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GEOCHEMICAL LABORATORIES OF NORWAY A/S

GEOCHEMICAL ANALYSIS REPORT
WELL NOCS 30/6-9

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SUMMARY

Well NOCS 30/6-9 is situated in the southern part of the Oseberg Field area in the Norwegian sector of the North Sea.

Samples were analysed from the Cretaceous through the Jurassic and include the upper part of the Triassic.

The well is immature/moderately mature down to about 2850 m (in the Cook Fm.). It reaches the top of the oil window between 3200 m and 3300 m. Peak oil generation is estimated to be at roughly 3800 m (below TD of the well).

There are no reliable data for the source rock potential of the Heather Fm., and the Draupne Fm. is absent in this well. The Drake and Statfjord Fms. appear to have poor to fair (good?) potentials for generation of gas and possibly for small amounts of oil and waxy oil respectively.

The Ness and Etive Fms. contain an oil column. This oil seems to have been generated by Viking Graben Upper Jurassic source rocks at a maturity estimated to be roughly 0.9 % Ro (possibly equivalent to a depth of about 4500 m).

INTRODUCTION

The well NOCS 30/6-9 is situated in the southern part of the Oseberg Field area. It was drilled in 1982 and was suspended as an oil and gas find, having a TD of 3476 m (RKB) in the Triassic.

A total of 224 samples was collected at the Norwegian Petroleum Directorate in Stavanger including 53 core chip samples. The cuttings samples between 2405 m and 3475 m (RKB) were washed and lithologically described. The analysed interval is from 2405 m to 3475 m (RKB), including formations from the Upper Cretaceous to Triassic.

From the 224 samples examined, 98 lithologies from 96 samples were selected for screening analysis (TOC and Rock-Eval analyses). Based on the results of these, the following number of samples were selected for further analysis.

Thermal extraction - pyrolysis - gas chromatography	74 samples
Extraction, MPLC fractionation, saturated and aromatic hydrocarbon - gas chromatography	43 samples
Vitrinite reflectance microscopy	18 samples
Visual kerogen analysis	15 samples
Gas chromatography - mass spectrometry of saturated and aromatic hydrocarbons	7 samples
Isotope analysis of C_{15}+ fractions	7 samples

Sample lists and tabulated analytical results are displayed in the Appendix.

General well data is as follows:

Postition	:	$60^{\circ}30'03.46"N$, $2^{\circ}46'52.62"E$
Elevation	:	25 m AMSL
Water depth	:	107 m
Status	:	Suspended, oil and gas discovery

Based on information from well data summary sheet (vol 13) from NPD, the following general stratigraphic division of the well can be made (RKB depths):

	RKB
Upper Cretaceous	2280 - 2422.5 m
Lower Cretaceous	ABSENT
Upper Jurassic	2422.5 - 2458 m
Viking Group	2422.5 - 2458 m
Draupne Formation	ABSENT
Heather Formation	2422.5 - 2458 m
Middle Jurassic	2458 - 2620 m
Brent Group	2458 - 2620 m
Ness Formation	2458 - 2554 m
Etive Formation	2554 - 2620 m
Lower Jurassic	2620 - 3398.5 m
Dunlin Group	2620 - 3040 m
Drake Formation	2620 - 2820.5 m
Cook Formation	2820.5 - 2877.5 m
Burton Formtion	2877.5 - 2963.5 m
Amundsen Formation	2963.5 - 3040 m
Statfjord Formation	3040 - 3398.5 m
Triassic	3388.5 - 3476 m
Hegre Group	3388.5 - 3476 m
TD	3476 m

LITHOLOGY AND TOTAL ORGANIC CARBON CONTENT

Figure 1 shows the variation in TOC over the analysed interval of the well plotted with a generalised litholo-stratigraphic column.

Cretaceous (2280 - 2922.5 m)

Shetland Group (2280- 2422.5 m)

Two samples from the bottom 20 m of the Group were described and analysed. The section consists mainly of white chalky limestone and some medium grey shale. TOC analysis of these two lithologies was performed. The shale from 2400 m has a fair TOC content of 0.9 %. The carbonate from 2422 m is virtually barren of organic matter, with a TOC content of 0.1 %. The two samples were also heavily contaminated with cement from the casing point just above 2400 m.

Jurassic (2422.5 - 3388.5 m)

Viking Group (2422.5 - 2458 m)

Heather Formation (2422.5 - 2458 m)

Five samples were described and one sample was analysed. The samples consist mostly of cement, except for the deepest sample interval, which consists of a mixture of green-grey to medium grey shale and dusky yellow-brown siltstone. Besides cement, the other samples contain small amounts of these shale/siltstones. TOC content of the shale from 2455 m is fair at 0.75 %.

Brent Group (2458 - 2620 m)

Ness Formation (2458 - 2554 m)

Except for the top 4 metres, this interval was almost entirely cored. Fifty-four samples were described and thirty-five lithologies were analysed for TOC content. Thirty-five analysed samples were core chips. Eighteen cuttings samples were described in the interval, however, these are unrepresentative of the cored interval, since they consist mostly of contaminants, cavings and only small amounts of indigenous material. Therefore, analysis was restricted mainly to the core chips, apart from the coal from the top. The core samples consist of a mixture of brown-grey, dusky yellow-brown siltstone and shales, some dark grey to black and brown-black carbonaceous shales and coals as well as coarse grained light orange to orange-grey sandstones. Coals were found in the cuttings sample at 2460 m and in core chips from 2476 m, 2478 m, 2507.5 m and 2535 m. These coals are evidently not all "pure" coal, since TOC values range from 23.8 % to 75.5 %. Located above and below the coals at 2476 m and 2478 m are dark grey to brown-black siltstone/ silty shale sequences from 2470.36 m to 2474 m and 2480 - 2486.4 m. These have mainly rich TOC contents with values of approximately 5 % above the coal and from 1.1 % to 9.2 % below the coal. Below the coal sample at 2507.5 m there are brown-grey siltstone and black to brown-black carbonaceous shales from 2509.39 m to 2524.5 m. The TOC content of six samples depends on the content of carbonaceous material and ranges from 0.7 % TOC at 2509.39 m (?) to 7 % TOC at 2518.5 m. Interspersed throughut the formation are sandstones and siltstones with widely varying TOC contents, ranging from 0.1 % for a sandstone from 2488.4 m to 8.2 % TOC for a carbonaceous sandstone at 2546.4 m. Sandstone dominates the analysed samples between 2460 m to 2470 m (~ 0.6 % TOC), 2488 - 2500 m (0.1 - 1.3 %) and 2537 - 2547 m (0.9 - 8.2 %).

Etive Formation (2554 - 2620 m)

Thirty-two samples were described, eighteen of which were core chips. Fifteen core chip samples were analysed. The cuttings samples were not considered to be suitable for good analysis for the reason previously discussed. The samples consist of orange-grey to brown-grey to dusky yellow-brown sandstones with some finer grained silty sandstones and sandy siltstones. Some of the sandstones and siltstones are carbonaceous, hence the variation in TOC from 0.7 % to 4.4 %. The general TOC range of non-carbonaceous samples is from 0.7 % to 1 %. These values are quite high for sandstones and is partly due to oil staining.

Dunlin Group (2620 - 3040 m)

Drake Formation (2620 - 2820.5 m)

Forty-three samples were described and seven samples were analysed. The formation is considered to consist mainly of brown-grey to dusky yellow-brown siltstone and shales, with some thin carbonate layers throughout the sequence. Apart from three core chips from the top 4 metres of the formation, the rest of the samples are cuttings. The latter were heavily contaminated with mud additives and/or cement and in many cuttings samples representative lithologies were absent. Besides the core chip samples, only three representative shale samples were satisfactory for analysis from 2720 m, 2780 m and 2790 m. The TOC content of the shale/siltstone core chips and cutting samples is good to rich, with values ranging from 1.2 % to 4.2 %. Apart from the sample from 2720 m, the samples have rich TOC contents, 2.3 % to 4.2 %. One carbonate, a grey-red limestone from 2815 m, was also analysed, it has a TOC content of 0.8 %. The uniform log characteristics (gamma, resistivity and sonic) suggests that the shales/siltstones are fairly uniform in composition and it is suspected that most TOC values are probably in the range from 1 - 3 %. The shales in the lower part of the Drake Fm. (2780 - 2810 m) may be slightly richer than average based on low sonic velocities.

Cook Formation (2820.5 - 2877.5 m)

Eleven samples were described and six samples analysed. Only cuttings samples were available, these consisted mostly of medium grey and brown-grey shales and siltstones with trace amounts of sandstones. Mud additives are a less prominent component of these samples than in the Drake Fm.

Burton Formation (2877.5 - 2963.5 m)

Seventeen samples were described and eight samples were analysed. The dominant lithology in the cuttings samples is the same as in the Cook and Drake Fms., i.e. medium grey and brown-grey siltstones and shales, but there are minor white to light grey calcareous sandstones. The log characteristics also suggest a fairly uniform shale sequence. Two sandstone samples from 2880 m and 2920 m were analysed, they have 0.6 % and 0.8 % TOC respectively. TOC content of the dominant shale/siltstones is good and ranges from 1.4 % to 1.7 %. Mud additives contamination is a problem in a few samples.

Amundsen Formation (2963.5 - 3040 m)

Sixteen samples were described and six were analysed. The dominant lithology in the cuttings samples is the same as in the Burton Fm., i.e. medium grey and brown-grey siltstones and shales, but with substantial amounts of white to light grey calcareous sandstone towards the base of this formation. Again, wire line log characteristics suggest a fairly uniform shale sequence which presumably has thin beds of sandstone. One sandstone sample from 3025 m was analysed, it has a TOC content of 0.6 %. The dominant siltstone/shales have good TOC contents, which range from 1.1 % to 1.5 %. Mud additive contamination is heavy in most samples.

Statfjord Formation (3040 - 3388 m)

Twenty-seven samples were described and eleven samples were analysed. Most of the cuttings samples consist mainly of a mixture of white to light grey, calcareous sandstones and medium grey and brown-grey to dusky yellow-brown shales/ siltstones. There are some samples with abundant coals, particularly from 3170 m and 3197 m. Five sandstone samples from 3050 m, 3090 m, 3140 m, 3265 m and 3325 m were analysed. TOC contents range from 0.1 % to 0.8 %. The shales/siltstones have mainly good TOC values from 0.9 % to 1.8 %. Two coals from 3170 m and 3197 m were analysed. These have low TOC values for coals and are mineral-rich and can be regarded as coaly shales or carbargillites (TOC, 28.3 % and 42.4 %). Mud additive contamination is relatively light in this interval. Based on log characteristics, the same formation consists mainly of interbedded shales and sandstones.

<u>Triassic</u> (3388 - 3476 m, TD)

Hegre Group (3388 - 3476 m, TD)

Six samples were described and five samples were analysed. The samples are similar in composition to the Statfjord Fm. samples. This, and log characteristics suggest a similarly lithological sequence to the Statfjord Fm. Two sandstones from 3430 m and 3475 m were analysed, they have very low TOC contents of ~ 0.2 %. The TOC content of the shales is also less than in the Statfjord Fm., it is mainly fair and ranges from 0.7 % to 1.1 %.

ROCK-EVAL ANALYSIS

Ninety-eight samples were analysed. The data are listed in Table 2, Appendix 1. Production index is plotted in Figure 2, Tmax in Figure 3 and Tmax versus hydrogen index in Figure 4.

Kerogen Type and Richness
(Hydrogen Index, Oxygen Index and Petroleum Potential)

Cretaceous (2280 - 2422.5 m)

Shetland Group (2280 - 2422.5 m)

A medium grey shale from 2410 m and a white chalky limestone from 2422 m were analysed. Both have fairly high S_1 values relative to S_2, which probably indicates the presence of migrated hydrocarbons. S_2 values are less than 0.8 mgs HC/g rock and kerogen is type IV with hydrogen indices less than 100 and oxygen indices of 65 mgs CO_2/g TOC for the shales and 608 mgs CO_2/g TOC for the carbonates. The high value in the case of the carbonate is probably due to generation of CO_2 from the carbonate. These lithologies have no or slight gas potential.

Jurassic (2422.5 - 3388.5 m)

Viking Group (2422.5 - 2458 m)

Heather Formation (2422.5 - 2458 m)

Two samples of shale were analysed. These consisted mainly of green-grey to medium grey shales. The probable in-situ lithology of this formation, the dusky yellow-brown silty shales, are present in small amounts in the samples and was not analysed. The S_1 and S_2 values of the analysed shales is similar to the analysed Cretaceous shale.

Brent Group (2458 - 2620 m)

Ness Formation (2458 - 2554 m)

Nineteen shale/siltstones and five coals were analysed. The petroleum potentials (S_1 + S_2) of these samples vary from 1 - 177 mgs HC/g rock. The coals, i.e. those with TOC contents greater than 50 %, are rich, with petroleum potentials from 93 -177 mgs HC/g rock. Some of the shales/siltstones which are carbonaceous, have petroleum potentials from about 3 to 30 mgs HC/g rock. The kerogen type in most of these samples is type III. Hydrogen indices vary from 35 - 286, but most of the samples with > 1 % TOC have hydrogen indices from 100 - 200 mgs HC/gTOC. Exceptions are the coal from 2460 m and shale from 2482.17 m with hydrogen indices greater than 200, indicating that they contain type II/III kerogen. Shales between 2510 m and 2525 m have hydrogen indices less than 100, these may be regarded as having poor type III or type IV kerogen. The sandstones have widely variable TOC contents (see previous chapter) and also petroleum potentials which range from 0.5 to 8 mgs HC/g rock. The highest values occur in samples between 2530 m. Testing of hydrocarbon flow rates from the Brent Group after drilling the well showed that gas - condensate was produced above 2500 m and oil below 2540 m. It is suspected that the increase in petroleum potential at 2532.26 m, particularly S_1 (which increases from less than 1 mgs HC/g rock above 2530 m to > 1 up to 6 mgs HC/g rock below 2530 m) marks the approximate depth of the gas - oil contact. Some of the sandstones are carbonaceous, i.e. they have coaly layers or lenses e.g. at 2491.5 m (1.3 % TOC S_2 1.9 mgs HC/g rock) and 2546.4 m (8.2 % TOC, S_2=22.1 mgs HC/g rock). This carbonaceous material has a similar kerogen type to that in the coals in the formation. The oil-stained, non-carbonaceous sandstones below 2530 m have hydrogen indices from 140 - 270 mgs HC/g TOC, which would indicate the presence of type II/III kerogen in a shale, however, in this case the high hydrogen index is due to migrated asphaltenes in the oil. If the oil were to remain in-situ and reach higher maturities, it would presumably make these sandstones a fair source rock for condensate. The coals and shales are predominantly gas-prone, except for certain liptinite-rich beds which are probably condensate and waxy - oil-prone.

Etive Formation (2554 - 2640 m)

The sandstones in this formation have petroleum potentials ranging from 3.5 to 17.7 mgs HC/g rock. Excluding the highest value, which is partly due to the presence of coaly clasts within the sandstones, values mainly range from 7 - 11, of which more than 70 % consists of "free" hydrocarbons in the S_1. The S_2 in these samples probably consists mostly of migrated asphaltenes. This last conclusion is partly confirmed by the low Tmax values in these samples without indigenous carbonaceous material (i.e. 389 - 410^{o}C). These sandstones are similar in hydrocarbon potential to those in the lower part of the Ness Fm. (i.e. below 2530 m). The indigenous carbonaceous material in the sandstones is similar to that in the Ness Fm. coals and is mostly gas-prone.

Dunlin Group (2620 - 3388.5 m)

Drake Formation (2620 - 2820.5 m)

Siltstone core chips from the top metres of the Drake Fm. have petroleum potentials from 1.5 to 3.3 mgs HC/g rock and hydrogen indices from 34 to 71 mgs HC/g TOC.These siltstones have poor to fair kerogen type IV or III. These siltstones are poor and gas-prone.

The shale from 2720 m has similar Rock-Eval data and is also poor and gas-prone. In contrast, two shale/siltstone samples in the interval close to the base of the Drake Fm. have good petroleum potentials of 7.2 and 11.4 mgs HC/g rock and hydrogen indices of 272 and 309 mgs HC/g rock. The kerogen in these two samples is type II/III. This interval has shales/siltstones with good oil and gas potential. One of the thin carbonate beds was also analysed, this has no hydrocarbon potential.

Cook Formation (2820.5 - 2877.5 m)

The medium grey, brown-grey, silty shales and siltstones from this formation which were analysed have petroleum potentials from 2.8 to 6.9 mgs HC/g rock and hydrogen indices from 120 to 196 mgs HC/g TOC. Excluding the uppermost sample, which may include caved oil-prone Lower Drake Fm. shale/siltstone, the petroleum potentials range from 2.8 - 3.2 and hydrogen indices from 120 - 155. Oxygen indices are high in these samples, ranging from 82 - 100 mgs CO_2/g TOC. This suggests the presence of carbonates or oxidised carbonaceous material. In conclusion,therefore, the Cook Fm. shales/siltstones have a poor - fair gas potential.

Burton Formation (2877.5 - 2963.5 m)

The shales/siltstones in this sequence have a similar gas potential to that in the Cook Fm., with petroleum potentials from 2.5 - 4.2 mgs HC/g rock and hydrogen indices from 106 - 155 mgs HC/g TOC. Two sandstones were also analysed in this interval. They have much lower petroleum potentials than the Brent Gp. sandstones (~ 1 mg HC/g rock) of which > 50 % is

S_1. The low hydrogen index values for these sandstones (34 and 74 mgs HC/g TOC) suggests that asphaltenes are absent and that trace amounts of migrated light hydrocarbons (i.e. condensate range?) are present.

Amundsen Formation (2963.5 - 3040 m)

The shales/siltstones in this formation have a similar gas potential to the Burton Fm. (e.g. petroleum potentials 2.3 - 4.8 mgs HC/g rock and hydrogen indices fro 98 to 180 mgs HC/g TOC).

The analysed sandstone also has similar Rock-Eval data to the Burton Fm. sandstones and the same conclusions can be made.

Statfjord Formation (3040 - 3388.5 m)

The shales/siltstones in this interval have slightly more variation in petroleum potentials, ranging from 1.2 to 5.4 mgs HC/g rock, but hydrogen indices are similar (92 to 167 mgs HC/g TOC) to the Amundsen Fm. section. The more variable petroleum potentials are due to the presence of coaly clasts in some shales and a reduction in TOC towards the base of the formation. Carbargillites from 3170 m and 3197 m have rich petroleum potentials of 58.2 and 104.1 mgs HC/g rock and type III (hydrogen index 191, oxygen index 6) or type II/III (hydrogen index 229, oxygen index 6) kerogen respectively.

The coaly shales have mainly rich gas or gas - condensate potential. The poorer quality shales have poor - fair gas potential. Sandstones have similar Rock-Eval data to the Amundsen and Burton Fms. and presumably contain some migrated hydrocarbons.

Triassic (3388.5 - 3476 m, TD)

Hegre Group (3388.5 - 3476 m, TD)

Shales have low petroleum potentials in this interval, mainly less than 1 mg HC/g rock and type IV kerogen (hydrogen indices from 46 - 108 mgs HC/g TOC). These shales have a very poor gas potential. Sandstones may be lightly stained with migrated hydrocarbons since S_1 values are 70 - 95 % of total petroleum potential.

Generation and Migration
(Production Index, $S_1/(S_1+S_2)$)

The production index is fairly high throughout the analysed interval. Only in the lower Drake Fm. shale and in some coals is it below 0.15. It is considered that most of the analysed sequence is stained with migrated hydrocarbons. The main oil show sequence is in the Brent Gp. sequence from 2425.8 - 2620 m. In this sequence, particularly in the lower Ness and all the Etive Fm., sandstones are very heavily stained, with production indices up to 0.8. Less heavily stained are sandstones in the upper part of the Ness Fm. Less stained, but with fairly high production indices and S_1 values are shales, siltstones and sandstones from the Viking, Dunlin and Hegre Gps. Although, if diesel was used in the drillng mud, then all the staining, apart from the Brent Gp. section, could be contamination (however, see GC and GC-MS discussion).

Maturity (Tmax)

Assessment of maturity based on Tmax is difficult due to the oil staining. Many of the samples, particularly sandstones, have low Tmax due to the presence of migrated asphaltic material. Coals and shales with type III kerogen and S_2 values greater than 1 show a rough Tmax trend from 430 - 435°C at 2500 m to 435 - 440°C at 3000 m and 440 - 445°C at 3250 m. This places the base of the well within the oil window, i.e. approximately 0.6 - 0.7 % Ro. Figure 3b shows a plot of Tmax versus hydrogen index which apparently confirms this for samples with values close to an equivalent vitrinite reflectance of 0.6 %. Hydrogen indices greater than 100 mgs HC/g TOC in the Drake Fm. and Brent Gp. have lower Tmax than the most of the Statfjord Gp. shales and coals.

THERMAL EXTRACTION - GAS CHROMATOGRAPHY

Sixty-four samples were analysed by thermal extraction gas chromatography. Typical thermal extract chromatograms are shown in Figures 5.

Jurassic (2422.5 - 3388.5 m)

Viking Group (2422.5 - 2458 m)

Heather Formation (2422.5 - 2458 m)

No samples were analysed.

Brent Group (2458 - 2620 m)

Ness Formation (2458 - 2554 m)

Twenty-six samples consisting of shales, sandstones and coals were analysed. It is considered that most shales, siltstones and coals as well as sandstones are stained to some extent. The coals from 2476 m and 2478 m appear to be unstained, for example Figure 5a, which shows that aromatic hydrocarbons derived from mainly woody remains of higher plants completely dominate the thermal extract (including toluene, xylenes, naphthalene, alkyl naphthalenes, phenanthrenes and alkyl phenanthrenes). In contrast, the thermal extract of the coal from 2460 m (Figure 5b) has some of the characteristics of the migrated hydrocarbons seen in the sandstone from 2462.74 m (Figure 5c) and some of those of the coal from 2478 m (Figure 5a). The migrated hydrocarbons present in samples above 2430 m (e.g. Figure 5c) are dominated by a fairly light saturated hydrocarbon distribution ranging from nC_{12} - nC_{27} with a maximum at nC_{14}. Isoprenoids are fairly prominent in this distribution, with pristane/ nC_{17} and phytane/nC_{18} ratios of 0.71 and 0.64 respectively, suggesting a mature source for the hydrocarbons. The pristane/phytane ratio is ~ 1.9, which is not typical for highly anoxic marine deposits or for land plant dominated deposit. The distribution is more typical of highly mature marine source rocks deposited in relatively mild anoxic environments, i.e. condensate - light oils generated from type III or type II/III kerogens deposited in marine environments.

The thermal extract of the coal from 2460 m (Figure 5b) shows that saturated hydrocarbons seen in the sandstones and aromatic hydrocarbons seen in the unstained coal (Figure 5a) which are derived from woody remains of higher plants as well as spores, pollen and other herbaceous remains. The coals from 2507.5 m shows similar features to the coals at 2476 m and 2478 m, except that (Figure 5d) there is also a prominent n-alkane envelope from nC_{19} - nC_{33} with a distinct odd n-alkane preference. These n-alkanes are derived from waxy - cuticular material present in the coal.

Some of the siltstones which are poor in TOC do not show the hydrocarbon distribution seen in the coals or the migrated hydrocarbons. For example Figure 5e, which shows the thermal extract of the siltstone at 2480 m, consists of a lower molecular weight range of n-alkanes from nC_8 to nC_{16} (maximum at nC_{13}). These hydrocarbons are probably mainly migrated hydrocarbons. The lack of nC_{17} to nC_{27} alkanes, seen in the sandstones, is probably due to the low porosity/ permeability of the siltstones which prevents the larger molecules from entering the pores in the siltstones. The migrated hydrocarbons in the coals are probably due to staining of surfaces and in fractures. Shales with low TOC contents are less stained and mainly with n-alkanes from nC_{10} to nC_{15} due to lower porosities than the siltstones. The lack of in-situ derived hydrocarbons in the nC_5 - nC_7

range is probably due to poor kerogen and low maturity and the abundant migrated hydrocarbons mainly from nC_7 to nC_{20}.

The sandstone at 2488.4 m shows a slightly different hydrocarbon pattern to that at 2462.74 m, having a slightly narrower n-alkane distribution nC_{12} - nC_{22} with a maximum at nC_{17} instead of nC_{14}, whereas the sandstone at 2491.5 m is very similar to that at 2462.74 m. The sandstone at 2496.56 m is intermediate between the two types. At 2532.6 m and below, there is a significant change in hydrocarbon distribution in the sandstones. At and below this depth the thermal extracts are dominated by saturated hydrocarbons from nC_{12} to nC_{34}, with a maximum varying from nC_{14} to nC_{23}. There is a very slight even n-alkane preference between nC_{19} and nC_{27}, pristane/phytane is less than 1.5 and the pristane/nC_{17} and phytane/nC_{18} ratios are both about 0.5 or less (Figure 5f). The alkane and isoprenoids are superimposed on a large unresolved hump over the same range as the n-alkanes. The n-alkane and isoprenoid distribution suggests that these migrated hydrocarbons are derived from a peak oil window mature type II kerogen deposited in a highly anoxic marine environment. These hydrocarbons are typical of the oil within the main part of the oil column of the reservoir. The lack of light, i.e. C_1 - C_{15} hydrocarbons, is due to loss through evaporation incurred during storage of the core samples. In the case of the sandstone sample from 2546.4 m, the presence of nC_{10} - nC_{15} hydrocarbons as well as C_{15+} hydrocarbon is probably due to retention of the former as well as the latter on the abundant carbonaceous material in this sample.

The high pristane/phytane ratio and plentiful aromatics in this sample (Figure 5g) are probably derived from the carbonaceous material (higher plant-derived) in the sandstone.

Etive Formation (2554 - 2620 m)

Seven sandstones were analysed, the thermal extracts are similar to that seen in the low TOC sandstone from 2532.26 m and below in the Ness Fm. It indicates that the section which constitutes the main part of the oil column has a very similar hydrocarbon composition.

Dunlin Group (2620 - 3388.5 m)

Drake Formation (2620 - 2820.5 m)

Three shale/siltstone samples were analysed from the top and near base of the formation. The distribution of hydrocarbons seen in the thermal extracts is similar in all three samples. They are dominated by n-alkanes from nC_{10} to nC_{20} with a maximum at nC_{13} - nC_{14}, e.g. Figure 5h. There is slightly more of the low molecular weight n-alkanes in the core sample at the top of the sequence at 2620.5 m (and less isoprenoids) than in the two samples from close to the base. The similarity in hydrocarbon pattern would not be expected from the Rock-Eval results, which show that the basal shale/siltstones have type II/III kerogen, i.e. oil-prone, whereas the core chip from the top has type III or IV kerogen and is only gas-prone. It is suspected that the pattern is due to the migrated hydrocarbons similar in distribution to those in the Ness Fm. above 2532.26 m, i.e. light oil or condensate.

Cook Formation (2820.5 - 2877.5 m)

Three shale/siltstones were analysed. The hydrocarbon distribution is virtually the same as in the Drake Fm. samples and the same conclusions apply.

Burton Formation (2877.5 - 2963.5 m)

Six samples, two sandstones and four siltstones, were analysed. The hydrocarbon distribution is virtually the same in the siltstones as in the Cook and Drake Fm. samples and the same conclusions apply. The sandstones also have very similar hydrocarbon distributions to the siltstones. The main difference is a reduction in the low molecular weight n-alkanes, i.e. nC_{10} - nC_{16} relative to the higher molecular weight n-alkanes, i.e. nC_{17} - nC_{22}. This is presumed to be due to greater relative loss during storage of the low molecular weight compounds from the sandstone compared with that from the siltstone, which is caused by the higher porosity of the sandstones, permitting more of the low molecular weight n-alkanes to evaporate.

Amundsen Formation (2963.5 - 3040 m)

Five samples, one shale, three silty shales and a sandstone, were analysed. The same conclusions made from the thermal extracts of samples from the Burton Fm. can also be applied to the Amundsen Fm. samples.

Statfjord Formation (3040 - 3388.5 m)

Ten samples, including two coals, four shales/siltstones and four sandstones, were analysed. In the shales/siltstones and sandstones there is very little difference in hydrocarbon pattern to that in the overlying Dunlin Gp. formations, except that shales and sandstones appear to be richer in nC_{12} - nC_{16} alkanes than higher up the sequence (for example, compare the thermal extracts of the sandstones from 3265 m (Figure 5i) and that from the Amundsen Fm. at 3025 m (5j). The reason for this is difficult to explain from porosity differences alone.

The two analysed coals have similar thermal extracts in which the dominant hydrocarbons are aromatics derived from woody higher plant material, but also show n-alkanes from nC_{20} - nC_{30}, which may be due to staining rather than in-situ generation (Figure 5k).

Triassic (3388.5 - 3476 m, TD)

Hegre Group (3388.5 - 3476 m, TD)

Four samples were analysed, including two sandstones and two shales. Both shales show a distinctly narrower n-alkane distribution than most of the Statfjord Fm. shales, except for the deeper samples from the latter Fm. This also appears to be the case for the sandstones and suggests perhaps that the hydrocarbons are from a different source, or the same source but more mature. There also appear to be more isoprenoids relative to n-alkanes in the sandstones (e.g. Figure 5l), which is probably due partly to the higher porosity of sandstones and perhaps preferential loss of n-alkanes over isoprenoids?

PYROLYSIS - GAS CHROMATOGRAPHY

67 samples were analysed. Typical pyrograms can be seen in Figure 6 and a pyrolysis products triangle in Figure 7. Pyrolysis GC data are listed in Table 3, Appendix 1.

Jurassic (2422.5 - 3388.5 m)

Viking Group (2422.5 - 2458 m)

Heather Formation (2422.5 - 2458 m)

No samples were analysed.

Brent Group (2458 - 2620 m)

Ness Formation (2458 - 2554 m)

The pyrograms of the shales, siltstones and coals confirm the Rock-Eval hydrogen indices that generally they are mostly gas-prone. Examples of pyrograms of gas-prone coals and shales/siltstones are shown in Figures 6a and 6b. In the coal sample (hydrogen index 130) the main pyrolysis products are C_1 - C_5 hydrocarbons, toluene, xylenes and certain polar compounds which probably include phenol and alkyl phenols and finally naphthalene plus C_2 - C_3 alkyl naphthalenes (Figure 6a). There is an unresolved hump which, though not prominent in the pyrogram, makes up 45 % of total pyrolysis products. These are probably mostly aromatics and NSO compounds.

The second example (Figure 6b) is a gas-prone siltstone (hydrogen index 186). In the pyrogram there is an appreciable amount of the alkene/alkane doublets from C_5 to

C_{20} and with n-alkanes up to C_{30}. The aromatic compounds seen in the coal sample are also present, but the polar compounds are less abundant. Besides, the difference in organic matter abundance (1.1 % in siltstone, 7.5 % in coal). The main differences are in abundance of unresolved material and polar compounds. The abundance of straight chain hydrocarbons is low in the coal, but alkene/alkanes are present, though they are much less prominent relative to polar products and unresolved material in the coal than in the siltstone. The difference in organic matter composition is probably caused by the coal being rich in vitrinite/inertinite derived mainly from woody remains of higher plant, whereas in the siltstone organic matter consists mainly of more resistant material (to oxidation, microbial degradation etc.) such as spores/pollen, inertinites and cuticular material. In isolated cases the organic matter in the Ness Fm. is rich in liptinites and this can be seen in the two pyrograms in Figures 6c and 6d. The carbargillite (Figure 6d) is richest in TOC of these two samples. Based on Rock-Eval hydrogen index, the carbargillite is gas-prone (HI=77 mgs HC/g TOC) and the shale is oil-prone (HI=286 mgs HC/g TOC). However, the pyrograms show fairly similar pyrograms. They both show prominent extended series of alkene/alkanes from C_5 - C_{30}, abundant xylene, toluene and the alkyl naphthalenes. The main difference in the pyrograms appears to be the abundance of polar compounds in the nC_{16} - nC_{12} alkane range. The prominent alkene-alkane series is presumably due to liptinite components such as algae, spores/pollen and cuticles preserved in an anoxic coal forming environment. In the case of the coal, presumably more woody material of higher plants has been preserved, indicated by the increase in polar products.

The pyrograms of the sandstones show two main patterns. Above 2532.26 m sandstones have pyrograms dominated by aromatics (e.g. Figure 6e), although minor amounts of alkenes and alkanes from C_6 - C_{18} are present. Below and including 2532.26 m, alkene-alkane doublets are predominant, although xylenes and toluene are still abundant (e.g. Figure 6f) and there is a prominent unresolved hump. The sandstones below 2532.26 m are interpreted to be rich in asphaltenes, whereas above that depth asphaltenes are virtually absent. This observation correlates with the production testing results when above 2500 m gas - condensate was recovered, whereas below 2537 m oil was recovered.

Figure 6g shows the pyrogram of the oil stained sandstone from 2546 m. In this virtually no alkene/alkanes are visible and the dominant features of the chromatogram are C_1 - C_5 hydrocarbons, toluene, xylenes, polar compounds plus a large unresolved hump. This sandstone is rich in carbonaceous material (TOC 8.2 %). The main pyrolysis products of this are those mentioned above and are typical for woody remains of higher plants. The asphaltene content of the oil is a fairly minor component in comparison to the carbonaceous content. Therefore, the alkene/alkane doublets are much less prominent.

Etive Formation (2554 - 2620 m)

Seven sandstones were analysed. The pyrograms are all fairly similar to the pyrogram of the sandstone from 2544 m in the Ness Fm. and are interpreted as being primarily representative of the asphaltenes present in the oil. One characteristic of the pyrogram is the distinct preference for alkenes over n-alkanes between C_6 and C_{15}, e.g. Figure 6h, which is taken as an indicator of the presence of asphaltenes.

Dunlin Group (2620 - 3388.5 m)

Drake Formation (2620- 2820.5 m)

Three shale/siltstones were analysed. One siltstone core chip sample from near the top of the formation at 2620.5 m and two siltstone/shale cuttings samples from near the base of the formation at 2780 m and 2790 m. The siltstone from the top of the Drake Fm. contains kerogen type IV or poor type III based on a hydrogen index of 71 mgs HC/g TOC. However, the pyrogram (Figure 6i) suggests that the kerogen has some, although minor, liquid hydrocarbon potential. This is indicated by the series of alkene/alkane doublets from C_5 - C_{30} in which alkanes are generally more abundant than alkenes and the aromatics, toluene and xylene, are prominent. It requires only trace amounts of liptinite for the alkene/alkane doublets to be prominent in a kerogen which probably consist mainly of inertinites and other refractory organic matter (i.e. resistant to oxidation, microbial degradation etc., during and immediately after deposition).

In contrast, the shale/siltstones from near the base of the formation have type II/III kerogen according to the Rock-Eval hydrogen indices of > 200 mgs HC/g TOC. Alkene-alkane doublets from C_5 to C_{30} are a major component and there is a distinct unresolved hump (Figure 6j). Prist-1-ene is present, but as a very minor component. The distribution is typical for mature marine type II kerogen. However, the lack of prist-1-ene and fairly high C_1 - C_5 content, ~ 15 - 16 %, low S_2 (< 10) and fairly low hydrogen index indicate a poorer quality kerogen than in marine type II kerogen. The reason for this lower quality is probably due to relatively mild anoxia during deposition, i.e. waters were probably not anoxic and full anoxic conditions only developed within the sediment.

Cook Formation (2820.5 - 2877.5 m)

Three shale/siltstones were analysed. The uppermost sample from 2825 m may have caved lower Drake Fm. shales with type II/III kerogen, since the pyrograms of the samples are similar. However, the other two Cook Fm. samples more closely resemble the pyrogram of the upper Drake Fm. sample.

This is taken to be due to similarity in organic matter rather than the presence of cavings (the well was cased below the upper section of the Drake Fm.). The pyrolysis products suggest that the kerogen is mainly gas - condensate prone (e.g. Figure 6k).

Burton Formation (2877.5 - 2963.5 m)

Six samples were analysed, four siltstone/shales and two sandstones. The pyrograms of the former are similar to the Cook Fm. samples, except that there appears to be slightly more C_1 - C_7 hydrocarbons in the Burton Fm. samples (e.g. Figure 6l). The shales/siltstones have gas and condensate potential. The sandstone pyrograms are dominated by benzene, toluene, xylenes and a few other peaks in the C_1 - C_6 range. Alkene/alkane doublets are also fairly prominent components in the range from C_6 - C_{20}. In the range C_6 to C_{10} the alkenes are much larger than the corresponding n-alkane (Figure 6m). The sandsones contain residual migrated hydrocarbons of condensate to light oil range. The alkene/alkane doublets may be due to traces of asphaltenes present in this oil.

Amundsen Formation (2963.5 - 3040 m)

Four siltstone/shales and a sandstone were analysed. The pyrogram of the sandstone is similar to that of the Burton Fm. sandstones and the same conclusions apply. The siltstones/shales pyrograms from 2965 m and 2985 m are similar in pattern to those in the Burton Fm. and have the same hydrocarbon potential, i.e. gas - plus minor condensate. In the two samples from below 2000 m, aromatics are much more prominent relative to the alkene/alkanes (Figure 6n), which suggests a reduction in kerogen quality toeards a mainly gas-prone kerogen.

Statfjord Formation (3040 - 3388.5 m)

Ten samples, including two coals, three sandstones and five shale/siltstone, were analysed. The sandstones have similar pyrograms to those in the Burton and Amundsen Fms., except that the alkene/alkane homology is less pronounced, due probably to a decrease in asphaltenes? The siltstone/shales, excluding one sample from 3325 m, have similar pyrograms to those from the Amundsen Fm., which indicates that they have mainly gas potential. The sample from 3325 m has a pyrogram dominated by C_1 - C_5 hydrocarbons plus xylenes with trace amounts of higher molecular weight aromatics plus alkene/ alkane up to nC_{12}. This shale has a poor gas-prone kerogen.

The two coals or carbargillites (< 50 % TOC) from 3170 m and 3197 m have similar pyrograms. These are typical of coals which have a fair liptinite content. The main features (Figure 6o) are abundant C_1 - C_5 hydrocarbons, toluene and xylenes, alkyl naphthalenes and polar compouds, all derived mainly from the woody remains of higher plants and also spores and pollen. In addition, there is a prominent series of alkene-alkane doublets from C_5 - C_{30}, in which C_{15} - C_{30} compounds are almost as abundant as the cuticular and cuticular wax from higher plants (particularly the low alkene to alkane ratio from C_{10} to C_{30}). These carbargillites are gas - condensate-prone with probably minor potential for waxy oil.

<u>Triassic</u> (2288.5 - 3476 m, TD)

Hegre Group (3388.5 - 3476 m, TD)

Four samples, including three shale/siltstones and a sandstone, were analysed. The shale/siltstones have pyrograms dominated by C_1 - C_7 hydrocarbons and are clearly poor gas-prone source rocks. The sandstone is virtually barren of any organic material, since only trace amounts of C_1 - C_5 were generated.

Figure 7 shows a triangular plot of pyrolysis products in the ranges C_1 - C_5, C_6 - C_{14} and C_{15}+.

EXTRACTION DATA

Thirty-three samples were extracted, fractionated and the hydrocarbons analysed by gas chromatograms. The data are listed in Tables 4a-e, Table 5 and Table 6, all in Appendix 1. The data are plotted in Enclosure 2. The chromatograms are in Appendix 4. Typical saturated chromatograms are shown in Figure 8 and typical aromatic chromatograms in Figure 9.

Jurassic (2422.5 - 3388.5 m)

Viking Group (2422.5 - 2458 m)

Heather Formation (2422.5 - 2458 m)

No samples were extracted.

Brent Group (2458 - 2620 m)

Ness Formation (2458 - 2554 m) and
Etive Formation (2554 - 2620 m

Seventeen core chip samples were extracted. These included five sandstones, two from the gas column and rest from the oil column, two coals (> 50 % TOC), two carbargillites (20.6 % and 30.2 % TOC), seven black or dark grey, brown-grey shales/siltstones with TOC from 1 to 2 %.

The amount of EOM in the sandstones increases dramatically within the oil column, as might be expected. In the gas column EOM contents increase downhole from 953 ppm at 2468.3 m to 2061 ppm at 2491.5 m to 3533 ppm near the gas - oil contact at 2532.26 m. There is marked increase in the sample at 2537.65 m to 7525 ppm and 12422 ppm at 2544 m.

(Between 2544 and 2602.74 m EOM contents range from 9491 - 12864 ppm. The sandstone below this at 2616.33 m has a decreased EOM content of 4834 ppm. Content of saturated and aromatic hydrocarbons follows the same trend, i.e. 536 -2741 ppm in the gas column sandstones, as from 5644 to 10221 ppm HC in the oil column).

The lowest sandstone has only 4235 ppm extractable hydrocarbons. The content of non hydrocarbons, including NSO and asphaltenes, shows a fairly distinct trend with less than 1000 ppm down to 2532.26 m and from 1000 - 3000 ppm between 2537.65 m to 2602.74 m. The lowest sample also has less than 1000 ppm non hydrocarbons. The low content of hydrocarbons and particularly non hydrocarbons in the deepest sample from 2616.33 m may indicate that the bottom few metres of the Etive Fm. sandstones are below the oil - water contact, or for some other reason the asphaltic content is much lower in the oil at the base of the formation.

The saturate to aromatic ratio in the sandstones varies from 1.1 in the gas zone to 2.4, but most values are from 1.5 to 1.9, making the oil fairly aromatic rich.

The amount of EOM in carbonaceous shales and coals depends on three factors, amount of organic matter, type of organic matter and degree of staining by migrated hydrocarbons. The two most important are the first and last factors. For example, the coals have very high TOC contents and correspondingly high EOM contents (> 50 % TOC > 50000 ppm EOM), while the siltstone from 2541 m has only 1 % TOC and a high EOM content of 3492 ppm compared with shale from 2515.5 m with a TOC of 1.8 % and only 785 ppm EOM. The indigenous organic matter in all the shales and coals in the Brent Gp. is relatively immature and consists mostly of type III kerogen and therefore should be poor in saturated relative to aromatic hydrocarbons. The degree of staining can be roughly gauged from the saturate to aromatic ratios and percentage of hydrocarbons. For many of the richer shales and the coals, the saturate to aromatic ratio is less than 1, suggesting they are not heavily stained, but the overall percentage of hydrocarbons is fairly high in most shales, >40 % up to 80 % and it is probable that they are all stained to some extent.

Dunlin Group (2620 - 3388.5 m)

Drake Formation (2620 - 2820.5 m)

Two shale/siltstone samples from near the base of the formation (2720 - 2790 m) were analysed. These have type II/III kerogen based on Rock-Eval and pyrolysis-gc results. The amount of EOM is very similar in both (2395, 2417 ppm EOM) and suggests a rich source rock. Amounts of extractable hydrocarbons are 1562, 1868 ppm HC and comprise more than 60 % of total EOM. This is high for what are regarded as moderate - early mature type II/III kerogens and this is presumably due to the presence of migrated hydrocarbons or a contaminant source of hydrocarbons such as diesel used in the drilling mud.

Cook Formation (2820.5 - 2877.5 m)

One shale was analysed from 2865 m. The amount of EOM and extractable hydrocarbons is similar to that of the Drake Fm. samples (2523 ppm EOM, 1822 ppm HC), but the percentage of saturated hydrocarbons relative to aromatics is much higher (saturate/aromatic ratio is 5.5 compared to 1.5 and 1.8 in the Drake Fm. samples). This shale is stained with migrated hydrocarbons and probably more so than in the Drake Fm., where in-situ generated hydrocarbons have contributed more to the total EOM (the kerogen is more oil-prone in the Drake Fm. shales).

Burton Formation (2877.5 - 2963.5 m)

One siltstone sample was analysed, although this sample, from 2965 m, includes material from both Amundsen and Burton Fms. The amount of EOM is similar to that in the Cook Fm. shale (2816 ppm EOM compared with 2523 ppm EOM). The amount of extractable hydrocarbons is much less (1141 ppm compared to 1822 ppm HC). Saturate to aromatic ratio is very high, so that the hydrocarbons are probably mainly migrated.

Amundsen Formation (2963.5 - 3040 m)

Two shale/siltstone samples were analysed. The TOC content and kerogen type is similar to those of the Cook and Burton Fm. samples, but the amount of EOM is higher (3181 ppm and 3815 ppm EOM). Only in the sample from 3020 m is the amount of extractable hydrocarbons any higher (2947 ppm HC). Saturated hydrocarbon content is markedly higher than in the Cook Fm. samples. In both cases saturate/aromatic ratios are high and the hydrocarbons are probably mainly migrated or possibly contaminants.

Statfjord Formation (3040 - 3388.5 m)

Three samples were analysed. A sandstone from 3090 m, a coal from 3170 m and a shale from 3325 m.

The coal, as expected, has the largest EOM content (17267 ppm EOM) compared with the shale (3147 ppm EOM) and sandstone (1624 ppm EOM). The sandstone has almost as much saturated hydrocarbons as the coal (920 ppm SHC compared with 1393 ppm SHC), but much less of the aromatics (162 ppm AHC compared with 2709 ppm AHC). This is due to the nature of the organic matter. In coals hydrocarbons are often aromatic rich, in the sandstone the hydrocarbons have either migrated from a very mature source (based on the very high saturate/aromatic ratio of 5.7) or is from contaminant hydrocarbons used as a mud additive.

The content of extractable hydrocarbons in the shale from 3325 m is very low (456 ppm EHC), but NSO content is very high and aromatic hydrocarbons are much more abundant than saturates (saturate/aromatic ratio is 0.2). This suggests either a very poor kerogen type from which saturated hydrocarbons cannot be generated, but normally neither can NSO compounds. It may be that the EOM consists mostly of the heavy residue of migrated hydrocarbons (or possibly is affected by some mud additive such as asphalt?).

Triassic (3388.5 - 3476 m, TD)

Hegre Group (3388.5 - 3476 m, TD)

Two samples, a sandstone (3430 m) as a shale (3475 m), were analysed. The shale sample has a similar EOM and extractable hydrocarbon content (2214 ppm EOM, 1285 ppm HC) as the Cook and Burton Fm. shale/siltstones and presumably is also stained with a saturated hydrocarbon-rich migrated oil or contaminant. The sandstone has a much lower EOM than other sandstone higher in the sequence (414 ppm EOM, 311 ppm HC compared with > 1000 ppm EOM and 1000 ppm HC), however, normalised to TOC the values indicate the sandstone (173 mgs EOM/g TOC and 130 mgs HC/g TOC) is still stained.

Saturated Hydrocarbons

Jurassic (2422.5 - 3388.5 m)

Viking Group (2422.5 - 2458 m)

Heather Fm. (2422.5 - 2458 m)

No samples were analysed.

Brent Group (2458 - 2620 m)

Ness Formation (2458 - 2554 m)

Sixteen samples were analysed.

Many of the shales, siltstones and coals are stained by migrated hydrocarbons, so that the dominant saturated hydrocarbon distribution is very front-end biased with a maximum between nC_{13} - nC_{17}. The main n-alkane envelope in this is from nC_{11} to nC_{20}, e.g. the coal from 2460 m (Figure 8a) and shale from 2474 m (Figure 8b). In some samples indigenous hydrocarbons are visible, such as in the coal from 2507.5 m (Figure 8c). In this sample the oil/condensate staining is still evident from the n-alkanes between nC_{12} to nC_{16}, the high pristane/phytane ratio of 5.3 is typical for a coal sample due to the land plant input and environmental condition. Also typical of an immature - moderate mature sediment with mostly higher plant remains is the prominent n-alkane envelope from nC_{18} - nC_{35}, with strong odd n-alkane preference over the same range. The low pristane/phytane ratio of the coal at 2460 m is more in character with staining from the oil than condensate. This may represent a separate isolate oil section?

Figures 8d and 8e show saturated hydrocarbon gas chromatograms of typical examples of the migrated hydrocarbons in the gas - condensate interval and the oil zone respectively. The main differences between the two are the more prominent nC_{20} - nC_{30} range and slightly lower pristane/phytane ratio of the oil compared with the condensate (1.5 compared with 2). Condensate-range hydrocarbons appear to be present in siltstones in the oil interval. This distribution may be due to the porosity of the siltstones in the oil interval. This distribution may be due to the porosity of the siltstone being sufficient to retain the lower molecular weight hydrocarbons but not the higher molecular weight hydrocarbons of the oil.

Etive Formation (2554 - 2620 m)

The distribution of saturated hydrocarbons in the five analysed sandstones is similar to that of the sandstone in the Ness Fm. from 2544 m, except that the pristane/phytane ratio is lower (1.2 - 1.4 compared with 1.5). The analysed sandstone from 2616.33 m near the base of the formation shows a slightly different n-alkane distribution to the other sandstones in that there are less n-alkanes from nC_{15} - nC_{20} relative to nC_{20}+ alkanes (Figure 8f). This sample also has much less NSO material. It may be that this sample represents a residual hydrocarbon zone which is below the oil water contact.

Dunlin Group (2620 - 3388.5 m)

Drake Formation (2620 - 2820.5 m)

Two siltstone/shale samples from near the base of the formation were analysed. These contain moderate - early mature type II/III kerogen and should have generated only minor amounts of hydrocarbons. The saturated hydrocarbons in both samples are dominated by nC_{14} - nC_{20} alkanes with a pristane/phytane ratio close to 1.5 (Figure 8g). It is considered that these samples are stained with migrated hydrocarbons similar to the condensate or oil in the Brent Group.

Cook Formation (2820.5 - 2877.5 m)

One shale/siltstone sample from 2865 m was analysed. The saturated hydrocarbon distribution is virtually identical to that of the Drake Fm. samples and the same conclusions apply.

Burton Formation (2877.5 - 2963.5 m)

One shale/siltstone sample from 2895 m was analysed, it has a similar saturated hydrocarbon distribution to the Cook and Drake Fm. samples and, like them, is stained with migrated hydrocarbons.

Amundsen Formation (2963.5 - 3040 m)

Two shale/siltstone samples were analysed and the same observations and conclusions made on the other Dunlin Gp. samples also applies to these samples.

Statfjord Formation (3040 - 3388.5 m)

Three samples, a shale/siltstone, a sandstone and a coal, were analysed. The migrated hydrocarbons seen in the other Dunlin Gp. samples is present in all three samples. The saturated hydrocarbons of the sandstone (Figure 8h) are more similar in distribution to the oil (Figure 8d) from the Etive Fm. than the condensate in the Ness Fm. (Figure 8e).

There are at least two possible explanations for the same migrated hydrocarbons in both Statfjord and Etive Fms. One explanation is that the same type of hydrocarbon from the same source have migrated through both formations, but has only accumulated in the Brent. Another possible explanation is that oil/condensate expelled from the Brent Gp. during drilling has contaminated the drilling mud, consequently oil entrained in the mud has stained all lithologies below the Brent Gp. This effect should be lessened below the 9 5/8" casing set in he middle of the Drake Fm. However, oil present in the drilling mud tends to remain in circulation unless complete replacement of mud type occurs.

The shale/siltstone from 3325 m has an identical saturated hydrocarbon distribution to the other Dunlin Gp. samples and, as discussed above, is stained with migrated or contaminant hydrocarbons.

In the saturated hydrocarbon gas chromatogram of the coal/ carbargillite from 3170 m there are several features characteristic of higher plant dominated organic matter which are partly masked by staining with the same migrated/ contaminant hydrocarbons seen in the other Dunlin Gp. samples. These features include high pristane/phytane ratio (~ 2.9) and distinct odd n-alkane preference from nC_{22} to nC_{30}. Biomarkers are also present as indicated by the peaks eluting between nC_{28} - nC_{34}. The latter plus the distinct odd n-alkane preference probably indicates that the coal is early mature at most. However, the mature oil staining means that the pristane/nC_{17} and CPI are lower than they would be, if not stained. So that to assess the maturity on these parameters is difficult.

Triassic (3388.5 - 3476 m, TD)

Hegre Group (3388.5 - 3476 m, TD)

Two sandstones were analysed. They have similar hydrocarbon distribution to the Statfjord Fm. sandstone. The differences in relative abundance of C_{15} - C_{20} in these two is probably not significant and is due to either differences in porosity, differences in TOC content or clay content etc.

Aromatic Hydrocarbons

Jurassic (2422.5 - 3388.5 m)

Viking Group (2422.5 - 2458 m)

Heather Formation (2422.5 - 2458 m)

No samples were analysed.

Brent Group (2458 - 2620 m)

Ness Formation (2458 - 2554 m)

Sixteen samples were analysed. Migrated condensate range hydrocarbons are present in the interval down to at least 2500 m as demonstrated by the thermal extract and saturated hydrocarbon distributions. The aromatic hydrocarbons representative of the condensate are best shown in the sandstone sample from 2468.3 m (Figure 9a). In this sample peaks representing C_2-, C_3-naphthalenes and C_1- and C_2-phenanthrenes are equally abundant. The dominant compound is phenanthrene. Sulphur aromatics, such as dibenzothiophene

(DBT) and methyldibenzothiophenes (MDBT), are present as fairly minor components, for example the DBT/P ratio is only 0.29. The maturity of the source of these hydrocarbons based on MPI 1 ratio is 0.7 - 0.8 % Ro, which is within the range for early oil generation and expulsion from marine type II kerogen, i.e. these hydrocarbons have not been generated within the "condensate window" which occurs at vitrinite reflectance values of 1 % to 1.3 % Ro. The sulphur aromatic distribution seen in Figure 9b is contaminated by free sulphur (marked by an asterisk). The high 4/1 MDBT (5.9) and low 3+2/1 MDBT ratio (0.9) suggests a fairly mature source, but not of condensate window maturity. Abundant biphenyl is seen in samples which are either highly mature or from land plant dominated sediments. Biphenyl is abundant in all samples, particularly in coals, but also in the migrated condensate range hydrocarbons. It is suspected that the reason for the latter is due to the solvent effect of the condensate percolating through the carbonaceous sediments in the Ness Fm.

Identification of the indigenous aromatics of the organic matter in the shales/siltstones and coals is difficult and there seems to be little difference in the aromatics of coals and sandstones. For example, one of the least contaminated coals based on the saturate hydrocarbon distribution (e.g. Figure 8c) is in contrast very little different in aromatic hydrocarbon distribution (Figure 9e) to that of the condensate-range migrated hydrocarbons present in sandstones (e.g. in Figure 9a). This is mainly due to he dominant aromatic compounds in the coal and condensate covering the same retention time range, i.e. the dominant aromatics in the coal are alkyl naphthalenes and phenanthrenes which are also those in the condensate. Only higher molecular weight aromatics in the coals should be significantly different. The distribution of alkyl naphthalenes and phenanthrenes in the coals are affected by the migrated hydrocarbons.

The aromatic hydrocarbons of the migrated hydrocarbons in the oil beneath the gas-condensate zone are much poorer in alkyl naphthalenes relative to phenanthrenes than the condensate (Figure 9d). This is due to losses of the alkyl naphthalenes through evaporation during storage of the cores, as well as the greater abundance of alkyl phenanthrenes and higher molecular weight aromatics in the oil. It is difficult to determine the maturity of the source of the oil so as to compare them with the condensate, since most maturity parameters depend on measuring alkyl naphthalenes and phenanthrenes and these are virtually absent or the relative distribution has been altered so that ratios are inaccurate. It appears from the 2/1 MP ratios that the maturity may be slightly higher for the oils, however, loss of 2MP relative to 1MP during storage of cores cannot be ruled out, so the ratio is probably inaccurate. The distribution of sulphur aromatics seen in the FPD trace of the sample from 2544 m (Figure 9e) is very similar to that of the condensate seen in Figure 9b and suggests that there is very little difference in maturity (or source).

Etive Formation (2554 - 2620 m)

The five analysed sandstones have a similar aromatic hydrocarbon distributions to that of the Ness Fm. sandstone at 2544 m and the same observations apply.

Dunlin Group (2620 - 3388.5 m)

Drake Formation (2620 - 2820.5 m)

Two shale/siltstones were analysed, both have a narrow range of aromatic hydrocarbons relative to that seen in the oil and condensate from the Brent Gp. Alkyl naphthalenes are only minor components relative to phenanthrene (which is the dominant compound in the chromatograms) and the C_1-phenanthrenes (Figure 9f). There is an increase in the 3+2 methyl-phenanthrenes relative to the 9+1 compounds in the Drake Fm. samples over that seen in the Brent Gp. samples. This suggests that the source of the hydrocarbons in the Drake Fm. is more mature than the Brent Gp. hydrocarbons. (2/1 MP ratio is ~ 0.9 - 1 in Brent and > 1.1 in Drake Fm.). This is supported by the change in distribution of the dimethyl dibenzothiophenes seen in the FPD trace of the aromatics from the sample at 2790 m (Figure 9g). In this the first two peaks (1 and 29 m Figure 9g) are larger relative to the second two peaks (3 and 4 in Figure 9g) in the aromatics of the sample from 2790 m than on the Brent Gp. samples. This change in relative distribution has only been seen with increase in maturity.

Cook Formation (2820.5 - 2877.5 m)

One sample was analysed, it has virtually the same aromatic hydrocarbon pattern as the Drake Fm. samples and the same conclusions apply.

Burton Formation (2877.5 - 2967.5 m)

The same observations and conclusions were made for the analysed sample from this formation as in the overlying Cook and Drake Fms.

Amundsen Formation (2963.5 - 3040 m)

The same observations and conclusions were made for the two analysed samples from this formation as in the overlying Cook, Drake and Burton Fms.

Statfjord Formation (3040 - 3388.5 m)

The same observations and conclusions were made for the sandstone and shale/siltstones as in the overlying Amundsen Fm.

The coal, in contrast, shows an abundance of alkyl naphthalenes (Figure 9h) presumably derived from the indigenous organic matter. Maturity based on alkyl naphthalenes is estimated to be no more than early mature, although the low DMNR and MNR may be partly due to loss of these components during sample preparation.

Triassic (3388.5 - 3476 m, TD)

Hegre Group (3388.5 - 3476 m, TD)

The two analysed samples (one sandstone and one shale) have similar aromatic hydrocarbon distribution to the Dunlin Gp. shales/siltstones and the same observation apply.

VITRINITE REFLECTANCE

Thirteen ditch cuttings samples and five core chip samples were analysed from the interval 2410 m to 3400 m in the well NOCS 30/6-9.

A vitrinite reflectance versus depth plot is shown in Figure 10 and thermal maturity data is tabulated in Table 7. Vitrinite reflectance histograms are found in Appendix 2.

The upper three analysed samples (2410 m, 2476 m, 2484 m) are characterised by their dominance of inertinite and reworked phytoclasts in a shale/claystone lithology and an intermediate carbargillite (2476 m). Vitrinite is poor to fair in quality and present in only trace to low proportions throughout this interval. The carbargillite contains minor, low reflecting liptinitic material. Organic bitumen staining is trace to light at 2410 m, moderate to strong in the claystone matrix at 2476 m and light to moderate by 2484 m. Spores, fluorescing yellow-orange to light orange (SCI 4-5), with a moderate intensity, are minor at 2410 m, where algal cysts dominate the moderately rich liptinite fraction. The lower carbargillite is rich in liptinite which is dominated by amorphous liptinite and bituminite with significant light orange (SCI 5) fluorescing spores and minor algae. By 2484 m liptinite is only trace to low and comprised of scattered spore shreds fluorescing a light orange (SCI 5) colour, with a moderate intensity.

The following two bulk samples (2525 m, 2535 m) incorporate a shale/claystone, coaly claystone and carbargillite. Both samples are rich in fair to good quality vitrinite and present with significant microinterlaminations of inertinite. Organic staining is moderate but strong in the carbargillite. Observations in fluorescence light show that both samples are rich in liptinite. This fraction is dominated by sporomorphs with minor to significant bands of amorphous material and algae. At 2525 m tennuispores fluoresce yellow-orange to light orange (SCI 4-5), but by 2535 m they fluoresce with the same low intensity, but are light orange in colour (SCI 5).

A marl core chip sample (2597.77 m) is barren of organic matter and no determinations were possible on this lithology.

From 2624 m through 2985 m an organic rich, pyritic shale passes into a shale claystone lithology. Throughout this interval large inertinite phytoclasts dominate with high proportions of bituminite. Vitrinite is, moreover, of fair quality, but poor at 2785 m and poor to fair at 2985 m. Organic bitumen staining is strong to 2785 m and thereafter, is light to moderate. Bitumen wisping is absent at 2624 m; moderate to strong at 2785 m; high at 2830 m and decreases gradually to low between 2860 m and 2985 m. In UV light the samples between 2624 m and 2985 m are moderately rich to rich in liptinite and contain a dominance of algae, with significant spores and dinoflagellate cysts and minor amorphous and liptodetrinite. Fluorescent bituminite and fluorescing hydrogen-rich vitrinite are significant in the samples at 2830 m and 2950 m. Spores throughout the interval 2624 m to 2985 m fluoresce a light orange colour (SCI 5) with a moderate intensity, except at 2985 m, where spores fluoresce light orange to mid orange (SCI 5.5), with a low to moderate intensity.

From 3110 m to 3197 m there is alternating calcareous shale, marl, claystone and carbargillite lithologies. These three samples are rich in inertinite, but contain significant proportions of poor to fair quality vitrinite at 3110 m, but good quality vitrinite at 3170 m and 3197 m. Organic bitumen staining is low in all samples. The rich liptinite fraction in the claystone at 3110 m is dominated by algae with significant amorphous, spores and minor dinoflagellates; the marl at the same depth is barren. Spores fluoresce a light to mid orange colour (SCI 5-6) with a moderate intensity. Partial oxidation is noted in some spores at this depth. The lower two samples have a rich and mixed algal and amorphous dominated liptinitic assemblage, with subsidiary spores and cuticles. Spores fluoresce light to mid orange (SCI 5-6) with a moderate intensity.

The lower two samples contain a marl and a claystone lithology which are extremely lean (barren) in organic material. They contain scattered inertinite and only at 3400 m a low proportion of poor to fair quality vitrinite. Organic staining is trace to light. From UV light observations the liptinite fraction is very low, but comprised of scattered algae and spore shreds which fluoresce a light orange colour (SCI 5) with a moderate intensity. Partial oxidation is noted at 3325 m.

Vitrinite reflectance values increase over the 990 m section with minor fluctuations. Vitrinite reflectance increases from Ro 0.51 % (10 readings) at 2410 m through Ro 0.54 % (41 readings) at 2525 m to Ro 0.56 % (26 readings) at 3170 m. There is a slight drop in reflectance to Ro 0.54 % (23 readings) by the base of the analysed section (3400 m). There is a good correlation between spore fluorescence and vitrinite reflectance data in this well.

From the above data a thermal maturity profile is proposed. This indicates this well is moderately mature, passing into maturity (Ro 0.55 %) for oil-prone organic matter by the approximate depth of 2850 m (Ro 0.60 % 3250 m). Extrapolation of this trend places the onset of peak oil generation (Ro 0.70 %) at approximately 3800 m.

VISUAL KEROGEN COMPOSITION

Figure 11 shows a triangular plot of the kerogen composition for the well while Table 8 lists the detailed kerogen composition for the samples examined.

Kerogen type is discussed with respect to the stratigraphic units of the well. Thermal maturity estimates based on spore colour index and spore fluorescence are presented in general terms for the well as a whole.

Fifteen samples were examined optically for this well. These were from the depth range of 2410 m (Cretaceous - Shetland Gp.) to 3400 m (Triassic - Hegre Gp.).

Kerogen Typing

Cretaceous (2280 - 2422.5 m)

Shetland Group (2280 - 2422.5 m)

One sample of medium grey shale/claystone was examined from this interval at 2410 m.

This contained only accessory (10 %) liptinite, mainly as reworked/oxidized material (of mostly terrestrial origin), spore/pollen and algae being present only in minor amounts. Vitrinite is dominant (80 %), mainly as vitrodetrinite, with subordinate telinite and amorphinite. Accessory inertinite is also present.

This kerogen assemblage is considered to have only limited potential for the generation of gaseous hydrocarbons.

Jurassic (2422.5 -3388.5 m)

Viking Group (2422.5 - 2458 m)

Heather Formation (2422.5 - 2458 m)

One sample was examined from this interval, a composite sample of medium grey to dusky yellow-brown from 2433, 2445 and 2450 m, listed as 2450 m.

The composite sample contains only accessory (10 %) liptinite, mainly as reworked material of mixed origin, together with spore/pollen (oxidized), algae and trace dinoflagellates. Vitrinite is strongly dominant (80 %), being predominantly vitrodetrinite with subordinate telinite and amorphinite. Accessory inertinite is also present.

This sample, which may well contain a significant caved component and which therefore may not represent the Heather Fm., has potential only for the generation of gaseous hydrocarbons.

Brent Group (2458 - 2620 m)

Ness Formation (2458 - 2554 m)

Four samples were examined from the Ness Fm. interval, a pale yellow-brown/light-dark grey siltstone from core chips at 2470 m, a coal from 2476 m, and two brownish grey/light brownish grey siltstones from core chips at 2501.5 and 2551 m.

The uppermost siltstone sample contains significant (20 %) liptinite, mainly as spore/pollen and algae, but also including amorphinite (with good quality fluffy, green fluorescent material), liptodetrinite and possibly bituminite. Vitrinite is dominant (75 %), mainly as telinite with minor quantities of hydrogen-rich varieties, collinite and amorphinite. Minor inertinite is also present. The kerogen assemblage is generally somewhat coaly in appearance.

The coal sample from 2476 m contains moderately abundant (30 %) liptinite, predominantly as spore/pollen and liptodetrinite together with trace algae. Vitrinite is dominant (65 %), this being somewhat more fine-grained and vitrodetrinite-rich for a coal. The sample could rather be termed as carbargillite. Minor inertinite is also present.

The two lower siltstone samples contain generally significant to moderately abundant liptinite (15 - 25 %), mainly as spore/pollen and algae with subordinate reworked material, algal (?) amorphinite, cuticle and traces of dinoflagellates. Vitrinite, which is of a coaly nature similar to the upper siltstone sample, is strongly dominant (70 - 80 %).This is mainly as telinite which is partly hydrogen-rich in the sample from 2501.5 m. Only minor inertinite is present.

From the samples examined, the Ness Fm. siltstones and coals/carbargillites have generally mixed marine/terrestrial kerogen compositions which are mainly gas-prone. In the upper levels, however, the kerogen quality is much better, including significant marine algal material, such that oil may also be generated in these lithologies.

Etive Formation (2554 - 2620 m)

No samples were examined from this interval.

Dunlin Group (2620 - 3040 m)

Drake Formation (2620 - 2820.5 m)

One sample of brownish to medium grey siltstone was examined from this formation at 2780 m.

This contained a rich, strongly dominant content of liptinite (85 %), mainly of good quality algal amorphous material and well preserved hydrogen-rich algae. Spore/pollen and dinoflagellates are also present. Vitrinite is significant at 15 %, this being in the form of hydrogen-rich telinite and amorphinite. Only trace inertinite is present.

This pyritic, marine assemblage is clearly capable of generating mainly oil.

Cook Formation (2820.5 - 2877.5 m)

One sample of brownish to medium grey siltstone similar to that above was examined from the Cook Fm. interval at 2835 m. This appears to be in-situ.

This siltstone contained abundant (40 %) liptinite, mainly as reworked mixed algal/spore material, together with amorphinite, spore/pollen, cuticle, algae and dinoflagellates. Vitrinite is dominant at 60 %, mainly in the form of vitrodetrinite with subordinate telinite (including hydrogen-rich varieties) and amorphinite. Only trace inertinite is present.

The Cook Fm. siltstone has therefore a kerogen composition of mixed provenance which is probably capable of generating mixed oil and gas hydrocarbons, with a probable bias towards the latter.

Burton Formation (2877 - 2963.5 m)

One sample of brownish to medium grey siltstone outwardly similar to those of the Drake and Cook Fms., was examined from 2895 m. This is probably in-situ.

The Burton Fm. siltstone contains abundant (80 %) liptinite, mainly as reworked spore material and algae, with subordinate spore/pollen, cuticle and dinoflagellates. Vitrinite is dominant at 65 %, this being mostly of vitrodetrinite, together with telinite and amorphinite. Only minor (5 %) inertinite is present.

Such a kerogen assemblage, of mixed marine and terrestrial origin, with low pyrite content, may be considered capable of generating mainly gaseous hydrocarbons.

Amundsen Formation (2963.5 - 3040 m)

Two samples of brownish to medium grey shale and siltstone were examined from 2965 and 3030 m respectively. These may be either in-situ or caved from the overlying Burton/Cook Fms.

Both have moderately abundant (25 - 35 %) liptinite, mainly as terrestrially-sourced components (liptodetrinite, spore/ pollen and cuticle). Algae are also significant, particularly in the shale sample. Vitrinite is dominant (60 -75 %), mainly as either vitrodetrinite in the shale sample or as telinite in the lower siltstone sample. The kerogen of the latter sample has a somewhat coaly appearance. Only trace to minor inertinite occurs in these lithologies.

The samples examined from the Amundsen Fm. interval can be considered as having potential for the generation of mainly gaseous to gas-only hydrocarbons.

In summary, within the Dunlin Gp. there appears to be a decrease in kerogen quaility with depth, from having oil potential in the Drake Fm. through potential for mainly gas in the Cook and Burton Fms. to mainly gas or gas only in the Amundsen Fm.

Statfjord Formation (3040 - 3387.5 m)

Three samples were examined from the Statfjord Fm. interval, consisting of two brownish to medium grey shales from 3110 m and 3325 m, and a coal from 3170 m.

The upper shale sample contains moderately abundant liptinite (30 %), this being mainly in the form of sporoform liptodetrinite and algae with subordinate spore/pollen, cuticle, dinoflagellates and traces of bituminite. Vitrinite is dominant (70 %), mainly as reworked material together with telinite and amorphinite. Only trace inertinite is present.

The coal sample from 3170 m (in-situ) contains only accessory (10 %) liptinite, mainly as spore/pollen with subordinate cuticle and algae. Vitrinite is strongly dominant (85 %), mainly as telinite/collinite and amorphinite (with very dull brown fluorescence, i.e. low-bituminous).

The lower shale sample has a distinctly different kerogen assemblage to those of the Dunlin Gp. in general. This contains moderately abundant fine-grained, poorly preserved liptinite (25 %), which is overwhelmingly algal composition/shreds and fine grained algal cysts with abundant dinoflagellates). Only traces of spore/pollen occur. Vitrinite is dominant (75 %), predominantly as reworked material together with telinite and amorphinite which includes hydrogen-rich variaties. Only trace inertinite is present.

The kerogen composition of these samples suggests the Statfjord Fm. shales and coals to be generally capable of yielding mainly gaseous hydrocarbons. However, the lowermost sample has a distinctly marine, algal-rich aspect which suggests that the lower horizons may also at least locally be capable of generating oil.

Triassic (3388.5 - 3476 m, TD)

Hegre Group (3388.5 - 3476 m, TD)

One sample of brownish to medium/dark grey shale was examined from the Hegre Gp. interval at 3400 m.

This shale contains abundant (50 %) liptinite, predominantly as liptodetrinite and algal amaterial, together with spore/pollen, cuticle, common dinoflagellates and traces of amorphinite. Witrinite is also abundant (45 %), mainly in the form of vitrodetrinite with subordinate telinite. Inertinite occurs in only minor quantity.

According to the proportion of liptinite in this sample, the lithology may be capable of generating mixed oil and gas. However, since there is an appreciable quantity of reworked (mainly sporoform) material, it is likely that the hydrocarbons generated will be mainly gaseous.

Thermal Maturity

(SCI - Spore Colour Index, Spore Fluorescence)

According to spore colour index determinations, samples from the Shetland and Viking Gps. are immature to moderately mature. Moderate maturity is certainly reached in the Brent Gp.: Ness Fm., however. Below this, the well appears to be moderately mature as far as the Dunlin Gp.: Burton Fm.. From here to TD the well appears to border between moderate maturity and oil window maturity. According to the linear regression line for SCI data, the top of the oil window (SCI 6.0) occurs at approximately 3190 m for type II kerogen, i.e. within the Statfjord Fm.

ISOTOPE ANALYSIS OF C_{15}+ FRACTIONS

A total of seven samples were analysed for carbon isotopes ($\sigma^{13}C$) of the saturated, aromatic, NSO and asphaltene fractions. The data are listed in Table 9 and 9B and shown in Figure 12. Information from papers of Martin Schoell and Zvi Sofer are used in the interpretation.

Middle Jurassic (2458 - 2620 m)

Brent Group (2458 - 2620 m)

Ness Formation (2458 - 2554 m)

Three samples were analysed, all of them are core chip samples (from 2468.30 m, 2527.5 m and 2544 m). The sample from 2527.5 m consists of claystone, while the other two consist of sandstone. The upper sample has an isotope composition different from the other samples (see Table 9) and it plots differently (see Figure 12). This could be due to mixing effects; the sample containing partly migrated hydrocarbons, partly locally generated hydrocarbons. The middle sample (claystone) is clearly different from the lower sample of the Ness Fm. and of the Etive Fm. samples, but resembles somewhat the Statfjord Fm. sample. The middle sample (the claystone sample from 2527.5 m) plots in the terrestrial part of Figure 12 and is thought to represent in-situ generated hydrocarbons in a non-marine deposit in the Ness Fm. This could have contributed to the hydrocarbons found in the upper sample. None of these two upper samples seem to be in the "oil-zone" of the Ness Fm. The lower sample (from 2544 m) in the Ness Fm. has isotope data identical to those for the Etive Fm. See discussion below.

Etive Formation (2554 - 2620 m)

Three samples were analysed, all of them are sandstone core chip samples (from 2576.4 m, 2602.74 m and 2616.33). These three samples have almost identical isotope data (see Table 9 and 9B) and they plot in the same area (see Figure 12). These samples (plus the lower Ness Fm. sample) are similar to the Oseberg Oils analysed (not surprising) and also resembles closely the Frigg Oil. These four samples are believed to come from the same marine source.

Lower Jurassic (2620 - 3398.5 m)

Statfjord Formation (3040 - 2298.5 m)

One sample was analysed, a sandstone cuttings sample from 3090 m. The isotope data show that the sample is fairly similar to the claystone sample from the Ness Fm., i.e. it is clearly terrestrial. The hydrocarbons are believed to be generated at least partly in-situ from the "carbargillites" and claystones of the Statfjord Fm. Hydrocarbons generated in the Dtatfjord Fm. do, however, not seem to affect the Ness and Etive Fm. hydrocarbons.

GAS CHROMATOGRAPHY - MASS SPECTROMETRY

Seven sandstone samples, including six core samples from the Brent Gp. and one cuttings sample from the Statfjord Fm., were analysed by GC-MS.

Saturated Hydrocarbons

Terpanes

The M/Z 163 fragmentogram shows that hopane compounds are much more abundant than steranes. Figure 13a is taken as a representative sample of the sandstones, which all have very similar fragmentograms. The dominant hopanes are the C_{29} to C_{35} hopane in which the C_{30} αβ compound or αβ hopane is dominant. Other prominent peaks are the 25,28,30 trisnor-hopane (moretane) and 28,30 bisnorhopane. Minor components are 18 α(H) 22,29,30 trisnorhopane and what is probably a C_{29} demthylated hopane, with a retention time just after the 28,30 bisnorhopane. The M/Z 177 fragmentogram is also used to monitor demethylated hopanes. In the sandstones these include the 25,28,30 trisnorhopane (moretane), a bisnor-hopane and 25-norhopane (Figure 13b). The dominant peaks in the fragmentogram are βα and αβ 30-norhopanes.

The M/Z 191 fragmentogram (Figure 13c) shows that the dominant hopanes are C_{29} - C_{35} αβ hopanes with the 22S > 22R in the C_{31} - C_{35} αβ hopanes. The C_{29} - C_{31} βα hopanes are present as minor components along with the two common trisnorhopanes, 18α(H) trisnorneohopane and 17α(H) trisnor-hopane and 28,30 bisnorhopane. Less prominent components include a C_{29} demethylated hopane, triterpane X and a compound between the αβ and βα hopane which may be a methyl hopane (C_{31} compound).

The tricyclic terpanes are only minor components in all of these samples. There are some small variations between the different sandstone samples in these two formations, but this is minor. The M/Z 205 fragmentograms show mainly the C_{31} $\alpha\beta$ and $\beta\alpha$ hopanes together with the $\alpha\beta$ C_{30} hopane (Figure 13d). The peak found to elute between the $\beta\alpha$ and $\alpha\beta$ hopanes is also seen here, verifying the indication that this is most probably a methylated hopane. There are small variations between the different samples. This is mainly in the magnitude of the unresolved envelope seen at the front of the fragmentograms. This unresolved enelope is particularly large in the sample from 2532.6 m in the Brent Gp. and in the Statfjord Fm. sample. The fragmentograms of the molecular ions verify what has been discussed above.

The M/Z 370 fragmentograms show the 25,28,30 trisnorhopane to be the major peak, while the M/Z 384 fragmentograms show the C_{28} bisnorhopane as the major peak. This fragmentogram also shows a significant peak eluting before the bisnorhopane (Figure 13e). This peak is also found in the M/Z 177 fragmentograms, showing this to be a C_{28} demethylated triterpane. The M/Z 398 fragmentograms show mainly six separate peaks (Figure 13f). Three of these are the C_{29} $\alpha\beta$ and $\beta\alpha$ hopanes and C_{30} $\alpha\beta$ hopane. The second largest peak is a peak eluting between bisnorhopane and C_{29} $\alpha\beta$ hopane. This compound has also a large peak in the M/Z 177 fragmentogram and is most probably a C_{29} demethylated hopane. The M/Z 412 fragmentograms mainly show the C_{30} hopane together with a few smaller components, while the M/Z 426 fragmentograms mainly show the C_{31} hopanes.

Steranes

The M/Z 149 fragmentograms show the rearranged steranes and the triterpanes. There is approximately equal abundance of the largest rearranged sterane peaks and the triterpane peaks. The M/Z 189 fragmentograms show the rearranged

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steranes. These fragmentograms show the C_{27} components to be far more abundant than the C_{29} components. The low molecular weight steranes, the C_{21} and C_{22} components, are also quite abundant. A peak eluting in front of the C_{27} rearranged steranes has also a relatively large abundance (Figure 13g.) There is some variation, especially in the relative abundance, of the low molecular weight components to the C_{27} - C_{29} components in the different samples. The low molecular weight compounds are especially abundant in the samples at the top of the analysed sequence. The M/Z 259 fragmentograms also show the rearranged steranes (Figure 13h). The C_{29} components have a far larger relative abundance in these fragmentograms than in the M/Z 189 fragmentograms. The M/Z 217 and 218 fragmentograms show the different steranes (Figure 13i, j). The rearranged steranes have a larger abundance than the regular steranes. The C_{27} components have a high relative abundance, showing the marine input in the kerogen which has generated these hydrocarbons. The low molecular weight components have a high relative abundance, showing the high maturity of these samples. The fragmentograms of the molecular ions verify what has been discussed above. The M/Z 414 fragmentograms show all the analysed samples to contain C_{30} steranes.

Aromatic Hydrocarbons

Alkyl Benzenes

The distribution of C_2-substituted benzenes seen in the M/Z 106 fragmentograms of all seven sandstones is fairly similar, except that in the main oil zone the range is larger than in the gas - condensate zone (above 2530 m). This would be expected from the general n-alkane distribution of the migrated hydrocarbon in the two sections. In all samples the two main series of C_2-benzenes are the 1-methyl-or 2 or 3 alkyl-benzenes with the meta-compounds (1, 3 benzenes) dominant.

The C_4 alkyl benzene distribution seen in the M/Z 134 fragmentograms shows that there are differences between the gas condensate zone of the upper gas column of the Brent Gp. reservoir, the oil zone in the Brent Gp. and in Statfjord Fm. sandstone. This can mainly be seen in the shape of the unresolved envelope. The dominant resolved components are similar in all seven samples. However, the unresolved hump is more prominent in the oil zone than in either the gas zone of the Brent reservoir or the Statfjord Fm. sandstone. This is considered to be due to the type of migrated hydrocarbons rather than source differences, i.e. mostly condensate-range hydrocarbons occur in the gas column of the Brent Gp. in the Statfjord Fm. sandstones, whereas in the oil column more high molecular weight material is present.

Alkyl Naphthalenes

No significant variations were seen in the M/Z 142, 136 and 170 fragmentograms used to monitor for C_1-, C_2- and C_3-naphthalenes in the seven sandstones. The high 2,6 and 2,7 DMN peak relative to he 1,5 DMN peak is typical of mature hydrocarbons.

Alkyl Phenanthrenes

Thee are slight differences in the distribution of C_1-, C_2- and C3-phenanthrenes. In the sandstone sample, from near the top of the Brent Gp. interval at 2468.3 m and the Statfjord Fm. sandstone, the amounts of 3+2 methylphenanthrenes relative to 9+1 methylphenanthrenes seen in the M/Z 192 fragmentograms are significantly different. In the Statfjord Fm. sample the 3+2 compounds are approximately the same size as the 9+1 compounds. In the Brent sample they are appproximately 70 % of 9+1 compounds. This suggests that the hydrocarbons in the Statfjord Fm. sample are more mature. The methyl phenanthrene in the other sandstone samples are intermediate in distribution, if anything showing a slight increase from top to bottom of the Brent Gp. sequence. One additional feature in the uppermost sandstone in the Brent is the presence of a small peak intermedia between the 3+2 and 9+1 methyl phenanthrene, which is probably 2-methylanthracene. The presence of this compound (in addition to anthracene seen as a minor peak after phenanthrene in the M/Z 178 fragmentogram) is probably derived from coaly clasts within the sandstones rather than an indicator of the type of source of the migrated hydrocarbons.

There is very little difference in the distribution of C_2- and C_3-phenanthrenes seen in M/Z 206 and 220 fragmentograms. One slight difference between the Brent Gp. sandstones and the Statfjord Fm. sandstone is in the relative heights of the peak which includes 1,9, 4,9 and 4,10 dimethylphenanthrenes and the other main peaks in the M/Z 206 fragmentograms. In the Statfjord Fm. the former peak is smaller than in the Brent Gp. sandstones. A decrease in this peak relative to other isomers with increasing maturity has been observed (Rudke 1987). A higher maturity for the migrated hydrocarbons in the Statfjord Fm. sandstone was also indicated by the methylphenanthrene distribution.

Dibenzothiophenes

There is very little difference in the relative peak heights of C_1 and C_2 dibenzothiophenes seen in the M/Z 198 and 212 fragmentograms. The distribution of C_1-dibenzothiophenes is typical of a mature source rock deposited in an anoxic environment, since the 3+2- and 1-methyldibenzothiophenes are about equal in abundance. There is a slight decrease in 4-methyldibenzothiophene relative to the 3+2 and 1 compounds in the main oil zone in the Etive Fm. sandstones compared to the gas-condensate section in the Ness Fm. and Statfjord Fm. sandstone. This is perhaps due more to maturity and to differences in the main boiling point range of the migrated hydrocarbons in the different intervals than to source differences. There is a distinct difference in the distribution of C_2 dibenzothiophenes seen in the M/Z 212 fragmentograms of the Brent Gp. and Statfjord Fm. sandstones. In the latter the two main peaks with the longest retention time are relatively less abundant due most probably to the higher maturity of the migrated hydrocarbons in the Statfjord Fm.

Aromatic Steranes

The monoaromatic and triaromatic steranes are monitored by the M/Z 253 and 231 fragmentograms respectively. There are slight differences in the distribution of these compounds in all seven sandstone samples. There are very slight differences in the relative amounts of the C_{26} - C_{28} triaromatic steranes, but there are distinct differences in the monoaromatic sterane in the C_{27} - C_{29} range between the Ness sandstone samples and the rest. This is considered to be due to the presence of in-situ coaly material contributing to the monoaromatic sterane "fingerprint". The most marked difference are the larger peak H1 representing C_{28} and C_{29} monoaromatic compounds and also the additional peak between G1 (C_{28} monoaromatic steranes) and H1 in the 2468.3 m sample.

CONLUSIONS

Based on the analyses performed on the samples from this well the following conclusions have been made:

Source Rock Potential

Cretaceous (2280 - 2922. 5 m)

Shetland Group (2280 - 2422.5 m)

No source rock potential of significance.

Jurassic (2422.5 - 3388.5 m)

Viking Group (2422.5 - 2458 m)

Heather Formation (2422.5 - 2458 m)

No reliable data due to lack of in-situ material in this section of the well.

Brent Group (2458 - 2620 m)

Ness Formation (2458 - 2554 m)

The carbonaceous and coaly material (especially in the upper part of the formation) seems to have some potential (poor - fair?) for oil generation. However, the main potential of the carbonaceous material, coal and claystones is for gas (probably only poor to fair). The volume of the most prolific source rocks in this formation seems to be low, indicating that the overall source potential for this formation is insignificant.

Etive Formation (2554 - 2620 m)

Carbonaceous material in the sandstones seems to be able to generate small amounts of hydrocarbons. The volume is, however, insignificant and the Etive Fm. is believed to be an insignificant source rock.

Dunlin Group (2620 - 3388.5 m)

Drake Formation (2620 - 2820.5 m)

The upper part of this formation has only a poor potential for gas generation. At the base the formation has a good potential for generation of (mainly) oil and gas. This most prolific section seems to consist only of the lower 40 to 50 metres of the formation.

Cook Formation (2820.5 - 2877.5 m)

This formation has only a poor potential for gas generation from silty shales/siltstones.

Burton Formation (2877.5 - 2963.5 m)

Siltstones/shales within this formation seem to have a poor to possibly fair potential for gas (and condensate?) generation but no potential for oil generation.

Amundsen Formation (2963.5 - 3040 m)

As the Burton Fm.

Statfjord Formation (3040 - 3388.5 m)

Carbargillites in this formation seem to have mainly a potential for generation of gas, but the base of the formation could have some potential for generation of waxy oil.

Triassic (3388.5 - 3476 m, TD)

Hegre Group (3388.5 - 3476 m, TD)

This formation has at best a poor potential for gas generation.

Generation and Migration

No generation of hydrocarbons is believed to have taken place in the post Jurassic section. No information is available for the Heather Fm. All other formations, except the Drake Fm. and Statfjord Fm., have generated very insignificant amounts of hydrocarbons. The Drake Fm. could have generated some oil at the base and the Statfjord Fm. seems to have generated some amounts of a waxy oil. However, this might be exaggerated as the samples below the oil-column appear to be stained.

The well is known to contain oil and gas below 2500 m. The gas/oil contact seems to be at 2532 m (in the Ness Fm.) based on changes in the hydrocarbon distribution. It seems that the oil/water contact is just above the base of the

Etive Fm., possibly around 2610 m. The hydrocarbons within this oil column seem to be very similar in origin. The formations below the Etive Fm. and above the Statfjord Fm. also contain free hydrocarbons. It seems, however, likely that these at least are partly due to staining with Ness/ Etive Fm. oil, but could also be due to hydrocarbons migrating through these formations, but only being trapped in the Ness/Etive Fms.

The Statjord Fm. contains hydrocarbons at least partly generated in-situ from the carbargillites, but undoubtedly also affected by migrated hydrocarbons and/or staining with Ness/Etive Fm. oil.

The Hegre Gr. seems to contain hydrocarbons similar to those from the Dunlin Gr.

Maturity

The maturity of the hydrocarbons in the oil column (2532 m to 2610 m) in the Ness and Etive Fms. seems to correspond to a maturity at roughly 0.9 % Ro, i.e. at the main phase of expulsion of hydrocarbons from typical Upper Jurassic Viking Graben source rock. The gas/condensate column above the oil column seems to be slightly less mature, but this could be an effect of gas/condensate replacing oil.

The hydrocarbons in the Dunlin Gp. seem to be more mature than those in the Ness/Etive Fms.

The hydrocarbons of the Statfjord Fm. seem to have two different maturities. Some (predominantly the heavy molecular weight) hydrocarbons have a maturity similar to that found for the Ness/Etive Fm., while others (predominantly the light molecular weight hydrocarbons) have a much lower maturity (they are early mature, i.e. corresponding to a vitrinite reflectance of about 0.5 % to 0.6 % Ro). The latter hydrocarbons are believed to be generated in-situ.

The hydrocarbons in the Hegre Gp. have a similar maturity to those of the Dunlin Gp.

The analysed section of the well appears to be immature to moderately mature down to about 2850 m. The well seems to enter the oil window between 3200 m and 3300 m, i.e. in the lower part of the Statfjord Fm.

Correlation

The data from the samples within the Oil-column, i.e. the lower part of Ness Fm. and Etive Fm. indicates that these samples are generated from typical Viking Graben Upper Jurassic source rocks at a maturity of roughly 0.9 % Ro. Very generally, this maturity should correspond to a depth of about 4500 m.

