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Summary/Conclusion//Recommendation

Three source facies have been identified in this well:

- 1) Draupne Fm. with excellent source potential.
- 2) Upper part of Heather Fm. with fair to good source potential.
- 3) The interbedded coals, and organic rich shales in the Tarbert and Ness Fm.

The maturity parameters show that the Jurassic section is in the early stages of oil generation.

The section from 2840 to 2860 m in the Tarbert Fm is invaded by mature, migrated hydrocarbons of a marine origin.

Keywords

Source Rocks, Maturity
Migrated Hydrocarbons

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1. INTRODUCTION.

Well 30/9-8 located in the Oseberg omega area was spudded 29.07.89 and reached T.D at 3200m in siltstones of Toarcian age. The well location is given in Figure 1.1, and the well summary outlining formation tops is given in Figure 1.2.

This report comprises the results from petroleum geochemical analysis of 117 DCs, SWCs and CCs. In addition to samples taken to establish a maturity trend throughout the well, geochemical data have been acquired for the following: Lower Cretaceous, Upper, Middle and Lower Jurassic series.

A list of the samples investigated is given in Table 1.1.

Vitrinite reflectance has been measured by Geo-optics (Newcastle upon Tyne UK) and stable isotopic composition of fractions has been analysed by Geolab Nor (Trondheim, Norway). All other analytical work, the interpretation of data and the compilation of this report was undertaken by Norsk Hydro Research Center, Bergen Norway.

2. SOURCE ROCK EVALUATION.

Source rock horizons have been identified using Rock Eval pyrolysis and total organic carbon (TOC) measurements. Characterization of these horizons have been done using pyrolysis gas chromatography, gas chromatography of saturated and aromatic hydrocarbons, biomarker analysis, stable isotope measurements and visual kerogen analysis.

2.1 Source rock screening data.

The organic richness in the Cretaceous section is generally under 1 % TOC with very low S_2 values, and as a consequence this section has no source rock potential.

The Viking Group have TOC values ranging from 11.4 % TOC to less than 1 %. The highest values are found in the Draupne Fm. and in the top of the Heather Fm. The S_2 values in the Draupne Fm. are higher than 22 kg/t indicating an excellent source potential. The S_2 values in the top of the Heather Fm. (2771-2775m) range from 3 to more than 11 kg/t indicating a fair to good source potential.

The Hydrogen Indices in the Draupne Fm. are higher than 400 mg HC/g TOC while the upper part of the Heather Fm. have values in the range 100 to 250. This suggests that the organic matter in the Draupne Fm. has a better potential for liquid hydrocarbons than the upper part of the Heather Fm. The lower part of the Heather Fm. has no source potential.

The Tarbert Fm. has a very varying source rock potential ranging from no potential to excellent source potential. Interbedded shales and coals have high TOC contents and are excellent source rocks. The Hydrogen Indices of these organic rich samples in the Tarbert Fm. are generally between 300 and 150 mg HC/g TOC suggesting a Type II/III kerogen with predominantly humic material and potential for gas/condensate.

Thin interbedded coals in the Ness Fm. also have a potential for gas/condensate.

2.2 Pyrolysis gas chromatography.

Programmed pyrolysis gas chromatography have been performed on extracted samples with a source rock potential. The pyrolysis gas chromatograms are given in Appendix I.

The sample from 2765 m (Draupne Fm.) shows a well developed homologous series of n-alkanes/alkenes decreasing in intensity with higher carbon number. This is typical of marine source rocks deposited in a reducing environment, and will act as an excellent source for liquid hydrocarbons. The two pyrolysed samples from the Heather Fm. (2771 m and 2775 m) are dominated by aromatic hydrocarbons like toluene and xylenes. This suggests a more humic origin and these source rocks will be a source of gas/condensate.

Most of the samples from the Tarbert Fm. are dominated by aromatic hydrocarbons, but most of the investigated samples also show a series of n-alkanes/alkenes. Some of the samples have a distinctly oil-prone character (2895.35 m) and indicates that this sequence as a whole will have a potential for some liquid hydrocarbons, but is dominantly gas prone.

Some of the coal samples are rich in n-alkanes in the higher molecular weight area. This is a residue after solvent extraction, and shows the difficulty of efficiently solvent extracting coaly material.

Also some of the samples from the Ness Fm. displays an unusually high content of alkanes/alkenes originating from liptinitic organic matter (2923.8 and 2930 m), and indicates some potential for liquid hydrocarbons.

The sample from 3095 m is dominated by alkanes/alkenes and appears to be derived from a marine source rock with potential for liquid hydrocarbons.

2.3 Gas chromatography of saturated hydrocarbons.

The gas chromatograms of the saturated hydrocarbons are given in Appendix II. Molecular ratios are given in Table 2.2.

The gas chromatograms of the saturated hydrocarbons from the Draupne Fm. both show a near unimodal distribution of n-alkanes with a slight odd/even carbon number predominance in the n-C₂₅ to n-C₃₃ region. These are typical of the predominantly marine organic matter found in the Draupne Fm. The Pristane/Phytane ratio is significantly lower in the upper sample, and this may indicate a more reducing depositional environment.

The upper sample in the Heather Fm. is similar to the bottom sample in the Draupne Fm., but with a higher Pristane/n-C₁₇ ratio, which might indicate a higher terrigenous input.

The samples in the interval from 2843.5 m to 2858.5 m appears to be invaded by migrated hydrocarbons of higher thermal maturity, and are characterized by a smooth, unimodal distribution of n-alkanes with a Pristane/Phytane ratio around 1.5, indicating a reducing environment.

Most of the source rock extracts from the Tarbert Fm. show a clear imprint of terrestrially derived higher molecular weight n-alkanes with a pronounced odd/even predominance, and high Pristane/Phytane and Pristane/n-C₁₇ ratios. These are typical features of coals consisting of predominantly terrestrially derived plant material.

The same distributions are evident in the source rock extracts from the Ness Fm.

2.4 Gas chromatography of aromatic hydrocarbons.

The gas chromatograms of the aromatic hydrocarbons are given in Appendix III, and Methyl phenantrene indices (MPI) are given in Table 2.3.

2.5 Biological markers, saturated hydrocarbons.

The fragmentograms of the terpanes (Ion m/z 191) and the steranes (Ion m/z 217) are given in Appendix IV. Biomarker ratios are listed in Table 2.4.

The distribution of steranes and triterpanes in the sample from 2765 m (Draupne) is typical of marginal mature, marine organic matter deposited under reducing conditions. The steranes are dominated by the C_{27} steranes which are believed to originate from marine algae and there is a relatively low Hopane/Sterane ratio, typical of marine deposits.

The samples from 2771 m and 2775 m are dominated by C_{29} steranes, originating mainly from terrestrially derived organic matter, and the Hopane/Sterane ratio is significantly higher. This suggests that the organic matter is predominantly terrestrially derived, most likely deposited under dysaerobic conditions.

The samples from 2832.7 m, 2857.6 m and 2863.45 m contain almost exclusively C_{29} steranes, and contain a high relative concentrations of $\beta\alpha$ hopanes. This sample is even more terrestrially dominated than the samples above.

The samples from 2843.5 m, 2858.5 m and 2872.4 m are invaded by mature, migrated hydrocarbons of a marine origin.

The sample from 2846.8 m resembles the Draupne Fm. and is clearly dominated by marine organic matter. The distribution of extended hopanes suggest a highly reducing depositional environment.

The samples in the interval 2880.8 m to 3095 m, with the exception of the sample from 2905 m which is contaminated by mature, migrated hydrocarbons, are all dominated by terrestrially derived material, giving a predominance of C_{29} steranes and a high Hopane/Sterane ratio. Variations in the Diasterane/Regular Sterane ratio may be attributed to the organic richness.

2.6 Biological markers, aromatic hydrocarbons.

The fragmentograms of the monoaromatic steranes (Ion m/z 253) and the triaromatic steranes (Ion m/z 231) are given in Appendix V.

The results show that all the analysed source rocks are marginal mature with respect to oil generation.

2.7 Stable isotopes measurements.

The $\delta^{13}\text{C}$ values for whole extract, saturated hydrocarbons, aromatic hydrocarbons, NSO-compounds and asphaltenes are listed in Table 2.5. Galimov plots are given in Appendix VI.

The results indicate that the marine organic matter in the Draupne Fm. (2765 m) is isotopically lighter than the terrestrially derived source rocks in the Brent Gr.

2.8 Visual kerogen analysis.

Kerogen compositions are listed in Table 2.6, and are plotted versus depth in Figure 2.4.

Four different characteristic types of composition have been recognized:

1) 2765.0 m SWC

High productivity; aggregates of liptinitic amorphous organic matter dominates the total kerogen; small pyrite framboids abundant in the amorphous organic matter (AOM). Relatively large proportion of pollen, spores and dinocysts embedded in AOM matrix; small (1-5 μm) spindle formed elements common; rare Pterospermella.

This suggests an anoxic, low energy open marine environment.

2) 2771.0 m and 2775.0 m SWC

Moderate productivity with a moderate proportion of fine material (60/40); pyrite rare. Coarse elongated fragments of inertinite dominate the kerogen; some wood, subordinate spores, pollen and dinocysts. This indicates a wave dominated, open marine depositional environment.

3) 2832.70, 2857.60, 2889.90 and 2895.35 m CC

Productivity unknown; small to medium-sized aggregates of variably fluorescing AOM dominates. Pyrite virtually absent. Allochthonous components embedded in AOM matrix with a low proportion in upper two and the lowermost sample (2832.70, 2857.60 and 2895.35 m). Large proportion of spores and pollen in middle two samples (2863.45 and 2889.90 m). Marine components absent, apart from Crassosphaera at 2863.45 m.

These samples originate in a low energy, lagoonal environment.

4) 3001.0 and 3095.0 m

Moderate to low productivity, finely disseminated material dominates, mostly inertinitic. Pyrite is rare. Coarse kerogen (>15 μm) consists of coarse to medium-sized inertinite and plant material (predominantly cuticula, spores and pollen. Low proportion of humic AOM. The origin is low energy swamps (3001.0 m) to fluvial (3095.0 m).

3. THERMAL MATURITY.

Evaluation of the thermal maturity of the section 1100m-T.D. is based upon determinations of vitrinite reflection. In addition to this, biomarker ratios have been used in the Jurassic section.

3.1 Vitrinite reflectance.

The vitrinite reflectance readings for each sample as measured by Geo-optics are given in Appendix VII. The interpreted average values are listed in Table 3.1, and are plotted versus depth in Figure 3.1.

Most of the Tertiary section and some of the samples from the Cretaceous consists of reworked material, and give high vitrinite reflectance readings. The samples from the upper Jurassic organic rich horizons are heavily bitumen stained and give low vitrinite reflectance readings. A line of what is believed to be the "correct" maturity trend is drawn in Figure 3.1. This indicates a R_0 of 0.3% at 1200m in the Tertiary, with a linear trend to a R_0 of 0.7% at T.D in the Lower Jurassic.

The source rocks in the Viking group have a vitrinite reflectance of 0.55%-0.6%, the low measured values (0.45%) for these samples are caused by bitumen staining.

A vitrinite reflectance of 0.6% indicates that this interval is in the early stage of hydrocarbon generation.

The shales and coals in the Tarbert and Ness Formations have vitrinite reflectance values around 0.65%, which indicates that they are in the main phase of hydrocarbon generation. The observed vitrinite reflectance agrees with the measured reservoir temperatures (2836 m, DST2A/2B) of 109.8°C.

3.2 Biomarker ratios.

The fragmentograms of the terpanes (Ion m/z 191) and the steranes (Ion m/z 217) are given in Appendix IV. Biomarker ratios are listed in Table 2.4.

The isomerisation of the $\alpha\alpha\alpha$ C29 steranes (%20S) of the Jurassic samples not invaded by mature migrated hydrocarbons, show values varying from approx. 30% in the upper Jurassic to approx. 40% in the Brent Group. These values correspond very well to the interpreted vitrinite reflectance curve.

4. MIGRATED HYDROCARBONS.

Determination and evaluation of migrated hydrocarbons are based upon several parameters from pyrolysis, extraction and biomarker data.

4.1 Rock Eval pyrolysis.

Pyrolysis data are listed in Table 2.1 and Production indices are plotted versus depth together with extraction data in Figure 4.1.

High S_1 values together with high production indices are indications of migrated hydrocarbons. In this well the interval from 2840m to 2860m in the Tarbert Fm. consists of sandstones with high amounts of migrated hydrocarbons. The S_1 values are up to 3.7 kg/t with Production Indices around 0.8, clearly showing the presence of migrated hydrocarbons.

4.2 Extraction and group type separation data.

The extraction yields and other extraction data are given in Tables 4.1 and 4.2. PI, extractable organic matter (EOM) and EOM/TOC are plotted versus depth in Figure 4.1.

The EOM/TOC values show that the samples 2843.5m, 2846.8m, 2858.5m have considerable amounts of extractable organic matter relative to their total organic content. This suggests that the EOM in these samples are migrated hydrocarbons. This might also be true for the samples at 2872.4m and 2905.0m.

4.3 Biological markers, saturated hydrocarbons.

The fragmentograms of the terpanes (Ion m/z 191) and the steranes (Ion m/z 217) are given in Appendix IV. Biomarker ratios are listed in Table 2.4.

The samples from 2843.5 m, 2846.8 m, 2858.5 m and 2872.4 m are invaded by mature, migrated hydrocarbons of a marine origin.

The sample at 2905.0 m also show presence of mature, migrated hydrocarbons of marine origin, and has a biomarker distribution similar to the produced oil from this well and the oils from wells 30/9-7, 30/9-3 & 3A. (A. Steen, Correlation study of 30/9-8. R-040093.)

5 SUMMARY.

Three source facies have been identified in this well:

- 1) Draupne Fm. with excellent source potential, deposited in a marine, reducing environment and have a potential for oil.

- 2) Upper part of Heather Fm. with fair to good source potential. The organic matter is strongly influenced by terrestrially derived material, and is deposited in a dysaerobic environment. This sequence have a potential for gas and condensate.

- 3) The interbedded coals, and organic rich shales in the Tarbert and Ness Fm. These are dominated by terrestrially derived organic matter and have a potential mainly for gas. The Tarbert Fm. is probably deposited in a lagoonal environment.

The maturity parameters show that the jurassic section is in the early stages of oil generation, and this is supported by the measured reservoir temperatures of 109.8°C and 112.9°C.

The section from 2840 to 2860 m in the Tarbert Fm is invaded by mature, migrated hydrocarbons of a marine origin, and have a biomarker distribution similar to the produced oil from this well and the oils from wells 30/9-7, 30/9-3 & 3A.

Table 1.1 List of samples analysed.

DEPTH, m	Rock-Eval	TOC	PyGC	Extr.	GCMSD-Sat	GCMSD-Aro	Isotope	Vitrinite reflectance	Visual Kerogen
113 3112.00	*	*							
114 3137.00	*	*						*	
115 3140.00	*	*							
116 3146.00	*	*							
117 3196.00	*	*							

Table 2.1 Source rock screening data.

Table 2.1 SOURCE ROCK SCREENING DATA WELL 30/9-8

Petroleum Geochemistry Group
Research Center Bergen



Depth (m)	Group/Fm	% Lithology	Sample	S1 Kg/t	S2 Kg/t	S3 Kg/t	TOC %	HI	OI	PI	Tmax Deg.c	Company
2659.00	SHETLAND GR		DC	0.0	0.3	0.4	0.6	43	60	0.07	433	F-BG
2665.00	SHETLAND GR		DC	0.0	0.5	0.6	0.8	70	82	0.07	434	F-BG
2675.00	SHETLAND GR		DC	0.1	0.4	0.6	0.6	60	102	0.18	434	F-BG
2690.00	SHETLAND GR		DC		0.1	0.3	0.3	22	97		380	F-BG
2701.00	SHETLAND GR		DC	0.0	0.1	0.1	0.0	300	450	0.14	304	F-BG
2708.00	SHETLAND GR		DC		0.0	0.5	0.0	50	2600			F-BG
2714.00	SHETLAND GR		DC	0.0	0.0	0.5	0.0	50	2450	0.50		F-BG
2720.00	SHETLAND GR		DC	0.2	0.1	1.0	0.1	100	927	0.65	359	F-BG
2722.00	SHETLAND GR		DC		0.1	0.9	0.1	67	967		419	F-BG
2724.00	SHETLAND GR		DC		0.0	0.8	0.0	75	1925		440	F-BG
2728.00	SHETLAND GR		DC		0.0	0.8	0.0	300	8000		305	F-BG
2740.00	SHETLAND GR		DC		0.0	0.9	0.2	17	391		356	F-BG
2745.00	SHETLAND GR		DC	0.0	0.1	1.2	0.3	31	450	0.11	387	F-BG
2754.00	SHETLAND GR		DC		0.1	0.2	0.0	700	1600		415	F-BG
2758.00	SHETLAND GR		DC		0.0	0.9	0.1	40	1880			F-BG
2761.00	SHETLAND GR		DC	0.0	0.0	1.4	0.1	33	1133	0.20		F-BG
2762.00	SHETLAND GR		DC		0.0	0.8	0.1	20	1660			F-BG
2764.00	VIKING GROU		DC	0.0	0.1	0.5	0.1	86	329	0.08	432	F-BG

Table 2.1 SOURCE ROCK SCREENING DATA WELL 30/9-8 (cont'd)



Depth (m)	Group/Fm	% Lithology	Sample	S1 Kg/t	S2 Kg/t	S3 Kg/t	TOC %	HI	OI	PI	Tmax Deg. c	Company
2765.00	VIKING GROU		DC	1.3	23.5	0.7	5.4	438	13	0.05	430	F-BG
2767.00	VIKING GROU		DC	1.5	22.1	0.5	5.5	403	9	0.06	426	F-BG
2769.00	VIKING GROU		DC	0.4	2.9	1.0	1.4	213	77	0.12	427	F-BG
2771.00	VIKING GROU		DC	0.7	3.5	0.2	4.0	89	5	0.16	428	F-BG
2773.00	VIKING GROU		DC	2.1	11.5	0.4	11.4	101	3	0.15	429	F-BG
2775.00	VIKING GROU		DC	1.8	9.1	0.4	11.4	80	3	0.17	430	F-BG
2780.00	VIKING GROU		DC	0.2	3.0	0.0	1.4	218	0	0.05	433	F-BG
2786.00	VIKING GROU		DC	0.1	1.0	1.4	0.8	115	162	0.13	434	F-BG
2791.00	VIKING GROU		DC		0.1	0.2	0.0	200	600		477	F-BG
2795.00	VIKING GROU		DC	0.0	0.4	0.3	0.1	279	179	0.03	478	F-BG
2798.00	VIKING GROU		DC	0.6	1.0	2.4	0.9	109	264	0.36	432	F-BG
2803.35	VIKING GROU		DC	0.1	0.6	0.0	0.7	98	5	0.17	427	F-BG
2807.40	VIKING GROU		DC	0.1	0.2		0.4	59		0.19	432	F-BG
2812.60	VIKING GROU		DC	0.1	0.2		0.4	61		0.21	437	F-BG
2816.55	VIKING GROU		DC	0.1	0.3		0.5	62		0.20	436	F-BG
2819.65	VIKING GROU		DC	0.2	0.8	0.1	1.5	55	7	0.23	439	F-BG
2821.75	VIKING GROU		DC	0.3	1.1	0.0	2.1	50	1	0.22	440	F-BG
2828.20	TARBERT FM.		DC	0.0	0.1		0.2	59		0.17	445	F-BG
2832.70	TARBERT FM.		DC	1.1	5.2	0.1	5.4	97	2	0.17	427	F-BG

Table 2.1 SOURCE ROCK SCREENING DATA WELL 30/9-8 (cont'd)



Depth (m)	Group/Fm	% Lithology	Sample	S1 Kg/t	S2 Kg/t	S3 Kg/t	TOC %	HI	OI	PI	Tmax Deg. c	Company
2838.10	TARBERT FM.		DC	0.1	0.2	0.4	0.3	82	154	0.18	482	F-BG
2841.65	TARBERT FM.		DC	0.7	1.8	0.5	3.1	58	15	0.27	438	F-BG
2843.50	TARBERT FM.		DC	2.7	0.7	0.3	0.5	146	65	0.80	418	F-BG
2844.50	TARBERT FM.		DC	2.7	0.6	0.3	0.5	132	70	0.81	413	F-BG
2846.80	TARBERT FM.		DC	2.9	1.0	0.3	0.4	239	59	0.73	418	F-BG
2849.20	TARBERT FM.		DC	0.3	0.1	0.3	0.1	36	250	0.85	412	F-BG
2850.80	TARBERT FM.		DC	0.1	0.1		0.1	89		0.53	426	F-BG
2853.50	TARBERT FM.		DC	3.7	1.3	0.2	0.6	227	30	0.74	414	F-BG
2857.00	TARBERT FM.		DC	3.9	0.9	0.3	0.5	173	69	0.81	400	F-BG
2857.60	TARBERT FM.		DC	1.4	9.5	0.1	5.0	189	1	0.13	419	F-BG
2858.50	TARBERT FM.		DC	3.2	0.9	0.2	0.7	123	32	0.79	400	F-BG
2860.50	TARBERT FM.		DC	0.1	1.1	0.1	0.3	365	16	0.10	456	F-BG
2863.45	TARBERT FM.		DC	1.6	15.5	0.2	7.3	213	3	0.09	425	F-BG
2869.50	TARBERT FM.		DC	0.0	0.5	0.1	0.1	540	70	0.04	487	F-BG
2872.40	TARBERT FM.		DC	0.3	0.7		1.0	64		0.34	439	F-BG
2875.00	TARBERT FM.		DC	0.6	4.9	0.1	2.7	182	2	0.12	424	F-BG
2877.00	TARBERT FM.		DC	0.1	0.3	0.1	0.3	76	42	0.17	476	F-BG
2880.10	TARBERT FM.		DC	1.2	17.3	0.1	7.6	228	1	0.07	426	F-BG
2880.80	TARBERT FM.		DC	2.3	30.8		13.5	229		0.07	428	F-BG

Table 2.1 SOURCE ROCK SCREENING DATA WELL 30/9-8 (cont'd)



Depth (m)	Group/Fm	% Lithology	Sample	S1 Kg/t	S2 Kg/t	S3 Kg/t	TOC %	HI	OI	PI	Tmax Deg.c	Company
2881.50	TARBERT FM.		DC	16.5	170.0		80.9	210		0.09	430	F-BG
2883.60	TARBERT FM.		DC	0.1	0.5	0.1	0.6	92	12	0.08	443	F-BG
2889.90	TARBERT FM.		DC	1.8	31.4	0.3	13.8	227	2	0.05	422	F-BG
2891.00	TARBERT FM.		DC	12.0	183.0		80.9	226		0.06	431	F-BG
2893.50	TARBERT FM.		DC	9.2	148.0		77.6	191		0.06	430	F-BG
2893.95	TARBERT FM.		DC	0.1	0.6		1.4	43		0.10	440	F-BG
2895.35	TARBERT FM.		DC	0.9	28.0	0.3	9.2	304	3	0.03	431	F-BG
2895.70	TARBERT FM.		DC	11.5	170.0		80.5	211		0.06	432	F-BG
2898.70	TARBERT FM.		DC	0.8	16.0	0.2	6.1	260	4	0.05	420	F-BG
2901.20	TARBERT FM.		DC	13.5	194.0		70.5	275		0.07	434	F-BG
2901.75	TARBERT FM.		DC	0.1	0.4	0.5	0.7	52	72	0.12	438	F-BG
2903.00	TARBERT FM.		DC	0.1	0.6		0.9	64		0.15	438	F-BG
2905.00	TARBERT FM.		DC	0.1	0.2		0.3	66		0.21	437	F-BG
2908.00	TARBERT FM.		DC	0.4	4.7		2.8	165		0.08	422	F-BG
2910.80	TARBERT FM.		DC	0.2	2.1		2.2	98		0.08	431	F-BG
2913.80	TARBERT FM.		DC	0.1	0.6		1.0	56		0.11	435	F-BG
2916.90	TARBERT FM.		DC	0.4	7.3		5.6	130		0.06	423	F-BG
2919.35	TARBERT FM.		DC	1.1	26.8		12.5	215		0.04	427	F-BG
2919.60	TARBERT FM.		DC	13.5	200.0		83.4	240		0.06	432	F-BG

Table 2.1 SOURCE ROCK SCREENING DATA WELL 30/9-8 (cont'd)



Depth (m)	Group/Fm	% Lithology	Sample	S1 Kg/t	S2 Kg/t	S3 Kg/t	TOC %	HI	OI	PI	Tmax Deg. c	Company
2921.45	NESS FM.		DC	0.1	4.2		1.7	242		0.03	432	F-BG
2923.50	NESS FM.		DC	0.1	1.4		1.1	125		0.03	434	F-BG
2923.80	NESS FM.		DC	0.7	16.2		8.6	187		0.04	429	F-BG
2925.80	NESS FM.		DC	0.1	2.7		1.7	156		0.04	431	F-BG
2928.50	NESS FM.		DC	0.3	7.5		3.5	216		0.04	431	F-BG
2930.30	NESS FM.		DC	8.0	135.0		77.5	174		0.06	439	F-BG
2930.90	NESS FM.		DC	0.1	1.4		1.8	79		0.05	440	F-BG
2933.10	NESS FM.		DC	0.0	0.3		0.5	72		0.03	433	F-BG
2933.70	NESS FM.		DC	0.1	4.3		1.4	312		0.02	432	F-BG
2937.00	NESS FM.		DC	0.1	0.3	13.3	0.3	85	4042	0.15	446	F-BG
2943.00	NESS FM.		DC	0.1	0.6	0.3	0.4	125	64	0.13	443	F-BG
2947.00	NESS FM.		DC	0.1	0.5	0.3	0.1	386	179	0.08	392	F-BG
2964.00	NESS FM.		DC	0.0	0.1	0.7	0.1	150	1167	0.10	443	F-BG
2970.00	NESS FM.		DC		0.3	0.1	0.1	179	43		561	F-BG
2979.00	NESS FM.		DC		0.3	0.9	0.1	238	662		465	F-BG
3001.00	NESS FM.		DC	1.2	31.0	0.4	9.1	342	4	0.04	431	F-BG
3011.00	NESS FM.		DC	0.1	1.0	0.3	0.8	123	35	0.05	446	F-BG
3025.00	NESS FM.		DC	0.0	0.6	2.0	0.5	112	406	0.04	446	F-BG
3035.00	NESS FM.		DC	0.1	0.7	0.1	0.2	300	33	0.15	445	F-BG

Table 2.1 SOURCE ROCK SCREENING DATA WELL 30/9-8 (cont'd)



Depth (m)	Group/Fm	% Lithology	Sample	S1 Kg/t	S2 Kg/t	S3 Kg/t	TOC %	HI	OI	PI	Tmax Deg.c	Company
3075.00	NESS FM.		DC	0.1	1.1	2.0	0.6	185	340	0.08	442	F-BG
3095.00	NESS FM.		DC	0.3	8.5	0.0	3.5	239	1	0.04	442	F-BG
3112.00	NESS FM.		DC	0.1	0.9	0.4	0.8	118	46	0.10	449	F-BG
3137.00	BRENT GROUP		DC	0.5	3.9	1.1	2.5	158	44	0.11	442	F-BG
3140.00	BRENT GROUP		DC	2.8	5.6	3.9	2.4	231	163	0.34	399	F-BG
3146.00	BRENT GROUP		DC	0.3	2.1	1.3	1.5	142	88	0.11	442	F-BG
3196.00	BRENT GROUP		DC	0.2	2.1	1.2	1.5	140	81	0.09	447	F-BG

Table 2.2 Molecular ratios.

