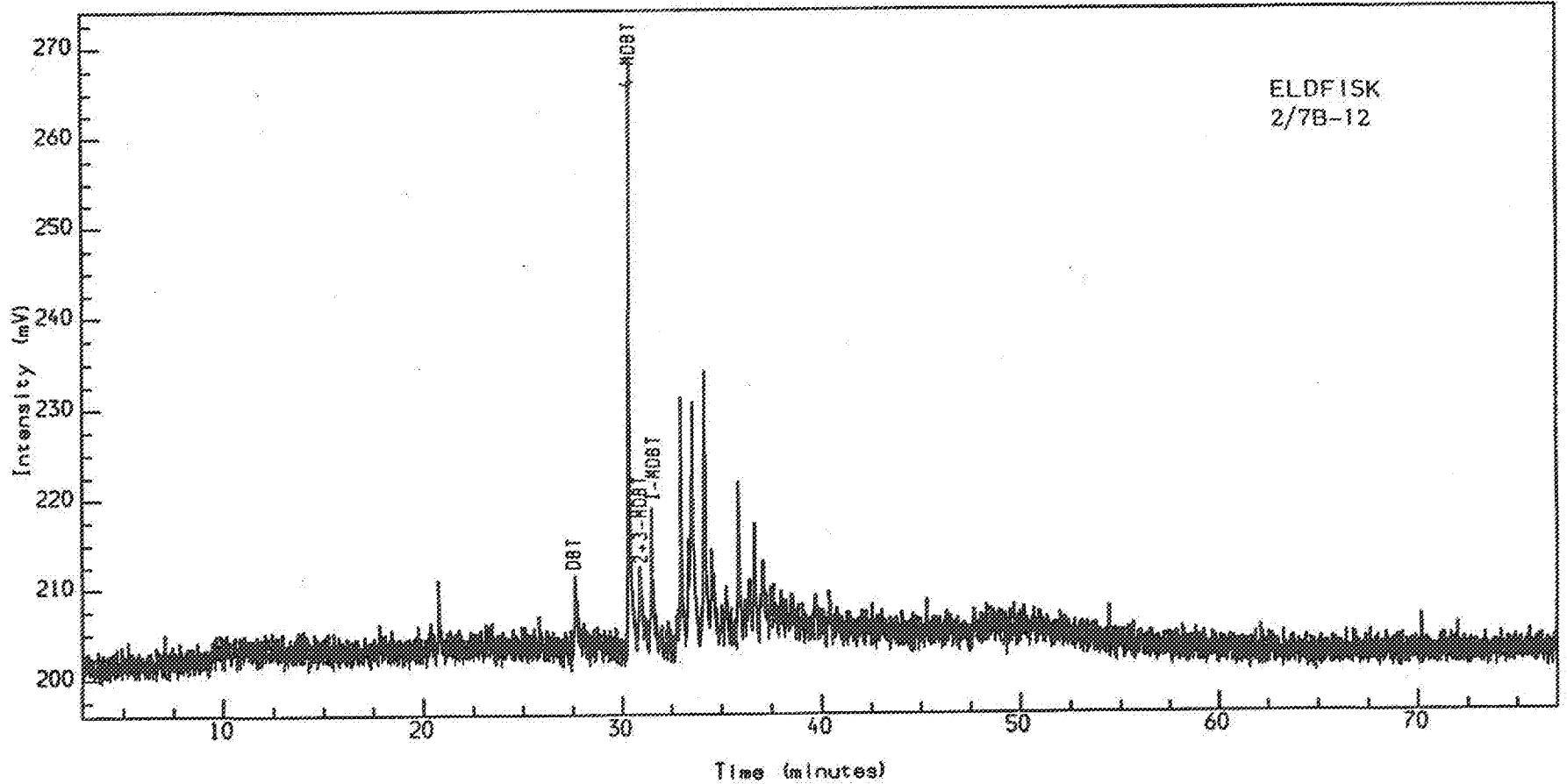


Analysis Name : [P2304PHIL] 10 AE30427B12,1,1.

2/7-B12 ARO Amount : 1.000

AROMATIC GC

Multichrom



Instrument : PE 2000

Channel Title : ARO GC FPD

Lims ID :

Acquired on 14-SEP-1990 at 08:41

Reported on 14-SEP-1990 at 10:17

Method : ARO

Calibration : ARO

Run Sequence : ARO