Figure 1 Client:

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

TOC Data for Well NOCS 30/6-9

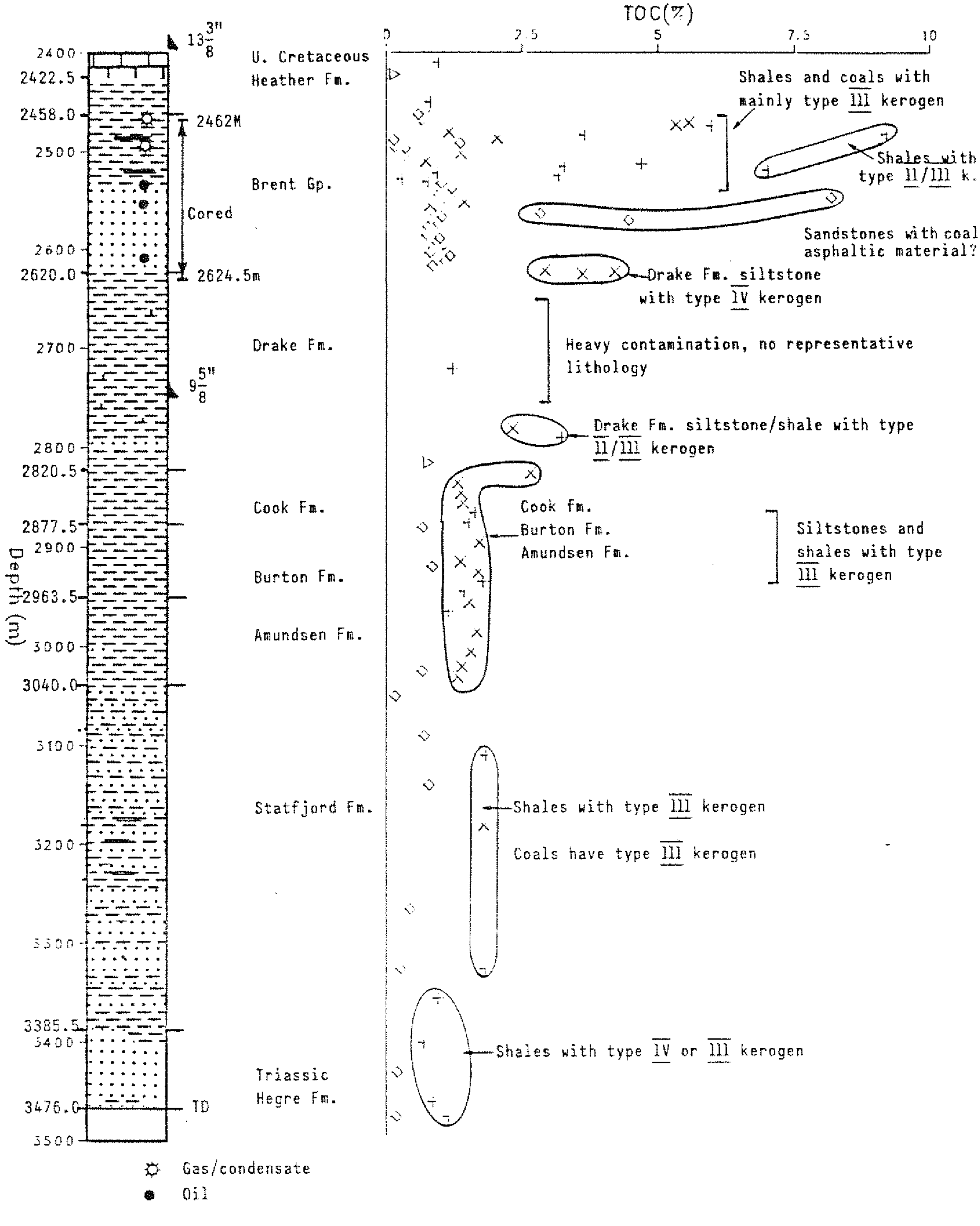

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Figure: 2 Client: GEOLAB NOR GEOCHEMICAL LABORATORIES OF NORWAY A/S

Production Index Data for Well NOCS 30/6–9

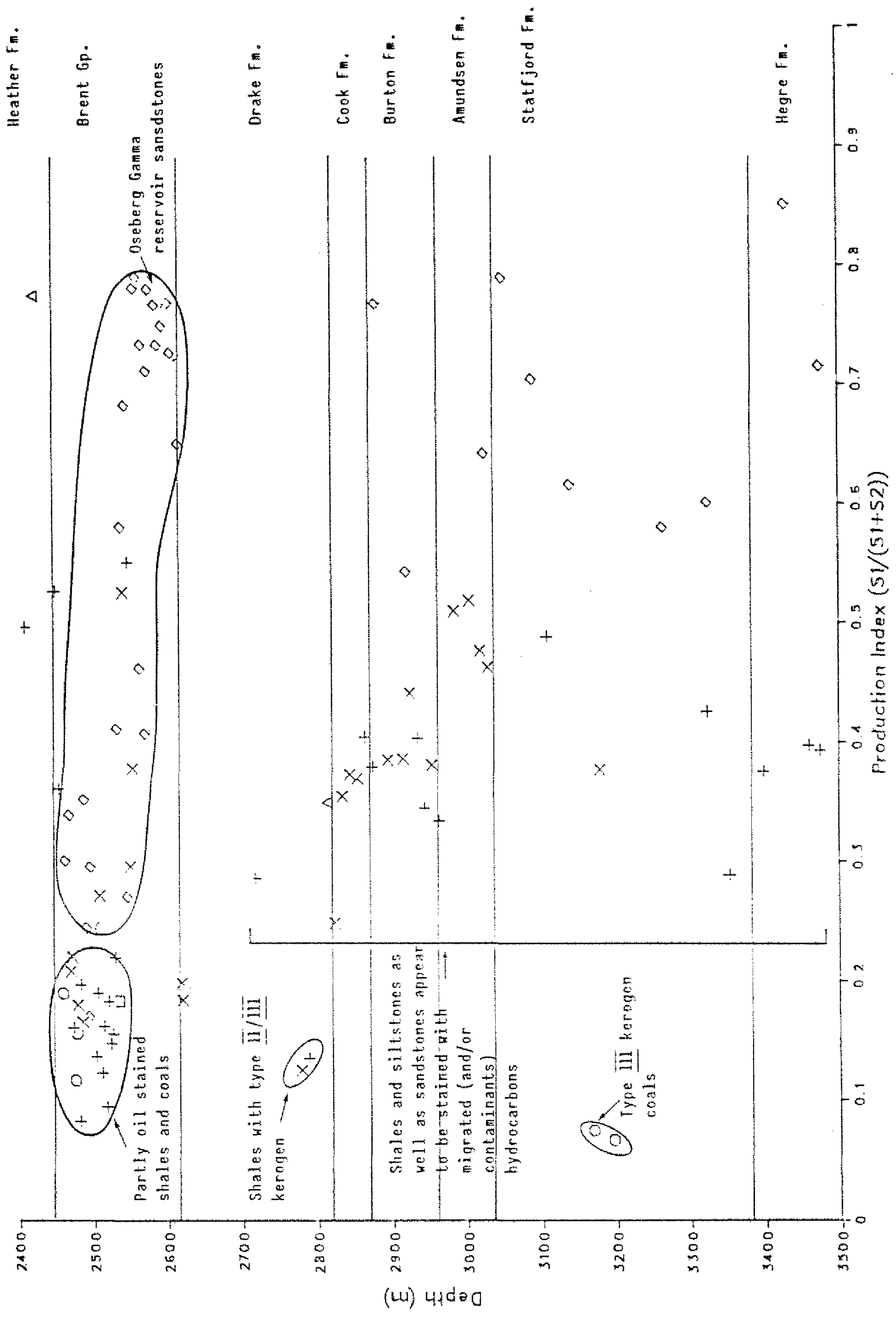
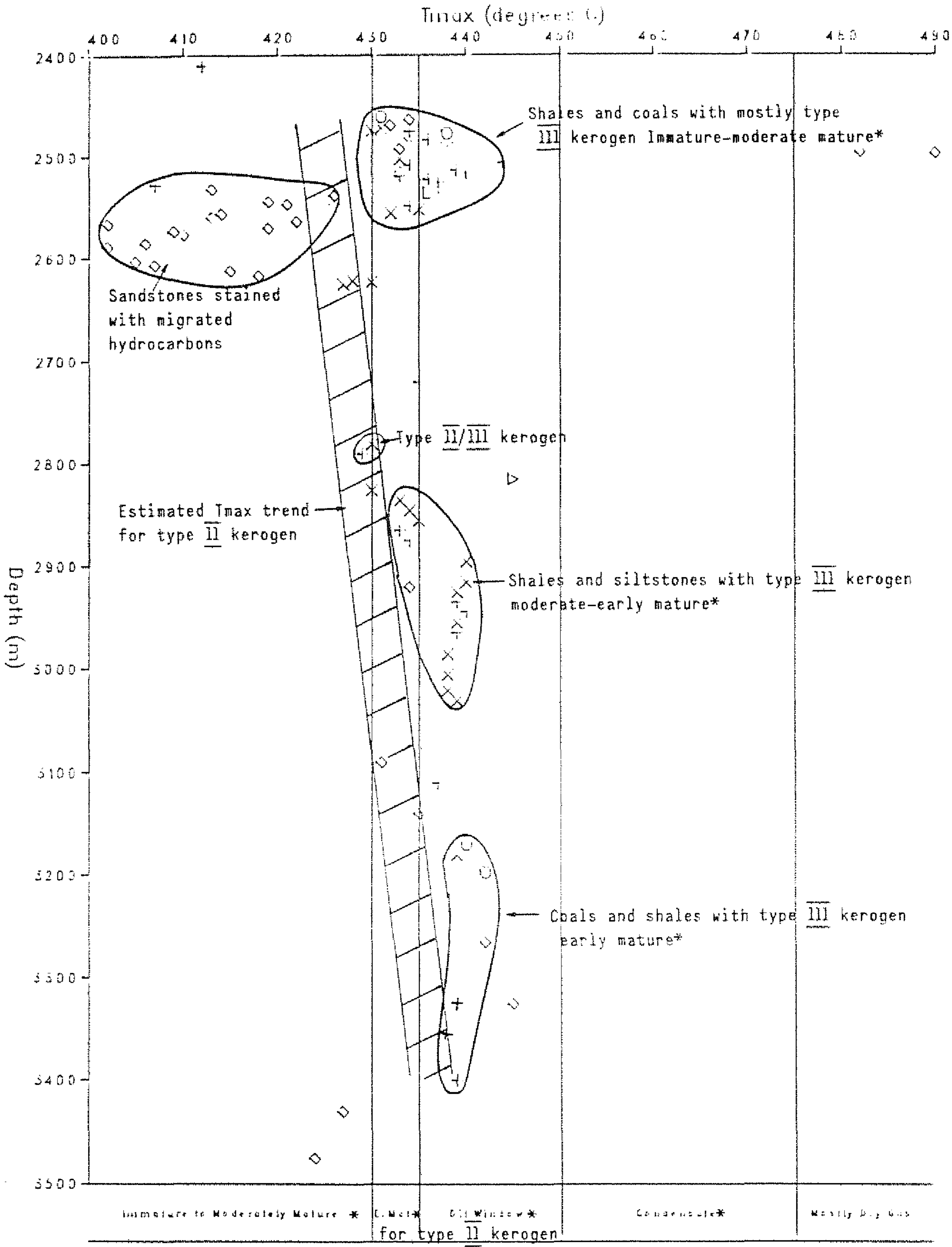


Figure: 3

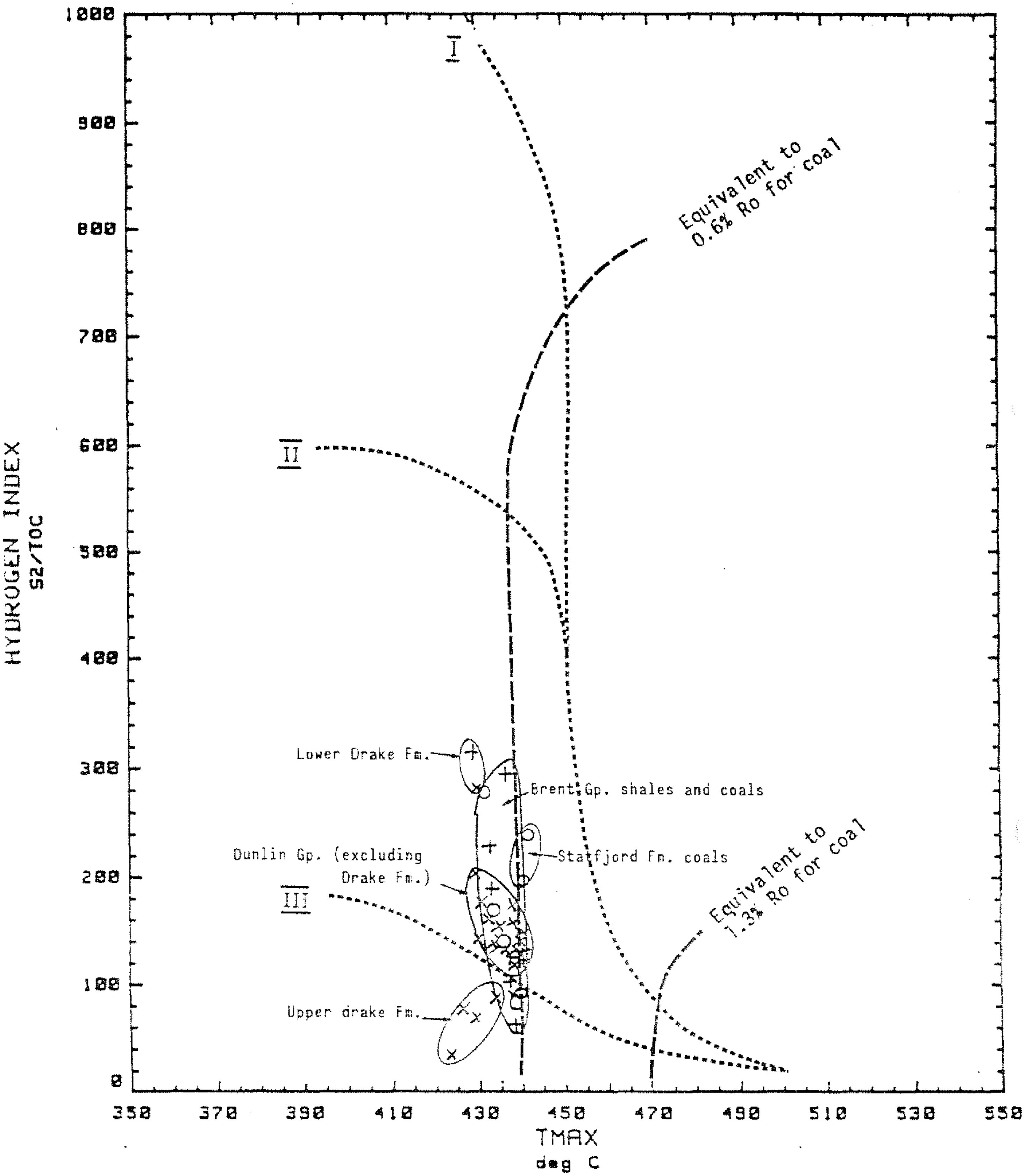
Client:

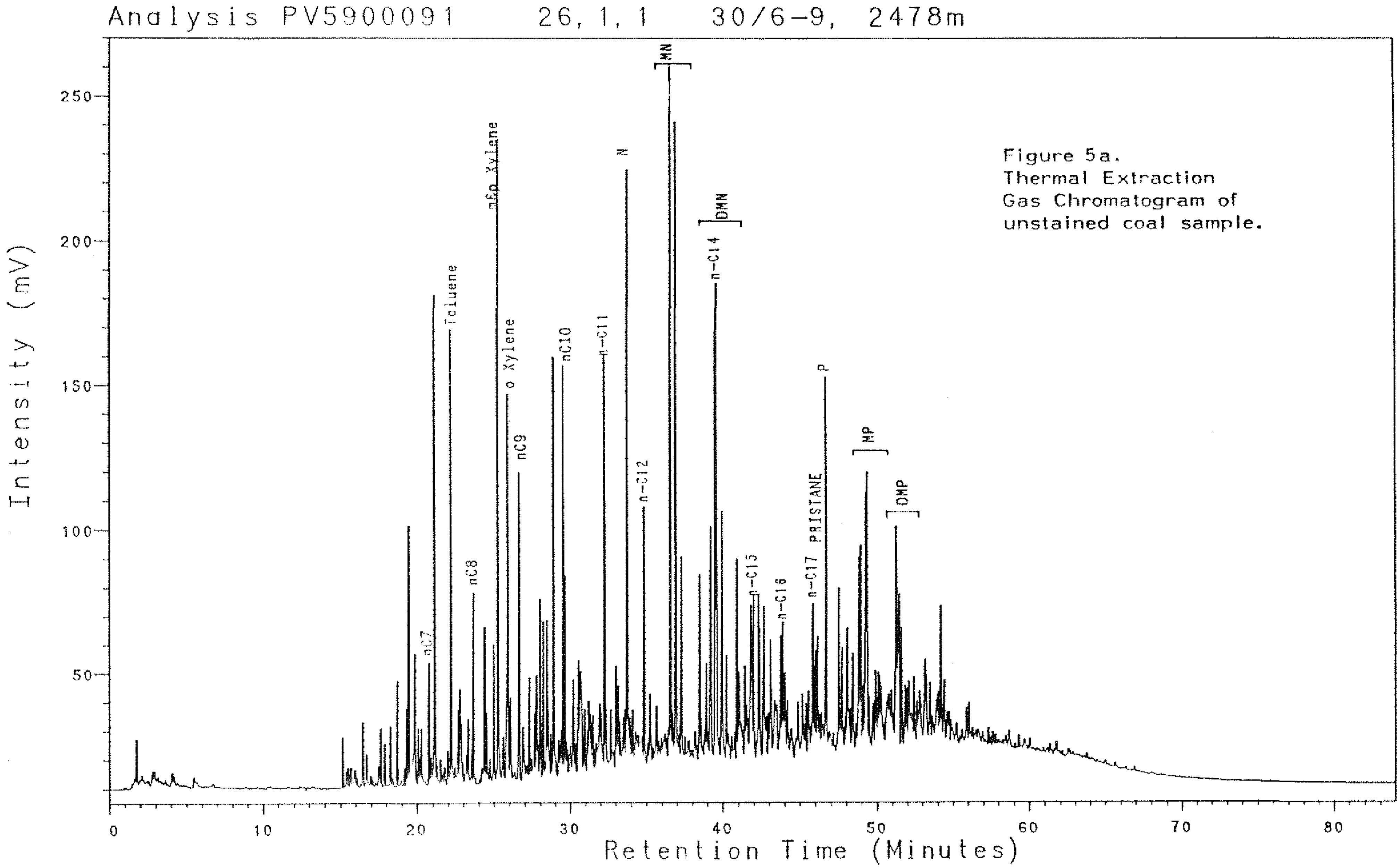
Tmax Data for Well NOCS 30/6-9



*Note the Tmax oil generation boundaries are only for marine type ll kerogen not for other kerogen types.

Figure 4. Hydrogen Index vs Tmax for well NOCS 30/6-9.





NOCS 30/6-9 2478m
THERMAL EXTRACTION GC (S1)
COAL:blk

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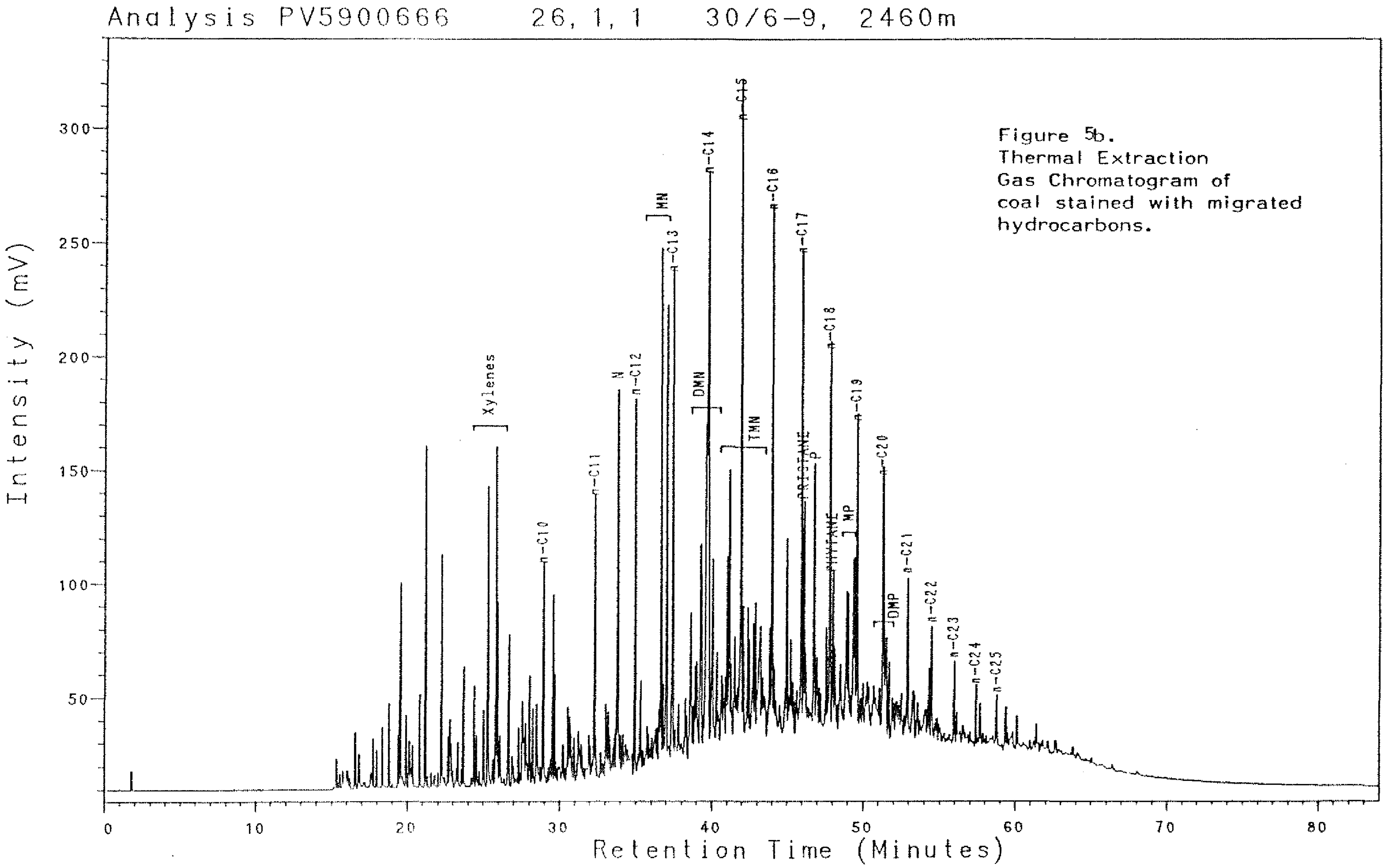

NOCS 30/6-9 2460m
THERMAL EXTRACTION GC (S1)
COAL: k

GEOLAB NOR
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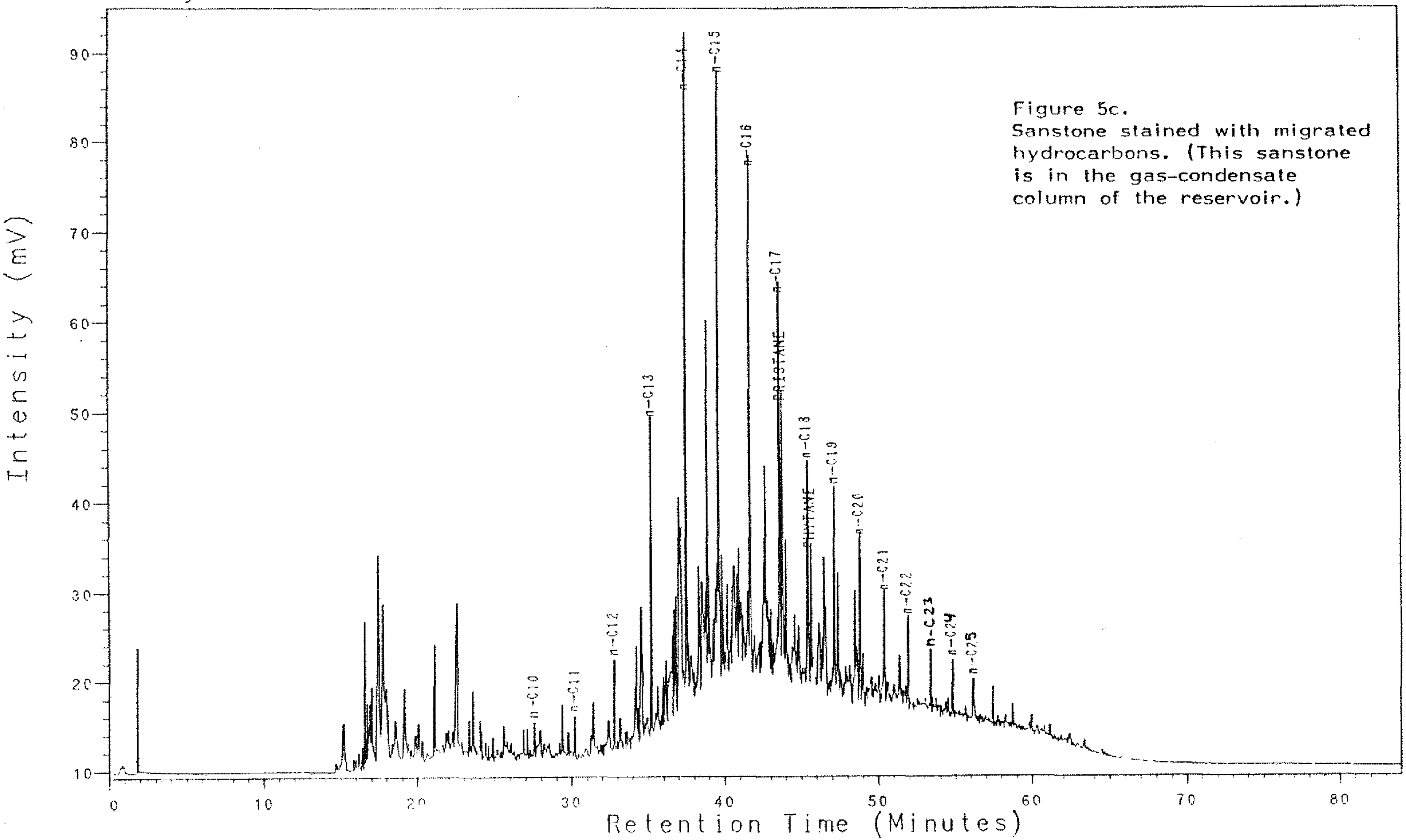
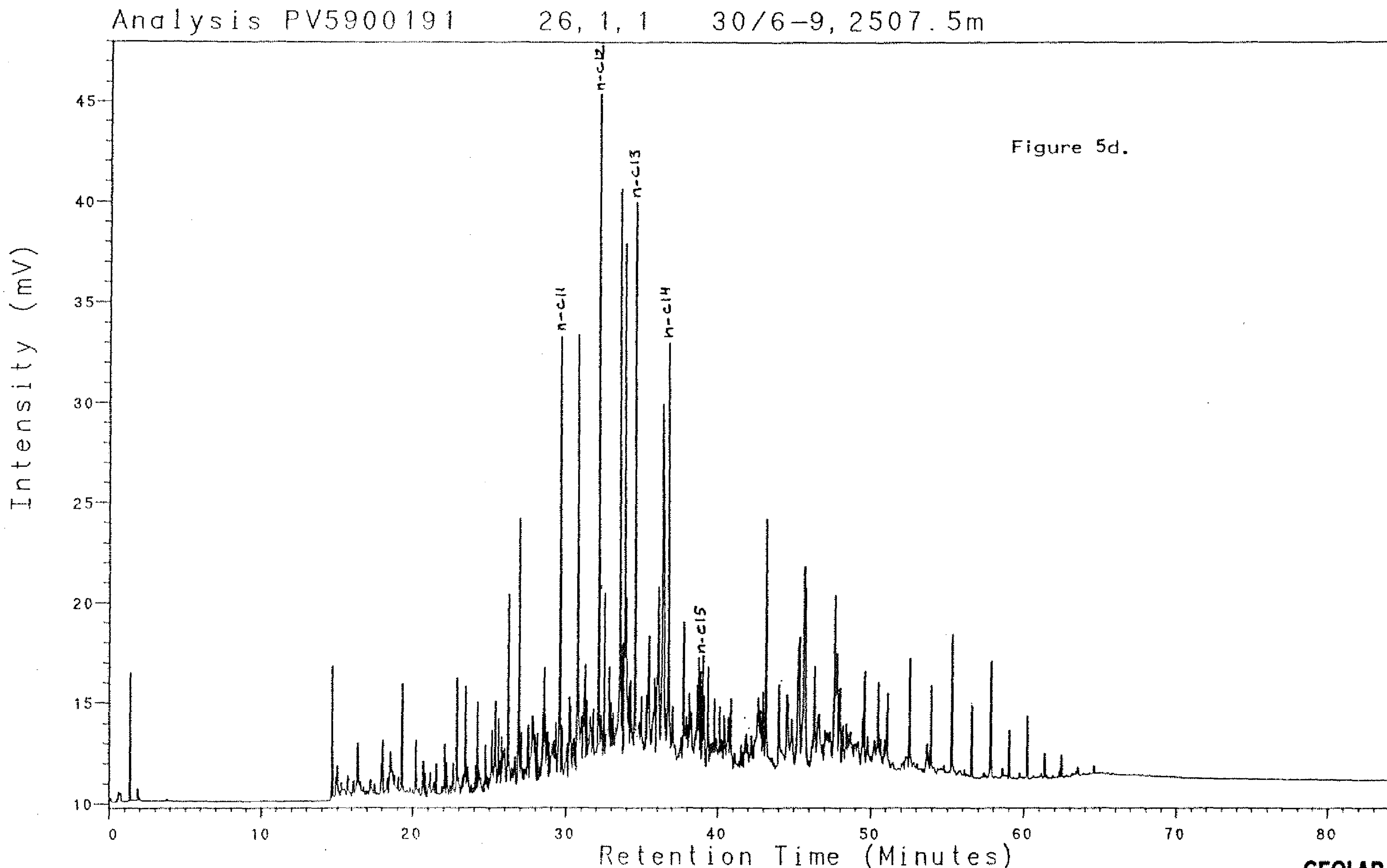
Analysis PV5900021 26, 1, 1 30/6-9, 2462.74m



NOCS 30/6-9 2462.74m
THERMAL EXTRACTION GC (S1)
S/SST:pl brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.



NOCS 30/6-9 2507.5m
THERMA EXTRACTION GC (S1)

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5900101 26, 1, 1 30/6-9, 2480m

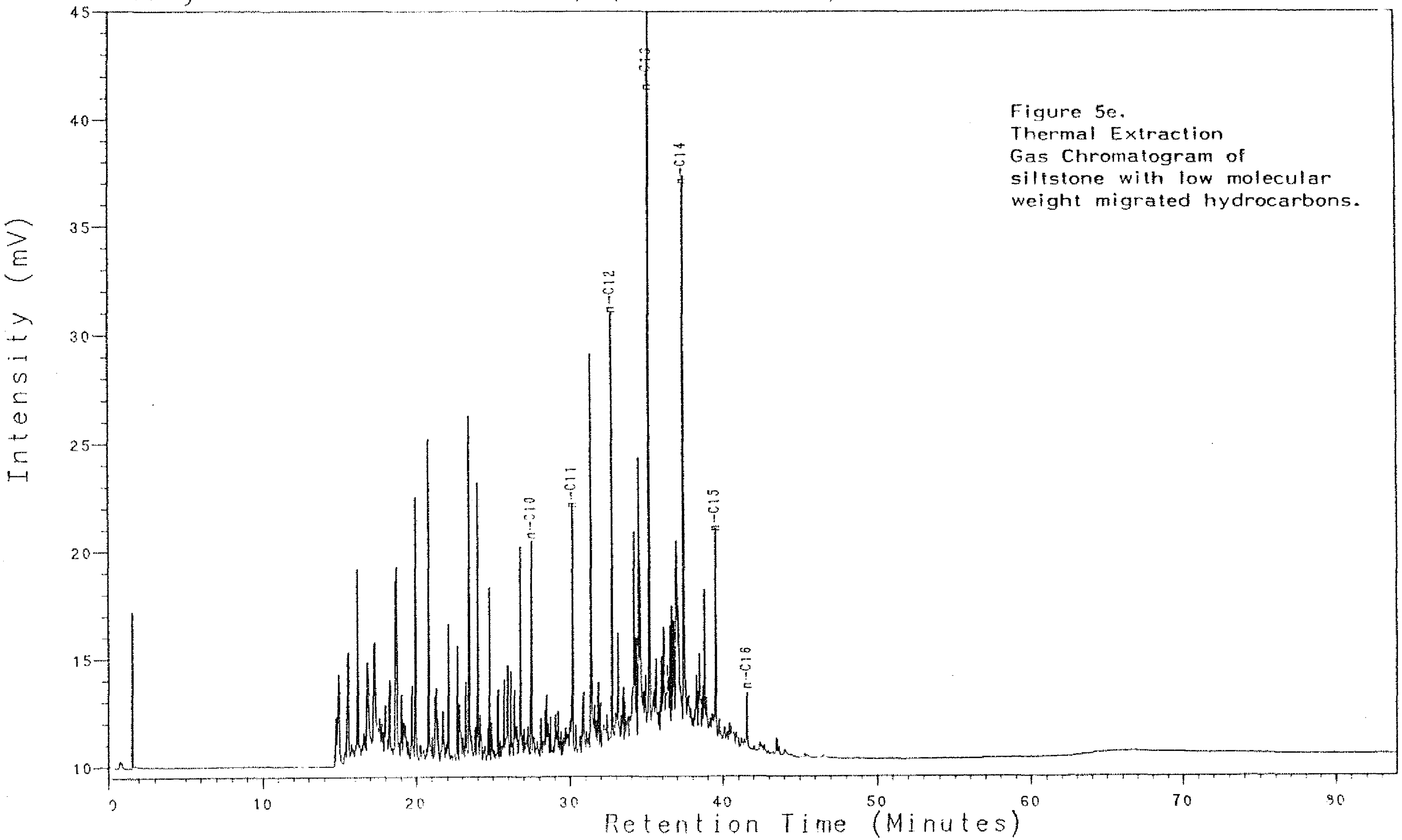


Figure 5e.
Thermal Extraction
Gas Chromatogram of
siltstone with low molecular
weight migrated hydrocarbons.

NOCS 30/6-9 2480m
THERMAL EXTRACTION GC (S1)
SLTST:lt brn gy to brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Analysis PV5900291 26, 1, 1 30/6-9, 2532, 26m

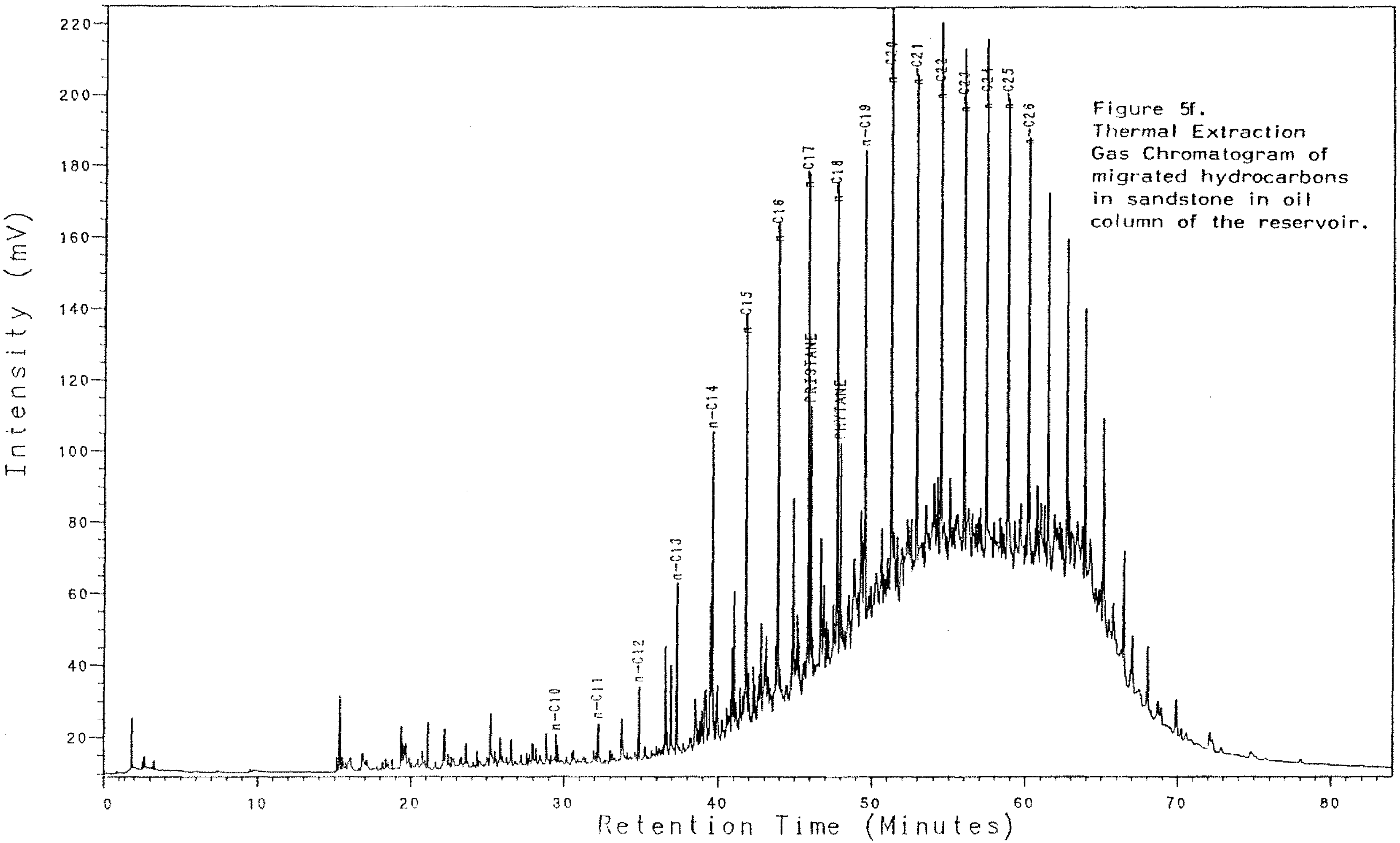


Figure 5f.
Thermal Extraction
Gas Chromatogram of
migrated hydrocarbons
in sandstone in oil
column of the reservoir.

NOCS 30/6-9 2532.26m
THERMAL EXTRACTION GC (SI)

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5900321 26, 1, 1 30/6-9, 2546.4m

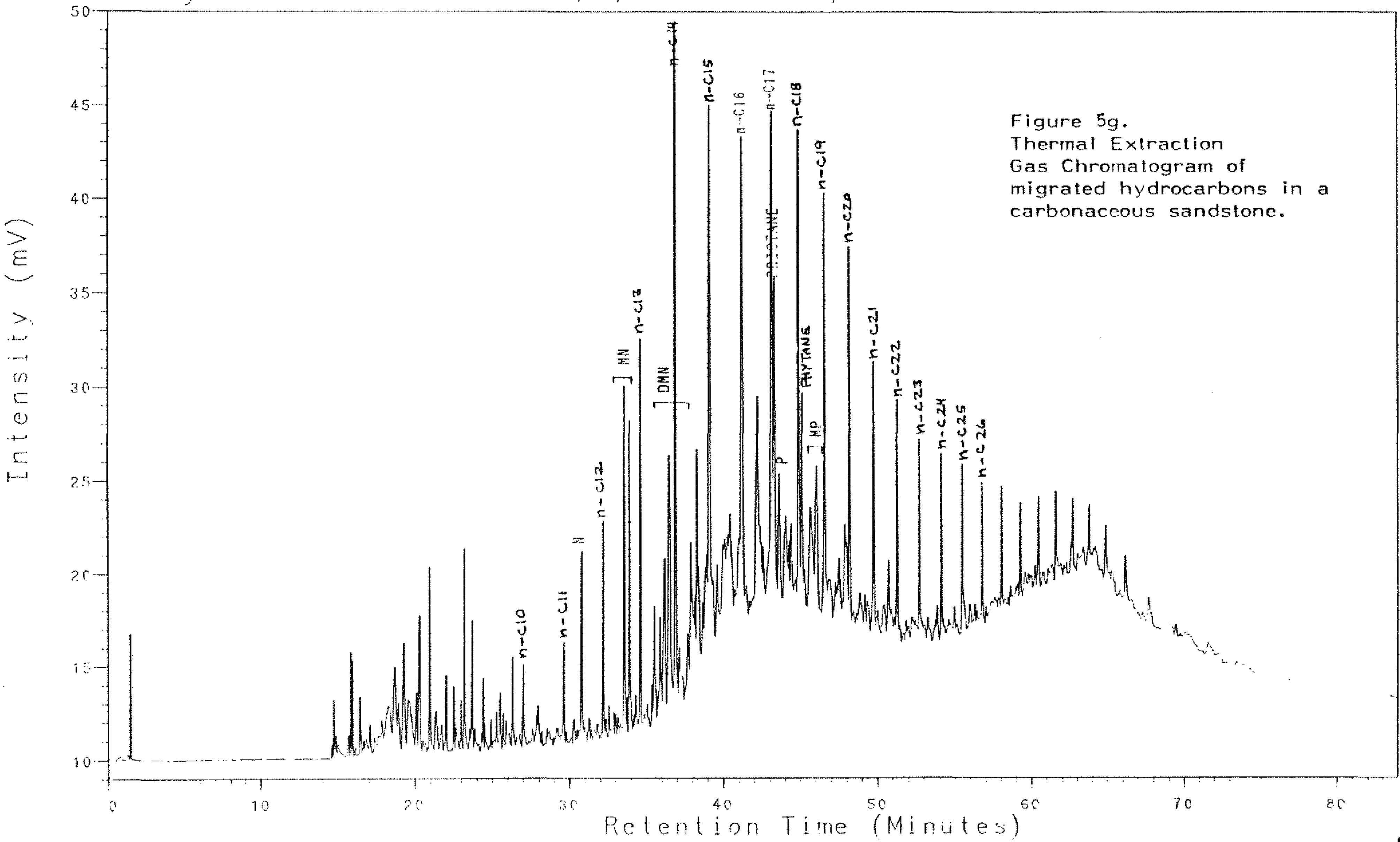
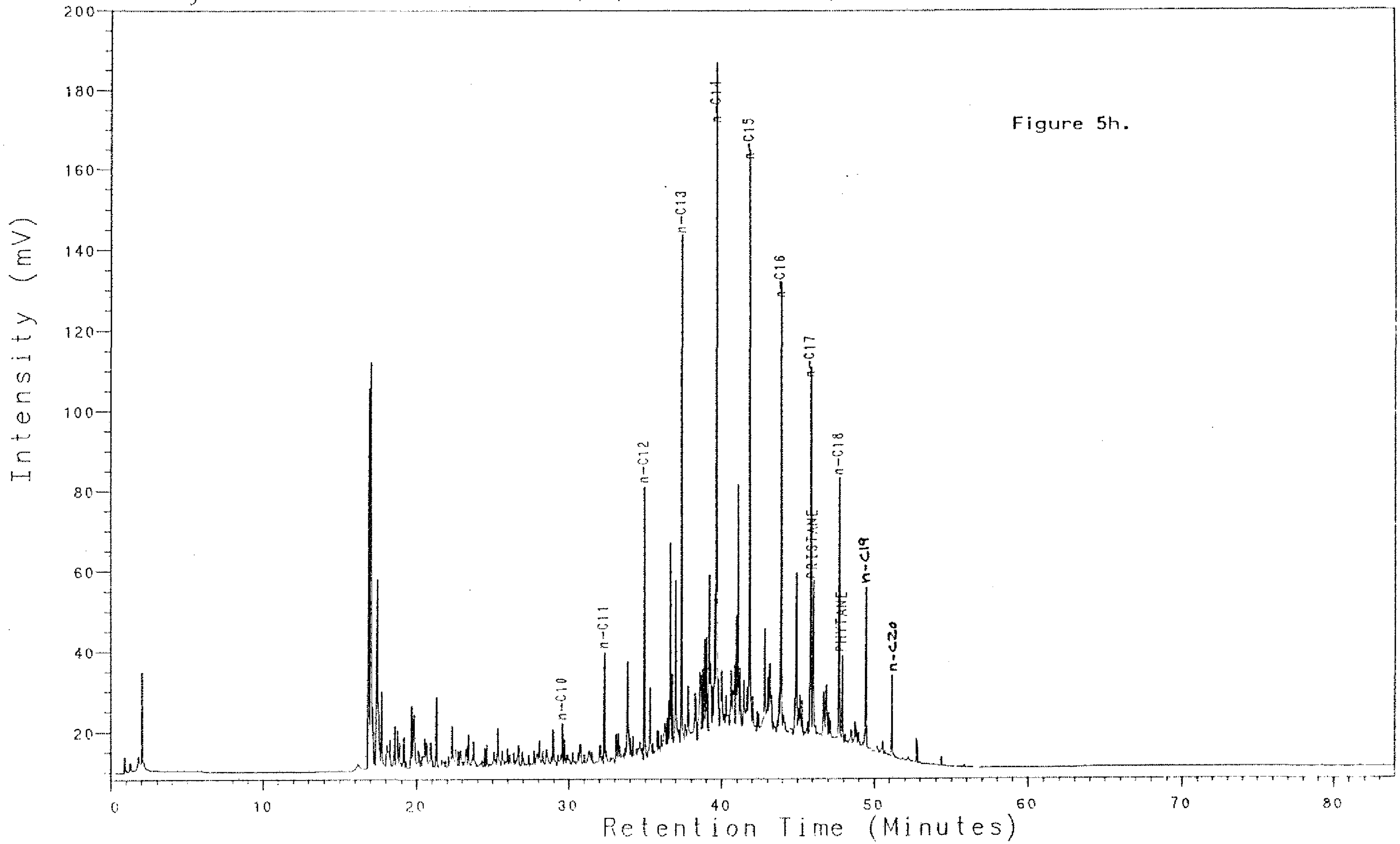


Figure 5g.
Thermal Extraction
Gas Chromatogram of
migrated hydrocarbons in a
carbonaceous sandstone.

NOCS 30/6-9 2546.4m
THERMAL EXTRACTION GC (S1)
S/SST:lt or to pl y brn

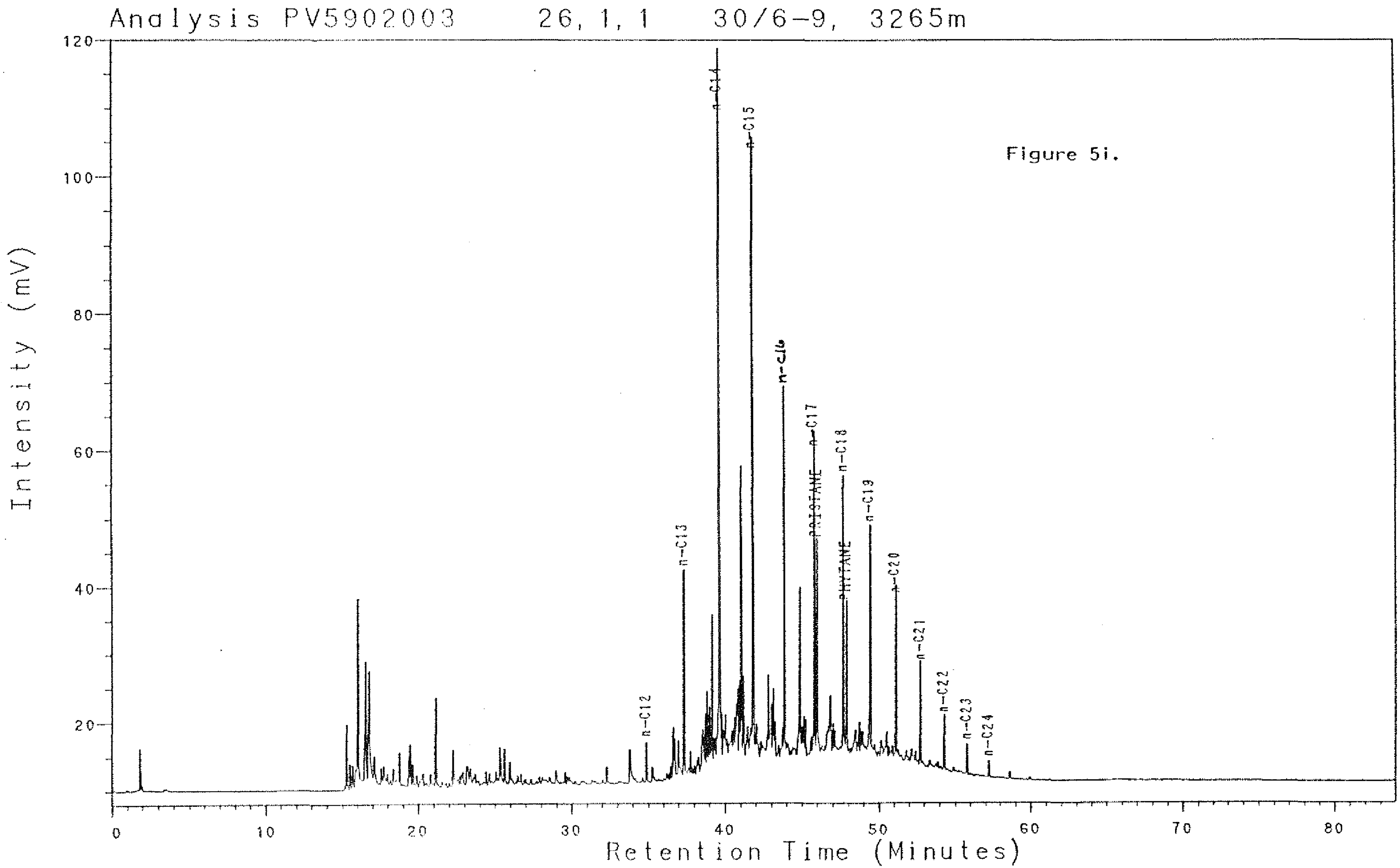
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Analysis PV5901313 26, 1, 1 30/6-9, 2790m



NOCS 30/6-9 2790m
THERMAL EXTRACTION GC (S1)
CLST: brn gy to m gy

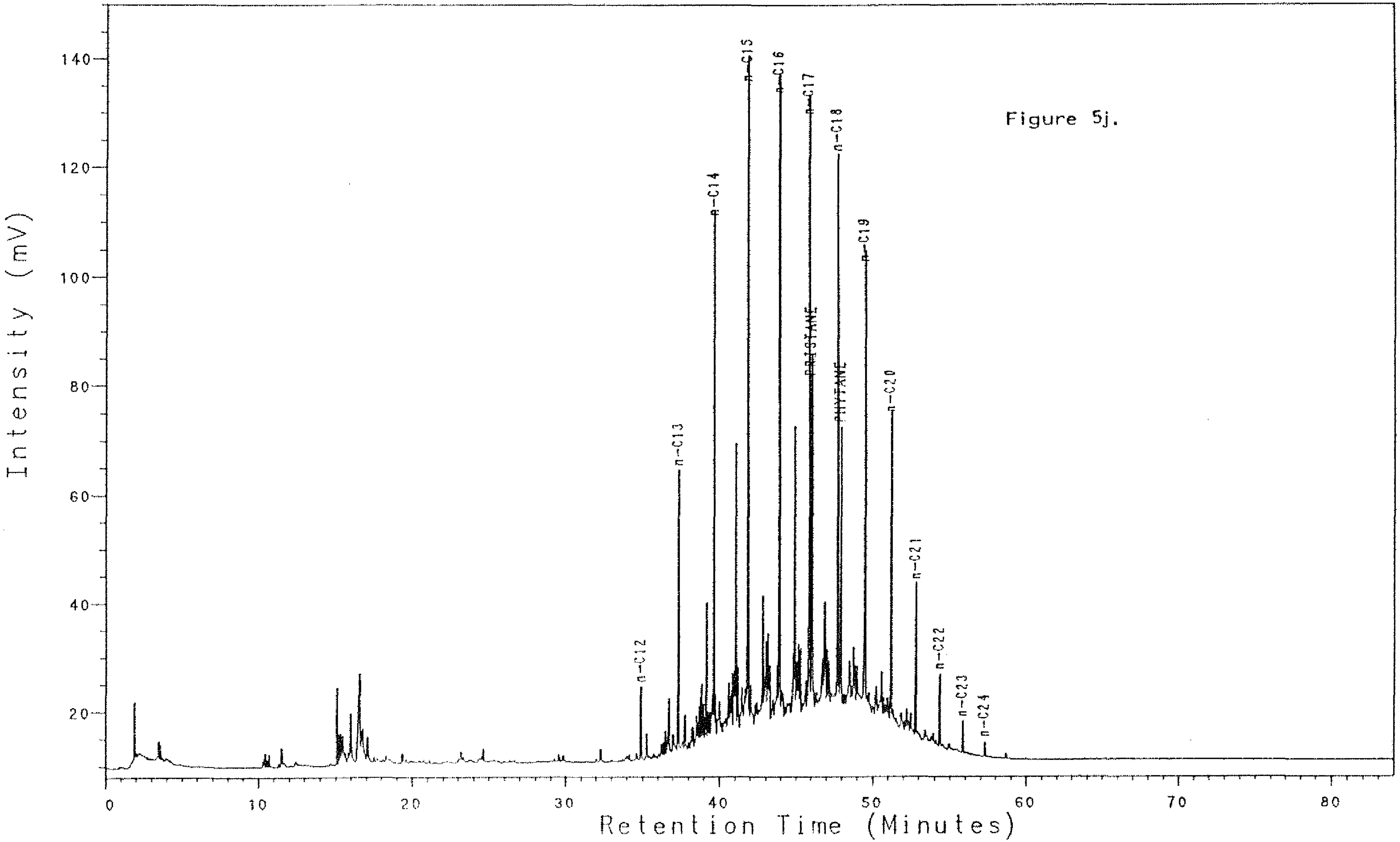
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 3265m
THERMAL EXTRACTION GC (S1)
S/SST:w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

Analysis PV5901784 26, 1, 1 30/6-9, 3025m



NOCS 30/6-9 3025m
THERMAL EXTRACTION GC (S1)
S/SST:w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5901965 26, 1, 1 30/6-9, 3197m

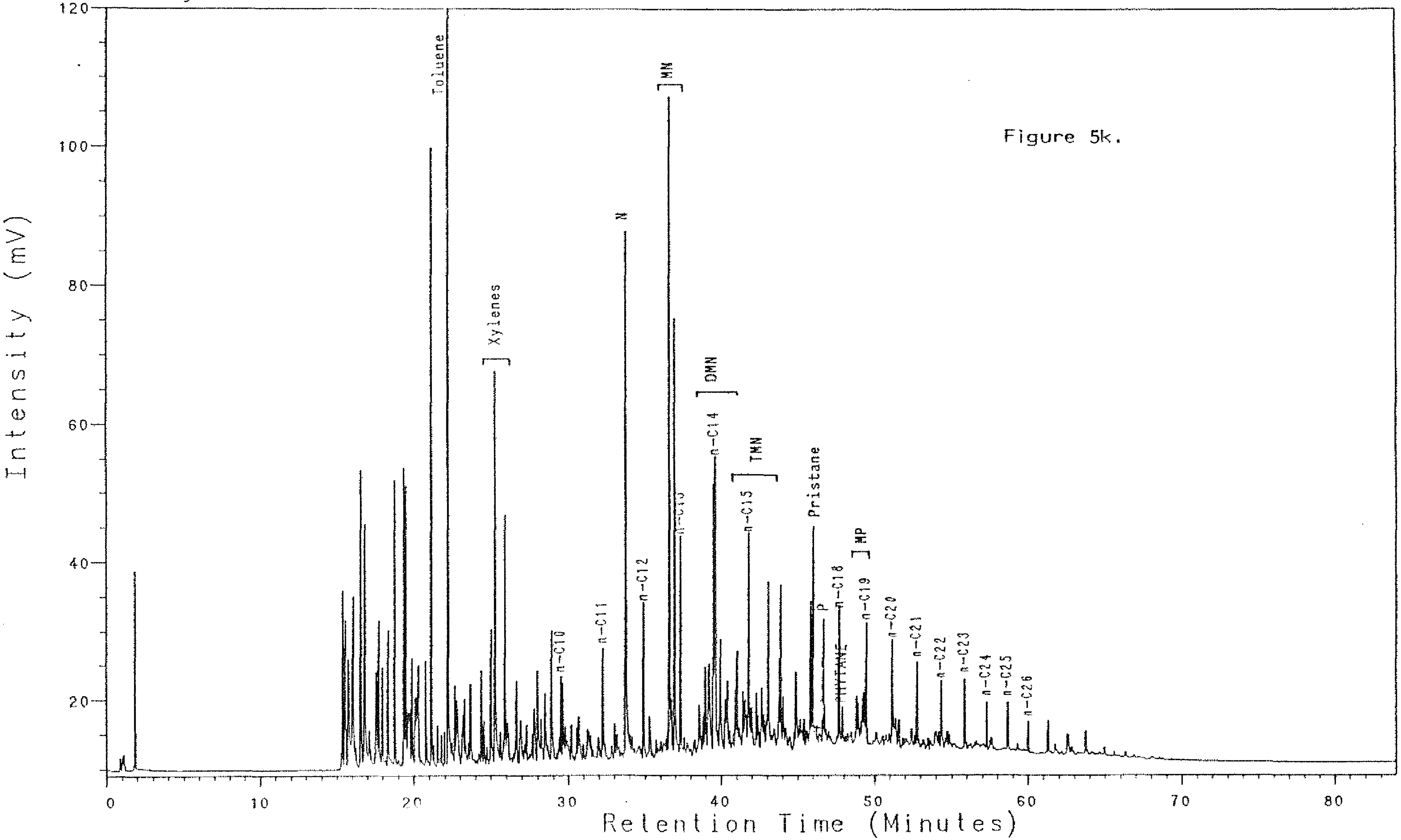
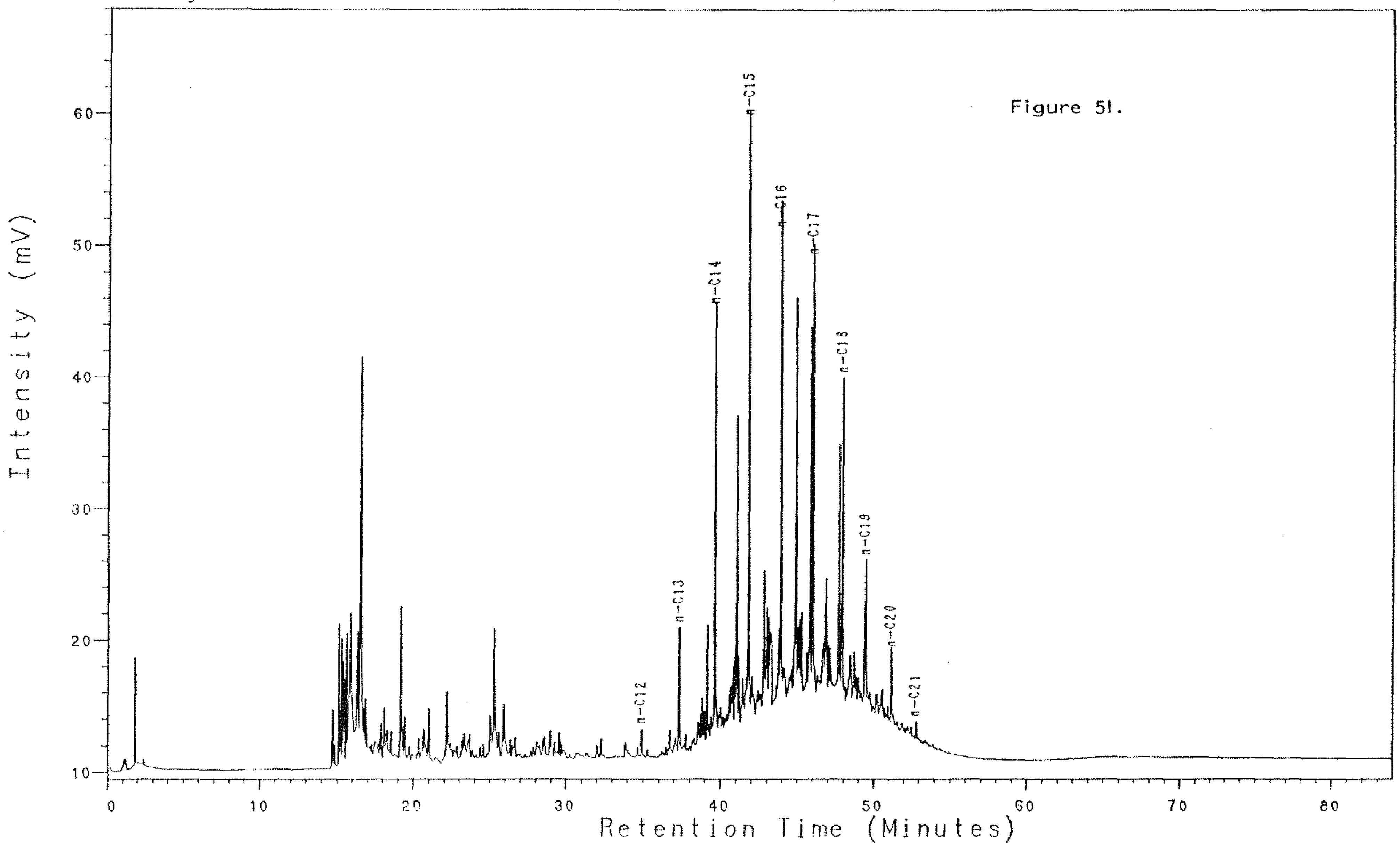


Figure 5k.

NOCS 30/6-9 3197m
THERMAL EXTRACTION GC (S1)
COAL:blk to dsk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

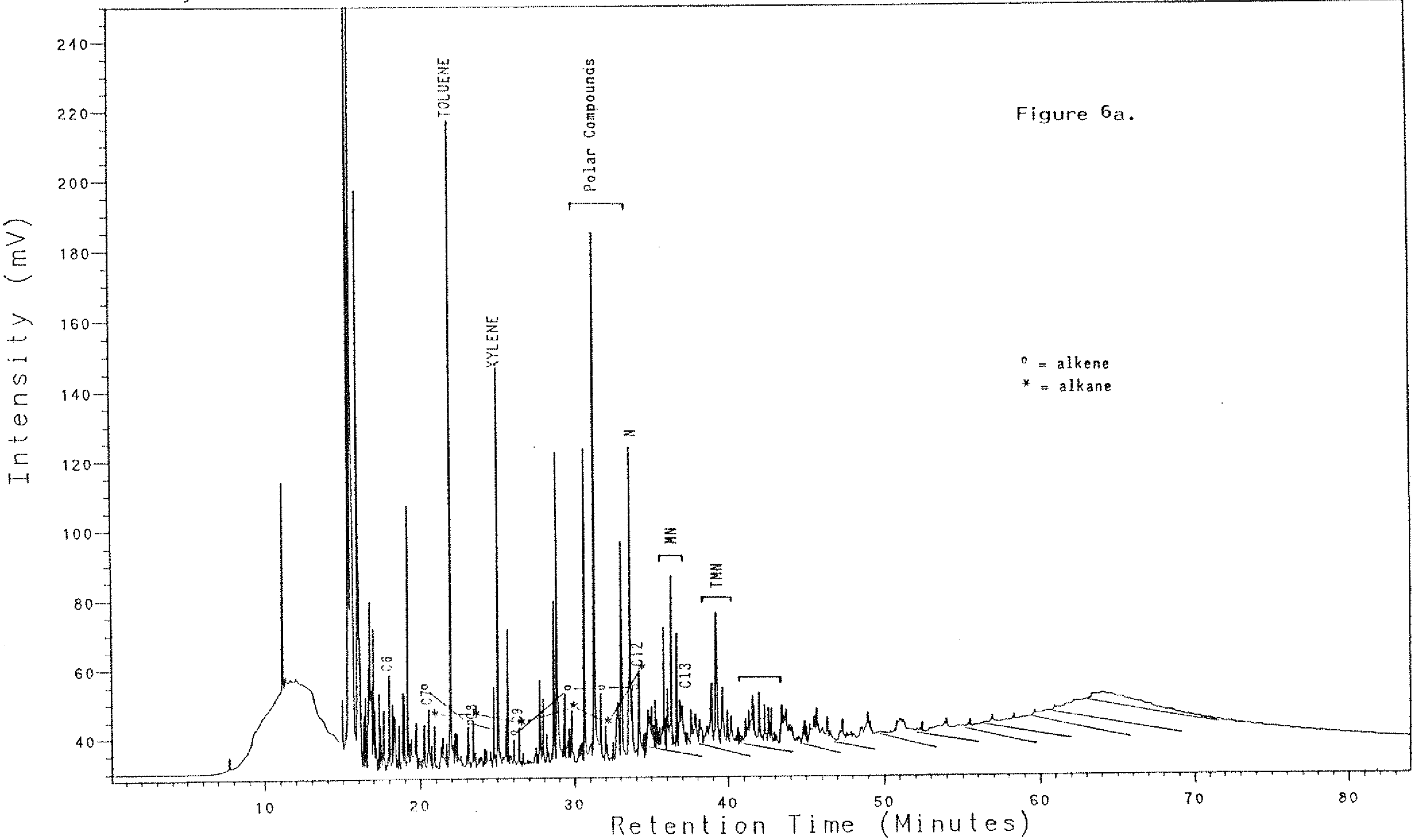
Analysis PV5902143   26, 1, 1   30/6-9, 3475m



NOCS 30/6-9 3475m
THERMAL EXTRACTION GC (S1)
S/SST:w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

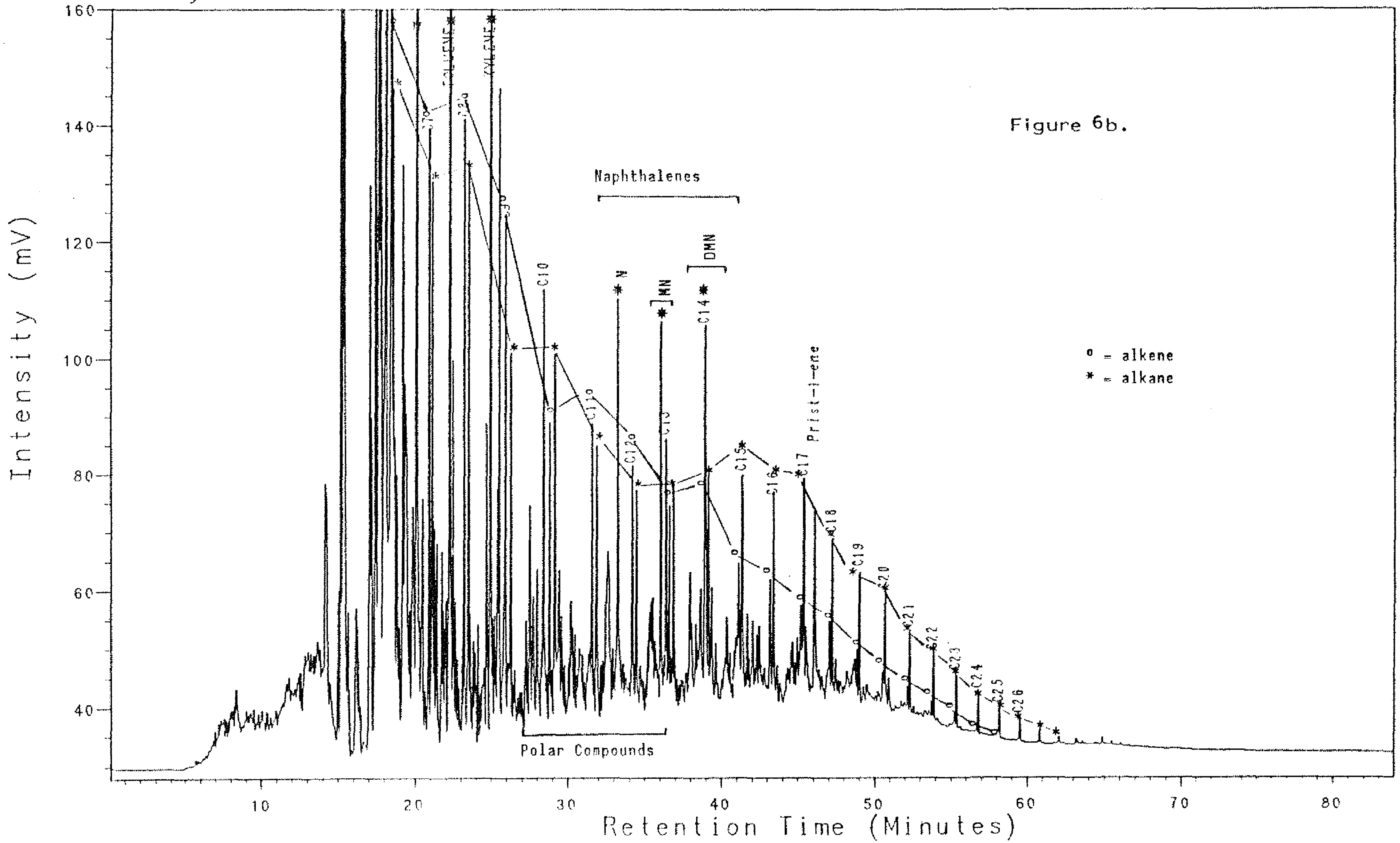
Analysis PV5900300 25, 1, 1 30/6-9, 2535m



NOCS 30/6-9 2535m
PYROLYSIS GC(S2)
BULK

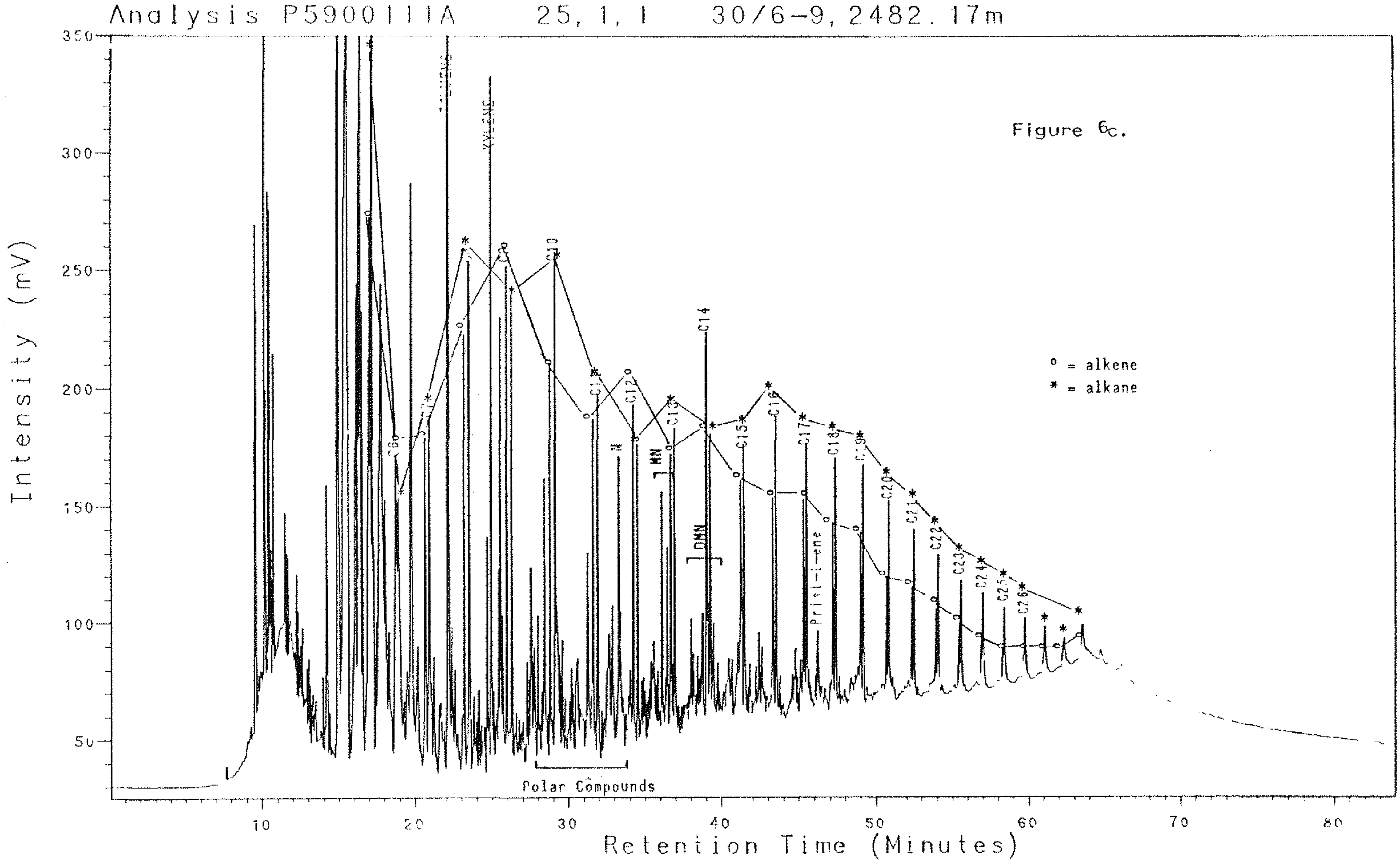
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Analysis PV5900341   25, 1, 1   30/6-9, 2541m



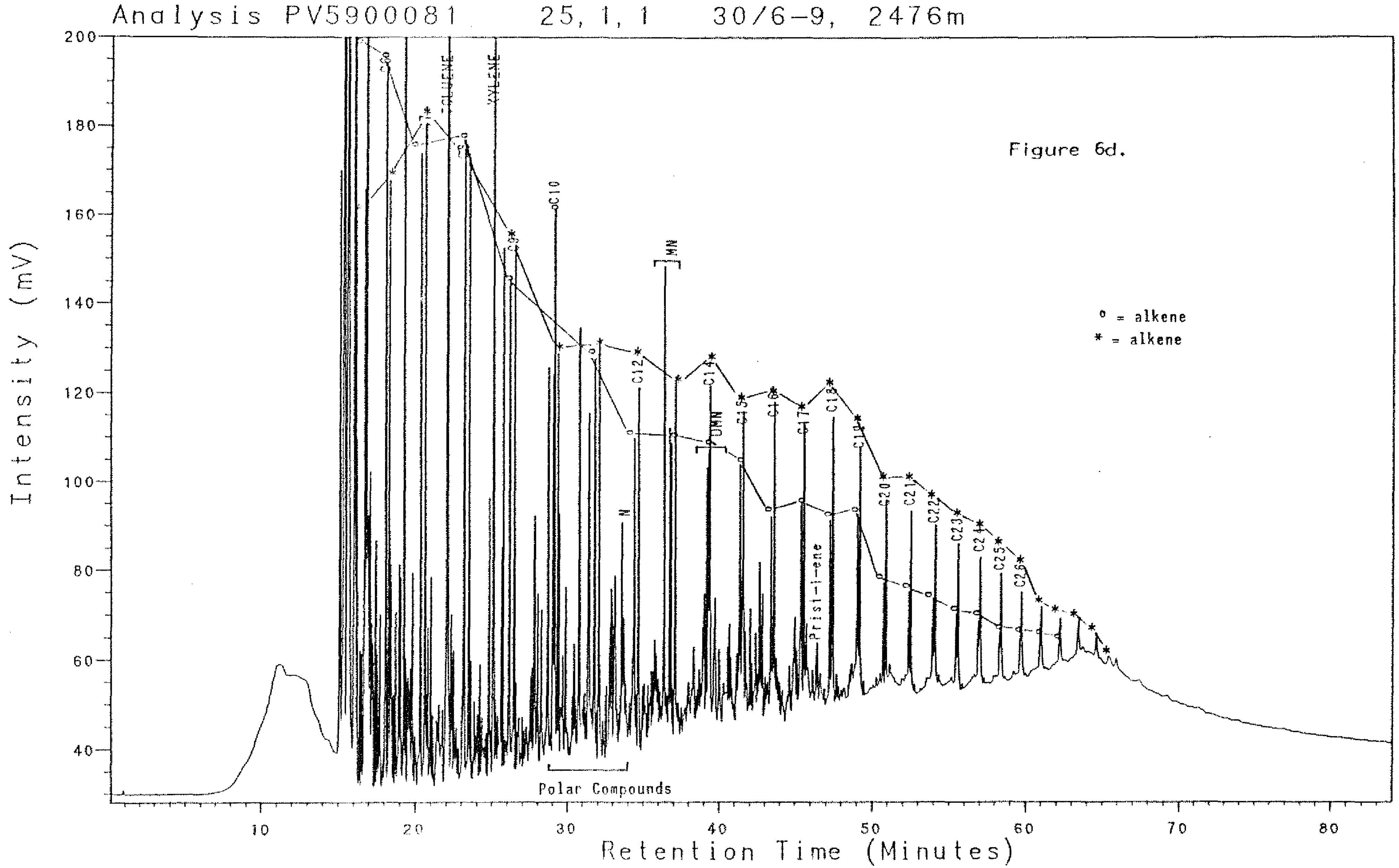
NOCS 30/6-9 2541m
PYROLYSIS GC (S2)
SLTST: brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 2482.17m
PYROLYSIS GC (S2)
CLST: drk gy to brn blk

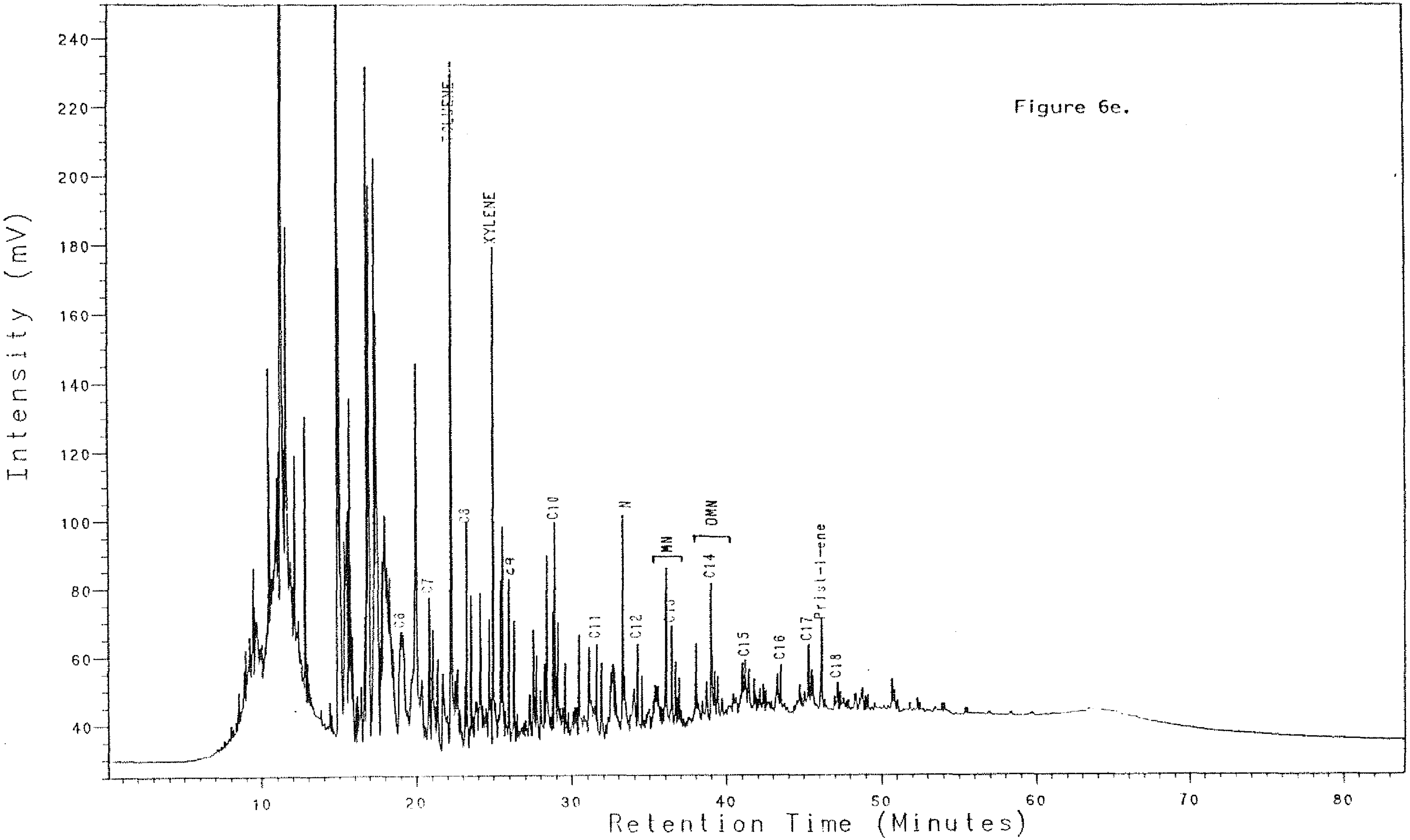
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S



NOCS 30/6-9 2476m
PYROLYSIS GC(S2)
COAL: blk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY

Analysis PV5900021 25, 1, 1 30/6-9, 2462.74m



NOCS 30/6-9 2462.74m
PYROLYSIS GC (S2)
SST: pl brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Analysis PV5900571   25, 1, 1   30/6-9, 2544m

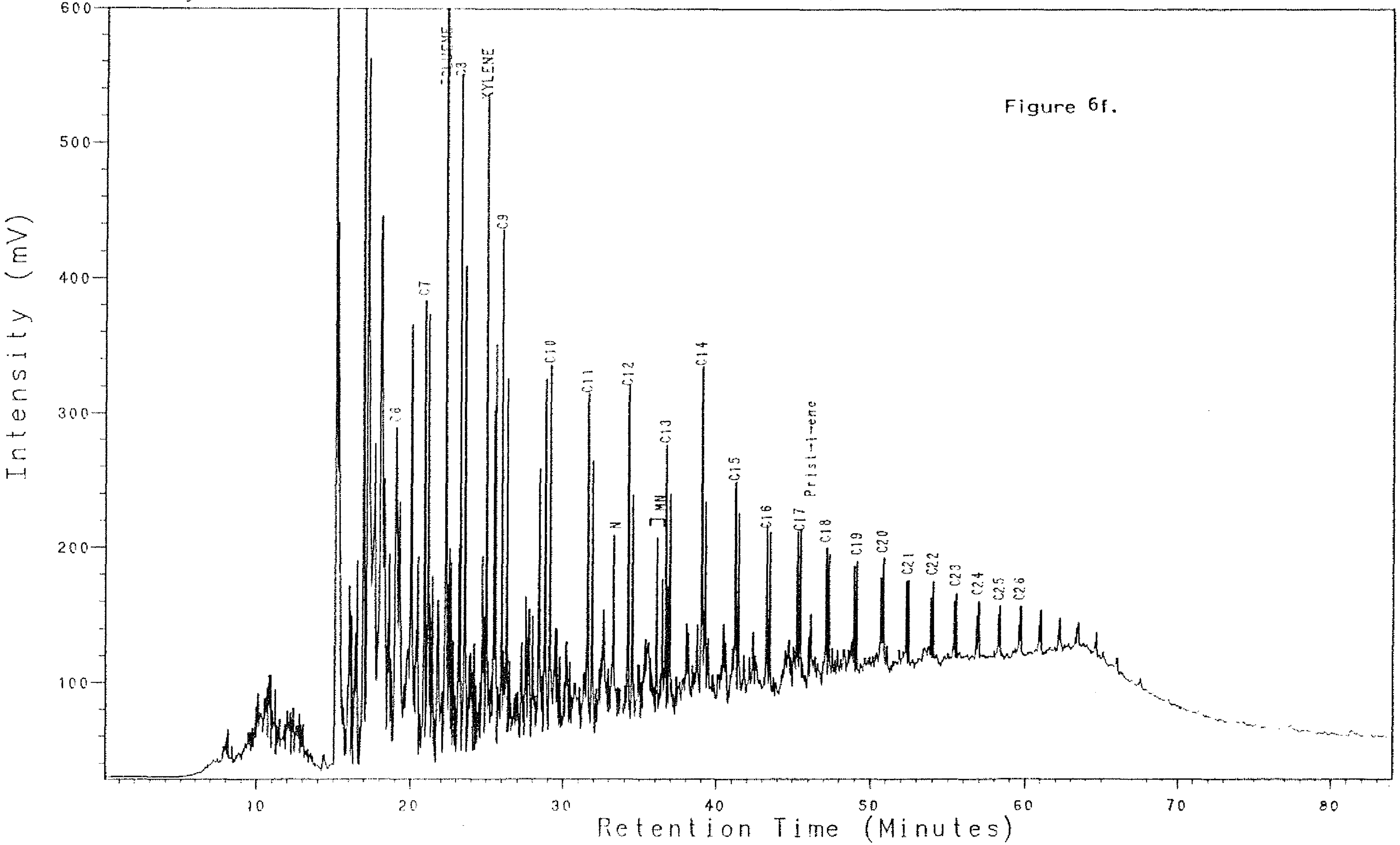
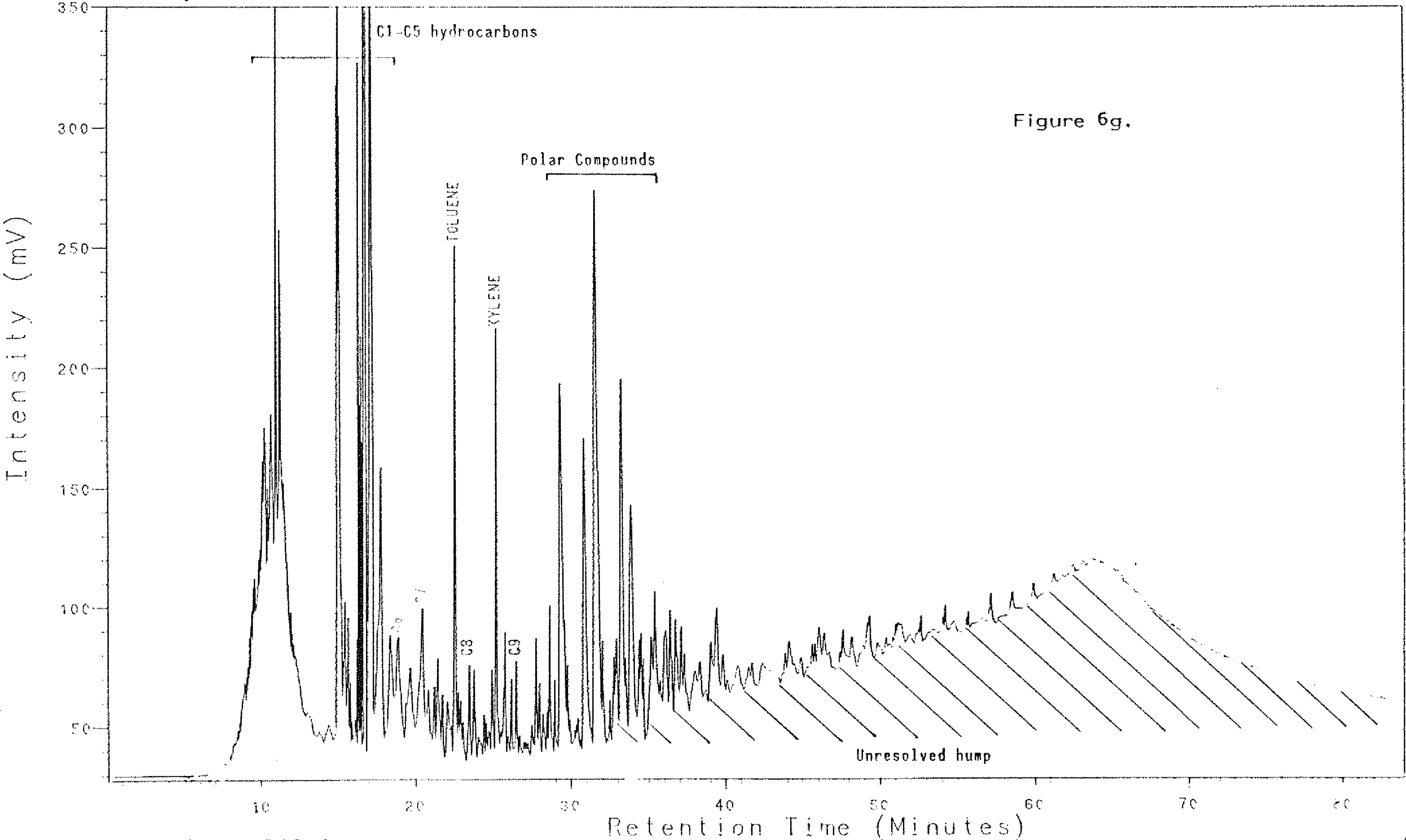


Figure 6f.