Table 2.2 SATURATED FRAC., MOLECULAR RATIOS WELL 30/9-8



Depth	Group/Fm	Pr/n-C17	Pr/Ph	CPI-I	CPI-II	n-C15+/Total	n-C20/n-C25
2765.00	VIKING GROUP	1.29	1.30	1.21	1.15		
2771.00	VIKING GROUP	1.23	3.18	1.38	1.22		
2775.00	VIKING GROUP	1.83	3.67	1.43	1.10		
2832.70	TARBERT FM.	3.92	6.24	1.45	1.29		
2843.50	TARBERT FM.	0.74	1.80	0.93	0.97		
2846.80	TARBERT FM.	1.34	1.28	1.20	1.17		
2857.60	TARBERT FM.	1.32	3.01	1.16	1.20		
2858.50	TARBERT FM.	0.75	1.68	0.98	0.99		
2863.45	TARBERT FM.	6.98	7.87	1.57	1.39		
2872.40	TARBERT FM.	1.15	2.08	1.00	1.19		
2880.80	TARBERT FM.	6.50	6.61	1.59	1.37		
2889.90	TARBERT FM.	8.23	7.58	1.74	1.49		
2895.35	TARBERT FM.	21.18	10.33	1.56	1.43		
2901.20	TARBERT FM.	73.63	9.49	1.42	0.91		
2905.00	TARBERT FM.	3.92	6.24	1.45	1.29		
2919.60	TARBERT FM.	5.79	6.45	1.56	1.09		
2923.80	NESS FM.	2.14	3.97	1.60	1.33		
2930.30	NESS FM.	9.09	8.85	1.58	1.04		

Table 2.2 SATURATED FRAC., MOLECULAR RATIOS WELL 30/9-8 (cont'd)



Depth	Group/Fm	Pr/n-C17	Pr/Ph	CPI-I	CPI-II	n-C15+/Total	n-C20/n-C25
3001.00	NESS FM.	2.05	6.28	1.54	1.49		
3095.00	NESS FM.	1.06	4.78	1.63	1.75		

Table 2.3 MPI indecies.

DEPTH	MPI-1	MPI-2
m		
2765.00	0.68	0.73
2771.00	0.65	0.58
2775.00	0.49	0.47
2832.70	0.64	0.66
2843.50	0.68	0.74
2846.80	0.66	0.72
2857.60	0.59	0.65
2858.50	0.64	0.61
2863.45	0.53	0.57
2872.40	0.52	0.58
2880.80	0.46	0.51
2889.90	0.52	0.59
2895.35	0.52	0.59
2901.20	0.52	0.57
2905.00	0.58	0.64
2919.60	0.55	0.61
2923.80	0.59	0.65
2930.30	0.57	0.63
3001.00	0.54	0.64
3095.00	0.57	0.60



RESEARCH CENTER IN BERGEN

Table 2.4 Biomarker ratios.

DEPTH m	Ts/Tm	%29aaa20S	%29abb
2765.00	0.55	30	26
2771.00	0.11	31	34
2775.00	0.14	28	28
2832.70	0.07	37	45
2843.50	1.05	48	57
2846.80	0.56	30	28
2857.60	0.02	37	37
2858.50	1.13	48	59
2863.45	0.03	35	31
2872.40	0.29	43	53
2880.80	0.03	38	29
2889.90	0.03	43	36
2895.35	0.04	42	35
2901.20	0.02	43	27
2905.00	0.32	41	52
2919.60	0.05	42	31
2923.80	3.00	40	22
2930.30	0.03	37	20
3001.00	0.04	37	34
3095.00	0.06	38	31


 The logo for HYDRO features a stylized graphic of three curved lines on the left, resembling a wave or a propeller, followed by the word "HYDRO" in a bold, sans-serif font.

RESEARCH CENTER IN DURGEN

Table 2.5 Stable isotopes.

DEPTH M	d13C SAT	d13C ARO	d13C NSO	d13C ASPH	d13C EOM
2765.00	-30.75	-28.03	-29.58	-29.82	-31.60
3001.00	-26.70	-25.92	-25.68	-25.06	-25.88
2901.20	-27.06	-25.51	-26.34	-25.93	-25.64
2895.35	-26.69	-25.07	-25.75	-25.69	-25.15
2775.00	-26.73	-24.06	-25.44	-24.44	-25.11
2857.60	-26.25	-24.49	-25.57	-24.69	-24.93
2832.70	-25.97	-24.39	-25.17	-24.51	-24.89
2863.45	-25.68	-24.32	-25.77	-24.53	-24.58



RESEARCH CENTER IN MURKIN

Table 2.6 Visual kerogen composition.

	C/F	Inert	Woody	Lipt	AOM	Remarks
2765	10/90			35% <25 P+S, 10 Cy>	65% (5%)	tr. PTEROSPERMELLA
2771	60/40	80%	10%	10% <5 P+S, 5 Cy>		coarse
2775	60/40	80%	10%	10% <5 P+S, 5 Cy>		coarse
2832.7	20/80	20%	(5%)	10% <10 P+S>	65%	
2857.6	20/80	10%	10%	15% <5 Cu, 5 P+S>	65%	
2863.45	10/90	10%	10%	35% <5 Cu, 30 P+S>	45%	tr. CRASSOSPHAERA
2889.9	10/90	(5%)		30% <30 P+S>	65%	
2895.35	10/90	10%	5%	10% <5 Cu, 5 P+S>	75%	tr. BOTRYOCOCCUS
3001.0	50/50	20%	10%	60% <40 Cu, 20 P+S>	10%	humic AOM
3095.0	30/70	(5%)	(5%)	80% <20 Cu, 60 P+S>	10%	tr. MACROSPORE humic AOM

Explanation:

C/F: ratio coarse (>15u) vs. finely disseminated.
(5): traces of kerogen component.
< >: composition of liptinitic components.
AOM 80% (5%): kerogen components not embedded in AOM matrix.



RESEARCH CENTER IN BERGEN

Table 3.1 Vitrinite reflectance.

Table 3.1 VITRINITE REFLECTANCE DATA WELL 30/9-8
Average values



Depth	Group/Fm	Population I	Population II	Population III	SCI
1100.00		0.30 (21)			
1200.00	HORDALAND GR	0.37 (21)			
1300.00	HORDALAND GR	0.37 (12)			
1400.00	HORDALAND GR	0.38 (21)			
1500.00	HORDALAND GR	0.40 (10)			
1600.00	HORDALAND GR	0.41 (6)			
1700.00	HORDALAND GR	0.51 (3)			
1800.00	HORDALAND GR	0.41 (4)			
1900.00	HORDALAND GR	0.58 (3)			
2000.00	HORDALAND GR	0.50 (6)			
2100.00	BALDER FM.	0.53 (4)			
2200.00	SELE FM.	0.43 (8)			
2300.00	LISTA FM.	0.49 (1)	0.81 (1)		
2390.00		0.50 (4)			
2500.00	SHETLAND GRO	0.65 (1)			
2600.00	SHETLAND GRO	0.60 (2)			
2659.00	SHETLAND GRO	0.56 (1)			
2765.00	VIKING GROUP	0.44 (7)			

Table 3.1 VITRINITE REFLECTANCE DATA WELL 30/9-8 (cont'd)
Average values



Depth	Group/Fm	Population I	Population II	Population III	SCI
2780.00	VIKING GROUP	0.46 (20)			
2881.50	TARBERT FM.	0.63 (20)			
2893.50	TARBERT FM.	0.61 (20)			
2919.60	TARBERT FM.	0.66 (20)			
2930.30	NESS FM.	0.66 (20)			
3011.00	NESS FM.	0.63 (20)			
3095.00	NESS FM.	0.69 (20)			
3137.00	BRENT GROUP	0.62 (20)			

Table 4.1 Extraction data I.

Table 4.1 SOURCE ROCK EXTRACTION DATA I WELL 30/9-8

Depth(m)	Group/Fm	EOM(mg)	EOM(%)	Hydrocarbons			Non Hydrocarbons		
				SAT(%)	ARO(%)	TOTAL(%)	NSO(%)	ASPH(%)	TOTAL(%)
2765.00	VIKING GROUP	38.10	0.50				27		27
2771.00	VIKING GROUP	16.50	0.14				51		51
2775.00	VIKING GROUP	19.00	0.21				63		63
2832.70	TARBERT FM.	44.30	0.50				62		62
2843.50	TARBERT FM.	115.60	0.58				9		9
2846.80	TARBERT FM.	123.60	0.62						
2857.60	TARBERT FM.	43.60	0.43						
2858.50	TARBERT FM.	126.00	0.62				19		19
2863.45	TARBERT FM.	47.10	0.67				69		69
2872.40	TARBERT FM.	26.20	0.15				87		87
2880.80	TARBERT FM.	49.10	0.95				73		73
2889.90	TARBERT FM.	59.60	1.19				89		89
2895.35	TARBERT FM.	39.20	0.51				82		82
2901.20	TARBERT FM.	65.80	6.65				83		83
2905.00	TARBERT FM.	13.80	0.06				88		88
2919.60	TARBERT FM.	66.00	0.73				73		73
2923.80	NESS FM.	10.30	0.20				72		72
2930.30	NESS FM.	30.70	3.07				77		77

Table 4.1 SOURCE ROCK EXTRACTION DATA I WELL 30/9-8 (cont'd)



Depth(m)	Group/Fm	EOM(mg)	EOM(%)	Hydrocarbons			Non Hydrocarbons		
				SAT(%)	ARO(%)	TOTAL(%)	NSO(%)	ASPH(%)	TOTAL(%)
3001.00	NESS FM.	51.30	0.68				54		54
3095.00	NESS FM.	13.00	0.87				61		61

Table 4.2 Extraction data II.

Table 4.2 SOURCE ROCK EXTRACTION DATA II WELL 30/9-8



Depth(m)	Group/Fm	TOC (%)	EOM(%) / TOC(%)	SAT(%) / TOC(%)	SAT(%) / ARO(%)	HC/non HC
2765.00	VIKING GROUP	5.37	0.09			
2771.00	VIKING GROUP	3.97	0.04			
2775.00	VIKING GROUP	11.43	0.02			
2832.70	TARBERT FM.	5.43	0.09			
2843.50	TARBERT FM.	0.46	1.26			
2846.80	TARBERT FM.	0.44	1.41			
2857.60	TARBERT FM.	5.00	0.09			
2858.50	TARBERT FM.	0.69	0.90			
2863.45	TARBERT FM.	7.31	0.09			
2872.40	TARBERT FM.	1.04	0.14			
2880.80	TARBERT FM.	13.46	0.07			
2889.90	TARBERT FM.	13.82	0.09			
2895.35	TARBERT FM.	9.21	0.06			
2901.20	TARBERT FM.	70.50	0.09			
2905.00	TARBERT FM.	0.29	0.21			
2919.60	TARBERT FM.	83.40	0.01			
2923.80	NESS FM.	8.65	0.02			
2930.30	NESS FM.	77.50	0.04			

Table 4.2 SOURCE ROCK EXTRACTION DATA II WELL 30/9-8 (cont'd)



Depth(m)	Group/Fm	TOC (%)	EOM(%) / TOC(%)	SAT(%) / TOC(%)	SAT(%) / ARO(%)	HC/non HC
3001.00	NESS FM.	9.05	0.08			
3095.00	NESS FM.	3.55	0.25			

Figure 1.1 Well location map.

PROSPECT OVERVIEW, BLOCK 30/9

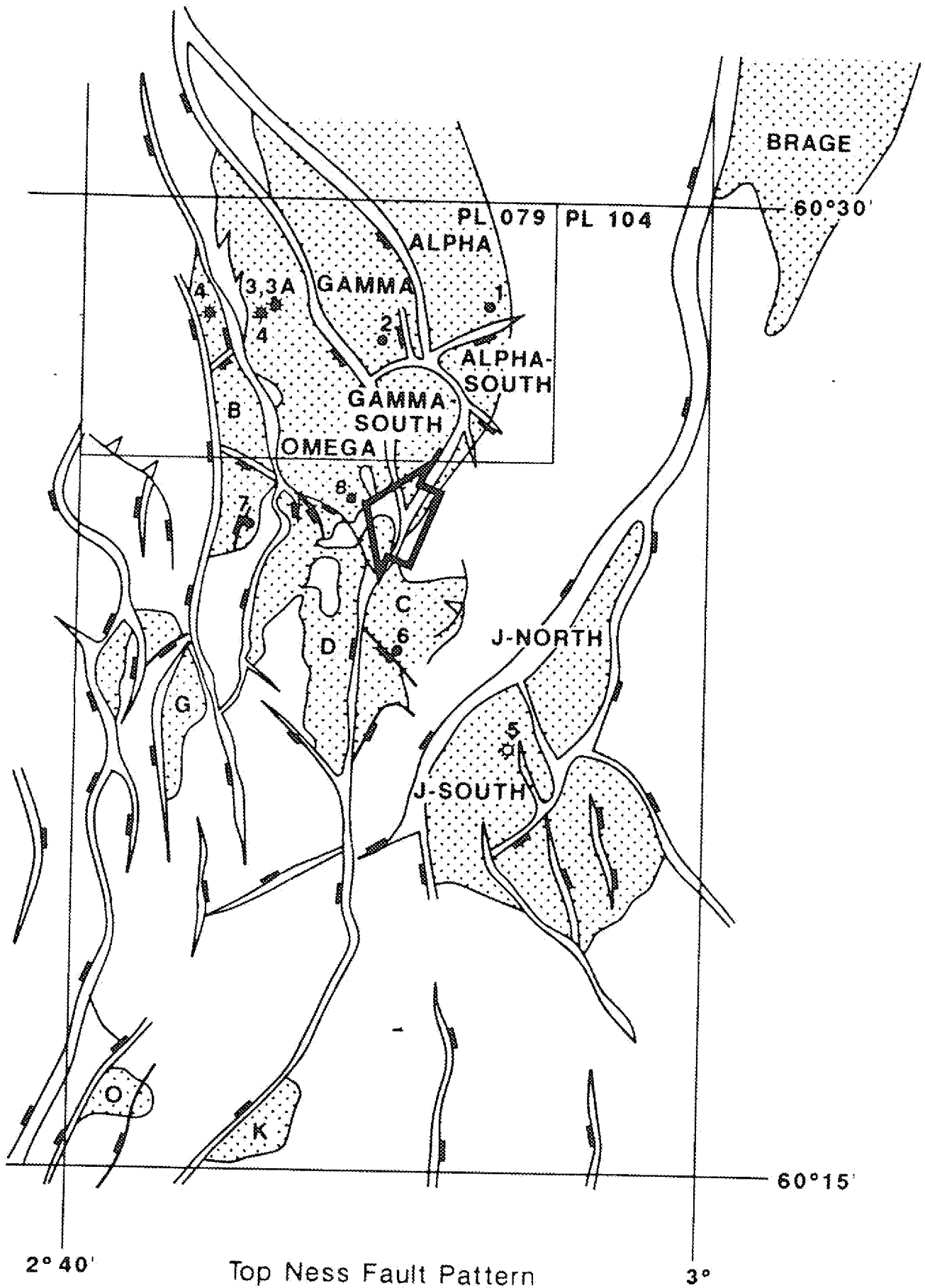


Fig. 2.1

Figure 1.2 Well summary outlining
formation tops.

WELL: 30/9-8

(m)	SYSTEM	GROUP	FORMATION		
1000	TERTIARY	HORDALAND			
1200					
1400					
1600					
1800					
2000					
2065					
2137				BALDER	
2200			ROGALAND	2252	SELE
2372				2372	LISTA
2382					
2400	CRETACEOUS	SHETLAND			
2725					
2763			2763	CROMER KNOLL	
2800			2824.5	VIKING	DRAUPNE & HEATHER
2921	JURASSIC	BRENT	2921	TARBERT	
3120				NESS	
3149				3149	OBE
3200			T.D. 3200m		DRAKE

Figure 2.1 TOC, S₂ and HI versus depth.

Well: 30/9-8

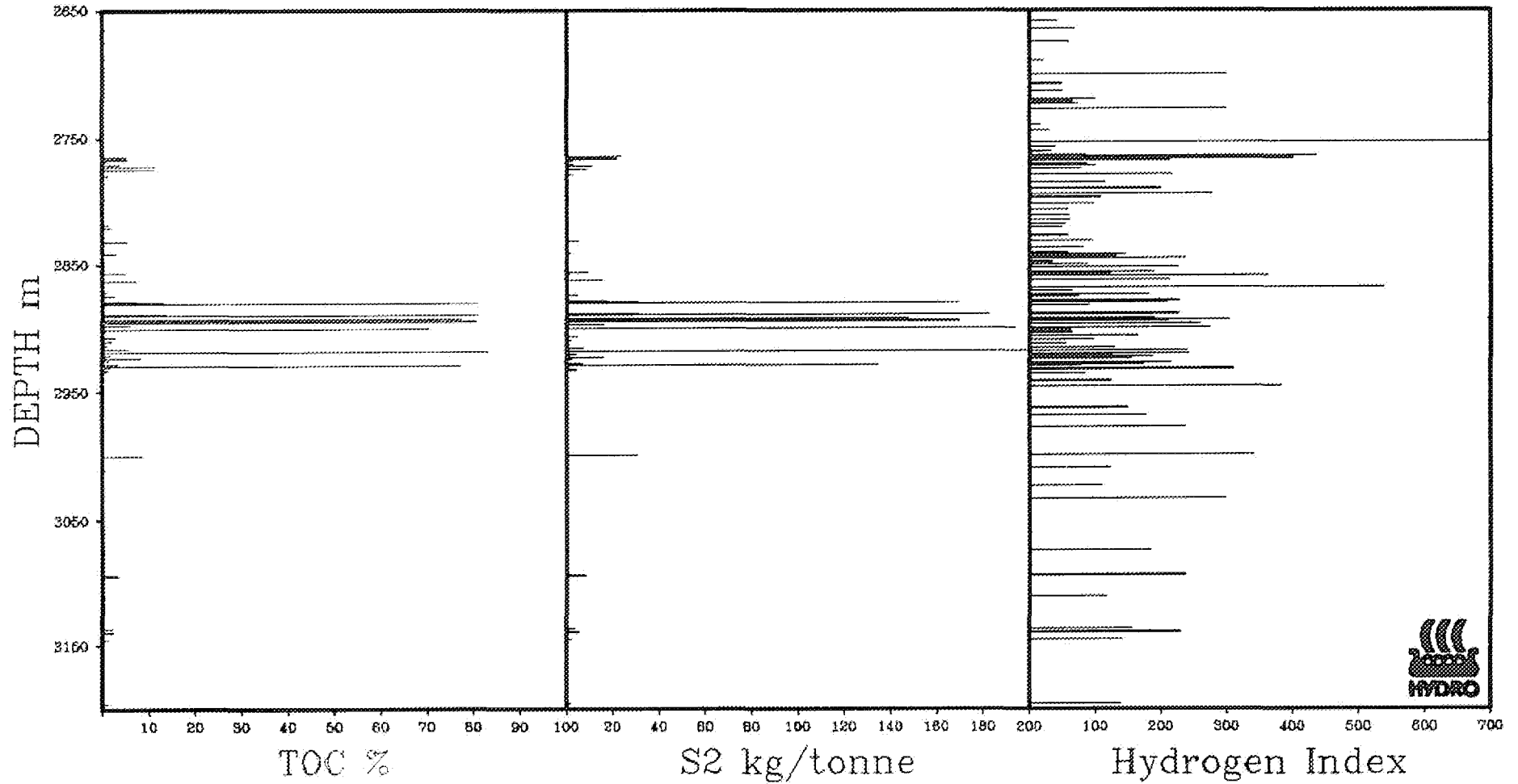


Figure 2.2 Hydrogen Index versus T_{\max} .

Figure 3.1 Vitrinite Reflectance versus
depth.

Well: 30/9-8

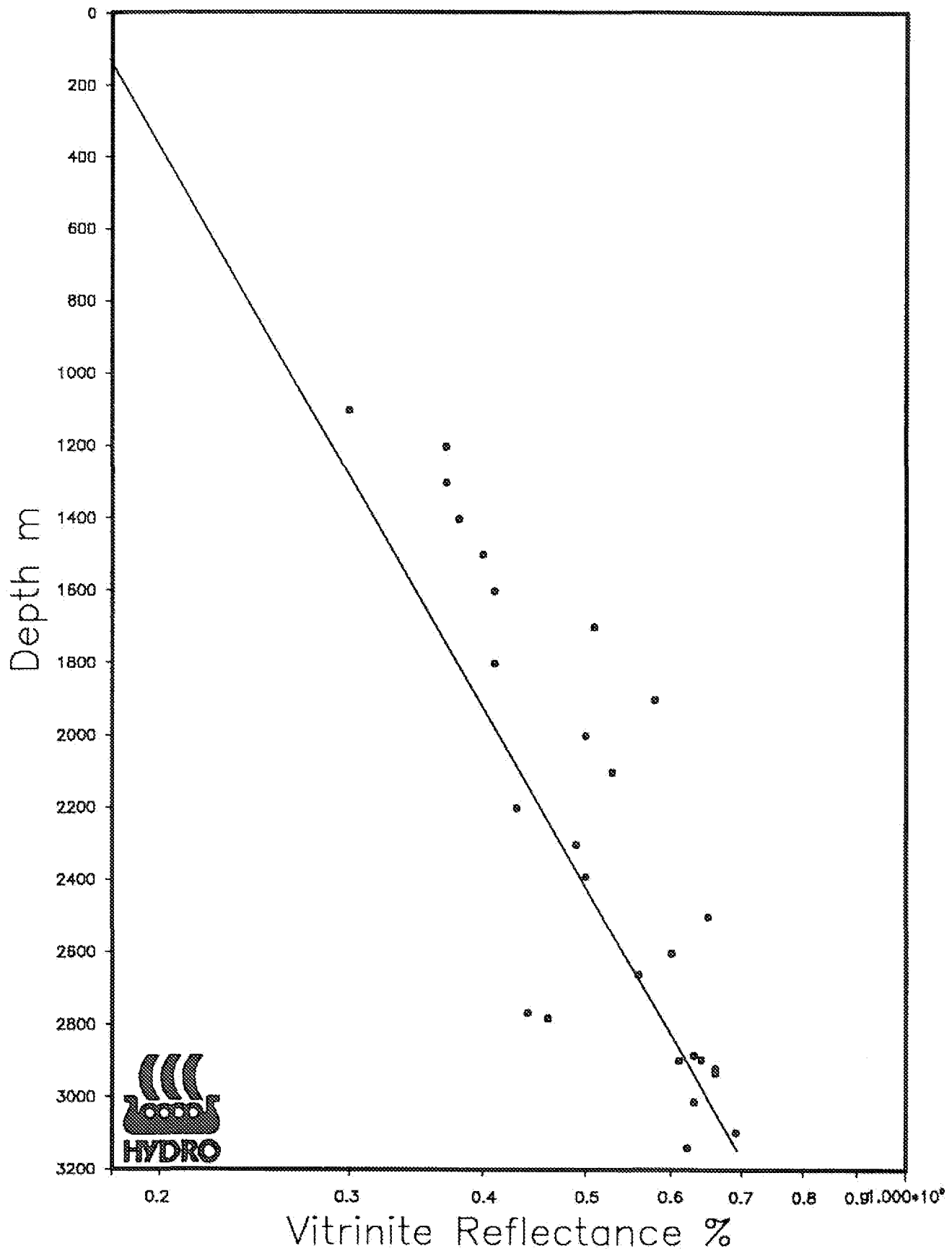


Figure 4.1 PI, EOM ppm and EOM/TOC versus depth.

Well: 30/9-8

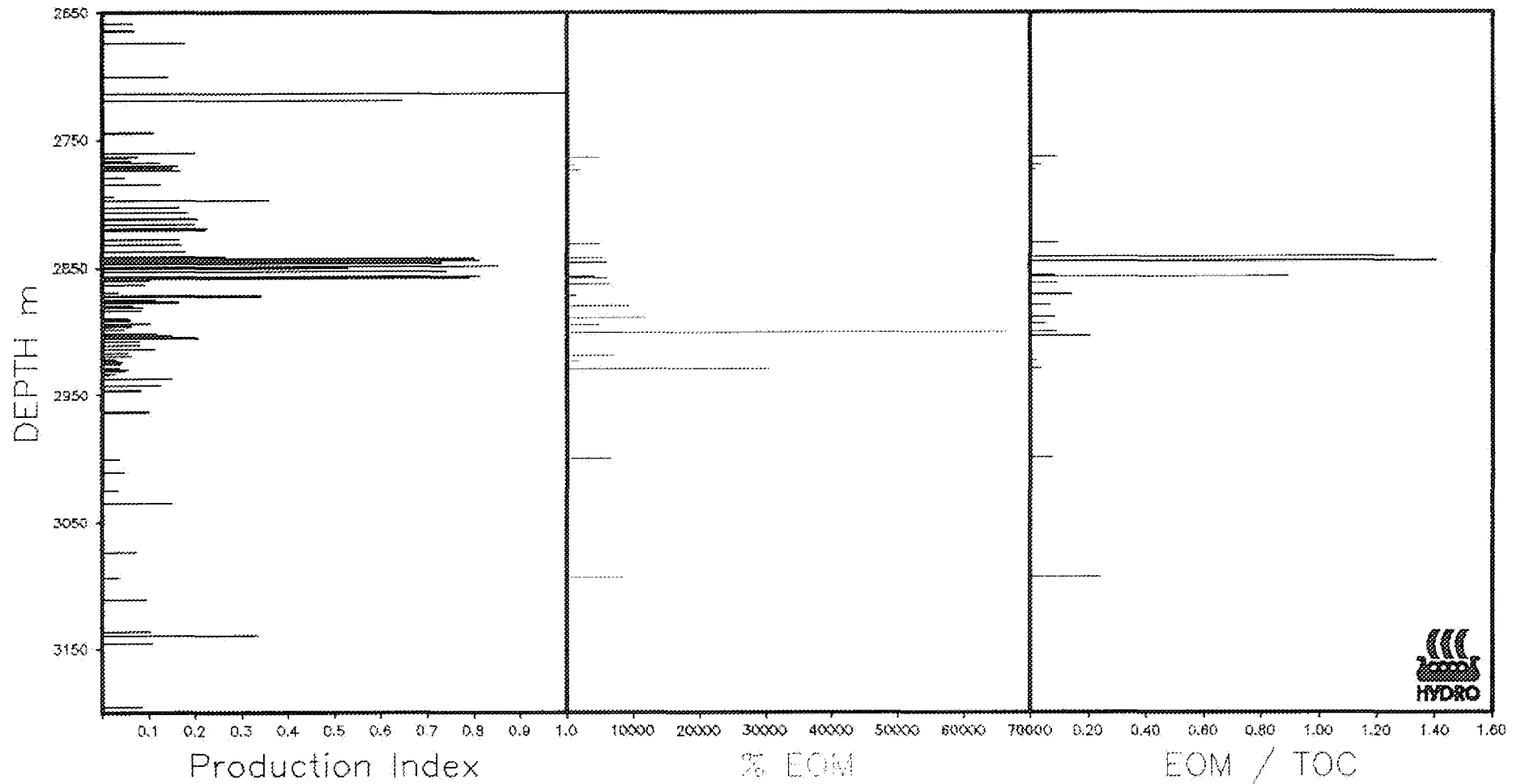


Figure 2.4 Kerogen composition.

30/9-8

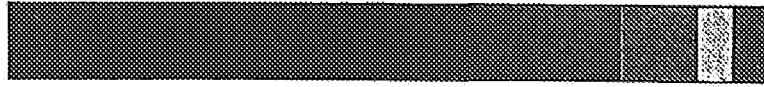
KEROGEN COMPOSITION

50

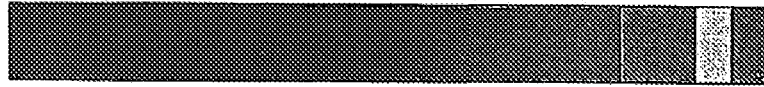
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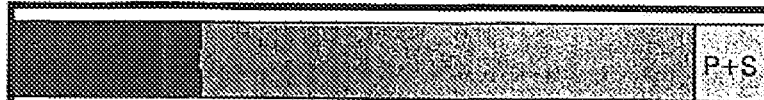
2771.0



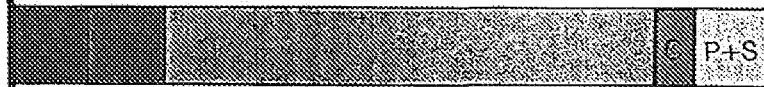
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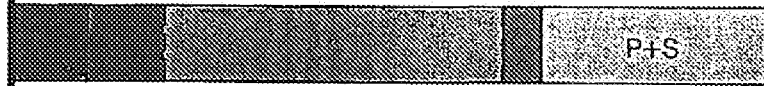
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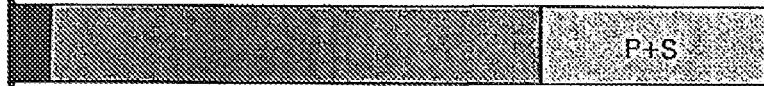
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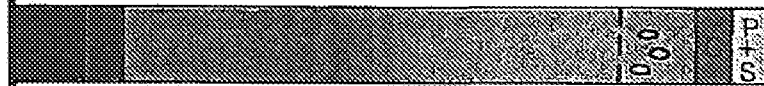
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2889.90



2895.35



3001.0

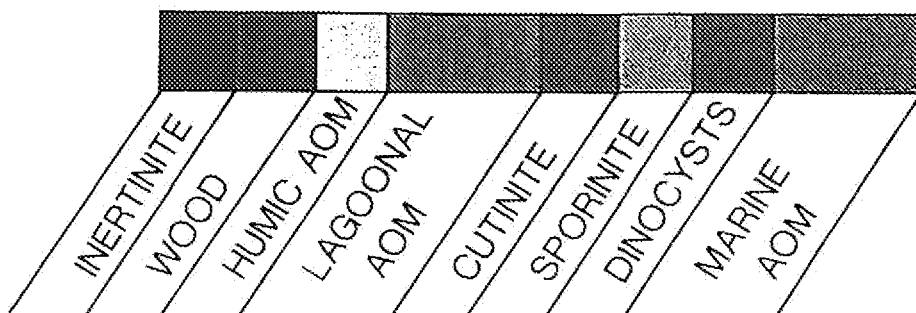
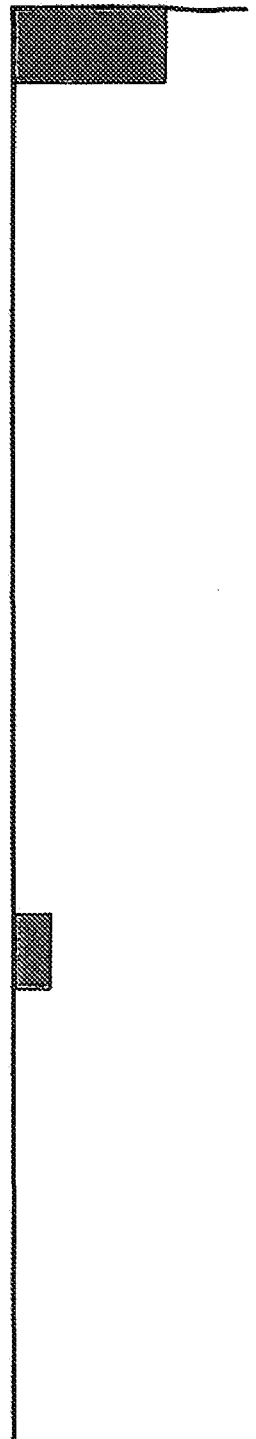


3095.0



PYRITE

L M H



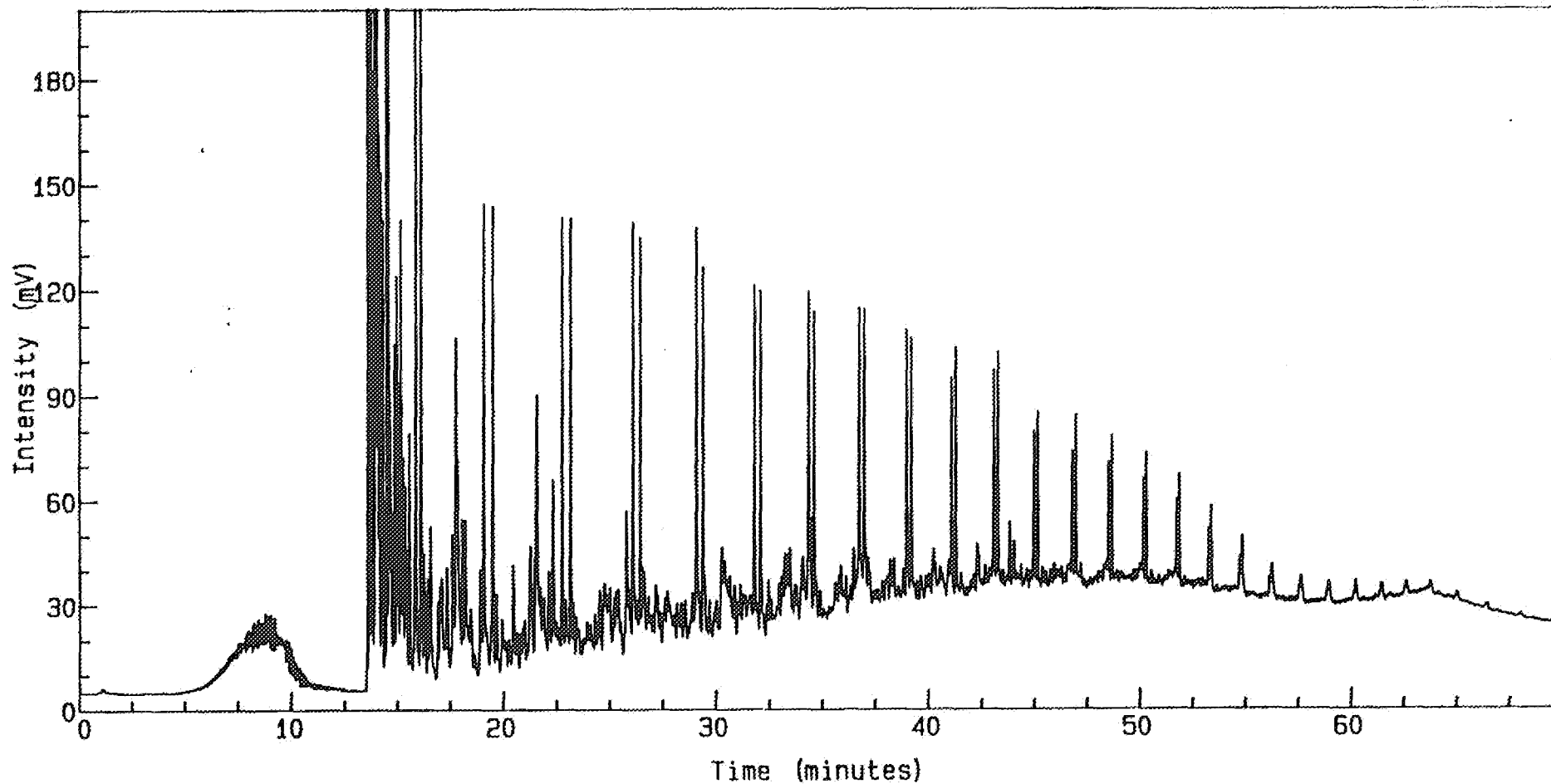
APPENDIX I

Pyrolysis Gas Chromatograms.

Analysis Name : [PETRO] 9 A300908_P, 18, 1.

2765 M Amount : 1.000

Multichrom



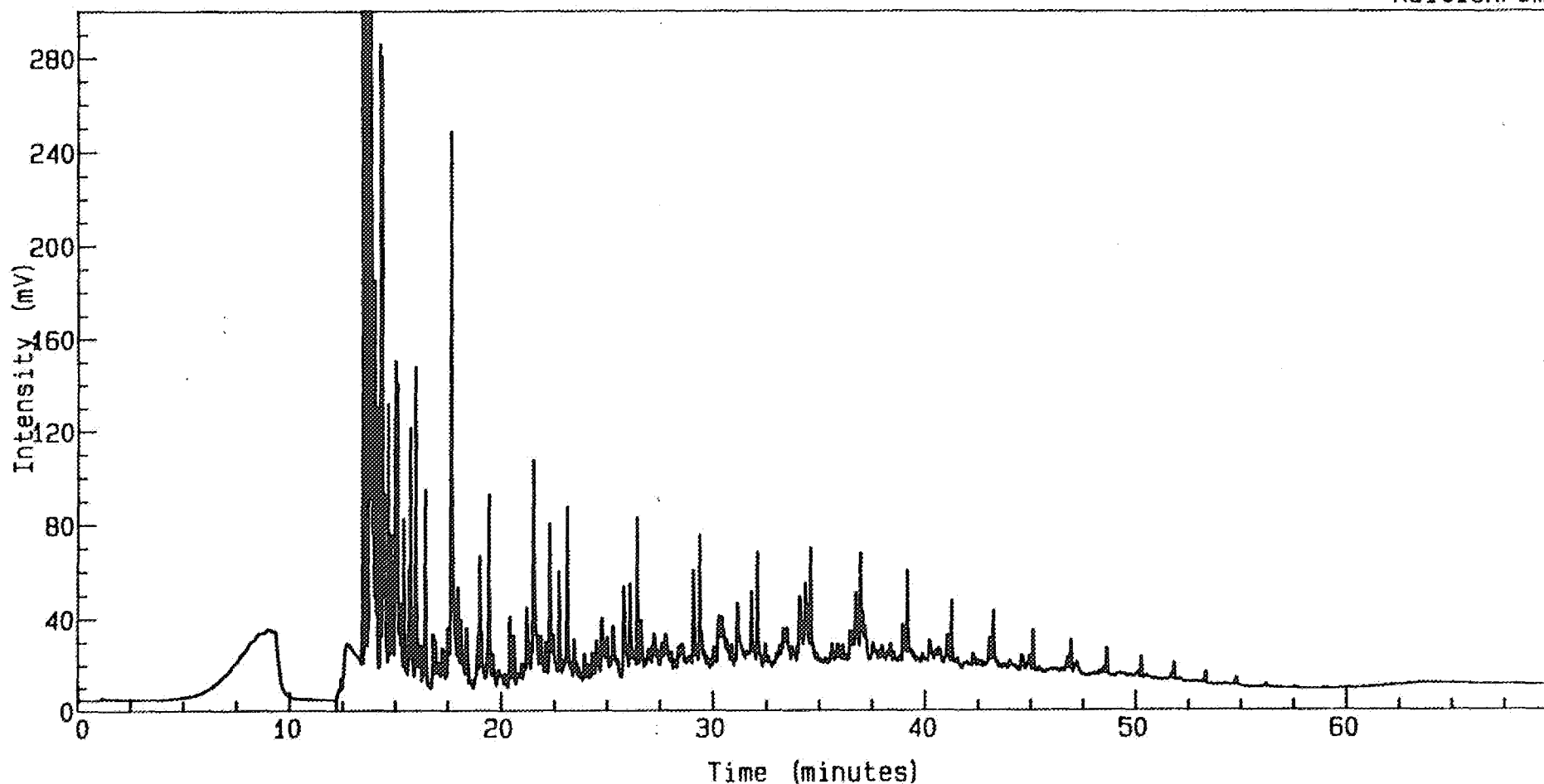
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Channel Title : PYROLYSIS FID
Lims ID :
Acquired on 7-NOV-1989 at 14:33
Reported on 9-NOV-1989 at 10:21

Method : PYRO
Calibration :
Run Sequence : PYRO

Analysis Name : [PETRO] 9 A300908_P, 4, 1.

2771 M Amount : 1.000

Multichrom



Instrument : HP5890

Method : PYRO

Channel Title : PYROLYSIS FID

Calibration :

Lims ID :

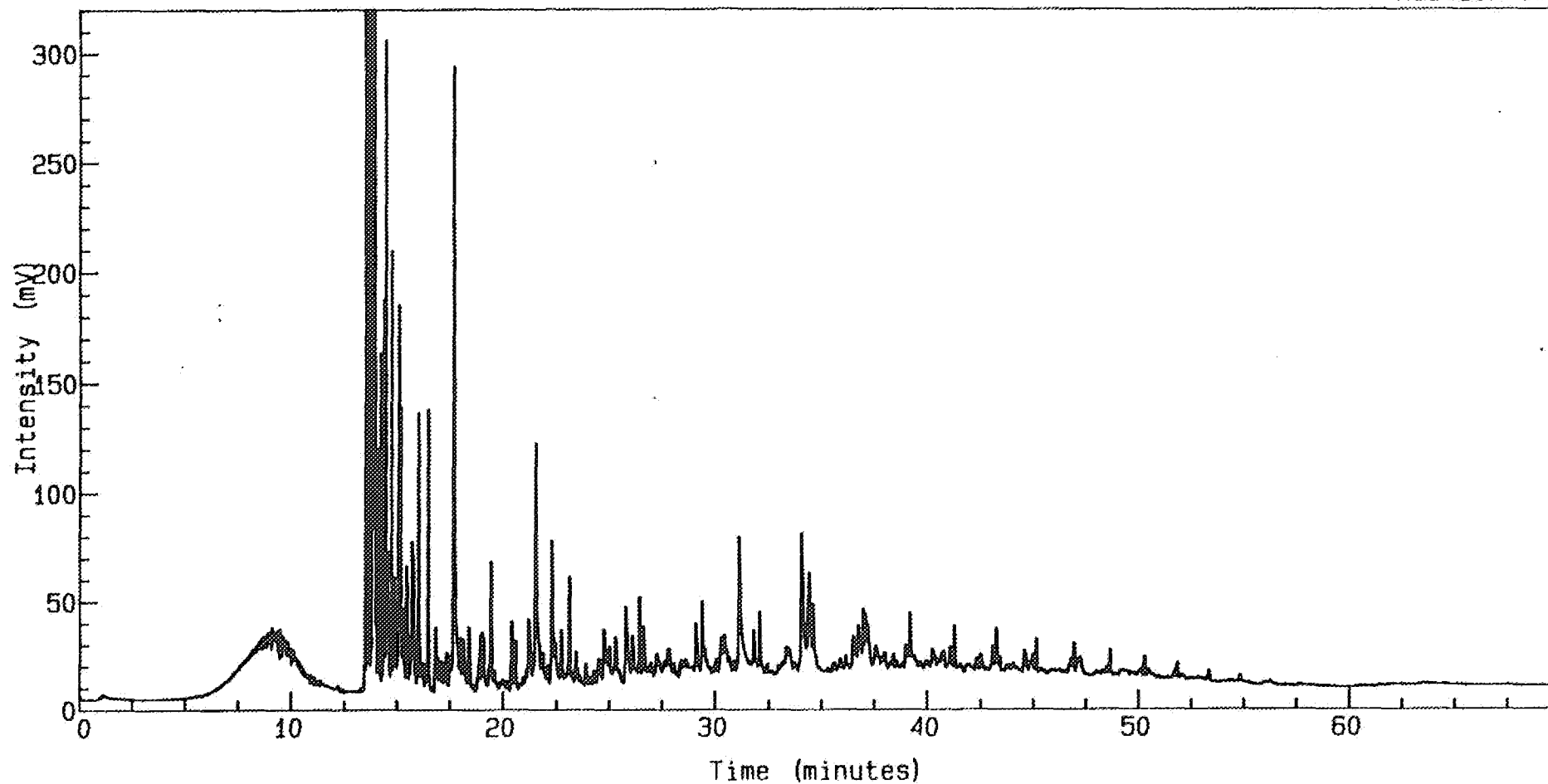
Run Sequence : PYRO

Acquired on 31-OCT-1989 at 12: 10

Reported on 1-NOV-1989 at 12: 39

Analysis Name : [PETRO] 9 A300908_P, 5, 1.
2775 M Amount : 1.000

Multichrom

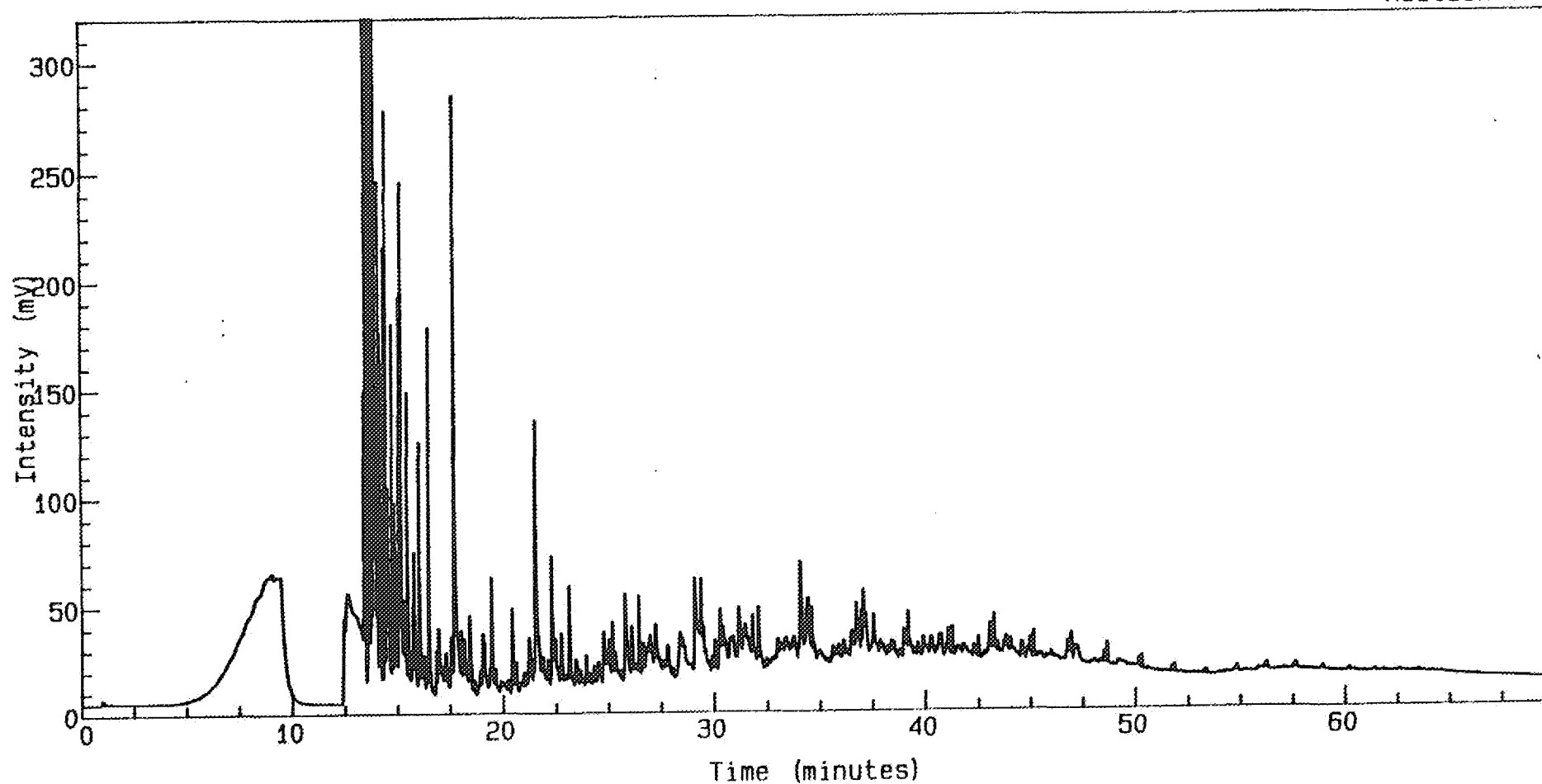


Instrument : HP5890
Channel Title : PYROLYSIS FID
Lims ID :
Acquired on 31-OCT-1989 at 14:45
Reported on 1-NOV-1989 at 12:43