NOCS 30/6-9 2544m
PYROLYSIS GC (S2)
SST drk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

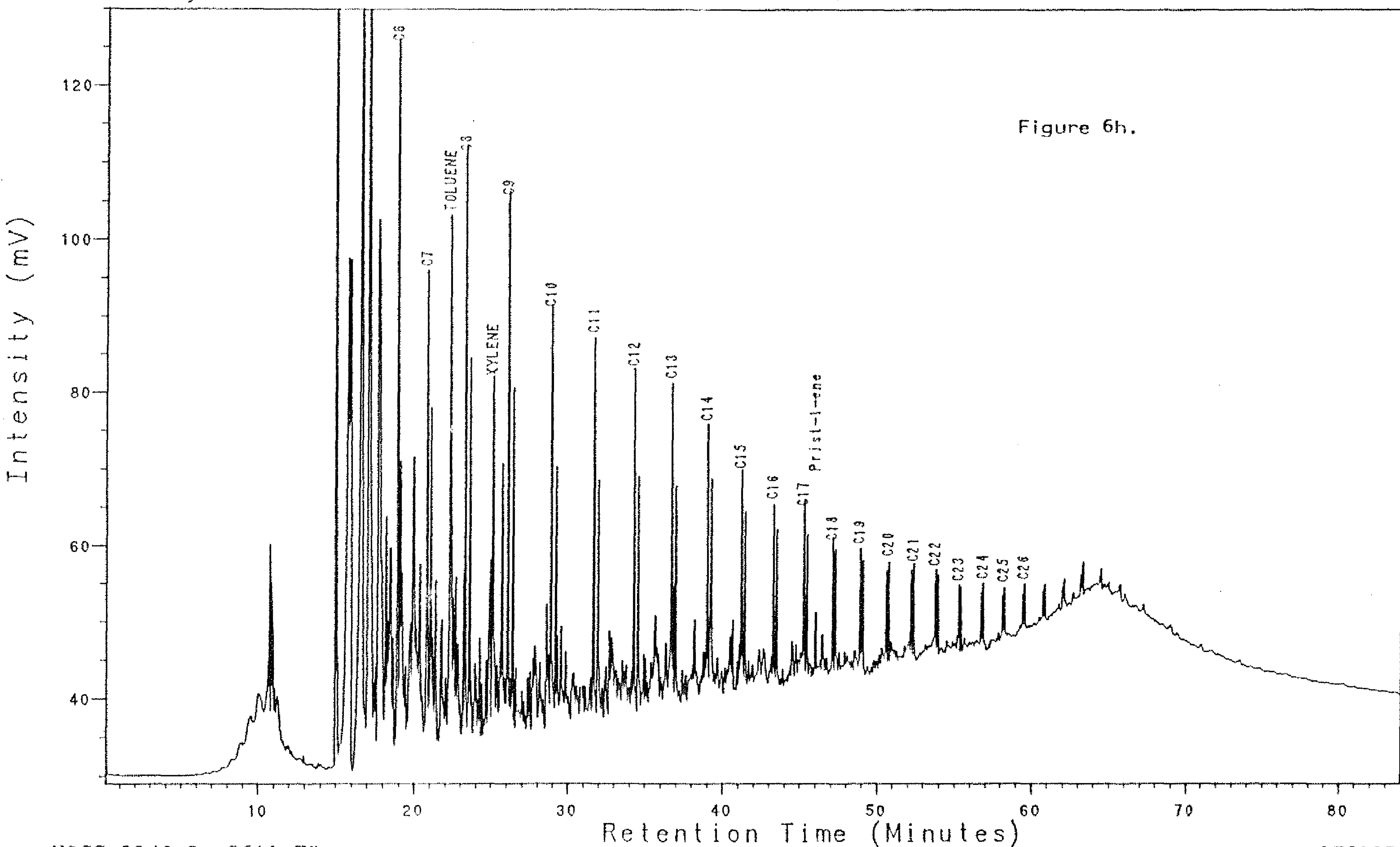
Analysis PV5900321 25, 1, 1 30/6-9, 2546.4m



NOCS 30/6-9 2546.40m
PYROLYSIS GC(S2)
SST: lt or to pl y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

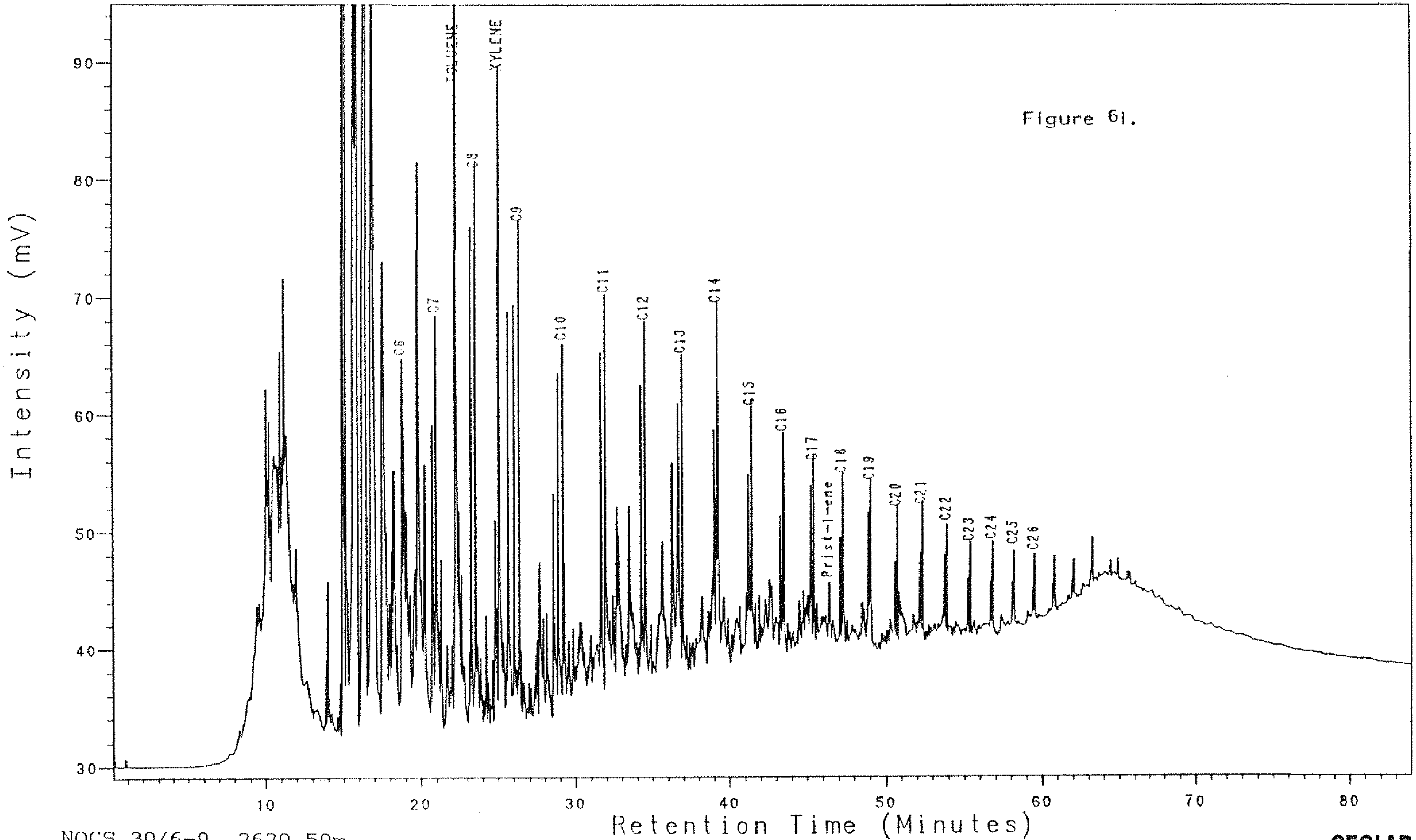
Analysis PV5900521 25,1,1 30/6-9,2611.75m



NOCS 30/6-9 2611.75m
PYROLYSIS GC(S2)
SST lt y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY

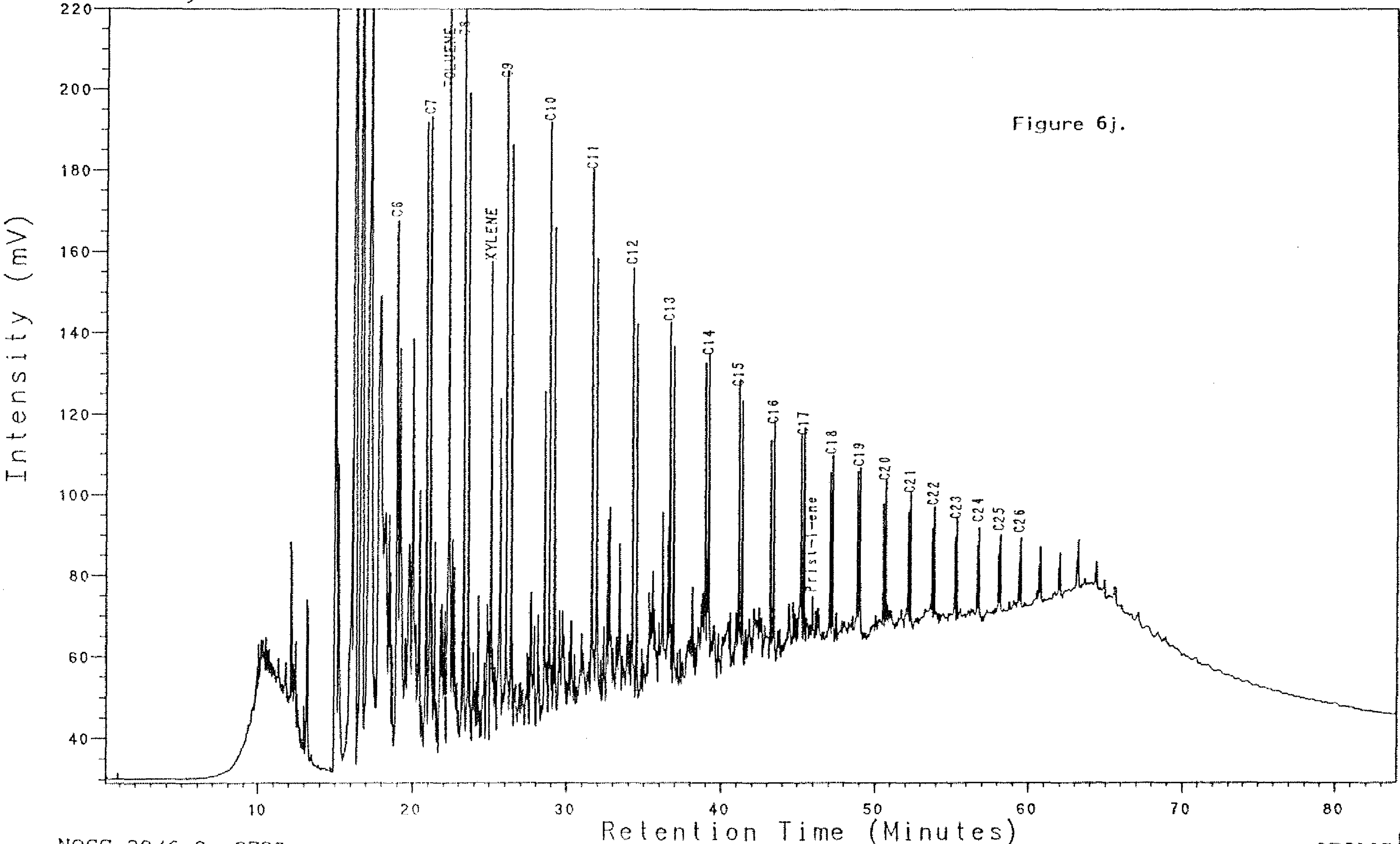
Analysis PV5900541   25, 1, 1   30/6-9, 2620.5m



NOCS 30/6-9 2620.50m
PYROLYSIS GC(S2)
SLTST: brn gy to dsk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

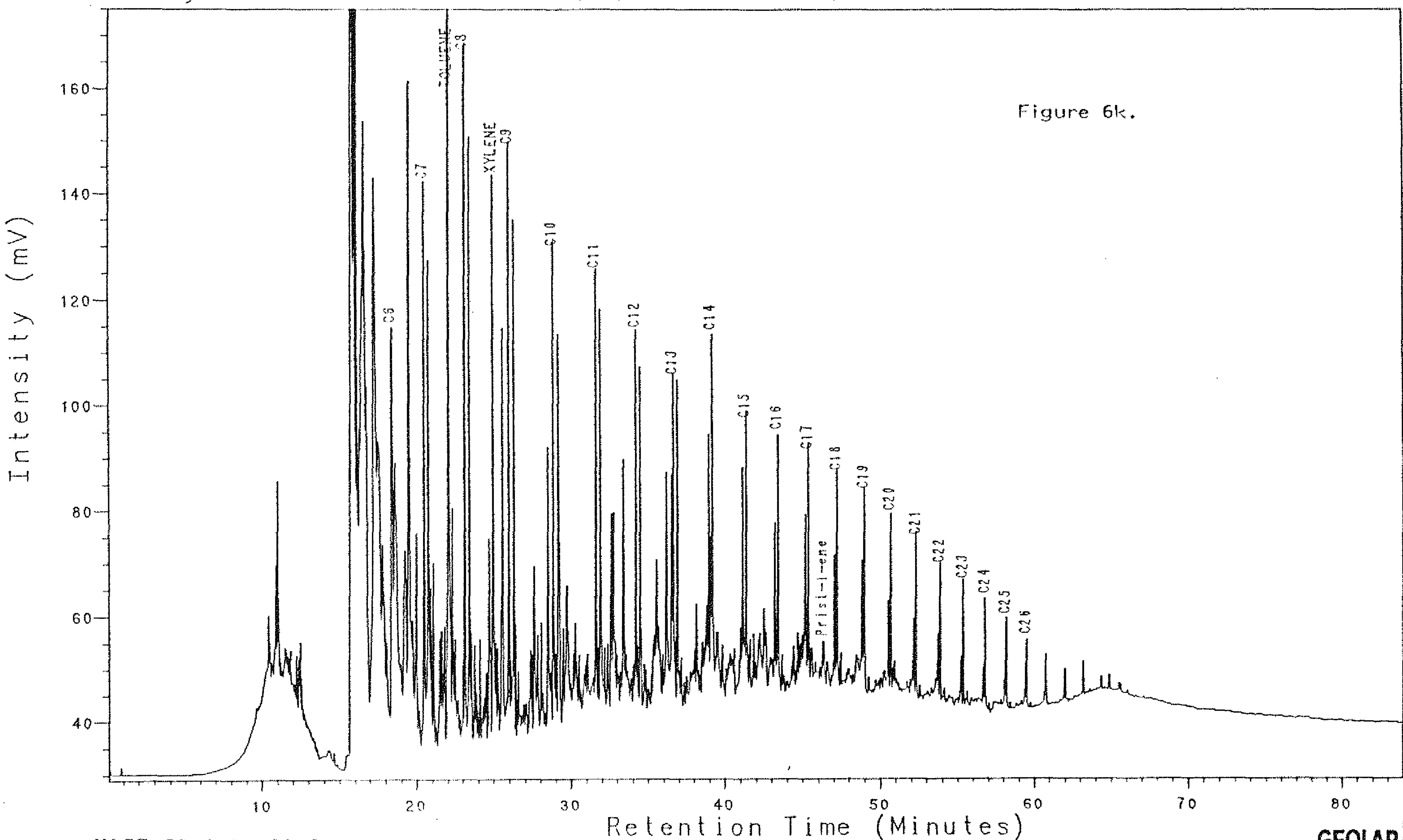
Analysis PV5901293   25, 1, 1   30/6-9, 2780m



NOCS 30/6-9 2780m
PYROLYSIS GC(S2)
SL T: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

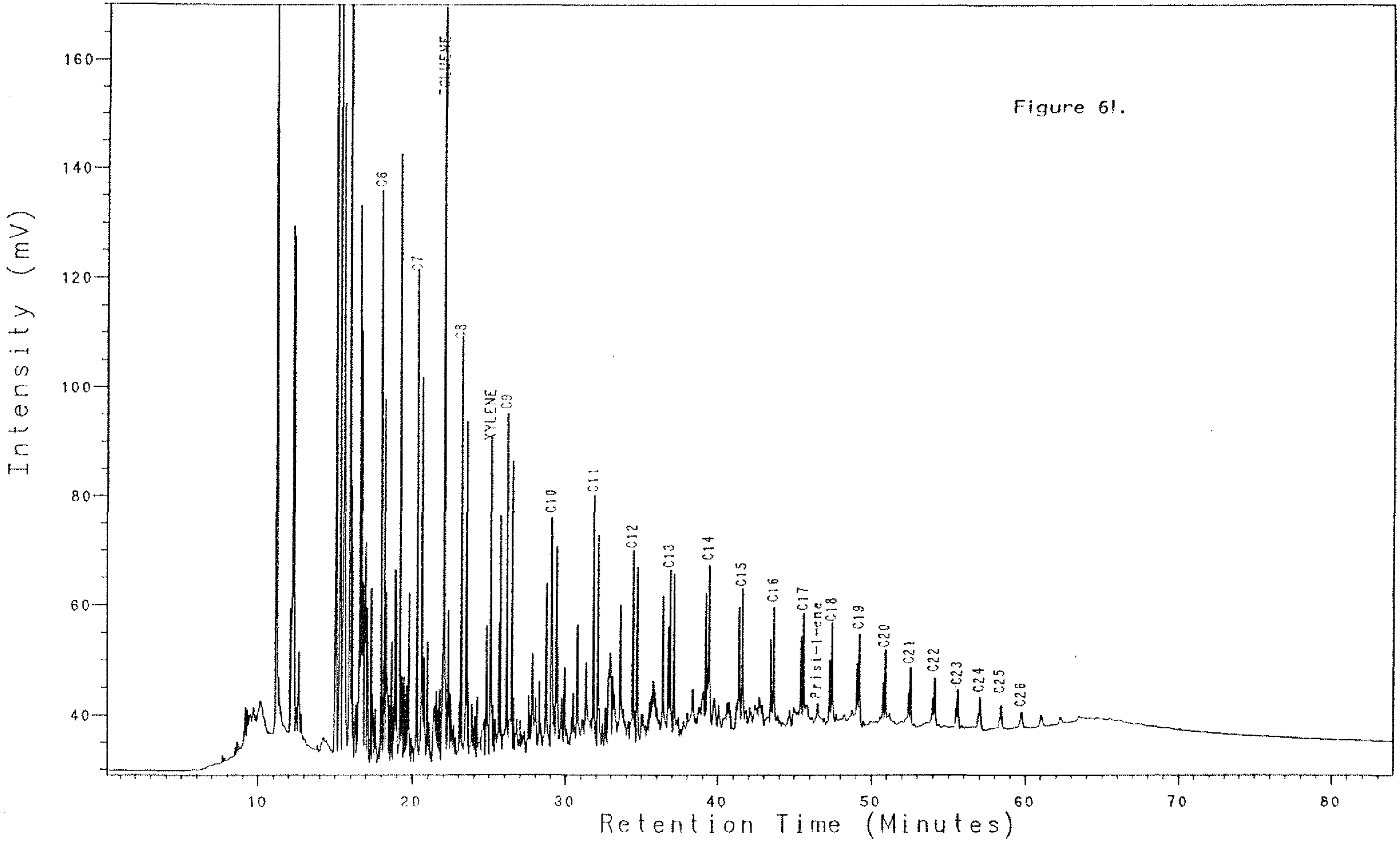
Analysis PV5901422 25, 1, 1 30/6-9, 2845m



NOCS 30/6-9 2845m
PYROLYSIS GC(S2)
SLTST: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

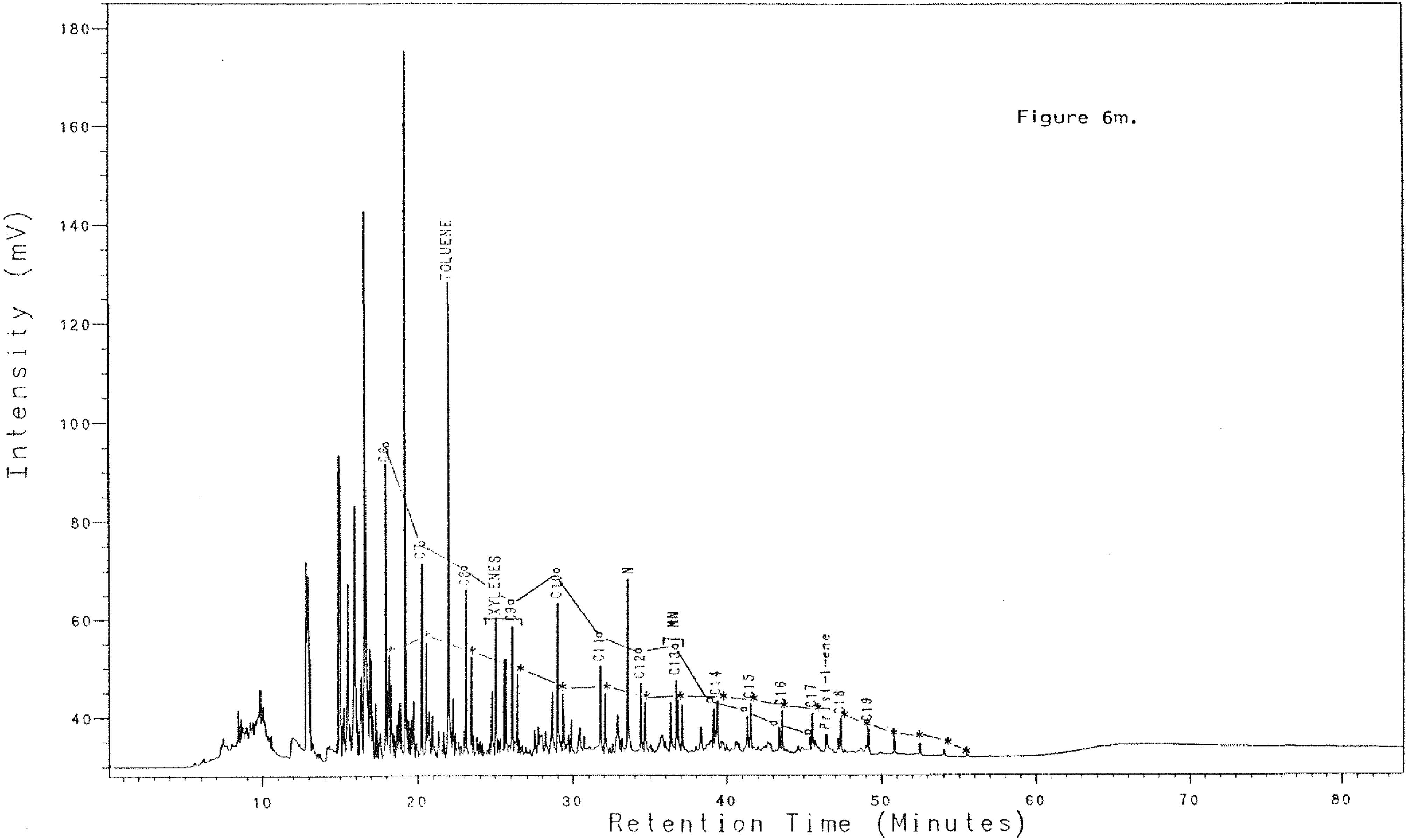
Analysis PV5901522 25, 1, 1 30/6-9, 2895m



NOCS 30/6-9 2895m
PYROLYSIS GC(S2)
SLTST: brn gy to m gy

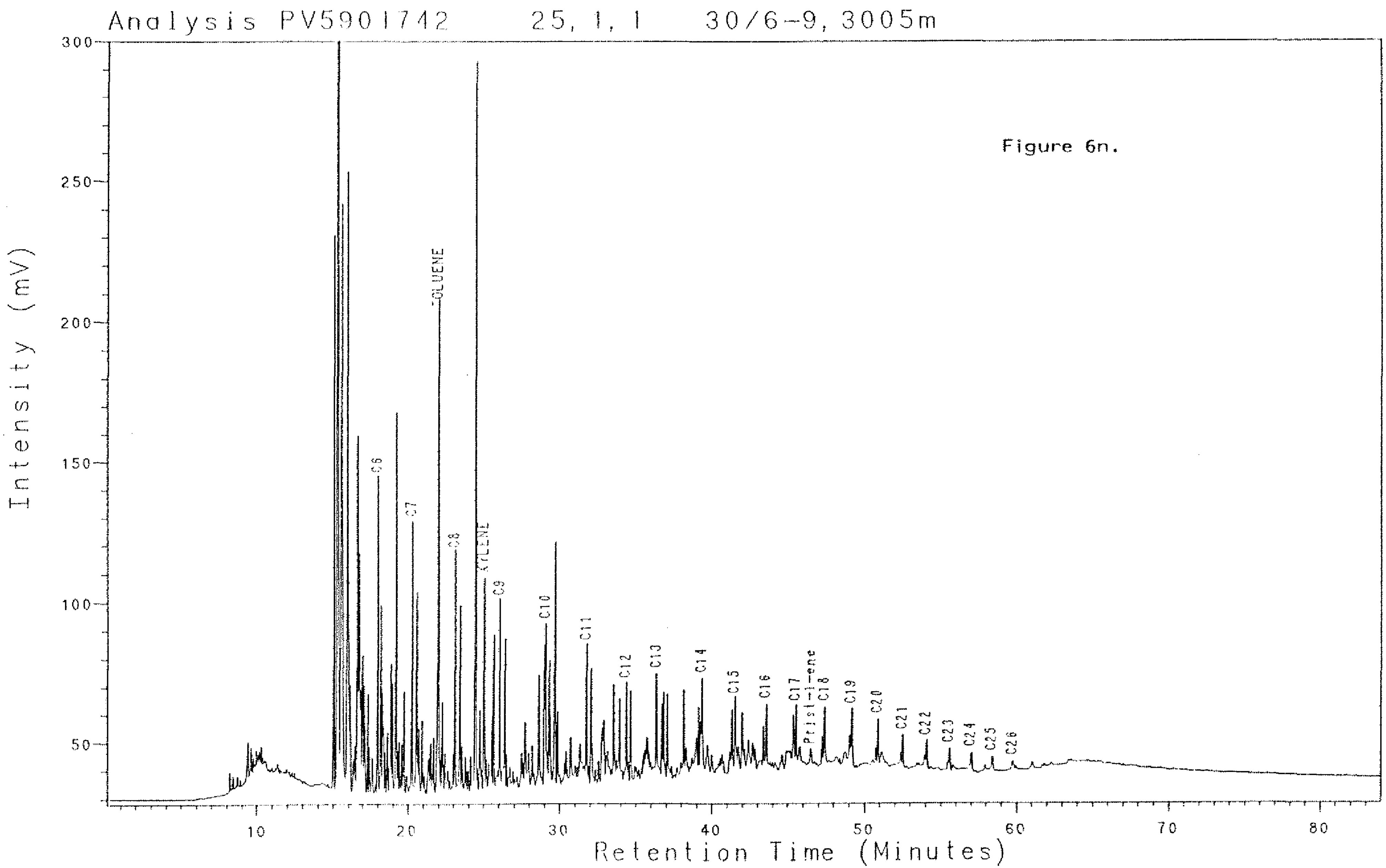
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5901574   25, 1, 1   30/6-9, 2920m



NOCS 30/6-9 2920m
PYROLYSIS GC(S2)
SST: w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S



NOCS 30/6-9 3005m
PYROLYSIS GC(S2)
SLTST: brn gy to m gy

GEOLAB NOR
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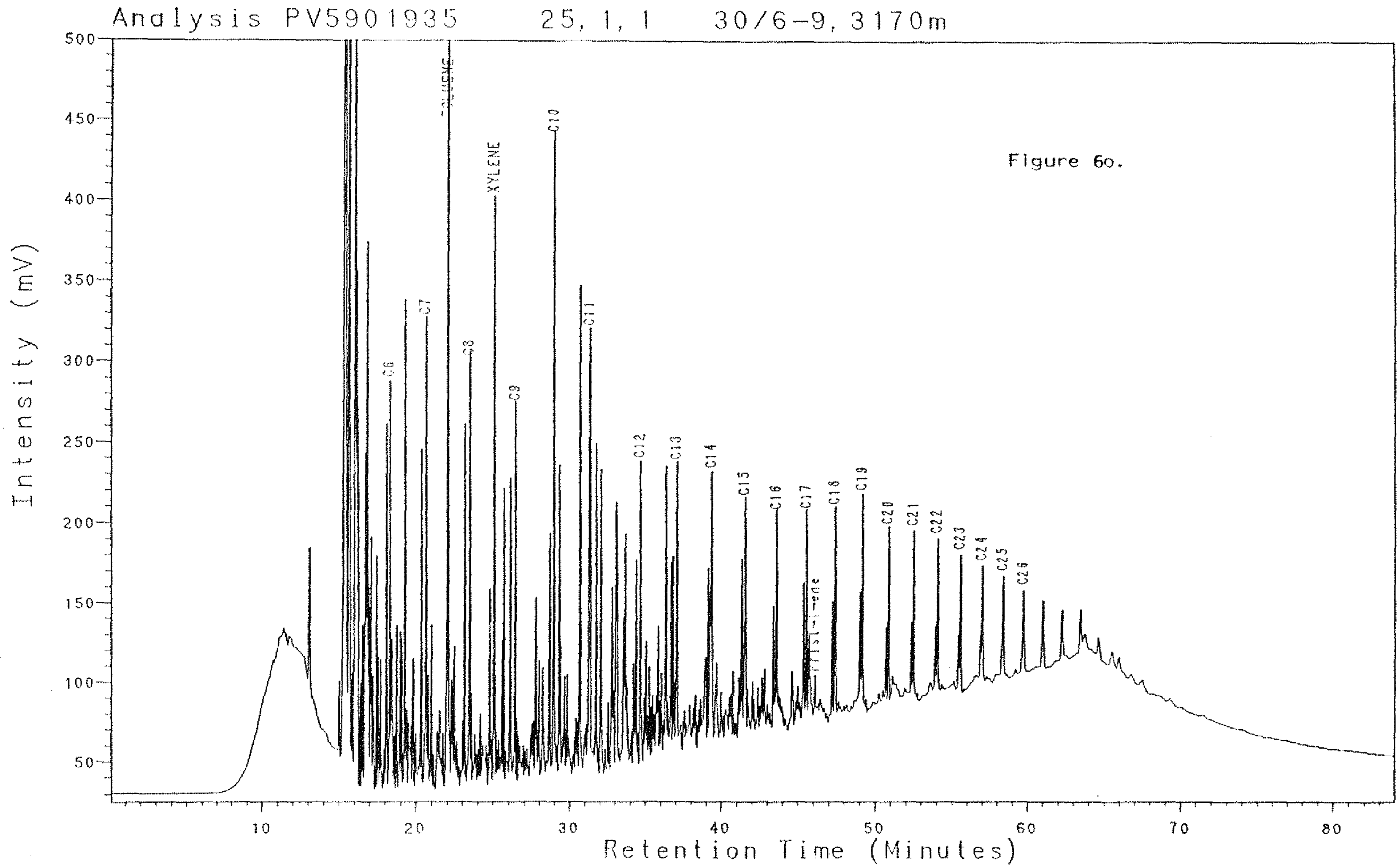

NOCS 30/6-9 3170m
PYROLYSIS GC(S2)
COAL: blk

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Figure 7 : Pyrolysis GC Composition

Well NOCS 30/6-9

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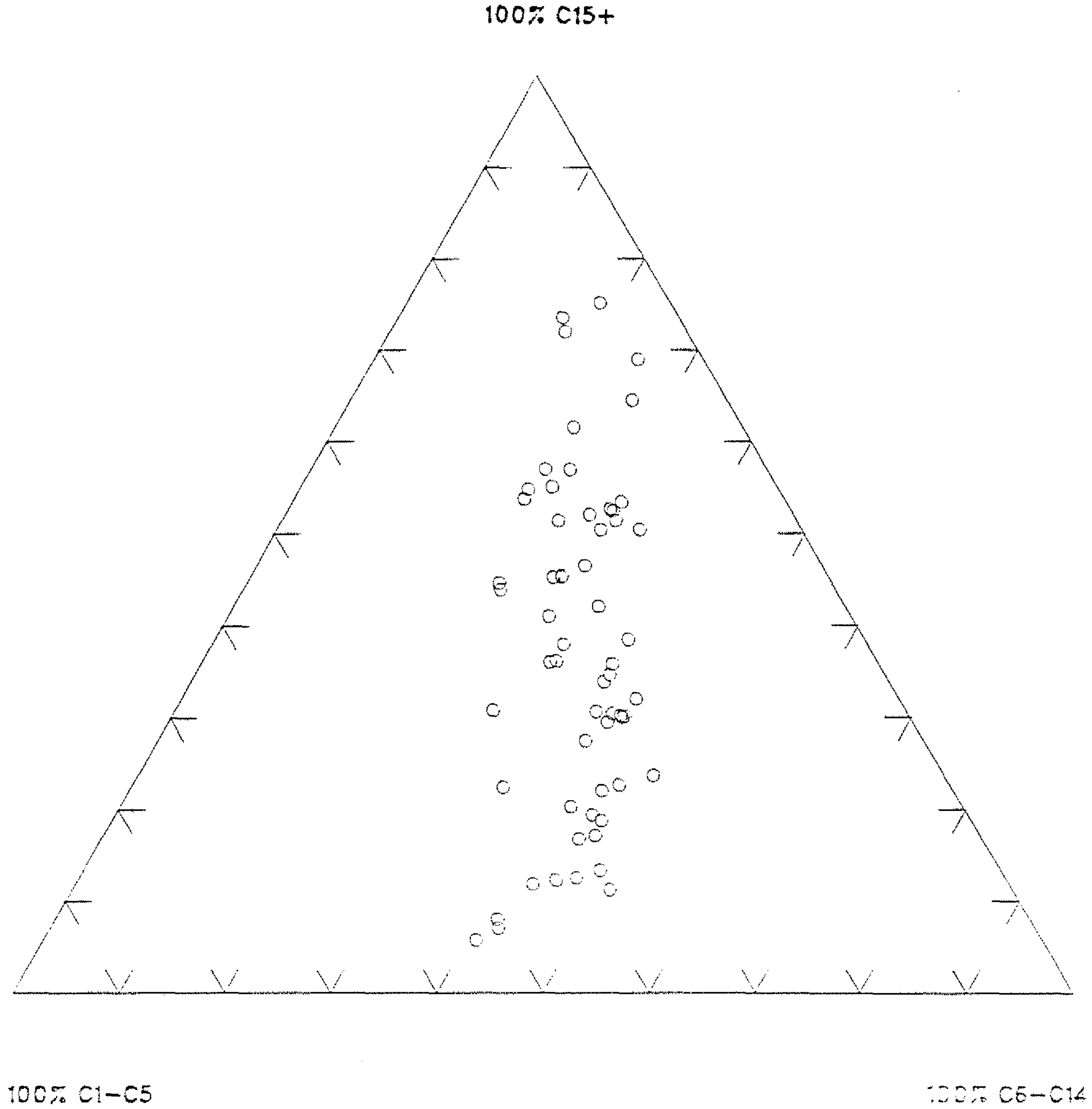

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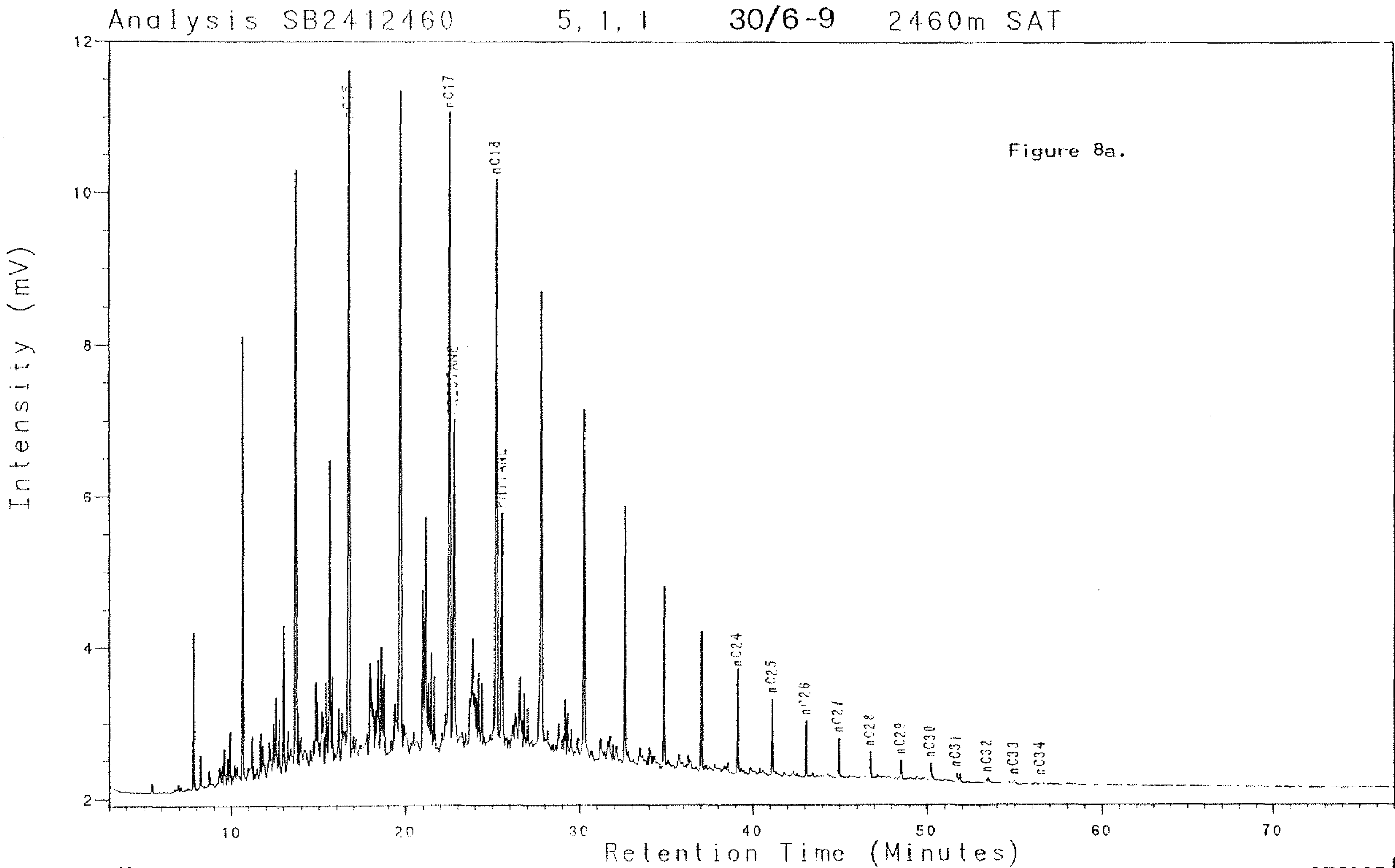
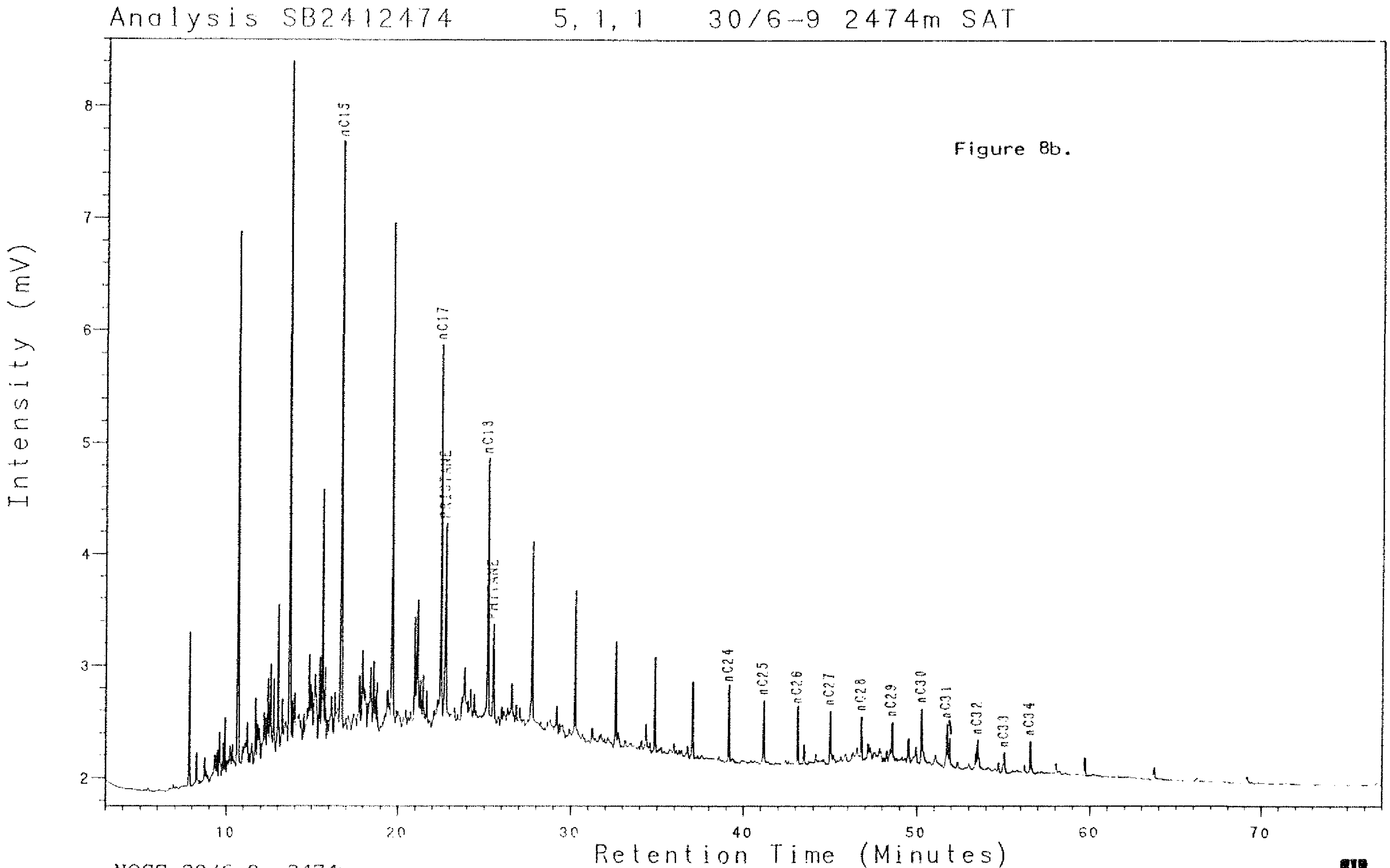


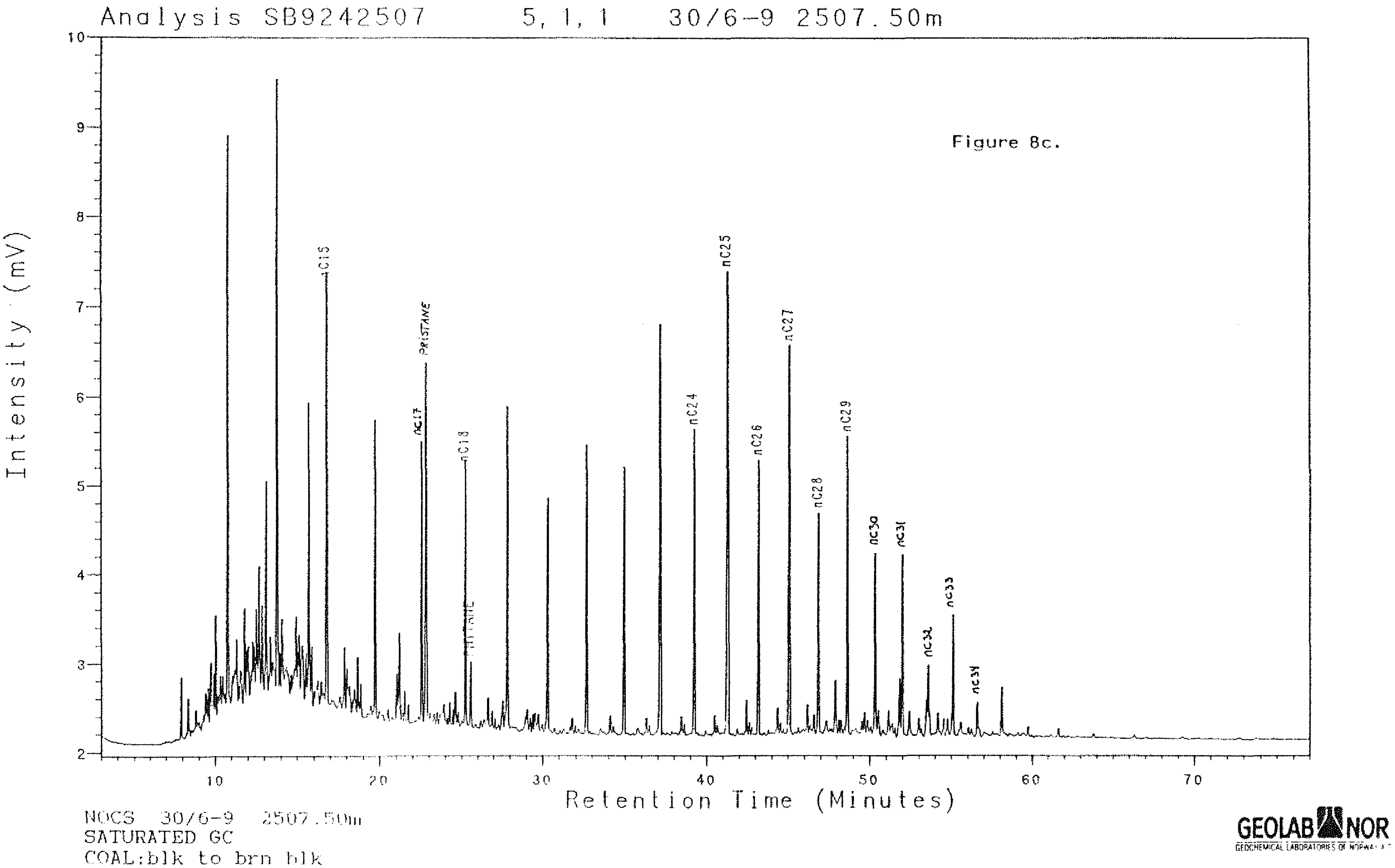
NOCS 30/6-9 2460m
SATURATED GC
COAL: blk

GEOLAB NOR

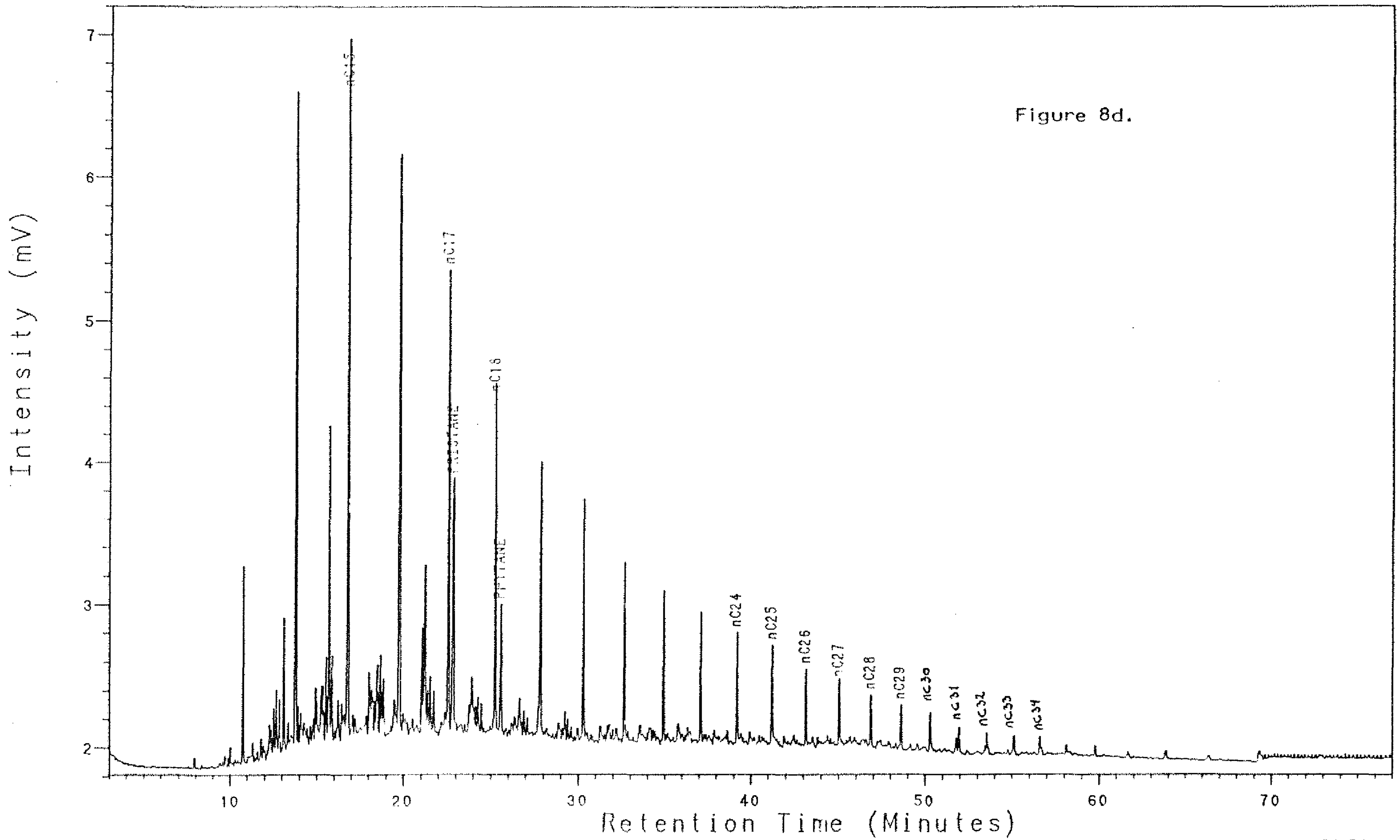


NOCS 30/6-9 2474m
SATURATED GC
CLST: drk gy to brn blk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S


Analysis SB9242507 5, 1, 1 30/6-9 2507.50m
Figure 8c.
Intensity (mV)
Retention Time (Minutes)
nC15
PRISTANE
nC17
nC18
PHYTANE
nC24
nC25
nC26
nC27
nC28
nC29
nC30
nC31
nC32
nC33
nC34
10
9
8
7
6
5
4
3
2
10
20
30
40
50
60
70
NOCS 30/6-9 2507.50m
SATURATED GC
COAL:blk to brn blk
GEOLAB NOR

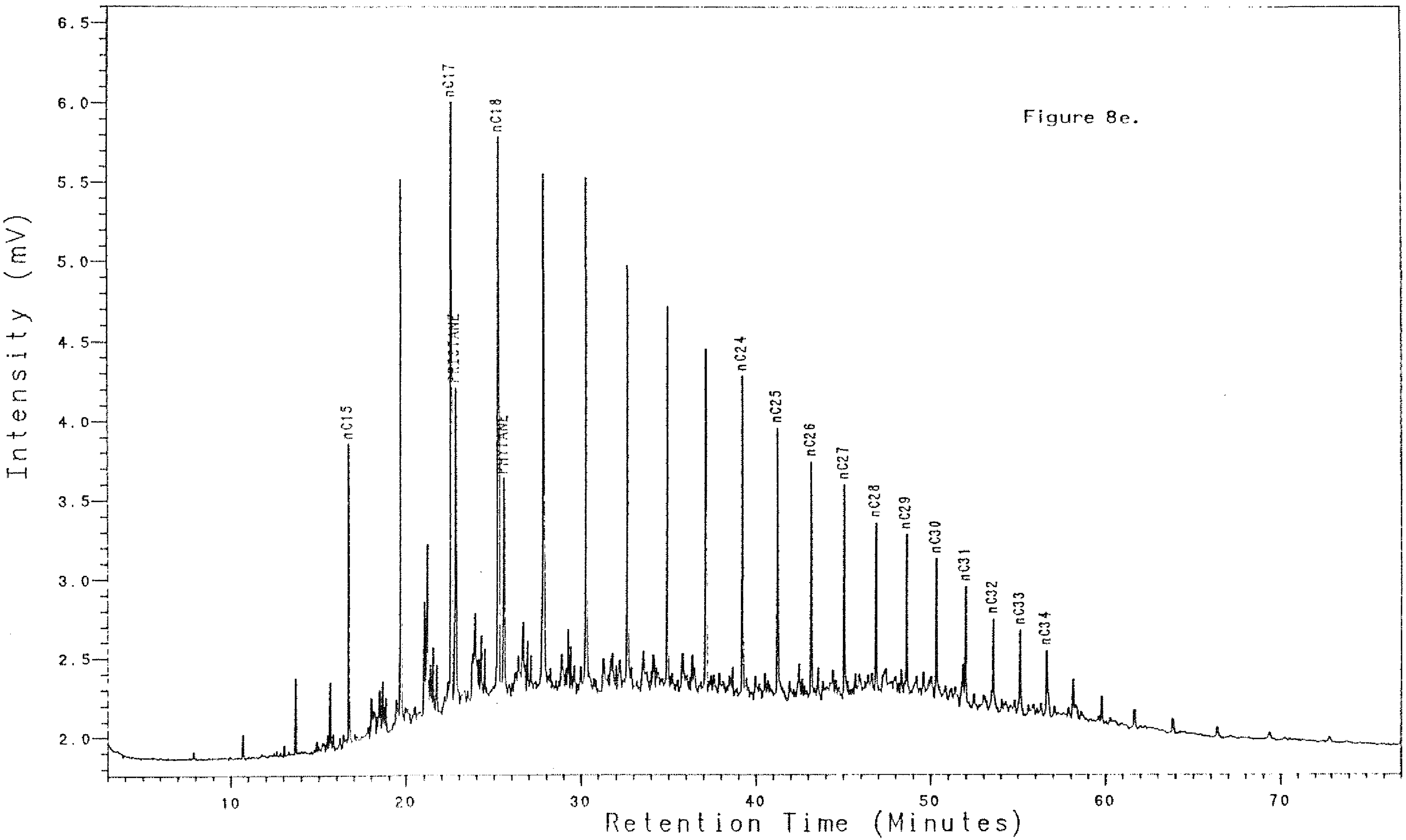
Analysis SB9242468   5, 1, 1   30/6-9 2462.75-68.30



NOCS 30/6-9 2462.75-2468.30m
SATURATED GC
./Sst: pl brn

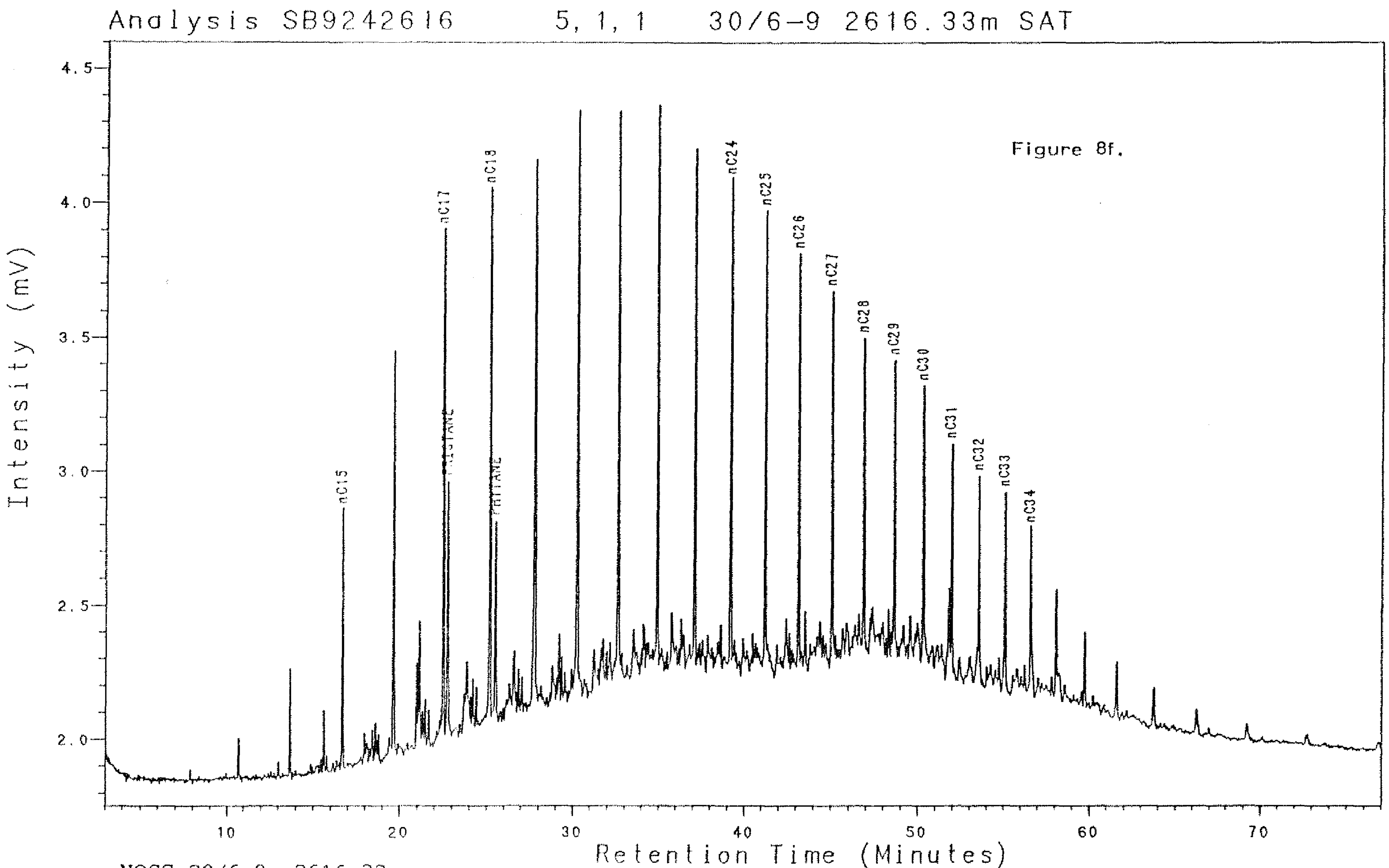
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis SB9242544 5, 1, 1 30/6-9 2544m SAT



NOCS 30/6-9 2544.00m
SATURATED GC
S/Sst: drk y brn

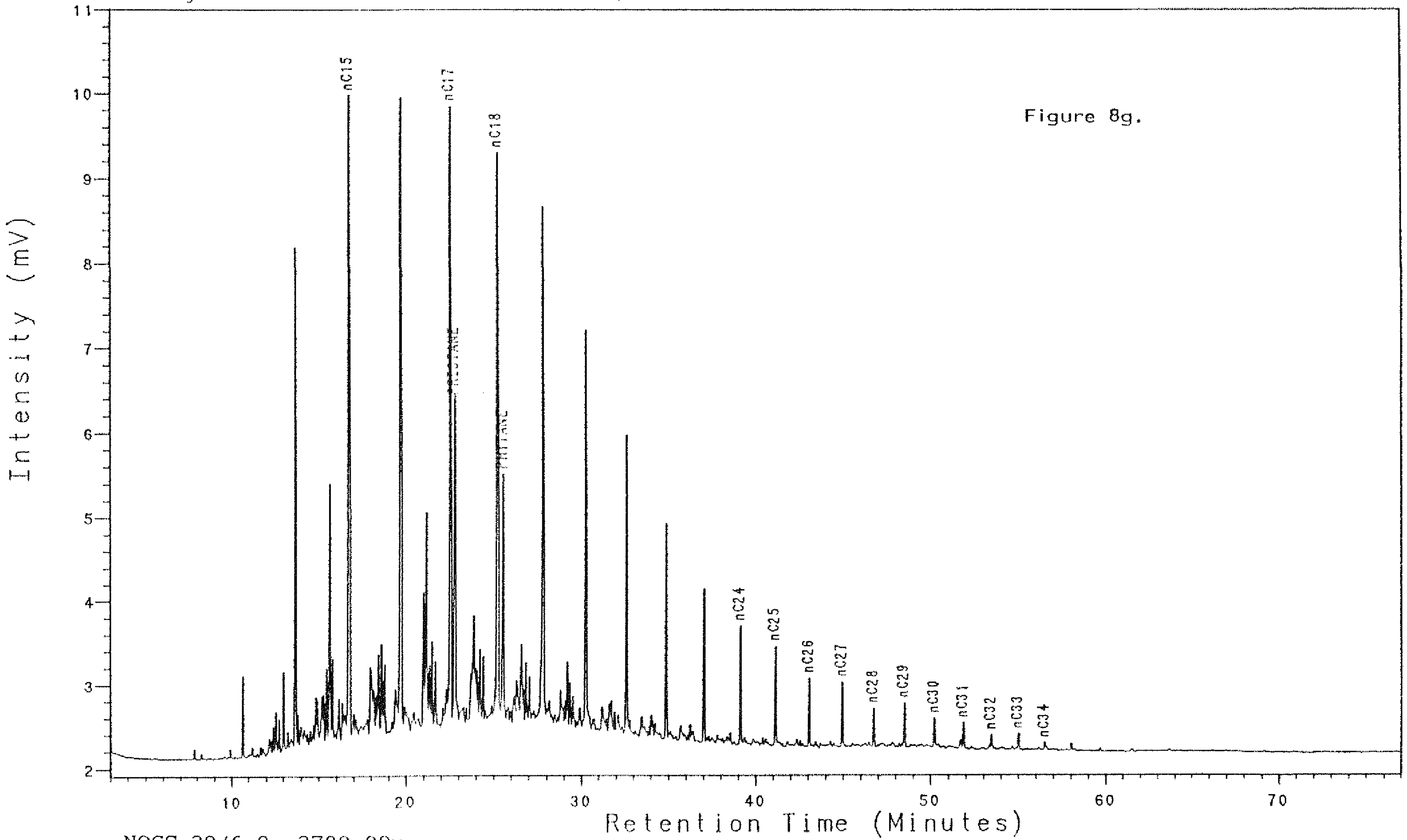
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.



NOCS 30/6-9 2616.33m
SATURATED GC
S/Sst: lt gy to lt y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

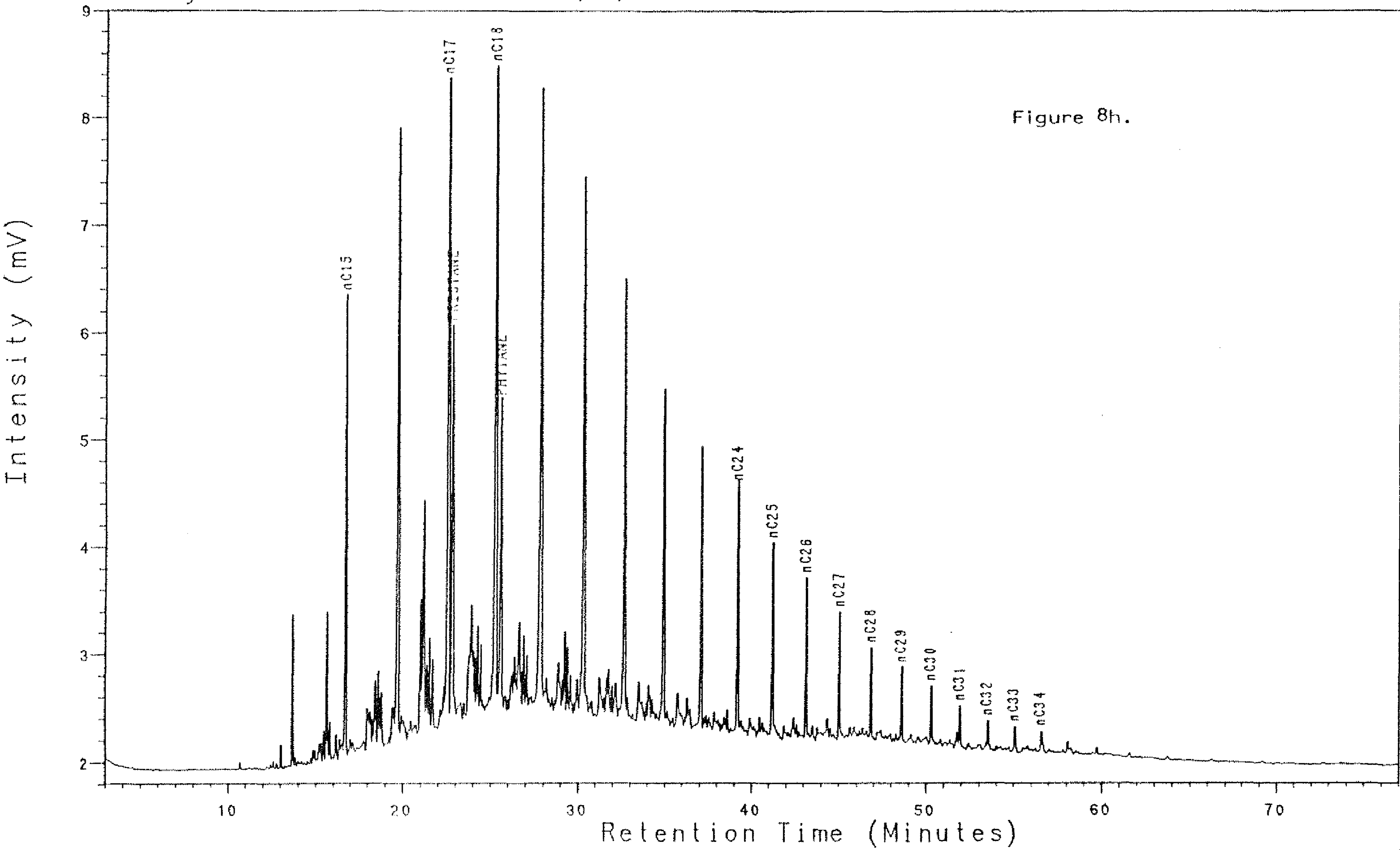
Analysis SB9242790 5, 1, 1 30/6-9 2790m SAT



NOCS 30/6-9 2790.00m
SATURATED GC
Clst: brn gy to m gy

GEOLAB NOR

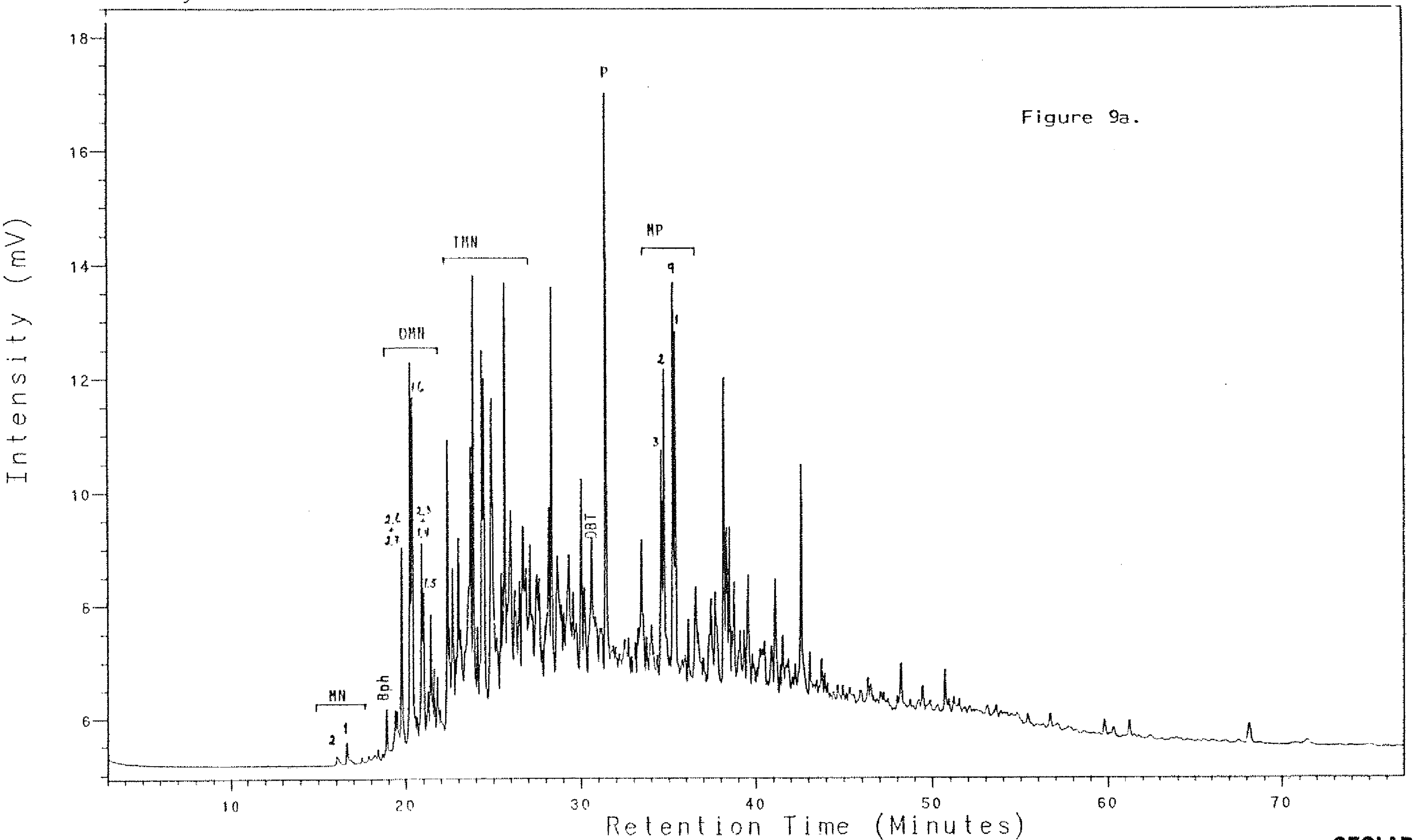
Analysis SB9243090 5, 1, 1 30/6-9 3090m SAT



NOCS 30/6-9 3090.00m
SATURATED GC
S/Sst: w to lt gy

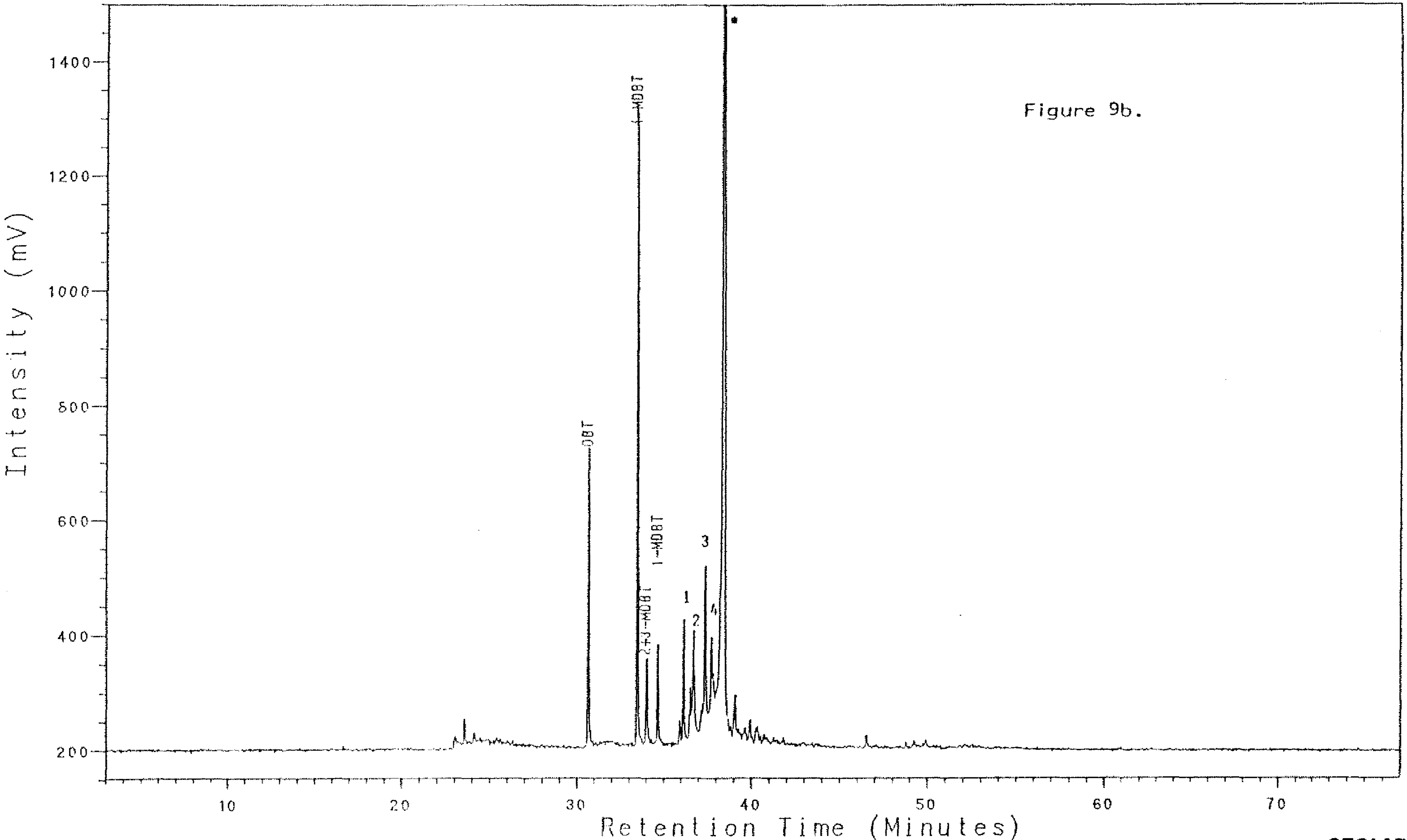
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis AB9242468 8, 1, 1 30/6-9 2462.74-68.30



NOCS 30/6-9 2462.75-2468.30m
AROMATIC GC (FID)

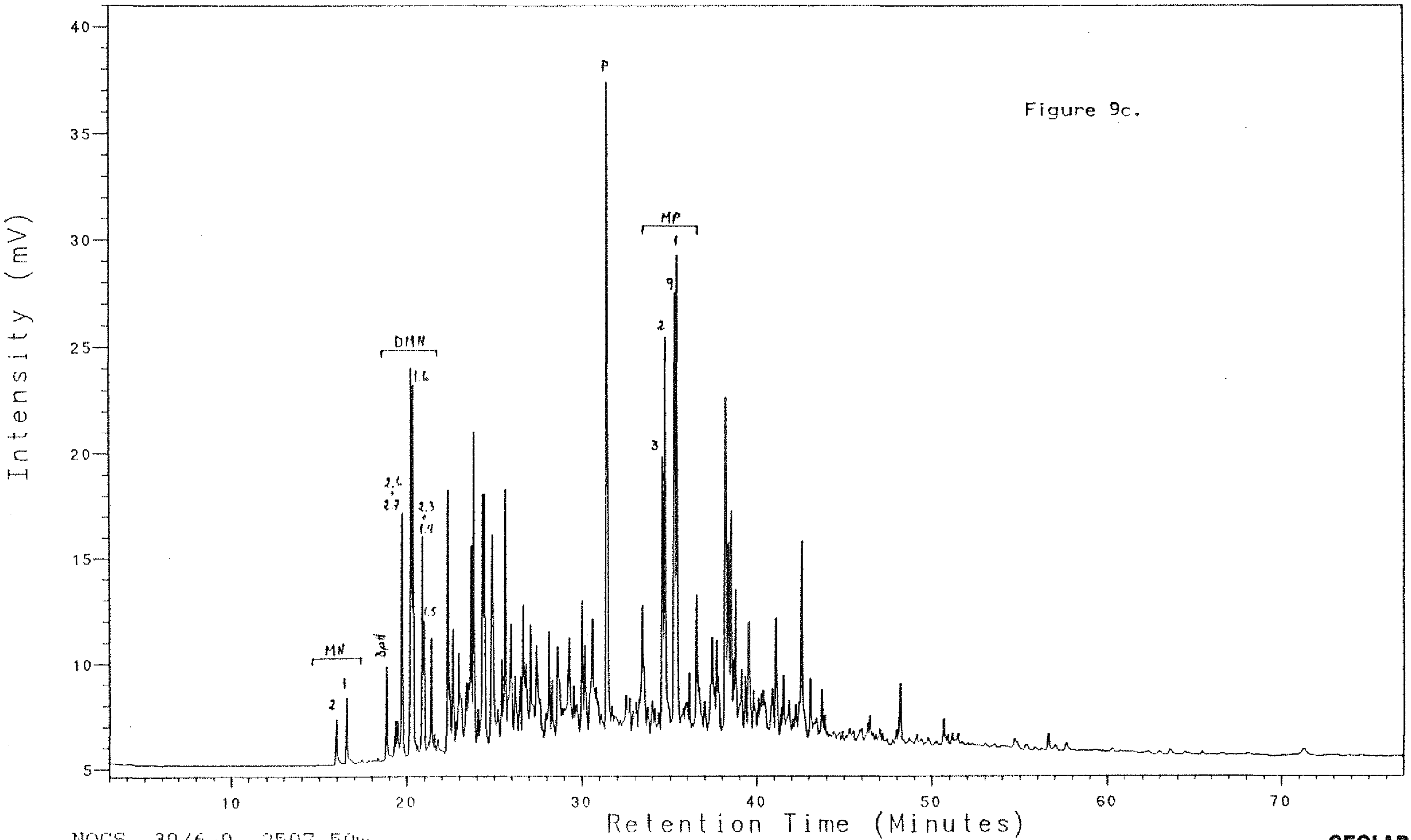
Analysis AB9242468 7, 1, 1 30/6-9 2462.74-68.30



NOCS 30/6-9 2462.75-2468.30m
AROMATIC GC (FPD)

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis AB9242507 8, 1, 1 30/6-9 2507.50m ARO



NOCS 30/6-9 2507.50m
AROMATIC GC (FID)
COAL:blk to brn blk

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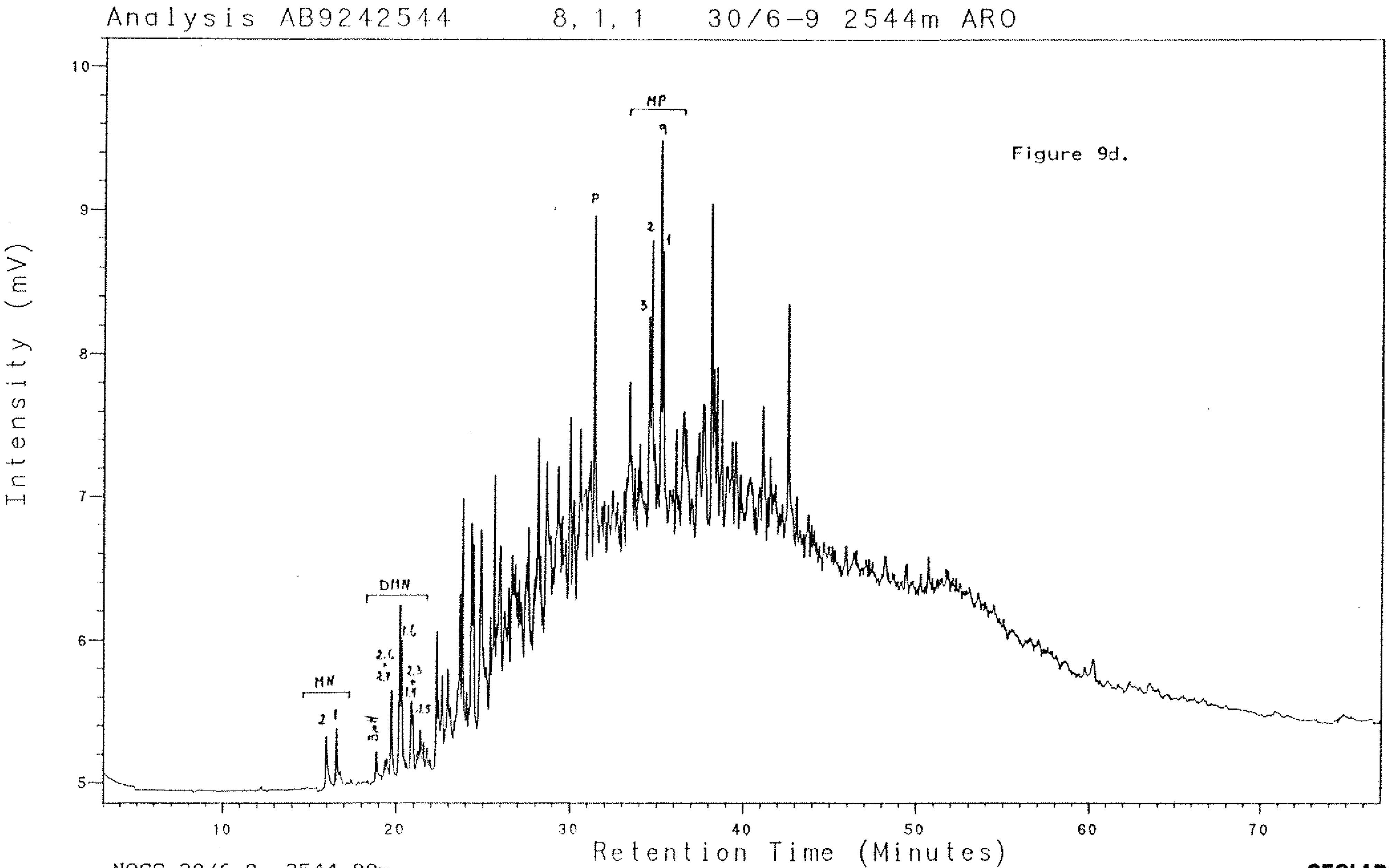

NOCS 30/6-9 2544.00m
AROMATIC GC (FID)
S/Sst: drk y brn

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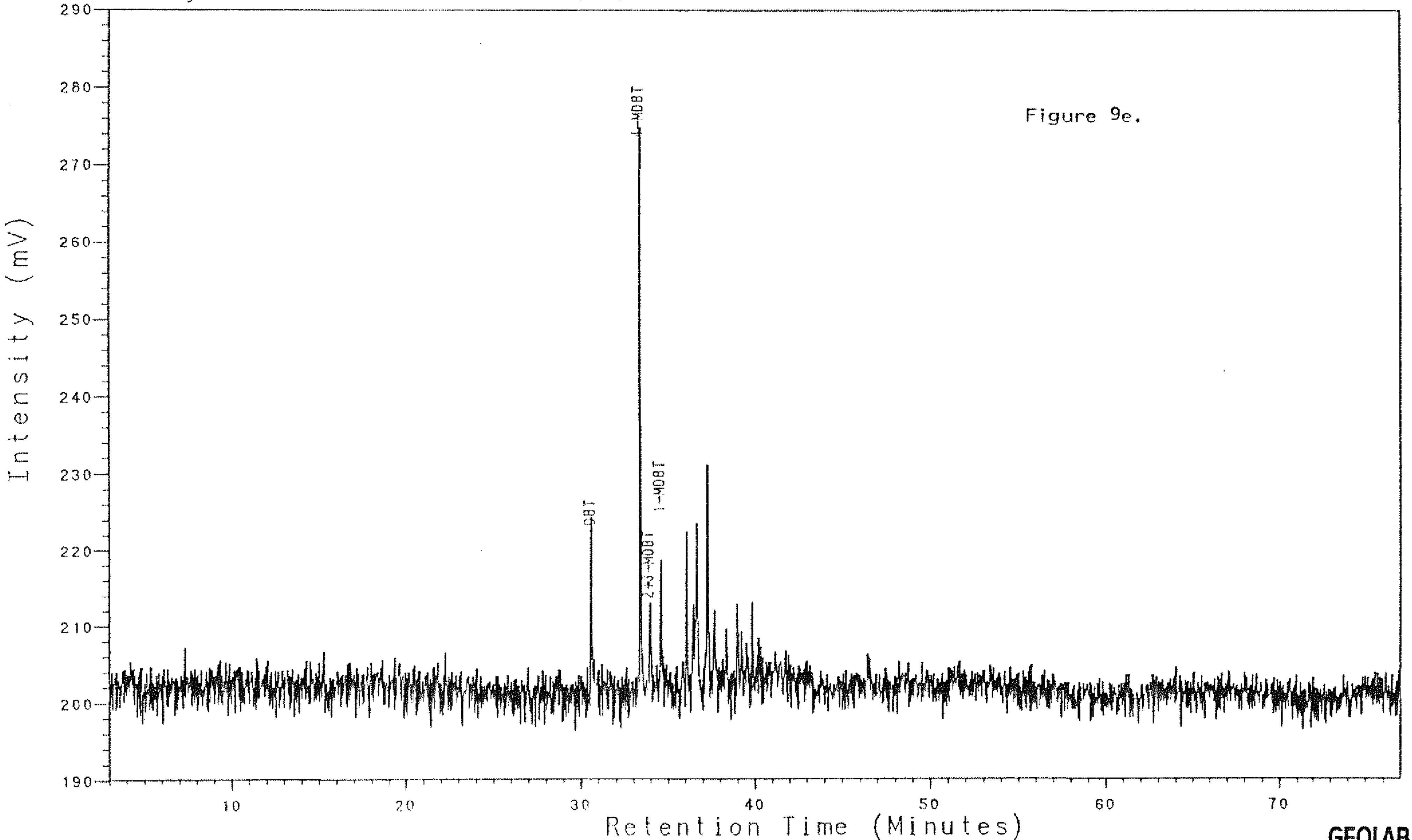
Analysis AB9242544   7, 1, 1   30/6-9 2544m ARO



NOCS 30/6-9 2544.00m
AROMATIC GC (FPD)

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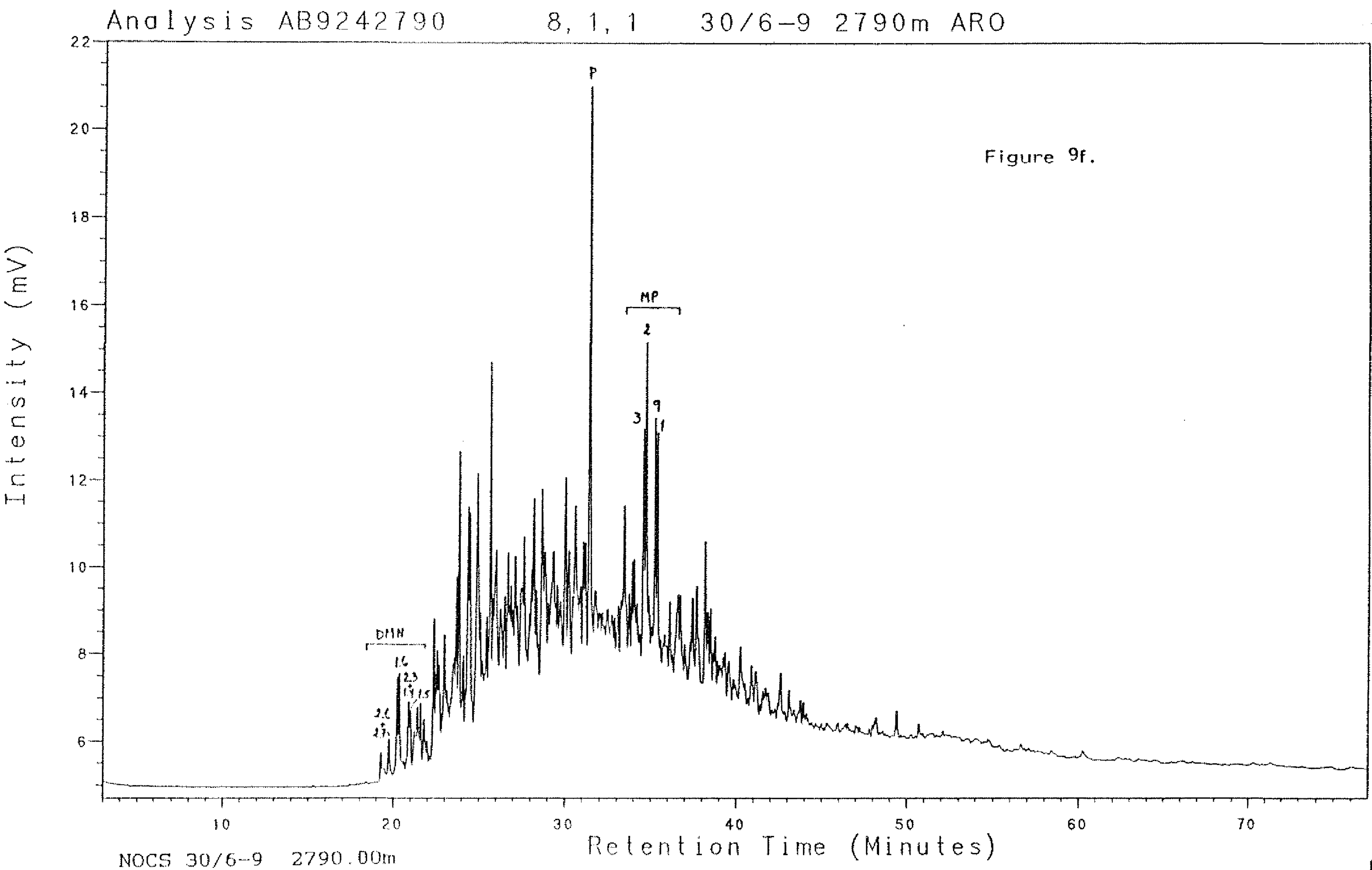

NOCS 30/6-9 2790.00m
AROMATIC GC (FID)
Clst: brn gy to m gy

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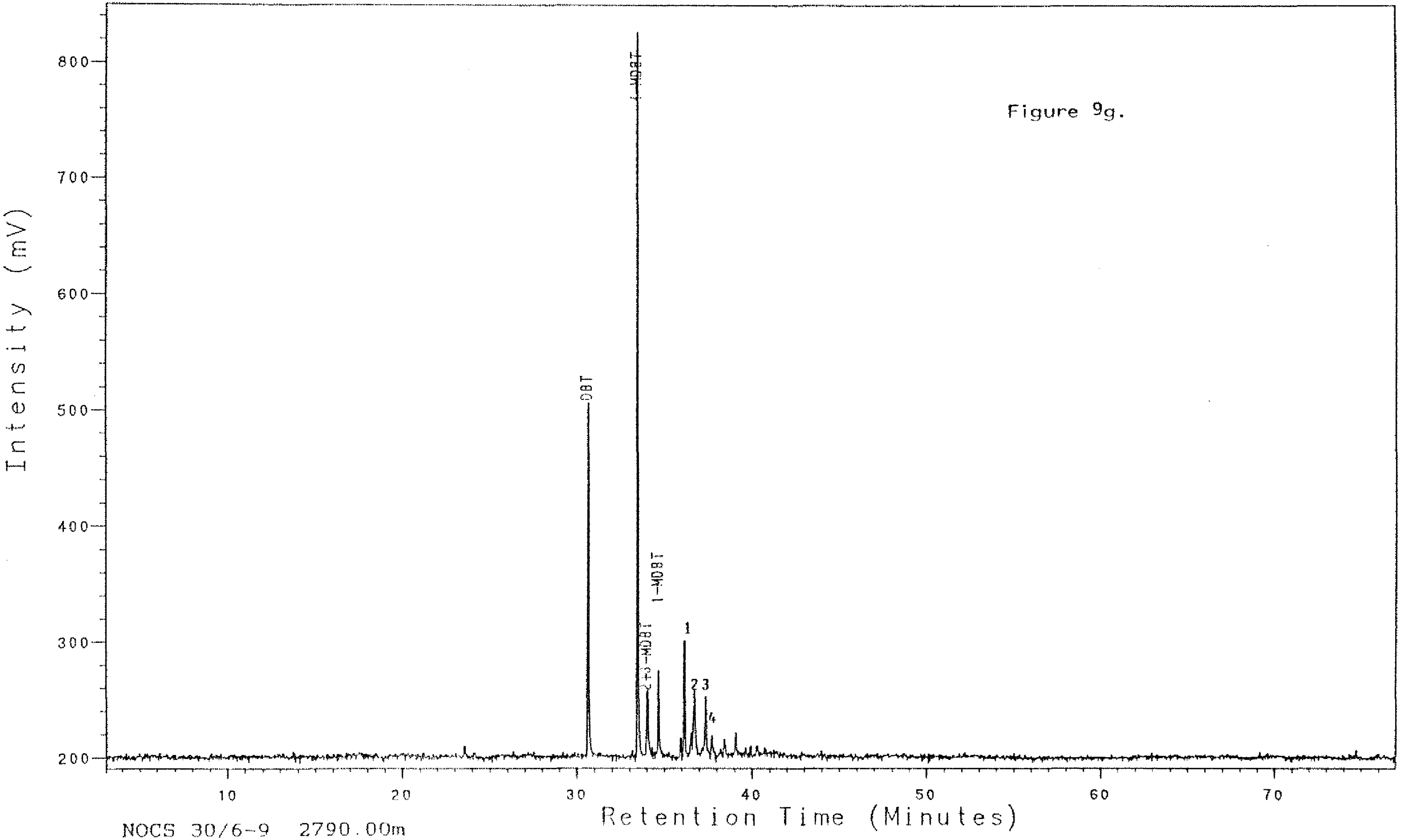
Analysis AB9242790 7, 1, 1 30/6-9 2790m ARO