Method : PYRO
Calibration :
Run Sequence : PYRO

Analysis Name : [PETRO] 9 A300908_P, 6, 1.
2832.7 M Amount : 1.000

Multichrom



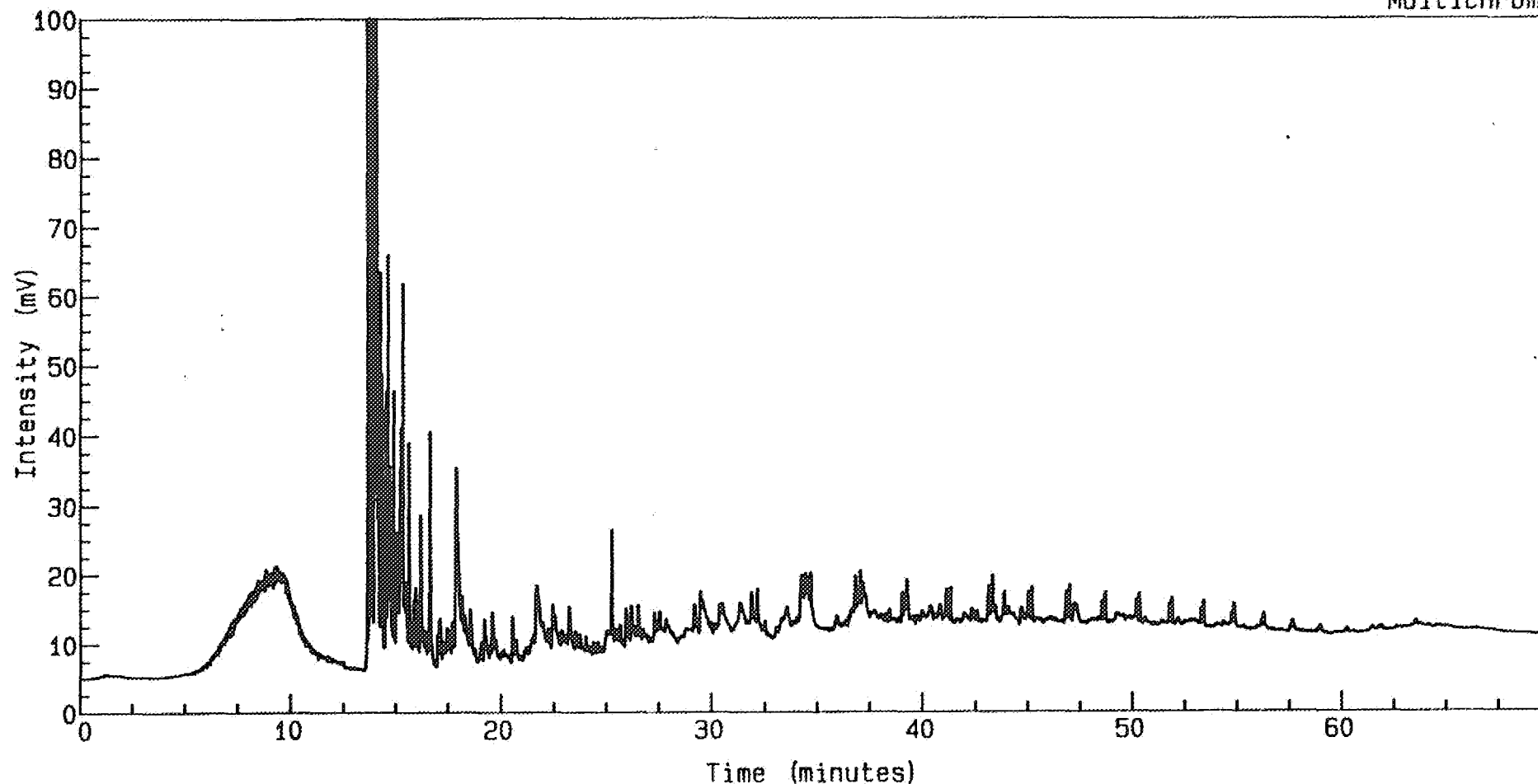
Instrument : HP5890
Channel Title : PYROLYSIS FID
Lims ID :
Acquired on 1-NOV-1989 at 08:31
Reported on 1-NOV-1989 at 12:47

Method : PYRO
Calibration :
Run Sequence : PYRO

Analysis Name : [PETRO] 9 A300908_P, 7, 1.

2857.6 M Amount : 1.000

Multichrom



Instrument : HP5890

Method : PYRO

Channel Title : PYROLYSIS FID

Calibration :

Lims ID :

Run Sequence : PYRO

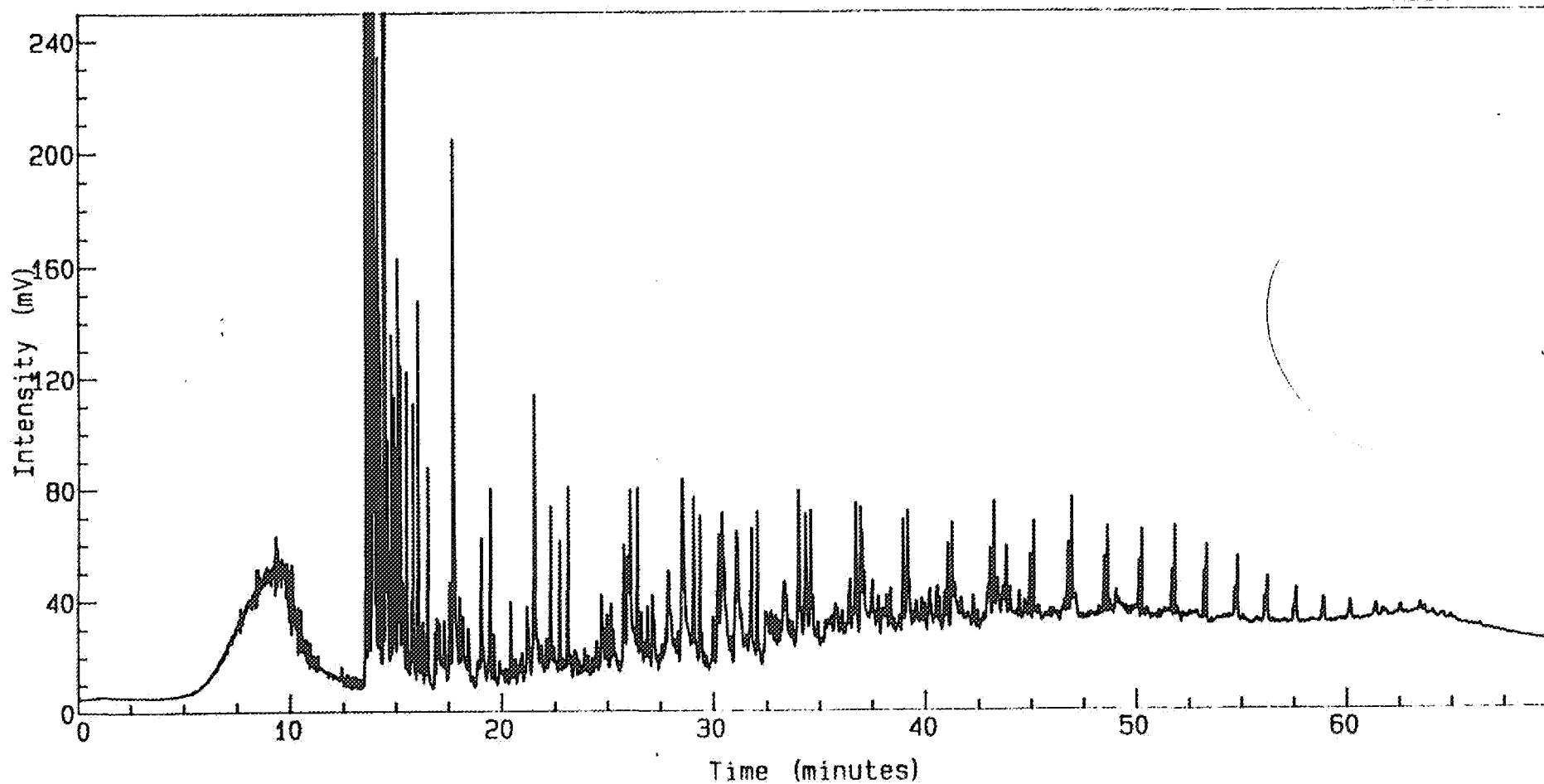
Acquired on 1-NOV-1989 at 10:21

Reported on 1-NOV-1989 at 12:48

Analysis Name : [PETRO] 9 A300908_P, 8, 1.

2863.45 M Amount : 1.000

Multichrom



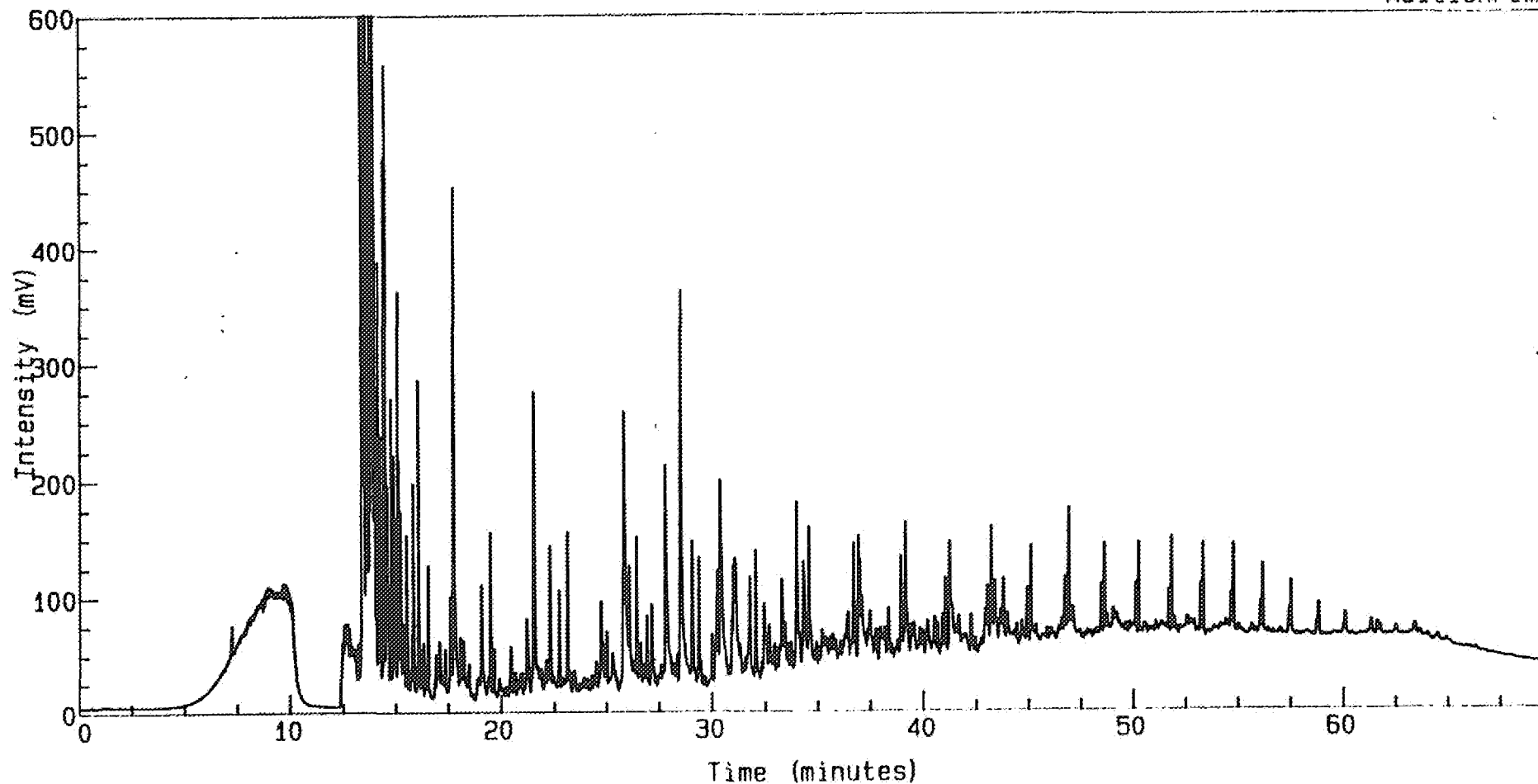
Instrument : HP5890
Channel Title : PYROLYSIS FID
Lims ID :
Acquired on 2-NOV-1989 at 11:19
Reported on 9-NOV-1989 at 15:45

Method : PYRO
Calibration :
Run Sequence : PYRO

Analysis Name : [PETRO] 9 A300908_P, 9, 1.

2880.8 M Amount : 1.000

Multichrom



Instrument : HP5890

Method : PYRO

Channel Title : PYROLYSIS FID

Calibration :

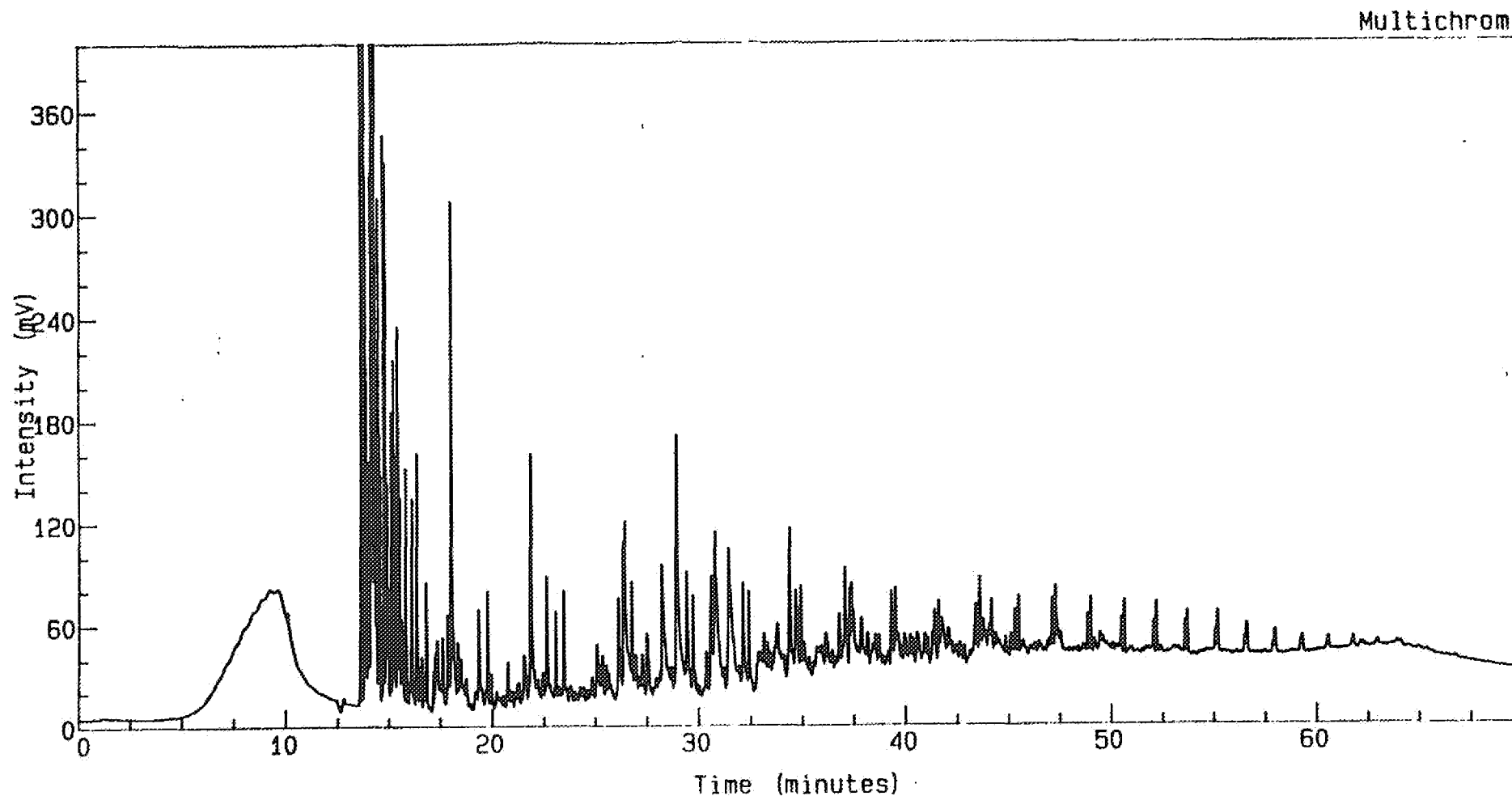
Lims ID :

Run Sequence : PYRO

Acquired on 2-NOV-1989 at 12:53

Reported on 9-NOV-1989 at 15:21

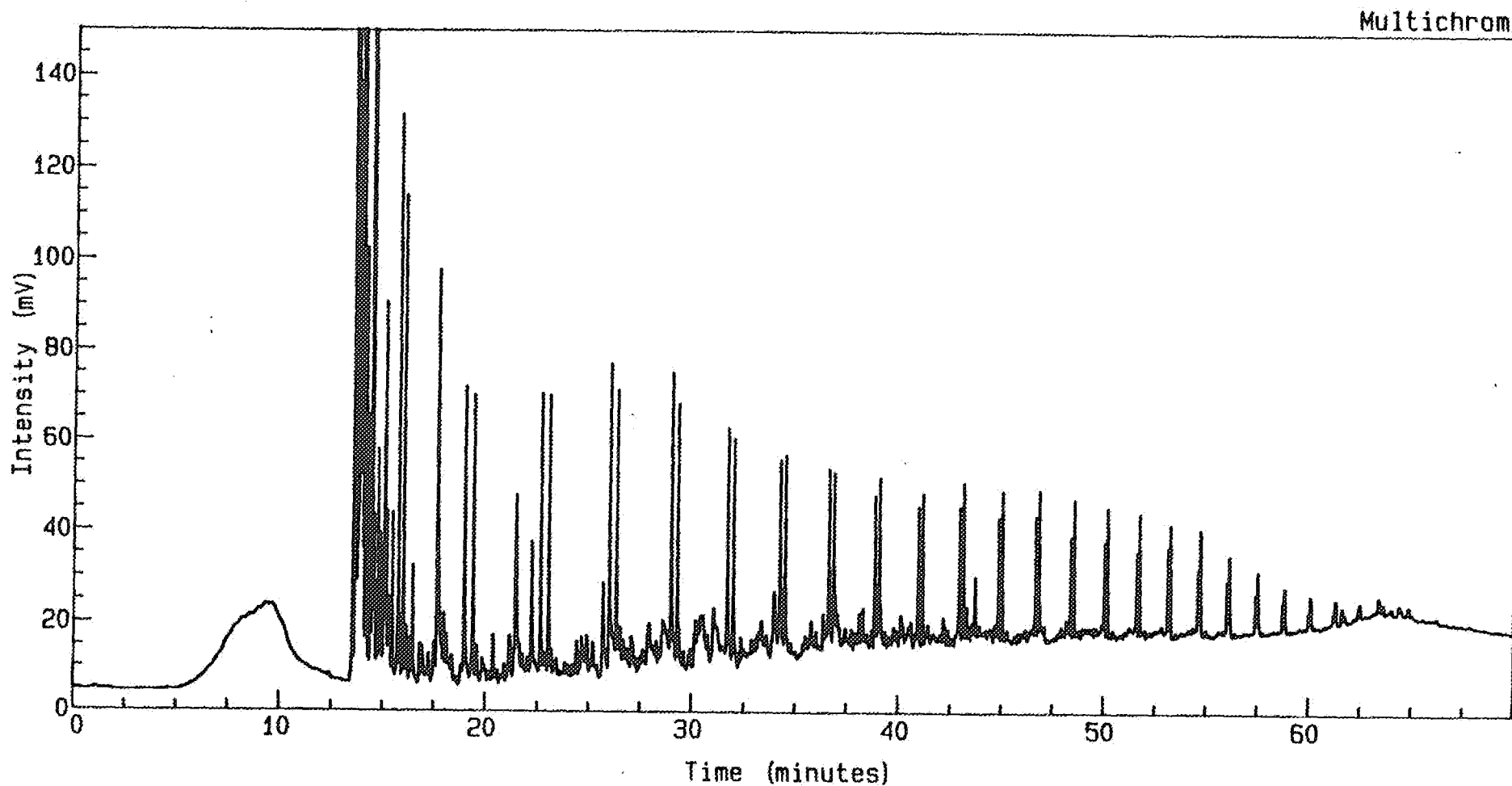
Analysis Name : [PETRO] 9 A300908_P, 21, 1.
2889.9 M Amount : 1.000



Instrument : HP5890
Channel Title : PYROLYSIS FID
Lims ID :
Acquired on 9-NOV-1989 at 13:12
Reported on 9-NOV-1989 at 15:19

Method : PYRO
Calibration :
Run Sequence : PYRO

Analysis Name : [PETRO] 9 A300908_P, 11, 1.
2895.35 M Amount : 1.000



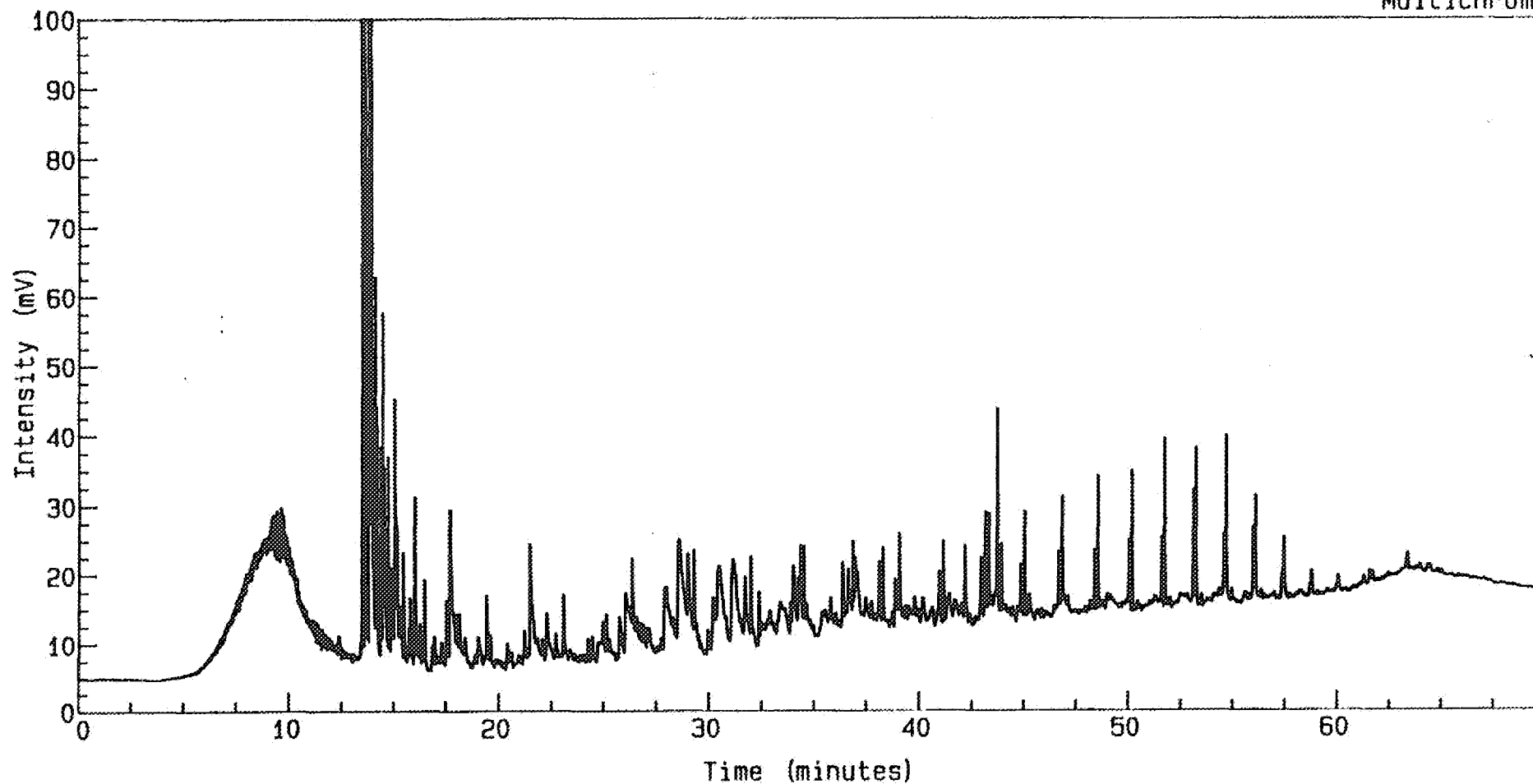
Instrument : HP5890
Channel Title : PYROLYSIS FID
Lims ID :
Acquired on 6-NOV-1989 at 08:58
Reported on 6-NOV-1989 at 12:20

Method : PYRO
Calibration :
Run Sequence : PYRO

Analysis Name : [PETRO] 9 A300908_P, 12, 1.