NOCS 30/6-9 2790.00m
AROMATIC GC (FPD)
Clst: brn gy to m gy

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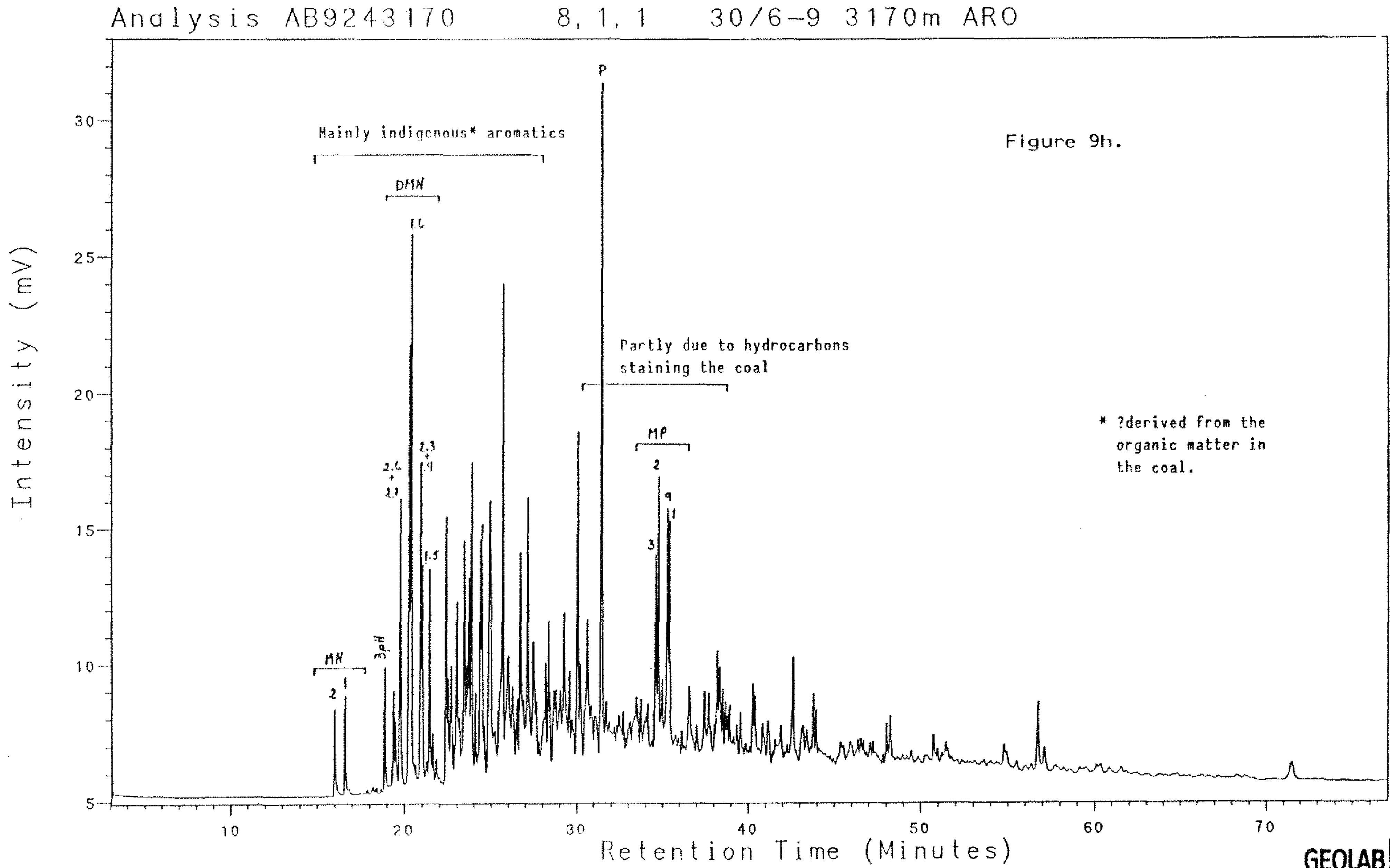

NOCS 30/6-9 3170.00m
AROMATIC GC (FID)
Coal: blk

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Figure 10: Vitrinite Reflectance versus Depth
Well NOCS 30/6-9

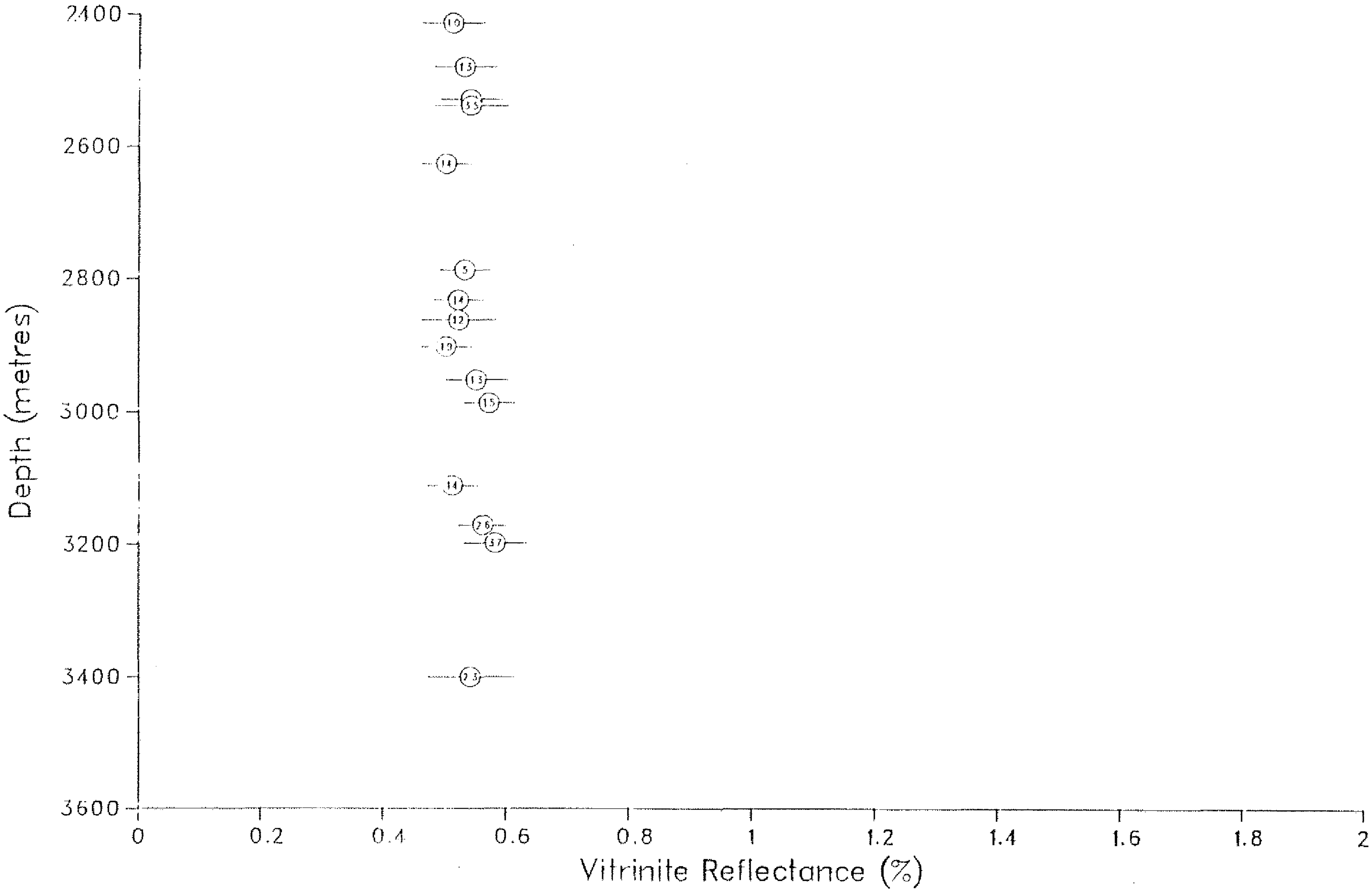

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Figure 11: Kerogen Composition and Potential Hydrocarbon Products

Well NOCS 30/6-9

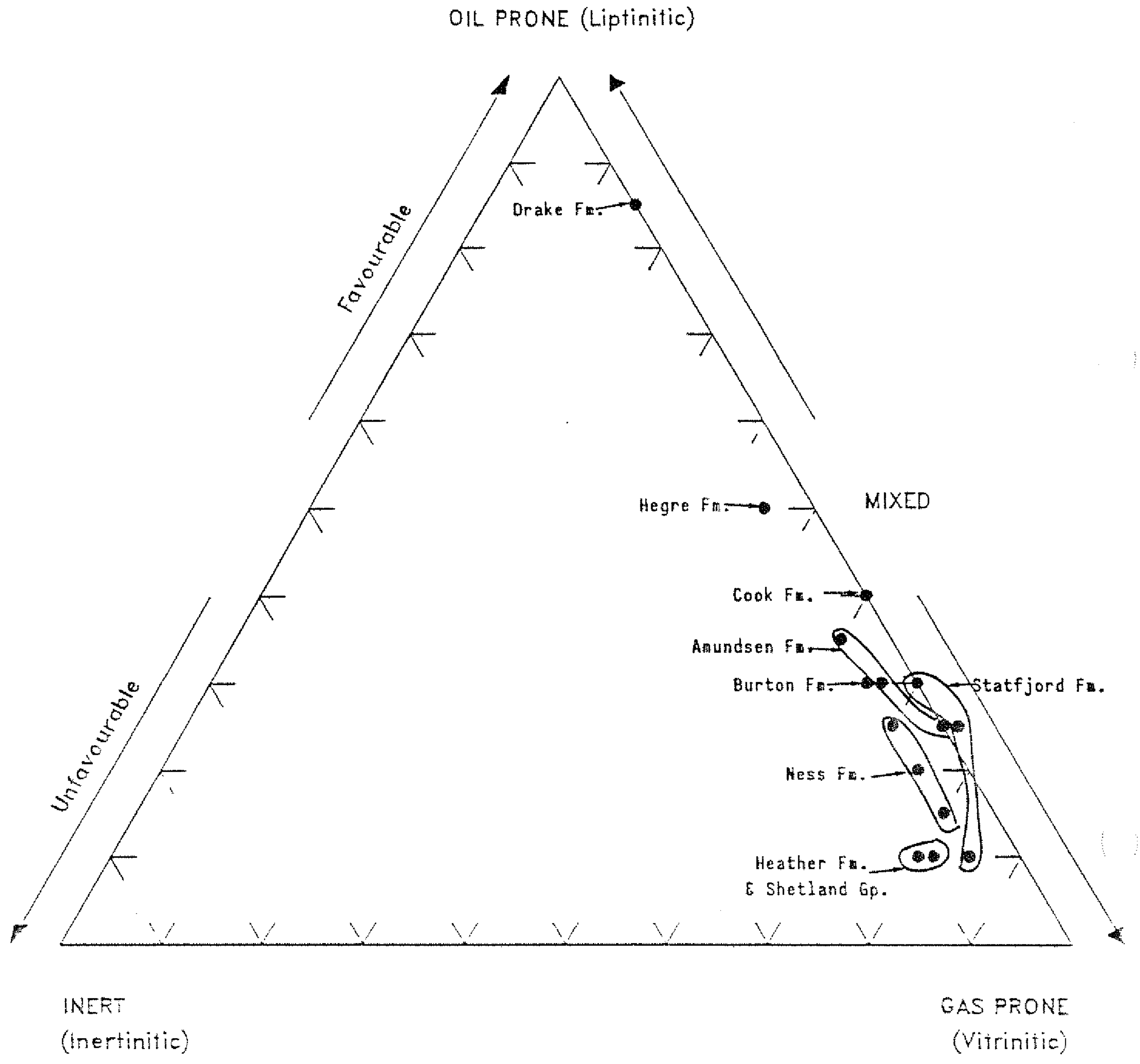
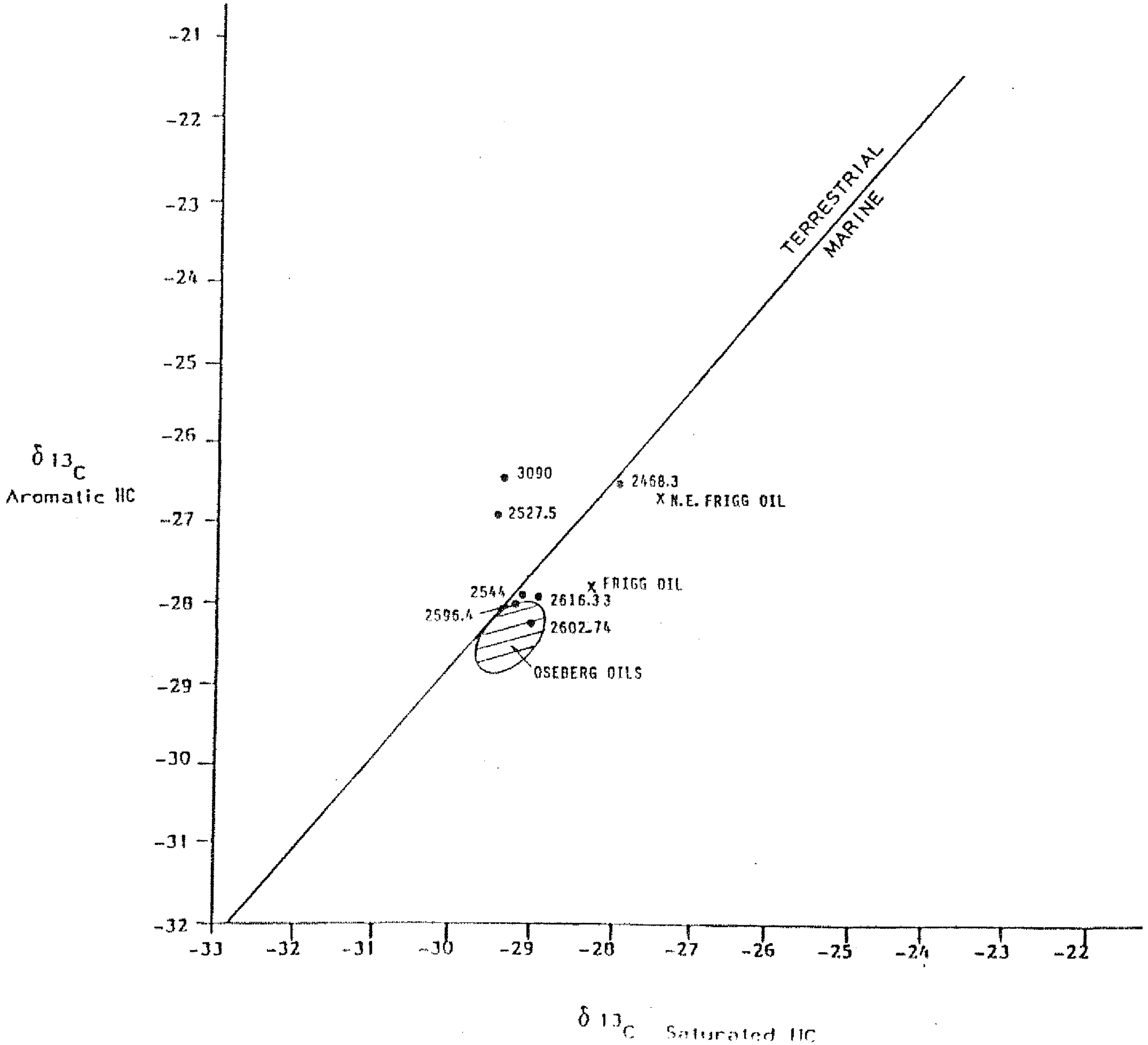


Figure 12. Plot of $\delta^{13}C$ in saturated fraction versus aromatic fraction for Well NOCS 30/6-9.



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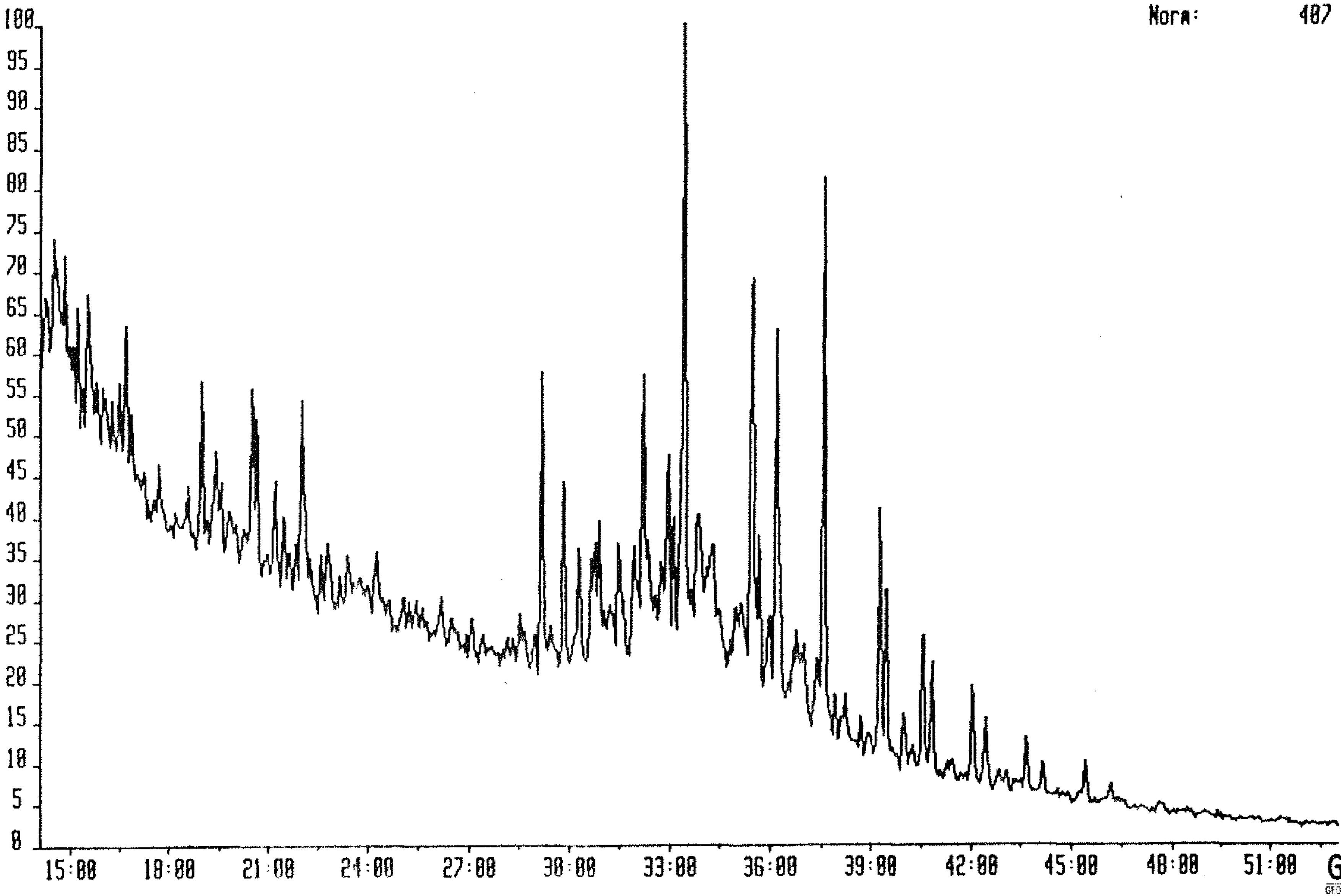
B3012SA 19-MAY-89 Sir:Magnetic TS250 Acnt:GEOLAB System:SAT1
Sample 1 Injection 1 Group 1 Mass 163.1405
Text:WELL 30/6-9, 2460.3M, CORE 1, SATURATED FRACTION

Figure 13a.



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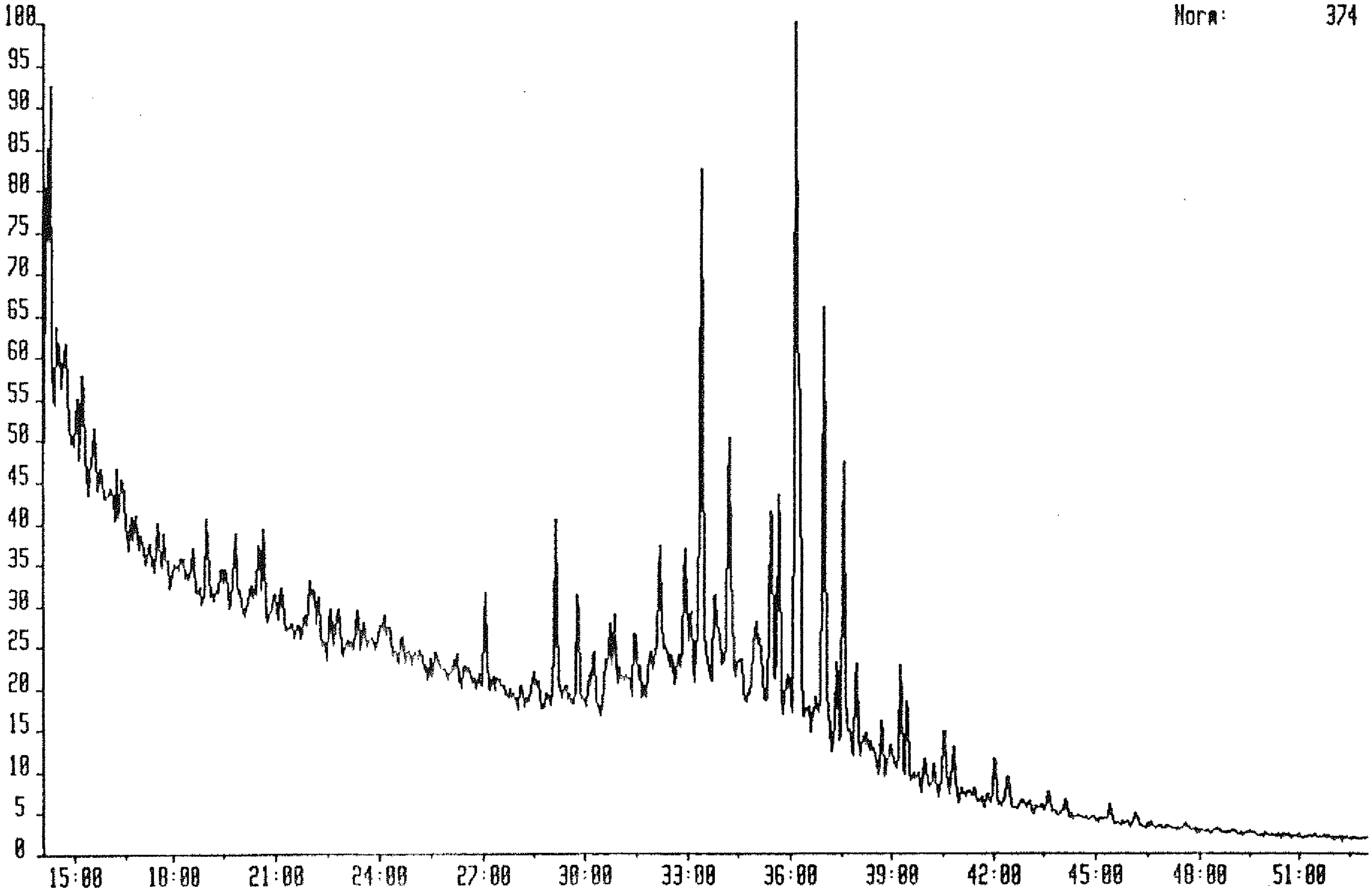
GEOCHEMICAL LABORATORIES OF NORWAY A/S

B3012SA 19-MAY-89 Sir:Magnetic TS250 Acnt:GEOLAB System:SAT1
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:WELL 30/6-9, 2460.3M, CORE 1, SATURATED FRACTION

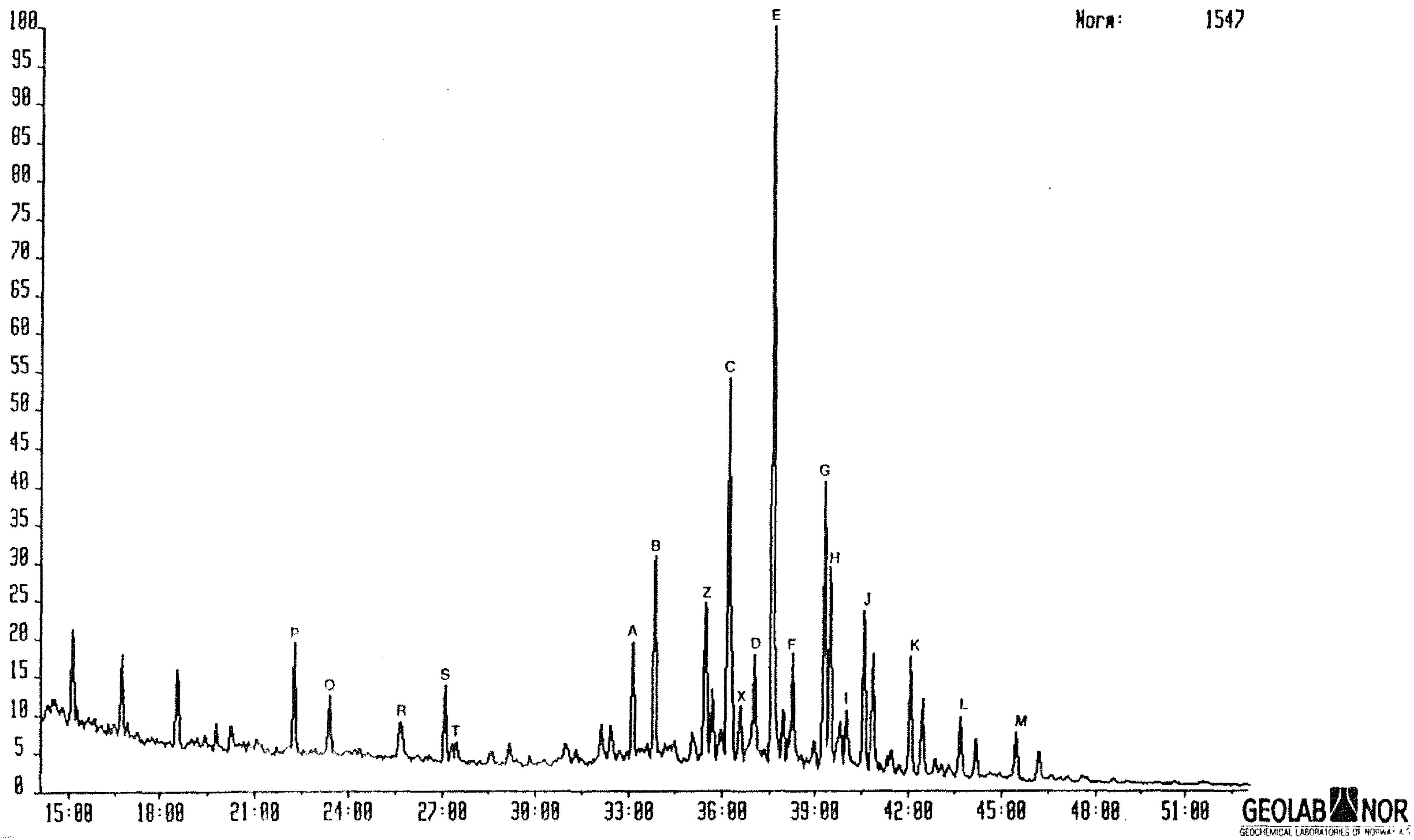
Figure 13b.



GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

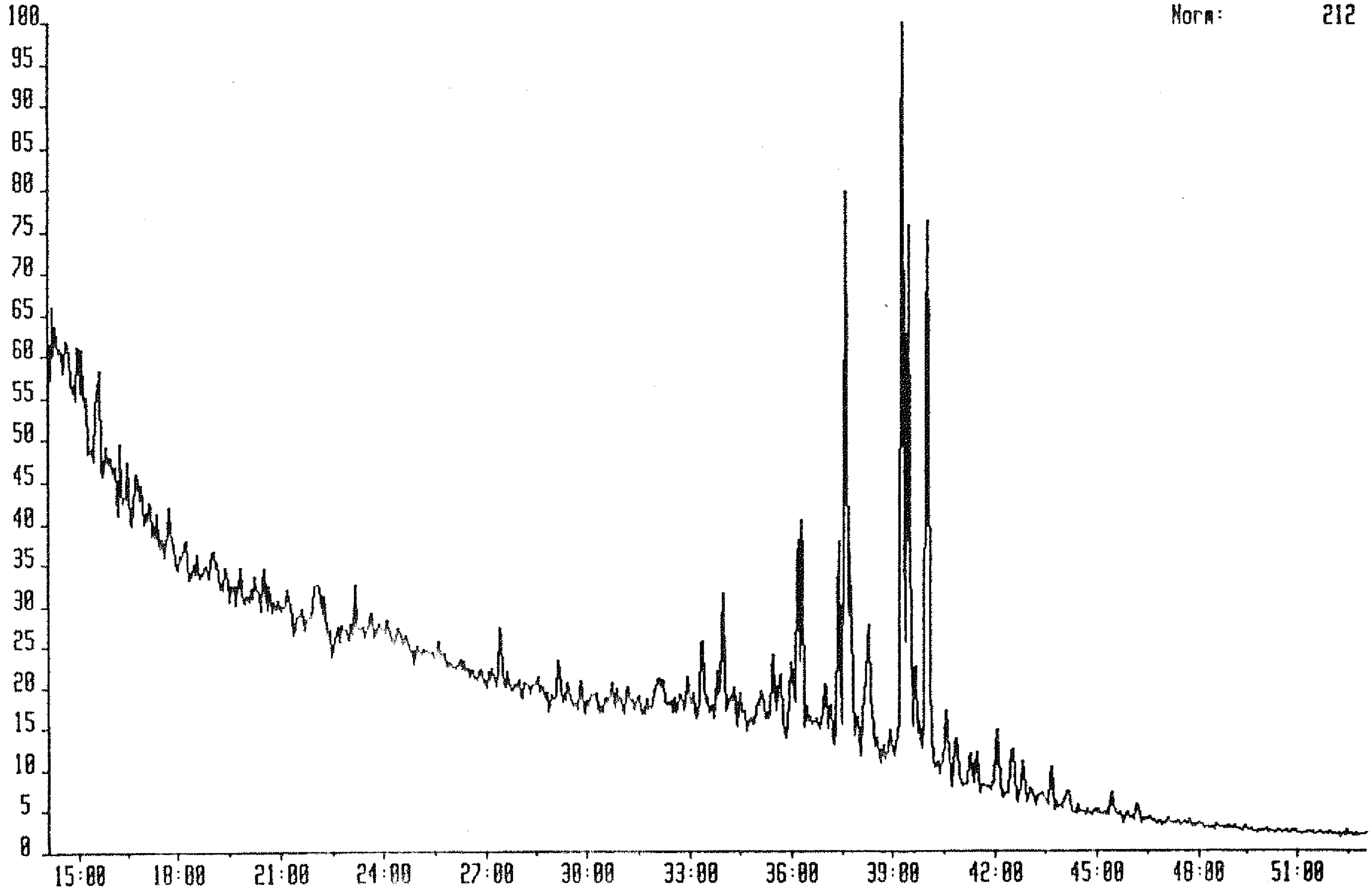
B3012SA 19-MAY-89 Sir:Magnetic TS250 Acnt:GEOLAB System:SAT1
Sample 1 Injection 1 Group 1 Mass 191.1000
Text:WELL 30/6-9, 2460.3M, CORE 1, SATURATED FRACTION

Figure 13c.



B3012SA 19-MAY-89 Sir:Magnetic TS250 Acnt:GEOLAB System:SAT1
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:WELL 30/6-9, 2460.3M, CORE 1, SATURATED FRACTION

Figure 13d.

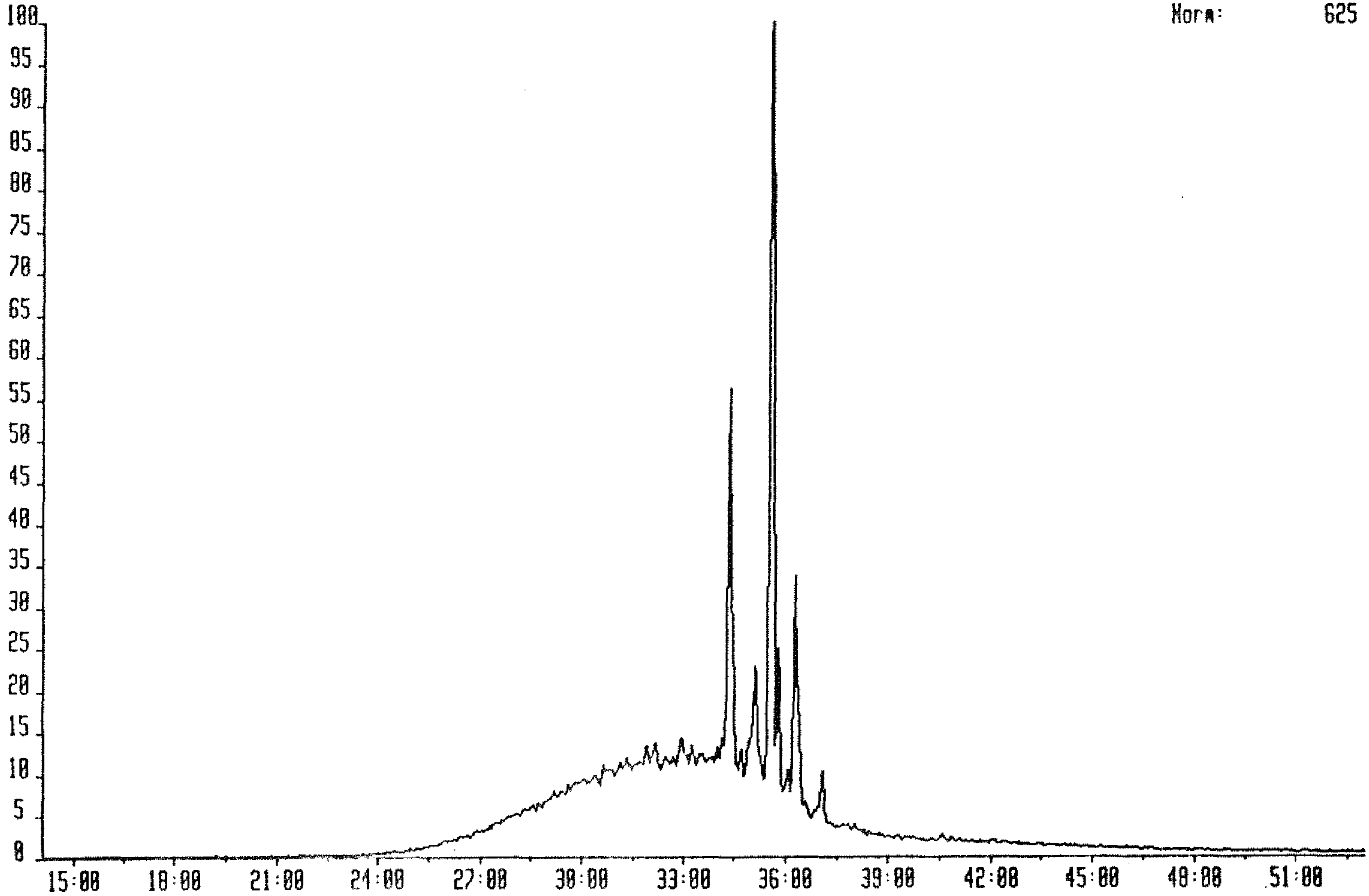


GEOLAB NOR

B3012SA 19-MAY-89 Sir:Magnetic TS250 Acnt:GEOLAB System:SAT1
Sample 4 Injection 1 Group 1 Mass 384.3757
Text:WELL 30/6-9, 2576.4M, CORE 0, SATURATED FRACTION

Figure 13e.

Norm: 625



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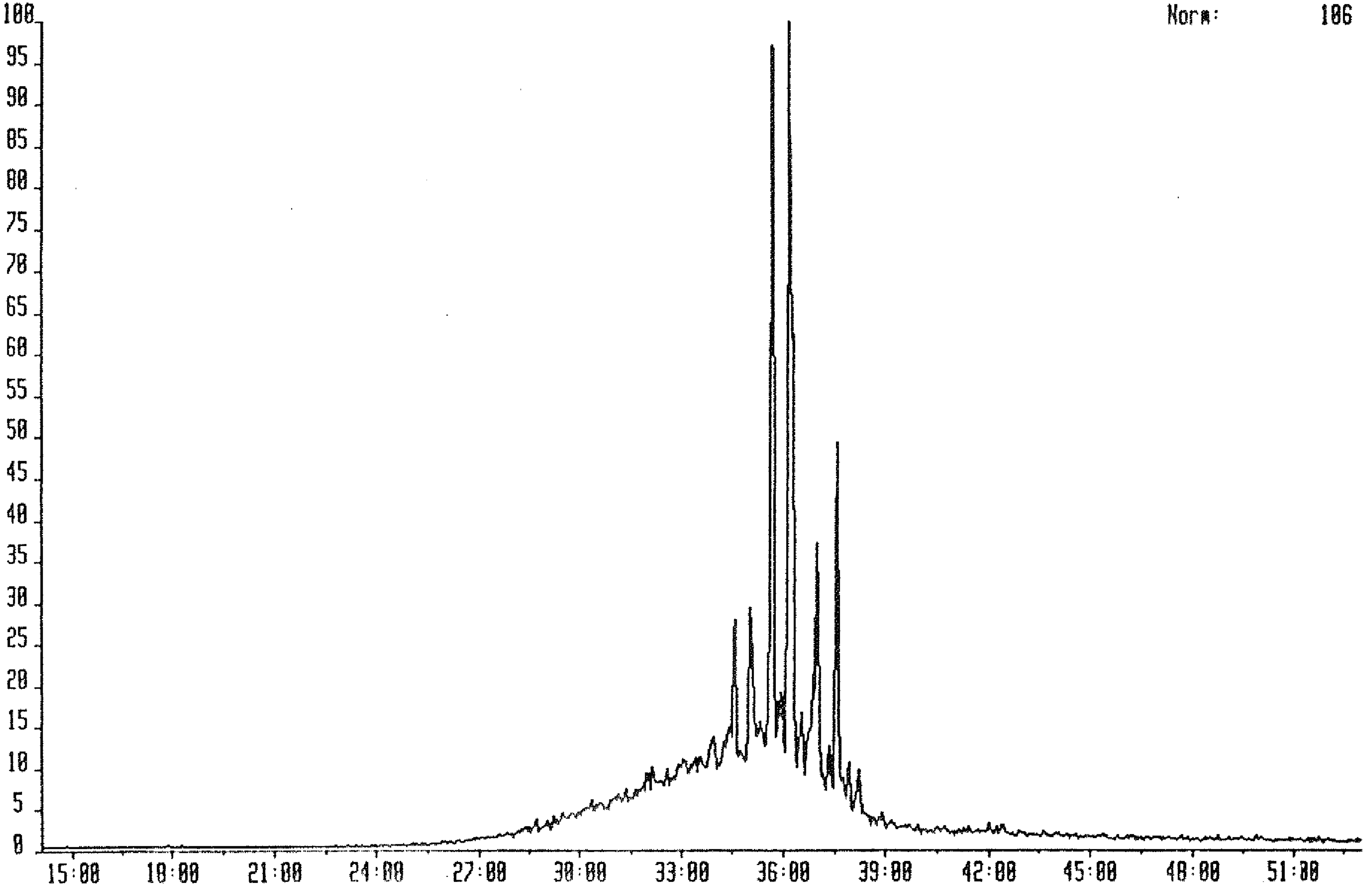
GEOCHEMICAL LABORATORIES OF NORWAY A.S

B3012SA 19-MAY-89 Sir:Magnetic TS250 Acnt:GEOLAB System:SAT1
Sample 2 Injection 1 Group 1 Mass 398.3914
Text:WELL 30/6-9, 2532.6M, CORE 4, SATURATED FRACTION

Figure 13f.

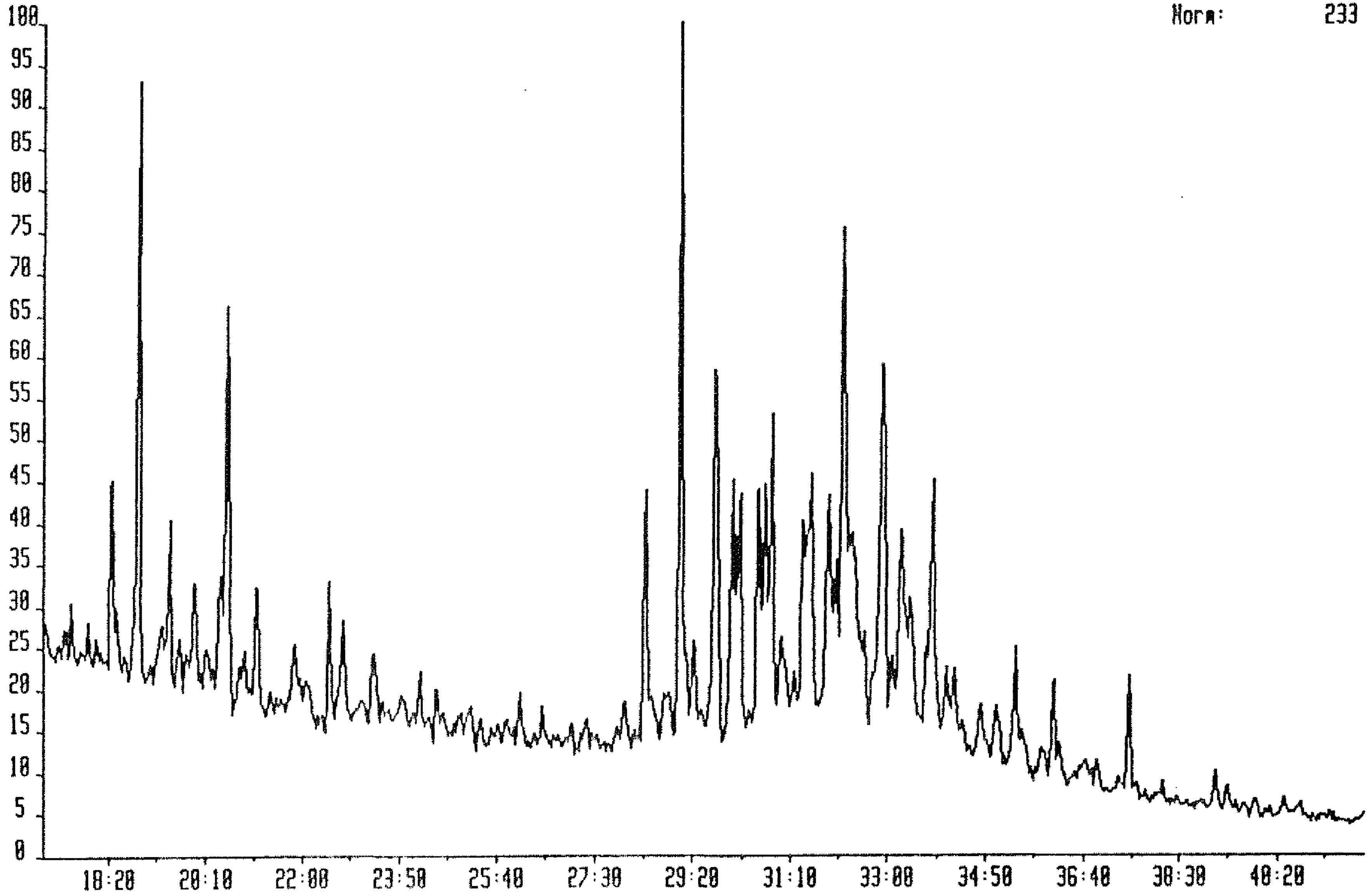


GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

83012SA 19-MAY-89 Sir:Magnetic TS250 Acnt:GEOLAB System:SAT1
Sample 1 Injection 1 Group 1 Mass 189.1643
Text:WELL 30/6-9, 2460.3M, CORE 1, SATURATED FRACTION

Figure 13g.

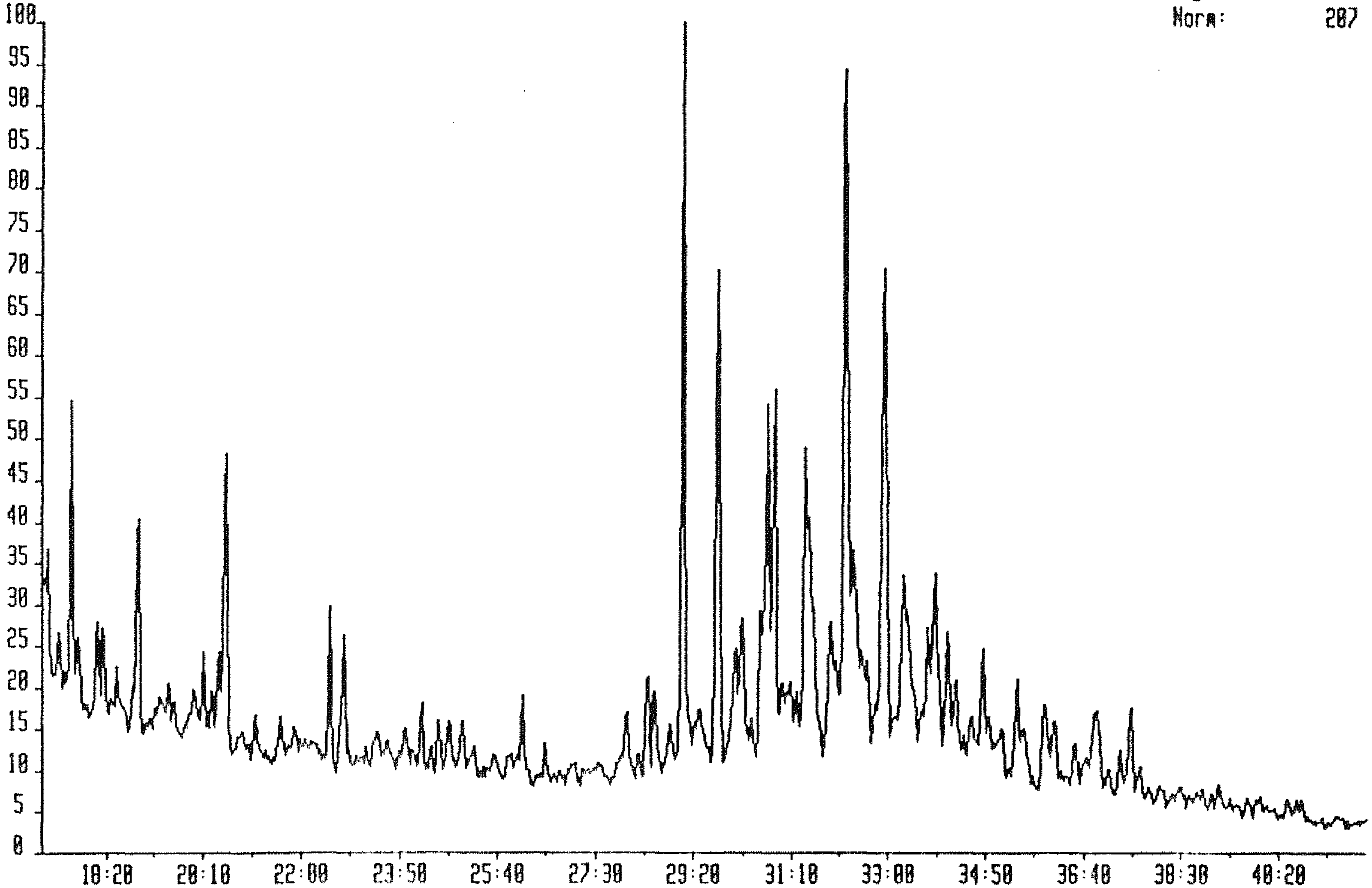
Norm: 233



GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

B3012SA 19-MAY-89 Sir:Magnetic TS250 Acnt:GEOLAB System:SAT1
Sample 1 Injection 1 Group 1 Mass 259.2427
Text:WELL 30/6-9, 2460.3M, CORE 1, SATURATED FRACTION

Figure 13h.

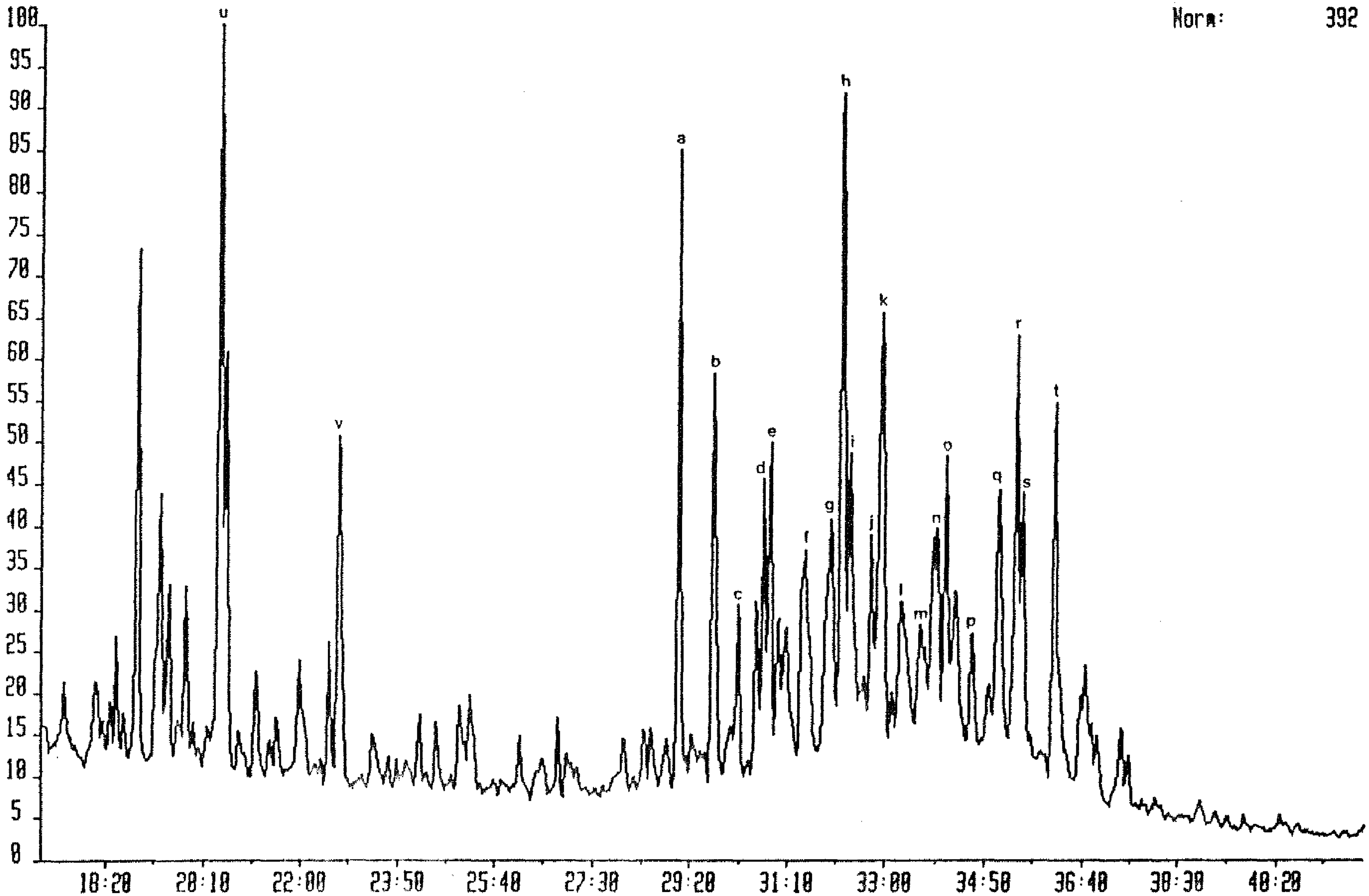


GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

B3012SA 19-MAY-89 Sir:Magnetic TS250 Acnt:GEOLAB System:SAT1
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:WELL 30/6-9, 2460.3M, CORE 1, SATURATED FRACTION

Figure 13i.

Norm: 392



GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

B3012SA 19-MAY-89 Sir:Magnetic TS250 Acnt:GEOLAB System:SAT1
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:WELL 30/6-9, 2460.3M, CORE 1, SATURATED FRACTION

Figure 13j

Norm: 494

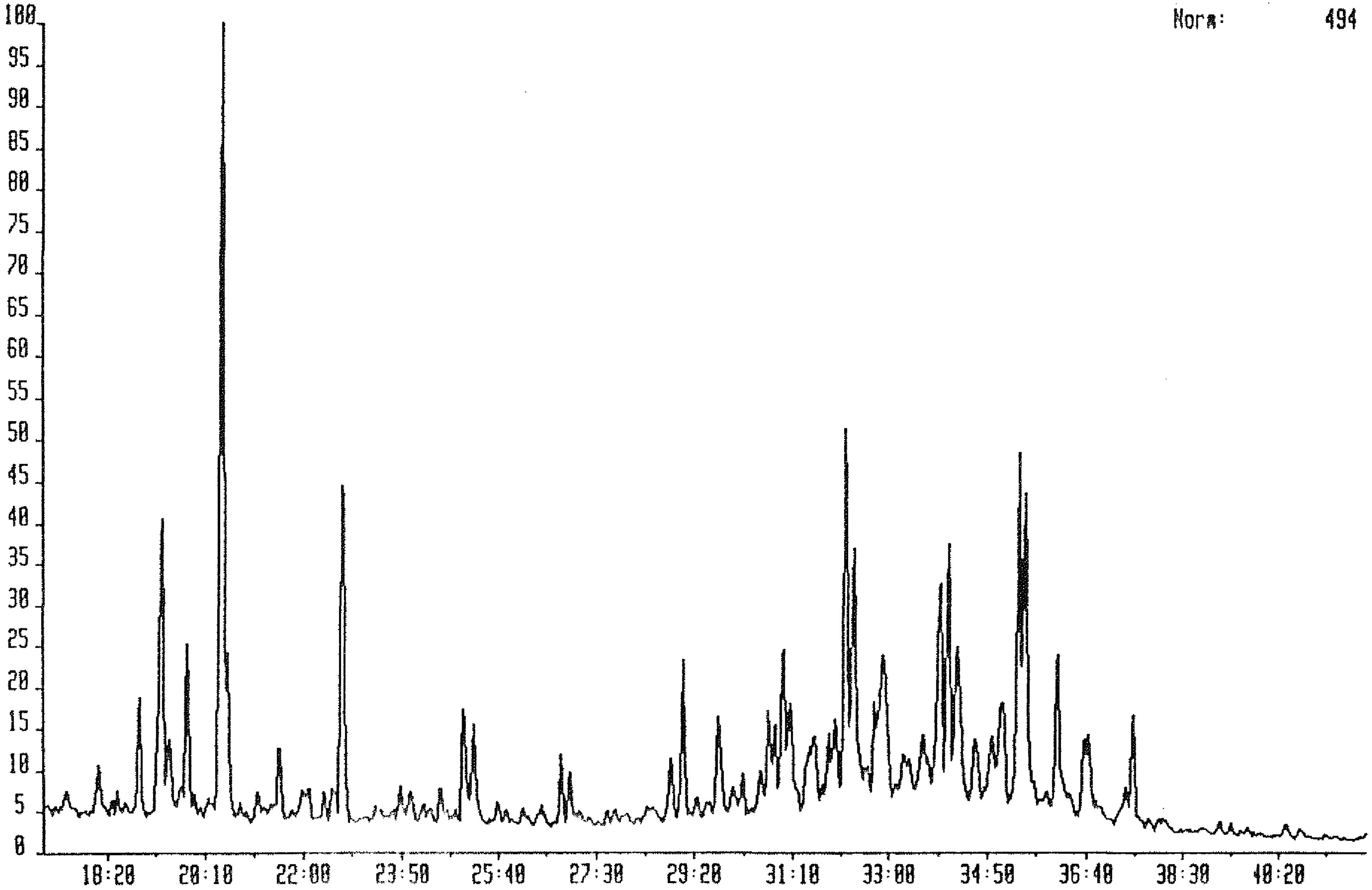


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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
2410.00				Shet		U.Cretaceous		0059
			80	Cont		: cem, prp, dd		0059-1L
		0.92	15	Sh/Clst		: m gy, calc, mic		0059-2L
			5	Ca		: or gy		0059-4L
			tr	S/Sst		: v col, crs, l		0059-3L
2422.00				Shet		U.Cretaceous		0060
		0.13	85	Ca		: w, chk		0060-4L
			10	Cont		: cem, prp, dd		0060-1L
			5	Sh/Clst		: m gy, calc, mic		0060-2L
			tr	S/Sst		: v col, crs, l		0060-3L
2427.00				Vikg	Heat	U.Jurassic		0061
			90	Cont		: cem, prp, dd		0061-1L
			5	Sh/Clst		: m gy, calc, mic		0061-2L
			5	Other		: pyr		0061-5L
			tr	S/Sst		: v col, crs, l		0061-3L
			tr	Ca		: w, chk		0061-4L
2433.00				Vikg	Heat	U.Jurassic		0062
			95	Cont		: cem		0062-1L
			5	Sh/Clst		: m gy to dsk y brn, calc, mic		0062-2L
			tr	S/Sst		: v col, crs, l		0062-3L
			tr	Ca		: w, chk		0062-4L
			tr	Other		: pyr		0062-5L
2445.00				Vikg	Heat	U.Jurassic		0063
			90	Cont		: cem, prp		0063-1L
			10	Sh/Clst		: m gy to dsk y brn, calc, mic		0063-2L
			tr	S/Sst		: v col, crs, l		0063-3L
			tr	Ca		: w, chk		0063-4L
			tr	Other		: pyr		0063-5L

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GEOCHEMICAL LABORATORIES OF NORWAY A.S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
2450.00				Vikg	Heat	U.Jurassic		0064
			85	Cont		: cem, prp		0064-1L
			10	Sh/Clst		: gn gy to m gy		0064-6L
			5	Sh/Clst		: dsk y brn, slt, mic		0064-2L
			tr	S/Sst		: v col, crs, l		0064-3L
			tr	Ca		: w, chk		0064-4L
			tr	Other		: pyr		0064-5L
			tr	Coal		: blk		0064-7L
2455.00				Vikg	Heat	U.Jurassic		0065
		0.75	45	Sh/Clst		: gn gy to m gy		0065-5L
			35	Sltst		: dsk y brn, s, mic		0065-2L
			15	Cont		: cem, prp		0065-1L
			5	Sh/Clst		: gy red		0065-6L
			tr	Ca		: w, chk		0065-3L
			tr	Other		: pyr		0065-4L
2460.00				Brnt	Ness	M.Jurassic		0066
			45	S/Sst		: w to lt gy, l		0066-7L
		54.57	35	Coal		: blk		0066-6L
			20	Cont		: cem, prp, fib		0066-1L
			tr	Sltst		: dsk y brn, s, mic		0066-2L
			tr	Other		: pyr		0066-3L
			tr	Sh/Clst		: gn gy to m gy		0066-4L
			tr	Sh/Clst		: gy red		0066-5L
2462.74	ccp			Brnt	Ness	M.Jurassic		0002
		0.56	100	S/Sst		: pl brn, cem		0002-1L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
2465.00			Brnt Ness M.Jurassic		0067
		100	Cont : ns, dd		0067-1L
2465.72	ccp		Brnt Ness M.Jurassic		0003
		100	S/Sst : pl y brn, mic, f, cem		0003-1L
2468.30	ccp		Brnt Ness M.Jurassic		0004
	0.61	100	S/Sst : pl y brn, f, cem, lam		0004-1L
2470.00			Brnt Ness M.Jurassic		0068
		100	Cont : Coal-ad, ns, dd		0068-1L
2470.36	ccp		Brnt Ness M.Jurassic		0005
	5.54	100	Sltst : pl y brn to lt gy to drk gy, s, lam		0005-1L
2472.94	ccp		Brnt Ness M.Jurassic		0006
	5.31	100	Sltst : drk gy to lt gy, s, lam		0006-1L
2474.00	ccp		Brnt Ness M.Jurassic		0007
	5.95	100	Sh/Clst: drk gy to brn blk, slt, mic		0007-1L
2475.00			Brnt Ness M.Jurassic		0069
		70	Other : trbofgs		0069-2L
		30	Cont : Coal-ad, prp, ns		0069-1L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Cvd	Type / TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
2476.00		ccp		Brnt	Ness	M.Jurassic		0008
		23.83	100	Coal		: blk		0008-1L
2478.00		ccp		Brnt	Ness	M.Jurassic		0009
		59.22	100	Coal		: blk		0009-1L
2480.00		ccp		Brnt	Ness	M.Jurassic		0010
		1.12	100	Sltst		: lt brn gy to brn gy, mic		0010-1L
2482.17		ccp		Brnt	Ness	M.Jurassic		0011
		9.17	100	Sh/Clst:		drk gy to brn blk, carb		0011-1L
2484.00		ccp		Brnt	Ness	M.Jurassic		0012
		3.62	100	Sh/Clst:		drk gy to dsk y brn, carb, slt, mic		0012-1L
2485.00				Brnt	Ness	M.Jurassic		0070
			70	Cont		: Coal-ad, prp, fib		0070-1L
			30	Other		: trbofgs		0070-2L
2486.39		ccp		Brnt	Ness	M.Jurassic		0013
		2.02	100	Sltst		: brn gy, mic		0013-1L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
2488.40	ccp			Brnt	Ness	M.Jurassic		0014
		0.12	100	S/Sst		: lt or, cem		0014-1L
2490.00				Brnt	Ness	M.Jurassic		0071
			80	Cont		: Coal-ad, cem, prp, ns, fib		0071-1L
			20	Other		: trbofgs		0071-2L
2491.50	ccp			Brnt	Ness	M.Jurassic		0015
		1.34	100	S/Sst		: lt or to or gy, cem		0015-1L
			tr	Other		: carb		0015-2L
2494.89	ccp			Brnt	Ness	M.Jurassic		0016
		0.13	100	S/Sst		: lt or to or gy, crs, cem		0016-1L
2495.00				Brnt	Ness	M.Jurassic		0072
			90	Cont		: Coal-ad, cem, prp, ns, fib, tar-ad		0072-1L
			10	Other		: trbofgs		0072-2L
2496.56	ccp			Brnt	Ness	M.Jurassic		0017
		0.32	100	S/Sst		: lt or to pl y brn, cem		0017-1L
2500.00				Brnt	Ness	M.Jurassic		0073
			90	Cont		: Coal-ad, prp, ns, dd, fib, tar-ad		0073-1L
			10	Other		: trbofgs		0073-2L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
2501.50		ccp		Brnt	Ness	M.Jurassic		0022
		1.34	100	Sltst		: lt brn gy, mic		0022-1L
2504.50		ccp		Brnt	Ness	M.Jurassic		0018
		0.31	100	Sh/Clst:		lt brn gy to brn gy, wx		0018-1L
2505.00				Brnt	Ness	M.Jurassic		0074
			90	Cont		: Coal-ad, prp, ns, dd, fib		0074-1L
			10	Other		: trbofgs		0074-2L
2507.50		ccp		Brnt	Ness	M.Jurassic		0019
		60.87	100	Coal		: blk to brn blk, carb		0019-1L
2509.39		ccp		Brnt	Ness	M.Jurassic		0020
		0.69	100	Sltst		: lt brn gy to lt or, s, mic		0020-1L
2510.00				Brnt	Ness	M.Jurassic		0075
			90	Cont		: Coal-ad, prp, ns, dd, fib		0075-1L
			10	Other		: trbofgs		0075-2L
			tr	Sh/Clst:		brn gy to dsk y brn		0075-3L
			tr	S/Sst		: w to lt gy, l		0075-4L
2512.50		ccp		Brnt	Ness	M.Jurassic		0021
		4.68	100	Sh/Clst:		blk to brn blk, carb		0021-1L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
2515.00				Brnt Ness M.Jurassic		0076
			65	Cont : prp, ns, dd, fib, tar-ad		0076-1L
			20	Coal : blk		0076-5L
			10	Other : trbofgs		0076-2L
			5	Sh/Clst: brn gy to dsk y brn		0076-3L
			tr	S/Sst : w to lt gy, l		0076-4L
2515.50		ccp		Brnt Ness M.Jurassic		0023
		3.25	100	Sh/Clst: brn gy, carb		0023-1L
2518.50		ccp		Brnt Ness M.Jurassic		0024
		6.98	100	Sh/Clst: drk gy to brn gy, carb		0024-1L
2520.00				Brnt Ness M.Jurassic		0077
			45	Sh/Clst: brn gy to dsk y brn, carb		0077-3L
			25	Coal : blk		0077-5L
			20	Cont : prp, fib		0077-1L
			10	Other : trbofgs		0077-2L
			tr	S/Sst : w to lt gy, l		0077-4L
2521.50		ccp		Brnt Ness M.Jurassic		0025
		0.90	100	Sh/Clst: brn gy, wx		0025-1L
			tr	Other : carb		0025-2L
2524.50		ccp		Brnt Ness M.Jurassic		0026
		3.15	100	Sh/Clst: brn gy, wx		0026-1L
			tr	Other : carb		0026-2L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth (Int / Cvd)	Type / TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
2525.00			Brnt Ness M.Jurassic		0078
		45	Sh/Clst: brn gy to dsk y brn		0078-3L
		30	Coal : blk, cly		0078-5L
		20	Cont : prp, fib		0078-1L
		5	Other : trbofgs		0078-2L
		tr	S/Sst : w to lt gy, l		0078-4L
2527.50	ccp		Brnt Ness M.Jurassic		0027
	0.25	100	Sh/Clst: brn gy		0027-1L
2530.00			Brnt Ness M.Jurassic		0079
		70	Cont : prp, dd, fib		0079-1L
		15	Sh/Clst: brn gy to dsk y brn		0079-3L
		10	Coal : blk, cly		0079-5L
		5	Other : trbofgs		0079-2L
		tr	S/Sst : w to lt gy, l		0079-4L
2530.50	ccp		Brnt Ness M.Jurassic		0028
	0.73	100	Sh/Clst: brn gy		0028-1L
		tr	Other : carb		0028-2L
2532.26	ccp		Brnt Ness M.Jurassic		0029
	0.99	100	S/Sst : brn gy, lt or, slt, f, lam		0029-1L
2535.00	ccp		Brnt Ness M.Jurassic		0030
		75	Sh/Clst: brn blk to brn gy, carb		0030-1L
		25	Coal : blk to brn blk, cly		0030-2L
	75.52		bulk		0030-0B

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GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
2535.00			Brnt Ness M.Jurassic		0080
		50	Cont : prp, dd, fib		0080-1L
		25	Coal : blk, cly		0080-5L
		20	Sh/Clst: brn gy to dsk y brn		0080-3L
		5	Other : trbofgs		0080-2L
		tr	S/Sst : w to lt gy, l		0080-4L
2537.65	ccp		Brnt Ness M.Jurassic		0031
	1.17	100	S/Sst : lt or to pl y brn, mic, cem		0031-1L
2539.00	ccp		Brnt Ness M.Jurassic		0033
		100	S/Sst : lt or to pl y brn to drk gy, carb, cem, lam		0033-1L
2540.00			Brnt Ness M.Jurassic		0081
		60	Cont : prp, dd, fib		0081-1L
		20	Sh/Clst: brn gy to dsk y brn		0081-3L
		15	Coal : blk, cly		0081-5L
		5	Other : trbofgs		0081-2L
		tr	S/Sst : w to lt gy, l		0081-4L
2541.00	ccp		Brnt Ness M.Jurassic		0034
	1.13	100	Sltst : brn gy, s, mic		0034-1L
2544.00	ccp		Brnt Ness M.Jurassic		0057
	0.94	100	S/Sst : drk y brn, cem		0057-1L
		tr	Other : carb		0057-2L

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type / TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
2545.00				Brnt	Ness	M.Jurassic		0082
			80			Cont : prp, dd, fib		0082-1L
			15			Sh/Clst: brn gy		0082-3L
			5			Coal : blk, cly		0082-5L
			tr			Other : trbofgs		0082-2L
			tr			S/Sst : w to lt gy, l		0082-4L
2546.40		ccp		Brnt	Ness	M.Jurassic		0032
		8.16	100			S/Sst : lt or to pl y brn, crs, cem		0032-1L
			tr			Other : carb		0032-2L
			tr			Cont : fib		0032-3L
2548.00		ccp		Brnt	Ness	M.Jurassic		0035
		1.03	100			Sh/Clst: brn gy to lt brn gy		0035-1L
			tr			Other : carb		0035-2L
2550.00				Brnt	Ness	M.Jurassic		0083
			40			Cont : prp, dd, fib		0083-1L
			40			Sh/Clst: brn gy		0083-3L
			20			Coal : blk, cly		0083-5L
			tr			Other : trbofgs		0083-2L
			tr			S/Sst : w to lt gy, l		0083-4L
2551.00		ccp		Brnt	Ness	M.Jurassic		0036
		1.41	100			Sltst : brn gy, mic		0036-1L
2554.39		ccp		Brnt	Etiv	M.Jurassic		0037
		0.78	100			Sltst : brn gy, mic		0037-1L

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp / Lithology description	Frm	Age	Trb	Sample
2555.00				Brnt	Etiv	M.Jurassic		0084
			40	Cont : prp, dd, fib				0084-1L
			40	Sh/Clst: brn gy				0084-3L
			15	Coal : blk, cly				0084-5L
			5	Other : trbofgs				0084-2L
			tr	S/Sst : w to lt gy, l				0084-4L
2556.10		ccp		Brnt	Etiv	M.Jurassic		0038
		0.75	100	S/Sst : or gy to lt y brn, crs, cem				0038-1L
2560.00				Brnt	Etiv	M.Jurassic		0085
			45	Cont : prp, dd				0085-1L
			35	Sh/Clst: brn gy				0085-3L
			10	Other : trbofgs				0085-2L
			10	Coal : blk, cly				0085-4L
2560.11		ccp		Brnt	Etiv	M.Jurassic		0039
		0.79	100	S/Sst : or gy to lt y brn, crs, cem, l				0039-1L
2563.33		ccp		Brnt	Etiv	M.Jurassic		0040
		2.82	100	S/Sst : pl y brn, cem				0040-1L
			tr	Other : carb				0040-2L
2565.00				Brnt	Etiv	M.Jurassic		0086
			45	Cont : prp, dd				0086-1L
			35	Sh/Clst: brn gy				0086-3L
			15	Other : trbofgs				0086-2L
			5	Coal : blk, cly				0086-4L

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type / TOC%	%	Grp / Lithology description	Frm	Age	Trb	Sample
2566.24		ccp		Brnt	Etiv	M.Jurassic		0041
		0.99	100	S/Sst : m y brn to drk y brn, st, cem				0041-1L
2570.00		ccp		Brnt	Etiv	M.Jurassic		0058
		4.44	100	S/Sst : lt y brn, crs, cem				0058-1L
2570.00				Brnt	Etiv	M.Jurassic		0087
			50	Sh/Clst: brn gy, carb				0087-3L
			35	Cont : prp, dd				0087-1L
			15	Other : trbofgs				0087-2L
			tr	Coal : blk, cly				0087-4L
2573.41		ccp		Brnt	Etiv	M.Jurassic		0042
		0.93	100	S/Sst : or gy to m y brn, crs, cem				0042-1L
2575.00				Brnt	Etiv	M.Jurassic		0088
			40	Cont : prp, dd				0088-1L
			30	Sh/Clst: brn gy				0088-3L
			25	Other : trbofgs				0088-2L
			5	Coal : blk, cly				0088-4L
2576.40		ccp		Brnt	Etiv	M.Jurassic		0043
		0.74	100	S/Sst : m y brn to drk y brn, crs, cem				0043-1L
2580.00				Brnt	Etiv	M.Jurassic		0089
			45	Sh/Clst: brn gy				0089-3L
			35	Cont : prp, dd				0089-1L
			15	Other : trbofgs				0089-2L
			5	Coal : blk, cly				0089-4L

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
2581.14	ccp		Brnt Etiv M.Jurassic		0044
		100	S/Sst : m y brn to drk y brn, crs, cem		0044-1L
2585.00	ccp		Brnt Etiv M.Jurassic		0045
	0.71	100	S/Sst : m y brn to drk y brn, crs, cem		0045-1L
2585.00			Brnt Etiv M.Jurassic		0090
		65	Sh/Clst: brn gy		0090-3L
		15	Cont : prp, dd		0090-1L
		10	Other : trbofgs		0090-2L
		10	Coal : blk, cly		0090-4L
2588.27	ccp		Brnt Etiv M.Jurassic		0046
	0.95	100	S/Sst : m y brn to drk y brn, crs, cem		0046-1L
2590.00			Brnt Etiv M.Jurassic		0091
		60	Cont : prp, dd		0091-1L
		25	Sh/Clst: brn gy		0091-3L
		10	Other : trbofgs		0091-2L
		5	Coal : blk, cly		0091-4L
2591.86	ccp		Brnt Etiv M.Jurassic		0047
	0.89	100	S/Sst : drk gy, pyr, crs, cem		0047-1L
2594.71	ccp		Brnt Etiv M.Jurassic		0048
	1.01	100	S/Sst : drk y brn to dsk y brn, crs, cem		0048-1L

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
2595.00			Brnt Etiv M.Jurassic		0092
		40	Sh/Clst: brn gy		0092-3L
		35	Cont : prp, dd		0092-1L
		15	Other : trbofgs		0092-2L
		10	Coal : blk, cly		0092-4L
2597.77	ccp		Brnt Etiv M.Jurassic		0049
		100	S/Sst : drk y brn to dsk y brn, crs, cem		0049-1L
2600.00			Brnt Etiv M.Jurassic		0093
		55	S/Sst : w to lt gy, l		0093-5L
		20	Cont : prp, dd		0093-1L
		20	Sh/Clst: brn gy		0093-3L
		5	Other : trbofgs		0093-2L
		tr	Coal : blk, cly		0093-4L
2602.74	ccp		Brnt Etiv M.Jurassic		0050
	0.78	100	S/Sst : drk y brn to dsk y brn, crs, cem		0050-1L
2605.00			Brnt Etiv M.Jurassic		0094
		75	Cont : prp, dd		0094-1L
		15	S/Sst : w to lt gy, l		0094-5L
		10	Sh/Clst: brn gy		0094-3L
		tr	Other : trbofgs		0094-2L
		tr	Coal : blk, cly		0094-4L
2606.03	ccp		Brnt Etiv M.Jurassic		0051
	1.15	100	S/Sst : drk y brn, cem, cngl		0051-1L

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GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
2610.00				Brnt	Etiv	M.Jurassic		0095
			55	S/Sst		: w to lt gy, l		0095-5L
			25	Sh/Clst		: brn gy		0095-3L
			20	Cont		: prp, dd, fib		0095-1L
			tr	Other		: trbofgs		0095-2L
			tr	Coal		: blk, cly		0095-4L
2611.75	ccp			Brnt	Etiv	M.Jurassic		0052
		1.05	100	S/Sst		: lt y brn, crs, cem		0052-1L
2615.00				Brnt	Etiv	M.Jurassic		0096
			60	S/Sst		: w to lt gy, l		0096-5L
			30	Sh/Clst		: brn gy to dsk y brn		0096-3L
			10	Cont		: prp, dd, fib		0096-1L
			tr	Other		: trbofgs		0096-2L
			tr	Coal		: blk, cly		0096-4L
2616.33	ccp			Brnt	Etiv	M.Jurassic		0053
		0.83	100	S/Sst		: lt gy to lt y brn, carb, pyr, cem, lam		0053-1L
2620.00				Brnt	Etiv	M.Jurassic		0097
			90	S/Sst		: w to lt gy, l		0097-5L
			10	Cont		: prp, dd, fib		0097-1L
			tr	Other		: trbofgs		0097-2L
			tr	Sh/Clst		: brn gy to dsk y brn		0097-3L
			tr	Coal		: blk, cly		0097-4L

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GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type / TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
2620.50		ccp		Dunl Drak L.Jurassic		0054
		2.90	100	Sltst : brn gy to dsk y brn, s		0054-1L
2622.00		ccp		Dunl Drak L.Jurassic		0055
		4.19	100	Sltst : brn gy to dsk y brn, carb, mic		0055-1L
2624.00		ccp		Dunl Drak L.Jurassic		0056
		3.59	100	Sltst : brn gy to dsk y brn, carb, mic		0056-1L
2625.00				Dunl Drak L.Jurassic		0098
			65	Cont : prp, dd, fib		0098-1L
			25	S/Sst : w to lt gy, l		0098-5L
			10	Sh/Clst: brn gy to dsk y brn		0098-3L
			tr	Other : trbofgs		0098-2L
			tr	Coal : blk, cly		0098-4L
2630.00				Dunl Drak L.Jurassic		0099
			50	Cont : prp, dd, fib		0099-1L
			40	S/Sst : w to lt gy, l		0099-5L
			10	Sh/Clst: brn gy to dsk y brn		0099-3L
			tr	Other : trbofgs		0099-2L
			tr	Coal : blk, cly		0099-4L
2635.00				Dunl Drak L.Jurassic		0100
			65	S/Sst : w to lt gy, l		0100-5L
			30	Cont : prp, dd, fib		0100-1L
			5	Sh/Clst: brn gy to dsk y brn		0100-3L
			tr	Other : trbofgs		0100-2L
			tr	Coal : blk, cly		0100-4L

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GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
2640.00				Dunl	Drak	L.Jurassic		0101
			55	Cont		: prp, dd, fib		0101-1L
			45	S/Sst		: w to lt gy, l		0101-5L
			tr	Other		: trbofgs		0101-2L
			tr	Sh/Clst		: brn gy to dsk y brn		0101-3L
			tr	Coal		: blk, cly		0101-4L
			tr	Sh/Clst		: brn gy to dsk brn, slt, mic		0101-6L
2645.00				Dunl	Drak	L.Jurassic		0102
			55	Cont		: prp, dd, fib		0102-1L
			45	S/Sst		: w to lt gy, l		0102-4L
			tr	Other		: trbofgs		0102-2L
			tr	Sh/Clst		: brn gy to dsk y brn		0102-3L
			tr	Other		: pyr		0102-5L
2650.00				Dunl	Drak	L.Jurassic		0103
			80	Cont		: prp, dd, fib		0103-1L
			20	S/Sst		: w to lt gy, l		0103-3L
			tr	Sh/Clst		: brn gy to dsk y brn		0103-2L
			tr	Other		: pyr		0103-4L
2655.00				Dunl	Drak	L.Jurassic		0104
			85	Cont		: prp, dd, fib		0104-1L
			15	S/Sst		: w to lt gy, l		0104-3L
			tr	Sh/Clst		: brn gy to dsk y brn		0104-2L
2660.00				Dunl	Drak	L.Jurassic		0105
			60	Cont		: prp, dd, fib		0105-1L
			40	S/Sst		: w to lt gy, l		0105-3L
			tr	Sh/Clst		: brn gy to dsk y brn		0105-2L

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GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth	Type		Grp Frm Age	Trb	Sample
Int Cvd	TOC%	%	Lithology description		
2665.00			Dunl Drak L.Jurassic		0106
		90	Cont : prp, dd, fib		0106-1L
		10	S/Sst : w to lt gy, l		0106-3L
		tr	Sh/Clst: brn gy to dsk y brn		0106-2L
		tr	Other : pyr		0106-4L
2670.00			Dunl Drak L.Jurassic		0107
		60	Cont : prp, dd, fib		0107-1L
		40	S/Sst : w to lt gy, l		0107-3L
		tr	Sh/Clst: brn gy to dsk y brn		0107-2L
		tr	Other : pyr		0107-4L
2675.00			Dunl Drak L.Jurassic		0108
		90	Cont : prp, dd, fib		0108-1L
		10	S/Sst : w to lt gy, l		0108-3L
		tr	Sh/Clst: brn gy to dsk y brn		0108-2L
		tr	Other : pyr		0108-4L
2680.00			Dunl Drak L.Jurassic		0109
		90	Cont : prp, dd, fib		0109-1L
		10	S/Sst : w to lt gy, l		0109-3L
		tr	Sh/Clst: brn gy to dsk y brn		0109-2L
		tr	Other : pyr		0109-4L
2687.00			Dunl Drak L.Jurassic		0110
		85	Cont : prp, dd, fib		0110-1L
		15	S/Sst : w to lt gy, l		0110-3L
		tr	Sh/Clst: brn gy to dsk y brn		0110-2L
		tr	Other : pyr		0110-4L
		tr	Ca : m y brn		0110-5L

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GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
2690.00				Dunl	Drak	L.Jurassic		0111
			75	Cont		: prp, dd, fib		0111-1L
			25	S/Sst		: w to lt gy, l		0111-3L
			tr	Sh/Clst		: brn gy to dsk y brn		0111-2L
			tr	Other		: pyr		0111-4L
			tr	Ca		: m y brn		0111-5L
2695.00				Dunl	Drak	L.Jurassic		0112
			60	S/Sst		: w to lt gy, slt, l		0112-3L
			40	Cont		: prp, dd, fib		0112-1L
			tr	Sh/Clst		: brn gy to dsk y brn		0112-2L
			tr	Other		: pyr		0112-4L
			tr	Ca		: m y brn		0112-5L
			tr	Sltst		: brn gy, mic		0112-6L
2700.00				Dunl	Drak	L.Jurassic		0113
			60	S/Sst		: w to lt gy, slt, l		0113-3L
			40	Cont		: prp, dd, fib		0113-1L
			tr	Sh/Clst		: brn gy to dsk y brn		0113-2L
			tr	Other		: pyr		0113-4L
			tr	Ca		: m y brn		0113-5L
			tr	Sltst		: brn gy, mic		0113-6L
2705.00				Dunl	Drak	L.Jurassic		0114
			60	S/Sst		: w to lt gy, slt, l		0114-3L
			40	Cont		: prp, dd, fib		0114-1L
			tr	Sh/Clst		: brn gy to dsk y brn		0114-2L
			tr	Other		: pyr		0114-4L
			tr	Ca		: m y brn		0114-5L
			tr	Sltst		: brn gy, mic		0114-6L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Lithology description	Frm	Age	Trb	Sample
2710.00				Dunl	Drak	L.Jurassic		0115
			95	Cont : prp, dd, fib				0115-1L
			5	S/Sst : w to lt gy, slt, l				0115-3L
			tr	Sh/Clst: brn gy to dsk y brn				0115-2L
			tr	Other : pyr				0115-4L
			tr	Ca : m y brn				0115-5L
			tr	Sltst : brn gy, mic				0115-6L
2715.00				Dunl	Drak	L.Jurassic		0116
			100	Cont : prp, dd, fib				0116-1L
			tr	Sh/Clst: brn gy to dsk y brn				0116-2L
			tr	S/Sst : w to lt gy, slt, l				0116-3L
			tr	Other : pyr				0116-4L
			tr	Ca : m y brn				0116-5L
			tr	Sltst : brn gy, mic				0116-6L
2720.00				Dunl	Drak	L.Jurassic		0117
			85	Cont : prp, dd, fib				0117-1L
		1.18	15	Sh/Clst: brn gy to dsk y brn				0117-2L
			tr	Ca : m y brn				0117-3L
			tr	Sltst : brn gy, mic				0117-4L
2725.00				Dunl	Drak	L.Jurassic		0118
			95	Cont : prp, dd, fib				0118-1L
			5	Sh/Clst: brn gy to dsk y brn				0118-2L
			tr	Ca : m y brn				0118-3L
			tr	Sltst : brn gy, mic				0118-4L
			tr	S/Sst : w to lt gy, l				0118-5L
			tr	Other : pyr				0118-6L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
2730.00			Dunl Drak L.Jurassic		0119
		70	S/Sst : w to lt gy, calc, cem, l		0119-4L
		25	Cont : prp, dd, fib		0119-1L
		5	Other : pyr		0119-5L
		tr	Sh/Clst: brn gy to dsk y brn		0119-2L
		tr	Ca : m y brn		0119-3L
2735.00			Dunl Drak L.Jurassic		0120
		75	Cont : prp, dd, fib		0120-1L
		20	S/Sst : w to lt gy, calc, cem, l		0120-4L
		5	Ca : lt gy		0120-3L
		tr	Sh/Clst: brn gy to dsk y brn		0120-2L
		tr	Other : pyr		0120-5L
2740.00			Dunl Drak L.Jurassic		0121
		85	Cont : prp, dd, fib		0121-1L
		10	S/Sst : w to lt gy, calc, cem, l		0121-4L
		5	Other : pyr		0121-5L
		tr	Sh/Clst: brn gy to dsk y brn		0121-2L
		tr	Ca : lt gy		0121-3L
2745.00			Dunl Drak L.Jurassic		0122
		100	Cont : prp, dd, fib		0122-1L
		tr	Sh/Clst: brn gy to dsk y brn		0122-2L
		tr	Ca : lt gy		0122-3L
		tr	S/Sst : w to lt gy, calc, cem, l		0122-4L
		tr	Other : pyr		0122-5L
2750.00			Dunl Drak L.Jurassic		0123
		75	Cont : prp, dd, fib		0123-1L
		25	S/Sst : w to lt gy, calc, cem, l		0123-4L
		tr	Sh/Clst: brn gy to dsk y brn		0123-2L
		tr	Ca : lt gy		0123-3L
		tr	Other : pyr		0123-5L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
2755.00				Dunl Drak L.Jurassic		0124
			80	Cont : cem, prp, dd		0124-3L
			20	S/Sst : w to lt gy, calc, cem, l		0124-1L
			tr	Other : pyr		0124-2L
			tr	Sltst : lt gy to m gy, mic		0124-4L
			tr	Sh/Clst: m gy		0124-5L
2760.00				Dunl Drak L.Jurassic		0125
			100	Cont : cem		0125-1L
2765.00				Dunl Drak L.Jurassic		0126
			100	Cont : cem		0126-1L
			tr	Sh/Clst: m gy		0126-2L
			tr	Sltst : brn gy to m gy, mic		0126-3L
2770.00				Dunl Drak L.Jurassic		0127
			100	Cont : cem, prp, dd		0127-1L
			tr	Sh/Clst: m gy		0127-2L
			tr	Sltst : brn gy to m gy, mic		0127-3L
2775.00				Dunl Drak L.Jurassic		0128
			100	Cont : cem, prp, dd		0128-1L
			tr	Sh/Clst: m gy		0128-2L
			tr	Sltst : brn gy to m gy, mic		0128-3L
2780.00				Dunl Drak L.Jurassic		0129
			85	Cont : cem, prp, dd		0129-1L
		2.30	15	Sltst : brn gy to m gy, mic		0129-3L
			tr	Sh/Clst: m gy		0129-2L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
2785.00				Dunl Drak L.Jurassic		0130
			80	Cont : cem, prp, dd		0130-1L
			20	Sh/Clst: brn gy to m gy, slt, mic		0130-3L
			tr	Sh/Clst: m gy		0130-2L
2790.00				Dunl Drak L.Jurassic		0131
			75	Cont : cem, prp, dd		0131-1L
		3.19	25	Sh/Clst: brn gy to m gy, slt, mic		0131-3L
			tr	Sh/Clst: m gy		0131-2L
2795.00				Dunl Drak L.Jurassic		0132
			95	Cont : cem, prp, dd		0132-1L
			5	Sh/Clst: brn gy to m gy, slt, mic		0132-3L
			tr	Sh/Clst: m gy		0132-2L
2800.00				Dunl Drak L.Jurassic		0133
			85	Cont : cem, prp, dd		0133-1L
			10	Ca : brn gy		0133-4L
			5	Sh/Clst: brn gy to m gy, calc, slt, mic		0133-3L
			tr	Sh/Clst: m gy		0133-2L
2805.00				Dunl Drak L.Jurassic		0134
			95	Cont : cem, prp, dd		0134-1L
			5	S/Sst : w to lt gy, calc, cem, l		0134-5L
			tr	Sh/Clst: m gy		0134-2L
			tr	Sh/Clst: brn gy to m gy, calc, slt, mic		0134-3L
			tr	Ca : brn gy		0134-4L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
2810.00				Dunl Drak L.Jurassic		0135
			90	Cont : cem, prp, dd		0135-1L
			10	S/Sst : w to lt gy, calc, cem, l		0135-5L
			tr	Sh/Clst: m gy		0135-2L
			tr	Sh/Clst: brn gy to m gy, slt, mic		0135-3L
			tr	Ca : brn gy		0135-4L
2815.00				Dunl Drak L.Jurassic		0136
			75	Cont : cem, prp, dd		0136-1L
		0.75	20	Ca : gy red		0136-3L
			5	S/Sst : w to lt gy, calc, cem, l		0136-4L
			tr	Sh/Clst: brn gy to m gy, calc, mic		0136-2L
2820.00				Dunl Drak L.Jurassic		0137
			65	Sltst : brn gy, calc, mic		0137-2L
			20	Cont : cem, prp, dd		0137-1L
			10	S/Sst : w to lt gy, calc, cem, l		0137-4L
			5	Ca : gy red to gy brn		0137-3L
2825.00				Dunl Cook L.Jurassic		0138
			55	Cont : cem, prp, dd		0138-1L
		2.63	40	Sltst : brn gy, calc, mic		0138-2L
			5	Ca : gy red to gy brn		0138-3L
			tr	S/Sst : w to lt gy, calc, cem, l		0138-4L
			tr	Coal : blk		0138-5L
2830.00				Dunl Cook L.Jurassic		0139
			65	Sltst : brn gy, calc, mic		0139-2L
			25	Cont : cem, prp, dd		0139-1L
			10	Ca : gy red to gy brn		0139-3L
			tr	S/Sst : w to lt gy, calc, cem, l		0139-4L
			tr	Coal : blk		0139-5L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
2835.00			Dunl Cook L.Jurassic		0140
	1.28	45	Sltst : brn gy to m gy, calc, mic		0140-2L
		30	Cont : cem, prp, dd		0140-1L
		25	Ca : gy red to gy brn, dol		0140-3L
		tr	S/Sst : w to lt gy, calc, cem, l		0140-4L
2840.00			Dunl Cook L.Jurassic		0141
		75	Cont : cem, prp, dd		0141-1L
		20	Sltst : brn gy, calc, mic		0141-2L
		5	Ca : gy red to gy brn, dol		0141-3L
		tr	S/Sst : w to lt gy, calc, cem, l		0141-4L
		tr	Other : pyr		0141-5L
2845.00			Dunl Cook L.Jurassic		0142
	1.34	85	Sltst : brn gy to m gy, calc, mic		0142-2L
		15	Cont : cem, prp, dd		0142-1L
		tr	Ca : gy red to gy brn, dol		0142-3L
		tr	S/Sst : w to lt gy, calc, cem, l		0142-4L
		tr	Other : pyr		0142-5L
2850.00			Dunl Cook L.Jurassic		0143
		90	Sltst : brn gy to m gy, calc, mic		0143-2L
		10	Cont : cem, prp, dd		0143-1L
		tr	Ca : gy red to gy brn, dol		0143-3L
		tr	S/Sst : w to lt gy, calc, cem, l		0143-4L
		tr	Other : pyr		0143-5L
2855.00			Dunl Cook L.Jurassic		0144
		50	Cont : cem, prp, dd		0144-1L
	1.38	50	Sltst : brn gy to m gy, calc, mic		0144-2L
		tr	Ca : gy red to gy brn, dol		0144-3L
		tr	S/Sst : w to lt gy, calc, cem, l		0144-4L
		tr	Other : pyr		0144-5L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
2860.00				Dunl	Cook	L.Jurassic		0145
			70	Sh/Clst:		brn gy to m gy, calc, slt, mic		0145-2L
			30	Cont		: cem, prp, dd		0145-1L
			tr	Ca		: gy red to gy brn, dol		0145-3L
			tr	S/Sst		: w to lt gy, calc, cem, l		0145-4L
			tr	Other		: pyr		0145-5L
2865.00				Dunl	Cook	L.Jurassic		0146
		1.60	80	Sh/Clst:		brn gy to m gy, calc, slt, mic		0146-2L
			20	Cont		: cem, prp, dd		0146-1L
			tr	Ca		: gy red to gy brn, dol		0146-3L
			tr	S/Sst		: w to lt gy, calc, cem, l		0146-4L
			tr	Other		: pyr		0146-5L
2870.00				Dunl	Cook	L.Jurassic		0147
			50	Cont		: cem, prp, dd		0147-1L
			50	Sh/Clst:		brn gy to m gy, calc, slt, mic		0147-2L
			tr	Ca		: gy red to gy brn, dol		0147-3L
			tr	S/Sst		: w to lt gy, calc, cem, l		0147-4L
			tr	Other		: pyr		0147-5L
2875.00				Dunl	Cook	L.Jurassic		0148
		1.48	80	Sh/Clst:		brn gy to m gy, calc, slt, mic		0148-2L
			20	Cont		: cem, prp, dd		0148-1L
			tr	Ca		: gy red to gy brn, dol		0148-3L
			tr	S/Sst		: w to lt gy, calc, cem, l		0148-4L
			tr	Other		: pyr		0148-5L
2880.00				Dunl	Burt	L.Jurassic		0149
			55	Sh/Clst:		brn gy to m gy, calc, slt, mic		0149-2L
		0.64	30	S/Sst		: w to lt gy, calc, cem, l		0149-4L
			15	Cont		: cem, prp, dd		0149-1L
			tr	Ca		: gy red to gy brn, dol		0149-3L
			tr	Other		: pyr		0149-5L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
2885.00				Dunl	Burt	L.Jurassic		0150
			60	Sltst		: brn gy to m gy, calc, mic		0150-2L
			15	Cont		: cem, prp, dd		0150-1L
			15	Ca		: brn gy to gy brn, dol		0150-3L
			10	S/Sst		: w to lt gy, calc, cem, l		0150-4L
			tr	Other		: pyr		0150-5L
2890.00				Dunl	Burt	L.Jurassic		0151
			45	Cont		: cem, prp, dd		0151-1L
			30	Sltst		: brn gy to m gy, calc, mic		0151-2L
			15	Ca		: brn gy to gy brn, dol		0151-3L
			10	S/Sst		: w to lt gy, calc, cem, l		0151-4L
			tr	Other		: pyr		0151-5L
2895.00				Dunl	Burt	L.Jurassic		0152
		1.68	80	Sltst		: brn gy to m gy, calc, mic		0152-2L
			10	Cont		: cem, prp, dd		0152-1L
			10	Ca		: brn gy to gy brn, dol		0152-3L
			tr	S/Sst		: w to lt gy, calc, cem, l		0152-4L
			tr	Other		: pyr		0152-5L
2900.00				Dunl	Burt	L.Jurassic		0153
			75	Sltst		: brn gy to m gy, calc, mic		0153-2L
			25	Cont		: cem, prp, dd		0153-1L
			tr	Ca		: brn gy to gy brn, dol		0153-3L
			tr	S/Sst		: w to lt gy, calc, cem, l		0153-4L
			tr	Other		: pyr		0153-5L
2905.00				Dunl	Burt	L.Jurassic		0154
			50	Sltst		: brn gy to m gy, calc, mic		0154-2L
			30	Ca		: brn gy to gy brn, dol		0154-3L
			15	Cont		: cem, prp, dd		0154-1L
			5	S/Sst		: w to lt gy, calc, cem, l		0154-4L
			tr	Other		: pyr		0154-5L

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
2910.00			Dunl Burt L.Jurassic		0155
		50	S/Sst : w to lt gy, calc, cem		0155-4L
		30	Sltst : brn gy to m gy, calc, mic		0155-2L
		10	Cont : cem, prp, dd		0155-1L
		10	Ca : brn gy to gy brn, dol		0155-3L
2915.00			Dunl Burt L.Jurassic		0156
	1.33	50	Sltst : brn gy to m gy, calc, mic		0156-2L
		30	S/Sst : w to lt gy, calc, cem		0156-4L
		10	Cont : cem, prp, dd		0156-1L
		10	Ca : brn gy to gy brn, dol		0156-3L
2920.00			Dunl Burt L.Jurassic		0157
		40	Sltst : brn gy to m gy, calc, mic		0157-2L
	0.82	30	S/Sst : w to lt gy, calc, cem		0157-4L
		20	Cont : cem, prp, dd		0157-1L
		10	Ca : brn gy to gy brn, dol		0157-3L
		tr	Other : pyr		0157-5L
2925.00			Dunl Burt L.Jurassic		0158
	1.66	70	Sltst : brn gy to m gy, calc, mic		0158-2L
		15	Cont : cem, prp, dd		0158-1L
		15	S/Sst : w to lt gy, calc, cem		0158-4L
		tr	Ca : brn gy to gy brn, dol		0158-3L
		tr	Other : pyr		0158-5L
2930.00			Dunl Burt L.Jurassic		0159
		90	Cont : cem, prp, dd, tar-ad		0159-1L
		10	Sltst : brn gy to m gy, calc, mic		0159-2L
		tr	Ca : brn gy to gy brn, dol		0159-3L
		tr	S/Sst : w to lt gy, calc, cem		0159-4L
		tr	Other : pyr		0159-5L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp / Lithology description	Frm	Age	Trb	Sample
2935.00				Dunl	Burt	L.Jurassic		0160
		1.74	60	Sh/Clst: brn gy to m gy, calc, slt, mic				0160-2L
			40	Cont : cem, prp, dd				0160-1L
			tr	Ca : brn gy to gy brn, dol				0160-3L
			tr	S/Sst : w to lt gy, calc, cem				0160-4L
2940.00				Dunl	Burt	L.Jurassic		0161
			75	Sh/Clst: brn gy to m gy, calc, slt, mic				0161-2L
			20	Cont : cem, prp, dd				0161-1L
			5	Ca : brn gy to gy brn, dol				0161-3L
			tr	S/Sst : w to lt gy, calc, cem				0161-4L
2945.00				Dunl	Burt	L.Jurassic		0162
		1.40	65	Sh/Clst: brn gy to m gy, calc, slt, mic				0162-2L
			20	S/Sst : w to lt gy, calc, cem				0162-4L
			15	Cont : cem, prp, dd				0162-1L
			tr	Ca : brn gy to gy brn, dol				0162-3L
2950.00				Dunl	Burt	L.Jurassic		0163
			80	Sltst : brn gy to m gy, calc, mic				0163-2L
			10	Cont : cem, prp, dd				0163-1L
			10	S/Sst : w to lt gy, calc, cem				0163-4L
			tr	Ca : brn gy to gy brn, dol				0163-3L
2955.00				Dunl	Burt	L.Jurassic		0164
		1.49	70	Sltst : brn gy to m gy, calc, mic				0164-2L
			20	S/Sst : w to lt gy, calc, cem				0164-4L
			10	Cont : cem, prp, dd				0164-1L
			tr	Ca : brn gy to gy brn, dol				0164-3L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp / Lithology	Frm	Age / Lithology description	Trb	Sample
2960.00				Dunl	Burt	L.Jurassic		0165
			50	Sltst		: brn gy to m gy, calc, mic		0165-2L
			30	S/Sst		: w to lt gy, calc, cem		0165-4L
			20	Cont		: cem, prp, dd		0165-1L
			tr	Ca		: brn gy to gy brn, dol		0165-3L
2965.00				Dunl	Amun	L.Jurassic		0166
		1.11	60	Sh/Clst		: brn gy to m gy, calc, slt, st		0166-2L
			40	Cont		: cem, prp, dd		0166-1L
			tr	Ca		: brn gy to gy brn, dol		0166-3L
			tr	S/Sst		: w to lt gy, calc, cem		0166-4L
2970.00				Dunl	Amun	L.Jurassic		0167
			60	Cont		: cem, prp, dd		0167-1L
			40	Sltst		: brn gy to m gy, calc, mic, st		0167-2L
			tr	Ca		: brn gy to gy brn, dol		0167-3L
			tr	S/Sst		: w to lt gy, calc, cem		0167-4L
2975.00				Dunl	Amun	L.Jurassic		0168
			90	Cont		: cem, prp, dd		0168-1L
			10	Sltst		: brn gy to m gy, calc, mic, st		0168-2L
			tr	Ca		: brn gy to gy brn, dol		0168-3L
			tr	S/Sst		: w to lt gy, calc, cem		0168-4L
2980.00				Dunl	Amun	L.Jurassic		0169
			60	Cont		: cem, prp, dd		0169-1L
			30	Sltst		: brn gy to m gy, calc, mic, st		0169-2L
			10	S/Sst		: w to lt gy, calc, cem		0169-4L
			tr	Ca		: brn gy to gy brn, dol		0169-3L
			tr	Coal		: blk		0169-5L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp / Lithology	Frm / description	Age	Trb	Sample
2985.00				Dunl	Amun	L.Jurassic		0170
		1.63	50	Sltst	: brn gy to m gy, calc, mic, st			0170-2L
			40	Cont	: cem, prp, dd			0170-1L
			10	S/Sst	: w to lt gy, calc, cem			0170-4L
			tr	Ca	: brn gy to gy brn, dol			0170-3L
			tr	Coal	: blk			0170-5L
2990.00				Dunl	Amun	L.Jurassic		0171
			90	Cont	: cem, prp, dd			0171-1L
			10	Sltst	: brn gy to m gy, calc, mic			0171-2L
			tr	Ca	: brn gy to gy brn, dol			0171-3L
			tr	S/Sst	: w to lt gy, calc, cem			0171-4L
2995.00				Dunl	Amun	L.Jurassic		0172
			95	Cont	: cem, prp, dd			0172-1L
			5	Sltst	: brn gy to m gy, calc, mic			0172-2L
			tr	Ca	: brn gy to gy brn, dol			0172-3L
			tr	S/Sst	: w to lt gy, calc, cem			0172-4L
3000.00				Dunl	Amun	L.Jurassic		0173
			100	Cont	: cem, prp, dd			0173-1L
			tr	Sltst	: brn gy to m gy, calc, mic			0173-2L
			tr	Ca	: brn gy to gy brn, dol			0173-3L
			tr	S/Sst	: w to lt gy, calc, cem			0173-4L
3005.00				Dunl	Amun	L.Jurassic		0174
			85	Cont	: cem, prp, dd			0174-1L
		1.52	15	Sltst	: brn gy to m gy, calc, mic			0174-2L
			tr	Ca	: brn gy to gy brn, dol			0174-3L
			tr	S/Sst	: w to lt gy, calc, cem			0174-4L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Lithology	Frm	Age / Lithology description	Trb	Sample
3010.00				Dunl	Amun	L.Jurassic		0175
			85	Cont		: cem, prp, dd		0175-1L
			10	Sltst		: brn gy to m gy, calc, mic		0175-2L
			5	S/Sst		: w to lt gy, calc, cem		0175-4L
			tr	Ca		: brn gy to gy brn, dol		0175-3L
3015.00				Dunl	Amun	L.Jurassic		0176
			90	Cont		: cem, prp, dd		0176-1L
			10	Sltst		: brn gy to m gy, calc, mic		0176-2L
			tr	Ca		: brn gy to gy brn, dol		0176-3L
			tr	S/Sst		: w to lt gy, calc, cem		0176-4L
3020.00				Dunl	Amun	L.Jurassic		0177
			60	Cont		: cem, prp, dd		0177-1L
		1.36	20	Sltst		: brn gy to m gy, calc, mic		0177-2L
			20	S/Sst		: w to lt gy, calc, cem		0177-4L
			tr	Ca		: brn gy to gy brn, dol		0177-3L
3025.00				Dunl	Amun	L.Jurassic		0178
		0.63	60	S/Sst		: w to lt gy, calc, cem		0178-4L
			30	Cont		: cem, prp, dd		0178-1L
			10	Sltst		: brn gy to m gy, calc, mic		0178-2L
			tr	Ca		: brn gy to gy brn, dol		0178-3L
3030.00				Dunl	Amun	L.Jurassic		0179
			75	S/Sst		: w to lt gy, calc, cem		0179-4L
		1.28	15	Sltst		: brn gy to m gy, calc, mic		0179-2L
			10	Cont		: cem, prp, dd		0179-1L
			tr	Ca		: brn gy to gy brn, dol		0179-3L

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Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp	Frm	Age / Lithology description	Trb	Sample
3035.00				Dunl	Amun	L.Jurassic		0180
			100	Cont		: cem, prp, dd		0180-1L
			tr	Sltst		: brn gy to m gy, calc, mic		0180-2L
			tr	Ca		: brn gy to gy brn, dol		0180-3L
			tr	S/Sst		: w to lt gy, calc, cem		0180-4L
3040.00				Dunl	Amun	L.Jurassic		0181
			70	S/Sst		: w to lt gy, calc, mic, cem		0181-4L
			20	Cont		: cem, prp, dd		0181-1L
			10	Sltst		: brn gy to m gy, calc, mic		0181-2L
			tr	Ca		: brn gy to gy brn, dol		0181-3L
3050.00					Stat	L.Jurassic		0182
		0.14	85	S/Sst		: w to lt gy, calc, crs, cem, l		0182-4L
			10	Cont		: cem, prp, dd		0182-1L
			5	Sltst		: brn gy to m gy, calc, mic		0182-2L
			tr	Ca		: brn gy to gy brn, dol		0182-3L
3060.00					Stat	L.Jurassic		0183
			85	S/Sst		: w to lt gy, calc, crs, cem, l		0183-4L
			10	Cont		: cem, prp, dd		0183-1L
			5	Sltst		: brn gy to m gy, calc, mic		0183-2L
			tr	Ca		: brn gy to gy brn, dol		0183-3L
3070.00					Stat	L.Jurassic		0184
			95	S/Sst		: w to lt gy, calc, crs, cem, l		0184-4L
			5	Cont		: cem, prp, dd		0184-1L
			tr	Sltst		: brn gy to m gy, calc, mic		0184-2L
			tr	Ca		: brn gy to gy brn, dol		0184-3L

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3080.00				Stat L.Jurassic		0185
			95	S/Sst : w to lt gy, calc, crs, cem, l		0185-4L
			5	Cont : cem, prp, dd		0185-1L
			tr	Sltst : brn gy to m gy, calc, mic		0185-2L
			tr	Ca : brn gy to gy brn, dol		0185-3L
3090.00				Stat L.Jurassic		0186
		0.67	90	S/Sst : w to lt gy, calc, crs, cem, l		0186-4L
			5	Cont : cem, prp, dd		0186-1L
			5	Sltst : brn gy to m gy, calc, mic		0186-2L
			tr	Ca : brn gy to gy brn, dol		0186-3L
3110.00				Stat L.Jurassic		0187
			65	Cont : prp, dd		0187-1L
		1.80	25	Sh/Clst: brn gy to m gy, slt, mic		0187-2L
			10	S/Sst : w to lt gy, calc, crs, l		0187-4L
			tr	Ca : brn gy to gy brn, dol		0187-3L
			tr	Other : carb		0187-5L
3120.00				Stat L.Jurassic		0188
			100	S/Sst : w to lt gy, calc, crs, l		0188-4L
			tr	Cont : prp, dd		0188-1L
			tr	Sh/Clst: brn gy to m gy, slt, mic		0188-2L
			tr	Ca : brn gy to gy brn, dol		0188-3L
			tr	Other : carb		0188-5L
3130.00				Stat L.Jurassic		0189
			55	Cont : prp, dd		0189-1L
			40	S/Sst : w to lt gy, calc, crs, l		0189-4L
			5	Sh/Clst: brn gy to m gy, mic		0189-2L
			tr	Ca : brn gy to gy brn, dol		0189-3L
			tr	Other : carb		0189-5L

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Lithology	Frm	Age / Lithology description	Trb	Sample
3140.00					Stat	L.Jurassic		0190
		0.76	75	S/Sst		: w to lt gy, calc, carb, crs, cem, l		0190-4L
			20	Sh/Clst		: brn gy to m gy, mic		0190-2L
			5	Cont		: prp		0190-1L
			tr	Ca		: brn gy to gy brn, dol		0190-3L
3150.00					Stat	L.Jurassic		0191
			80	S/Sst		: w to lt gy, calc, carb, crs, l		0191-4L
			10	Cont		: prp		0191-1L
			10	Sh/Clst		: brn gy to lt gy to m gy, mic		0191-2L
			tr	Ca		: brn gy to gy brn, dol		0191-3L
3160.00					Stat	L.Jurassic		0192
			65	S/Sst		: w to lt gy, calc, carb, crs, l		0192-4L
			30	Sltst		: brn gy to lt gy to m gy, mic		0192-2L
			5	Cont		: prp		0192-1L
			tr	Ca		: brn gy to gy brn, dol		0192-3L
3170.00					Stat	L.Jurassic		0193
			55	Sltst		: brn gy to lt gy to m gy, mic		0193-2L
		28.25	35	Coal		: blk		0193-5L
			10	S/Sst		: w to lt gy, calc, carb, crs, l		0193-4L
			tr	Cont		: prp		0193-1L
			tr	Ca		: brn gy to gy brn, dol		0193-3L
3180.00					Stat	L.Jurassic		0194
		1.76	60	Sltst		: brn gy to lt gy to m gy, mic		0194-2L
			25	Coal		: blk		0194-5L
			10	S/Sst		: w to lt gy, calc, carb, crs, l		0194-4L
			5	Cont		: prp		0194-1L
			tr	Ca		: brn gy to gy brn, dol		0194-3L

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Frm / Age / Lithology description	Trb	Sample
3190.00				Stat L.Jurassic		0195
			90	S/Sst : w to lt gy, calc, carb, crs, l		0195-4L
			10	Sh/Clst: brn gy to lt gy to m gy, slt, mic		0195-2L
			tr	Cont : prp		0195-1L
			tr	Ca : brn gy to gy brn, dol		0195-3L
			tr	Coal : blk		0195-5L
3197.00				Stat L.Jurassic		0196
		42.42	65	Coal : blk to dsk y brn, cly		0196-5L
			35	S/Sst : w to lt gy, calc, carb, crs, l		0196-4L
			tr	Cont : prp		0196-1L
			tr	Sh/Clst: brn gy to lt gy to m gy, slt, mic		0196-2L
			tr	Ca : brn gy to gy brn, dol		0196-3L
3220.00				Stat L.Jurassic		0197
			80	S/Sst : w to lt gy, calc, crs, l		0197-4L
			10	Sh/Clst: brn gy to lt gy to m gy, slt, mic		0197-2L
			5	Cont : prp		0197-1L
			5	Coal : blk to dsk y brn, cly		0197-5L
			tr	Ca : brn gy to gy brn, dol		0197-3L
3235.00				Stat L.Jurassic		0198
			90	S/Sst : w to lt gy, calc, crs, l		0198-4L
			5	Sh/Clst: brn gy to lt gy to m gy, slt, mic		0198-2L
			5	Coal : blk to dsk y brn, cly		0198-5L
			tr	Cont : prp		0198-1L
			tr	Ca : brn gy to gy brn, dol		0198-3L
3250.00				Stat L.Jurassic		0199
			100	S/Sst : w to lt gy, l		0199-4L
			tr	Cont : prp		0199-1L
			tr	Sh/Clst: brn gy to lt gy to m gy, slt, mic		0199-2L
			tr	Ca : brn gy to gy brn, dol		0199-3L
			tr	Coal : blk to dsk y brn, cly		0199-5L

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp / Lithology description	Frm	Age	Trb	Sample
3265.00					Stat	L.Jurassic		0200
		0.41	95	S/Sst : w to lt gy, calc, crs, cem, l				0200-3L
			5	Sltst : brn gy to lt gy to m gy, mic				0200-2L
			tr	Cont : prp				0200-1L
			tr	Coal : blk to dsk y brn, cly				0200-4L
3280.00					Stat	L.Jurassic		0201
			100	S/Sst : w to lt gy, calc, crs, l				0201-3L
			tr	Cont : prp				0201-1L
			tr	Sltst : brn gy to lt gy to m gy, mic				0201-2L
			tr	Coal : blk to dsk y brn, cly				0201-4L
3295.00					Stat	L.Jurassic		0202
			100	S/Sst : w to lt gy, calc, crs, l				0202-3L
			tr	Cont : prp				0202-1L
			tr	Sltst : brn gy to lt gy to m gy, mic				0202-2L
			tr	Coal : blk to dsk y brn, cly				0202-4L
3310.00					Stat	L.Jurassic		0203
			95	S/Sst : w to lt gy, calc, crs, cem, l				0203-3L
			5	Coal : blk to dsk y brn, cly				0203-4L
			tr	Cont : prp				0203-1L
			tr	Sltst : brn gy to lt gy to m gy, mic				0203-2L
3325.00					Stat	L.Jurassic		0204
		0.24	80	S/Sst : w to lt gy, calc, crs, cem, l				0204-3L
		1.78	20	Sh/Clst: brn gy to m gy				0204-2L
			tr	Cont : prp				0204-1L
			tr	Coal : blk to dsk y brn, cly				0204-4L

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GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Depth Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3340.00				Stat L.Jurassic		0205
			50	Sh/Clst: brn gy to m gy to dsk y brn		0205-2L
			25	Cont : prp		0205-1L
			25	S/Sst : w to lt gy, calc, crs, cem, l		0205-3L
			tr	Coal : blk to dsk y brn, cly		0205-4L
3355.00				Stat L.Jurassic		0206
		0.91	65	Sh/Clst: brn gy to m gy to dsk y brn		0206-2L
			35	S/Sst : w to lt gy, calc, crs, cem, l		0206-3L
			tr	Cont : prp		0206-1L
			tr	Coal : blk to dsk y brn, cly		0206-4L
3370.00				Stat L.Jurassic		0207
			50	Sh/Clst: brn gy to m gy to dsk y brn, slt		0207-2L
			50	S/Sst : w to lt gy, calc, crs, cem, l		0207-3L
			tr	Cont : prp		0207-1L
3385.00				Stat L.Jurassic		0208
			55	S/Sst : w to lt gy, calc, crs, cem, l		0208-3L
			45	Sh/Clst: brn gy to m gy to dsk y brn, slt		0208-2L
			tr	Cont : prp		0208-1L
			tr	Other : pyr		0208-4L
3400.00				Hegr Triassic		0209
		0.65	90	Sh/Clst: brn gy to m gy to drk gy		0209-2L
			10	S/Sst : w to lt gy, calc, crs, cem, l		0209-3L
			tr	Cont : prp		0209-1L
			tr	Other : pyr		0209-4L

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GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 1 : Lithology description for well NOCS 30/6-9

Depth unit of measure: m

Depth Int	Cvd	Type TOC%	%	Grp Frm Age / Lithology description	Trb	Sample
3415.00				Hegr Triassic		0210
			60	S/Sst : w to lt gy, calc, crs, cem, l		0210-3L
			40	Sh/Clst: brn gy to m gy to drk gy		0210-2L
			tr	Cont : prp		0210-1L
			tr	Other : pyr		0210-4L
3430.00				Hegr Triassic		0211
		0.18	85	S/Sst : w to lt gy, calc, crs, cem, l		0211-3L
			15	Sh/Clst: brn gy to m gy to drk gy		0211-2L
			tr	Cont : prp		0211-1L
			tr	Other : pyr		0211-4L
3445.00				Hegr Triassic		0212
			90	S/Sst : w to lt gy, calc, crs, cem, l		0212-3L
			10	Sh/Clst: brn gy to m gy, slt, mic		0212-2L
			tr	Cont : prp		0212-1L
			tr	Other : pyr		0212-4L
3460.00				Hegr Triassic		0213
		0.83	65	Sh/Clst: brn gy to m gy, slt, mic		0213-2L
			35	S/Sst : w to lt gy, calc, crs, cem, l		0213-3L
			tr	Cont : prp		0213-1L
			tr	Other : pyr		0213-4L
3475.00				Hegr Triassic		0214
		0.16	55	S/Sst : w to lt gy, calc, crs, cem, l		0214-3L
		1.10	45	Sh/Clst: brn gy to m gy, slt, mic		0214-2L
			tr	Cont : prp		0214-1L

Table 2 : Rock-Eval table for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2410.00	cut	Sh/Clst: m gy	0.76	0.77	0.60	1.28	0.92	84	65	1.5	0.50	412	0059-2L
2422.00	cut	Ca : w	0.41	0.12	0.79	0.15	0.13	92	608	0.5	0.77	322	0060-4L
2450.00	com	bulk	0.70	0.63	0.55	1.15	0.77	82	71	1.3	0.53	379	0215-0B
2455.00	cut	Sh/Clst: gn gy to m gy	0.39	0.69	0.71	0.97	0.75	92	95	1.1	0.36	380	0065-5L
2460.00	cut	Coal : blk	33.57	143.39	5.35	26.80	54.57	263	10	177.0	0.19	431	0066-6L
2462.74	ccp	S/Sst : pl brn	0.43	1.00	0.32	3.13	0.56	179	57	1.4	0.30	434	0002-1L
2468.30	ccp	S/Sst : pl y brn	0.39	0.76	0.25	3.04	0.61	125	41	1.1	0.34	432	0004-1L
2470.36	ccp	Sltst : pl y brn to lt gy to drk gy	2.38	9.08	0.76	11.95	5.54	164	14	11.5	0.21	431	0005-1L
2472.94	ccp	Sltst : drk gy to lt gy	2.05	7.27	1.68	4.33	5.31	137	32	9.3	0.22	430	0006-1L
2474.00	ccp	Sh/Clst: drk gy to brn blk	2.12	11.07	1.19	9.30	5.95	186	20	13.2	0.16	434	0007-1L
2476.00	ccp	Coal : blk	2.42	18.38	1.91	9.62	23.83	77	8	20.8	0.12	438	0008-1L
2478.00	ccp	Coal : blk	16.92	91.73	6.15	14.92	59.22	155	10	108.7	0.16	434	0009-1L
2480.00	ccp	Sltst : lt brn gy to brn gy	0.26	1.19	0.73	1.63	1.12	106	65	1.5	0.18	438	0010-1L
2482.17	ccp	Sh/Clst: drk gy to brn blk	2.35	26.24	0.98	26.78	9.17	286	11	28.6	0.08	436	0011-1L

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Table 2 : Rock-Eval table for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2484.00	ccp	Sh/Clst: drk gy to dsk y brn	0.49	2.00	0.48	4.17	3.62	55	13	2.5	0.20	438	0012-1L
2486.39	ccp	Sltst : brn gy	0.55	2.78	0.27	10.30	2.02	138	13	3.3	0.17	438	0013-1L
2488.40	ccp	S/Sst : lt or	0.19	0.35	0.22	1.59	0.12	292	183	0.5	0.35	527	0014-1L
2491.50	ccp	S/Sst : lt or to or gy	0.62	1.91	3.23	0.59	1.34	143	241	2.5	0.25	433	0015-1L
2494.89	ccp	S/Sst : lt or to or gy	0.08	0.39	2.25	0.17	0.13	300	1731	0.5	0.17	482	0016-1L
2496.56	ccp	S/Sst : lt or to pl y brn	0.34	0.81	1.80	0.45	0.32	253	563	1.1	0.30	490	0017-1L
2501.50	ccp	Sltst : lt brn gy	0.62	1.91	3.23	0.59	1.34	143	241	2.5	0.25	433	0022-1L
2504.50	ccp	Sh/Clst: lt brn gy to brn gy	0.06	0.38	0.14	2.71	0.31	123	45	0.4	0.14	444	0018-1L
2507.50	ccp	Coal : blk to brn blk	17.71	75.57	6.85	11.03	60.87	124	11	93.3	0.19	434	0019-1L
2509.39	ccp	Sltst : lt brn gy to lt or	0.48	1.29	0.41	3.15	0.69	187	59	1.8	0.27	433	0020-1L
2512.50	ccp	Sh/Clst: blk to brn blk	0.57	4.08	0.57	7.16	4.68	87	12	4.7	0.12	439	0021-1L
2515.50	ccp	Sh/Clst: brn gy	0.34	1.76	0.27	6.52	3.25	54	8	2.1	0.16	440	0023-1L
2518.50	ccp	Sh/Clst: drk gy to brn gy	1.65	15.91	0.92	17.29	6.98	228	13	17.6	0.09	433	0024-1L
2521.50	ccp	Sh/Clst: brn gy	0.19	0.85	0.22	3.86	0.90	94	24	1.0	0.18	436	0025-1L
2524.50	ccp	Sh/Clst: brn gy	0.51	2.95	0.40	7.38	3.15	94	13	3.5	0.15	437	0026-1L

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2527.50	ccp	Sh/Clst: brn gy	0.07	0.38	0.61	0.62	0.25	152	244	0.4	0.16	407	0027-1L
2530.50	ccp	Sh/Clst: brn gy	0.27	0.96	0.19	5.05	0.73	132	26	1.2	0.22	437	0028-1L
2532.26	ccp	S/Sst : brn gy, lt or	1.71	2.45	1.40	1.75	0.99	247	141	4.2	0.41	413	0029-1L
2535.00	ccp	bulk	22.07	98.30	10.00	9.83	75.52	130	13	120.4	0.18	436	0030-0B
2537.65	ccp	S/Sst : lt or to pl y brn	4.81	3.48	0.44	7.91	1.17	297	38	8.3	0.58	426	0031-1L
2541.00	ccp	Sltst : brn gy	2.32	2.10	2.24	0.94	1.13	186	198	4.4	0.52	426	0034-1L
2544.00	ccp	S/Sst : drk y brn	5.76	2.69	0.74	3.64	0.94	286	79	8.5	0.68	419	0057-1L
2546.40	ccp	S/Sst : lt or to pl y brn	8.20	22.10	0.95	23.26	8.16	271	12	30.3	0.27	421	0032-1L
2548.00	ccp	Sh/Clst: brn gy to lt brn gy	0.93	0.76	0.35	2.17	1.03	74	34	1.7	0.55	434	0035-1L
2551.00	ccp	Sltst : brn gy	0.65	1.55	1.25	1.24	1.41	110	89	2.2	0.30	435	0036-1L
2554.39	ccp	Sltst : brn gy	0.51	0.84	0.27	3.11	0.78	108	35	1.4	0.38	432	0037-1L
2556.10	ccp	S/Sst : or gy to lt y brn	6.05	1.71	0.39	4.38	0.75	228	52	7.8	0.78	414	0038-1L
2560.11	ccp	S/Sst : or gy to lt y brn	5.95	1.59	0.83	1.92	0.79	201	105	7.5	0.79	413	0039-1L
2563.33	ccp	S/Sst : pl y brn	4.84	5.65	0.45	12.56	2.82	200	16	10.5	0.46	422	0040-1L
2566.24	ccp	S/Sst : m y brn to drk y brn	7.57	2.77	0.51	5.43	0.99	280	52	10.3	0.73	402	0041-1L

Table 2 : Rock-Eval table for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2570.00	ccp	S/Sst : lt y brn	7.21	10.50	0.59	17.80	4.44	236	13	17.7	0.41	419	0058-1L
2573.41	ccp	S/Sst : or gy to m y brn	6.25	2.55	0.56	4.55	0.93	274	60	8.8	0.71	409	0042-1L
2576.40	ccp	S/Sst : m y brn to drk y brn	5.67	1.61	0.54	2.98	0.74	218	73	7.3	0.78	410	0043-1L
2585.00	ccp	S/Sst : m y brn to drk y brn	5.46	1.67	0.61	2.74	0.71	235	86	7.1	0.77	406	0045-1L
2588.27	ccp	S/Sst : m y brn to drk y brn	7.04	2.58	0.53	4.87	0.95	272	56	9.6	0.73	402	0046-1L
2591.86	ccp	S/Sst : drk gy	6.64	2.03	0.47	4.32	0.89	228	53	8.7	0.77	389	0047-1L
2594.71	ccp	S/Sst : drk y brn to dsk y brn	7.62	2.57	0.69	3.72	1.01	254	68	10.2	0.75	399	0048-1L
2602.74	ccp	S/Sst : drk y brn to dsk y brn	5.58	1.69	0.68	2.49	0.78	217	87	7.3	0.77	405	0050-1L
2606.03	ccp	S/Sst : drk y brn	8.03	3.04	0.79	3.85	1.15	264	69	11.1	0.73	407	0051-1L
2611.75	ccp	S/Sst : lt y brn	5.25	2.01	0.65	3.09	1.05	191	62	7.3	0.72	415	0052-1L
2616.33	ccp	S/Sst : lt gy to lt y brn	2.26	1.22	0.66	1.85	0.83	147	80	3.5	0.65	418	0053-1L
2620.50	ccp	Sltst : brn gy to dsk y brn	0.51	2.07	0.74	2.80	2.90	71	26	2.6	0.20	428	0054-1L
2622.00	ccp	Sltst : brn gy to dsk y brn	0.61	2.72	0.89	3.06	4.19	65	21	3.3	0.18	430	0055-1L
2624.00	ccp	Sltst : brn gy to dsk y brn	0.30	1.21	0.69	1.75	3.59	34	19	1.5	0.20	427	0056-1L
2720.00	cut	Sh/Clst: brn gy to dsk y brn	0.40	1.00	0.90	1.11	1.18	85	76	1.4	0.29	435	0117-2L

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2780.00	cut	Sltst : brn gy to m gy	0.89	6.26	1.13	5.54	2.30	272	49	7.2	0.12	430	0129-3L
2790.00	cut	Sh/Clst: brn gy to m gy	1.54	9.86	1.41	6.99	3.19	309	44	11.4	0.14	429	0131-3L
2815.00	cut	Ca : gy red	0.15	0.28	3.75	0.07	0.75	37	500	0.4	0.35	445	0136-3L
2825.00	cut	Sltst : brn gy	1.70	5.15	1.73	2.98	2.63	196	66	6.9	0.25	430	0138-2L
2835.00	cut	Sltst : brn gy to m gy	1.09	1.99	1.28	1.55	1.28	155	100	3.1	0.35	433	0140-2L
2845.00	cut	Sltst : brn gy to m gy	1.05	1.77	1.04	1.70	1.34	132	78	2.8	0.37	434	0142-2L
2855.00	cut	Sltst : brn gy to m gy	1.04	1.78	1.13	1.58	1.38	129	82	2.8	0.37	435	0144-2L
2865.00	cut	Sh/Clst: brn gy to m gy	1.30	1.92	1.53	1.25	1.60	120	96	3.2	0.40	433	0146-2L
2875.00	cut	Sh/Clst: brn gy to m gy	1.17	1.92	1.25	1.54	1.48	130	84	3.1	0.38	434	0148-2L
2880.00	cut	S/Sst : w to lt gy	0.72	0.22	5.18	0.04	0.64	34	809	0.9	0.77	385	0149-4L
2895.00	cut	Sltst : brn gy to m gy	1.63	2.61	0.62	4.21	1.68	155	37	4.2	0.38	440	0152-2L
2915.00	cut	Sltst : brn gy to m gy	1.26	2.01	0.60	3.35	1.33	151	45	3.3	0.39	440	0156-2L
2920.00	cut	S/Sst : w to lt gy	0.72	0.61	2.25	0.27	0.82	74	274	1.3	0.54	434	0157-4L
2925.00	cut	Sltst : brn gy to m gy	1.75	2.23	0.65	3.43	1.66	134	39	4.0	0.44	439	0158-2L
2935.00	cut	Sh/Clst: brn gy to m gy	1.24	1.84	0.83	2.22	1.74	106	48	3.1	0.40	439	0160-2L

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
2945.00	cut	Sh/Clst: brn gy to m gy	0.86	1.64	0.83	1.98	1.40	117	59	2.5	0.34	440	0162-2L
2955.00	cut	Sltst : brn gy to m gy	1.11	1.81	0.78	2.32	1.49	121	52	2.9	0.38	439	0164-2L
2965.00	cut	Sh/Clst: brn gy to m gy	1.00	2.00	0.79	2.53	1.11	180	71	3.0	0.33	439	0166-2L
2985.00	cut	Sltst : brn gy to m gy	2.16	2.09	0.58	3.60	1.63	128	36	4.3	0.51	438	0170-2L
3005.00	cut	Sltst : brn gy to m gy	2.46	2.30	0.65	3.54	1.52	151	43	4.8	0.52	438	0174-2L
3020.00	cut	Sltst : brn gy to m gy	2.10	2.32	0.54	4.30	1.36	171	40	4.4	0.48	438	0177-2L
3025.00	cut	S/Sst : w to lt gy	1.07	0.60	3.53	0.17	0.63	95	560	1.7	0.64	390	0178-4L
3030.00	cut	Sltst : brn gy to m gy	1.07	1.25	0.99	1.26	1.28	98	77	2.3	0.46	439	0179-2L
3050.00	cut	S/Sst : w to lt gy	0.26	0.07	0.66	0.11	0.14	50	471	0.3	0.79	393	0182-4L
3090.00	cut	S/Sst : w to lt gy	1.68	0.71	3.32	0.21	0.67	106	496	2.4	0.70	431	0186-4L
3110.00	cut	Sh/Clst: brn gy to m gy	2.63	2.77	0.94	2.95	1.80	154	52	5.4	0.49	437	0187-2L
3140.00	cut	S/Sst : w to lt gy	0.83	0.52	4.03	0.13	0.76	68	530	1.4	0.61	435	0190-4L
3170.00	cut	Coal : blk	4.32	53.91	1.75	30.81	28.25	191	6	58.2	0.07	440	0193-5L
3180.00	cut	Sltst : brn gy to lt gy to m gy	1.20	1.99	0.76	2.62	1.76	113	43	3.2	0.38	439	0194-2L
3197.00	cut	Coal : blk to dsk y brn	6.90	97.18	2.53	38.41	42.42	229	6	104.1	0.07	442	0196-5L

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Table 2 : Rock-Eval table for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
3265.00	cut	S/Sst : w to lt gy	0.22	0.16	0.50	0.32	0.41	39	122	0.4	0.58	442	0200-3L
3325.00	cut	Sh/Clst: brn gy to m gy	2.20	2.98	0.66	4.52	1.78	167	37	5.2	0.42	439	0204-2L
3325.00	cut	S/Sst : w to lt gy	0.15	0.10	0.34	0.29	0.24	42	142	0.3	0.60	445	0204-3L
3355.00	cut	Sh/Clst: brn gy to m gy to dsk y brn	0.34	0.84	0.16	5.25	0.91	92	18	1.2	0.29	438	0206-2L
3400.00	cut	Sh/Clst: brn gy to m gy to drk gy	0.42	0.70	0.11	6.36	0.65	108	17	1.1	0.38	439	0209-2L
3430.00	cut	S/Sst : w to lt gy	0.34	0.06	0.36	0.17	0.18	33	200	0.4	0.85	427	0211-3L
3460.00	cut	Sh/Clst: brn gy to m gy	0.25	0.38	0.21	1.81	0.83	46	25	0.6	0.40	346	0213-2L
3475.00	cut	Sh/Clst: brn gy to m gy	0.40	0.62	0.22	2.82	1.10	56	20	1.0	0.39	387	0214-2L
3475.00	cut	S/Sst : w to lt gy	0.20	0.08	0.09	0.89	0.16	50	56	0.3	0.71	424	0214-3L

Table 3 : Pyrolysis GC Data (S2 peak) as Percentage of Total Area for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	C1	C2-C5	C6-C14	C15+	S2 from Rock-Eval	Sample
2460.00	cut	Coal : blk	6.49	4.49	15.43	73.58	143.39	0066-6L
2462.74	ccp	S/Sst : pl brn	23.33	15.87	30.01	30.80	1.00	0002-1L
2470.36	ccp	Sltst : pl y brn to lt gy to drk gy	13.21	12.69	28.61	45.21	9.08	0005-1L
2472.94	ccp	Sltst : drk gy to lt gy	10.07	18.28	33.15	37.98	7.27	0006-1L
2474.00	ccp	Sh/Clst: drk gy to brn blk	15.38	15.05	33.40	36.17	11.07	0007-1L
2476.00	ccp	Coal : blk	7.97	14.57	30.98	46.50	18.38	0008-1L
2478.00	ccp	Coal : blk	8.27	7.65	22.47	61.61	91.73	0009-1L
2480.00	ccp	Sltst : lt brn gy to brn gy	18.69	31.55	41.71	8.04	1.19	0010-1L
2482.17	ccp	Sh/Clst: drk gy to brn blk	10.41	14.61	29.35	45.30	26.24	0011-1L
2484.00	ccp	Sh/Clst: drk gy to dsk y brn	12.78	25.38	45.05	16.79	2.00	0012-1L
2486.39	ccp	Sltst : brn gy	8.71	18.42	39.00	33.87	2.78	0013-1L
2488.40	ccp	S/Sst : lt or	13.57	21.43	46.23	18.77	0.35	0014-1L
2491.50	ccp	S/Sst : lt or to or gy	6.92	18.23	29.39	45.46	1.91	0015-1L
2496.56	ccp	S/Sst : lt or to pl y brn	3.94	23.73	48.67	23.66	0.81	0017-1L

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Table 3 : Pyrolysis GC Data (S2 peak) as Percentage of Total Area for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	C1	C2-C5	C6-C14	C15+	S2 from Rock-Eval	Sample
2501.50	ccp	Sltst : lt brn gy	11.82	19.32	32.84	36.02	1.91	0022-1L
2504.50	ccp	Sh/Clst: lt brn gy to brn gy	-	-	-	-	0.38	0018-1L
2507.50	ccp	Coal : blk to brn blk	15.22	16.61	24.23	43.94	75.57	0019-1L
2515.50	ccp	Sh/Clst: brn gy	19.38	34.08	40.82	5.73	1.76	0023-1L
2518.50	ccp	Sh/Clst: drk gy to brn gy	5.26	3.67	26.54	64.54	15.91	0024-1L
2527.50	ccp	Sh/Clst: brn gy	-	-	-	-	0.38	0027-1L
2532.26	ccp	S/Sst : brn gy, lt or	2.08	4.49	18.24	75.20	2.45	0029-1L
2535.00	ccp	bulk	15.47	16.12	23.75	44.66	98.30	0030-0B
2541.00	ccp	Sltst : brn gy	9.55	21.82	45.98	22.66	2.10	0034-1L
2544.00	ccp	S/Sst : drk y brn	3.65	11.71	34.22	50.42	2.69	0057-1L
2546.40	ccp	S/Sst : lt or to pl y brn	1.41	4.77	24.88	68.95	22.10	0032-1L
2551.00	ccp	Sltst : brn gy	8.39	16.21	21.61	53.79	1.55	0036-1L
2556.10	ccp	S/Sst : or gy to lt y brn	4.71	13.87	24.42	57.00	1.71	0038-1L
2566.24	ccp	S/Sst : m y brn to drk y brn	4.80	14.47	28.66	52.07	2.77	0041-1L

Table 3 : Pyrolysis GC Data (S2 peak) as Percentage of Total Area for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	C1	C2-C5	C6-C14	C15+	S2 from Rock-Eval	Sample
2576.40	ccp	S/Sst : m y brn to drk y brn	11.97	9.27	23.67	55.10	1.61	0043-1L
2588.27	ccp	S/Sst : m y brn to drk y brn	1.42	10.09	16.46	72.03	2.58	0046-1L
2591.86	ccp	S/Sst : drk gy	4.59	14.44	30.59	50.38	2.03	0047-1L
2602.74	ccp	S/Sst : drk y brn to dsk y brn	2.03	18.90	22.04	57.03	1.69	0050-1L
2611.75	ccp	S/Sst : lt y brn	3.50	13.36	30.69	52.45	2.01	0052-1L
2620.50	ccp	Sltst : brn gy to dsk y brn	11.15	17.60	30.27	40.98	2.07	0054-1L
2780.00	cut	Sltst : brn gy to m gy	4.26	12.80	30.28	52.66	6.26	0129-3L
2790.00	cut	Sh/Clst: brn gy to m gy	3.94	11.64	30.99	53.43	9.86	0131-3L
2825.00	cut	Sltst : brn gy	4.04	13.13	31.45	51.39	5.15	0138-2L
2845.00	cut	Sltst : brn gy to m gy	6.50	19.70	39.16	34.64	1.77	0142-2L
2865.00	cut	Sh/Clst: brn gy to m gy	13.95	23.18	42.55	20.32	1.92	0146-2L
2880.00	cut	S/Sst : w to lt gy	15.99	28.97	43.16	11.87	0.22	0149-4L
2895.00	cut	Sltst : brn gy to m gy	13.17	16.34	39.85	30.64	2.61	0152-2L
2915.00	cut	Sltst : brn gy to m gy	7.20	21.78	41.55	29.47	2.01	0156-2L

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Table 3 : Pyrolysis GC Data (S2 peak) as Percentage of Total Area for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	C1	C2-C5	C6-C14	C15+	S2 from Rock-Eval	Sample
2920.00	cut	S/Sst : w to lt gy	20.14	20.35	46.98	12.53	0.61	0157-4L
2935.00	cut	Sh/Clst: brn gy to m gy	10.15	14.93	42.91	32.01	1.84	0160-2L
2945.00	cut	Sh/Clst: brn gy to m gy	9.47	17.84	42.68	30.01	1.64	0162-2L
2965.00	cut	Sh/Clst: brn gy to m gy	13.24	18.87	40.42	27.47	2.00	0166-2L
2985.00	cut	Sltst : brn gy to m gy	9.05	14.44	34.46	42.05	2.09	0170-2L
3005.00	cut	Sltst : brn gy to m gy	7.82	17.51	38.86	35.80	2.30	0174-2L
3020.00	cut	Sltst : brn gy to m gy	7.97	14.56	38.99	38.48	2.32	0177-2L
3025.00	cut	S/Sst : w to lt gy	11.39	25.02	46.45	17.14	0.60	0178-4L
3050.00	cut	S/Sst : w to lt gy	-	-	-	-	0.07	0182-4L
3090.00	cut	S/Sst : w to lt gy	12.42	15.24	41.53	30.41	0.71	0186-4L
3110.00	cut	Sh/Clst: brn gy to m gy	7.60	19.40	42.84	30.17	2.77	0187-2L
3140.00	cut	S/Sst : w to lt gy	11.72	21.56	44.70	22.02	0.52	0190-4L
3170.00	cut	Coal : blk	9.78	12.78	26.02	51.42	53.91	0193-5L
3180.00	cut	Sltst : brn gy to lt gy to m gy	9.00	18.41	42.38	30.21	1.99	0194-2L

Table 3 : Pyrolysis GC Data (S2 peak) as Percentage of Total Area for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	C1	C2-C5	C6-C14	C15+	S2 from Rock-Eval	Sample
3197.00	cut	Coal : blk to dsk y brn	10.57	13.06	21.51	54.86	97.18	0196-5L
3265.00	cut	S/Sst : w to lt gy	26.37	16.08	35.10	22.45	0.16	0200-3L
3325.00	cut	Sh/Clst: brn gy to m gy	0.73	37.13	48.80	13.34	2.98	0204-2L
3355.00	cut	Sh/Clst: brn gy to m gy to dsk y brn	18.22	17.35	45.03	19.40	0.84	0206-2L
3400.00	cut	Sh/Clst: brn gy to m gy to drk gy	25.77	12.28	50.74	11.21	0.70	0209-2L
3430.00	cut	S/Sst : w to lt gy	-	-	-	-	0.06	0211-3L
3475.00	cut	Sh/Clst: brn gy to m gy	0.64	50.00	42.27	7.08	0.62	0214-2L
3475.00	cut	S/Sst : w to lt gy	7.14	35.41	45.15	12.30	0.08	0214-3L

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Table 4 a: Weight of EOM and Chromatographic Fraction for well NOCS 30/6-9

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
2460.00	cut	Coal : blk	0.8	70.6	12.8	17.5	25.5	14.8	30.3	40.3	62.10	0066-6L
2468.30	com	Composite sample - see table 4 e	14.3	13.6	4.7	3.0	2.9	3.1	7.7	5.9	0.68	0217-0B
2470.36	ccp	Sltst : pl y brn to lt gy to drk gy	9.4	30.7	11.4	8.4	2.0	8.9	19.8	10.9	3.35	0005-1L
2474.00	ccp	Sh/Clst: drk gy to brn blk	7.7	36.3	9.0	13.4	1.6	12.4	22.4	13.9	7.30	0007-1L
2476.00	ccp	Coal : blk	4.0	14.4	3.3	5.7	1.6	3.8	9.0	5.4	20.60	0008-1L
2478.00	ccp	Coal : blk	1.6	91.7	11.9	29.0	17.8	33.1	40.8	50.9	74.10	0009-1L
2482.17	ccp	Sh/Clst: drk gy to brn blk	9.2	24.1	6.8	10.2	1.3	5.9	17.0	7.2	9.50	0011-1L
2484.00	ccp	Sh/Clst: drk gy to dsk y brn	10.5	10.0	1.8	2.7	1.6	3.9	4.5	5.5	3.77	0012-1L
2491.50	ccp	S/Sst : lt or to or gy	9.8	20.2	6.0	5.6	4.1	4.6	11.6	8.7	1.73	0015-1L
2507.50	ccp	Coal : blk to brn blk	8.6	18.6	3.0	7.1	1.8	6.8	10.1	8.6	4.77	0019-1L
2515.50	ccp	Sh/Clst: brn gy	12.0	9.4	1.8	1.5	1.7	4.4	3.3	6.1	1.79	0023-1L
2518.50	ccp	Sh/Clst: drk gy to brn gy	5.6	13.6	3.8	4.3	2.8	2.7	8.1	5.5	6.94	0024-1L
2532.26	ccp	S/Sst : brn gy, lt or	6.5	23.0	11.7	6.2	0.8	4.4	17.9	5.2	1.76	0029-1L

Table 4 a: Weight of EOM and Chromatographic Fraction for well NOCS 30/6-9

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
2535.00	ccp	bulk	5.1	75.1	18.6	22.8	6.6	27.1	41.4	33.7	30.20	0030-0B
2537.65	ccp	S/Sst : lt or to pl y brn	9.6	72.4	38.5	15.8	2.1	16.0	54.3	18.1	1.58	0031-1L
2541.00	ccp	Sltst : brn gy	9.4	33.0	19.4	7.3	0.5	5.8	26.7	6.3	1.02	0034-1L
2544.00	ccp	S/Sst : drk y brn	12.2	151.8	74.3	42.4	3.9	31.2	116.7	35.1	1.65	0057-1L
2560.11	com	Composite sample - see table 4 e	9.4	89.6	40.0	21.5	4.6	23.5	61.5	28.1	0.90	0219-0B
2576.40	ccp	S/Sst : m y brn to drk y brn	9.4	93.7	45.2	26.9	4.0	17.7	72.0	21.7	0.90	0043-1L
2588.27	ccp	S/Sst : m y brn to drk y brn	9.6	108.6	59.1	35.0	2.7	11.8	94.1	14.5	1.02	0046-1L
2602.74	ccp	S/Sst : drk y brn to dsk y brn	10.4	133.4	64.8	41.2	3.7	23.7	106.0	27.4	1.25	0050-1L
2616.33	ccp	S/Sst : lt gy to lt y brn	9.4	45.2	24.0	15.6	1.6	4.0	39.6	5.6	0.90	0053-1L
2780.00	cut	Sltst : brn gy to m gy	1.0	2.3	0.9	0.6	0.5	0.3	1.5	0.8	2.66	0129-3L
2790.00	cut	Sh/Clst: brn gy to m gy	2.7	6.6	3.3	1.8	0.3	1.2	5.1	1.5	2.23	0131-3L
2865.00	cut	Sh/Clst: brn gy to m gy	1.1	2.7	1.6	0.3	0.3	0.5	2.0	0.8	1.48	0146-2L
2895.00	cut	Sltst : brn gy to m gy	0.9	2.6	0.9	0.2	0.6	1.0	1.0	1.5	1.57	0152-2L
2965.00	cut	Sh/Clst: brn gy to m gy	1.8	5.6	1.8	0.6	0.4	2.8	2.4	3.2	1.40	0166-2L

Table 4 a: Weight of EOM and Chromatographic Fraction for well NOCS 30/6-9

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
3020.00	cut	Sltst : brn gy to m gy	1.7	6.6	3.9	1.2	0.5	1.0	5.1	1.5	1.57	0177-2L
3090.00	cut	S/Sst : w to lt gy	2.8	4.5	2.5	0.4	0.5	1.0	3.0	1.5	0.35	0186-4L
3170.00	cut	Coal : blk	1.8	31.6	2.5	4.9	21.4	2.7	7.5	24.1	26.10	0193-5L
3325.00	cut	Sh/Clst: brn gy to m gy	2.0	6.2	0.2	0.8	0.5	4.8	0.9	5.3	1.51	0204-2L
3430.00	cut	S/Sst : w to lt gy	2.4	1.0	0.6	0.2	0.2	0.1	0.8	0.2	0.24	0211-3L
3475.00	cut	Sh/Clst: brn gy to m gy	2.8	6.2	2.8	0.8	0.7	1.9	3.6	2.6	1.06	0214-2L

Table 4 b: Concentration of EOM and Chromatographic Fraction (wt ppm rock) for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	EOM	Sat	Aro	Asph	NSO	HC	Non-HC	Sample
2460.00	cut	Coal : blk	86097	15548	21402	31097	18048	36951	49146	0066-6L
2468.30	com	Composite sample - see table 4 e	953	326	210	203	213	536	417	0217-0B
2470.36	ccp	Sltst : pl y brn to lt gy to drk gy	3283	1219	898	213	951	2117	1165	0005-1L
2474.00	ccp	Sh/Clst: drk gy to brn blk	4745	1176	1745	209	1614	2921	1823	0007-1L
2476.00	ccp	Coal : blk	3591	822	1421	399	947	2244	1346	0008-1L
2478.00	ccp	Coal : blk	56257	7269	17760	10920	20306	25030	31226	0009-1L
2482.17	ccp	Sh/Clst: drk gy to brn blk	2608	730	1103	140	633	1834	773	0011-1L
2484.00	ccp	Sh/Clst: drk gy to dsk y brn	954	171	257	152	372	429	524	0012-1L
2491.50	ccp	S/Sst : lt or to or gy	2061	612	566	418	464	1178	882	0015-1L
2507.50	ccp	Coal : blk to brn blk	2170	350	822	210	787	1172	997	0019-1L
2515.50	ccp	Sh/Clst: brn gy	785	150	125	142	367	275	509	0023-1L
2518.50	ccp	Sh/Clst: drk gy to brn gy	2446	674	782	503	485	1456	989	0024-1L
2532.26	ccp	S/Sst : brn gy, lt or	3533	1797	944	122	668	2741	791	0029-1L

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Table 4 b: Concentration of EOM and Chromatographic Fraction (wt ppm rock) for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	EOM	Sat	Aro	Asph	NSO	HC	Non-HC	Sample
2535.00	ccp	bulk	14871	3683	4514	1306	5366	8198	6673	0030-0B
2537.65	ccp	S/Sst : lt or to pl y brn	7525	4007	1637	218	1663	5644	1881	0031-1L
2541.00	ccp	Sltst : brn gy	3492	2047	777	52	613	2825	666	0034-1L
2544.00	ccp	S/Sst : drk y brn	12422	6080	3471	319	2551	9551	2870	0057-1L
2560.11	com	Composite sample - see table 4 e	9491	4242	2272	487	2489	6514	2976	0219-0B
2576.40	ccp	S/Sst : m y brn to drk y brn	9936	4787	2847	424	1876	7635	2301	0043-1L
2588.27	ccp	S/Sst : m y brn to drk y brn	11288	6140	3641	280	1226	9781	1507	0046-1L
2602.74	ccp	S/Sst : drk y brn to dsk y brn	12864	6244	3976	356	2285	10221	2642	0050-1L
2616.33	ccp	S/Sst : lt gy to lt y brn	4834	2566	1668	171	427	4235	598	0053-1L
2780.00	cut	Sltst : brn gy to m gy	2395	937	625	520	312	1562	833	0129-3L
2790.00	cut	Sh/Clst: brn gy to m gy	2417	1208	659	109	439	1868	549	0131-3L
2865.00	cut	Sh/Clst: brn gy to m gy	2523	1542	280	280	420	1822	700	0146-2L
2895.00	cut	Sltst : brn gy to m gy	2826	978	163	652	1032	1141	1684	0152-2L
2965.00	cut	Sh/Clst: brn gy to m gy	3181	1022	340	227	1590	1363	1818	0166-2L

Table 4 b: Concentration of EOM and Chromatographic Fraction (wt ppm rock) for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	EOM	Sat	Aro	Asph	NSO	HC	Non-HC	Sample
3020.00	cut	Sltst : brn gy to m gy	3815	2254	693	289	578	2947	867	0177-2L
3090.00	cut	S/Sst : w to lt gy	1624	920	162	180	361	1083	541	0186-4L
3170.00	cut	Coal : blk	17267	1393	2704	11693	1475	4098	13169	0193-5L
3325.00	cut	Sh/Clst: brn gy to m gy	3147	76	380	253	2436	456	2690	0204-2L
3430.00	cut	S/Sst : w to lt gy	414	248	62	82	20	311	103	0211-3L
3475.00	cut	Sh/Clst: brn gy to m gy	2214	1017	267	250	678	1285	928	0214-2L

Table 4 c: Concentration of EOM and Chromatographic Fraction (mg/g TOC(e)) for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	EOM	Sat	Aro	Asph	NSO	HC	Non-HC	Sample
2460.00	cut	Coal : blk	138.64	25.04	34.46	50.08	29.06	59.50	79.14	0066-6L
2468.30	com	Composite sample - see table 4 e	140.25	47.95	30.94	29.91	31.45	78.89	61.36	0217-0B
2470.36	ccp	Sltst : pl y brn to lt gy to drk gy	98.01	36.40	26.82	6.39	28.41	63.21	34.80	0005-1L
2474.00	ccp	Sh/Clst: drk gy to brn blk	65.00	16.12	23.91	2.87	22.11	40.02	24.98	0007-1L
2476.00	ccp	Coal : blk	17.43	3.99	6.90	1.94	4.60	10.90	6.54	0008-1L
2478.00	ccp	Coal : blk	75.92	9.81	23.97	14.74	27.40	33.78	42.14	0009-1L
2482.17	ccp	Sh/Clst: drk gy to brn blk	27.46	7.69	11.62	1.48	6.66	19.31	8.15	0011-1L
2484.00	ccp	Sh/Clst: drk gy to dsk y brn	25.31	4.56	6.83	4.05	9.87	11.39	13.92	0012-1L
2491.50	ccp	S/Sst : lt or to or gy	119.15	35.39	32.74	24.18	26.84	68.13	51.02	0015-1L
2507.50	ccp	Coal : blk to brn blk	45.50	7.34	17.25	4.40	16.51	24.58	20.92	0019-1L
2515.50	ccp	Sh/Clst: brn gy	43.87	8.40	7.00	7.93	20.54	15.40	28.47	0023-1L
2518.50	ccp	Sh/Clst: drk gy to brn gy	35.25	9.72	11.27	7.26	7.00	20.99	14.25	0024-1L
2532.26	ccp	S/Sst : brn gy, lt or	200.74	102.12	53.68	6.98	37.97	155.79	44.95	0029-1L

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Table 4 c: Concentration of EOM and Chromatographic Fraction (mg/g TOC(e)) for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	EOM	Sat	Aro	Asph	NSO	HC	Non-HC	Sample
2535.00	ccp	bulk	49.24	12.20	14.95	4.33	17.77	27.15	22.10	0030-0B
2537.65	ccp	S/Sst : lt or to pl y brn	476.33	253.63	103.62	13.82	105.27	357.25	119.08	0031-1L
2541.00	ccp	Sltst : brn gy	342.36	200.75	76.25	5.19	60.17	277.00	65.36	0034-1L
2544.00	ccp	S/Sst : drk y brn	752.86	368.50	210.39	19.34	154.64	578.88	173.98	0057-1L
2560.11	com	Composite sample - see table 4 e	1054.61	471.40	252.47	54.14	276.60	723.87	330.74	0219-0B
2576.40	ccp	S/Sst : m y brn to drk y brn	1104.04	531.99	316.37	47.13	208.55	848.36	255.69	0043-1L
2588.27	ccp	S/Sst : m y brn to drk y brn	1106.76	601.99	357.00	27.52	120.26	958.99	147.77	0046-1L
2602.74	ccp	S/Sst : drk y brn to dsk y brn	1029.12	499.60	318.15	28.54	182.84	817.74	211.38	0050-1L
2616.33	ccp	S/Sst : lt gy to lt y brn	537.14	285.20	185.38	19.01	47.53	470.59	66.55	0053-1L
2780.00	cut	Sltst : brn gy to m gy	90.07	35.24	23.50	19.58	11.75	58.74	31.33	0129-3L
2790.00	cut	Sh/Clst: brn gy to m gy	108.41	54.21	29.57	4.93	19.71	83.77	24.64	0131-3L
2865.00	cut	Sh/Clst: brn gy to m gy	170.50	104.19	18.94	18.94	28.42	123.14	47.36	0146-2L
2895.00	cut	Sltst : brn gy to m gy	180.01	62.31	10.38	41.54	65.77	72.69	107.31	0152-2L
2965.00	cut	Sh/Clst: brn gy to m gy	227.27	73.05	24.35	16.23	113.64	97.40	129.87	0166-2L

Table 4 c: Concentration of EOM and Chromatographic Fraction (mg/g TOC(e)) for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	EOM	Sat	Aro	Asph	NSO	HC	Non-HC	Sample
3020.00	cut	Sltst : brn gy to m gy	243.00	143.59	44.18	18.41	36.82	187.77	55.23	0177-2L
3090.00	cut	S/Sst : w to lt gy	464.16	263.02	46.42	51.57	103.15	309.44	154.72	0186-4L
3170.00	cut	Coal : blk	66.16	5.34	10.36	44.80	5.65	15.70	50.46	0193-5L
3325.00	cut	Sh/Clst: brn gy to m gy	208.42	5.04	25.21	16.81	161.36	30.26	178.17	0204-2L
3430.00	cut	S/Sst : w to lt gy	172.89	103.73	25.93	34.58	8.64	129.67	43.22	0211-3L
3475.00	cut	Sh/Clst: brn gy to m gy	208.89	96.02	25.27	23.58	64.02	121.29	87.60	0214-2L

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Table 4 d: Composition of material extracted from the rock (%) for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	Sat / EOM	Aro / EOM	Asph / EOM	NSO / EOM	HC / EOM	Non-HC / EOM	Sat / Aro	HC / Non-HC	Sample
2460.00	cut	Coal : blk	18.06	24.86	36.12	20.96	42.92	57.08	72.65	75.19	0066-6L
2468.30	com	Composite sample - see table 4 e	34.19	22.06	21.32	22.43	56.25	43.75	155.00	128.57	0217-0B
2470.36	ccp	Sltst : pl y brn to lt gy to drk gy	37.13	27.36	6.51	28.99	64.50	35.50	135.71	181.65	0005-1L
2474.00	ccp	Sh/Clst: drk gy to brn blk	24.79	36.78	4.41	34.02	61.57	38.43	67.42	160.22	0007-1L
2476.00	ccp	Coal : blk	22.92	39.58	11.11	26.39	62.50	37.50	57.89	166.67	0008-1L
2478.00	ccp	Coal : blk	12.92	31.57	19.41	36.10	44.49	55.51	40.93	80.16	0009-1L
2482.17	ccp	Sh/Clst: drk gy to brn blk	28.01	42.32	5.39	24.27	70.33	29.67	66.18	237.06	0011-1L
2484.00	ccp	Sh/Clst: drk gy to dsk y brn	18.00	27.00	16.00	39.00	45.00	55.00	66.67	81.82	0012-1L
2491.50	ccp	S/Sst : lt or to or gy	29.70	27.48	20.30	22.52	57.18	42.82	108.11	133.53	0015-1L
2507.50	ccp	Coal : blk to brn blk	16.13	37.90	9.68	36.29	54.03	45.97	42.55	117.54	0019-1L
2515.50	ccp	Sh/Clst: brn gy	19.15	15.96	18.09	46.81	35.11	64.89	120.00	54.10	0023-1L
2518.50	ccp	Sh/Clst: drk gy to brn gy	27.57	31.99	20.59	19.85	59.56	40.44	86.21	147.27	0024-1L
2532.26	ccp	S/Sst : brn gy, lt or	50.87	26.74	3.48	18.91	77.61	22.39	190.24	346.60	0029-1L

Table 4 d: Composition of material extracted from the rock (%) for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	Sat / EOM	Aro / EOM	Asph / EOM	NSO / EOM	HC / EOM	Non-HC / EOM	Sat / Aro	HC / Non-HC	Sample
2535.00	ccp	bulk	24.77	30.36	8.79	36.09	55.13	44.87	81.58	122.85	0030-0B
2537.65	ccp	S/Sst : lt or to pl y brn	53.25	21.75	2.90	22.10	75.00	25.00	244.76	300.00	0031-1L
2541.00	ccp	Sltst : brn gy	58.64	22.27	1.52	17.58	80.91	19.09	263.27	423.81	0034-1L
2544.00	ccp	S/Sst : drk y brn	48.95	27.94	2.57	20.54	76.89	23.11	175.15	332.73	0057-1L
2560.11	com	Composite sample - see table 4 e	44.70	23.94	5.13	26.23	68.64	31.36	186.71	218.86	0219-0B
2576.40	ccp	S/Sst : m y brn to drk y brn	48.19	28.66	4.27	18.89	76.84	23.16	168.16	331.80	0043-1L
2588.27	ccp	S/Sst : m y brn to drk y brn	54.39	32.26	2.49	10.87	86.65	13.35	168.63	648.97	0046-1L
2602.74	ccp	S/Sst : drk y brn to dsk y brn	48.55	30.91	2.77	17.77	79.46	20.54	157.03	386.86	0050-1L
2616.33	ccp	S/Sst : lt gy to lt y brn	53.10	34.51	3.54	8.85	87.61	12.39	153.85	707.14	0053-1L
2780.00	cut	Sltst : brn gy to m gy	39.13	26.09	21.74	13.04	65.22	34.78	150.00	187.50	0129-3L
2790.00	cut	Sh/Clst: brn gy to m gy	50.00	27.27	4.55	18.18	77.27	22.73	183.33	340.00	0131-3L
2865.00	cut	Sh/Clst: brn gy to m gy	61.11	11.11	11.11	16.67	72.22	27.78	550.00	260.00	0146-2L
2895.00	cut	Sltst : brn gy to m gy	34.62	5.77	23.08	36.54	40.38	59.62	600.00	67.74	0152-2L
2965.00	cut	Sh/Clst: brn gy to m gy	32.14	10.71	7.14	50.00	42.86	57.14	300.00	75.00	0166-2L

Table 4 e: List of composite samples appearing in the extraction tables for well NOCS 30/6-9

Depth unit of measure: m

NOTE: Depths shown in tables 4 a to d correspond to the composite samples' lower depth.

Upper depth	Lower depth	Typ	Sample	Depth	Typ	Lithology	Sample
2462.74	2468.30	com	0217-0B is composed of:	2462.74	ccp	S/Sst : pl brn, cem	0002-1L
				2468.30	ccp	S/Sst : pl y brn, f, cem, lam	0004-1L
2556.10	2560.11	com	0219-0B is composed of:	2556.10	ccp	S/Sst : or gy to lt y brn, crs, cem	0038-1L
				2560.11	ccp	S/Sst : or gy to lt y brn, crs, cem, l	0039-1L

Table 5 : Saturated Hydrocarbon Ratios for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	Pristane / nC17	Pristane / Phytane	Pristane + Phytane / nC17 + nC18	Phytane / nC18	CPI	Sample
2460.00	cut	Coal : blk	0.52	1.40	0.47	0.42	1.18	0066-6L
2468.30	com	bulk	0.55	1.96	0.47	0.37	1.15	0217-0B
2470.36	ccp	Sltst : pl y brn to lt gy to drk gy	0.52	1.81	0.45	0.36	0.98	0005-1L
2474.00	ccp	Sh/Clst: drk gy to brn blk	0.53	2.03	0.47	0.37	0.86	0007-1L
2476.00	ccp	Coal : blk	1.41	6.36	0.88	0.26	1.63	0008-1L
2478.00	ccp	Coal : blk	0.40	1.88	0.34	0.28	0.93	0009-1L
2482.17	ccp	Sh/Clst: drk gy to brn blk	0.50	2.41	0.41	0.28	1.11	0011-1L
2484.00	ccp	Sh/Clst: drk gy to dsk y brn	0.52	2.12	0.44	0.33	1.45	0012-1L
2491.50	ccp	S/Sst : lt or to or gy	0.49	2.01	0.43	0.35	0.99	0015-1L
2507.50	ccp	Coal : blk to brn blk	1.28	5.27	0.78	0.25	1.79	0019-1L
2515.50	ccp	Sh/Clst: brn gy	0.85	3.12	0.66	0.38	1.67	0023-1L
2518.50	ccp	Sh/Clst: drk gy to brn gy	1.25	3.63	0.81	0.36	1.65	0024-1L
2532.26	ccp	S/Sst : brn gy, lt or	0.55	1.59	0.48	0.40	1.10	0029-1L

Table 5 : Saturated Hydrocarbon Ratios for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	Pristane / nC17	Pristane / Phytane	Pristane + Phytane / nC17 + nC18	Phytane / nC18	CPI	Sample
2535.00	ccp	bulk	0.86	3.44	0.63	0.33	1.36	0030-0B
2537.65	ccp	S/Sst : lt or to pl y brn	0.52	1.20	0.45	0.38	1.08	0031-1L
2541.00	ccp	Sltst : brn gy	0.67	1.90	0.59	0.48	1.13	0034-1L
2544.00	ccp	S/Sst : drk y brn	0.53	1.48	0.46	0.39	1.11	0057-1L
2560.11	com	bulk	0.54	1.24	0.48	0.42	0.99	0219-0B
2576.40	ccp	S/Sst : m y brn to drk y brn	0.56	1.36	0.49	0.42	1.06	0043-1L
2588.27	ccp	S/Sst : m y brn to drk y brn	0.54	1.36	0.47	0.40	1.07	0046-1L
2602.74	ccp	S/Sst : drk y brn to dsk y brn	0.51	1.30	0.45	0.39	1.06	0050-1L
2616.33	ccp	S/Sst : lt gy to lt y brn	0.50	1.27	0.44	0.38	1.10	0053-1L
2780.00	cut	Sltst : brn gy to m gy	0.48	1.57	0.41	0.33	1.26	0129-3L
2790.00	cut	Sh/Clst: brn gy to m gy	0.54	1.32	0.49	0.44	1.26	0131-3L
2865.00	cut	Sh/Clst: brn gy to m gy	0.57	1.42	0.53	0.47	1.13	0146-2L
2895.00	cut	Sltst : brn gy to m gy	0.53	1.24	0.50	0.46	1.48	0152-2L
2965.00	cut	Sh/Clst: brn gy to m gy	0.50	1.34	0.46	0.42	1.25	0166-2L

Table 5 : Saturated Hydrocarbon Ratios for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	Pristane / nC17	Pristane / Phytane	Pristane + Phytane / nC17 + nC18	Phytane / nC18	CPI	Sample
3020.00	cut	Sltst : brn gy to m gy	0.52	1.38	0.48	0.44	1.18	0177-2L
3090.00	cut	S/Sst : w to lt gy	0.62	1.29	0.55	0.48	1.12	0186-4L
3170.00	cut	Coal : blk	0.73	2.85	0.49	0.25	1.23	0193-5L
3325.00	cut	Sh/Clst: brn gy to m gy	0.49	1.16	0.45	0.42	1.19	0204-2L
3430.00	cut	S/Sst : w to lt gy	0.55	1.05	0.51	0.47	1.06	0211-3L
3475.00	cut	Sh/Clst: brn gy to m gy	0.67	1.13	0.65	0.62	1.21	0214-2L

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Table 6 : Aromatic Hydrocarbon Ratios for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	MNR	DMNR	BPhR	2/1MP	MPI1	MPI2	Rc	DBT/P	4/1MDBT	(3+2) /1MDBT	Sample
2460.00	cut	Coal : blk	1.10	1.96	0.32	0.93	0.66	0.77	0.80	0.26	6.99	0.72	0066-6L
2468.30	com	bulk	0.39	1.33	0.14	0.89	0.60	0.69	0.76	0.26	5.93	0.87	0217-0B
2470.36	ccp	Sltst : pl y brn to lt gy to drk gy	1.09	1.98	0.32	0.91	0.66	0.76	0.80	0.29	7.60	0.90	0005-1L
2474.00	ccp	Sh/Clst: drk gy to brn blk	1.17	2.11	0.36	0.91	0.67	0.78	0.80	0.29	5.63	0.73	0007-1L
2476.00	ccp	Coal : blk	1.03	2.03	0.41	0.85	0.61	0.70	0.77	0.29	4.59	0.70	0008-1L
2478.00	ccp	Coal : blk	1.12	2.13	0.40	0.87	0.64	0.74	0.78	0.23	6.11	0.61	0009-1L
2482.17	ccp	Sh/Clst: drk gy to brn blk	1.15	1.87	0.42	0.70	0.57	0.62	0.74	0.22	5.49	0.71	0011-1L
2484.00	ccp	Sh/Clst: drk gy to dsk y brn	0.64	1.89	0.26	0.90	0.67	0.79	0.80	0.27	7.88	0.95	0012-1L
2491.50	ccp	S/Sst : lt or to or gy	1.13	1.99	0.34	0.89	0.64	0.75	0.78	0.24	9.49	1.02	0015-1L
2507.50	ccp	Coal : blk to brn blk	0.68	1.76	0.26	0.84	0.66	0.77	0.80	0.21	9.15	0.80	0019-1L
2515.50	ccp	Sh/Clst: brn gy	0.41	1.22	0.17	0.65	0.43	0.44	0.66	0.20	3.67	0.45	0023-1L
2518.50	ccp	Sh/Clst: drk gy to brn gy	0.94	1.41	0.55	0.67	0.36	0.37	0.62	0.16	1.90	0.56	0024-1L
2532.26	ccp	S/Sst : brn gy, lt or	1.14	1.89	0.33	0.98	0.70	0.79	0.82	0.37	7.67	0.77	0029-1L
2535.00	ccp	bulk	1.07	2.07	0.46	0.87	0.64	0.75	0.78	0.21	8.16	0.71	0030-0B

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Table 6 : Aromatic Hydrocarbon Ratios for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	MNR	DMNR	BPhR	2/1MP	MPI1	MPI2	Rc	DBT/P	4/1MDBT	(3+2) /1MDBT	Sample
2537.65	ccp	S/Sst : lt or to pl y brn	1.14	1.93	0.35	1.03	0.81	0.90	0.89	0.49	6.01	0.98	0031-1L
2541.00	ccp	Sltst : brn gy	0.97	1.36	0.20	1.14	0.76	0.85	0.86	0.58	8.96	0.89	0034-1L
2544.00	ccp	S/Sst : drk y brn	0.86	1.61	0.24	1.05	0.80	0.89	0.88	0.54	3.63	0.74	0057-1L
2560.11	com	bulk	-	-	-	1.03	0.97	1.02	0.98	0.79	2.98	0.61	0219-0B
2576.40	ccp	S/Sst : m y brn to drk y brn	-	-	-	1.07	0.94	1.03	0.96	0.79	2.25	0.78	0043-1L
2588.27	ccp	S/Sst : m y brn to drk y brn	-	-	-	1.09	0.98	1.07	0.99	0.84	2.45	-	0046-1L
2602.74	ccp	S/Sst : drk y brn to dsk y brn	-	-	-	1.05	0.87	0.98	0.92	0.69	2.52	-	0050-1L
2616.33	ccp	S/Sst : lt gy to lt y brn	0.48	1.45	0.11	0.97	0.69	0.81	0.81	0.37	2.18	-	0053-1L
2780.00	cut	Sltst : brn gy to m gy	-	-	-	1.11	0.83	0.86	0.90	-	-	-	0129-3L
2790.00	cut	Sh/Clst: brn gy to m gy	-	0.60	0.02	1.27	0.84	0.93	0.90	0.39	8.00	0.78	0131-3L
2865.00	cut	Sh/Clst: brn gy to m gy	-	-	-	1.42	0.93	1.10	0.96	0.43	-	-	0146-2L
2895.00	cut	Sltst : brn gy to m gy	-	-	-	1.30	0.99	1.12	0.99	0.37	9.97	-	0152-2L
2965.00	cut	Sh/Clst: brn gy to m gy	-	-	-	1.25	0.94	1.05	0.96	0.46	10.43	0.91	0166-2L
3020.00	cut	Sltst : brn gy to m gy	-	0.32	-	1.33	0.95	1.08	0.97	0.52	10.40	-	0177-2L
3090.00	cut	S/Sst : w to lt gy	-	-	-	1.26	1.03	1.16	1.02	-	-	-	0186-4L

Table 6 : Aromatic Hydrocarbon Ratios for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	MNR	DMNR	BPhR	2/1MP	MPI1	MPI2	Rc	DBT/P	4/1MDBT	(3+2) /1MDBT	Sample
3170.00	cut	Coal : blk	0.87	1.31	0.22	1.17	0.65	0.75	0.79	0.24	6.46	1.80	0193-5L
3325.00	cut	Sh/Clst: brn gy to m gy	-	-	-	1.36	1.18	1.31	1.11	-	-	-	0204-2L
3430.00	cut	S/Sst : w to lt gy	-	-	-	1.17	1.06	1.15	1.04	-	-	-	0211-3L
3475.00	cut	Sh/Clst: brn gy to m gy	-	-	-	1.24	1.00	1.09	1.00	0.64	13.47	1.08	0214-2L

Depth unit of measure: m

Depth	Typ	Lithology	Vitrinite Reflectance (%)	Number of Readings	Standard Deviation	Spore Fluorescence Colour	SCI	Tmax (°C)	Sample
2410.00	cut	bulk	0.51	10	0.05	4-5	-	-	0059-0B
2410.00	cut	Sh/Clst: m gy	-	-	-	-	4.5 (?)	412	0059-2L
2450.00	com	bulk	-	-	-	-	4.5 (?)	379	0215-0B
2470.36	ccp	Sltst : pl y brn to lt gy to drk gy	-	-	-	-	5.0-5.5	431	0005-1L
2476.00	ccp	bulk	0.53	13	0.05	5	-	-	0008-0B
2476.00	ccp	Coal : blk	-	-	-	-	5.0	438	0008-1L
2484.00	ccp	bulk	NDP	-	-	5 (?)	-	-	0012-0B
2501.50	ccp	Sltst : lt brn gy	-	-	-	-	5.0	433	0022-1L
2525.00	cut	bulk	0.54	41	0.05	5	-	-	0078-0B
2535.00	ccp	bulk	0.54	35	0.06	5	-	436	0030-0B
2551.00	ccp	Sltst : brn gy	-	-	-	-	5.5	435	0036-1L
2597.77	ccp	bulk	NDP	-	-	NDP	-	-	0049-0B
2624.00	ccp	bulk	0.50	14	0.04	5	-	-	0056-0B

Table 7 : Thermal Maturity Data for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	Vitrinite Reflectance (%)	Number of Readings	Standard Deviation	Spore Fluorescence Colour	SCI	Tmax (°C)	Sample
2780.00	cut	Sltst : brn gy to m gy	-	-	-	-	5.0-5.5	430	0129-3L
2785.00	cut	bulk	0.53	5	0.04	5	-	-	0130-0B
2830.00	cut	bulk	0.52	14	0.04	5	-	-	0139-0B
2835.00	cut	Sltst : brn gy to m gy	-	-	-	-	5.5	433	0140-2L
2860.00	cut	bulk	0.52	12	0.06	5	-	-	0145-0B
2895.00	cut	Sltst : brn gy to m gy	-	-	-	-	6.0	440	0152-2L
2900.00	cut	bulk	0.50	19	0.04	5	-	-	0153-0B
2950.00	cut	bulk	0.55	13	0.05	5	-	-	0163-0B
2965.00	cut	Sh/Clst: brn gy to m gy	-	-	-	-	5.5-6.0	439	0166-2L
2985.00	cut	bulk	0.57	15	0.04	5.5	-	-	0170-0B
3030.00	cut	Sltst : brn gy to m gy	-	-	-	-	5.5	439	0179-2L
3110.00	cut	bulk	0.51	14	0.04	5	-	-	0187-0B
3110.00	cut	Sh/Clst: brn gy to m gy	-	-	-	-	5.5	437	0187-2L
3170.00	cut	bulk	0.56	26	0.04	5-6	-	-	0193-0B

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Depth unit of measure: m

Depth	Typ	Lithology	Vitrinite Reflectance (%)	Number of Readings	Standard Deviation	Spore Fluorescence Colour	SCI	Tmax (°C)	Sample
3170.00	cut	Coal : blk	-	-	-	-	5.5-6.0	440	0193-5L
3197.00	cut	bulk	0.58	37	0.05	5-6	-	-	0196-0B
3325.00	cut	bulk	NDP	-	-	5	-	-	0204-0B
3325.00	cut	Sh/Clst: brn gy to m gy	-	-	-	-	5.5-6.0 (?)	439	0204-2L
3400.00	cut	bulk	0.54	23	0.07	5	-	-	0209-0B
3400.00	cut	Sh/Clst: brn gy to m gy to drk gy	-	-	-	-	5.5-6.0	439	0209-2L

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Table 8 : Visual Kerogen Composition Data for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	LIPT %	Amor L	Lipt Det	Sp/Pol	Cuticl	Resin	Algae	Dinofl	Acrit	Bit L	INERT %	Fusin	SemFus	IntDet	Micrin	Sclero	Bit I	VITR %	Telin	Collin	VitDet	Amor V	Bit V	Sample
2410.00	cut	Sh/Clst: m gy	10		**	*			*				10		*	*				80	*		**	*		0059-2L
2450.00	com	bulk	10		**	*			*	*			10			*				80	*		**	*		0215-0B
2470.36	ccp	Sltst : pl y brn to lt gy to drk gy	20	*	*	**			**			?	5	*	*					75	**	*		*		0005-1L
2476.00	ccp	Coal : blk	30		**	**			*				5		*	*				65	**	*	**	*		0008-1L
2501.50	ccp	Sltst : lt brn gy	25		*	**			*	*			5			*				70	**	*		*		0022-1L
2551.00	ccp	Sltst : brn gy	15	*	*	*	*		**	*			5	*	**					80	**	*		*		0036-1L
2780.00	cut	Sltst : brn gy to m gy	85	**		*			**	*			TR	*	*					15	*			*		0129-3L
2835.00	cut	Sltst : brn gy to m gy	40	*	**	*	*		*	*			TR		*					60	*		**	*		0140-2L
2895.00	cut	Sltst : brn gy to m gy	30		**	*	*		**	*			5	*	*	*				65	*		**	*		0152-2L
2965.00	cut	Sh/Clst: brn gy to m gy	25		**	*	*		**				TR	*	*	*				75	*		**	*		0166-2L
3030.00	cut	Sltst : brn gy to m gy	35		**	**			*	*			5	*	*					60	**		*			0179-2L
3110.00	cut	Sh/Clst: brn gy to m gy	30		**	*	*		*	*		*	TR			*				70	*		**	*		0187-2L

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Table 8 : Visual Kerogen Composition Data for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	LIPT %	Amor L	LipDet	Sp/Pol	Cuticl	Resin	Algae	Dinofl	Acrit	Bit L	INERT %	Fusin	SemFus	IntDet	Micrin	Sclero	Bit I	VITR %	Telin	Collin	VitDet	Amor V	Bit V	Sample
3170.00	cut	Coal : blk	10			**	*		*				5		*	*				85	**	*	*	**		0193-5L
3325.00	cut	Sh/Clst: brn gy to m gy	25			*			**	**			TR			*				75	*		**	*		0204-2L
3400.00	cut	Sh/Clst: brn gy to m gy to drk gy	50	*	**	*	*		**	*			5	*	*					45	*		**			0209-2L

Table 9A: Tabulation of carbon isotope data for EOM/EOM - fractions or Oils for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	EOM/Oil	Saturated	Aromatic	NSO	Asphaltenes	Kerogen	Sample
2468.30	com	Composite sample	-	-28.00	-26.53	-27.62	-26.04	-	0217-0B
2527.50	ccp		-	-29.49	-26.95	-27.97	-25.89	-	0027-1L
2544.00	ccp		-	-29.21	-27.91	-28.16	-27.16	-	0057-1L
2576.40	ccp		-	-29.30	-28.00	-28.34	-28.12	-	0043-1L
2602.74	ccp		-	-29.07	-28.29	-28.24	-27.93	-	0050-1L
2616.33	ccp		-	-28.95	-27.96	-28.13	-27.45	-	0053-1L
3090.00	cut		-	-29.41	-26.43	-28.26	-	-	0186-4L

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Table 9B : Tabulation of cv values from carbon isotope data for well NOCS 30/6-9

Depth unit of measure: m

Depth	Typ	Lithology	Saturated	Aromatic	cv value	Interpretation	Sample
2468.30	com	Composite sample	-28.00	-26.53	0.29	Marine	0217-0B
2527.50	ccp		-29.49	-26.95	3.13	Terrigenous	0027-1L
2544.00	ccp		-29.21	-27.91	0.29	Marine	0057-1L
2576.40	ccp		-29.30	-28.00	0.32	Marine	0043-1L
2602.74	ccp		-29.07	-28.29	-0.91	Marine	0050-1L
2616.33	ccp		-28.95	-27.96	-0.48	Marine	0053-1L
3090.00	cut		-29.41	-26.43	4.08	Terrigenous	0186-4L

Table 10A: Variation in Triterpane Distribution for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Lithology	B/A	B/B+A	B / B+E+F	C/E	C/C+E	X/E	Z/E	Z/C	Z/Z+E	Q/E	E/E+F	C+D / C+D+E+F	D+F/C+E	J1 / J1+J2%	Sample
2468.30	S/Sst	1.74	0.64	0.19	0.52	0.34	0.08	0.21	0.41	0.18	0.08	0.87	0.37	0.20	57.28	0217-0
2532.26	S/Sst	0.87	0.46	0.13	0.39	0.28	0.09	0.28	0.73	0.22	0.14	0.89	0.31	0.17	59.09	0029-1
2544.00	S/Sst	0.78	0.44	0.12	0.45	0.31	0.09	0.28	0.63	0.22	0.08	0.91	0.33	0.14	59.65	0057-1
2576.40	S/Sst	0.86	0.46	0.13	0.46	0.32	0.10	0.26	0.57	0.21	0.09	0.90	0.34	0.15	57.89	0043-1
2602.74	S/Sst	0.79	0.44	0.11	0.41	0.29	0.09	0.25	0.61	0.20	0.08	0.91	0.32	0.14	60.95	0050-1
2616.33	S/Sst	0.83	0.45	0.13	0.47	0.32	0.09	0.28	0.58	0.22	0.09	0.91	0.35	0.14	58.33	0053-1
3090.00	S/Sst	0.95	0.49	0.12	0.47	0.32	0.08	0.23	0.48	0.18	0.14	0.90	0.35	0.15	59.32	0186-4