2901.2 M Amount : 1.000

Multichrom



Instrument : HP5890

Method : PYRO

Channel Title : PYROLYSIS FID

Calibration :

Lims ID :

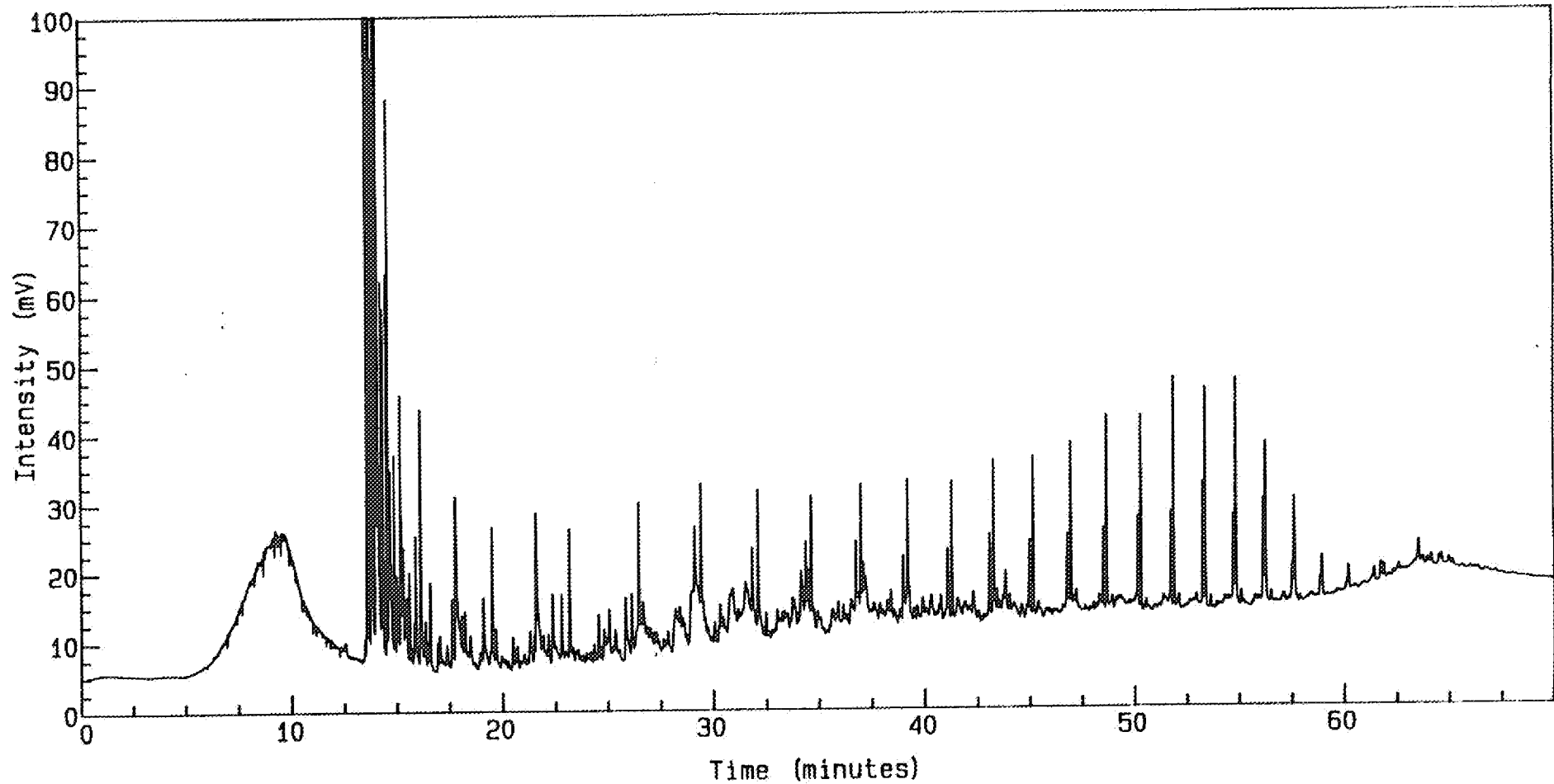
Run Sequence : PYRO

Acquired on 6-NOV-1989 at 10:39

Reported on 7-NOV-1989 at 10:36

Analysis Name : [PETRO] 9 A300908_P, 19, 1.
2919.6 M Amount : 1.000

Multichrom



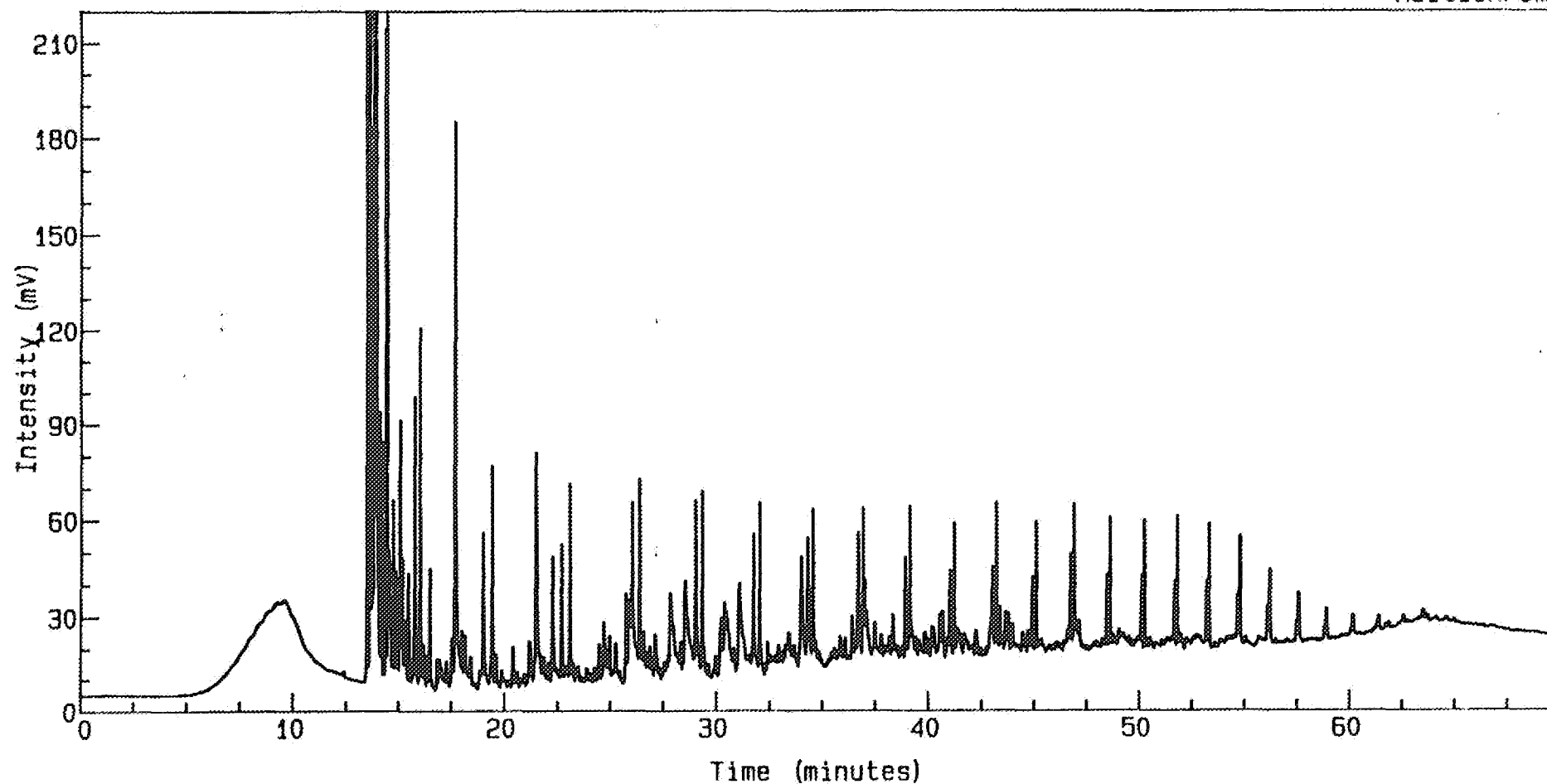
Instrument : HP5890
Channel Title : PYROLYSIS FID
Lims ID :
Acquired on 9-NOV-1989 at 08:15
Reported on 9-NOV-1989 at 10:15

Method : PYRO
Calibration :
Run Sequence : PYRO

Analysis Name : [PETRO] 9 A300908_P, 14, 1.

2923.8 M Amount : 1.000

Multichrom



Instrument : HP5890

Method : PYRO

Channel Title : PYROLYSIS FID

Calibration :

Lims ID :

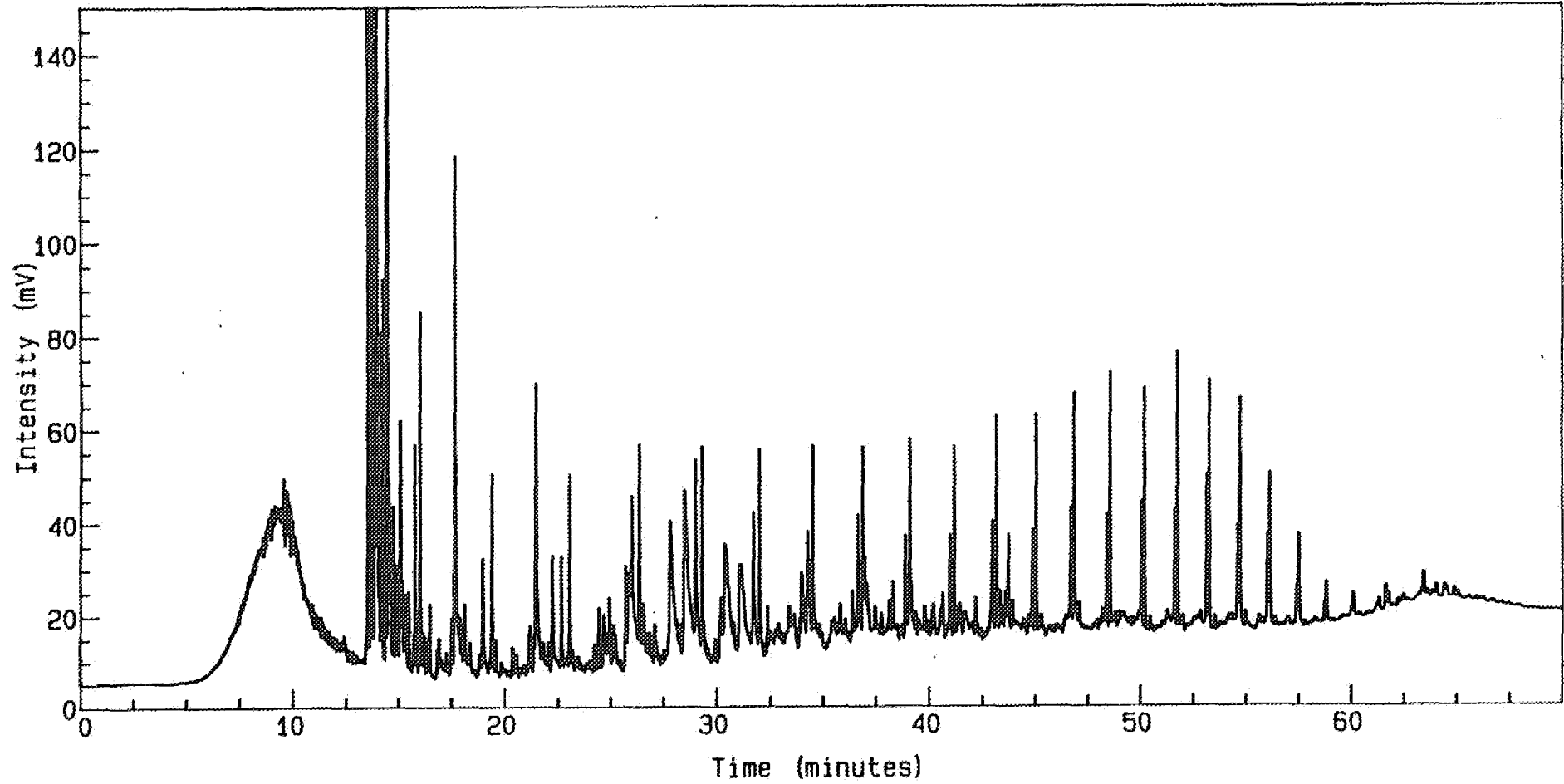
Run Sequence : PYRO

Acquired on 6-NOV-1989 at 14:27

Reported on 7-NOV-1989 at 10:54

Analysis Name : [PETRO] 9 A300908_P, 15, 1.
2930.3 M Amount : 1.000

Multichrom



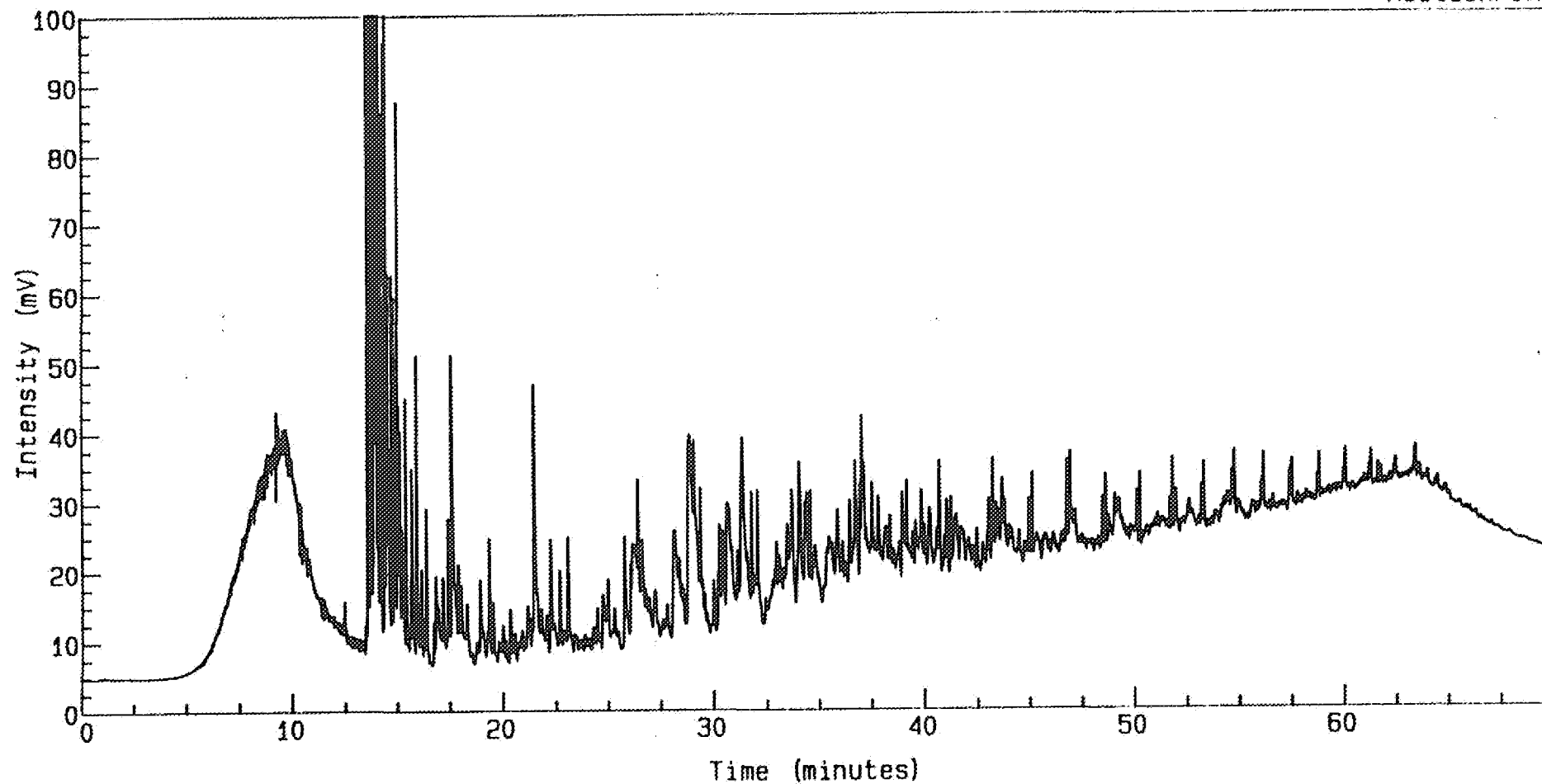
Instrument : HP5890
Channel Title : PYROLYSIS FID
Lims ID :
Acquired on 7-NOV-1989 at 08:13
Reported on 7-NOV-1989 at 12:08

Method : PYRO
Calibration :
Run Sequence : PYRO

Analysis Name : [PETRO] 9 A300908_P, 16, 1.

3001 M Amount : 1.000

Multichrom



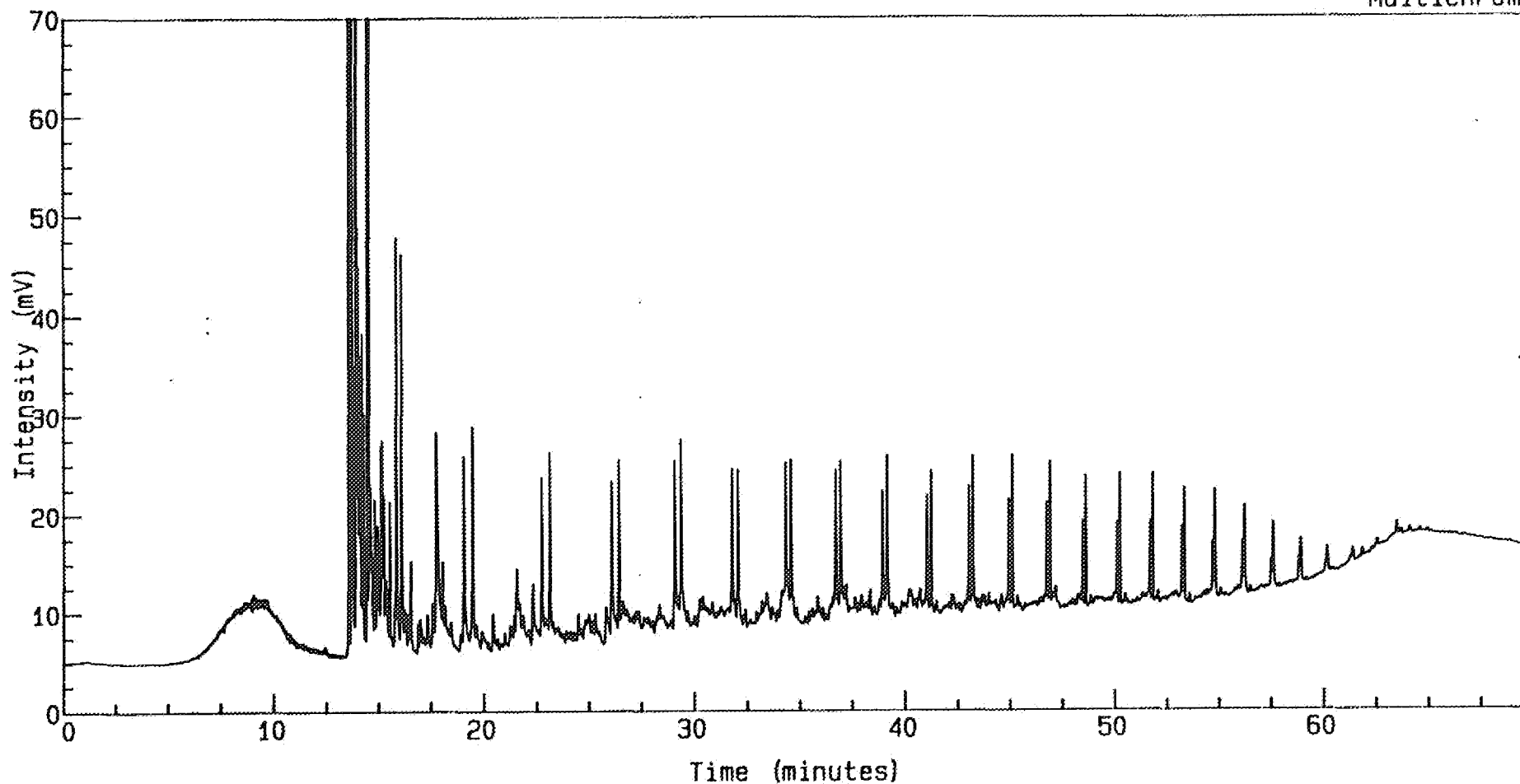
Instrument : HP5890
Channel Title : PYROLYSIS FID
Lims ID :
Acquired on 7-NOV-1989 at 09:44
Reported on 9-NOV-1989 at 15:47

Method : PYRO
Calibration :
Run Sequence : PYRO

Analysis Name : [PETRO] 9 A300908_P, 17, 1.

3095 M Amount : 1.000

Multichrom



Instrument : HP5890
Channel Title : PYROLYSIS FID
Lims ID :
Acquired on 7-NOV-1989 at 12:06
Reported on 9-NOV-1989 at 10:19

Method : PYRO
Calibration :
Run Sequence : PYRO

APPENDIX II

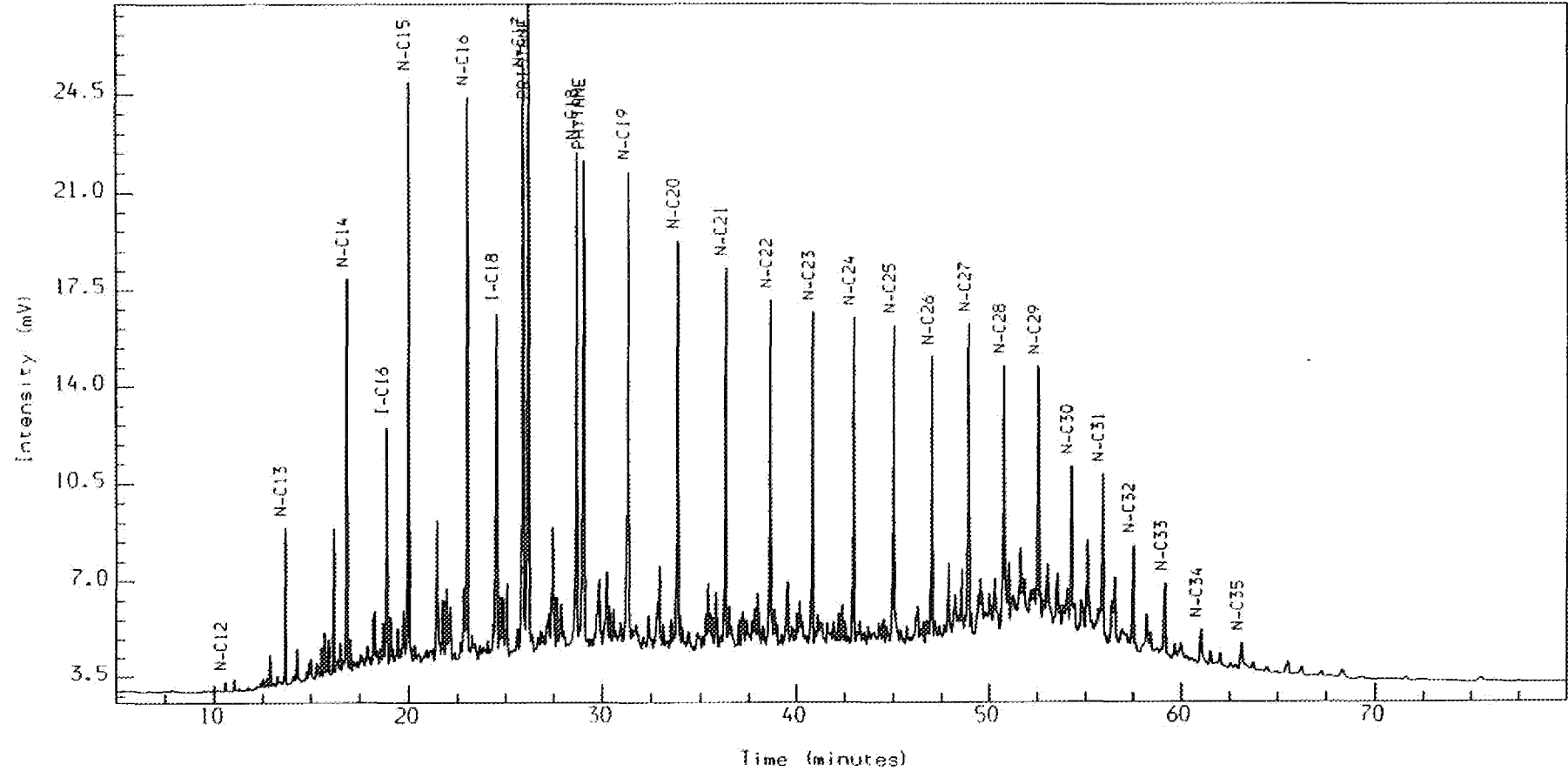
Gas Chromatograms of Saturated Hydrocarbons.

Analysis Name : [PETRO] 7 C300908_5.2.1.

2765 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 10-NOV-1989 at 15:44

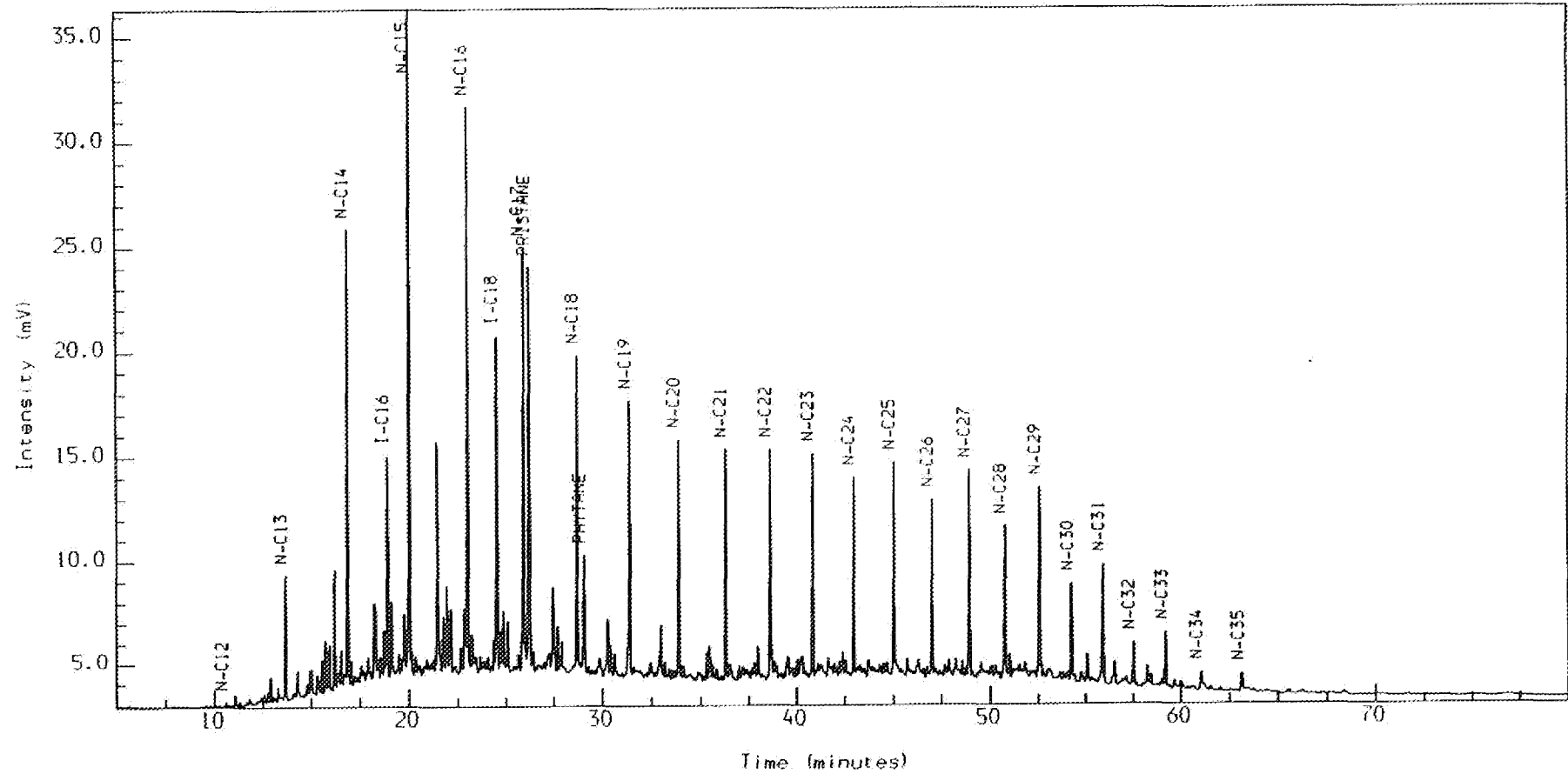
Reported on 10-NOV-1989 at 17:07

Analysis Name : [PETRO] 7 C300908_5.3.1.

2771 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Channel Title : MSD

Lims ID :

Acquired on 10-NOV-1989 at 17:16

Reported on 10-NOV-1989 at 18:39

Method : MSDS

Calibration : MSDS

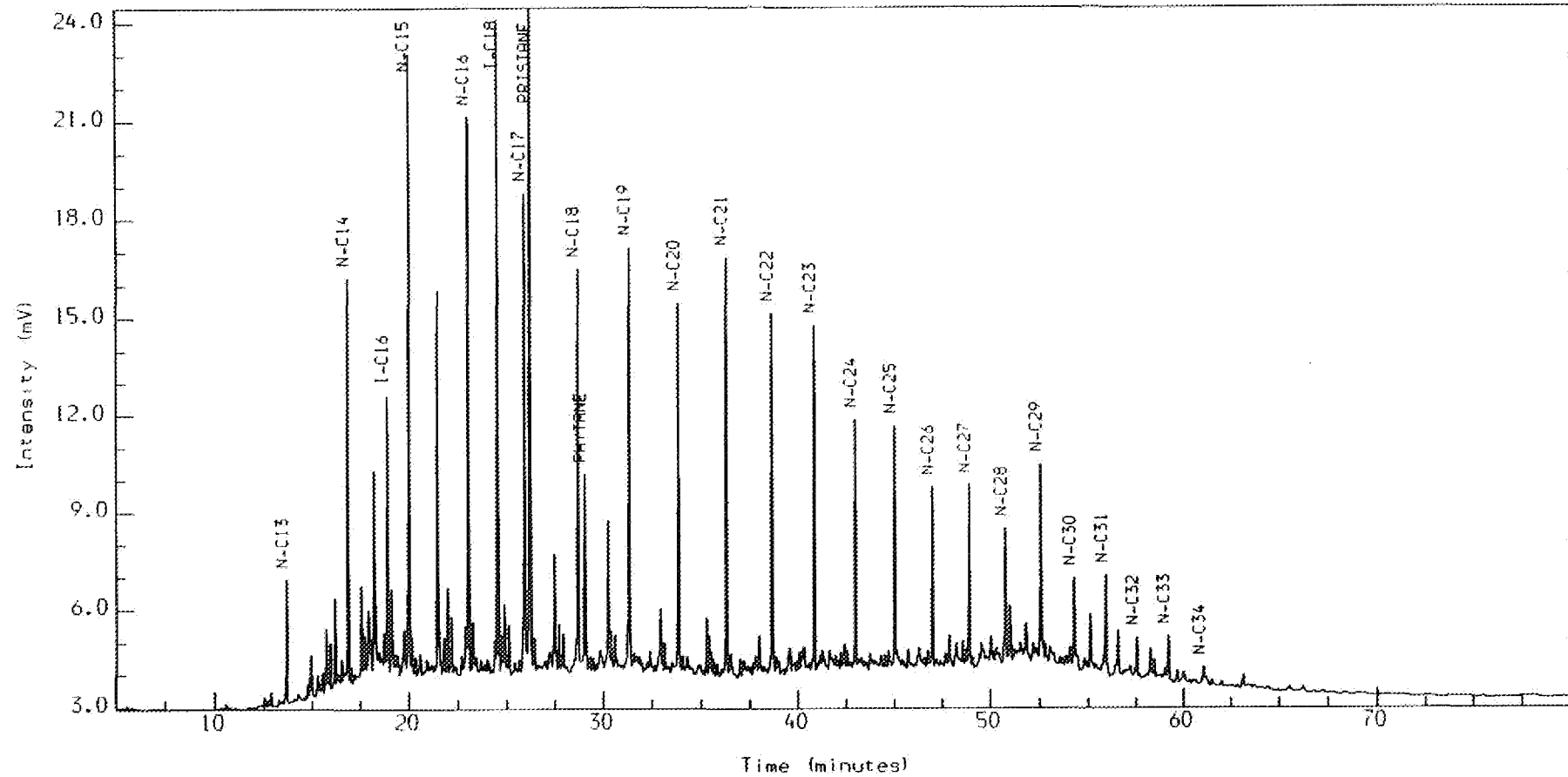
Run Sequence : MSDS

Analysis Name : [PETRO] 7 C300908_S.4.1.

2775 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 10-NOV-1989 at 18:48

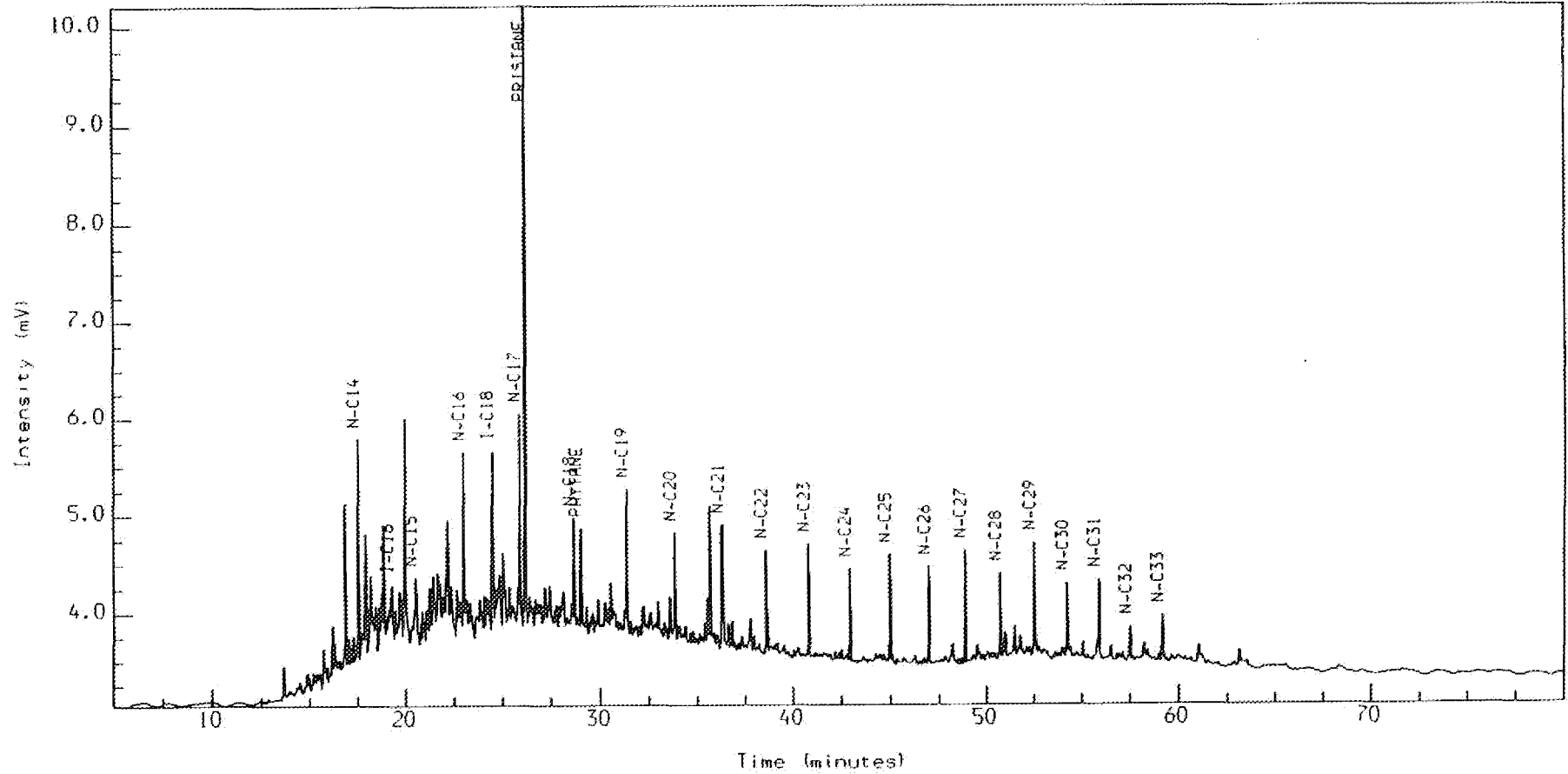
Reported on 15-NOV-1989 at 09:15

Analysis Name : [PETRO] 7 C300908_5.5.1.

2832.7 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Channel Title : MSD

Lims ID :

Acquired on 10-NOV-1989 at 20:20

Reported on 10-NOV-1989 at 21:42

Method : MSDS

Calibration : MSDS

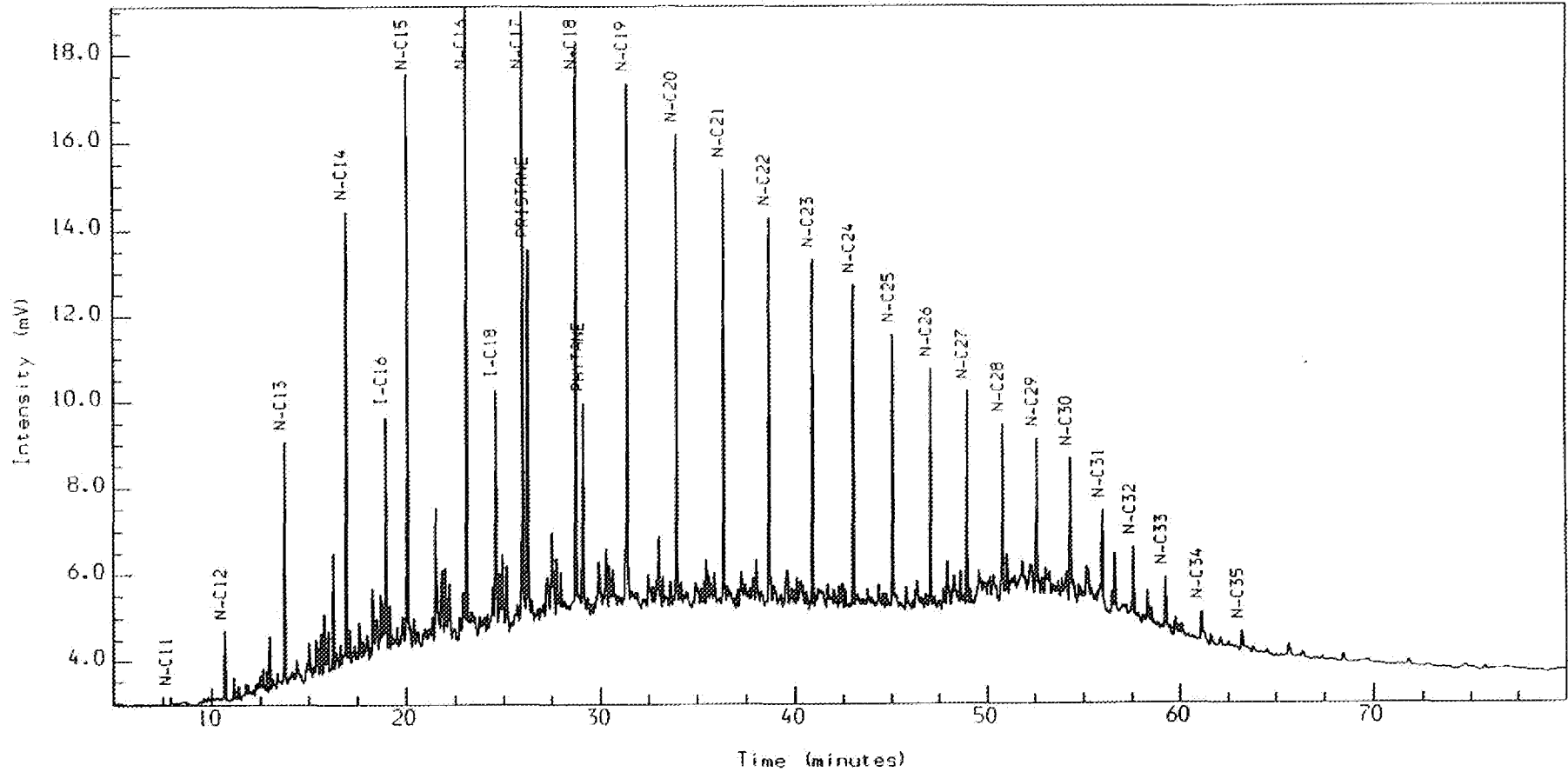
Run Sequence : MSDS

Analysis Name : [PETRO] 7 D500908_5.9.1.

2843.5 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 14-NOV-1989 at 03:26

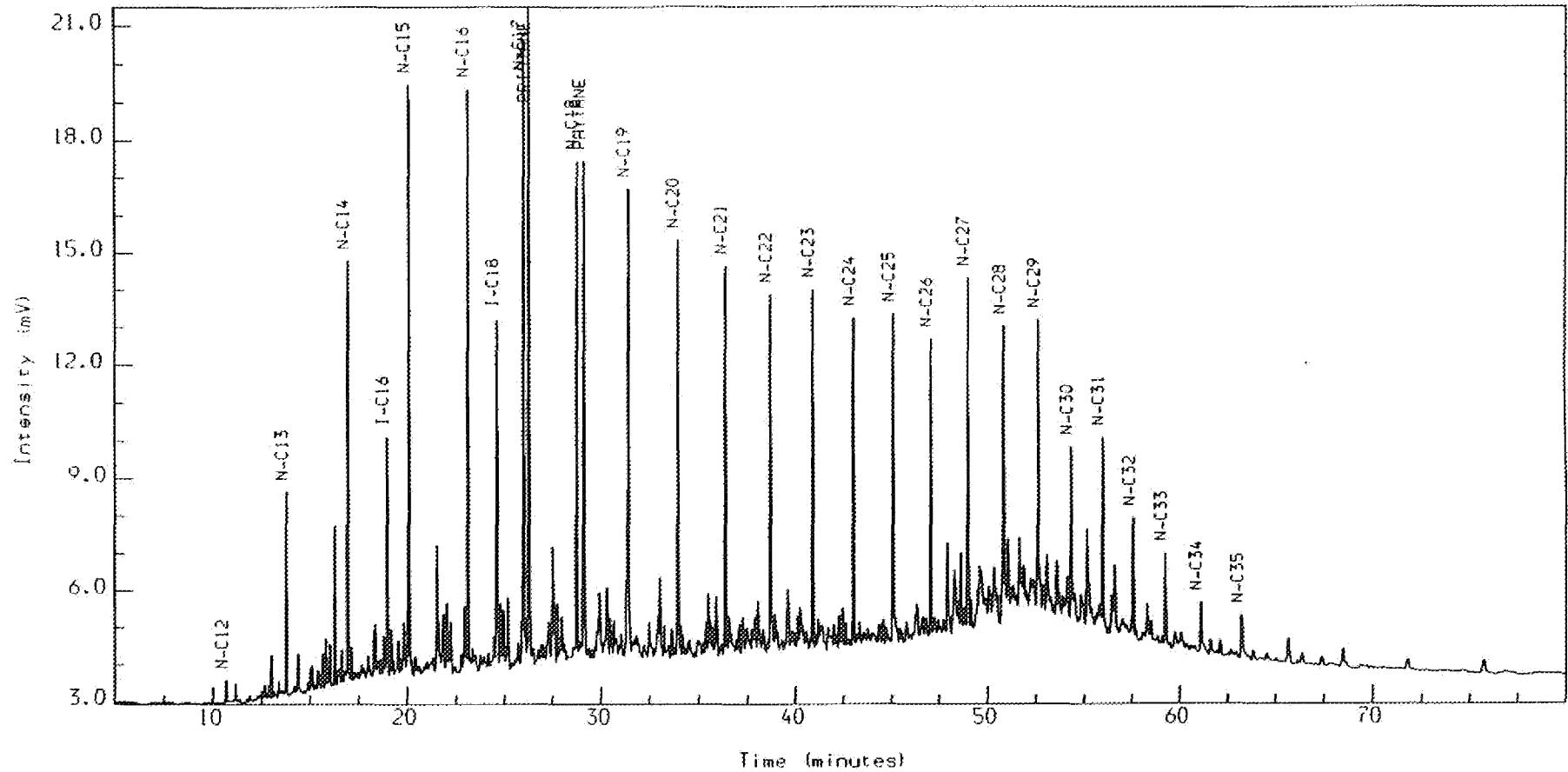
Reported on 14-NOV-1989 at 03:40

Analysis Name : [PETRO] 7 0300908_S.10.1.

2846.8 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 14-NOV-1989 at 03:58

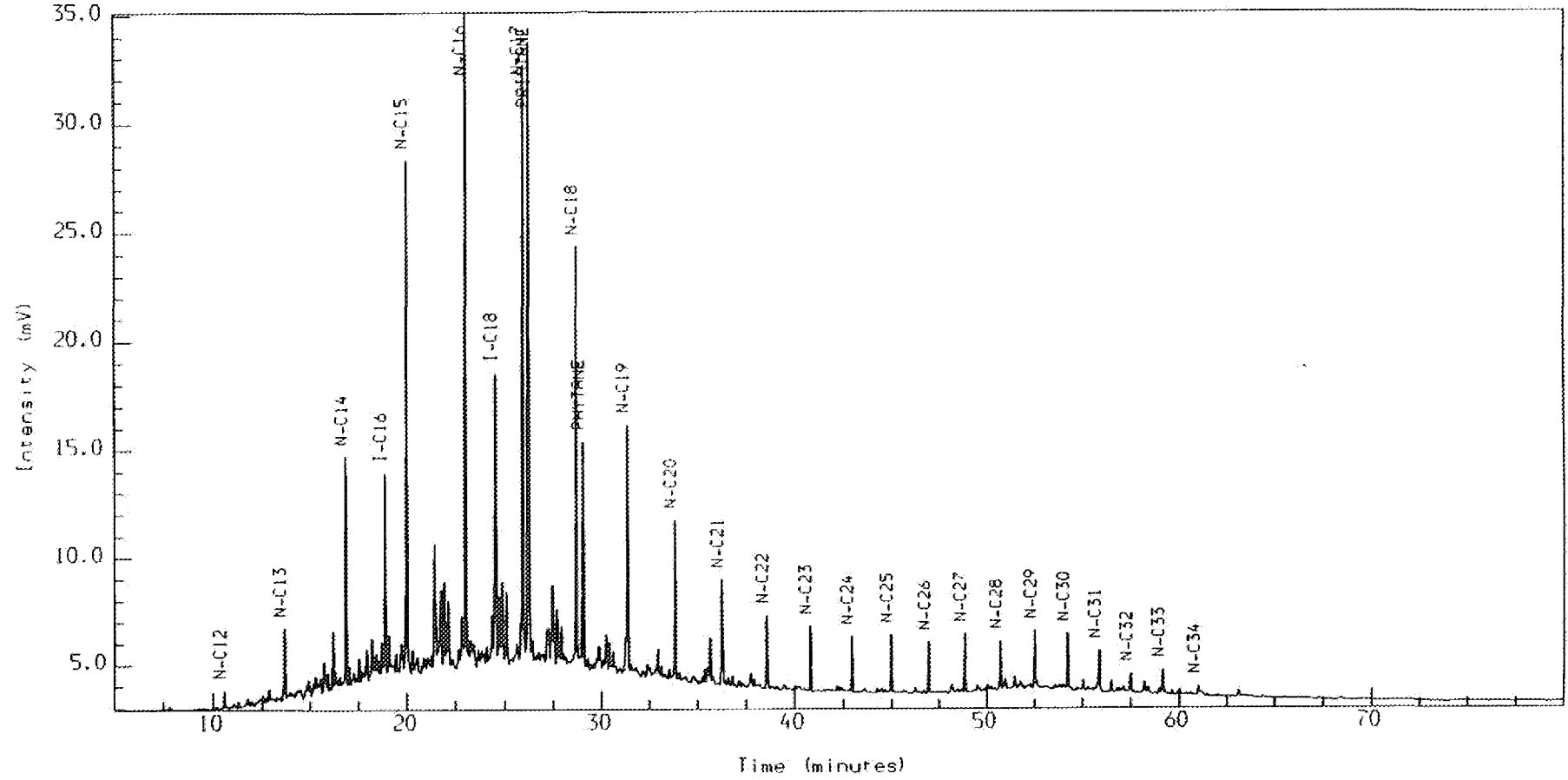
Reported on 14-NOV-1989 at 05:21

Analysis Name : [PETRO] 7 C300908_S.6.1.