Table 10B: Variation in Sterane Distribution (peak height) for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Lithology	Ratio1	Ratio2	Ratio3	Ratio4	Ratio5	Ratio6	Ratio7	Ratio8	Ratio9	Ratio10	Sample
2468.30	S/Sst	0.75	41.28	68.50	1.05	0.72	0.45	0.36	0.52	0.70	1.85	0217-0
2532.26	S/Sst	0.79	51.28	73.10	1.29	0.73	0.66	0.54	0.58	1.05	2.79	0029-1
2544.00	S/Sst	0.78	50.27	72.81	1.14	0.73	0.43	0.32	0.57	1.01	2.69	0057-1
2576.40	S/Sst	0.77	47.54	71.72	1.13	0.73	0.39	0.29	0.56	0.91	2.42	0043-1
2602.74	S/Sst	0.78	47.90	72.31	1.16	0.73	0.44	0.33	0.57	0.92	2.51	0050-1
2616.33	S/Sst	0.82	47.62	73.42	1.20	0.74	0.41	0.31	0.58	0.91	2.64	0053-1
3090.00	S/Sst	0.75	47.56	72.20	1.03	0.73	0.50	0.38	0.56	0.91	2.48	0186-4

Ratio1: a / a + j
Ratio2: q / q + t * 100%
Ratio3: 2(r + s)/(q + t + 2(r + s)) * 100%
Ratio4: a + b + c + d / h + k + l + n
Ratio5: r + s / r + s + q
Ratio6: u + v / u + v + q + r + s + t
Ratio7: u + v / u + v + i + m + n + q + r + s + t
Ratio8: r + s / q + r + s + t
Ratio9: q / t
Ratio10: r + s / t

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Table 10C: Aromatisation of Steranes for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Lithology	Ratio1	Ratio2	Sample
2468.30	S/Sst	0.28	0.94	0217-0
2532.26	S/Sst	0.26	0.93	0029-1
2544.00	S/Sst	0.31	0.92	0057-1
2576.40	S/Sst	0.31	0.92	0043-1
2602.74	S/Sst	0.31	0.92	0050-1
2616.33	S/Sst	0.31	0.92	0053-1
3090.00	S/Sst	0.35	0.91	0186-4

Ratio1: $$\frac{C1+D1+E1+F1+G1+H1+I1}{C1+D1+E1+F1+G1+H1+I1 + c1+d1+e1+f1+g1}$$

Ratio2: g1 / g1 + I1

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Table 100: Variation in Monoaromatic Sterane Distribution for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Lithology	Ratio1	Ratio2	Ratio3	Ratio4	Sample
2468.30	S/Sst	0.23	0.14	0.07	0.07	0217-0
2532.26	S/Sst	0.49	0.31	0.21	0.14	0029-1
2544.00	S/Sst	0.26	0.12	0.12	0.09	0057-1
2576.40	S/Sst	0.32	0.24	0.15	0.13	0043-1
2602.74	S/Sst	0.30	0.23	0.15	0.13	0050-1
2616.33	S/Sst	0.24	0.18	0.11	0.10	0053-1
3090.00	S/Sst	0.35	0.23	0.17	0.14	0186-4

Ratio1: A1 / A1 + E1
Ratio2: B1 / B1 + E1

Ratio3: A1 / A1 + E1 + G1
Ratio4: A1+B1 / A1+B1+C1+D1+E1+F1+G1+H1+I1

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Table 10E: Variation in Triaromatic Sterane Distribution for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Lithology	Ratio1	Ratio2	Ratio3	Ratio4	Ratio5	Sample
2468.30	S/Sst	0.37	0.40	0.22	0.18	0.31	0217-0
2532.26	S/Sst	0.54	0.56	0.32	0.29	0.40	0029-1
2544.00	S/Sst	0.26	0.29	0.14	0.12	0.19	0057-1
2576.40	S/Sst	0.24	0.30	0.14	0.11	0.18	0043-1
2602.74	S/Sst	0.26	0.29	0.14	0.11	0.18	0050-1
2616.33	S/Sst	0.26	0.30	0.15	0.12	0.19	0053-1
3090.00	S/Sst	0.31	0.33	0.16	0.14	0.22	0186-4

Ratio1: a1 / a1 + g1
Ratio2: b1 / b1 + g1
Ratio3: a1 + b1 / a1 + b1 + c1 + d1 + e1 + f1 + g1
Ratio4: a1 / a1 + e1 + f1 + g1
Ratio5: a1 / a1 + d1

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Table 10F: Raw GCMS triterpane data (peak height) for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Lithology	p	q	r	s	t	a	b	z	c	x	d	e	f	g	h	i	j1	j2	k1	k2	l1	l2	m1	m2	Sample
2468.30	S/Sst	20.50	11.00	7.00	14.50	4.00	21.50	37.50	29.00	70.50	10.50	20.00	135.50	21.00	53.50	37.50	10.50	29.50	22.00	22.00	14.00	11.50	7.50	9.00	6.00	0217-0
2532.26	S/Sst	31.50	19.50	10.50	17.50	6.00	26.50	23.00	38.00	52.00	12.00	15.00	134.50	16.50	44.50	35.00	7.50	32.50	22.50	26.50	17.00	15.00	9.50	11.00	8.00	0029-1
2544.00	S/Sst	15.00	10.50	7.00	9.00	4.00	27.00	21.00	38.00	60.50	11.50	13.50	134.00	13.50	50.00	31.50	6.00	34.00	23.00	27.50	17.50	15.00	9.50	11.00	7.00	0057-1
2576.40	S/Sst	16.50	11.50	8.50	12.00	4.50	25.00	21.50	35.50	62.00	13.00	15.50	134.00	14.50	49.00	32.00	6.00	33.00	24.00	26.50	17.00	15.50	9.50	12.00	7.50	0043-1
2602.74	S/Sst	13.50	10.50	6.50	11.00	4.00	24.00	19.00	33.50	55.00	11.50	13.00	134.00	13.50	44.50	32.50	6.00	32.00	20.50	25.50	16.00	15.00	9.00	11.50	7.00	0050-1

Table 10F: Raw GCMS triterpane data (peak height) for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Lithology	p	q	r	s	t	a	b	z	c	x	d	e	f	g	h	i	j1	j2	k1	k2	l1	l2	m1	m2	Sample
2616.33	S/Sst	15.50	12.00	7.50	12.00	4.50	27.00	22.50	37.00	63.50	11.50	14.50	134.00	13.00	48.00	31.50	6.00	31.50	22.50	28.50	18.00	14.50	8.50	11.50	7.50	0053-1
3090.00	S/Sst	29.50	18.00	9.50	11.50	5.00	21.00	20.00	29.50	61.50	10.50	15.00	131.00	14.00	49.50	35.00	9.00	35.00	24.00	31.00	21.00	18.50	14.00	17.00	12.00	0186-4

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Table 10G: Raw GCMS sterane data (peak height) for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Lithology	u	v	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	Sample
2468.30	S/Sst	125.50	59.00	107.50	69.00	29.50	49.50	55.00	35.00	39.00	110.50	50.00	35.50	72.50	23.50	20.00	36.00	48.50	19.00	45.00	72.50	46.00	64.00	0217-0
2532.26	S/Sst	125.50	54.50	79.50	48.00	22.00	30.00	39.50	23.50	24.00	64.50	30.00	21.00	41.50	14.00	12.00	19.00	26.50	10.00	20.00	33.00	20.00	19.00	0029-1
2544.00	S/Sst	104.50	54.50	128.50	83.00	39.50	61.00	70.00	44.50	45.00	115.00	56.00	37.00	87.00	31.00	25.00	40.00	59.00	22.00	46.00	76.00	46.50	45.50	0057-1
2576.40	S/Sst	80.50	53.50	121.50	86.00	37.00	60.00	70.50	46.00	47.50	116.00	51.00	37.00	88.00	28.00	24.00	38.50	55.50	22.00	43.50	70.00	46.00	48.00	0043-1
2602.74	S/Sst	103.00	46.00	117.50	87.50	36.50	60.00	73.50	42.00	42.50	115.00	53.00	33.00	80.50	27.00	21.00	38.00	51.00	17.50	40.00	65.00	44.00	43.50	0050-1

Table 10G: Raw GCMS sterane data (peak height) for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Lithology	u	v	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	Sample
2616.33	S/Sst	76.50	46.50	129.00	75.00	34.50	52.50	67.00	38.00	38.00	113.00	45.00	28.00	71.00	23.00	18.00	35.00	46.50	17.00	35.00	62.00	39.50	38.50	0053-1
3090.00	S/Sst	127.00	58.00	114.00	67.00	25.50	49.00	57.00	34.00	39.00	116.00	50.50	37.00	72.00	22.00	20.00	38.00	51.00	17.50	39.00	62.00	44.50	43.00	0186-4

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Table 10H: Raw GCMS monoaromatic sterane data (peak height) for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Lithology	a1	b1	c1	d1	e1	f1	g1	h1	i1	Sample
2468.30	S/Sst	20.40	11.49	36.41	25.70	69.41	18.18	182.31	106.68	18.80	0217-0
2532.26	S/Sst	52.41	24.92	45.10	38.29	55.44	17.94	146.87	154.02	19.35	0029-1
2544.00	S/Sst	112.38	44.98	188.29	204.21	316.94	48.98	505.56	244.11	60.07	0057-1
2576.40	S/Sst	146.63	99.24	181.79	221.08	317.79	58.38	499.70	252.15	65.20	0043-1
2602.74	S/Sst	148.68	102.32	214.25	217.44	349.31	50.39	516.34	274.95	65.41	0050-1
2616.33	S/Sst	112.80	78.20	204.17	220.44	356.96	73.15	589.78	280.00	77.63	0053-1
3090.00	S/Sst	127.39	71.97	148.51	159.38	235.67	55.22	375.97	185.34	42.94	0186-4

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Table 101: Raw GCMS trioaromatic sterane data (peak height) for Well NOCS 30/6-9

Depth unit of measure: m

Depth	Lithology	a1	b1	c1	d1	e1	f1	g1	Sample
2468.30	S/Sst	161.44	181.92	105.70	364.74	255.38	185.34	272.95	0217-0
2532.26	S/Sst	314.97	332.87	149.89	472.11	245.27	247.16	266.33	0029-1
2544.00	S/Sst	266.52	309.22	368.60	1171.32	681.73	603.21	739.78	0057-1
2576.40	S/Sst	247.91	324.24	368.25	1116.72	681.15	632.19	767.09	0043-1
2602.74	S/Sst	273.65	319.89	382.80	1243.85	720.29	634.61	795.28	0050-1
2616.33	S/Sst	306.74	378.51	416.51	1292.60	789.36	669.86	866.66	0053-1
3090.00	S/Sst	201.05	216.23	225.89	720.75	410.49	384.37	445.73	0186-4

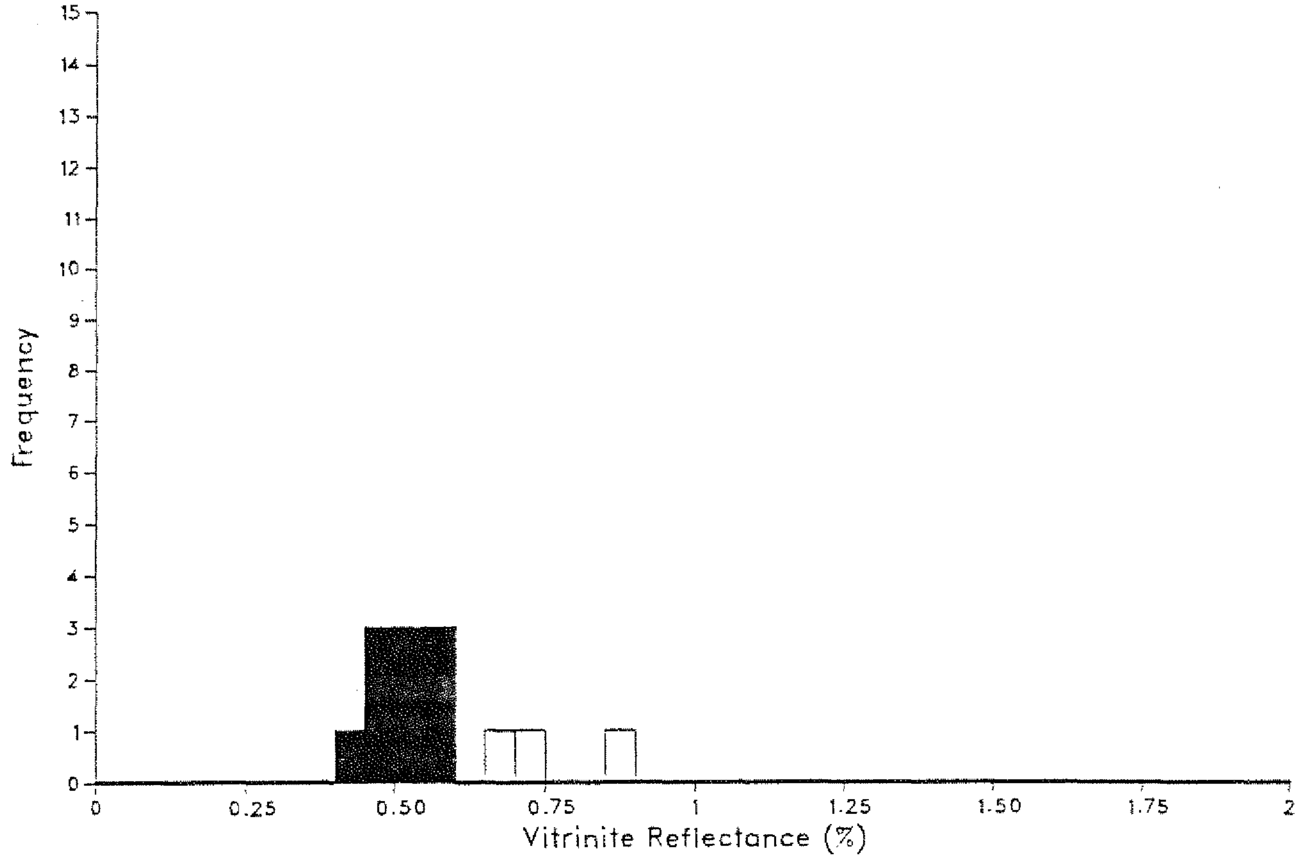
APPENDIX 2

Histograms

Vitrinite Reflectance Histogram

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Well: NOCS 307B-9
Depth: 2410.00(m)
Sample: 59- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.400 to 0.600):	0.51	0.05	10
Population Two (from 0.650 to 0.750):	0.69	0.05	2
Population Three (from 0.850 to 0.900):	0.90	0.00	1

Readings:

0.445	0.450	0.461	0.498	0.511	0.520	0.527	0.552	0.576	0.586
0.654	0.731	0.896							

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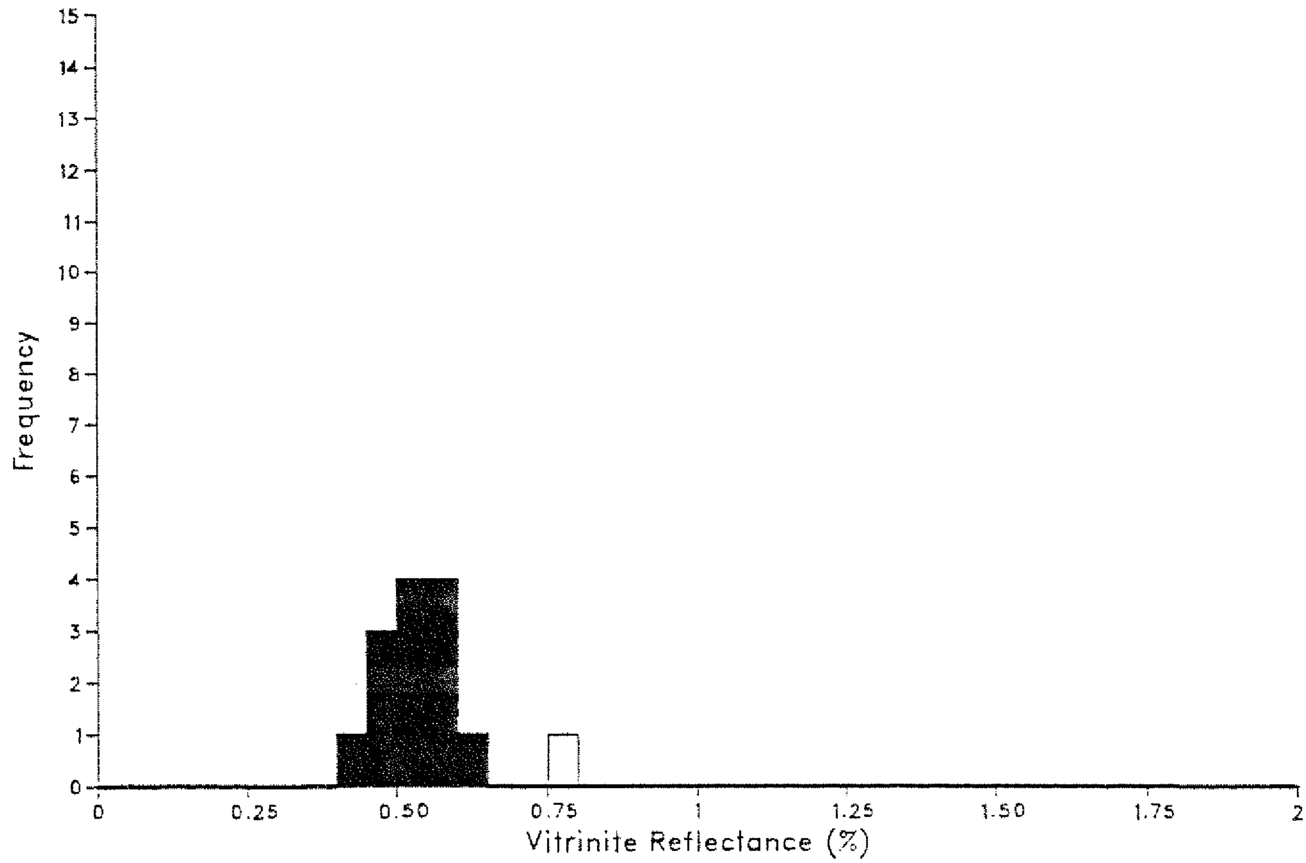
Vitrinite Reflectance Histogram

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Well: NOCS 30/6-9
Depth: 2476.00(m)
Sample: 8- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.400 to 0.650):	0.53	0.05	13
Population Two (from 0.750 to 0.800):	0.79	0.00	1

Readings:

0.417	0.479	0.494	0.495	0.509	0.526	0.541	0.543	0.569	0.569
0.570	0.597	0.604	0.785						

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Vitrinite Reflectance Histogram

GEOLAB NOR
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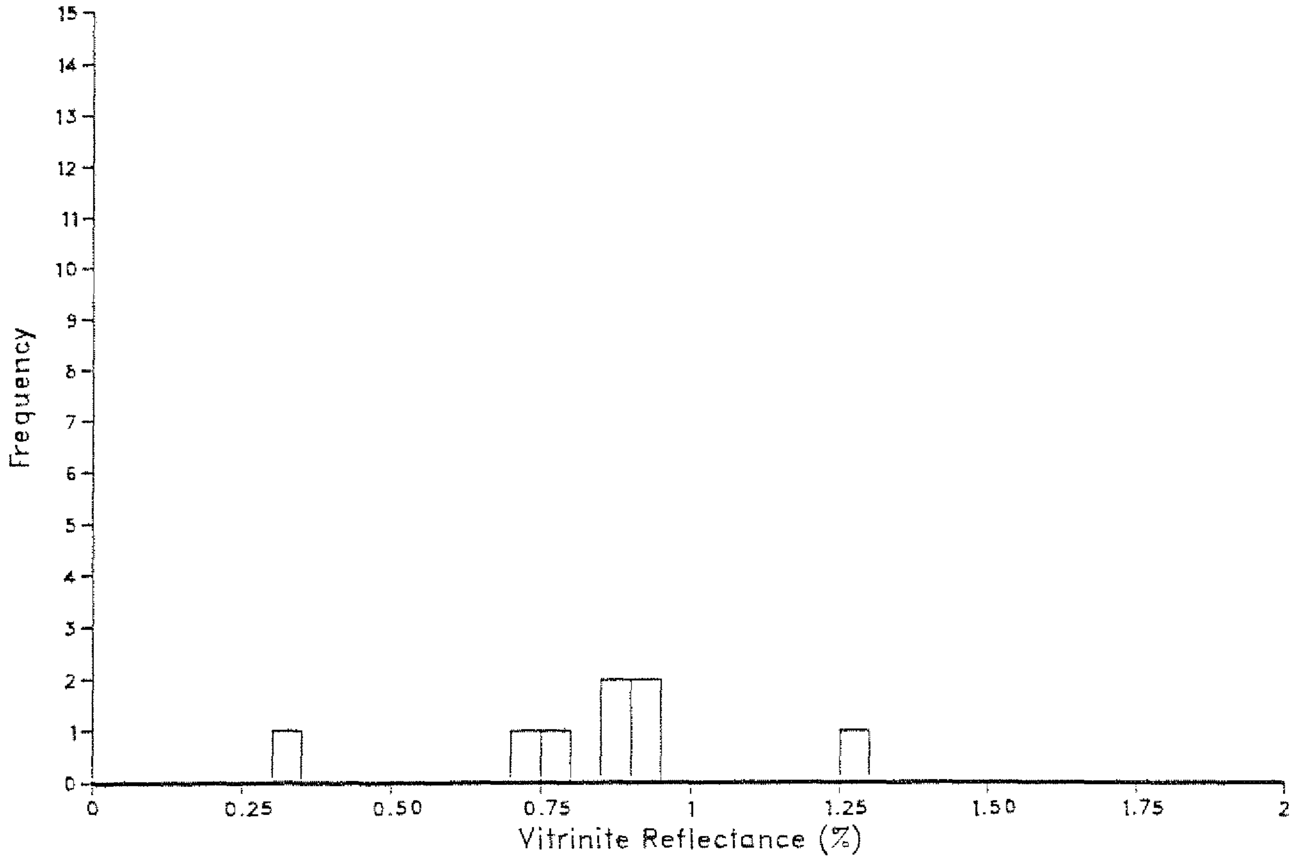
Well: NOCS 30/6-9
Depth: 2484.00(m)
Sample: 12- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.000 to 0.000):	0.00	0.00	0
Population Two (from 0.300 to 0.350):	0.35	0.00	1
Population Three (from 0.700 to 0.950):	0.84	0.07	6
Population Four (from 1.250 to 1.300):	1.26	0.00	1

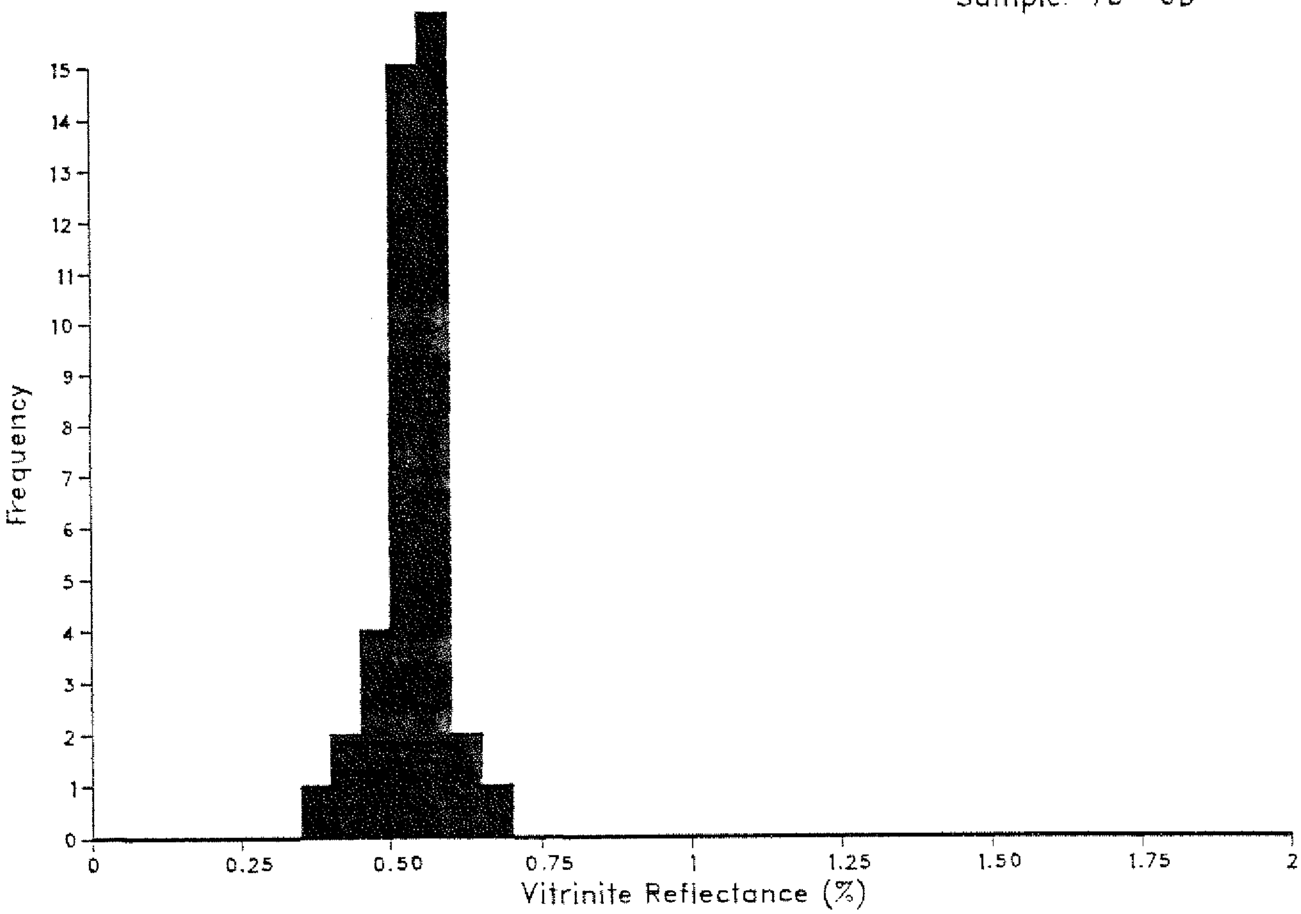
Readings:

0.347 0.747 0.763 0.854 0.854 0.901 0.913 1.259

Vitrinite Reflectance Histogram

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Well: NOCS 30/6-9
Depth: 2525.00(m)
Sample: 78- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.350 to 0.700):	0.54	0.05	41

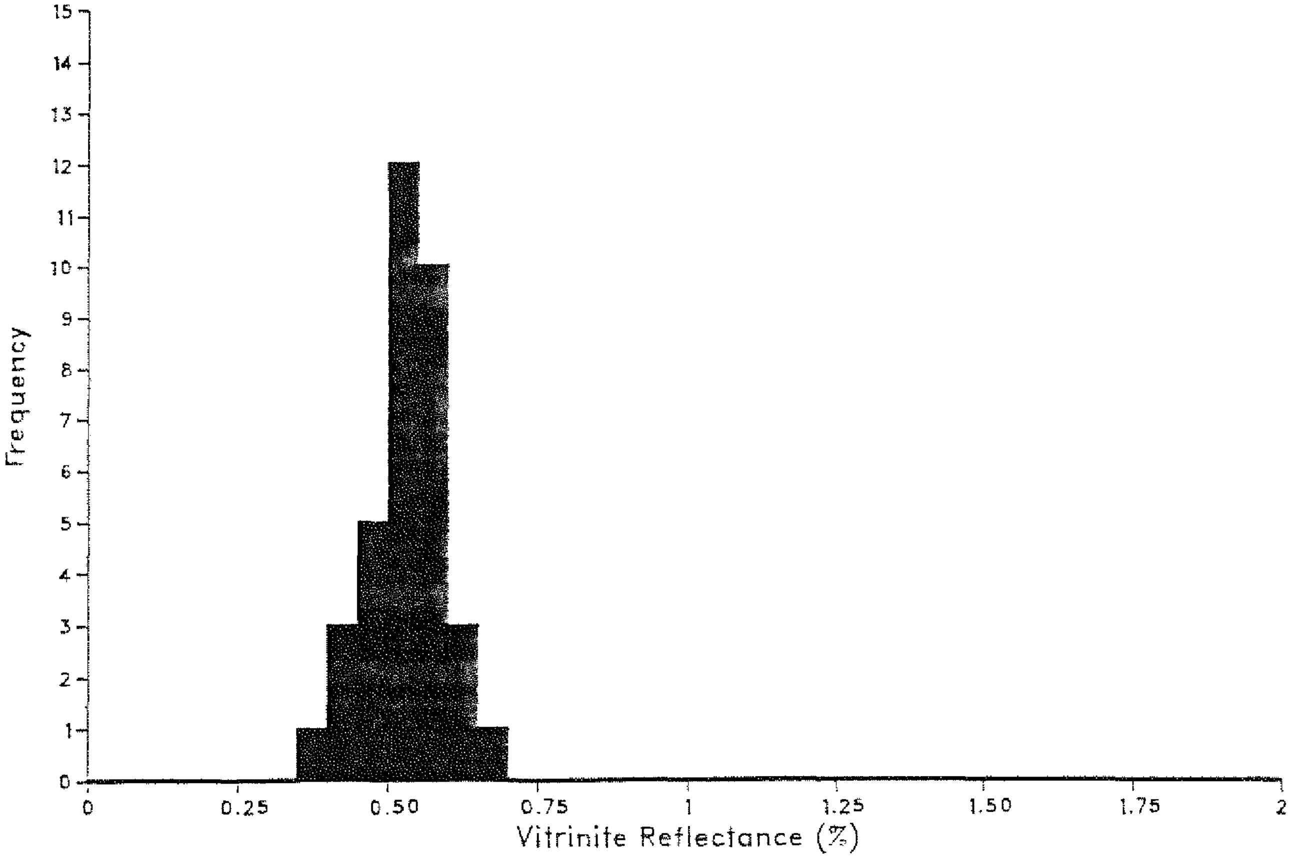
Readings:

0.394	0.420	0.446	0.470	0.473	0.489	0.495	0.500	0.500	0.500
0.502	0.511	0.514	0.514	0.525	0.535	0.537	0.539	0.545	0.546
0.548	0.549	0.551	0.563	0.563	0.564	0.565	0.566	0.567	0.568
0.572	0.574	0.581	0.589	0.590	0.593	0.595	0.599	0.601	0.632
0.657									

Vitrinite Reflectance Histogram

GEOLAB NOR

Well: NOCS 30/6-9
Depth: 2535.00(m)
Sample: 30- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.350 to 0.700):	0.54	0.06	35

Readings:

0.383	0.444	0.444	0.449	0.456	0.477	0.496	0.498	0.498	0.503
0.509	0.518	0.521	0.524	0.529	0.529	0.538	0.541	0.548	0.548
0.550	0.557	0.559	0.561	0.568	0.569	0.571	0.585	0.589	0.598
0.600	0.602	0.605	0.605	0.657					

Vitrinite Reflectance Histogram

GEOLAB NOR
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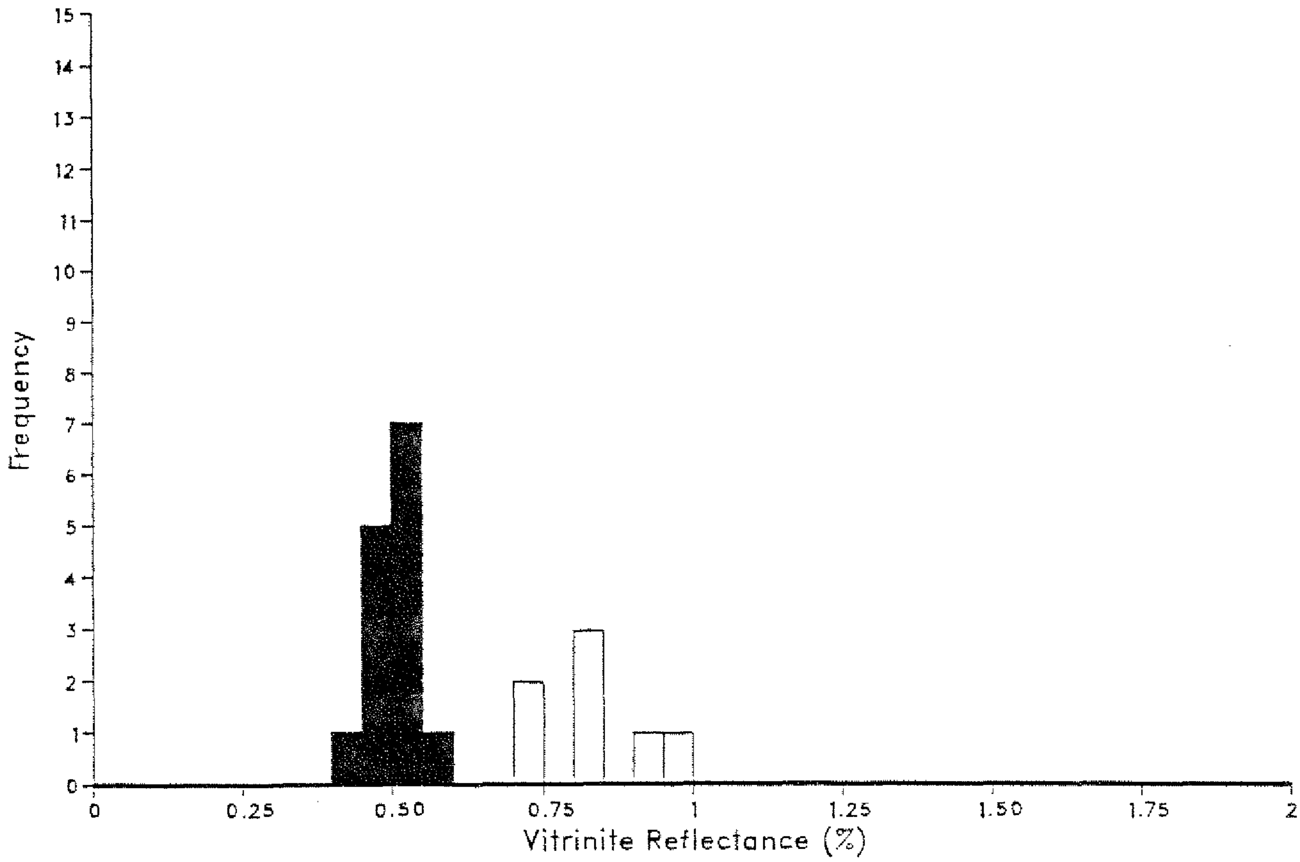
Well: NOCS 3[illegible]-9
Depth: 2624.00(m)
Sample: 56- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.400 to 0.600):	0.50	0.04	14
Population Two (from 0.700 to 0.950):	0.84	0.08	7

Readings:

0.416	0.455	0.478	0.483	0.487	0.487	0.502	0.506	0.509	0.510
0.520	0.522	0.526	0.573	0.745	0.748	0.826	0.827	0.841	0.940
0.950									

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Vitrinite Reflectance Histogram

GEOLAB NOR
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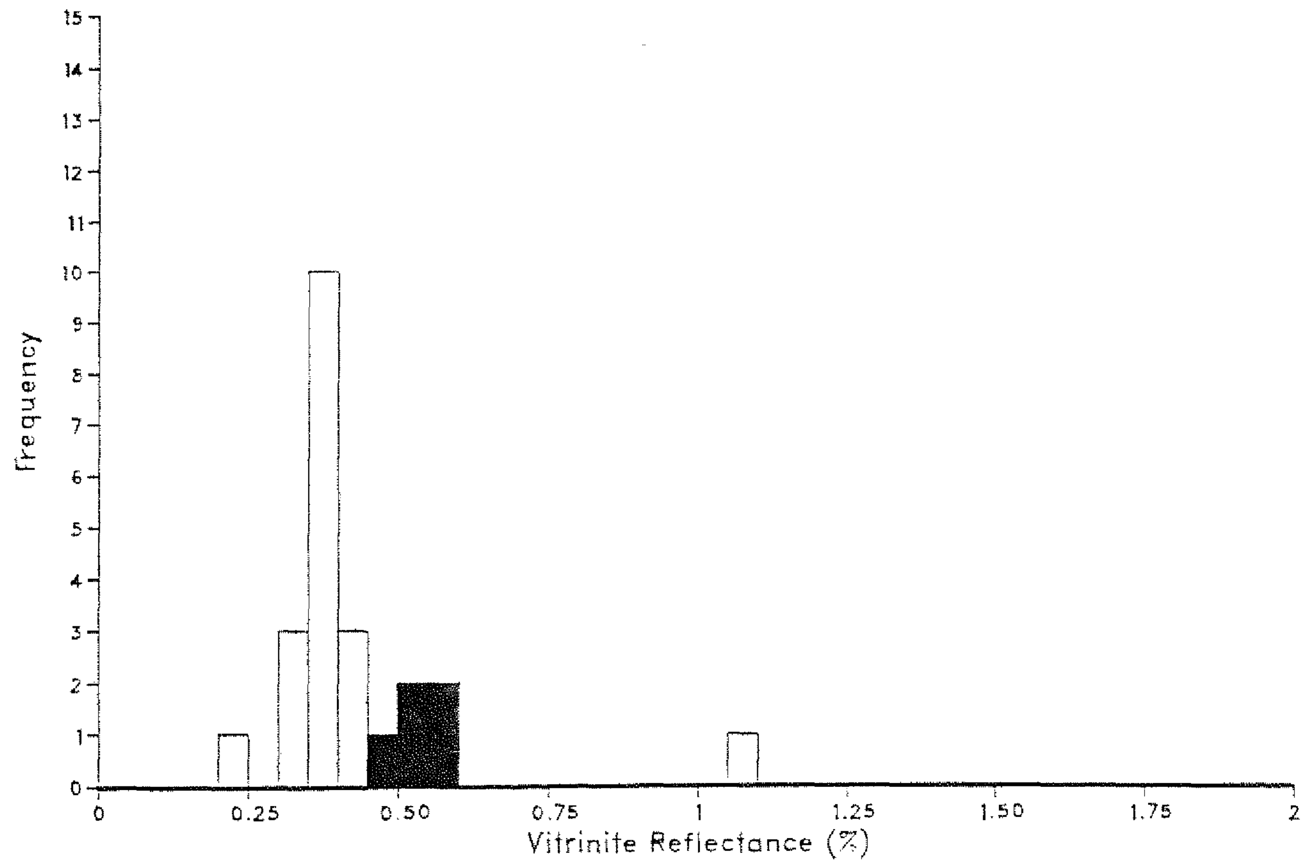
Well: NOCS 30/6-9
Depth: 2785.00(m)
Sample: 130- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.450 to 0.600):	0.53	0.04	5
Population Two (from 0.200 to 0.250):	0.22	0.00	1
Population Three (from 0.300 to 0.450):	0.37	0.04	16
Population Four (from 1.050 to 1.100):	1.07	0.00	1

Readings:

0.217	0.309	0.317	0.333	0.355	0.365	0.367	0.372	0.373	0.373
0.374	0.379	0.382	0.398	0.406	0.425	0.446	0.472	0.511	0.533
0.556	0.566	1.071							

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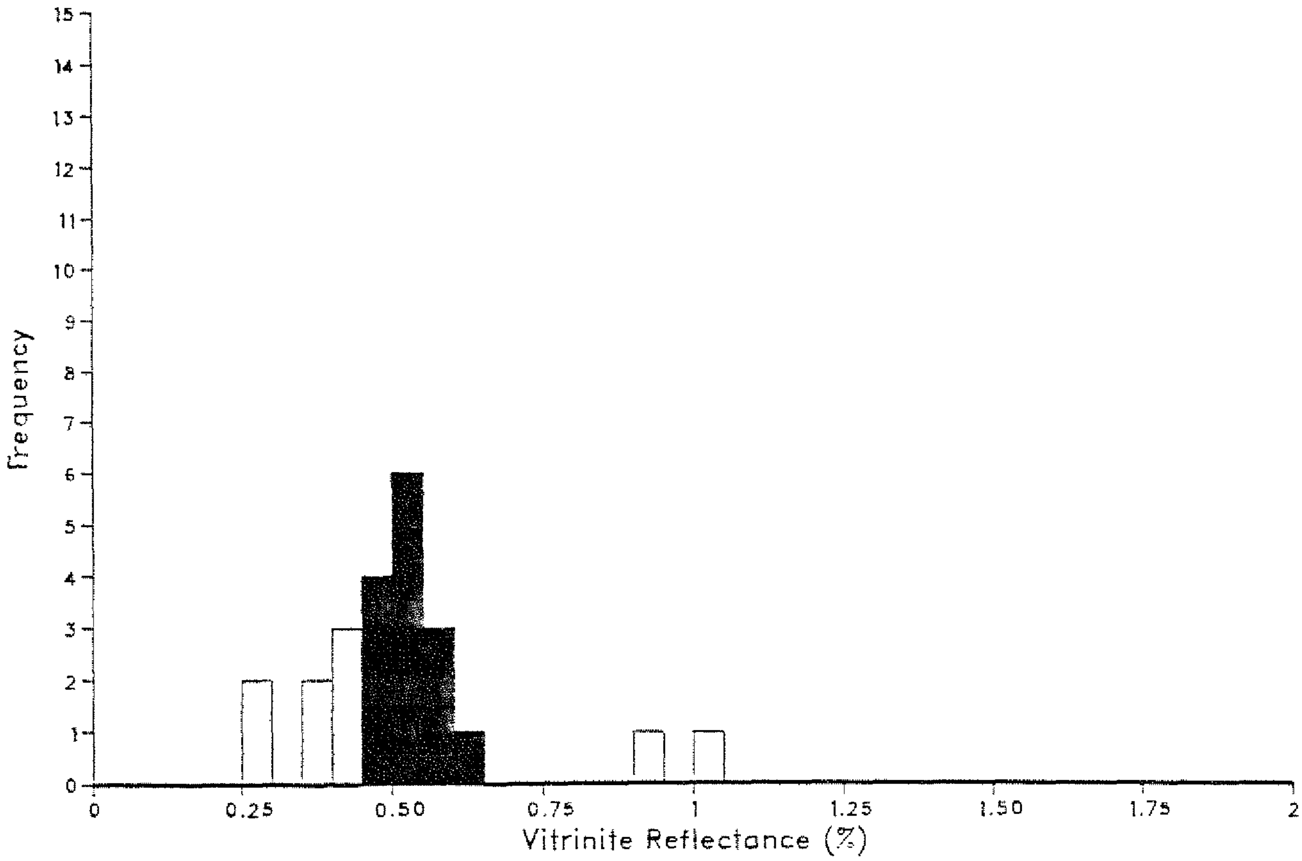
Vitrinite Reflectance Histogram

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Well: NOCS 30/6-9
Depth: 2830.00(m)
Sample: 139- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.450 to 0.650):	0.52	0.04	14
Population Two (from 0.250 to 0.300):	0.27	0.00	2
Population Three (from 0.400 to 0.450):	0.42	0.02	5
Population Four (from 0.900 to 1.050):	0.97	0.06	2

Readings:

0.268	0.271	0.400	0.400	0.414	0.421	0.443	0.455	0.467	0.474
0.490	0.517	0.523	0.525	0.527	0.527	0.530	0.555	0.556	0.560
0.601	0.928	1.009							

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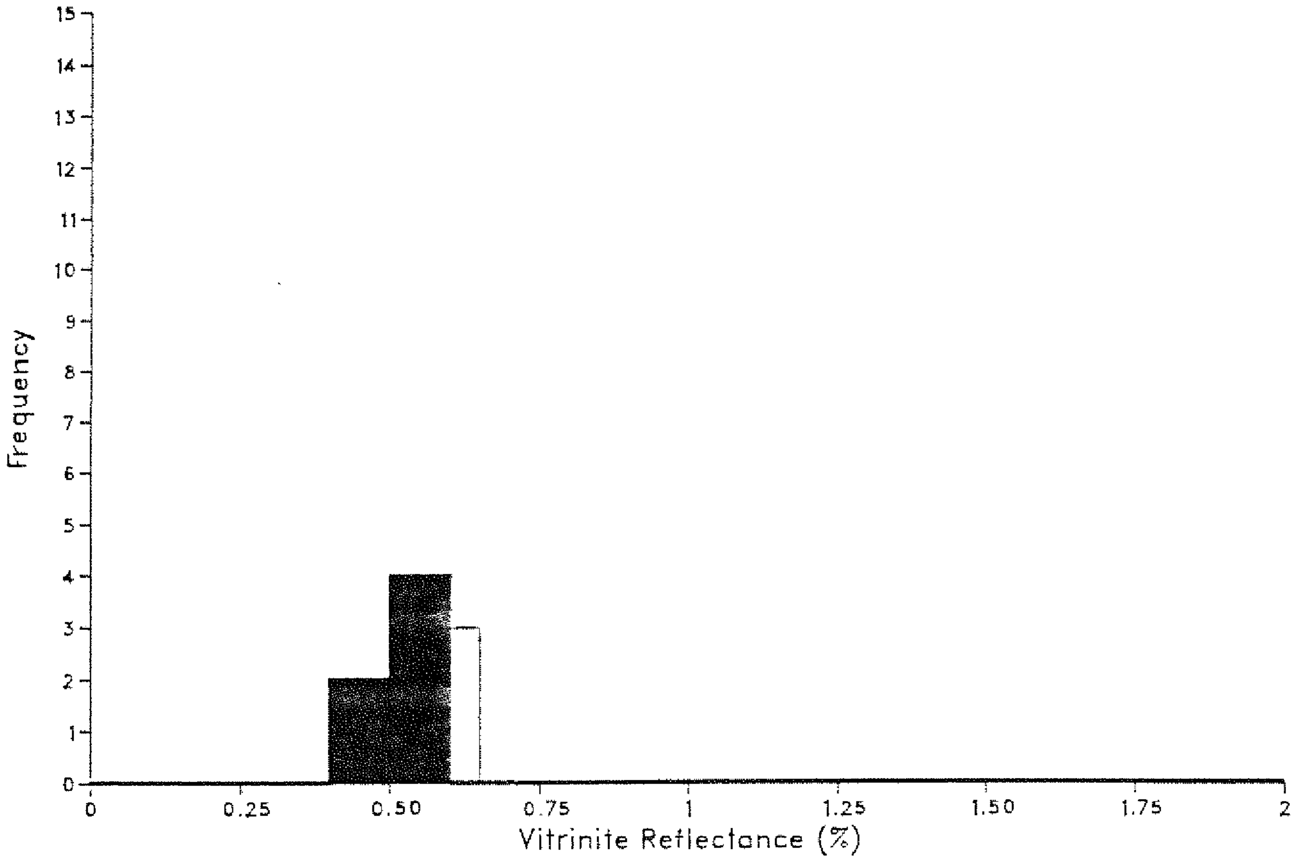
Vitrinite Reflectance Histogram

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

Well: NOCS 3[illegible]
Depth: 2860.00(m)
Sample: 145- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.400 to 0.600):	0.52	0.06	12
Population Two (from 0.600 to 0.650):	0.62	0.02	3

Readings:

0.422	0.434	0.471	0.487	0.508	0.515	0.531	0.537	0.556	0.558
0.580	0.599	0.601	0.611	0.640					

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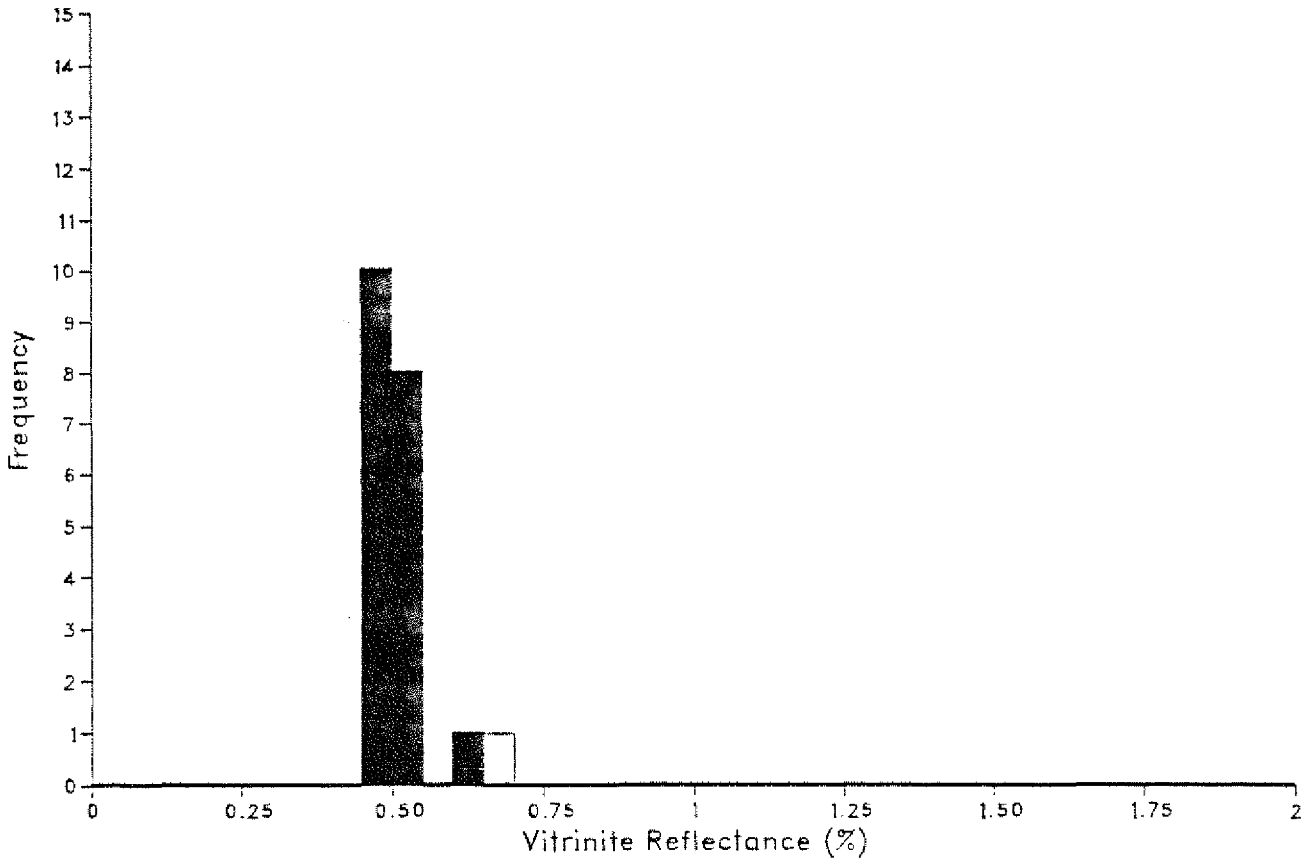
Vitrinite Reflectance Histogram

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Well: NOCS 30/6-8
Depth: 2900.00(m)
Sample: 153- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.450 to 0.650):	0.50	0.04	19
Population Two (from 0.650 to 0.700):	0.69	0.00	1

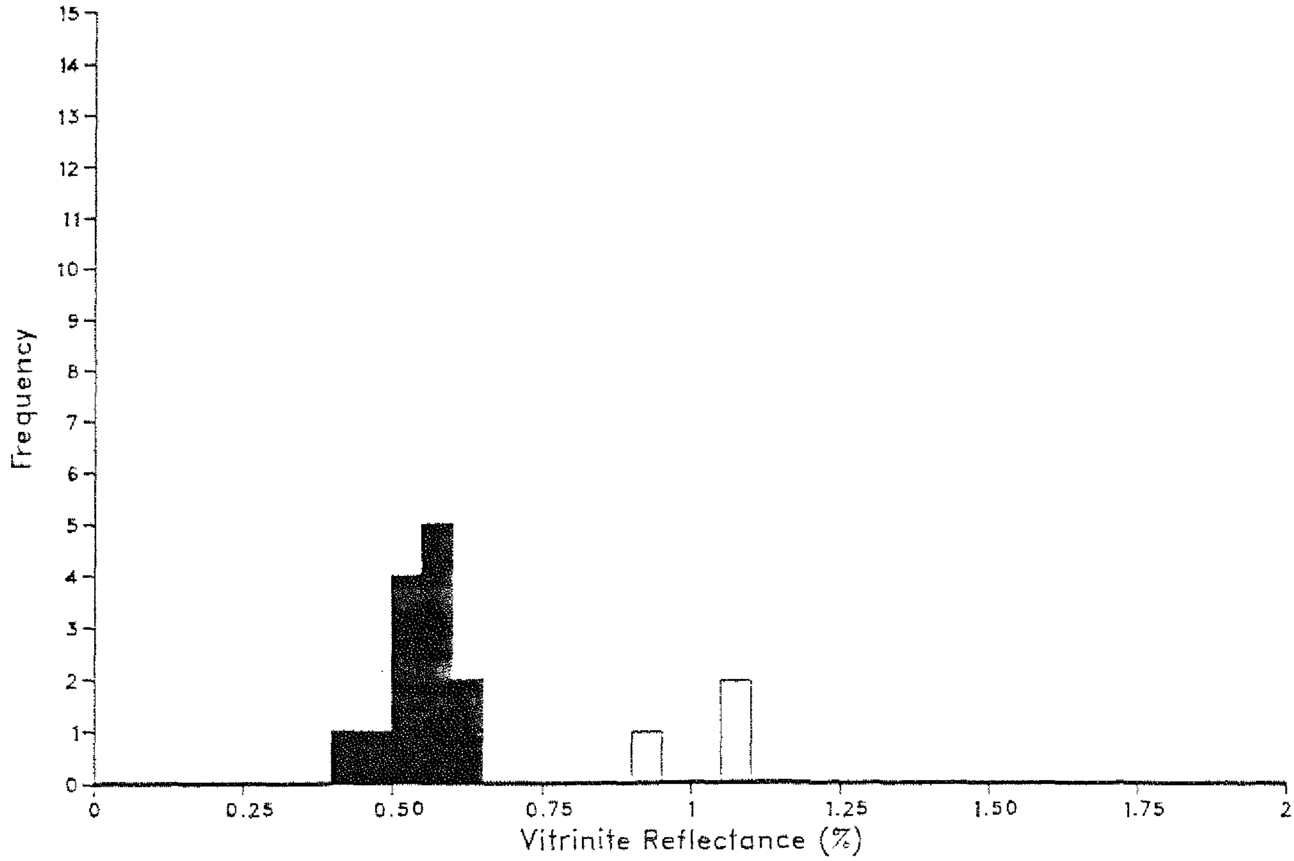
Readings:

0.456	0.463	0.464	0.465	0.468	0.471	0.476	0.492	0.493	0.498
0.504	0.505	0.506	0.508	0.515	0.521	0.535	0.543	0.604	0.689

Vitrinite Reflectance Histogram

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Well: NOCS 30/6-9
Depth: 2950.00(m)
Sample: 163- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.400 to 0.650):	0.55	0.05	13
Population Two (from 0.900 to 0.950):	0.93	0.00	1
Population Three (from 1.050 to 1.100):	1.08	0.00	2

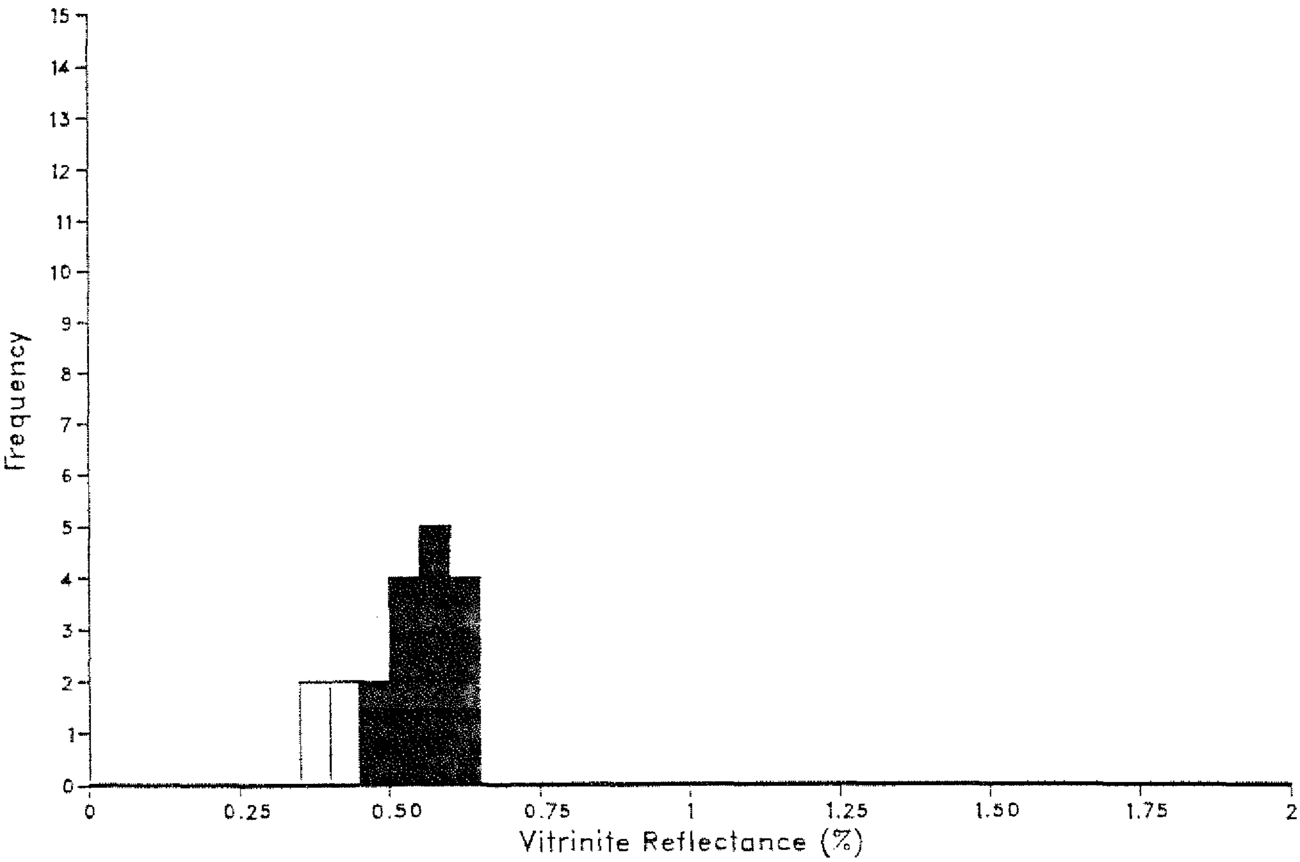
Readings:

0.434	0.491	0.507	0.518	0.529	0.532	0.561	0.563	0.567	0.582
0.591	0.607	0.644	0.934	1.079	1.080				

Vitrinite Reflectance Histogram

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Well: NOCS 30/6-9
Depth: 2985.00(m)
Sample: 170- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.450 to 0.650):	0.57	0.04	15
Population Two (from 0.350 to 0.450):	0.41	0.03	4

Readings:

0.379	0.386	0.406	0.449	0.491	0.495	0.531	0.536	0.541	0.549
0.552	0.567	0.573	0.581	0.595	0.604	0.611	0.614	0.642	

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Vitrinite Reflectance Histogram

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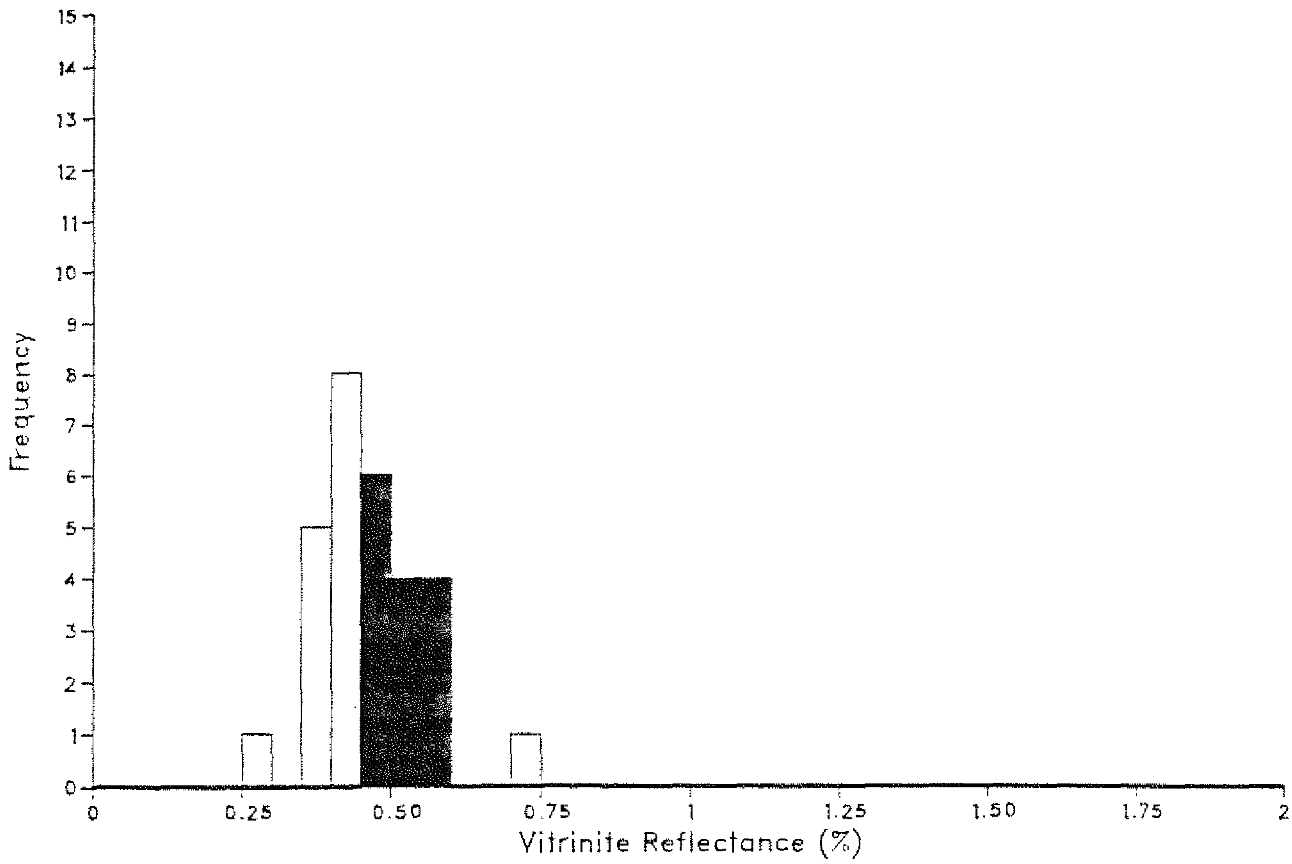
Well: NOCS 30/6-9
Depth: 3110.00(m)
Sample: 187- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.450 to 0.600):	0.51	0.04	14
Population Two (from 0.250 to 0.300):	0.29	0.00	1
Population Three (from 0.350 to 0.450):	0.41	0.03	13
Population Four (from 0.700 to 0.750):	0.75	0.00	1

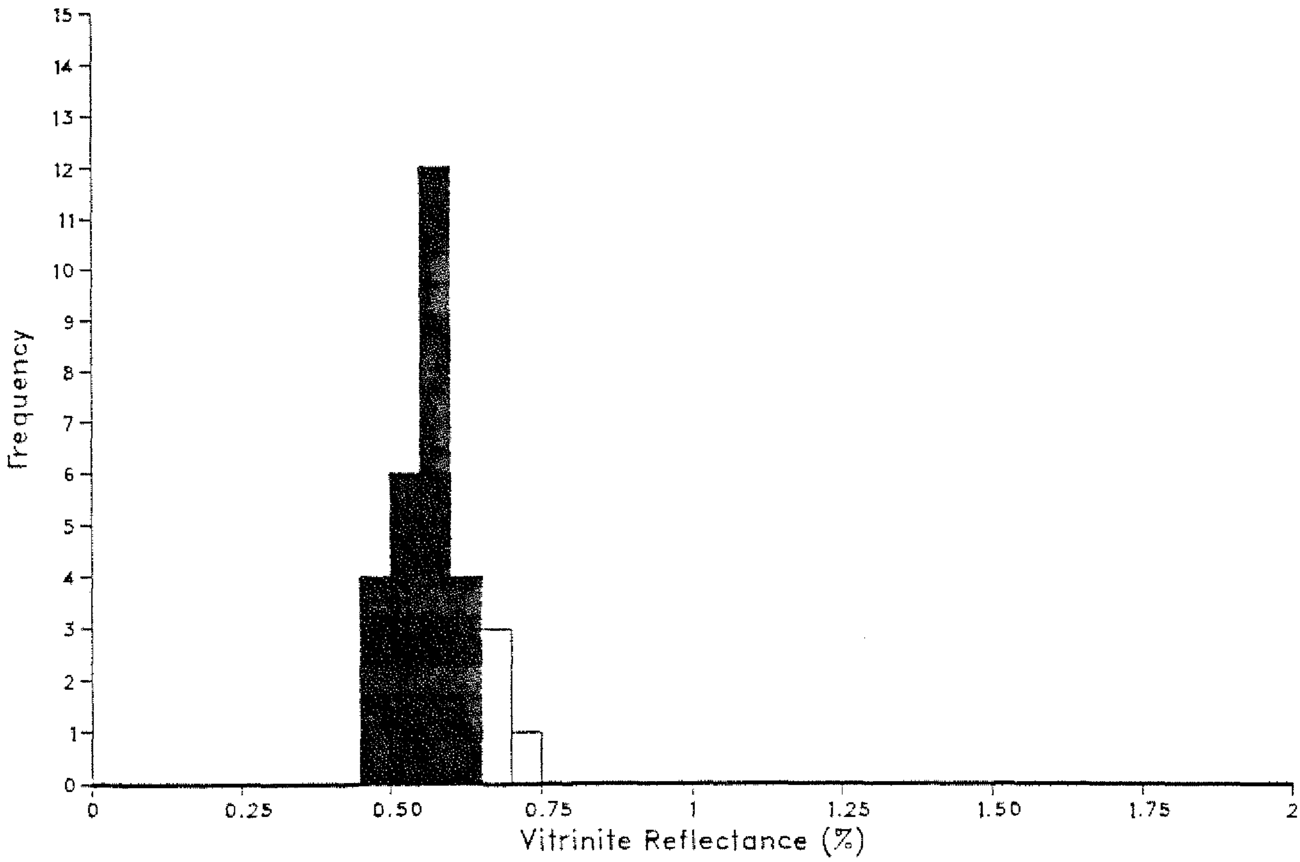
Readings:

0.287	0.360	0.369	0.373	0.373	0.399	0.414	0.416	0.437	0.437
0.442	0.443	0.447	0.447	0.457	0.471	0.475	0.481	0.481	0.489
0.500	0.504	0.506	0.517	0.553	0.565	0.582	0.598	0.748	

Vitrinite Reflectance Histogram

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Well: NOCS 30/6-9
Depth: 3170.00(m)
Sample: 193- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.450 to 0.650):	0.56	0.04	26
Population Two (from 0.650 to 0.750):	0.69	0.03	4

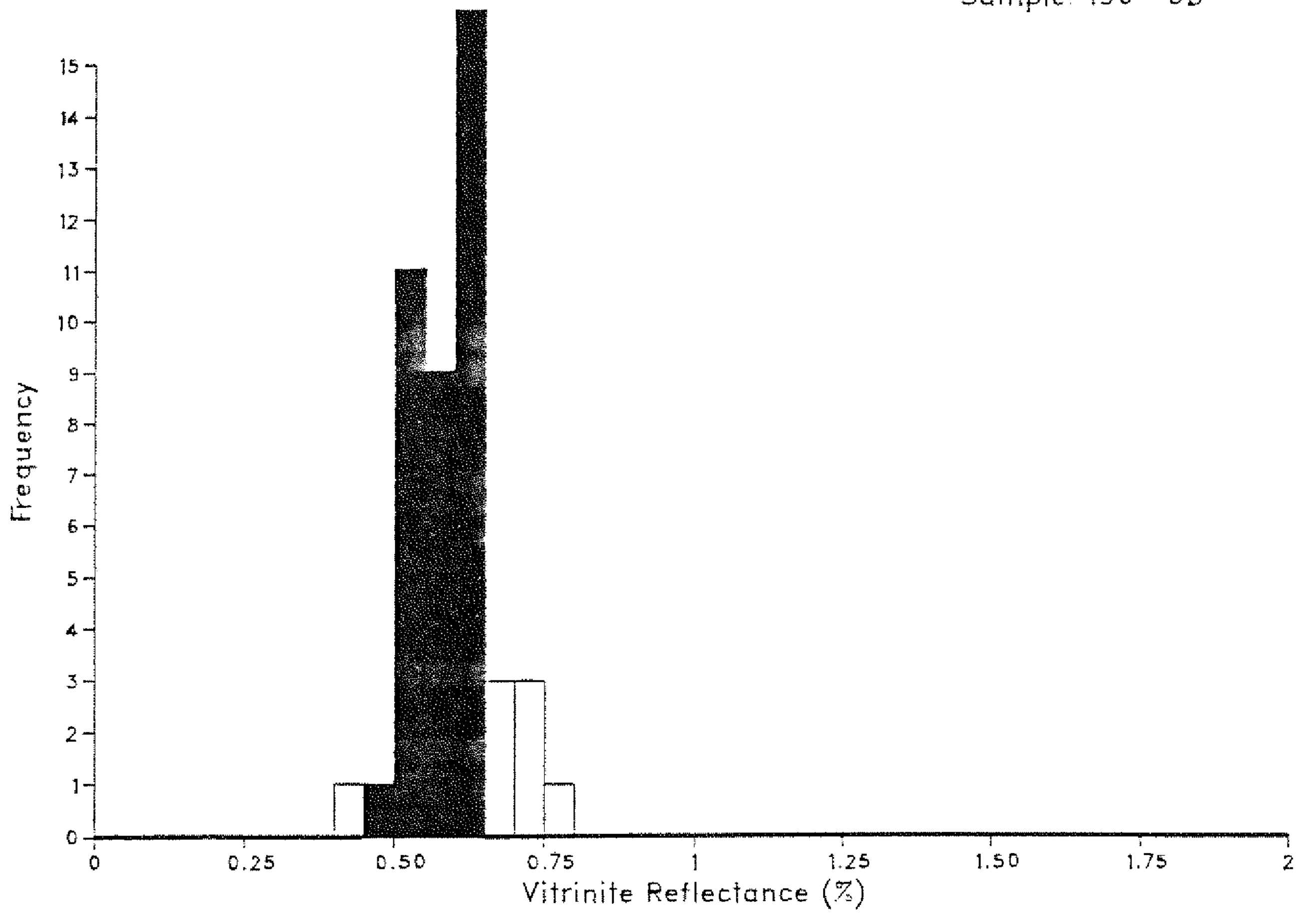
Readings:

0.468	0.492	0.495	0.499	0.505	0.511	0.528	0.529	0.535	0.543
0.553	0.557	0.563	0.573	0.573	0.574	0.576	0.579	0.580	0.584
0.590	0.592	0.606	0.609	0.613	0.628	0.656	0.668	0.699	0.733

Vitrinite Reflectance Histogram

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Well: NOCS 30/6-9
Depth: 3197.00(m)
Sample: 196- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.450 to 0.650):	0.58	0.05	37
Population Two (from 0.400 to 0.450):	0.45	0.00	1
Population Three (from 0.650 to 0.800):	0.71	0.05	7

Readings:

0.447	0.499	0.501	0.506	0.508	0.510	0.512	0.514	0.521	0.531
0.532	0.539	0.543	0.558	0.572	0.573	0.576	0.578	0.589	0.597
0.598	0.598	0.601	0.603	0.605	0.606	0.607	0.608	0.612	0.618
0.622	0.628	0.629	0.630	0.634	0.637	0.638	0.645	0.663	0.670
0.686	0.706	0.717	0.742	0.798					

Vitrinite Reflectance Histogram

GEOLAB NOR
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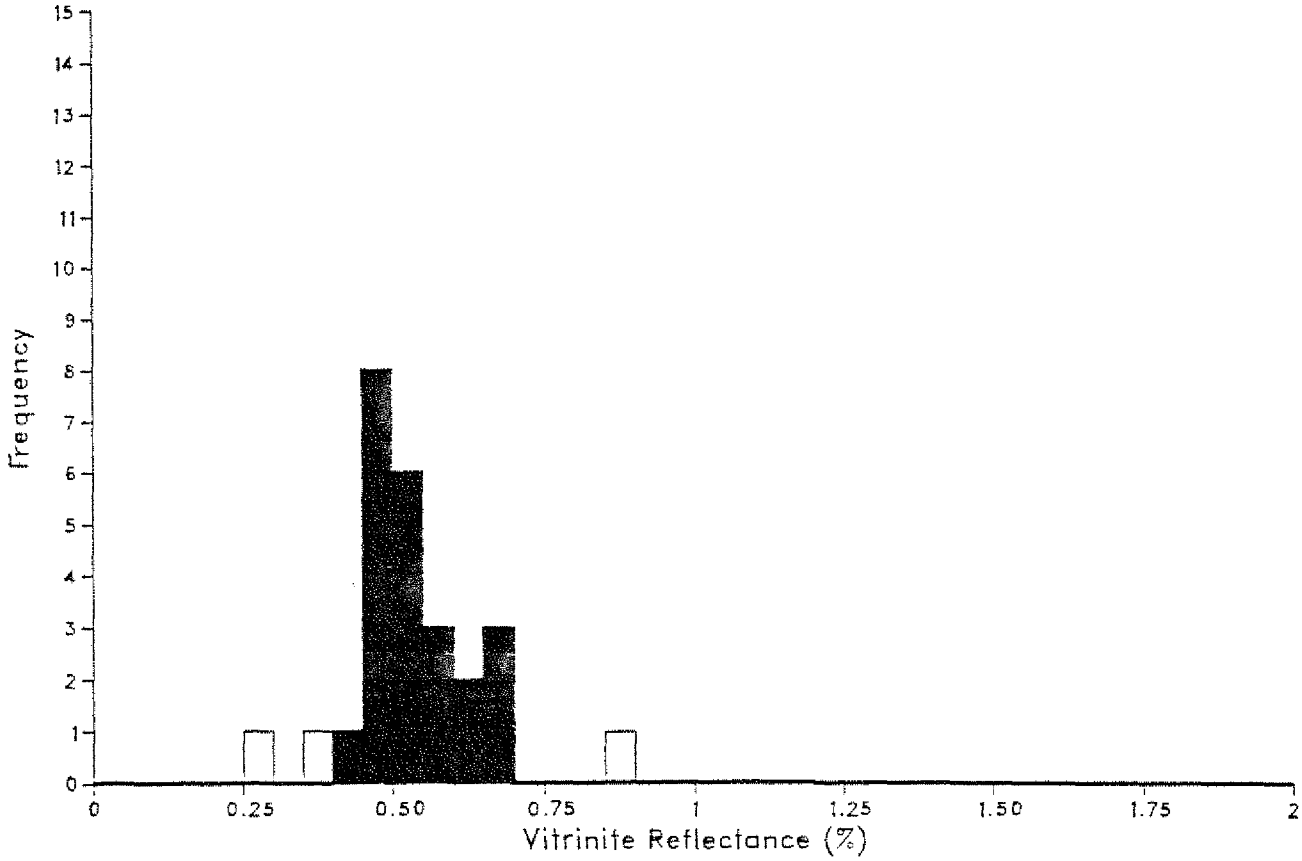
Well: NOCS 30/6-9
Depth: 3400.00(m)
Sample: 209- 0b



Statistics:	Mean	St.Dev.	n
Indigenous Population (from 0.400 to 0.700):	0.54	0.07	23
Population Two (from 0.250 to 0.400):	0.33	0.07	2
Population Three (from 0.850 to 0.900):	0.86	0.00	1

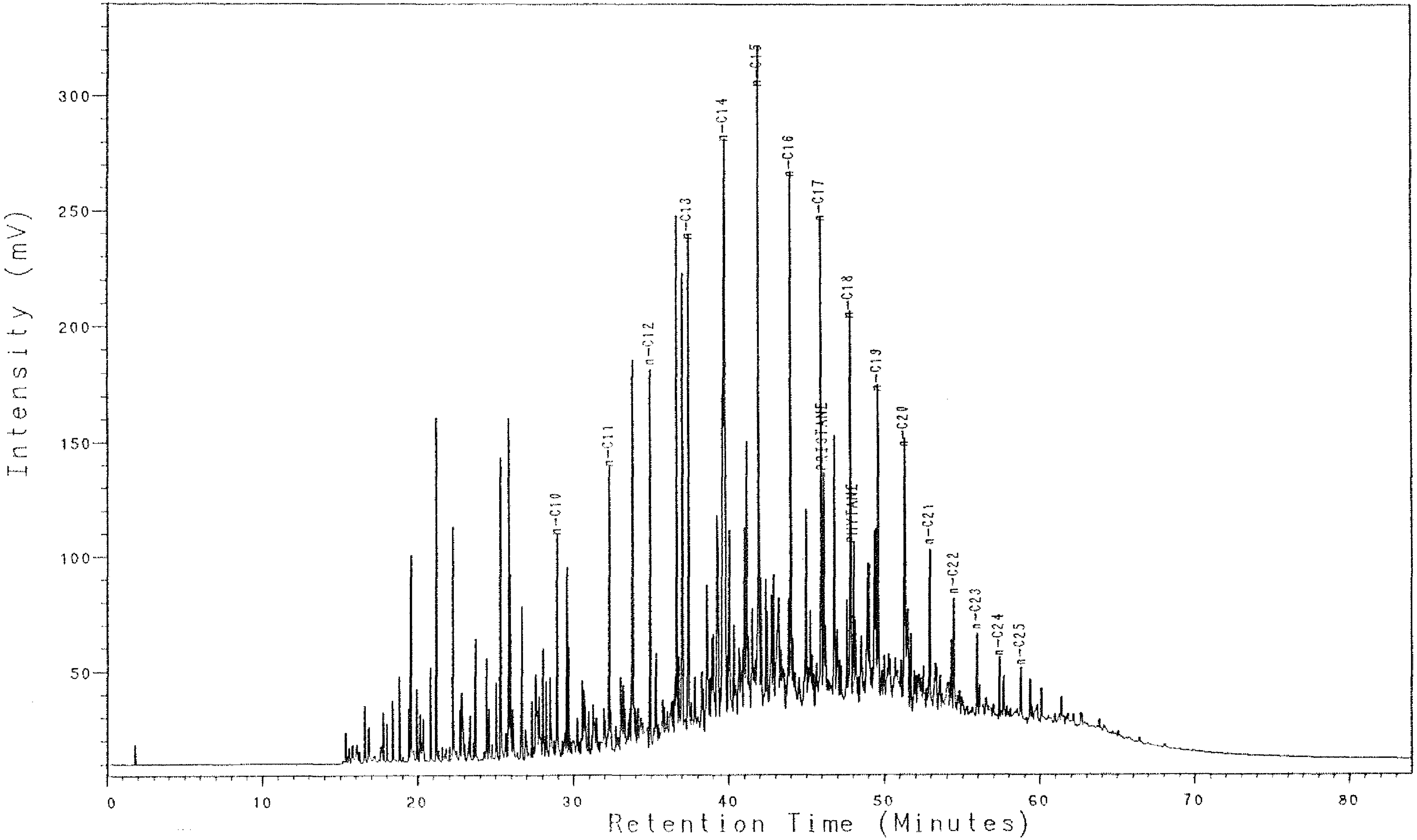
Readings:

0.278	0.381	0.433	0.461	0.463	0.466	0.475	0.487	0.493	0.496
0.497	0.515	0.522	0.524	0.527	0.531	0.549	0.555	0.570	0.575
0.607	0.628	0.659	0.672	0.679	0.859				

APPENDIX 3

Thermal Extraction and Pyrolysis Gas Chromatograms

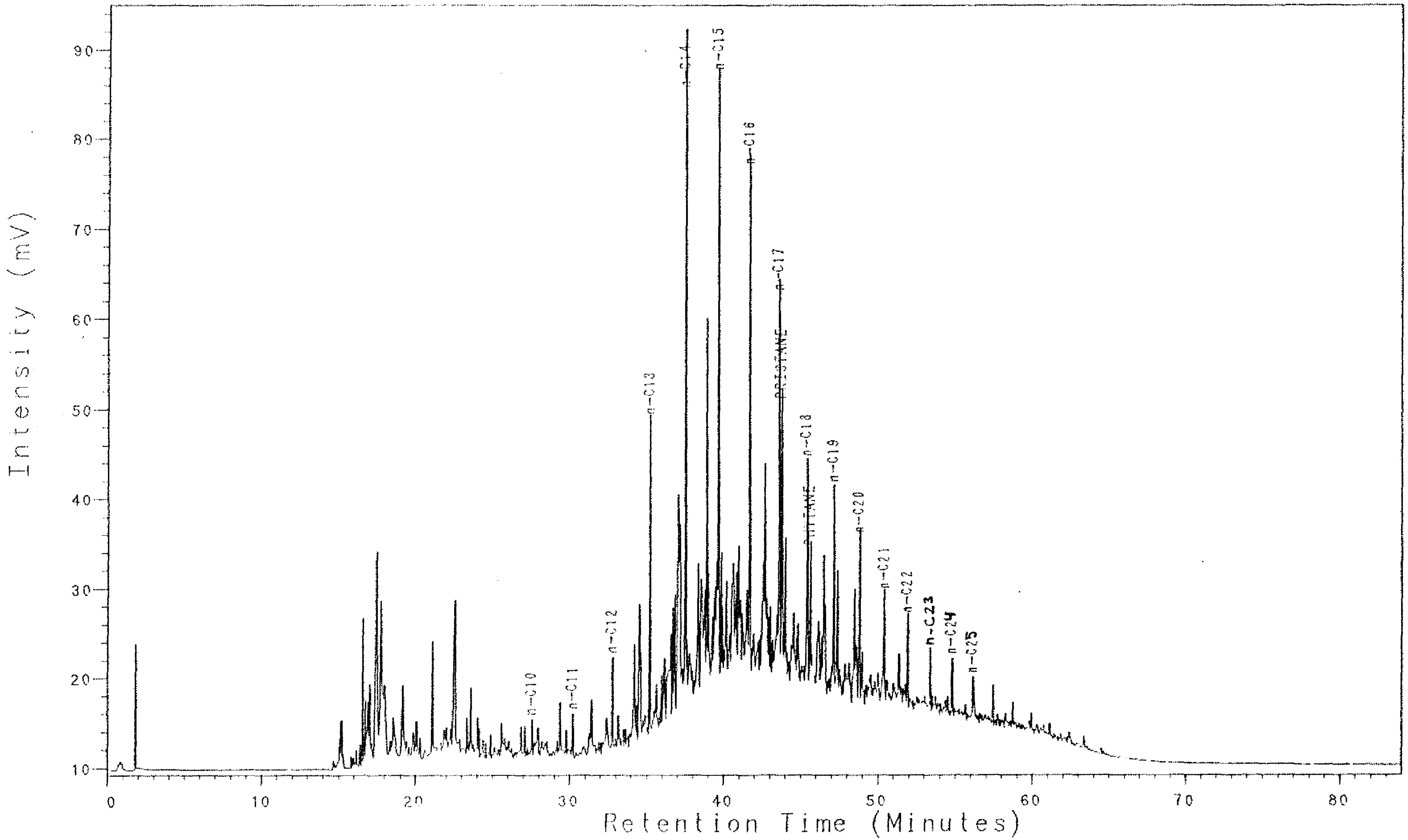
Analysis PV5900666   26, 1, 1   30/6-9, 2460m



NOCS 30/6-9 2460m
THERMAL EXTRACTION GC (S1)
CON1.blk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

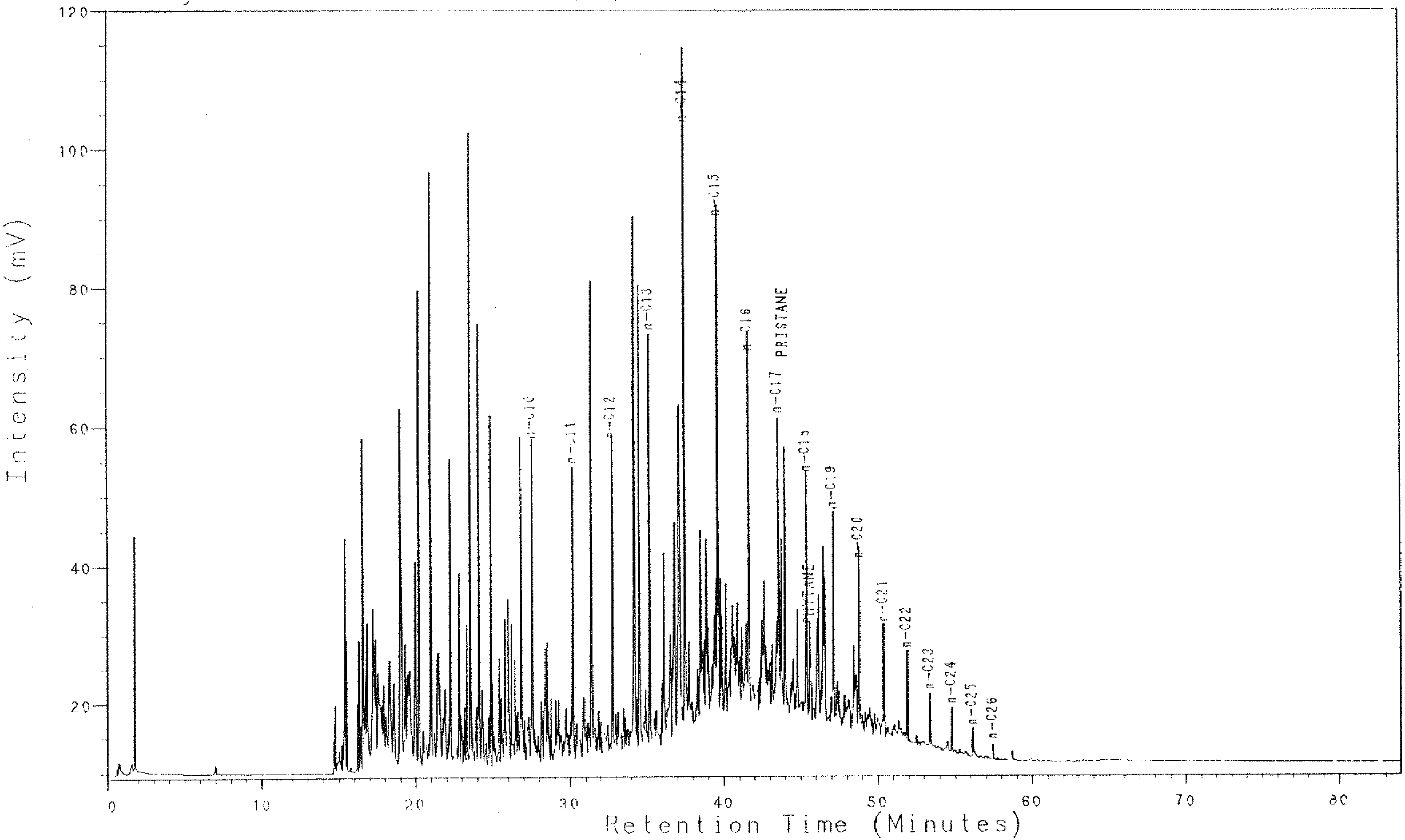
Analysis PV5900021   26, 1, 1   30/6-9, 2462.74m



NOCS 30/6-9 2462.74m
THERMAL EXTRACTION GC (S1)
S/SST:pl brn

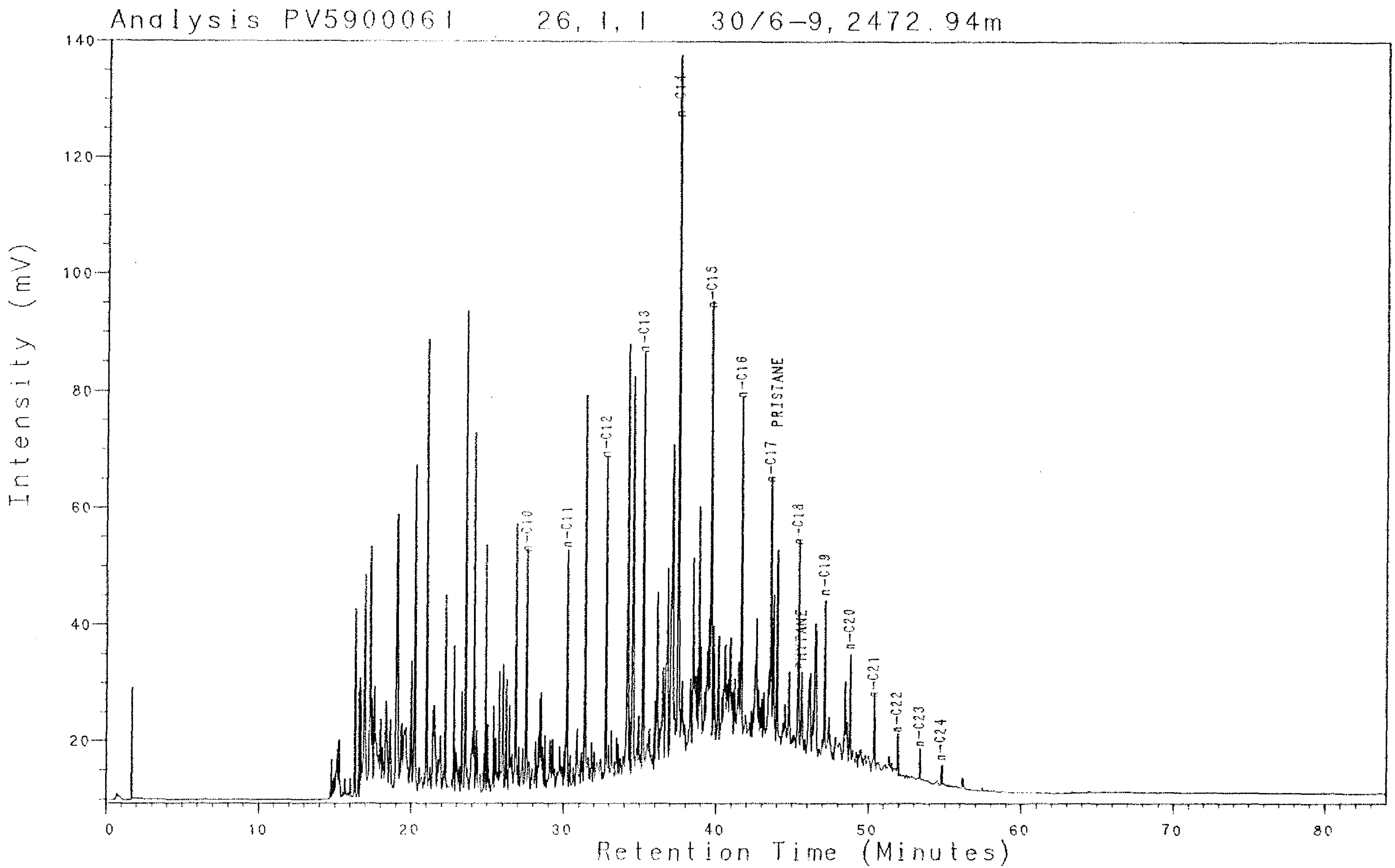
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5900051 26, 1, 1 30/6-9, 2470.36m