2857.6 M

SATURATED PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 10-NOV-1989 at 21:51

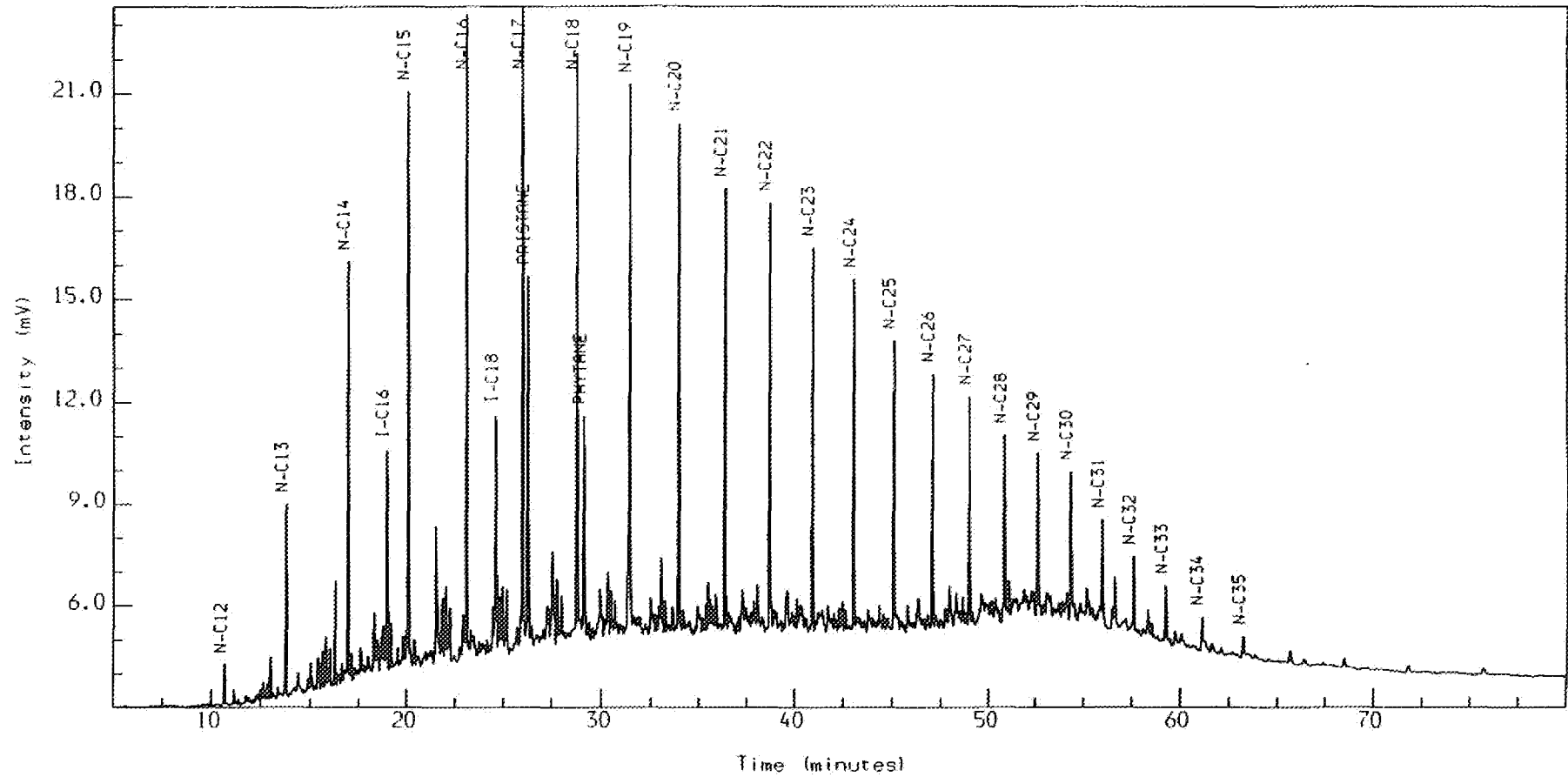
Reported on 10-NOV-1989 at 25:14

Analysis Name : [PETRO] 7 D300908_S.11.1.

2858.5 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 14-NOV-1989 at 05:30

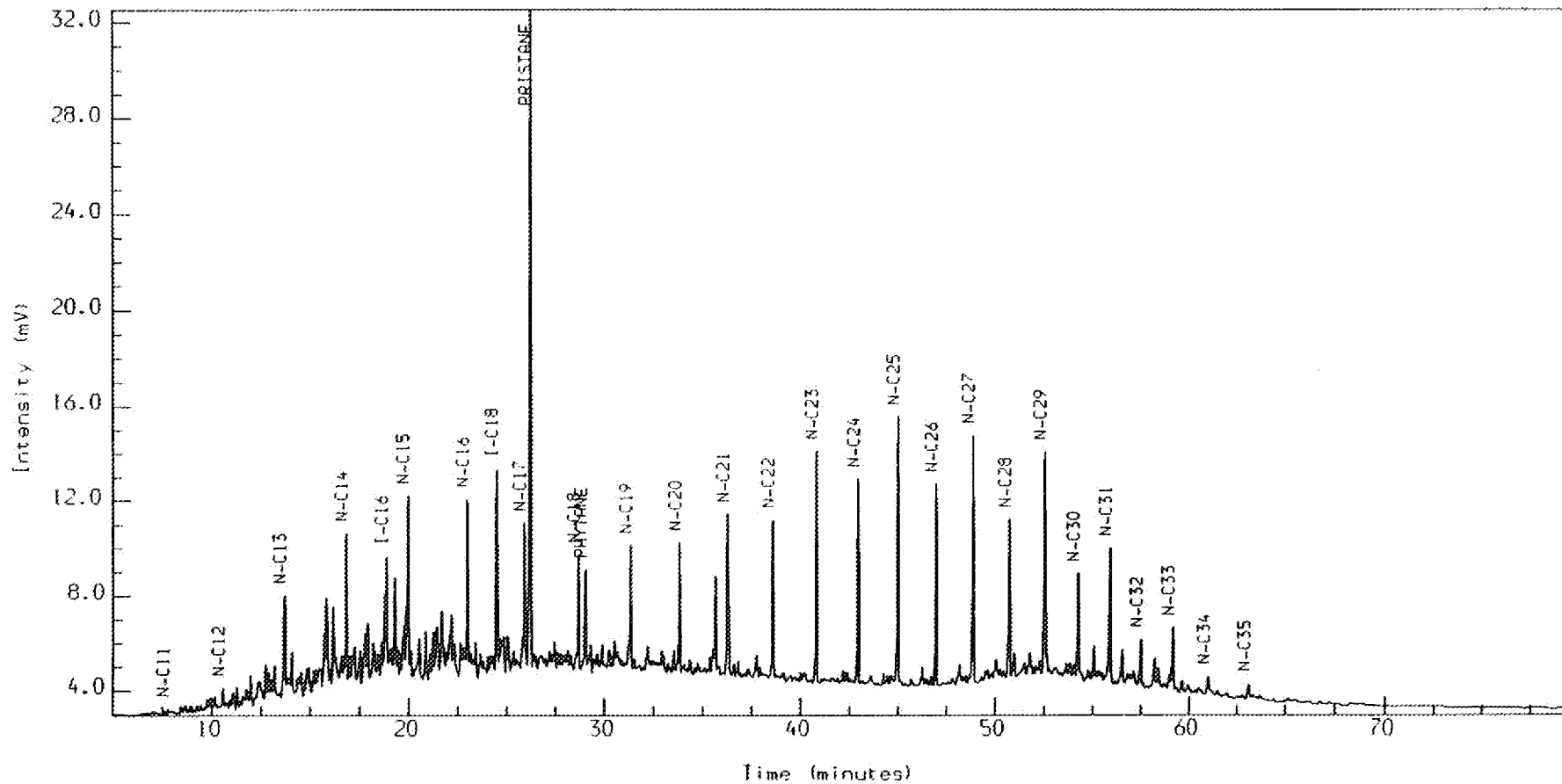
Reported on 14-NOV-1989 at 06:53

Analysis Name : [PETRO] 7 C300908_5.7.1.

2863.45 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Channel Title : MSD

Lims ID :

Acquired on 10-NOV-1989 at 25:23

Reported on 15-NOV-1989 at 09:17

Method : MSDS

Calibration : MSDS

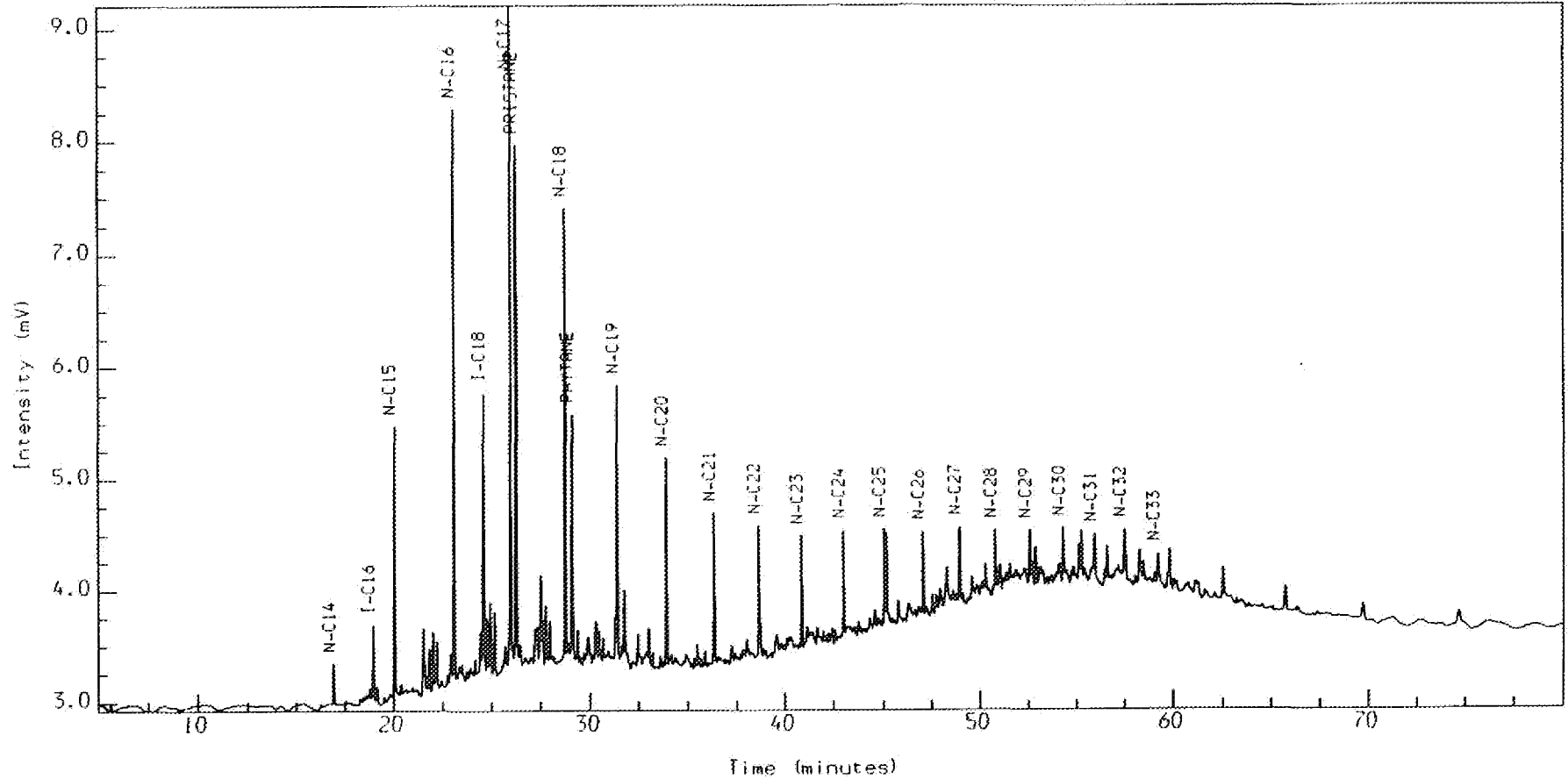
Run Sequence : MSDS

Analysis Name : [PETRO] 7 D300908_5.12.1.

2872.4 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

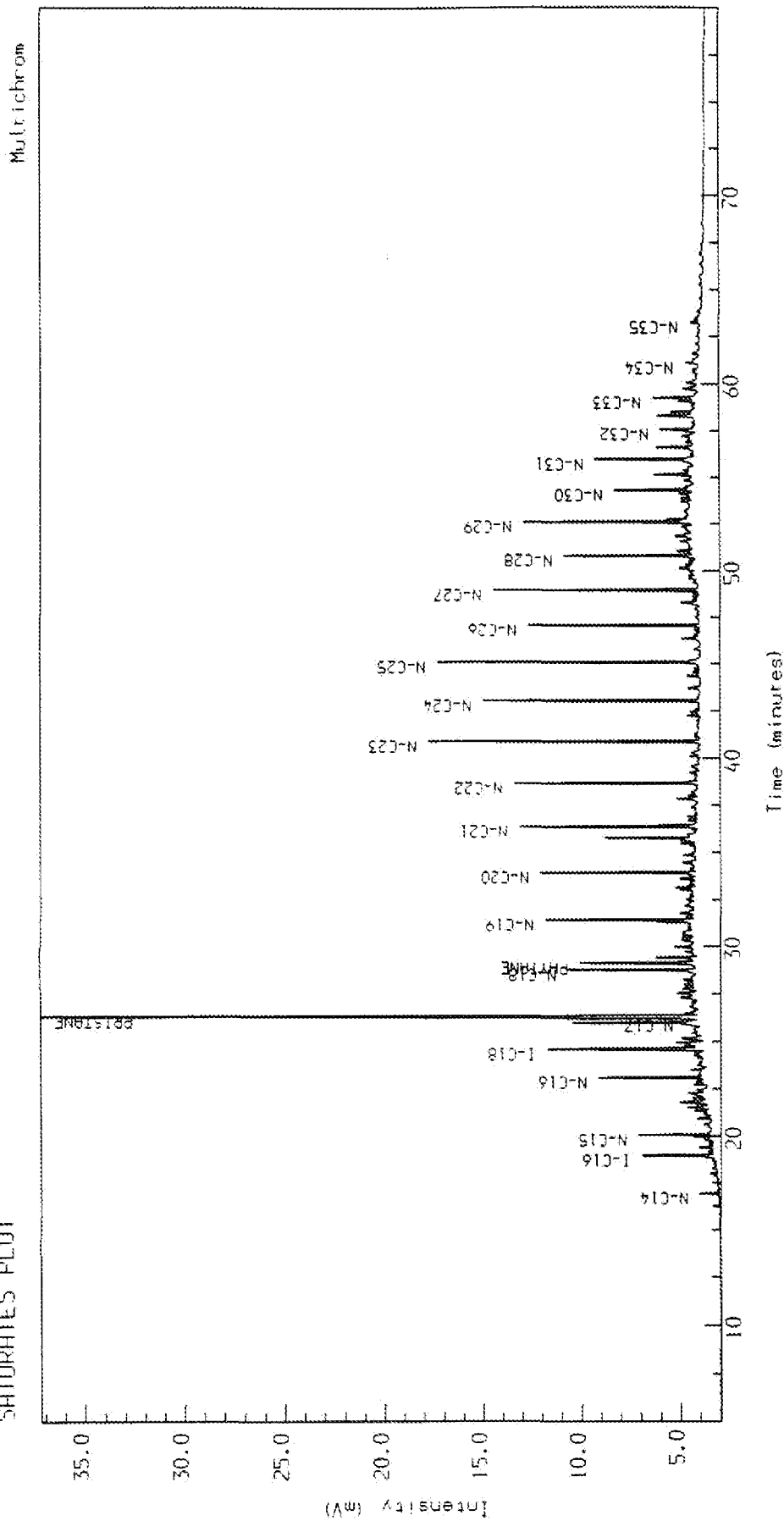
Acquired on 14-NOV-1989 at 07:02

Reported on 14-NOV-1989 at 08:24

Analysis Name : [PETRO] 7 [500908_5.14.1.

2880.8 M

SATURATES PLOT



Instrument : HP5890

Channel Title : MSD

Lims ID :

Acquired on 14-NOV-1989 at 10:05

Reported on 14-NOV-1989 at 11:28

Method : MSDS

Calibration : MSDS

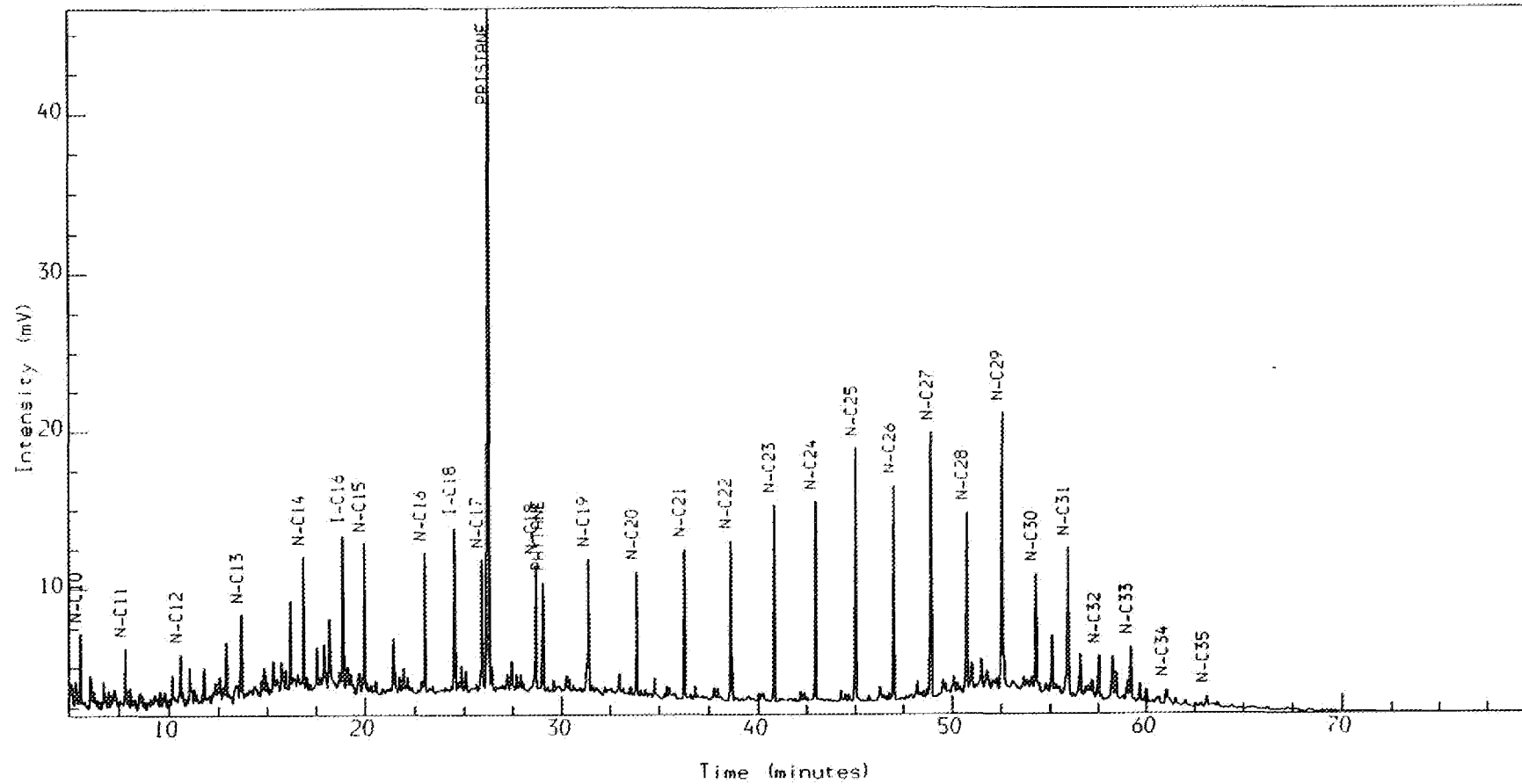
Run Sequence : MSDS

Analysis Name : [PETRO] 7 C300908_S.9.1.

2889.9 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 11-NOV-1989 at 02:27

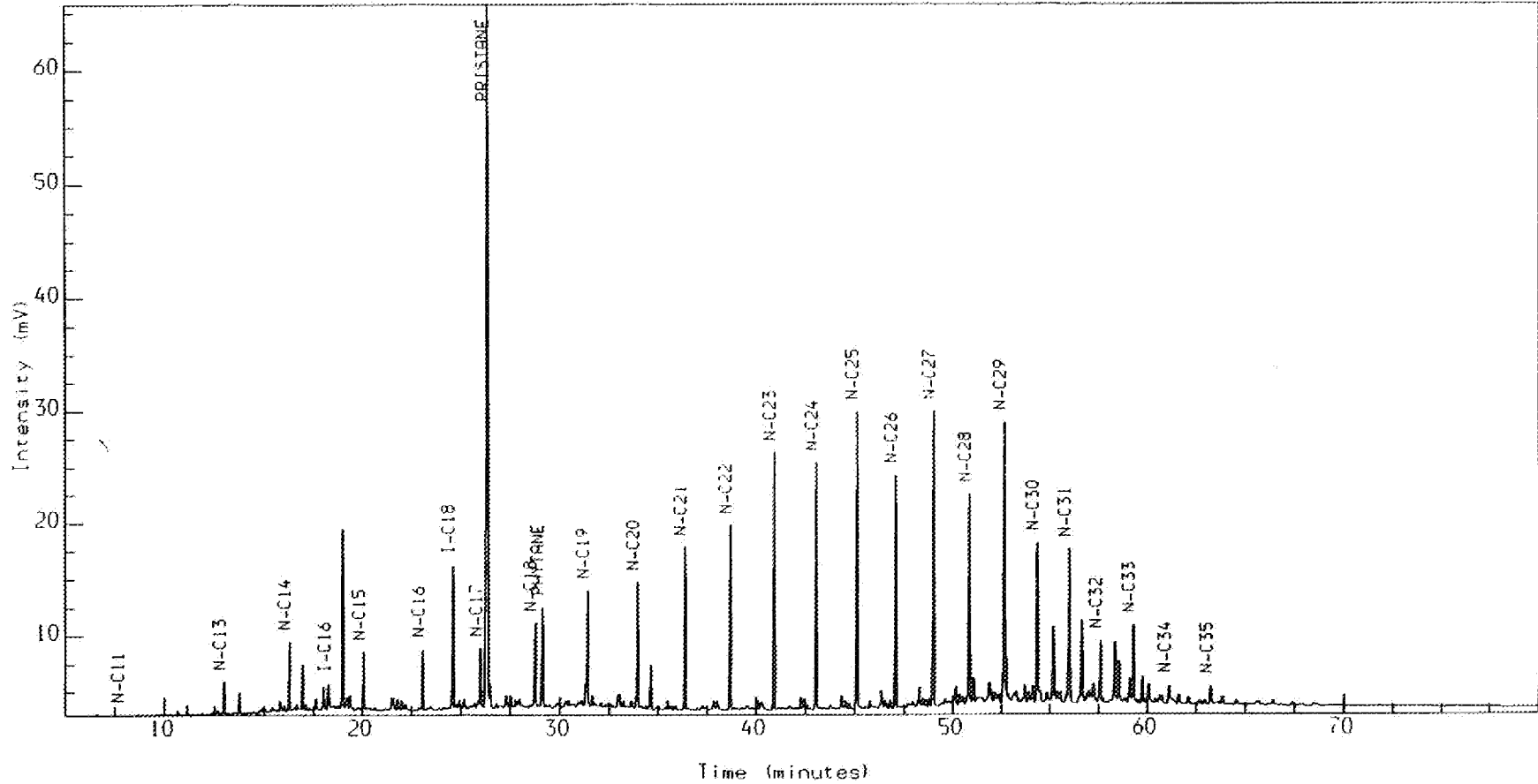
Reported on 11-NOV-1989 at 03:50

Analysis Name : [PETRO] 7 D300908_S.2.1.

2895.35 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 15-NOV-1989 at 15:44

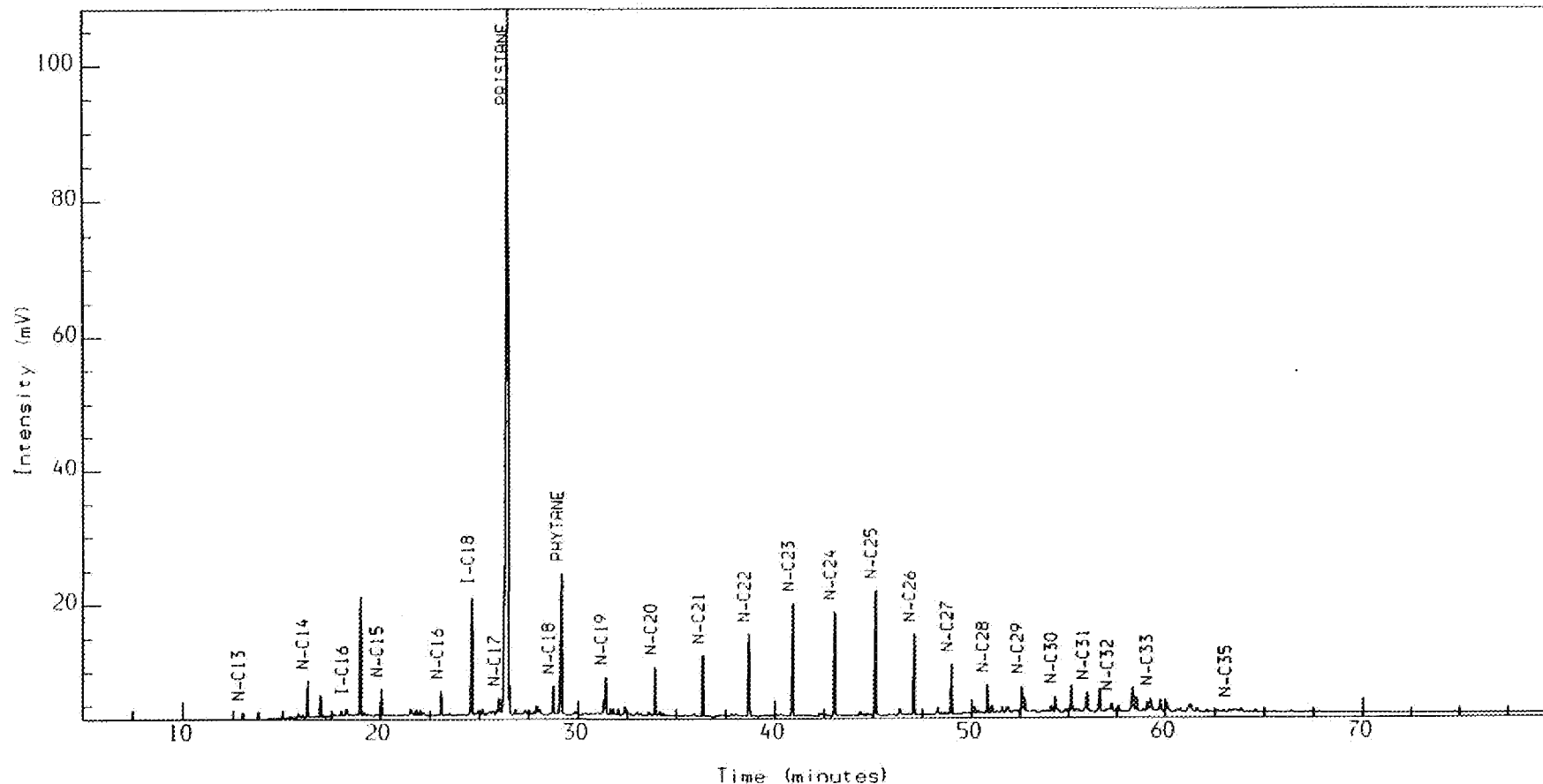
Reported on 15-NOV-1989 at 17:06

Analysis Name : [PETRO] 7 D300908_5.3.1.

2901.2 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 15-NOV-1989 at 17:16

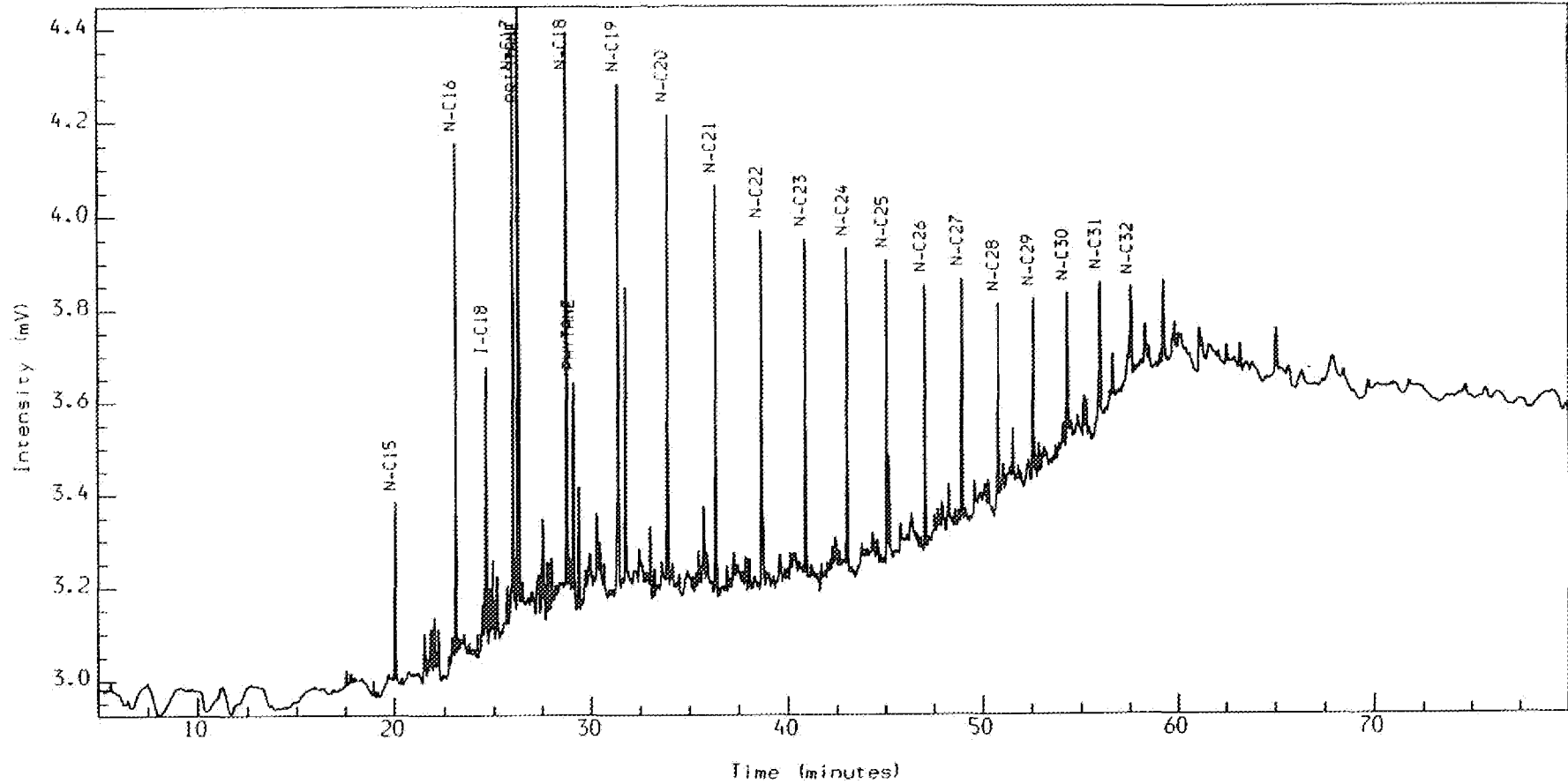
Reported on 15-NOV-1989 at 18:38

Analysis Name : [PETRO] 7 D300908_S.13.1.

2905.0 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 14-NOV-1989 at 08:34

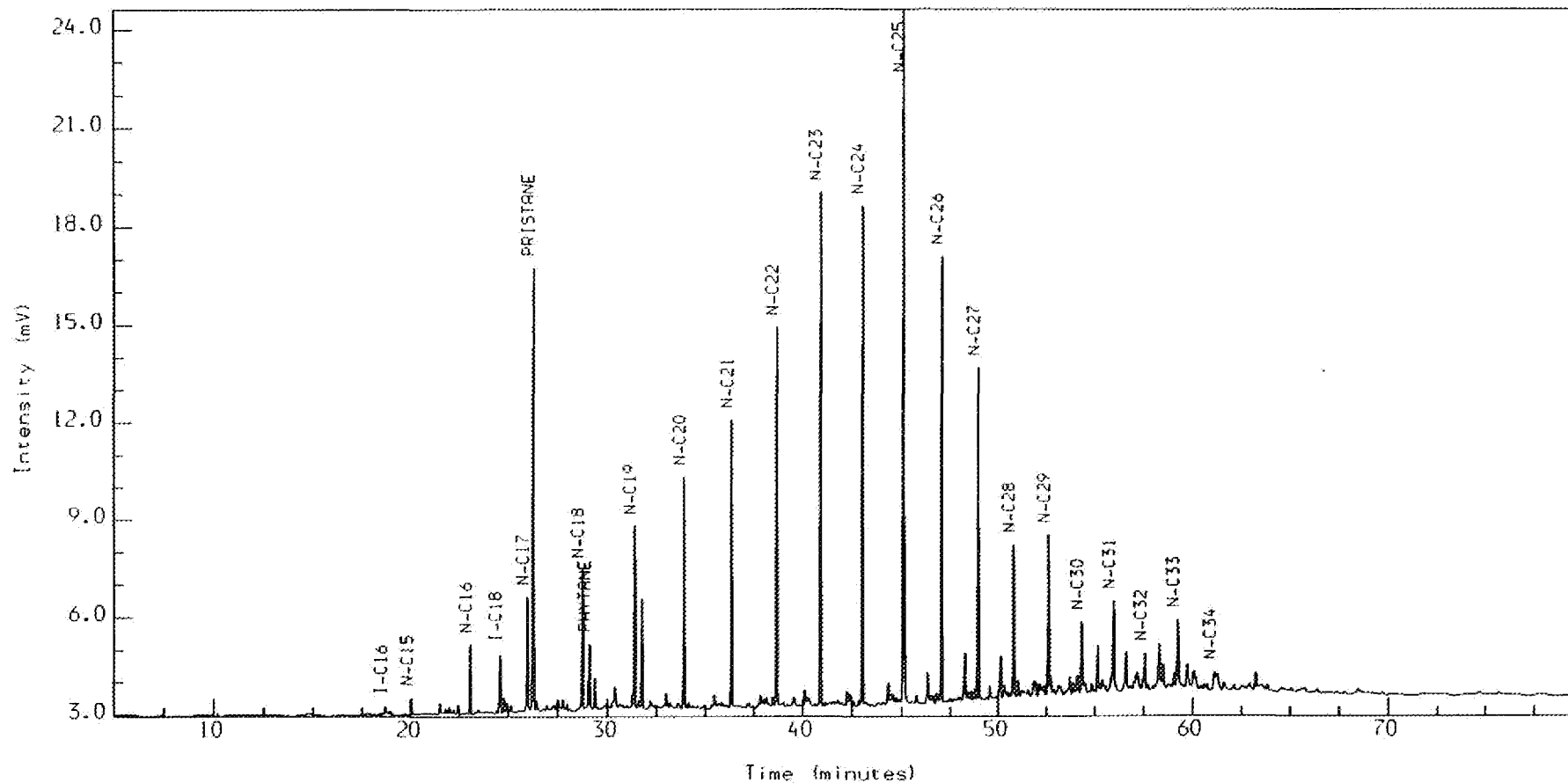
Reported on 15-NOV-1989 at 09:21

Analysis Name : [PETRO] 7 D300908_S.4.1.

2919.6 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 13-NOV-1989 at 18:47

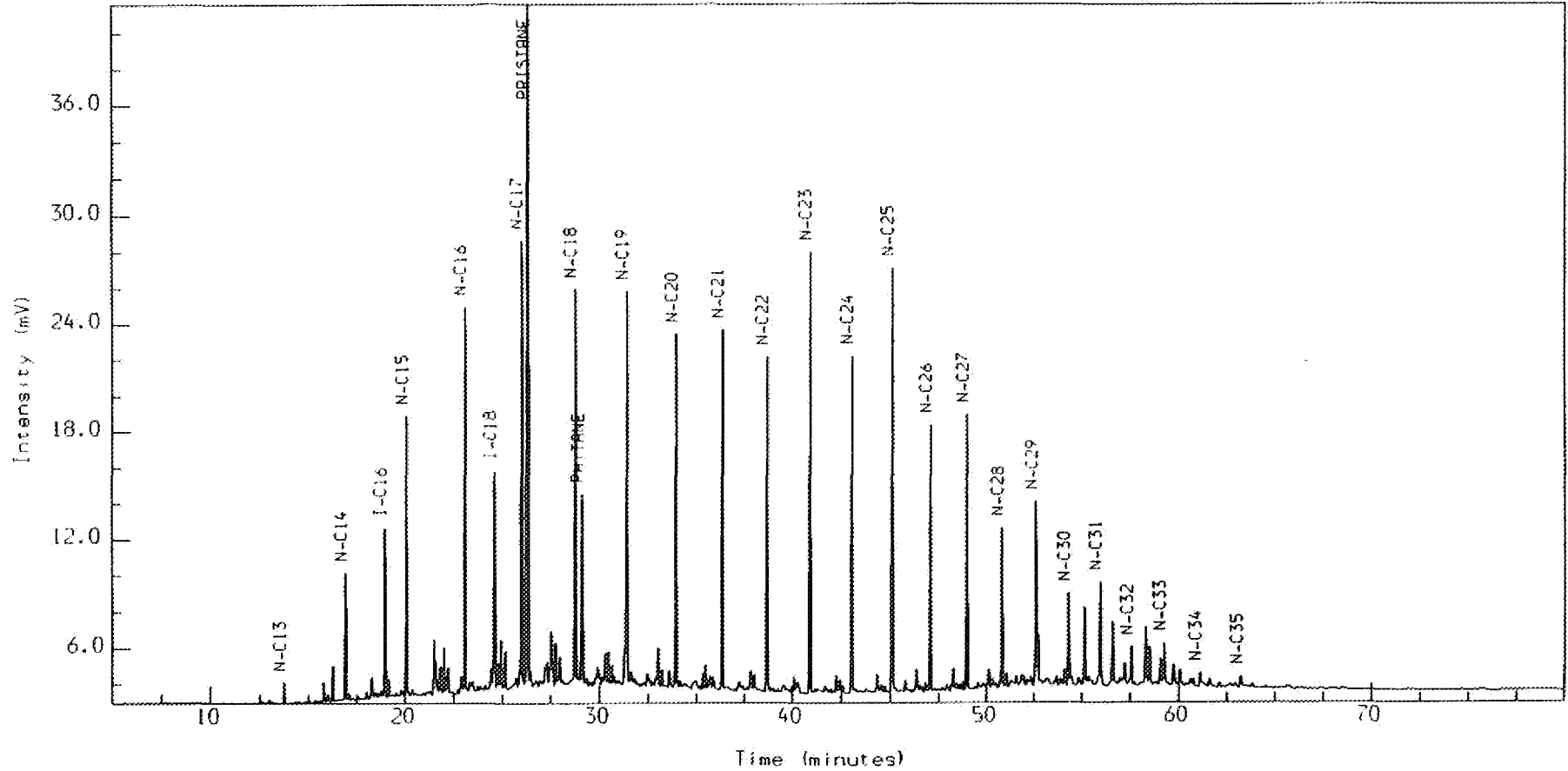
Reported on 13-NOV-1989 at 20:09

Analysis Name : [PETRO] 7 D300908_5.5.1.

2923.8 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 13-NOV-1989 at 20:19

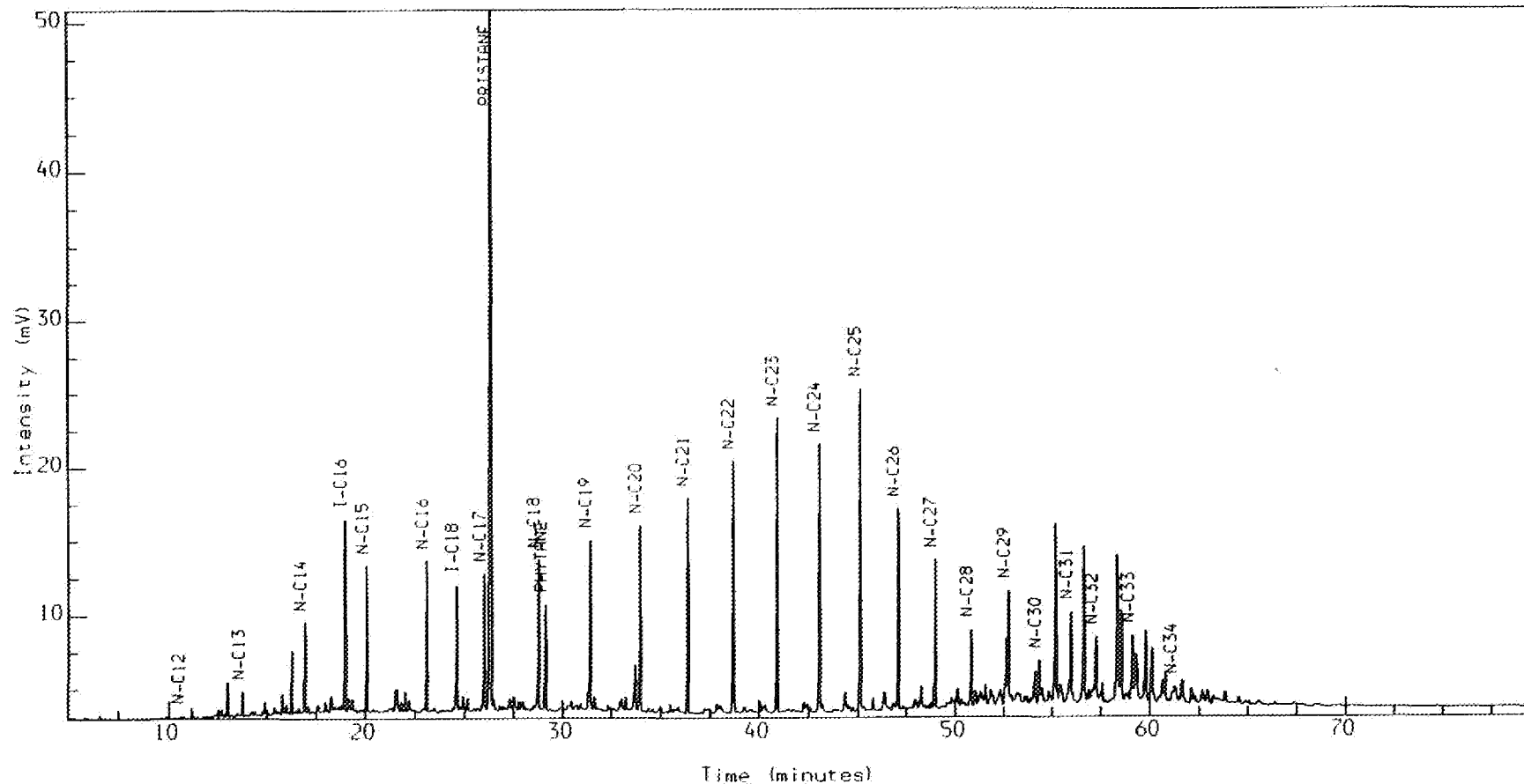
Reported on 13-NOV-1989 at 21:41

Analysis Name : [PETRO] 7 D300908_5.6.1.

2930.3 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 13-NOV-1989 at 21:51

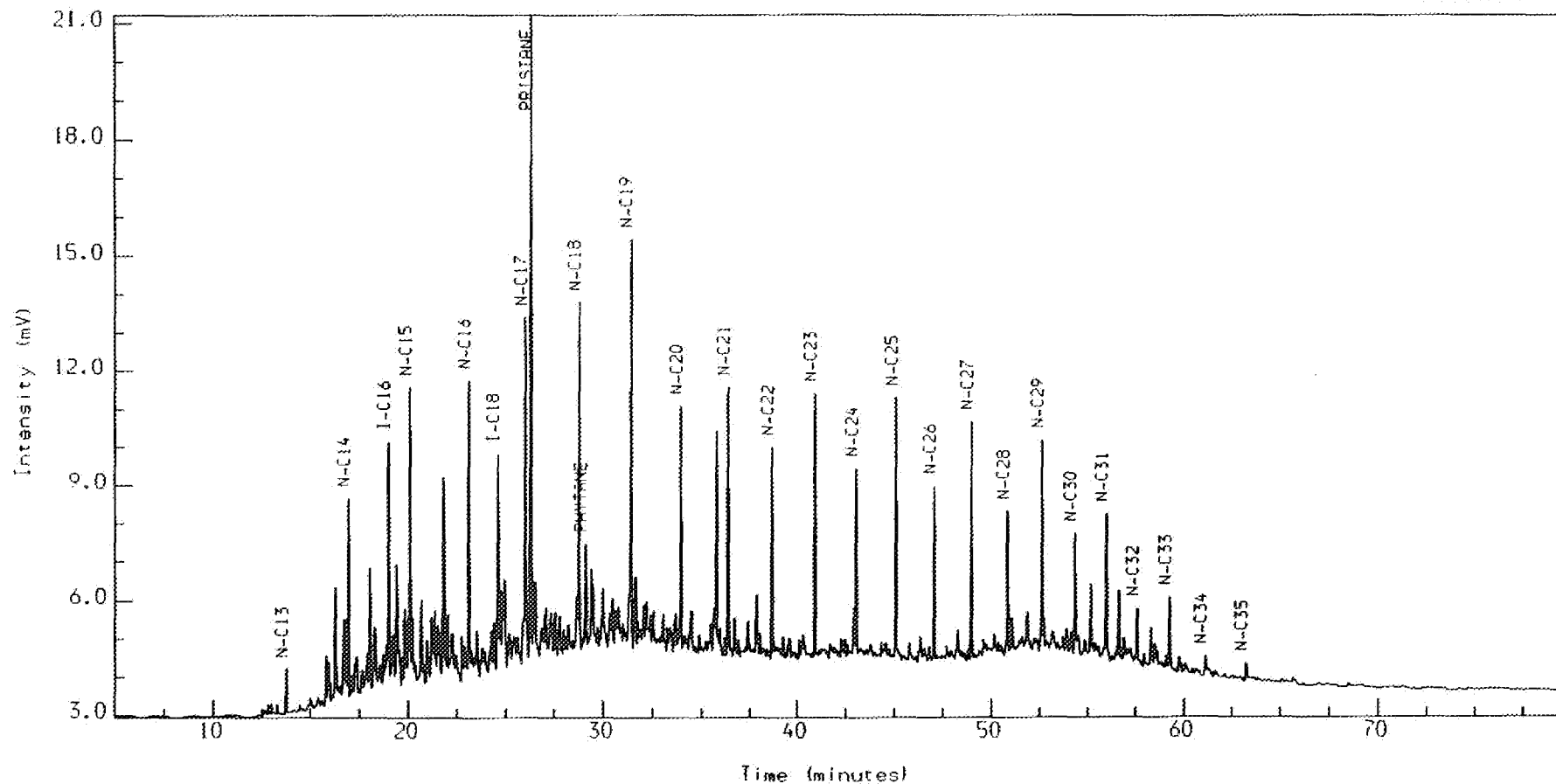
Reported on 13-NOV-1989 at 23:13

Analysis Name : [PETRO] 7 D300908_5.7.1.

3001 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Method : MSDS

Channel Title : MSD

Calibration : MSDS

Lims ID :

Run Sequence : MSDS

Acquired on 13-NOV-1989 at 25:25

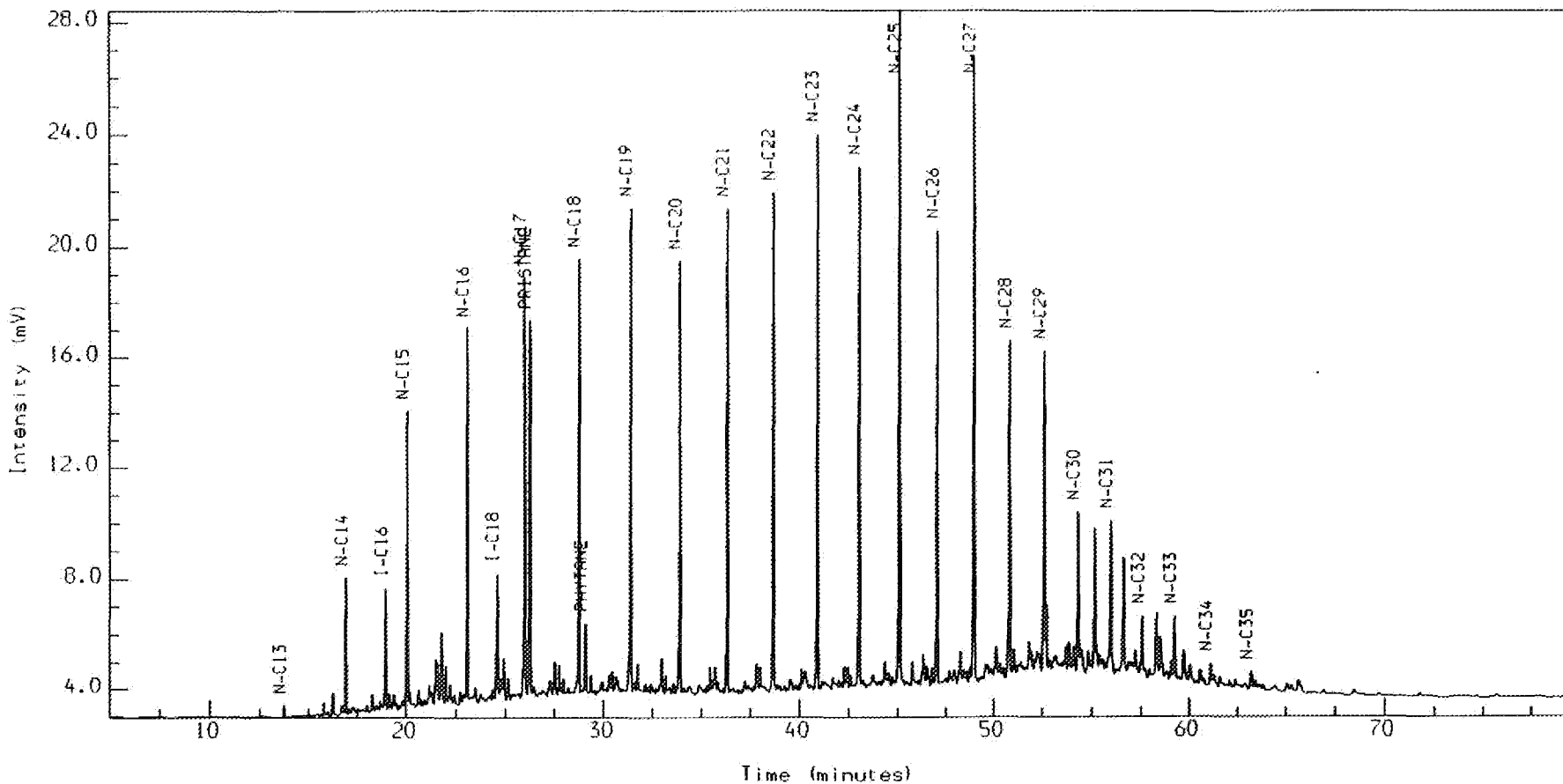
Reported on 15-NOV-1989 at 09:27

Analysis Name : [PETRO] 7 D300908_5.8.1.

3095 M

SATURATES PLOT

Multichrom



Instrument : HP5890

Channel Title : MSD

Lims ID :

Acquired on 14-NOV-1989 at 00:54

Reported on 14-NOV-1989 at 02:17

Method : MSDS

Calibration : MSDS

Run Sequence : MSDS