NOCS 30/6-9 2470.36m
THERMAL EXTRACTION GC (S1)
SLTST:pl y brn to lt gy to drk gy

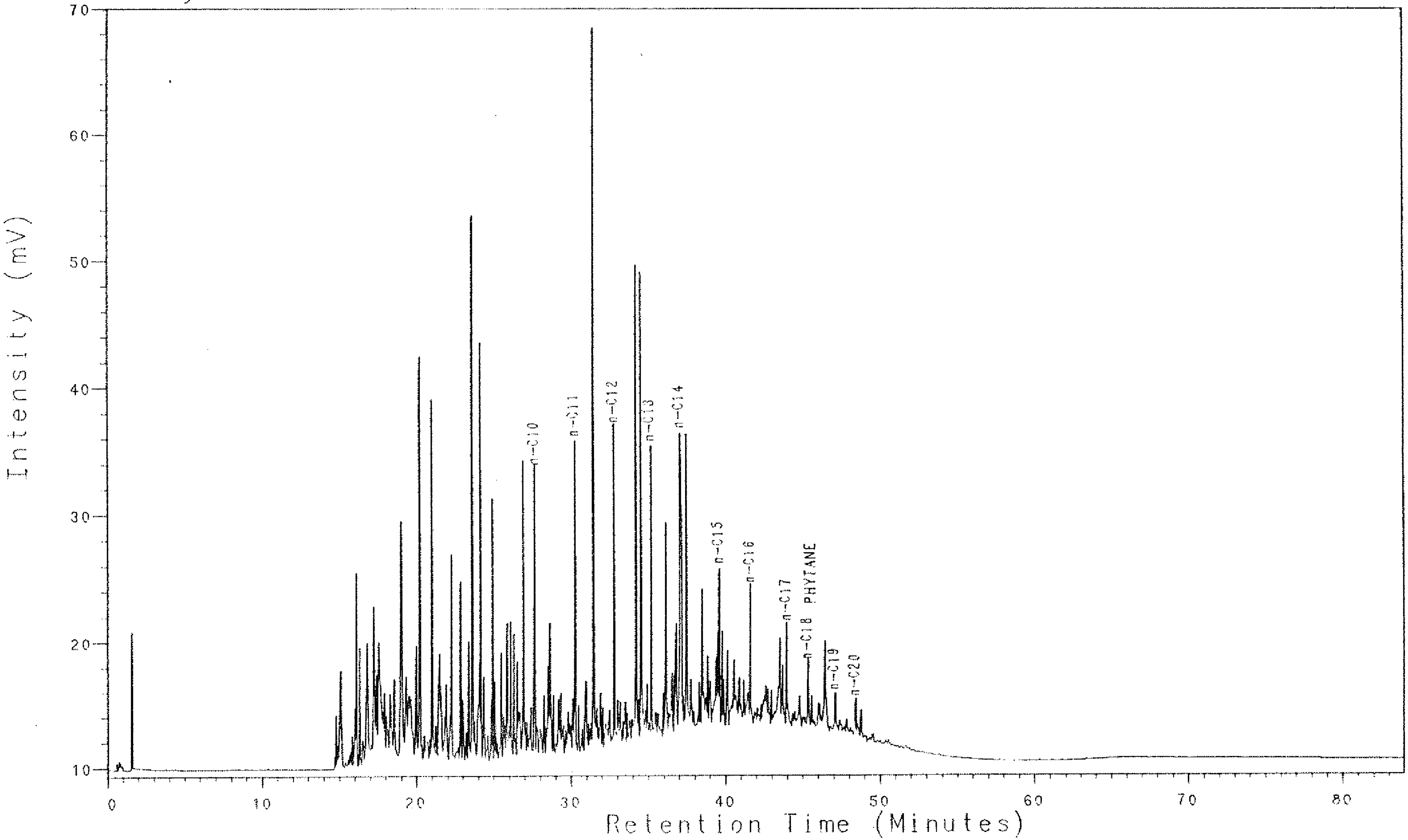
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 2472.94m
THERMAL EXTRACTION GC (S1)
SLTST:drk gy to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

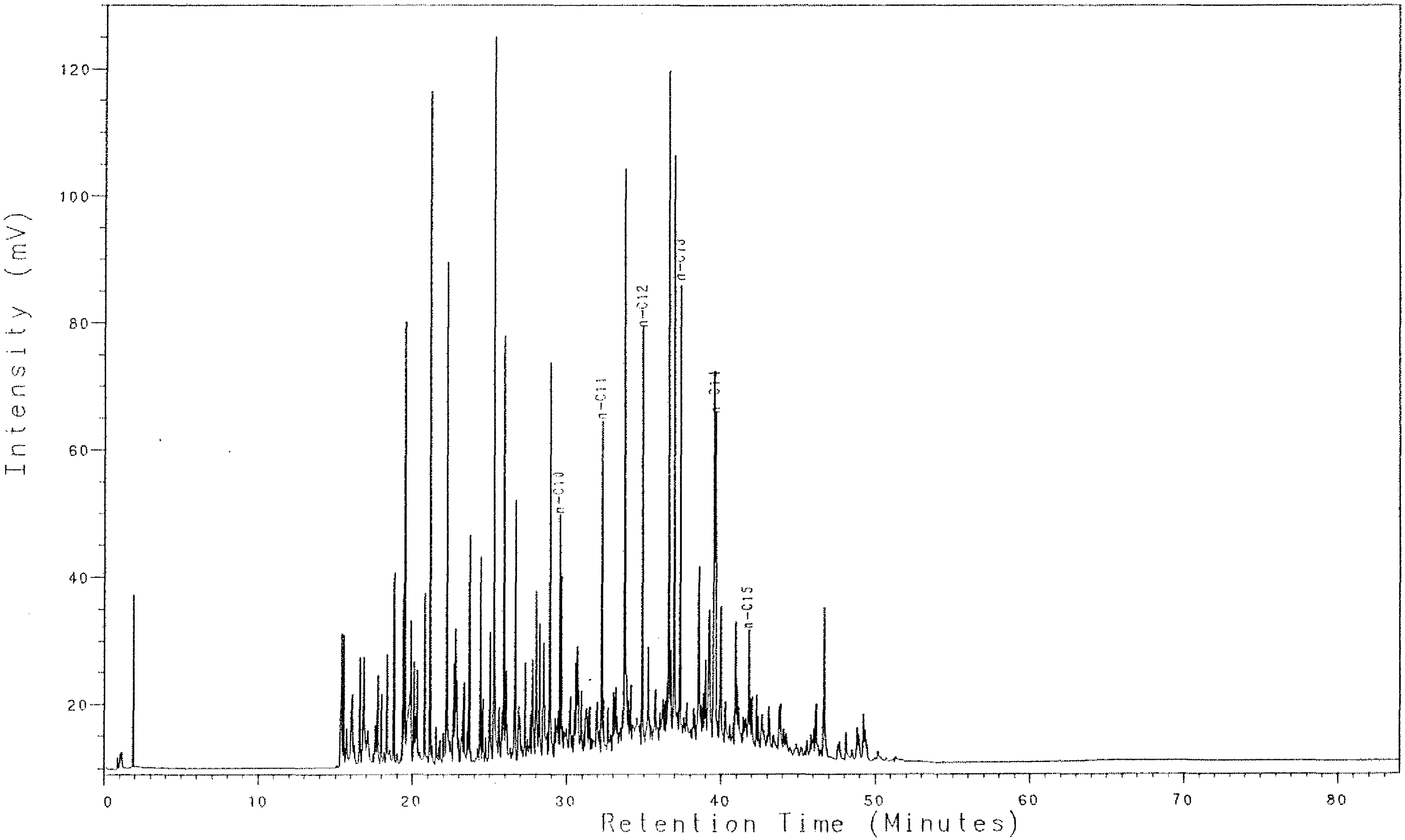
Analysis PV5900071   26, 1, 1   30/6-9, 2474m



NOCS 30/6-9 2474m
THERMAL EXTRACTION GC (S1)
CLST:drk gy to brn blk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

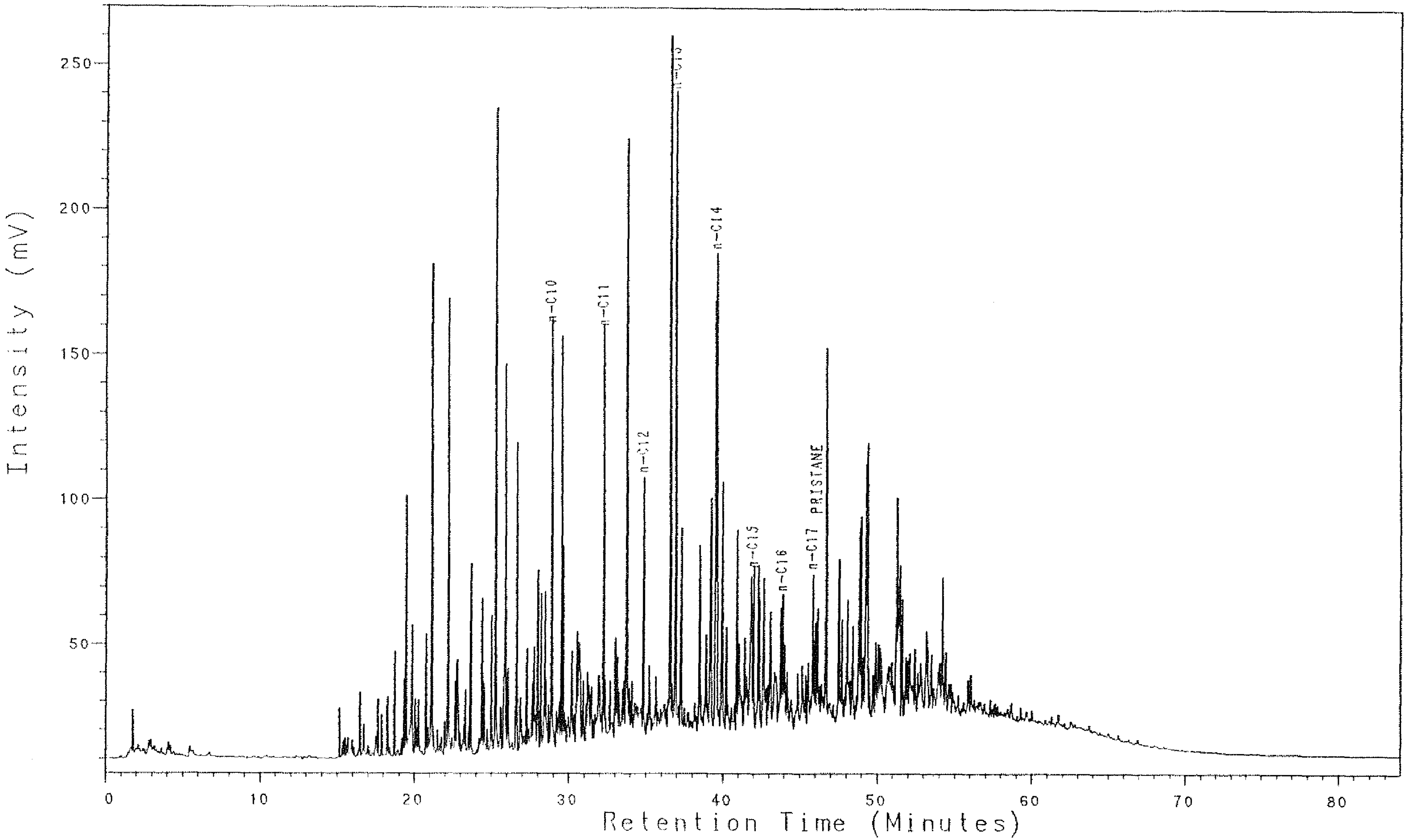
Analysis PV590081   26, 1, 1   30/6-9, 2476m



NOCS 30/6-9 2476m
THERMAL EXTRACTION GC (S1)
COAL ``lk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

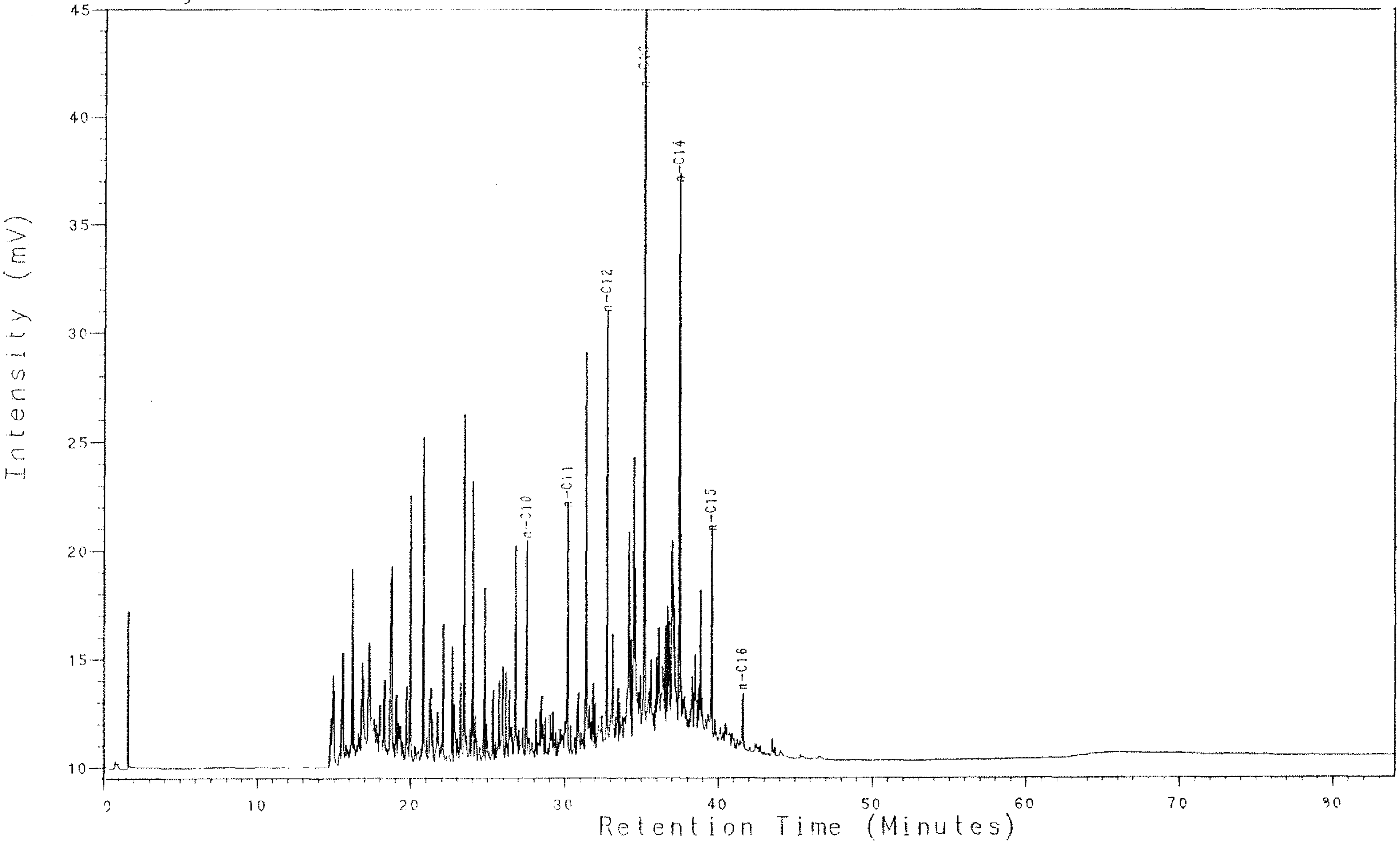
Analysis PV5900091 26, 1, 1 30/6-9, 2478m



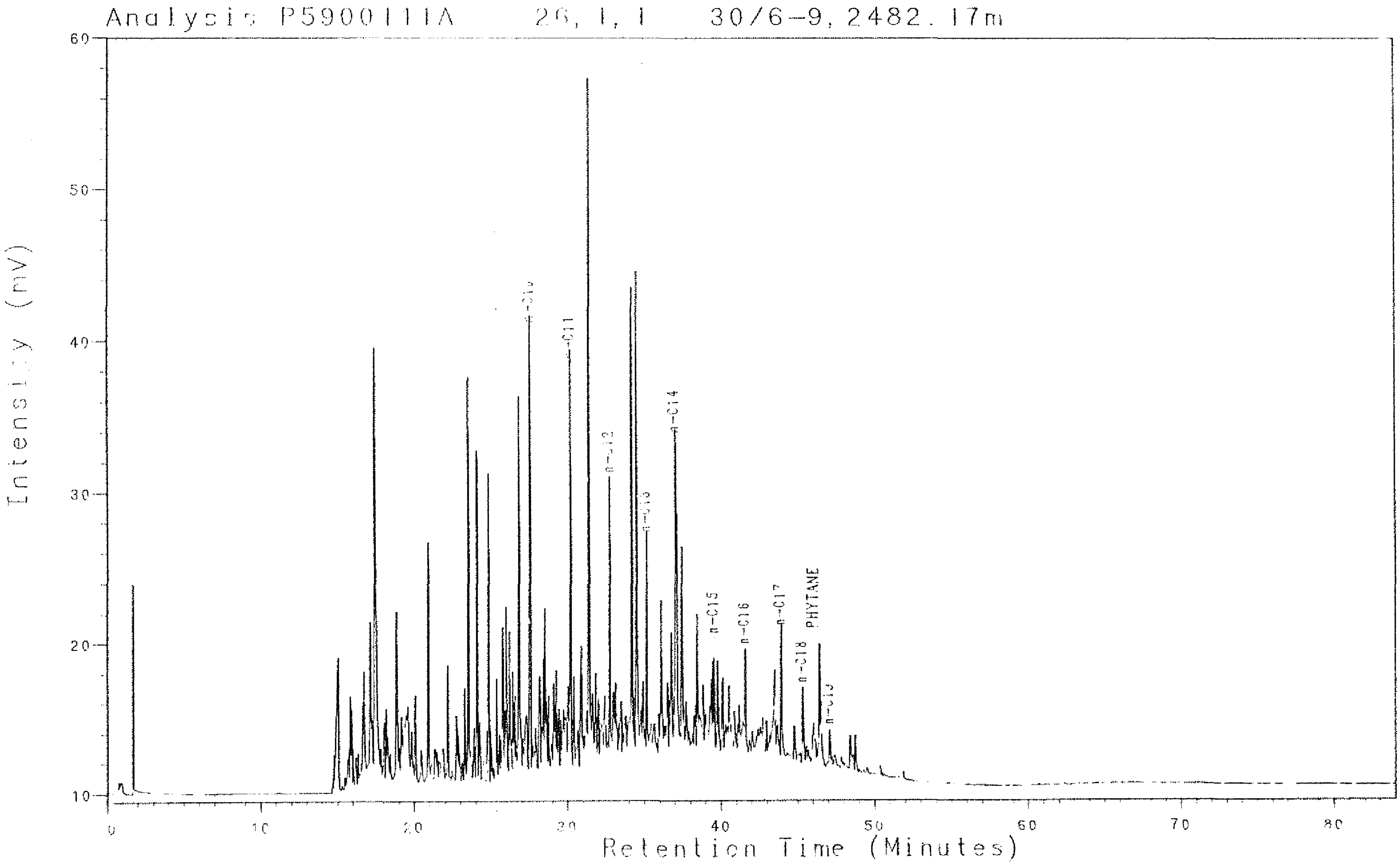
NOCS 30/6-9 2478m
THERMAL EXTRACTION GC (S1)
COAL:blk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5900101 26, 1, 1 30/6-9, 2480m



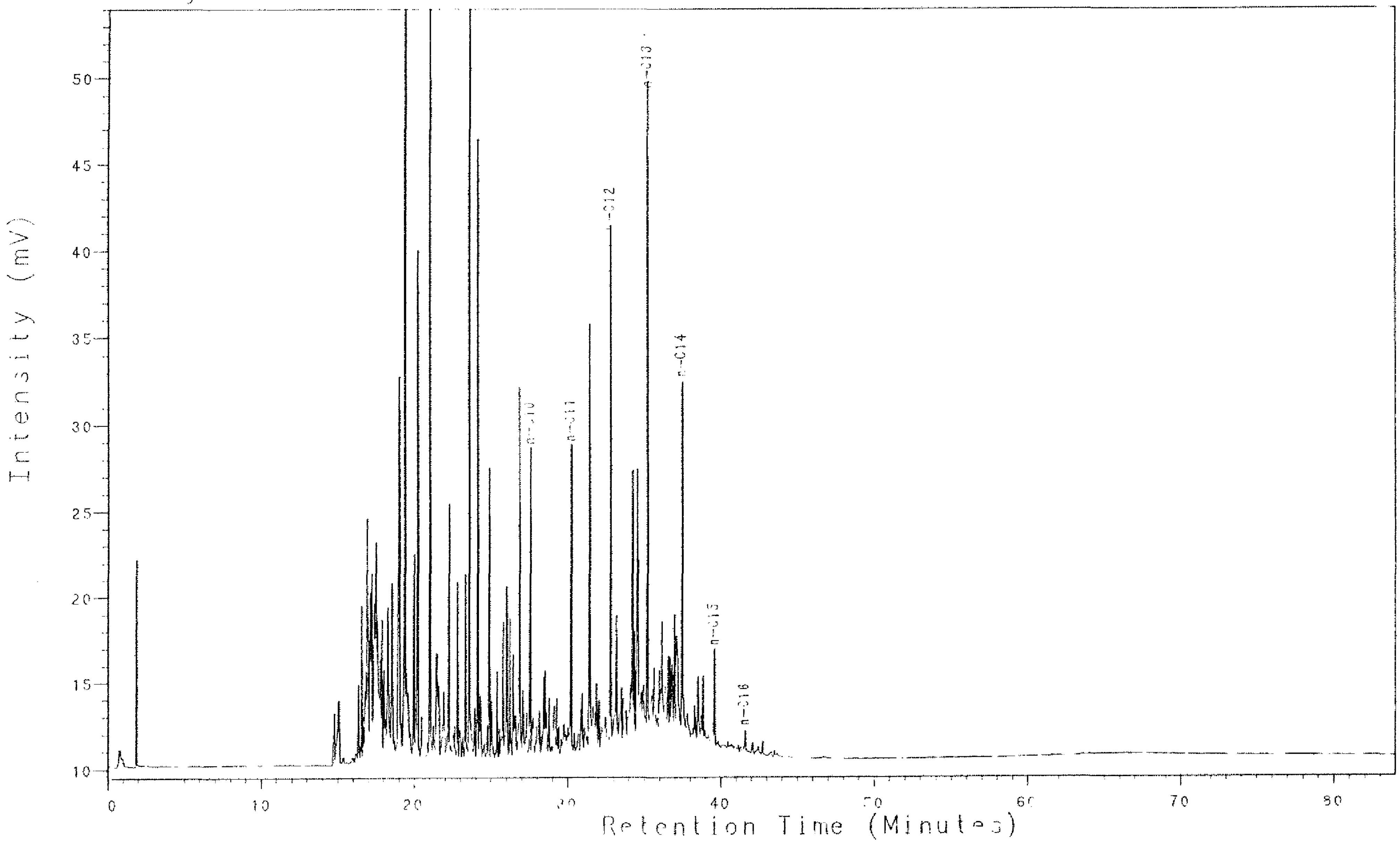
NOCS 30/6-9 2480m
THERMAL EXTRACTION GC (S1)
SLTST:lt brn gy to brn gy



NOCS 30/6-9 2482.17m
THERMAL EXTRACTION GC (S1)
CLST:drk gy to brn blk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

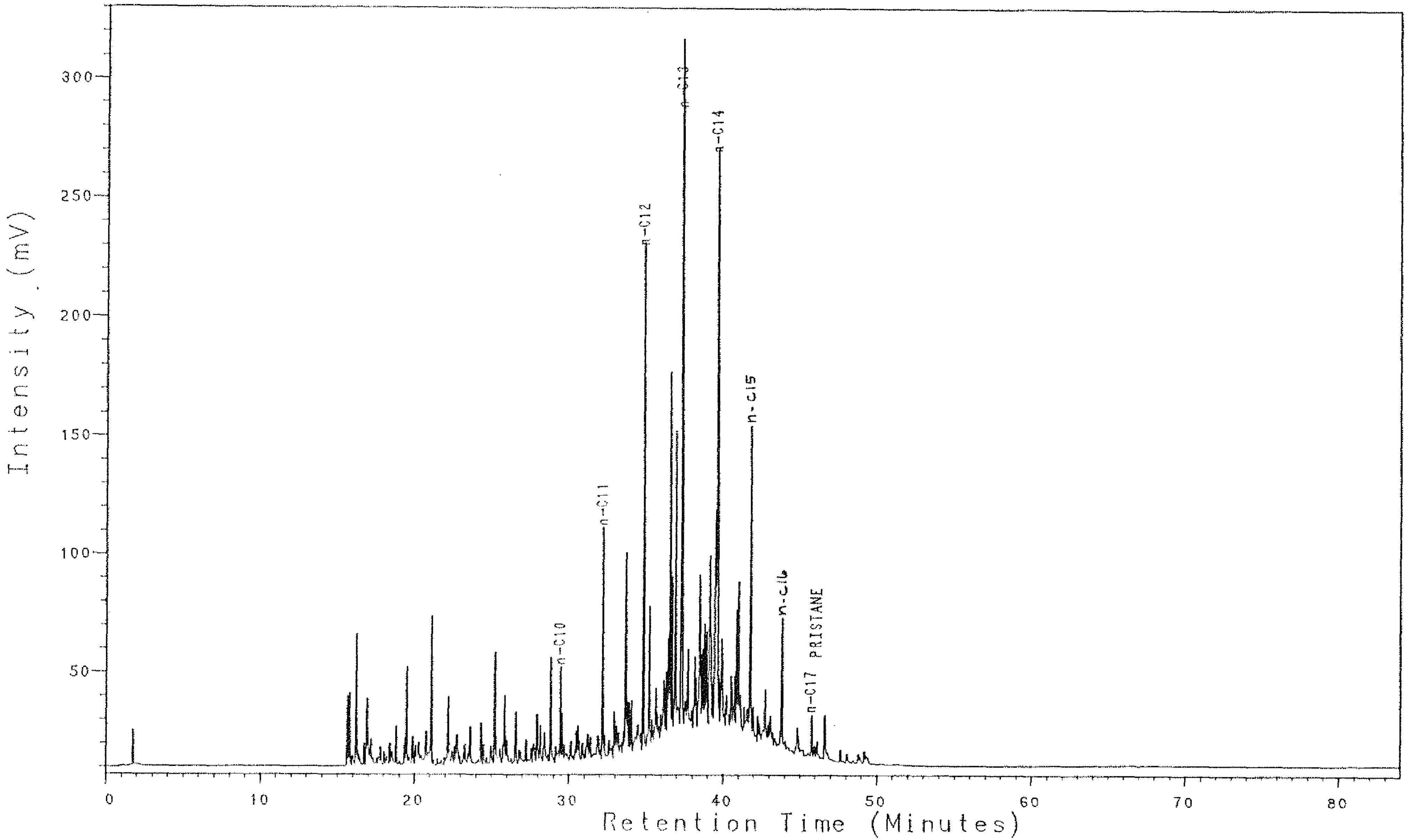
Analysis FV5900121   26, 1, 1   30/6-9, 2484m



NOCS   30/6-9   2484m
THERMAL EXTRACTION GC (S1)
CLST:drk gy to dsk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

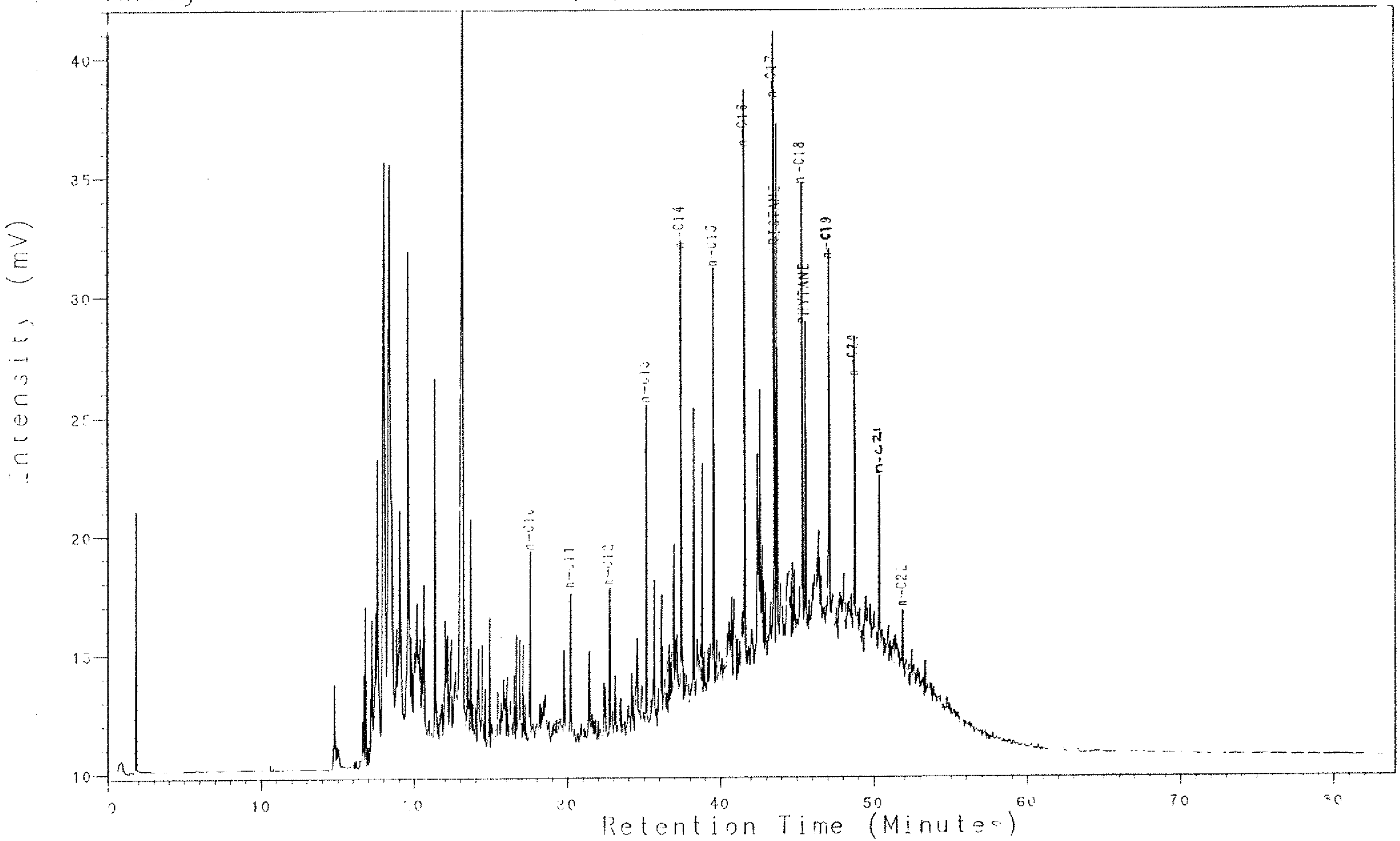
Analysis PV5900131 26, 1, 1 30/6-9, 2486.39m



NOCS 30/6-9 2486.39m
THERMAL EXTRACTION GC (S1)
SLIST: brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

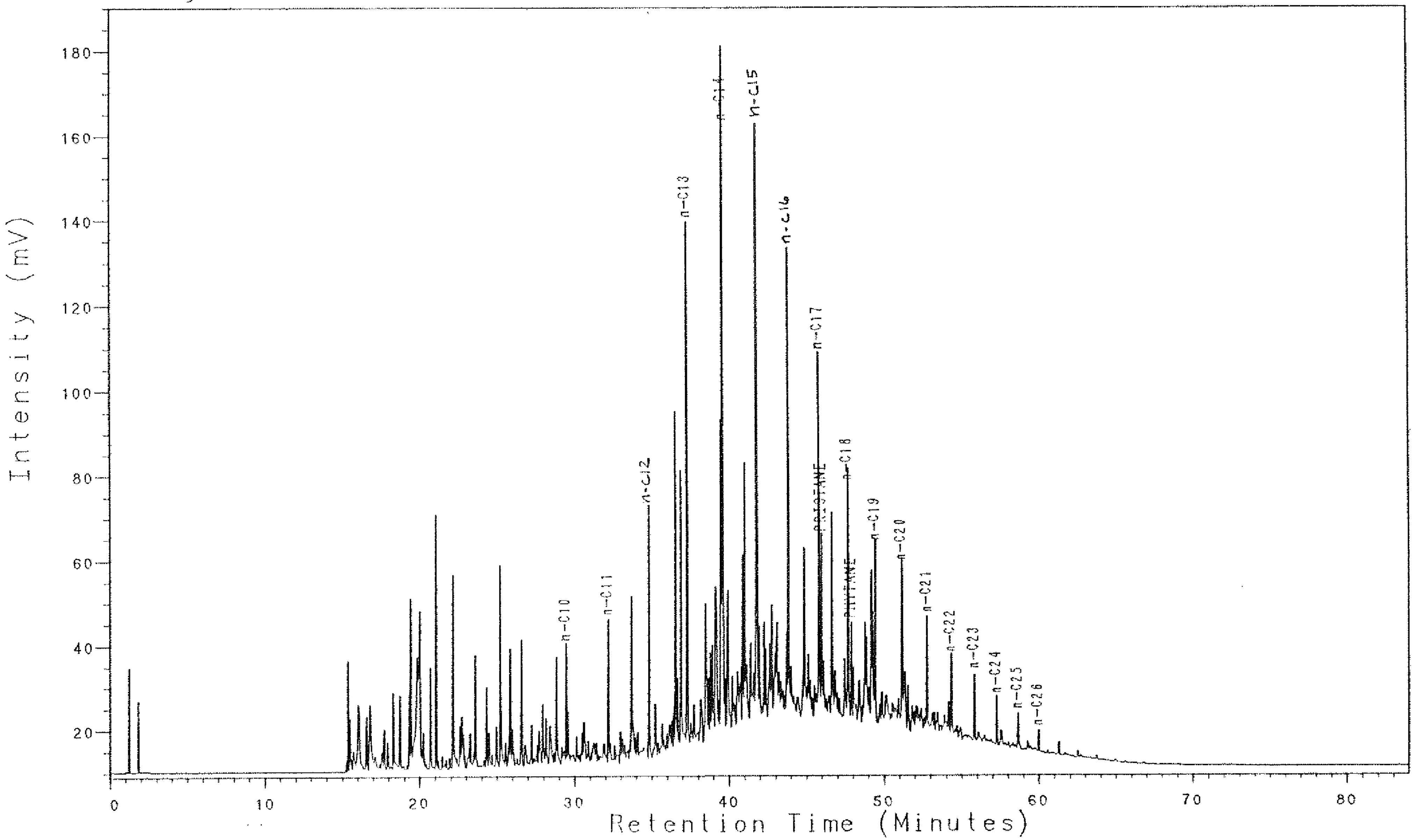
Analysis PV5900141   26, 1, 1   30/6-9, 2488.4m



NOCS 30/6-9 2488.4m
THERMAL EXTRACTION GC (S1)
S/SST:lt or

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

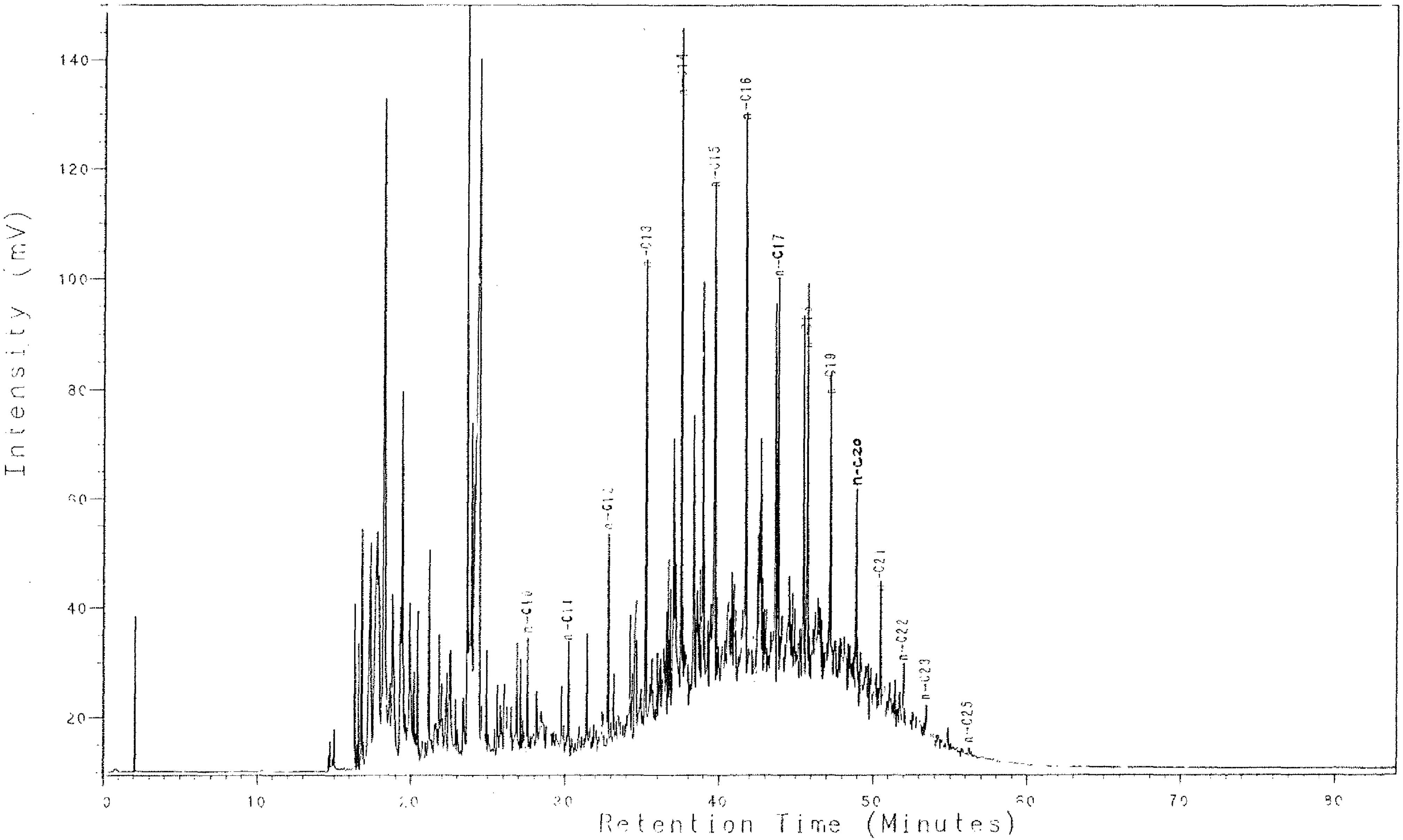
Analysis PV5900151 26, 1, 1 30/6-9, 2491.5m



NOCS 30/6-9 2491.5m
THERMAL EXTRACTION GC (S1)
S/CST: lt or to or gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

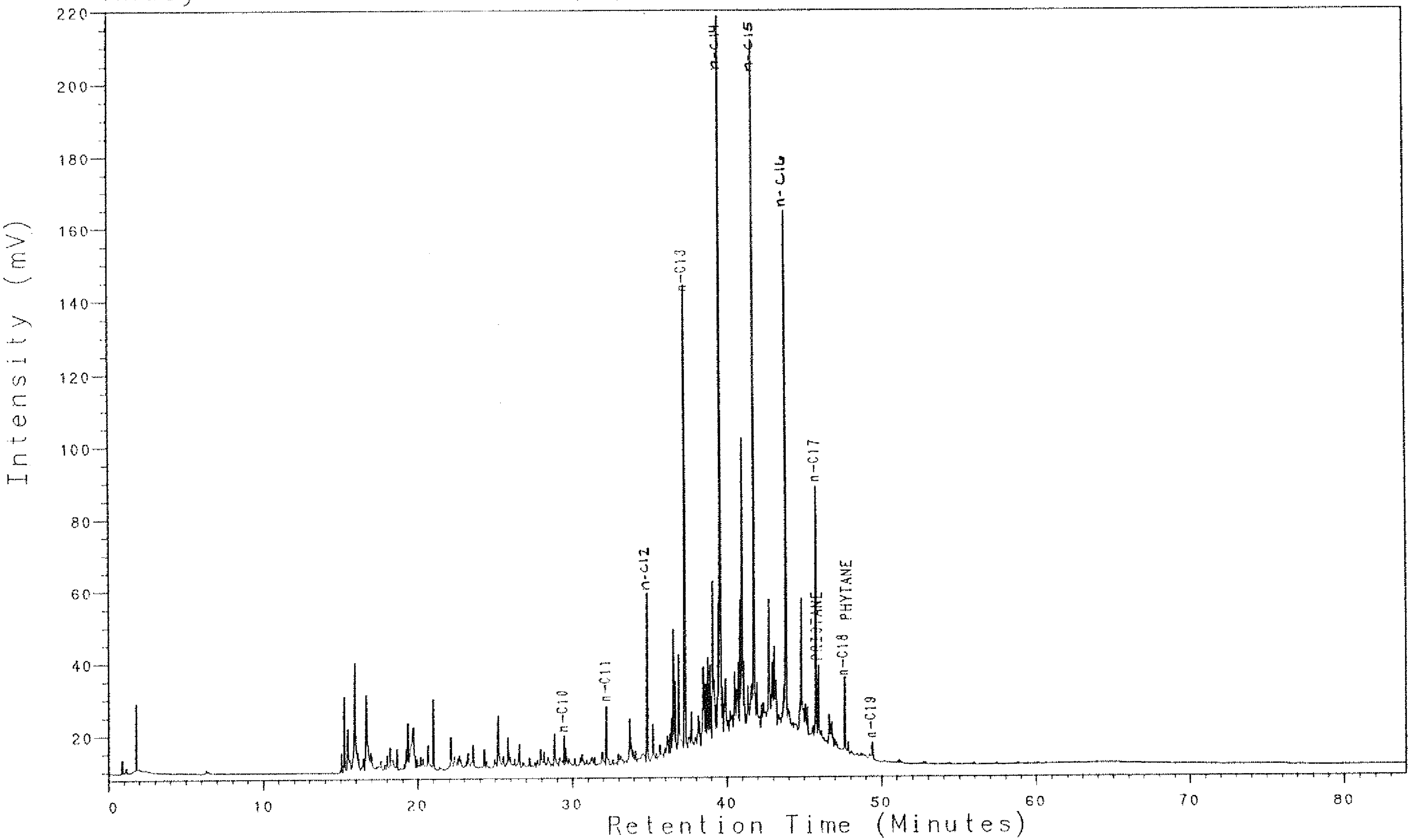
Analysis PV5900171 26, 1, 1 30/6-9, 2496.56m



NOCS 30/6-9 2496.56m
THERMAL EXTRACTION GC (S1)
S/SST:lt or to pl y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

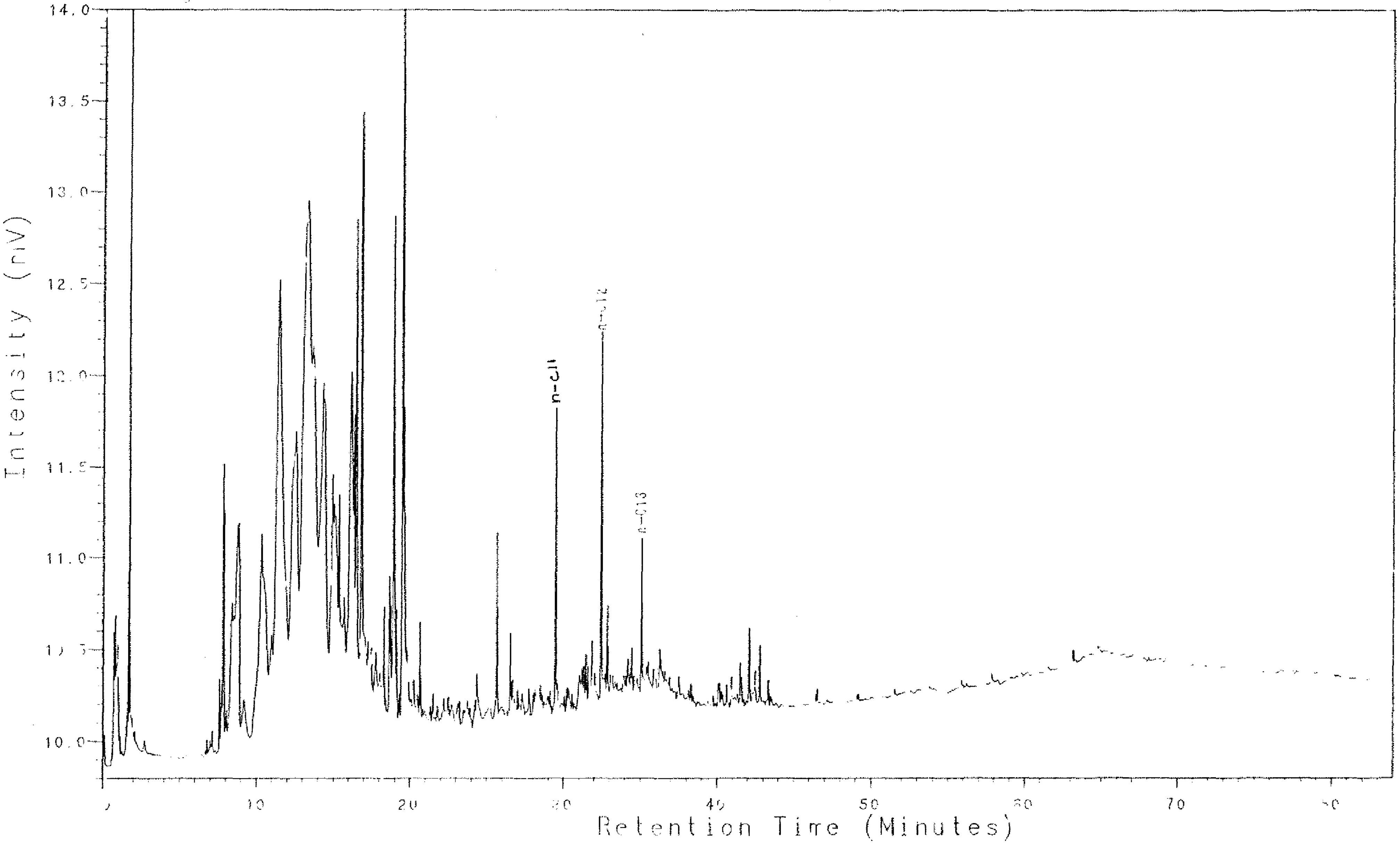
Analysis PV5900221 26, 1, 1 30/6-9, 2501.5m



NOCS 30/6-9 2501.5m
THERMAL EXTRACTION GC (S1)
SLTST: lt brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

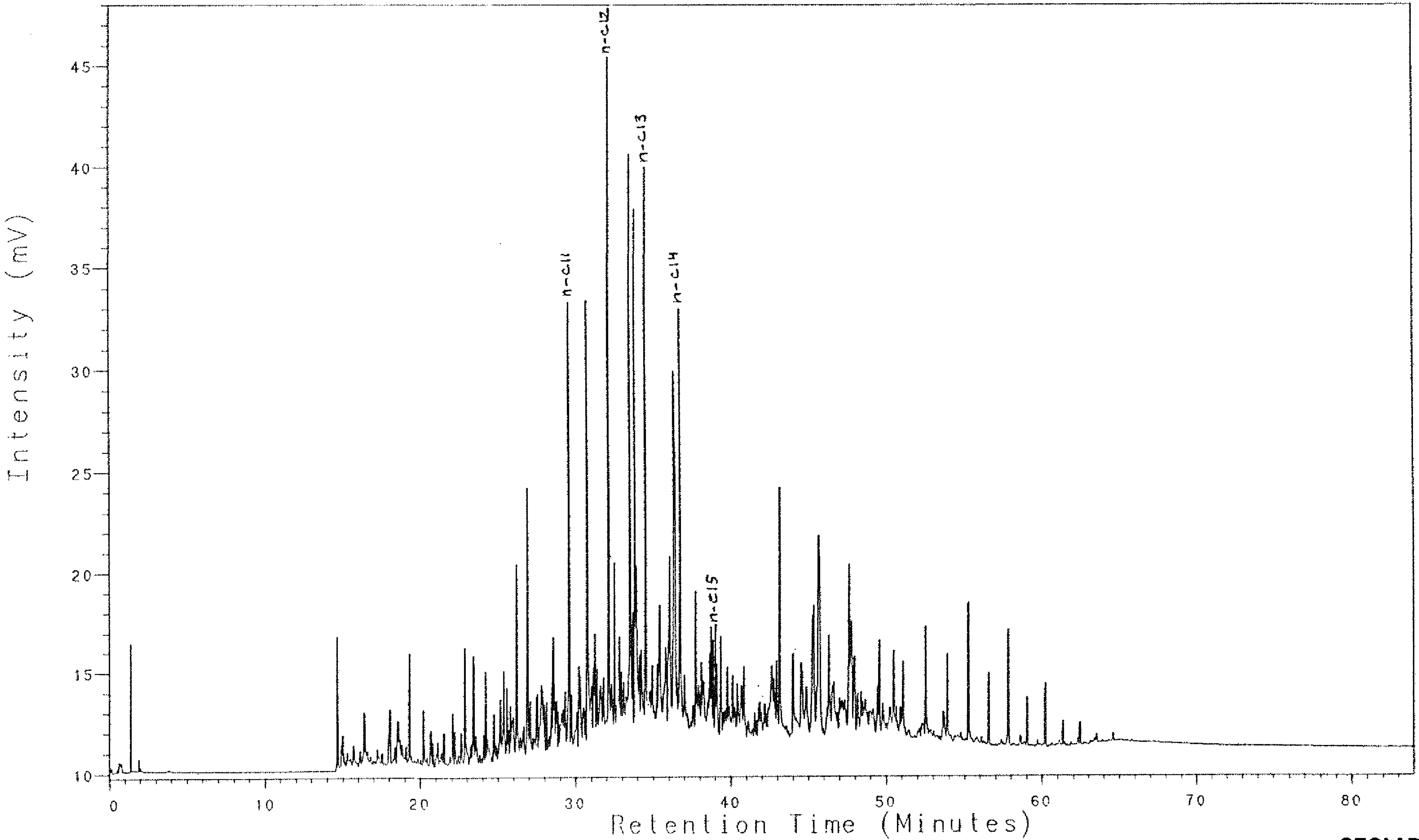
Analysis PV5900181 26, 1, 1 30/6-9, 2504.5m



NOCS 30/6-9 2504.5m
THERMAL EXTRACTION GC (S1)
CLST: lt brn gy to brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

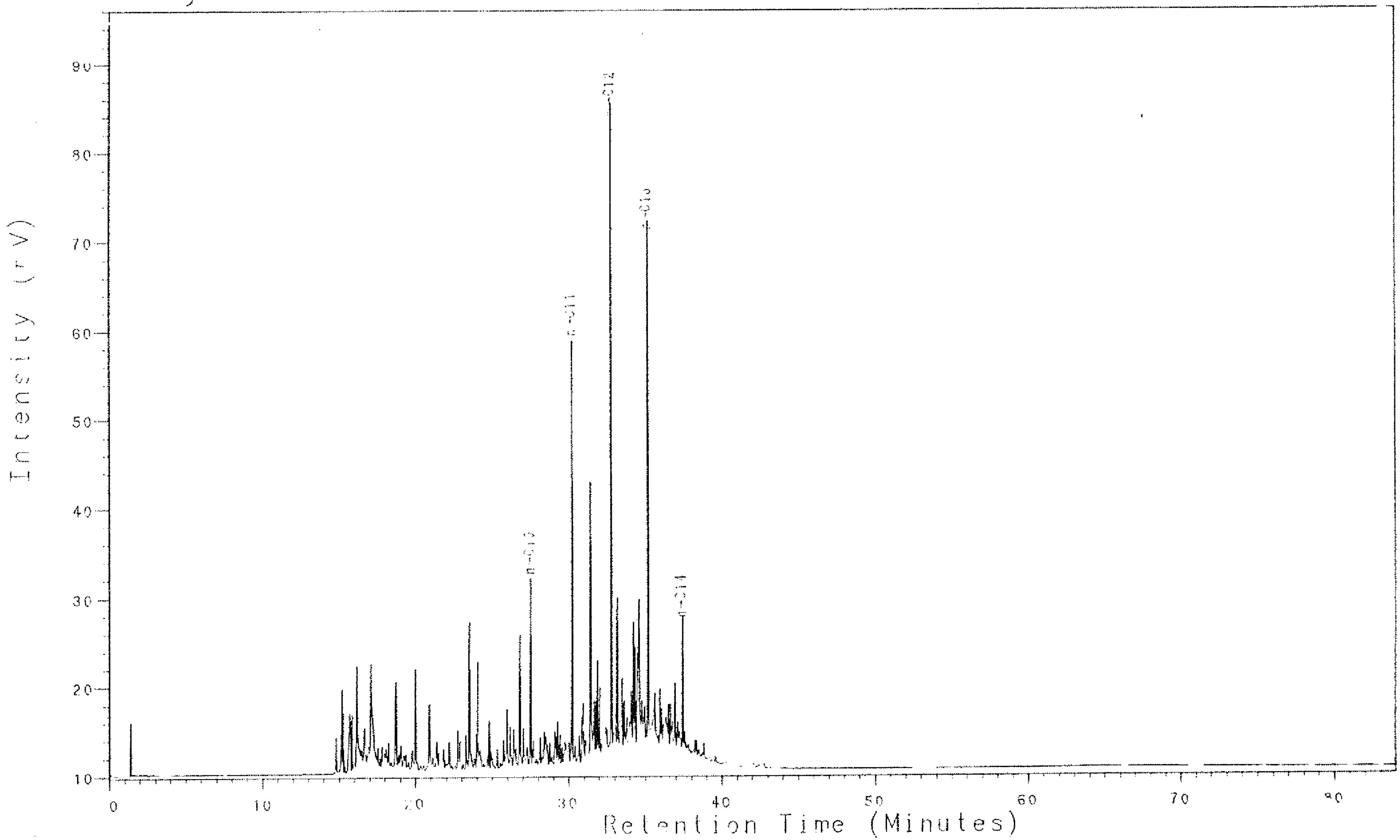
Analysis PV5900191 26, 1, 1 30/6-9, 2507.5m



NOCS 30/6-9 2507.5m
THERMAL EXTRACTION GC (S1)
COAL;blk to brn blk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

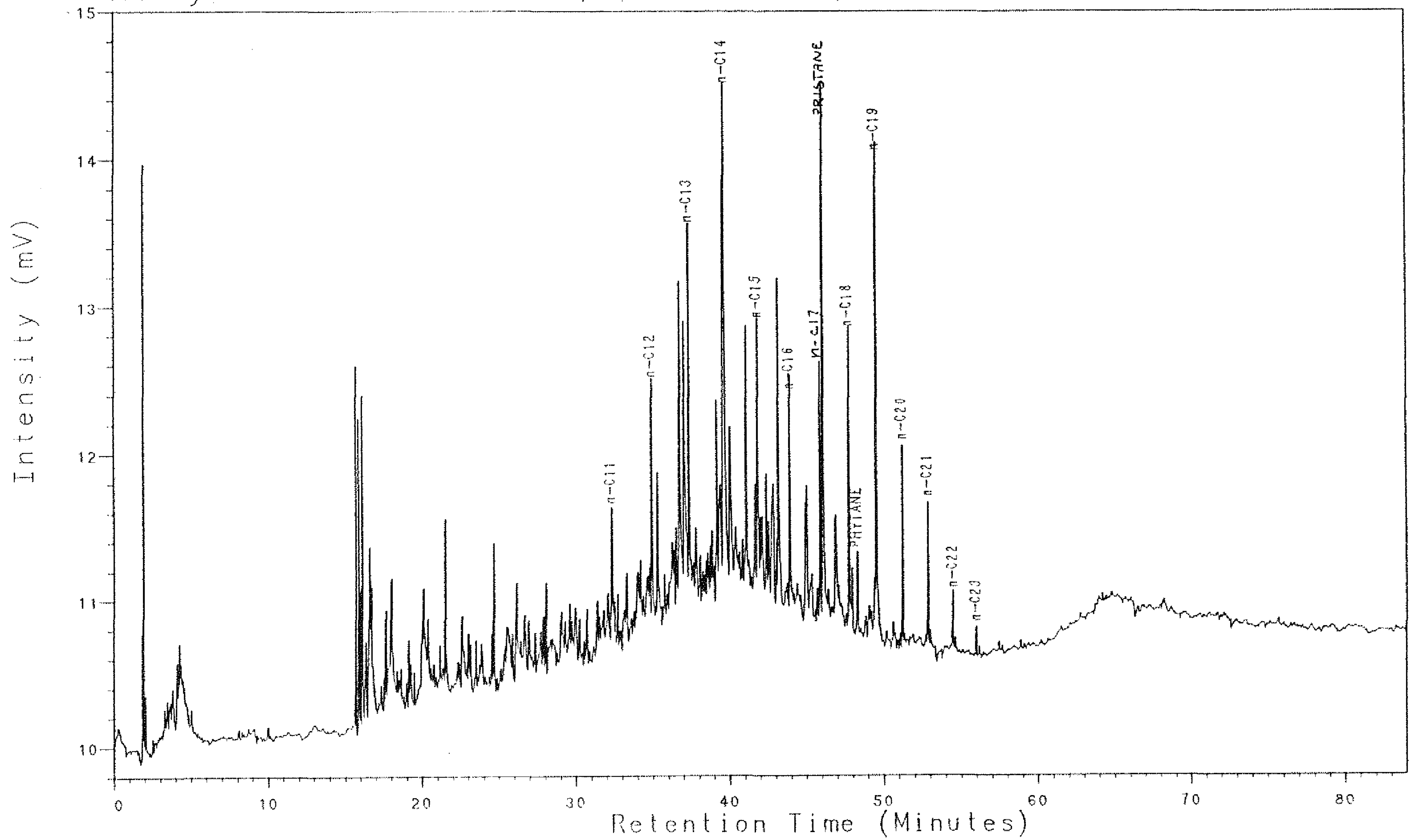
Analysis PV5900231 26, 1, 1 30/6-9, 2515.5m



NOCS 30/6-9 2515.5m
THERMAL EXTRACTION GC (S1)
CLST:brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

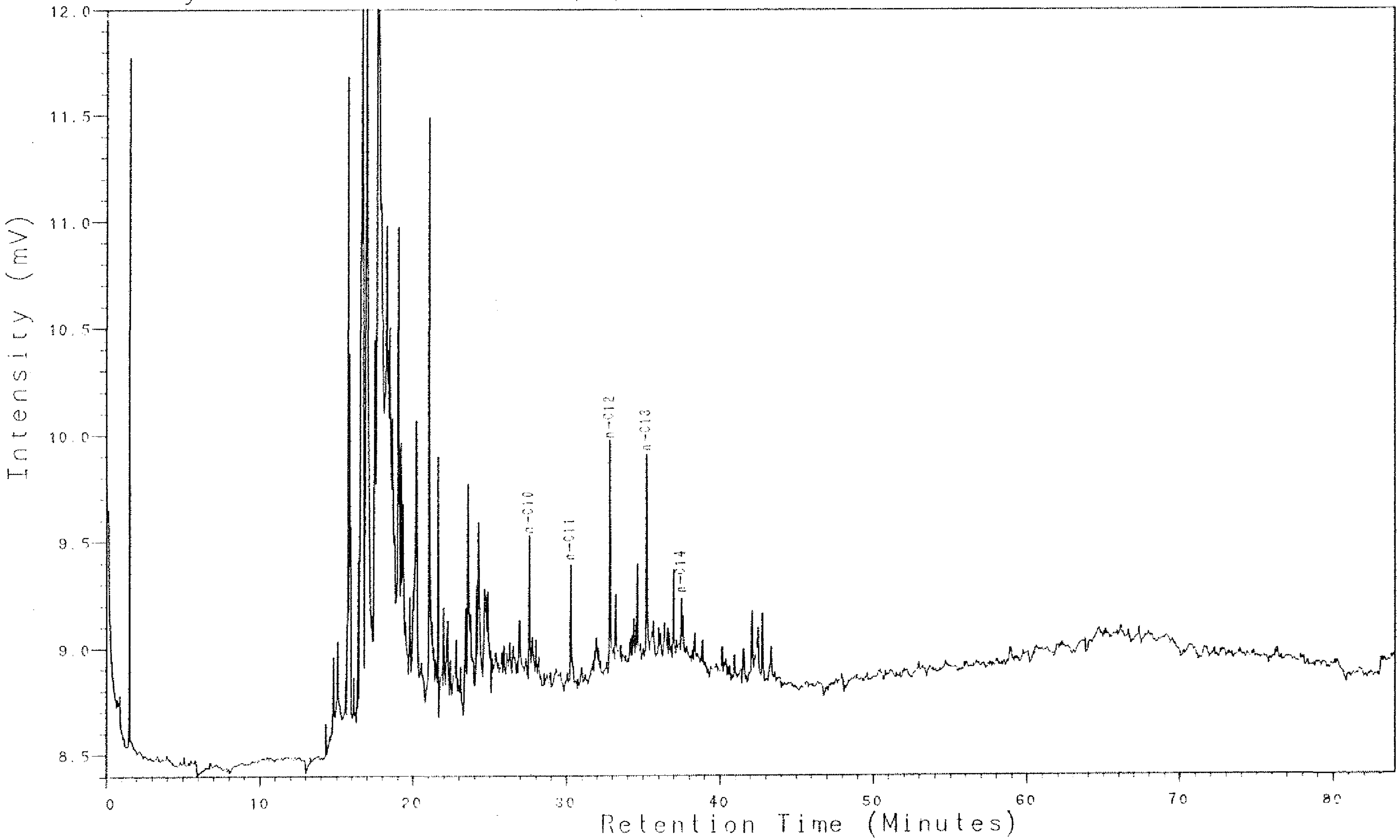
Analysis PV5900241 26,1,1 30/6-9,2518.5m



NOCS 30/6-9 2518.5m
THERMAL EXTRACTION GC (S1)
CLST:drk gy to brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

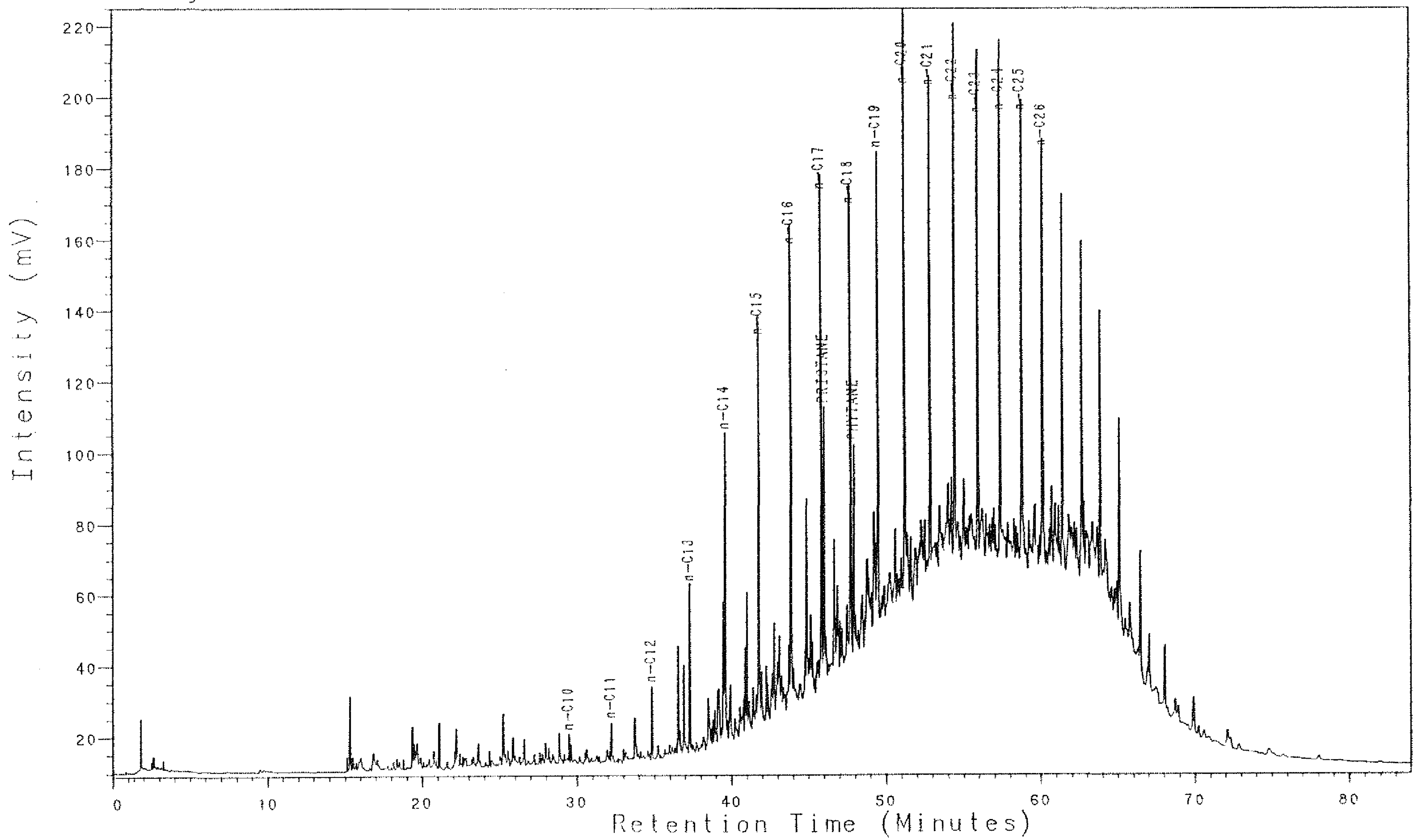
Analysis PV5900271   26, 1, 1   30/6-9, 2527.5m



NOCS   30/6-9   2527.5m
THERMAL EXTRACTION GC (S1)
CLST:brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

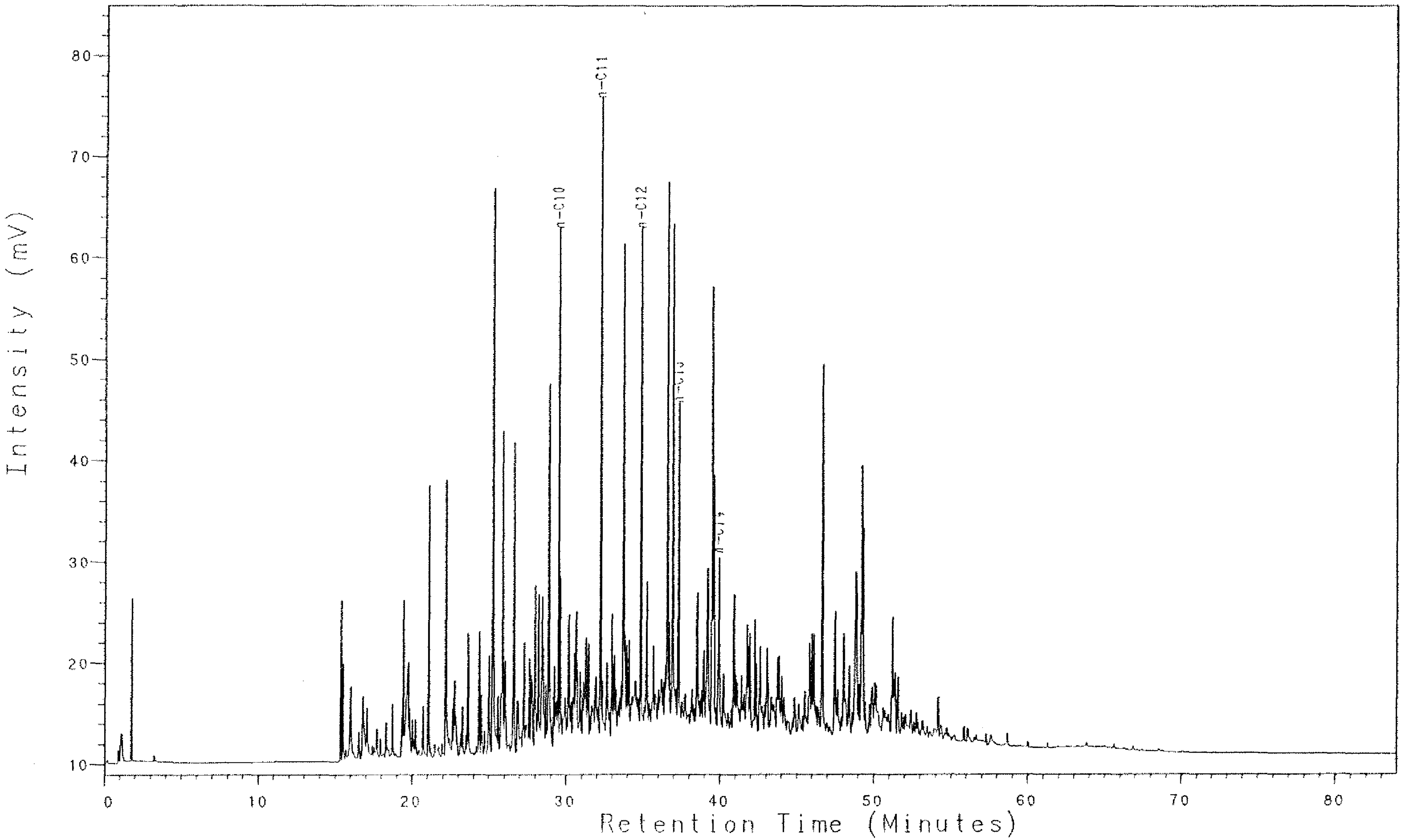
Analysis PV5900291 26, 1, 1 30/6-9, 2532, 26m



NOCS 30/6-9 2532.26m
THERMAL EXTRACTION GC (S1)
S/SST:brn gy,lt or

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

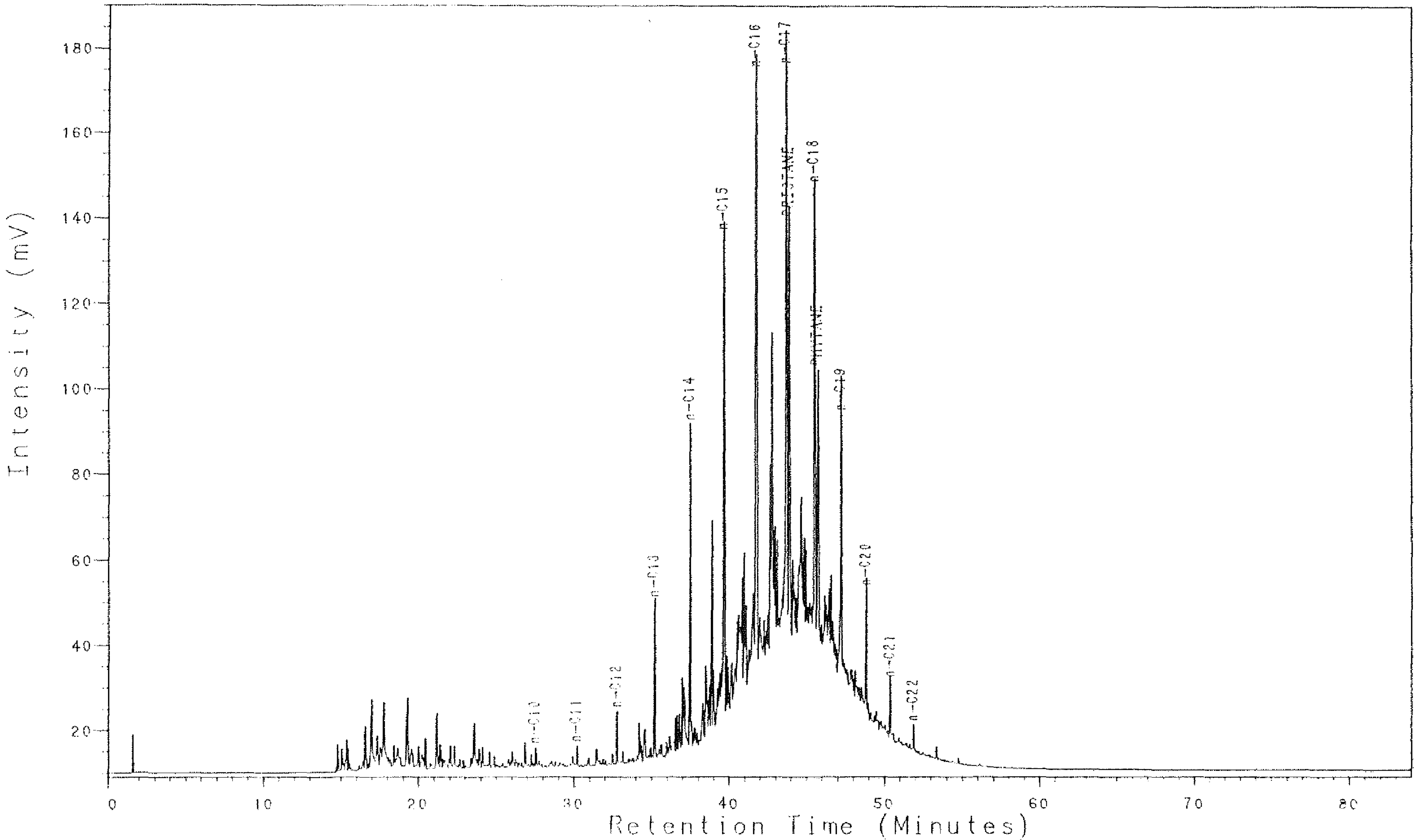
Analysis PV5900300 26, 1, 1 30/6-9, 2535m



NOCS 30/6-9 2535m
THERMAL EXTRACTION GC (S1)
BULK

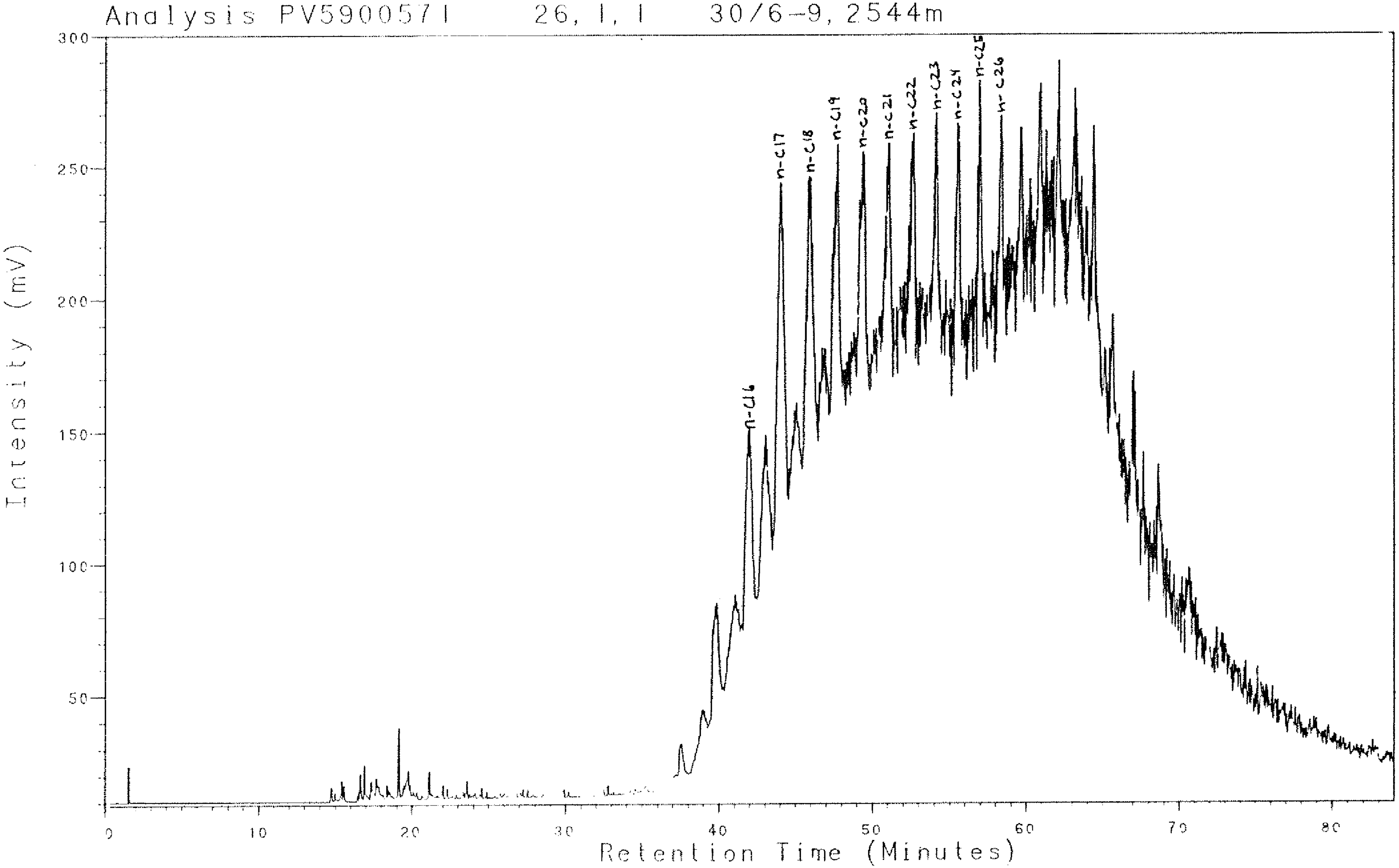
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5900341   26, 1, 1   30/6-9, 2541m



NOCS   30/6-9   2541m
THERMAL EXTRACTION GC (S1)
SLTST:brn gy

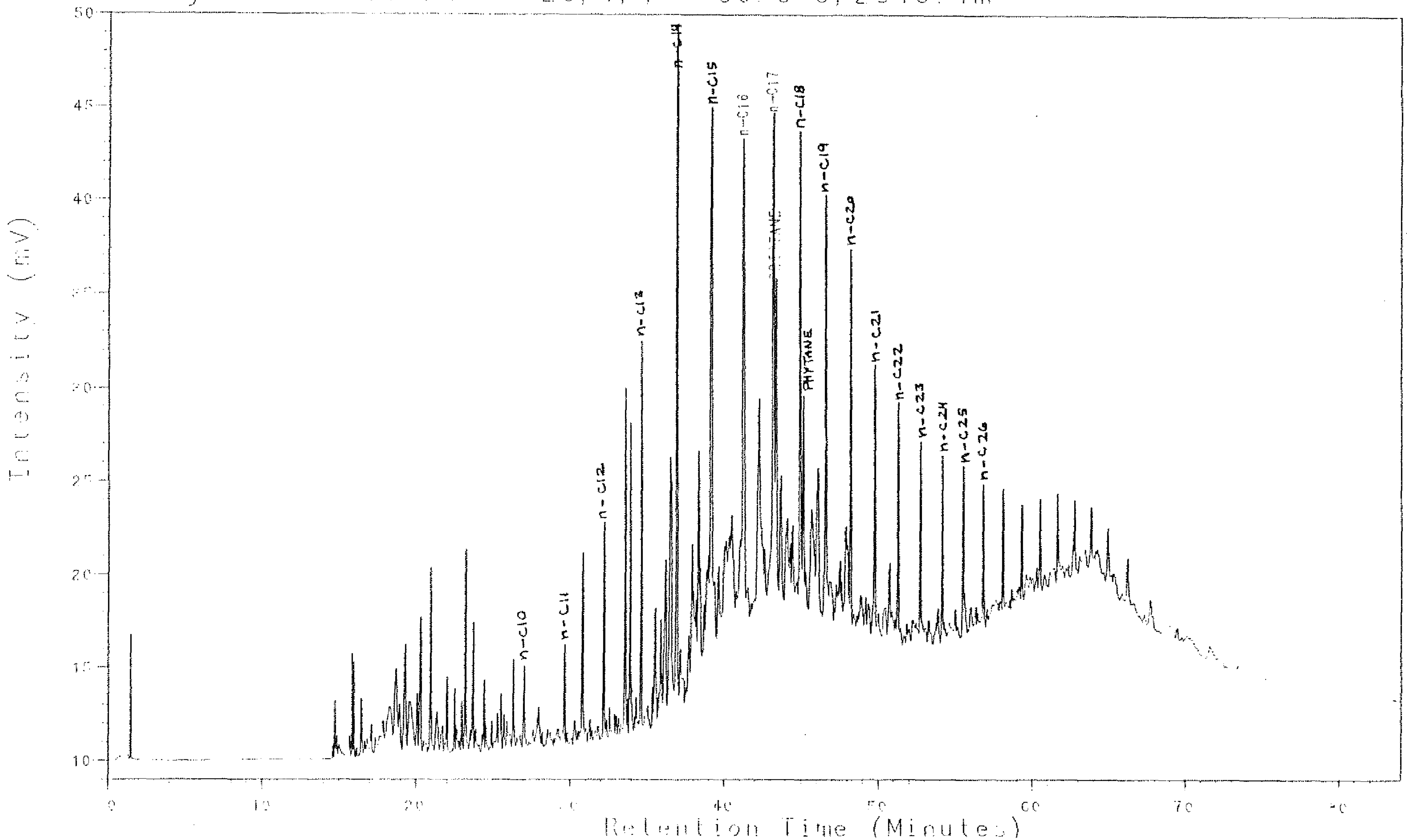
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S



NOCS 30/6-9 2544m
THERMAL EXTRACTION GC (S1)
S/SST:d—k y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

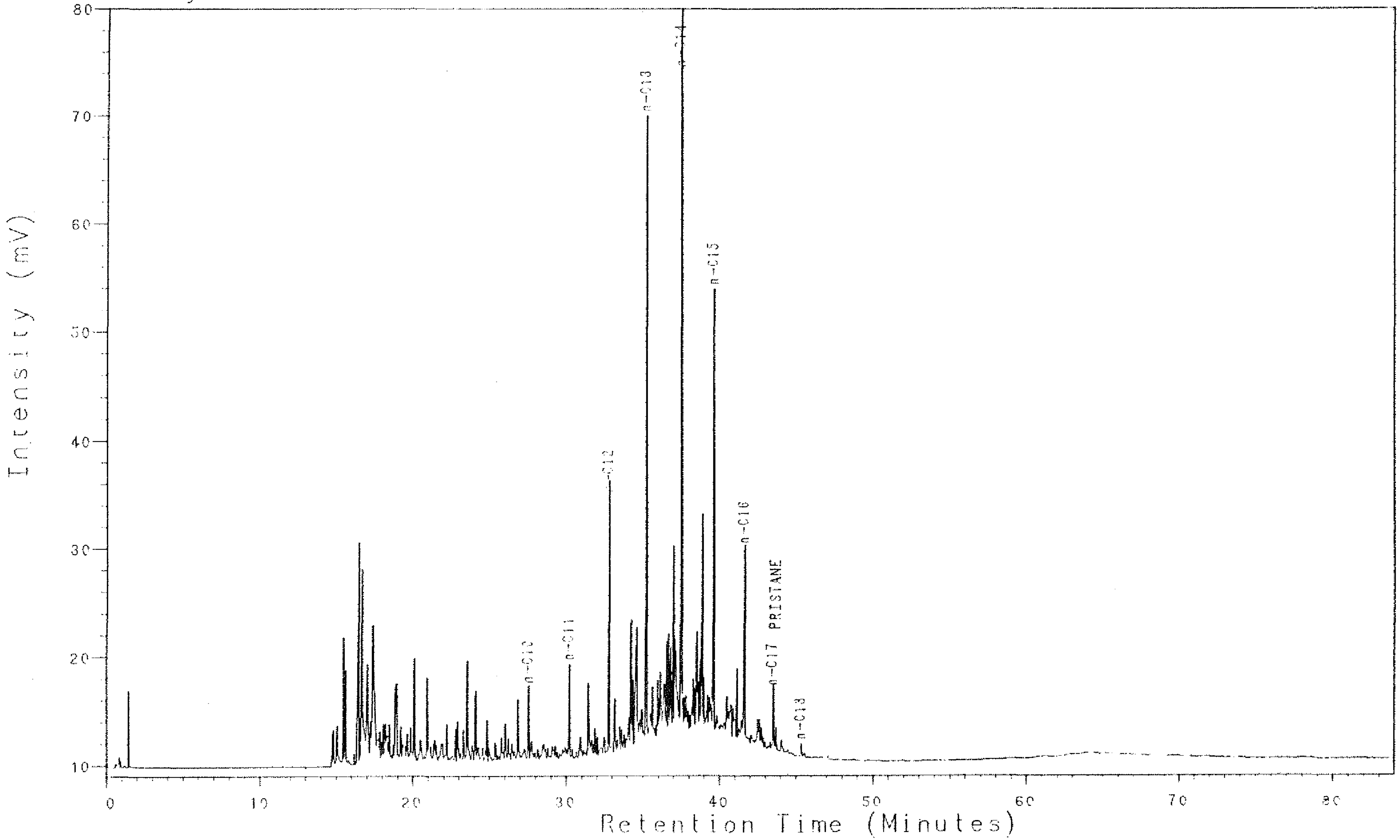
Analysis PV5900321   26, 1, 1   30/6-9, 2546.4m



NOCS 30/6-9 2546.4m
THERMAL EXTRACTION GC (S1)
S/SST:lt or to pl y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

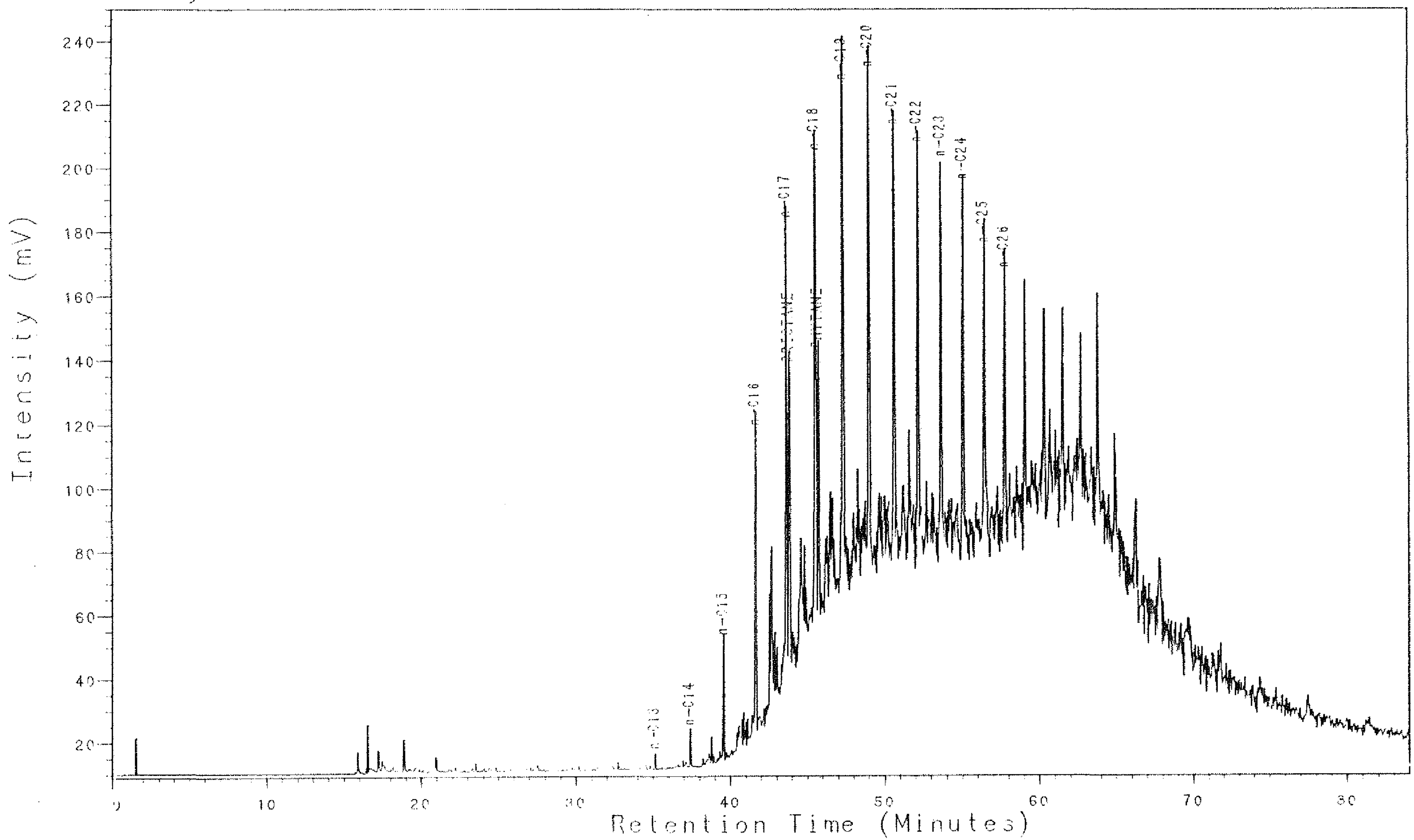
Analysis PV5900361 26, 1, 1 30/6-9, 2551m



NOCS 30/6-9 2551m
THERMAL EXTRACTION GC (S1)
SLTST: b—n gy

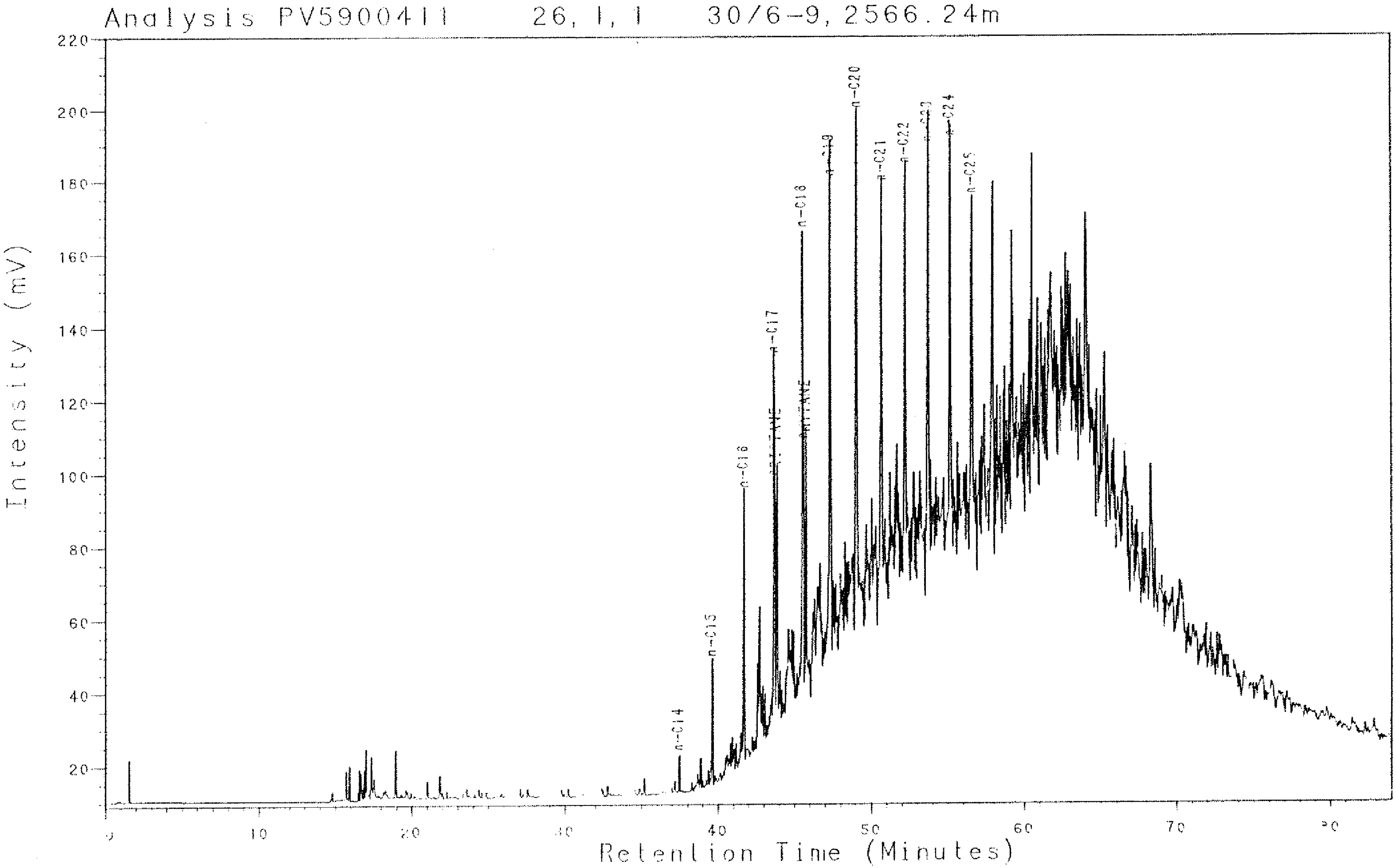
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Analysis PV5900381 26, 1, 1 30/6-9, 2556.1m



NOCS 30/6-9 2556.1m
THERMAL EXTRACTION GC (S1)
S/SST:or gy to lt y brn

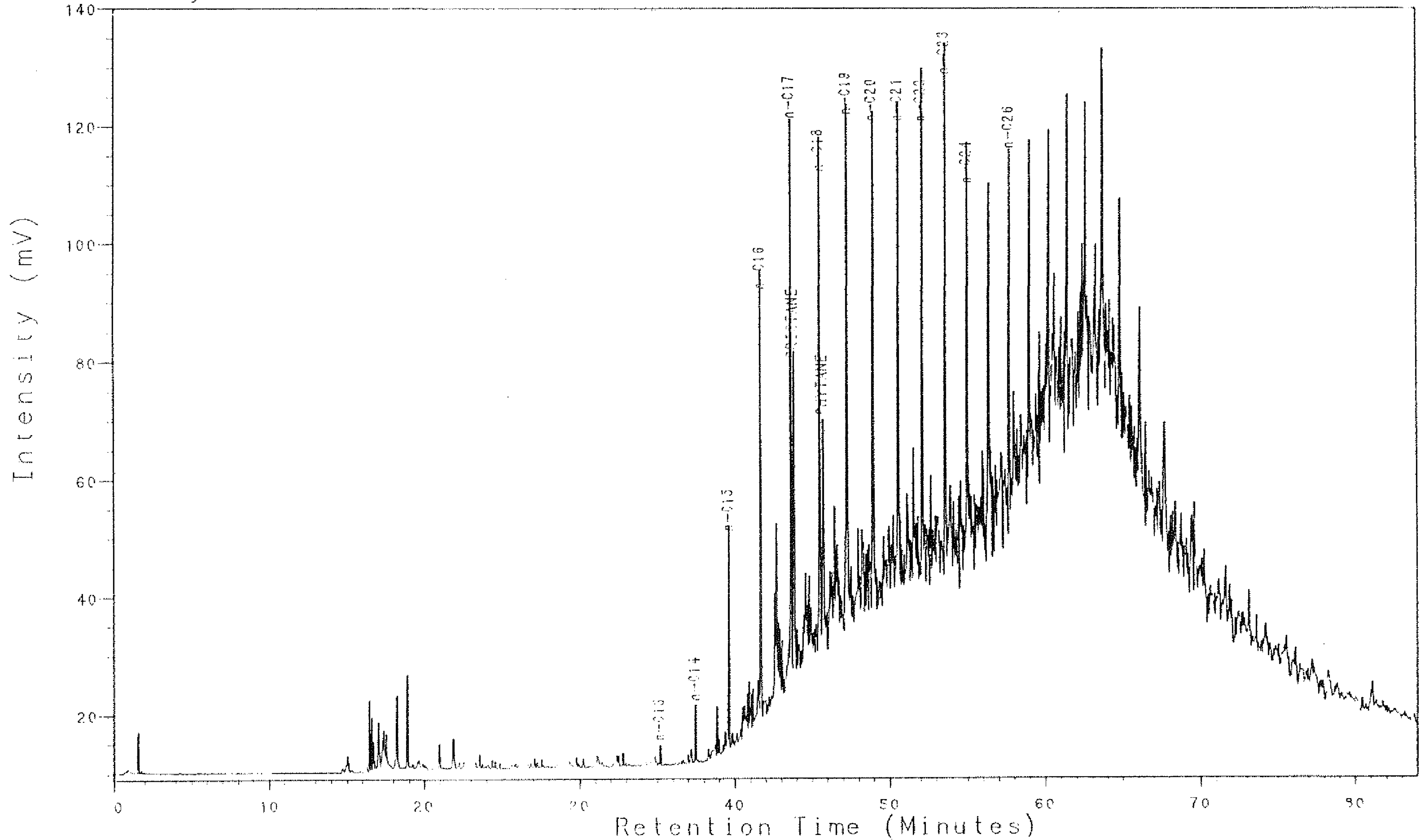
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S



NOCS 30/6-9 2566.24m
THERMAL EXTRACTION GC (S1)
S/SST:m-y brn to drk y brn

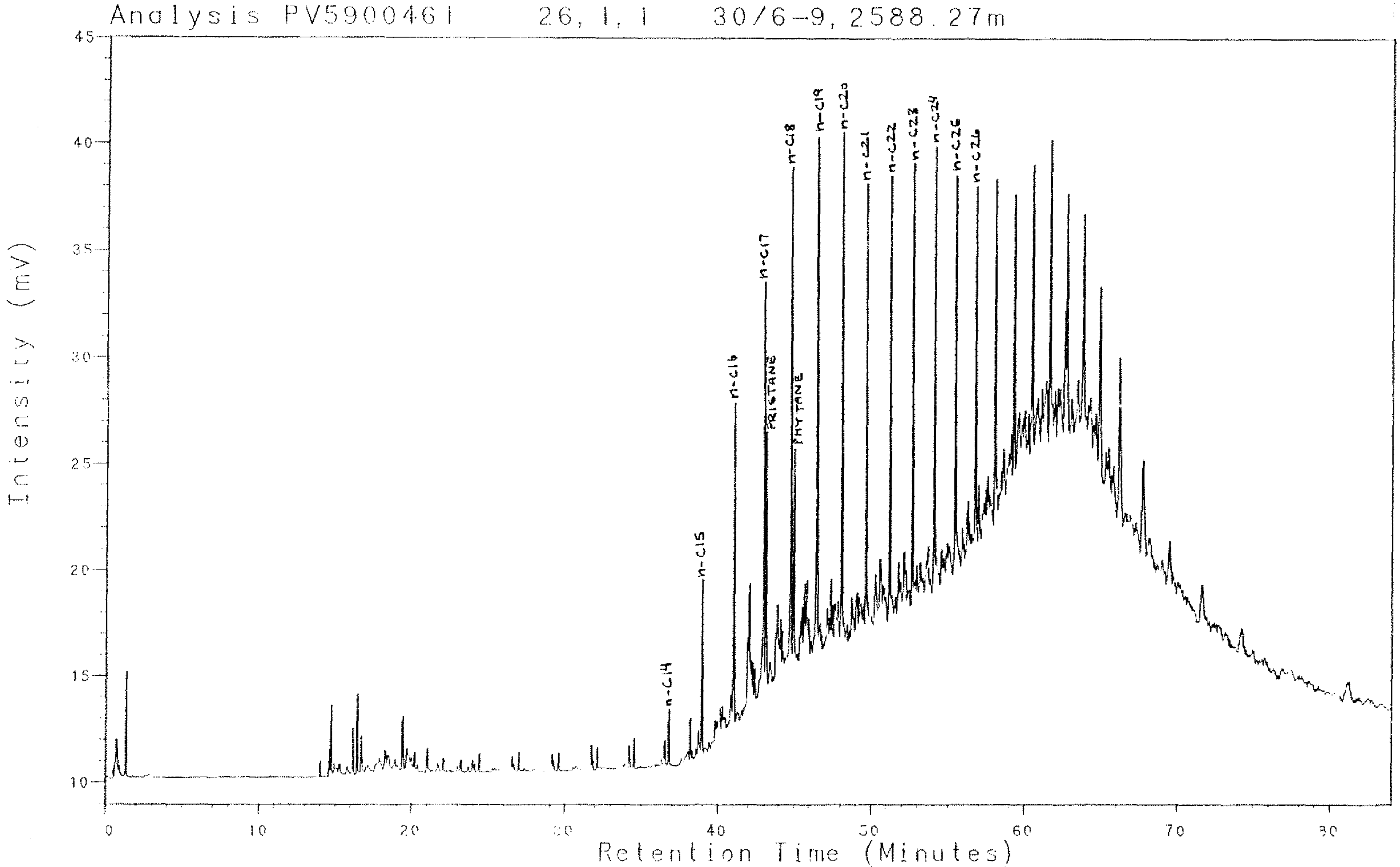
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5900431 26, 1, 1 30/6-9, 2576.4m



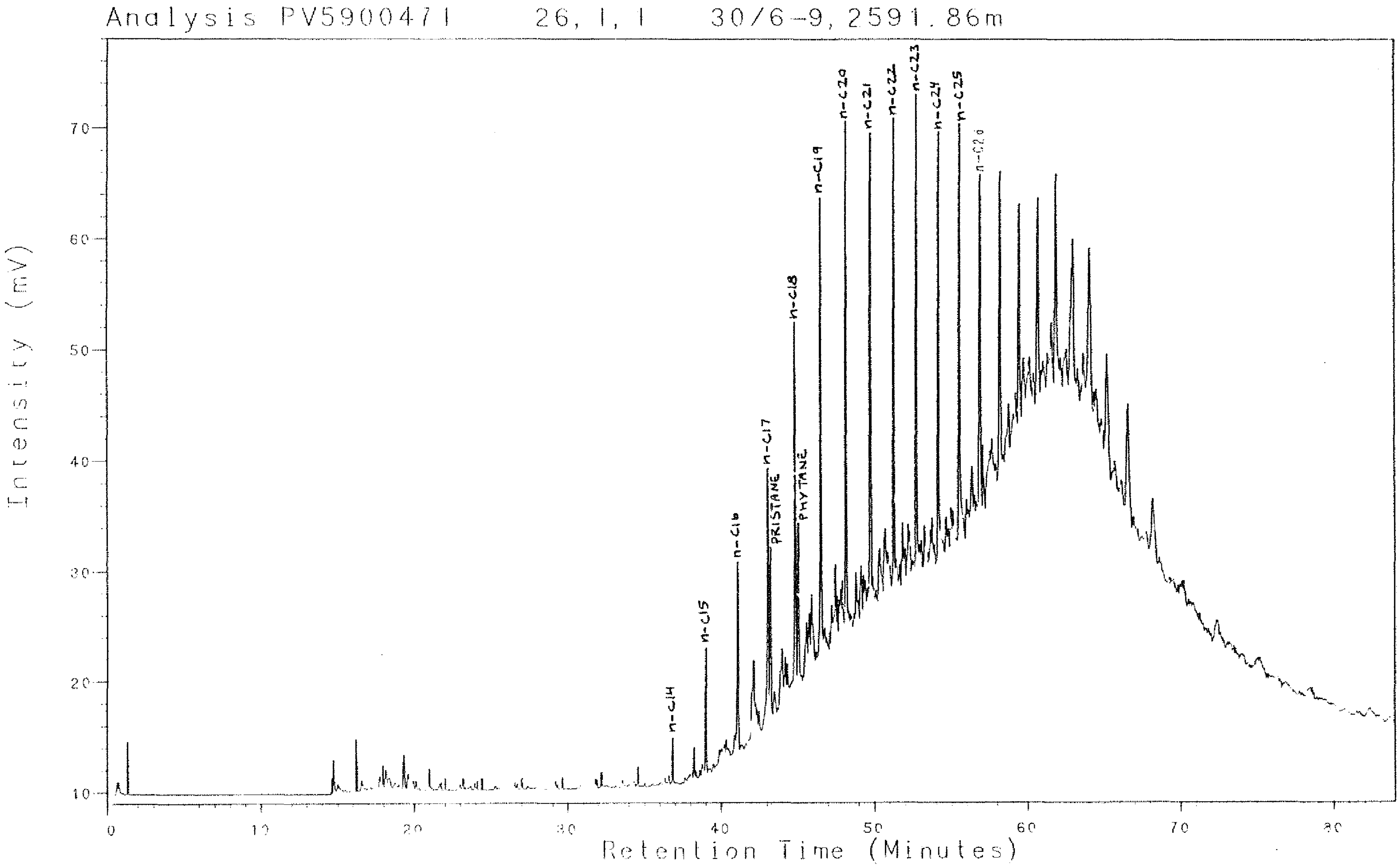
NOCS 30/6-9 2576.4m
THERMAL EXTRACTION GC (S1)
S/SST:m y brn to drk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.



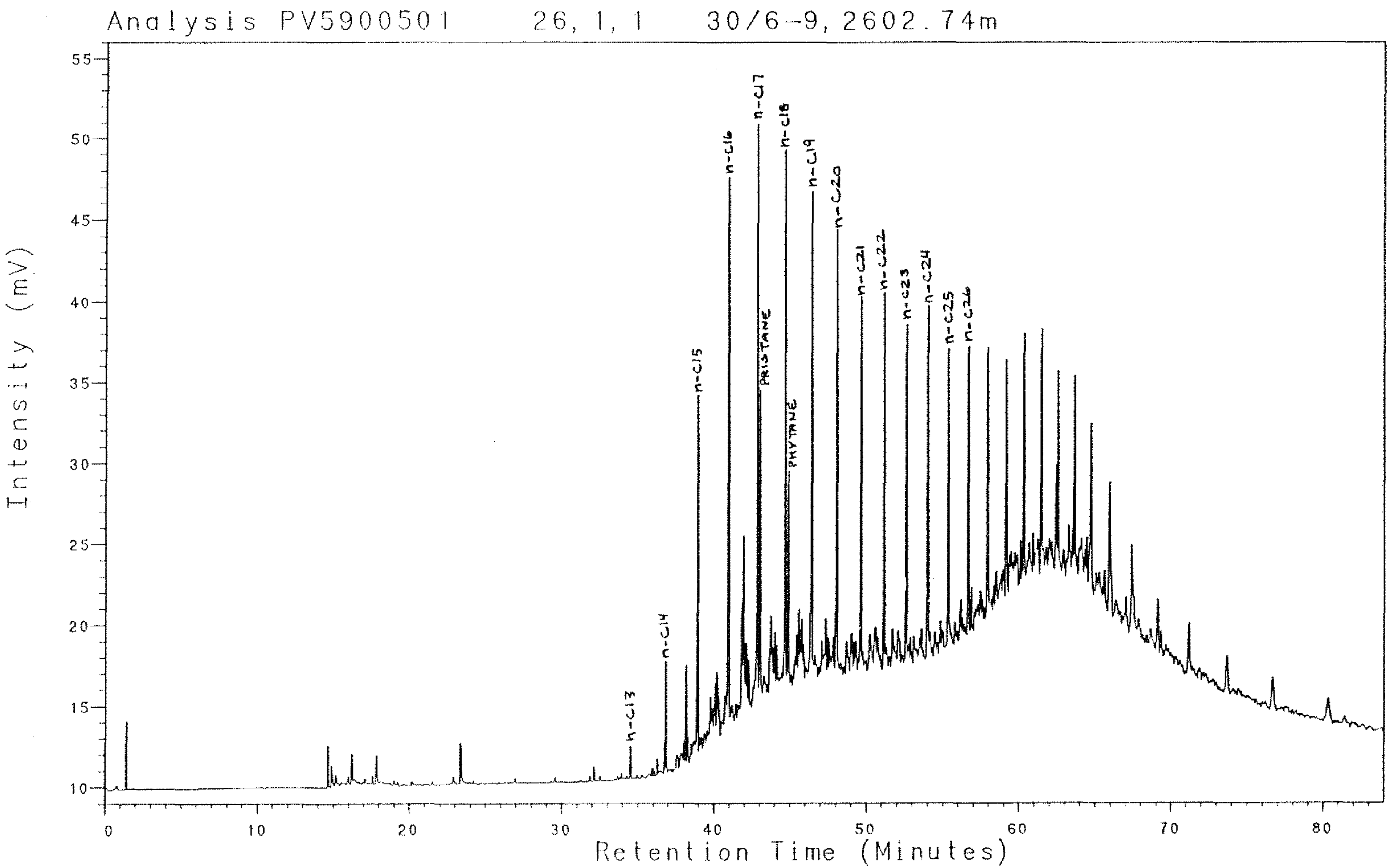
NOCS 30/6-9 2588.27m
THERMAL EXTRACTION GC (S1)
S/SST: v brn to drk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 2591.86m
THERMAL EXTRACTION GC (S1)
S/SST:drk gy

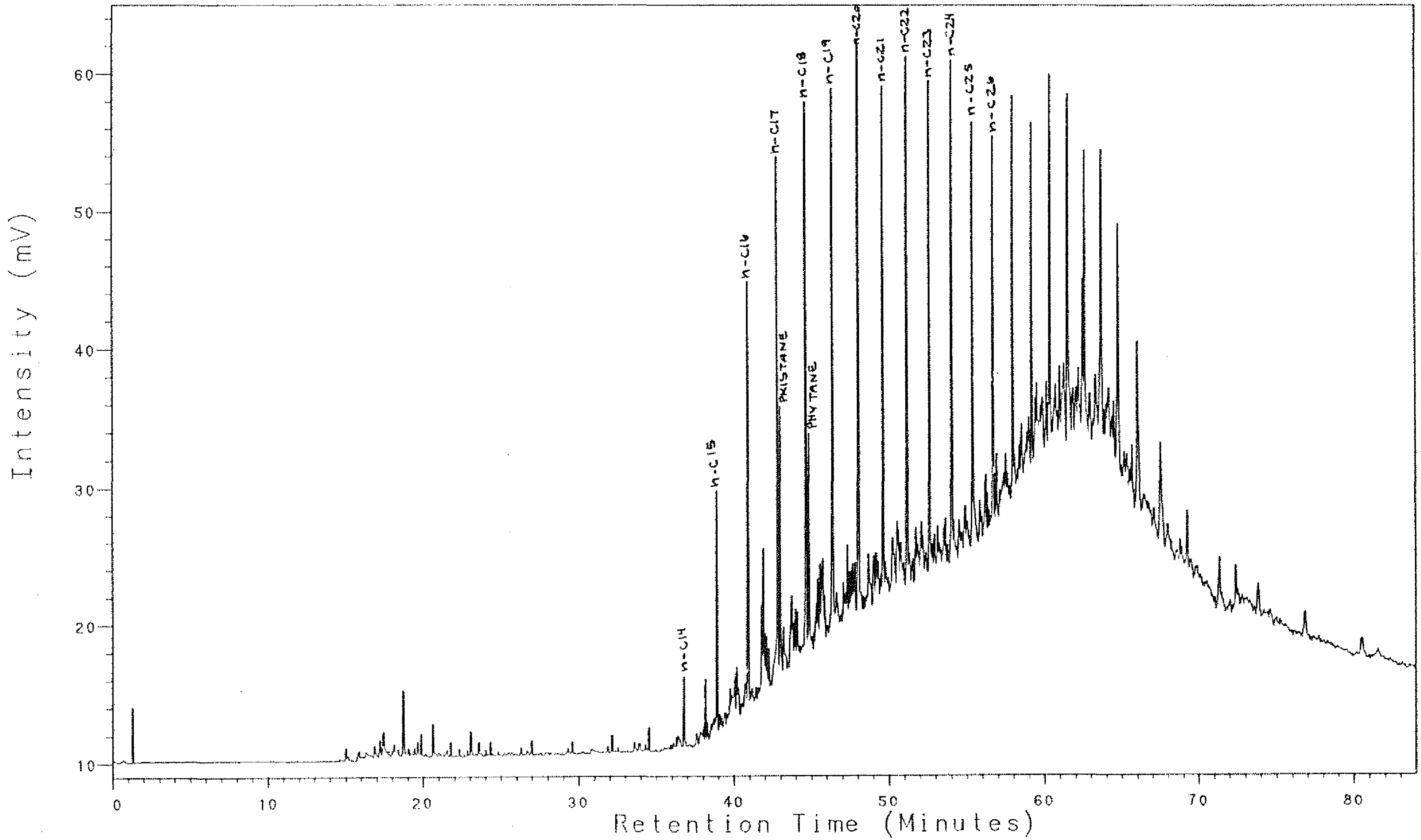
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY



NOCS 30/6-9 2602.74m
THERMAL EXTRACTION GC (S1)
S/SST k y brn to dsk y brn

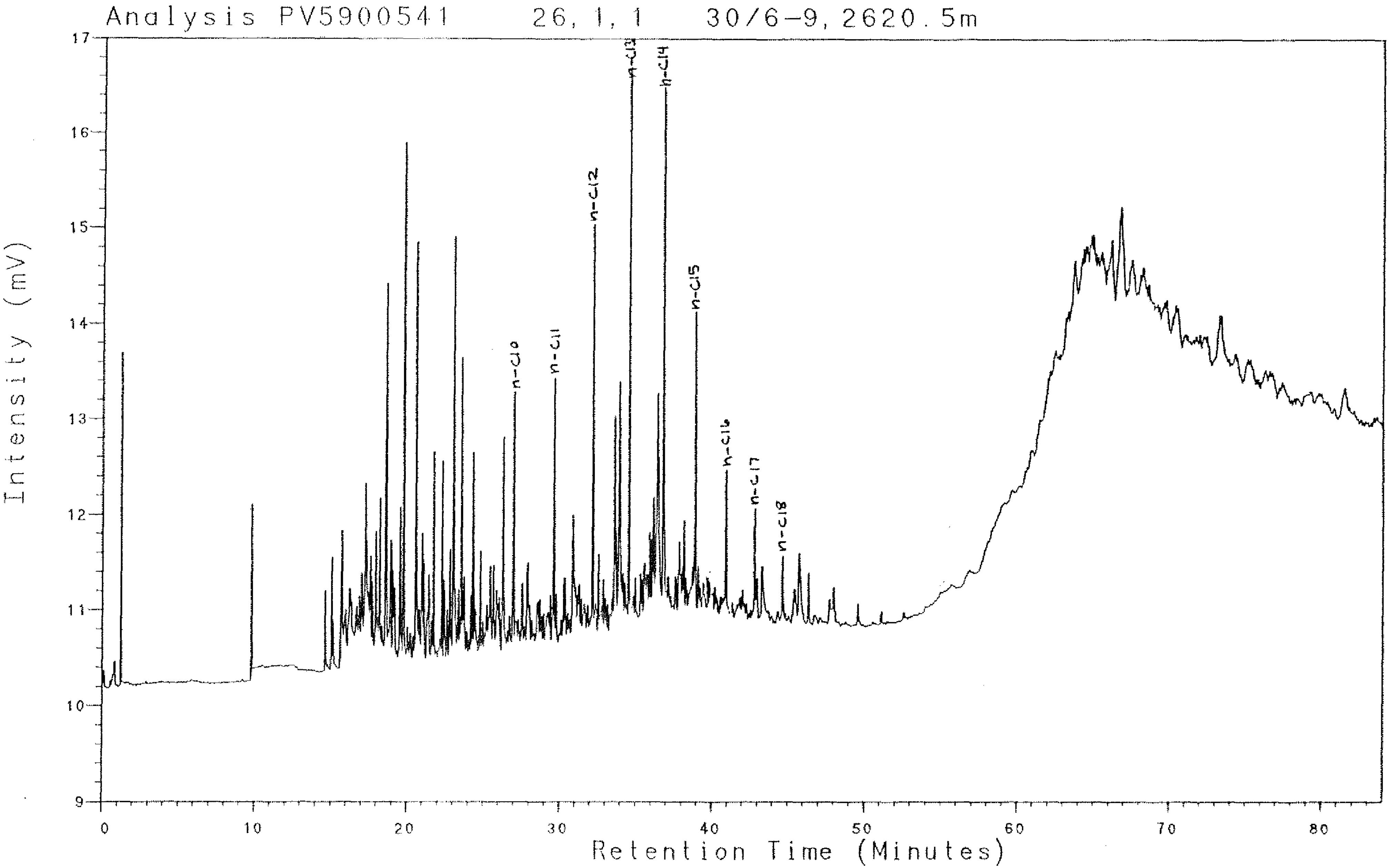
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5900521 26, 1, 1 30/6-9, 2611.75m



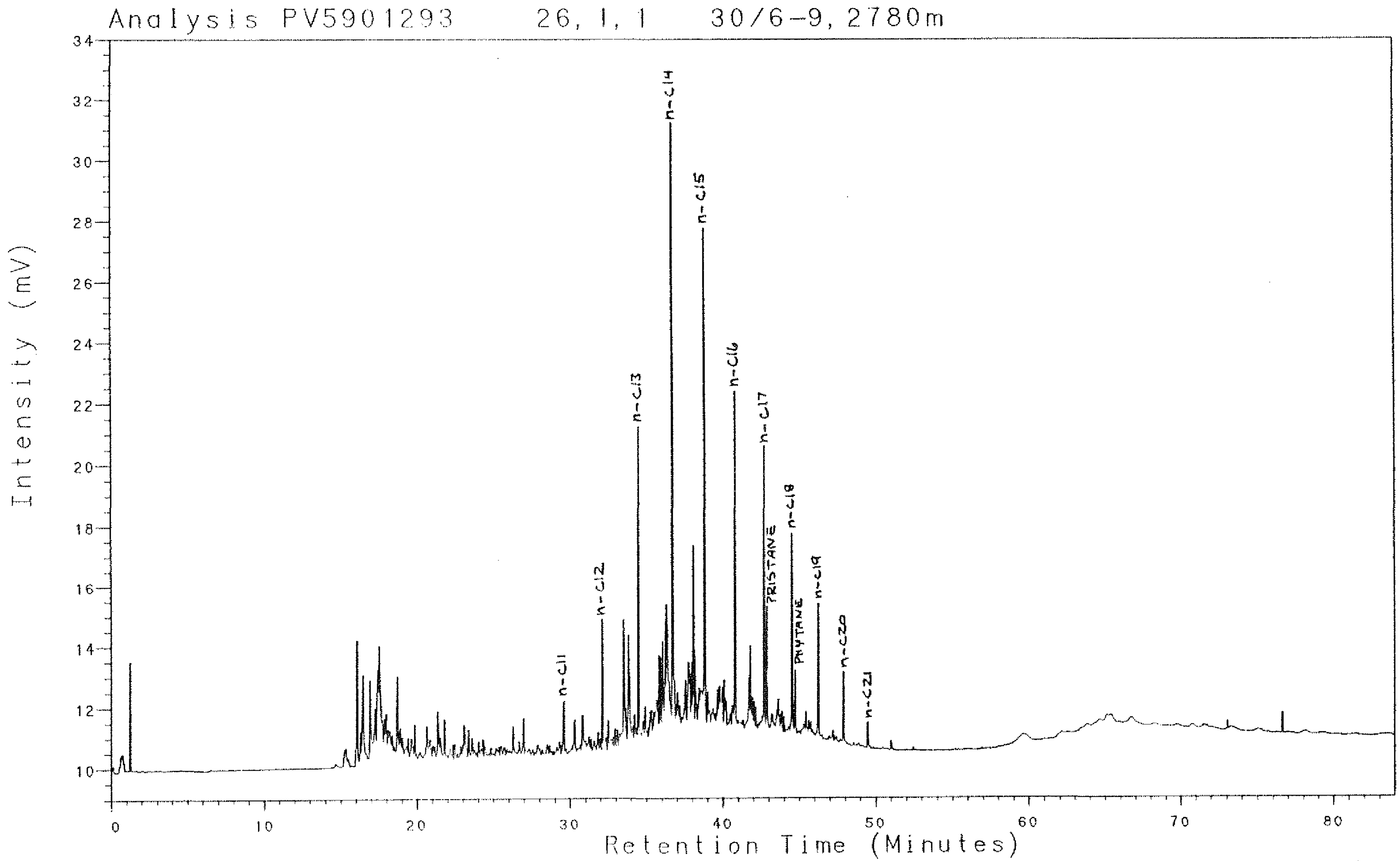
NOCS 30/6-9 2611.75m
THERMAL EXTRACTION GC (S1)
S/SST:lt y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.



NOCS 30/6-9 2620.5m
THERMAL EXTRACTION GC (S1)
SLTST:) gy to dsk y brn

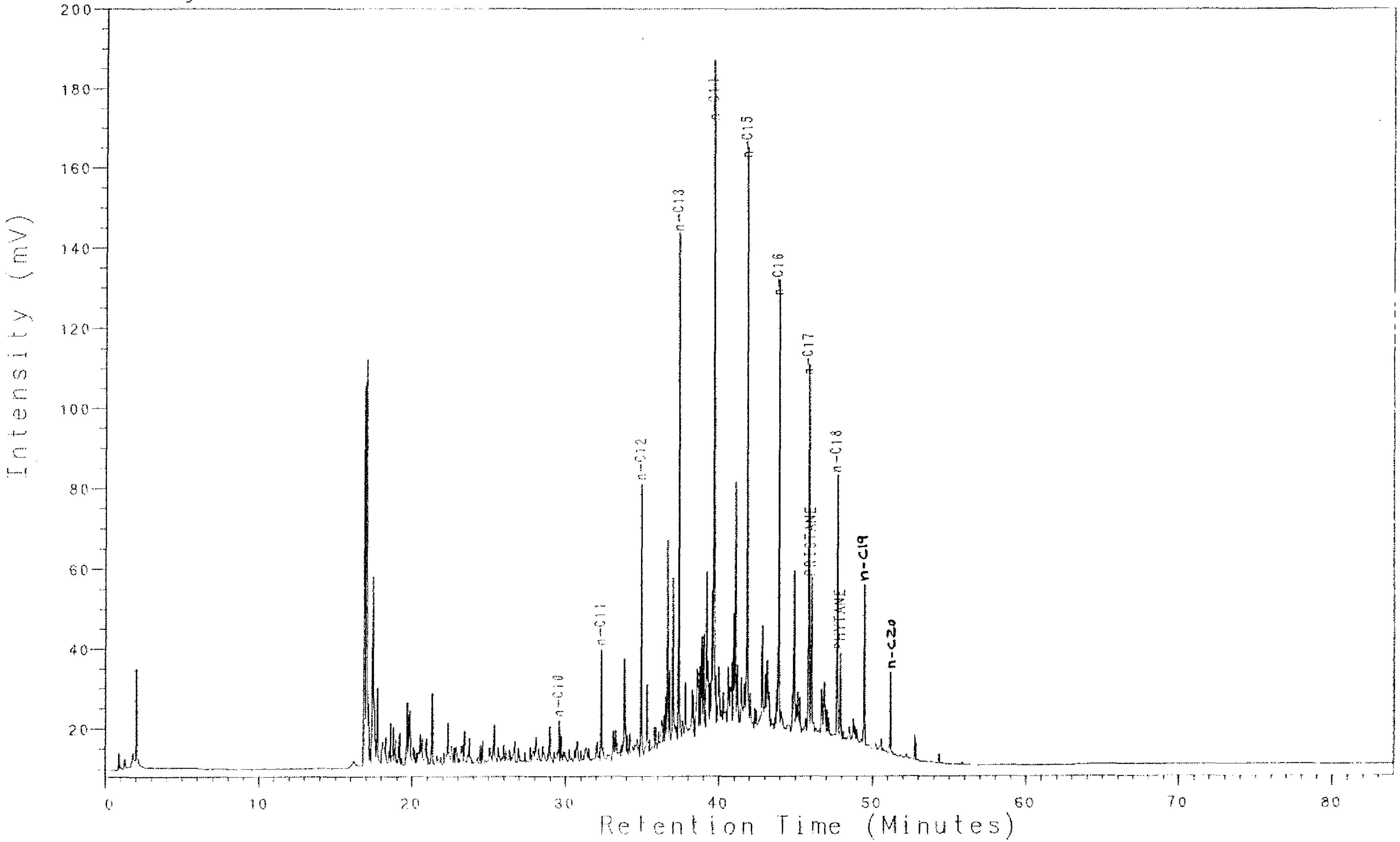
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 2780m
THERMAL EXTRACTION GC (S1)
SLTST:brn gy to m gy

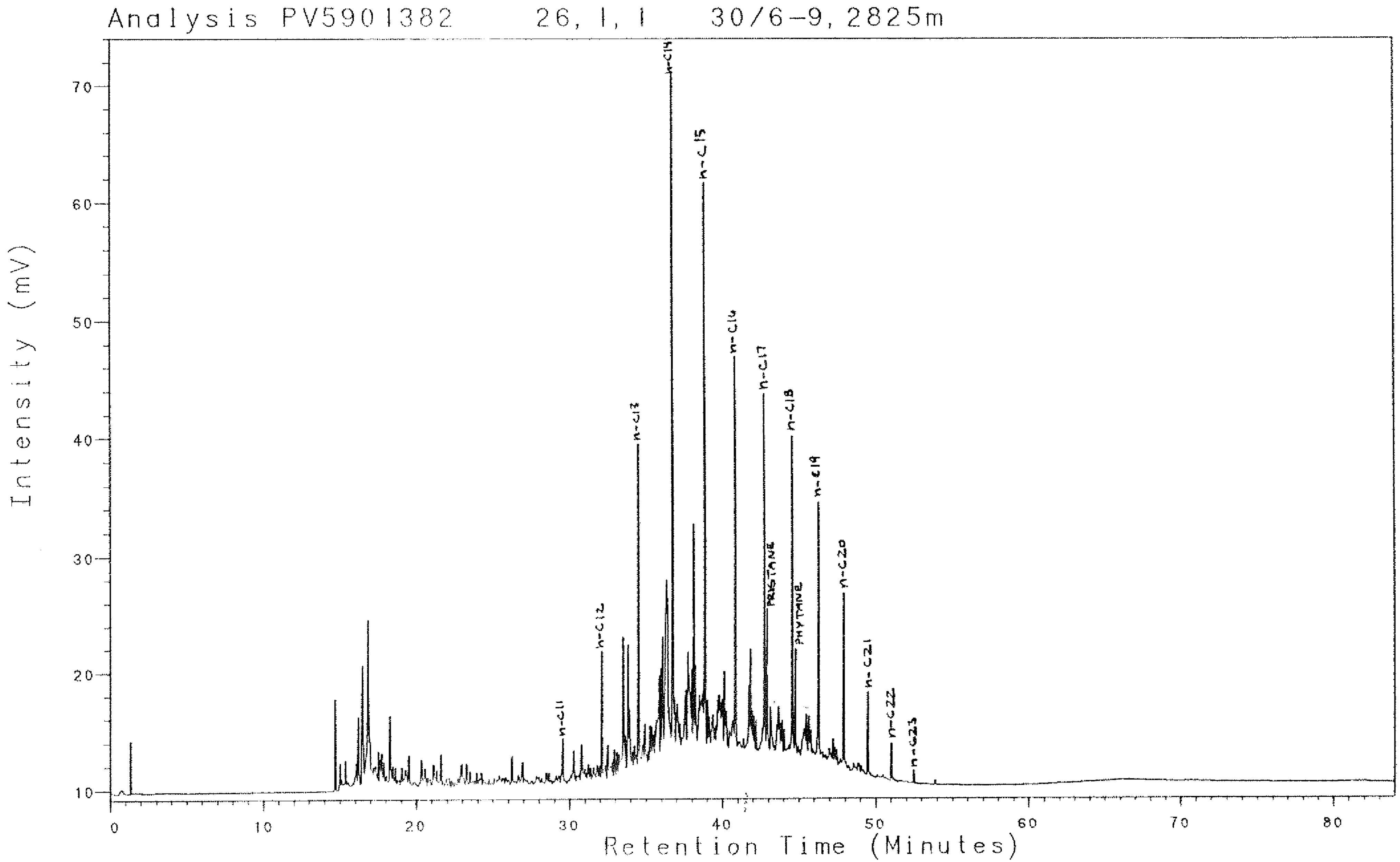
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Analysis PV5901313   26, 1, 1   30/6-9, 2790m



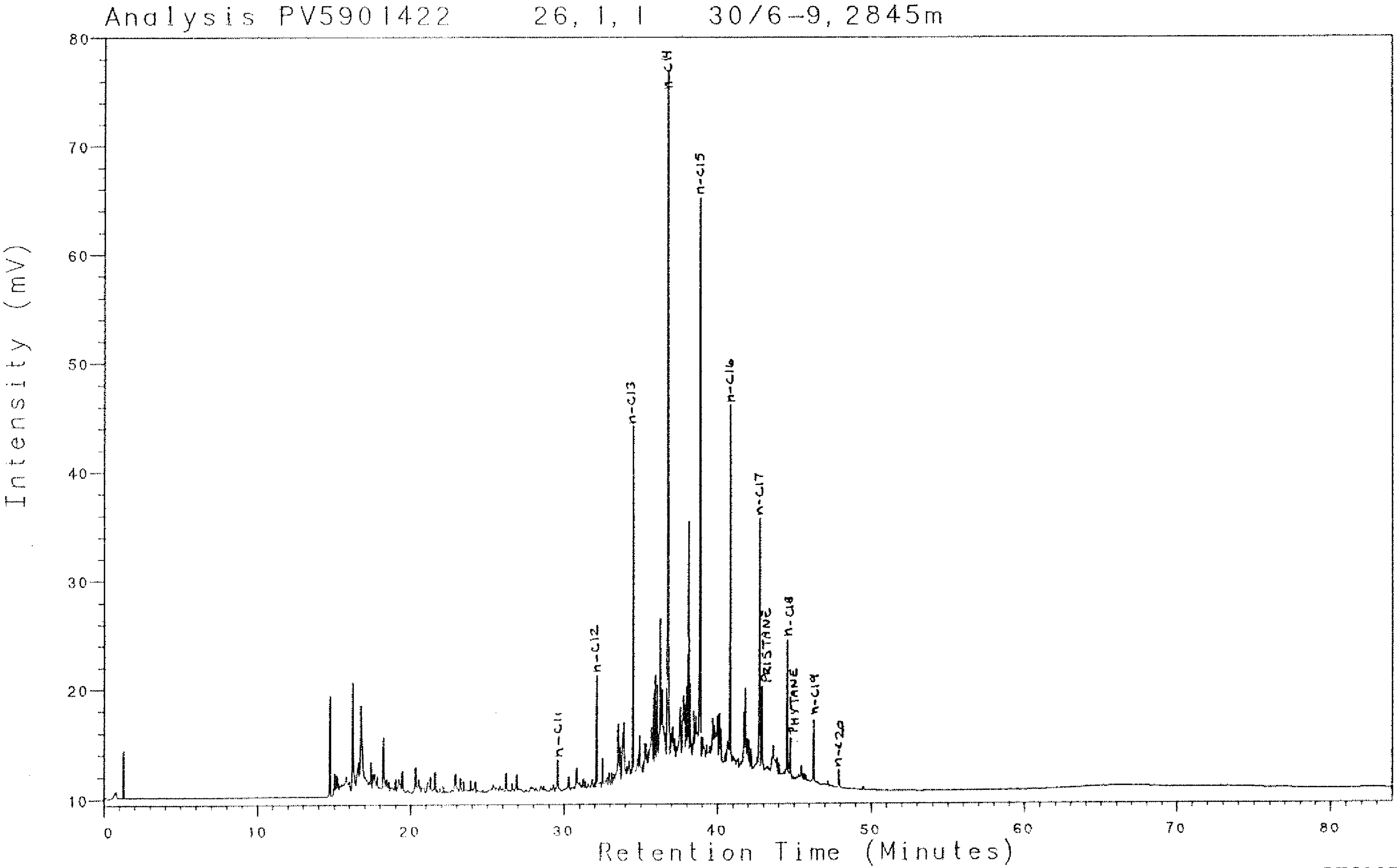
NOCS 30/6-9 2790m
THERMAL EXTRACTION GC (S1)
CLST:brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 2825m
THERMAL EXTRACTION GC (S1)
SLTST:brn gy

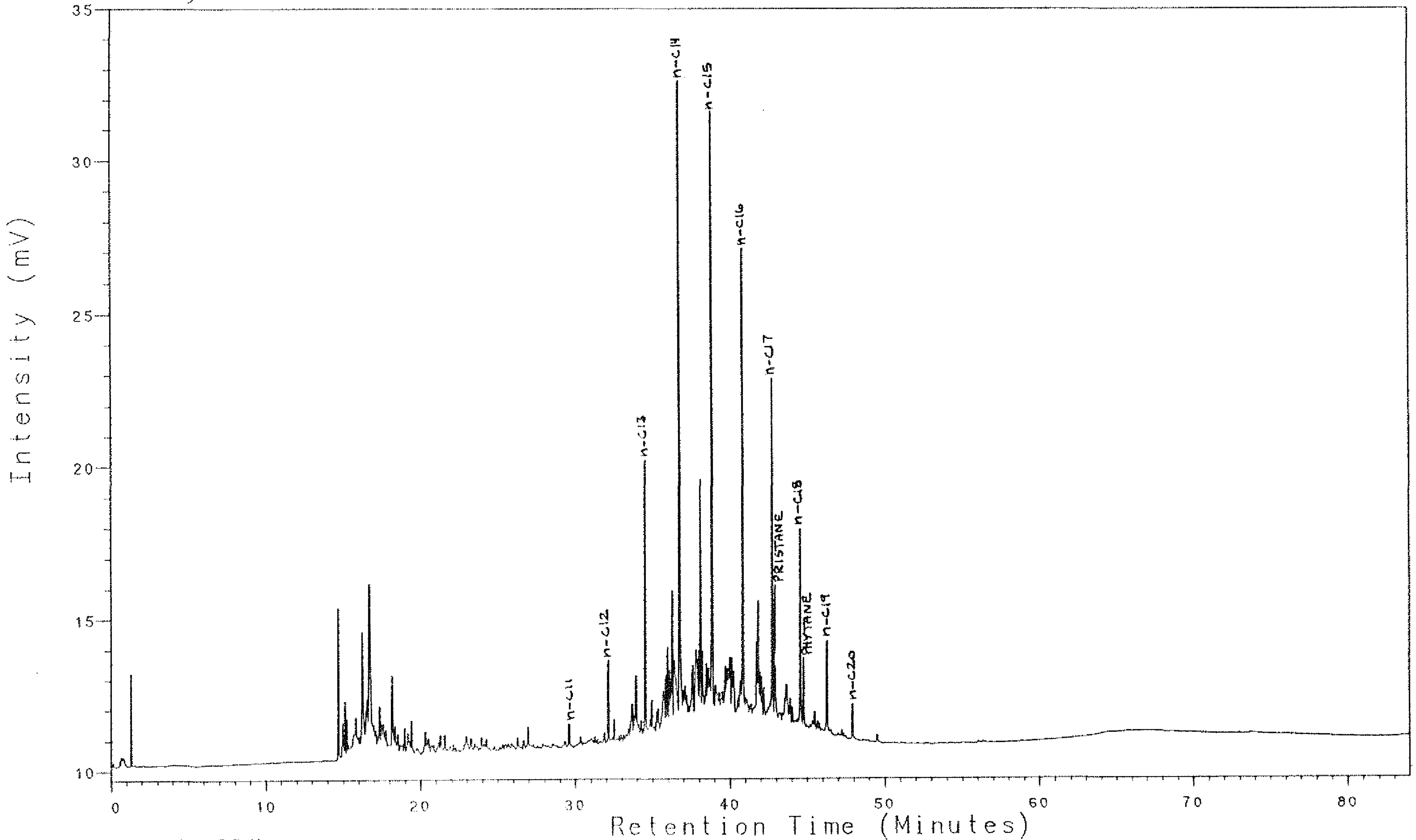
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S



NOCS 30/6-9 2845m
THERMAL EXTRACTION GC (S1)
SLTST:l gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

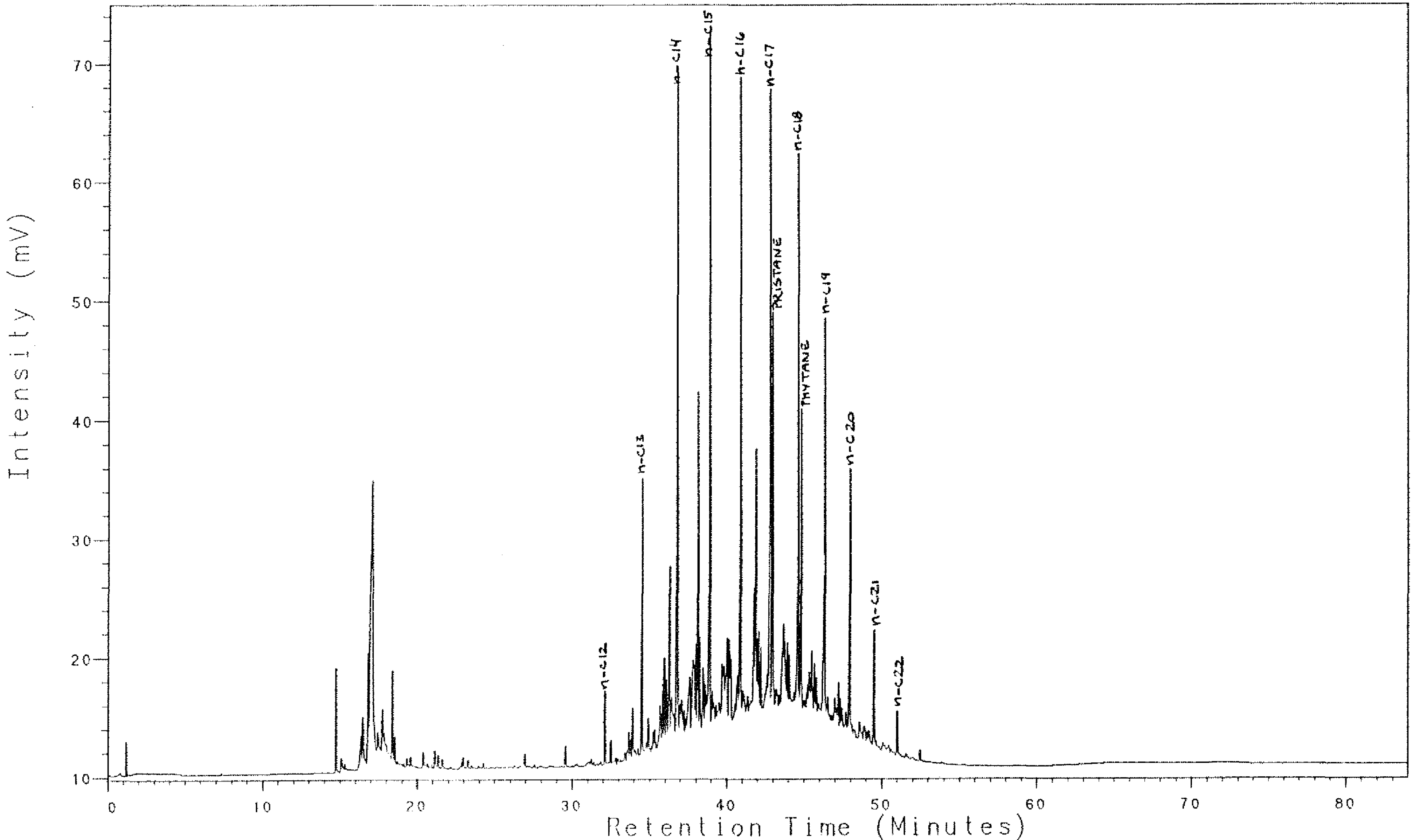
Analysis PV5901462 26, 1, 1 30/6-9, 2865m



HOCS 30/6-9 2865m
THERMAL EXTRACTION GC (S1)
CLST:brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

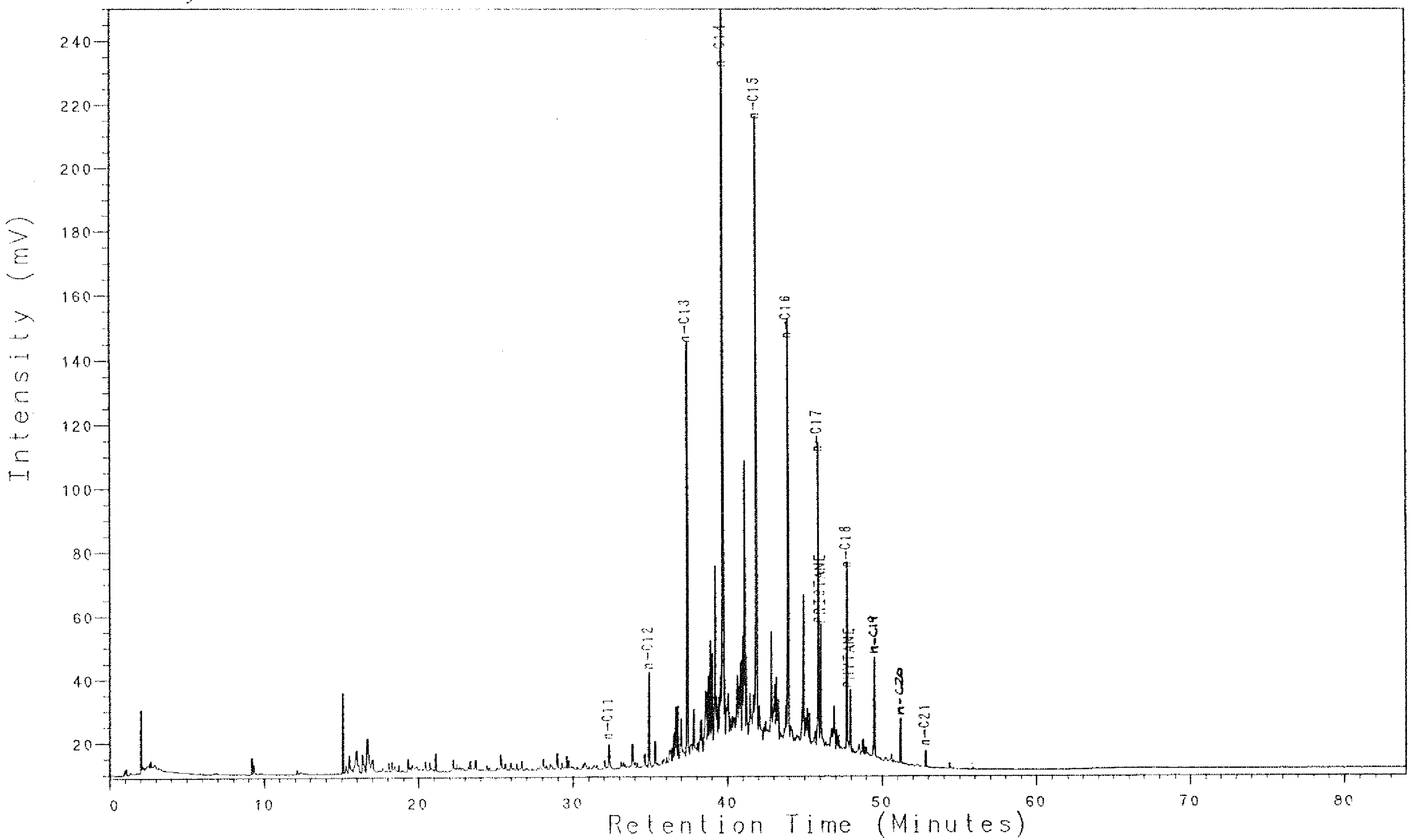
Analysis PV5901494   26, 1, 1   30/6-9, 2880m



NOCS 30/6-9 2880m
THERMAL EXTRACTION GC (S1)
S/SST to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

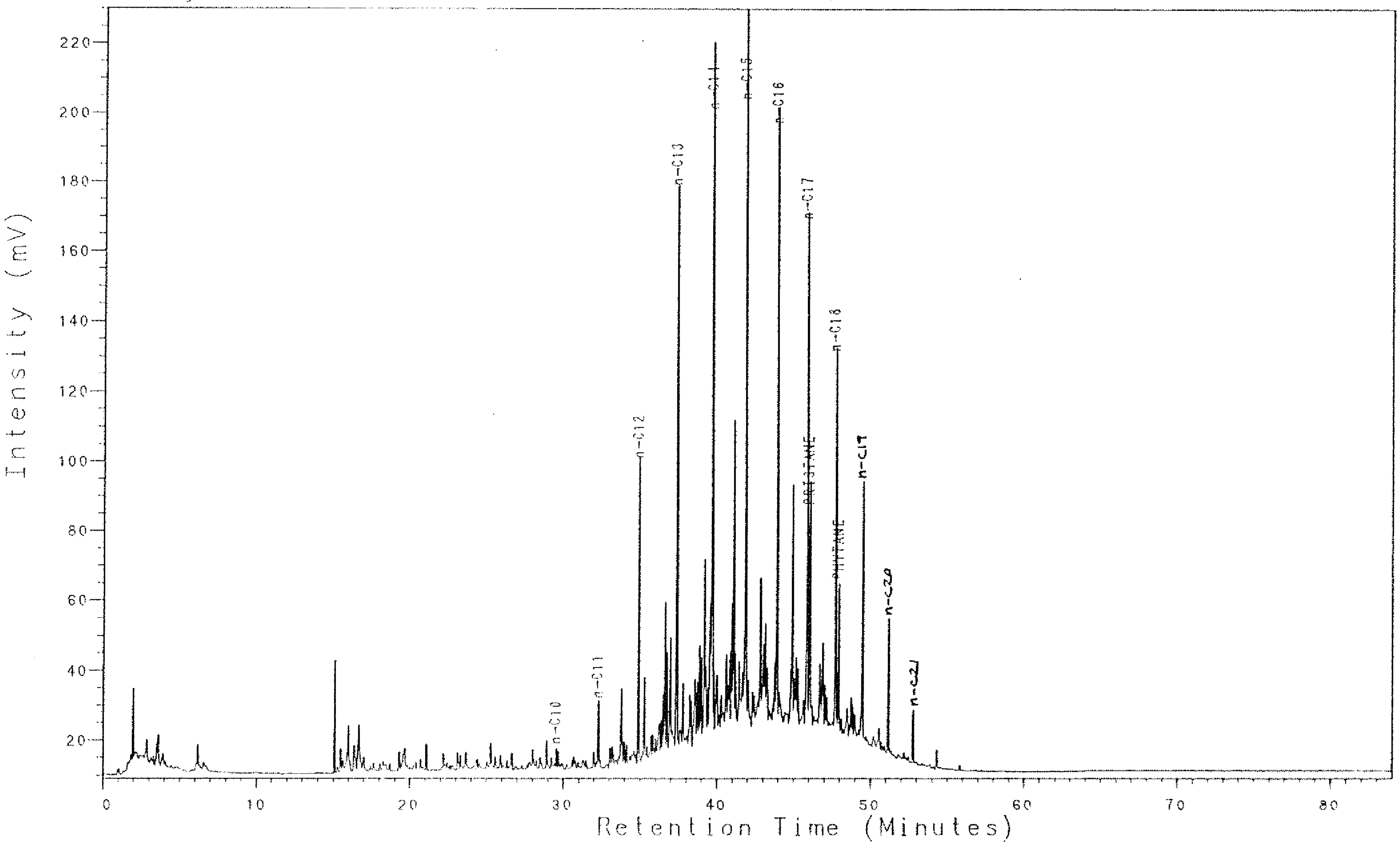
Analysis PV5901522 26, 1, 1 30/6-9, 2895m



NOCS 30/6-9 2895m
THERMAL EXTRACTION GC (S1)
SLTST:brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

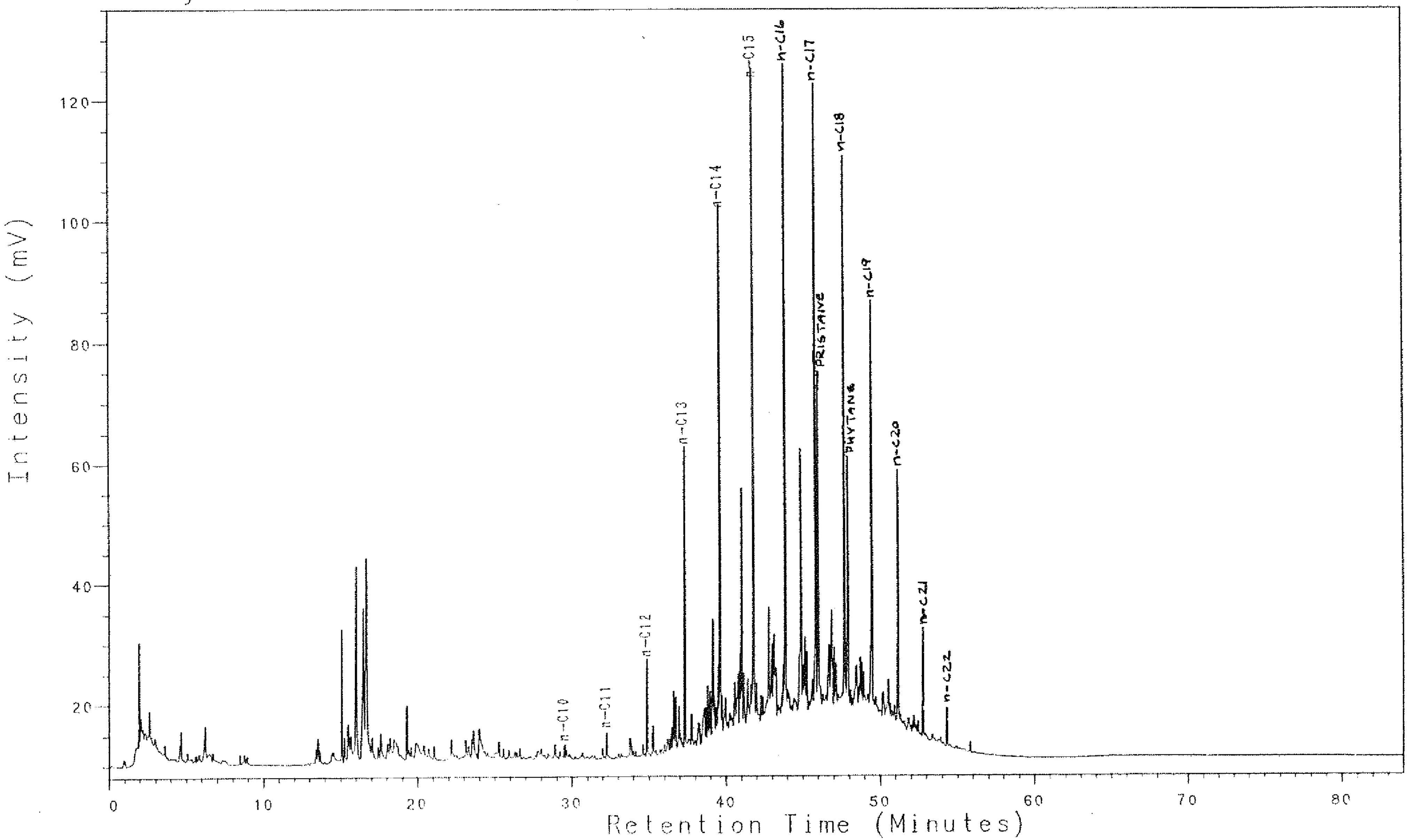
Analysis PV5901562 26, 1, 1 30/6-9, 2915m



NOCS 30/6-9 2915m
THERMAL EXTRACTION GC (S1)
SLTST:brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

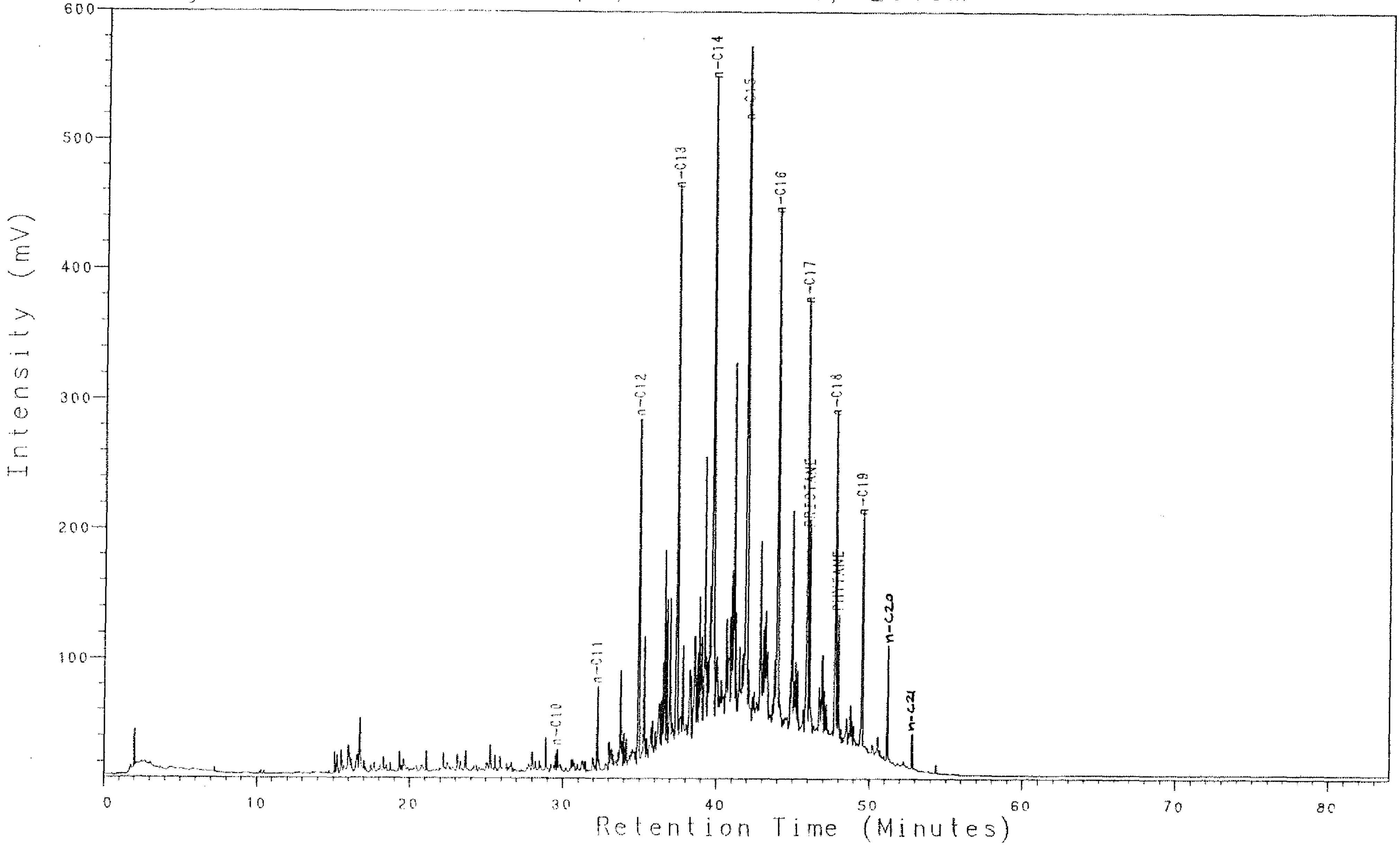
Analysis PV5901574   26, 1, 1   30/6-9, 2920m



NOCS 30/6-9 2920m
THERMAL EXTRACTION GC (S1)
S/SST:w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

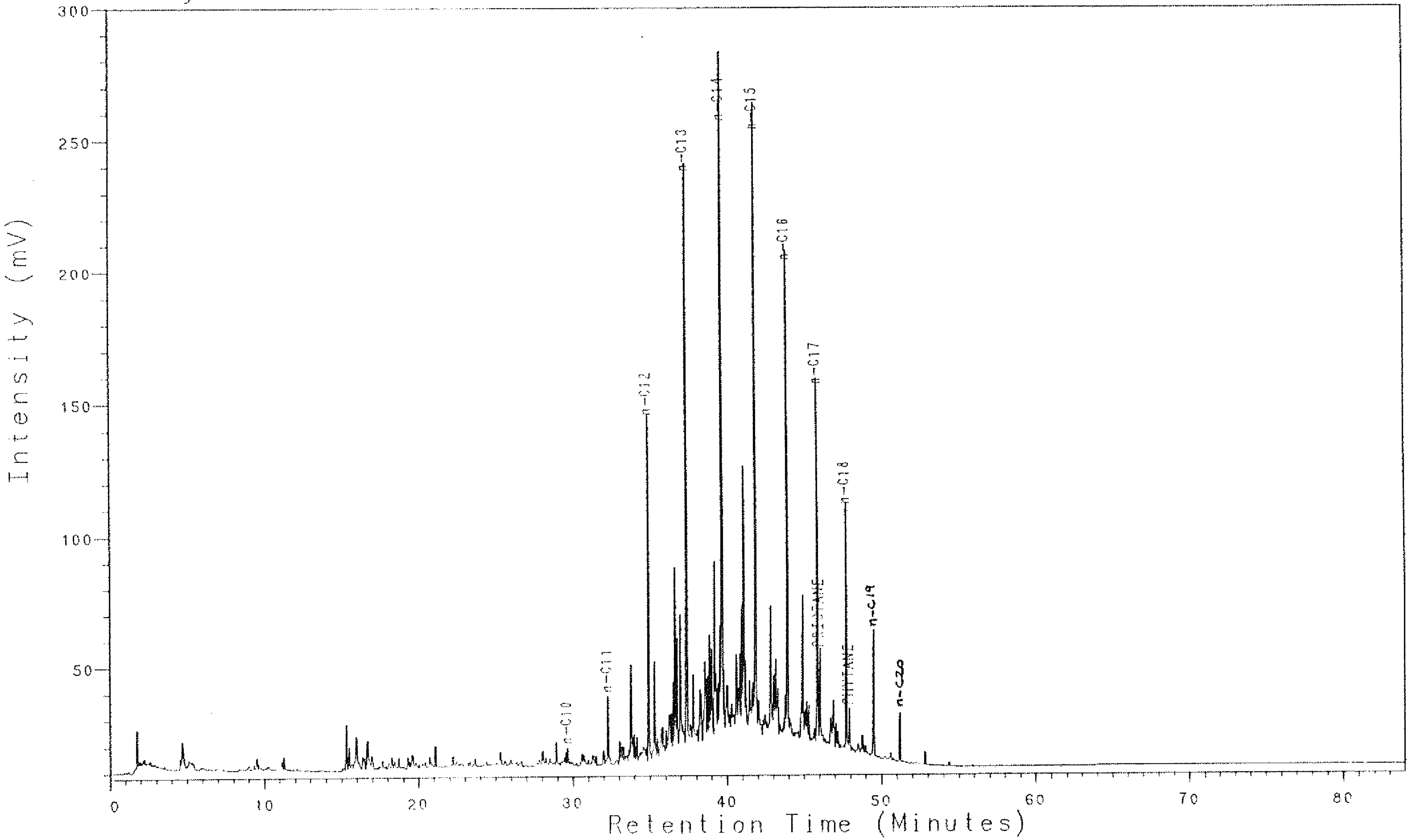
Analysis PV5901602 26, 1, 1 30/6-9, 2935m



HOC? 30/6-9 2935m
THERMAL EXTRACTION GC (S1)
CLST:brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

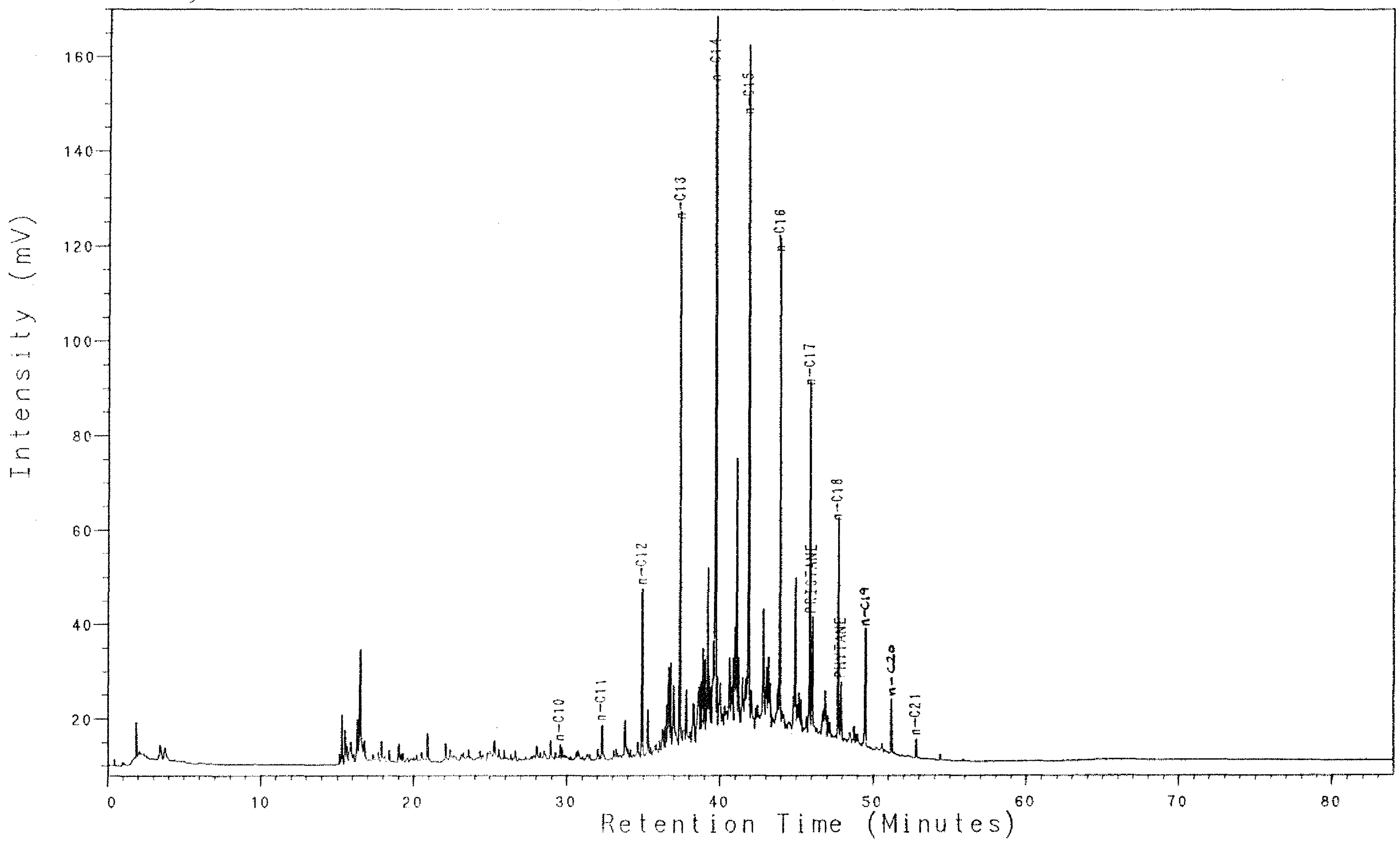
Analysis PV5901622 26, 1, 1 30/6-9, 2945m



[illegible] 30/6-9 2945m
THERMAL EXTRACTION GC (S1)
CLST:brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

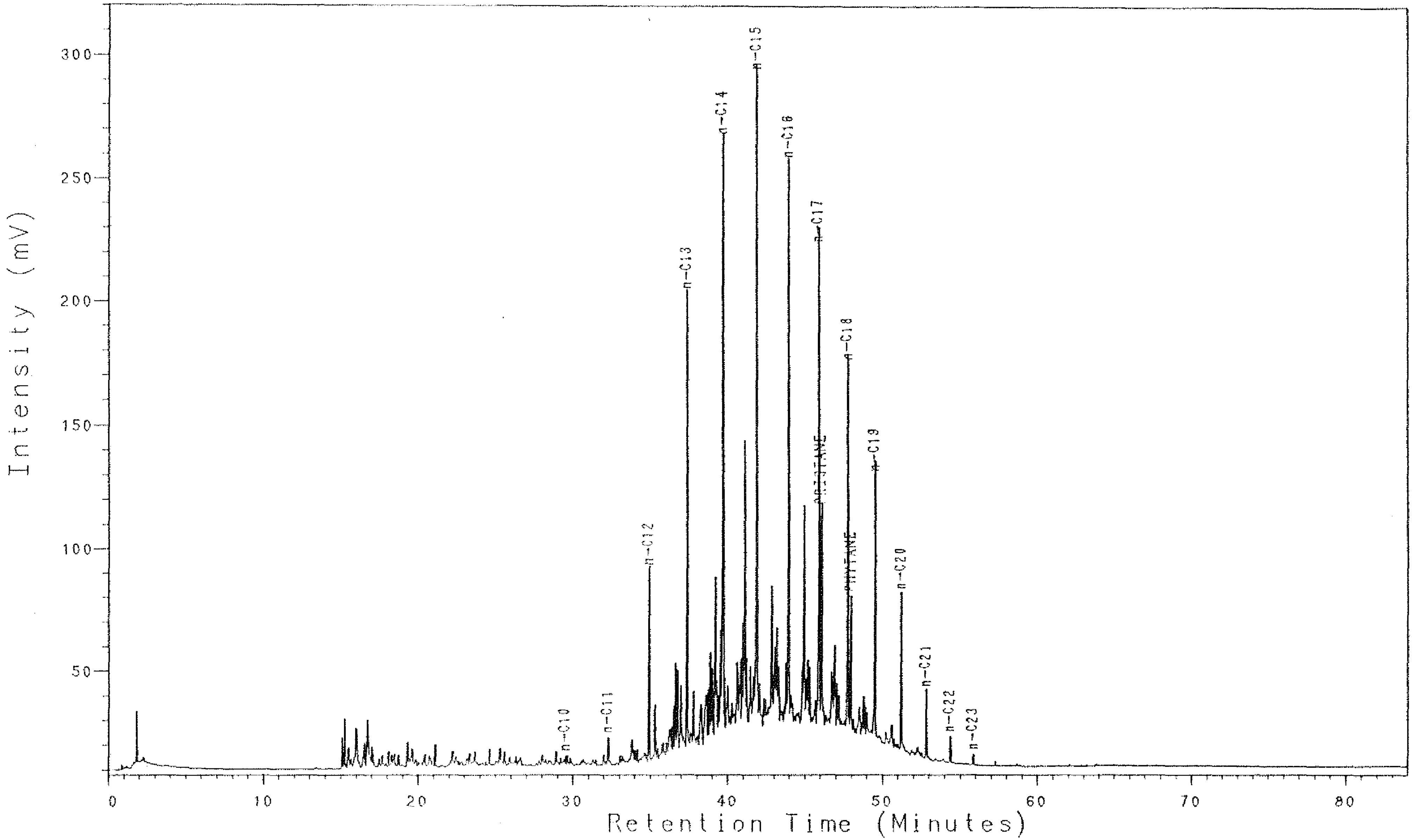
Analysis PV5901662 26, 1, 1 30/6-9, 2965m



TOCS 30/6-9 2965m
THERMAL EXTRACTION GC (S1)
LST: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

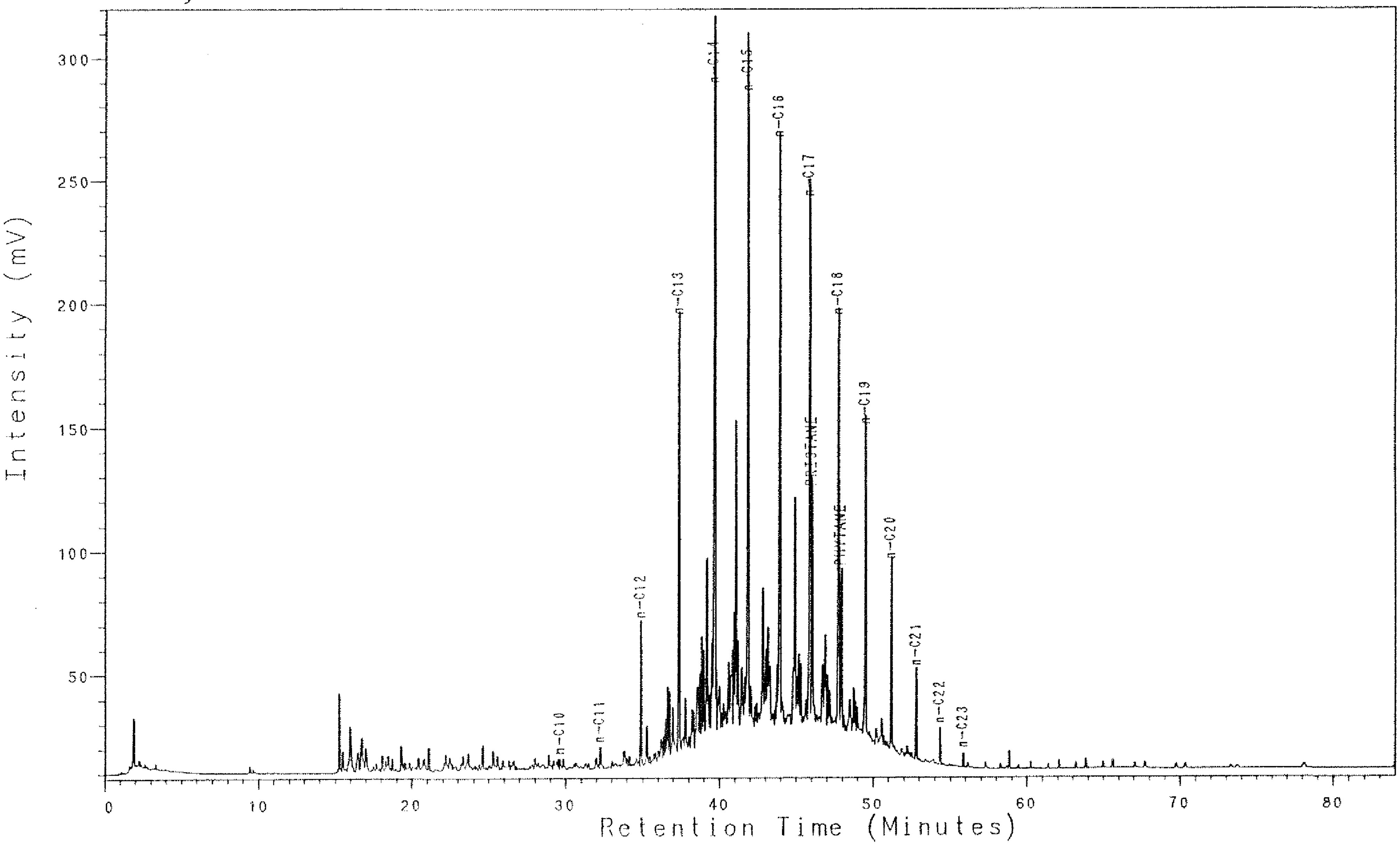
Analysis PV5901702 26, 1, 1 30/6-9, 2985m



HOCS 30/6-9 2985m
THERMAL EXTRACTION GC (S1)
SLTST:brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

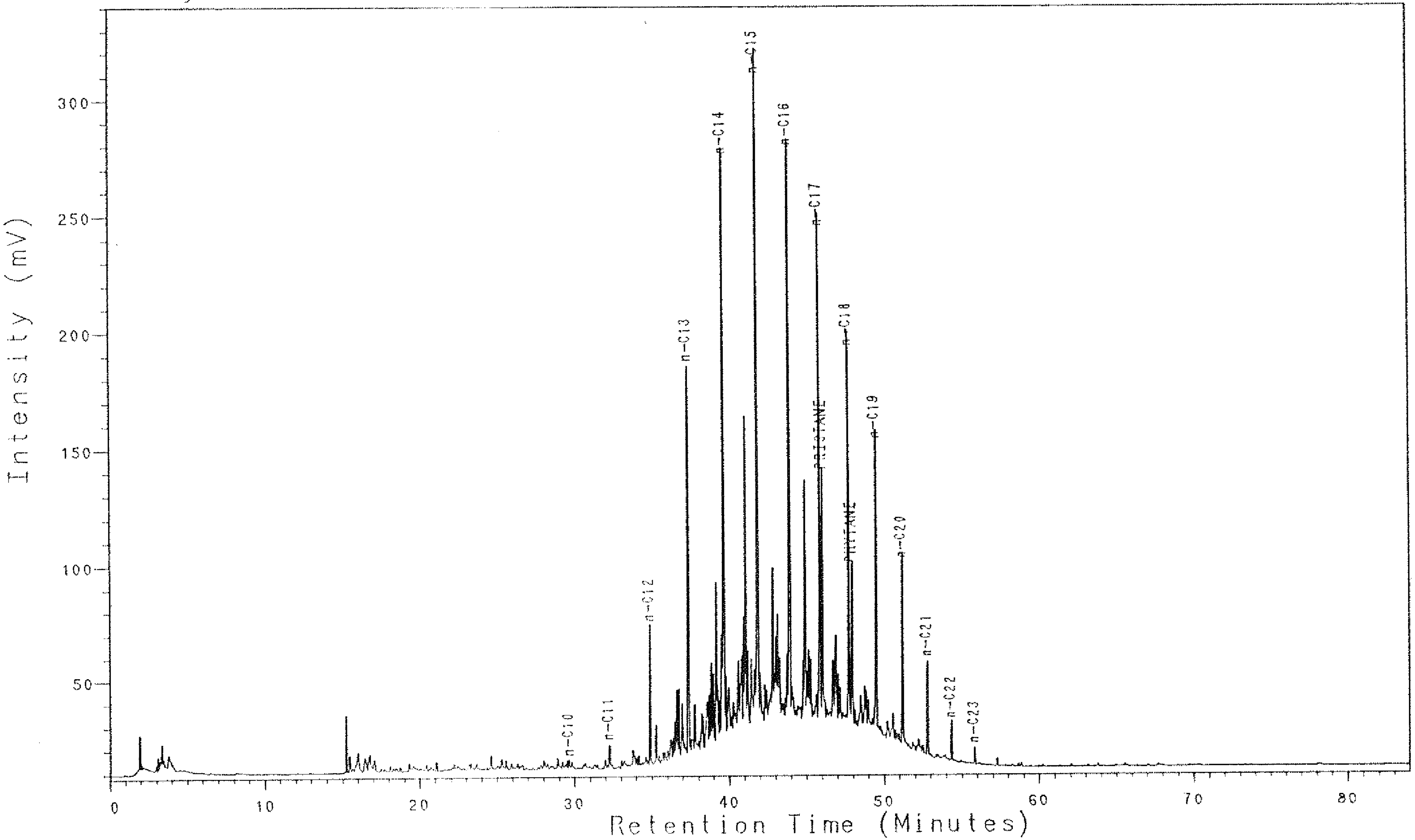
Analysis PV5901742   26, 1, 1   30/6-9, 3005m



HOCS 30/6-9 3005m
THERMAL EXTRACTION GC (S1)
SLTST:brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

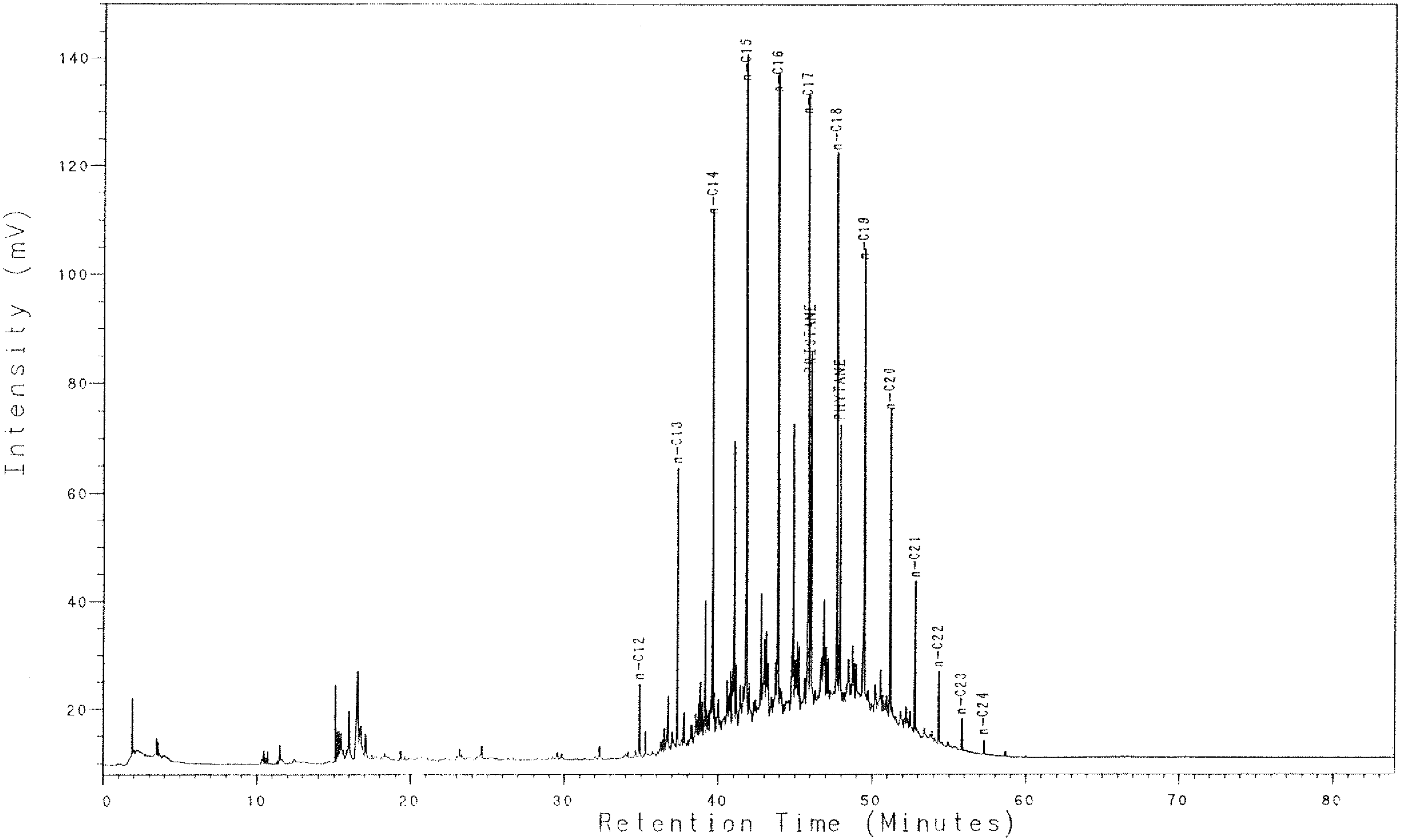
Analysis PV5901772 26, 1, 1 30/6-9, 3020m



GOCS 30/6-9 3020m
THERMAL EXTRACTION GC (S1)
SLTST:brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

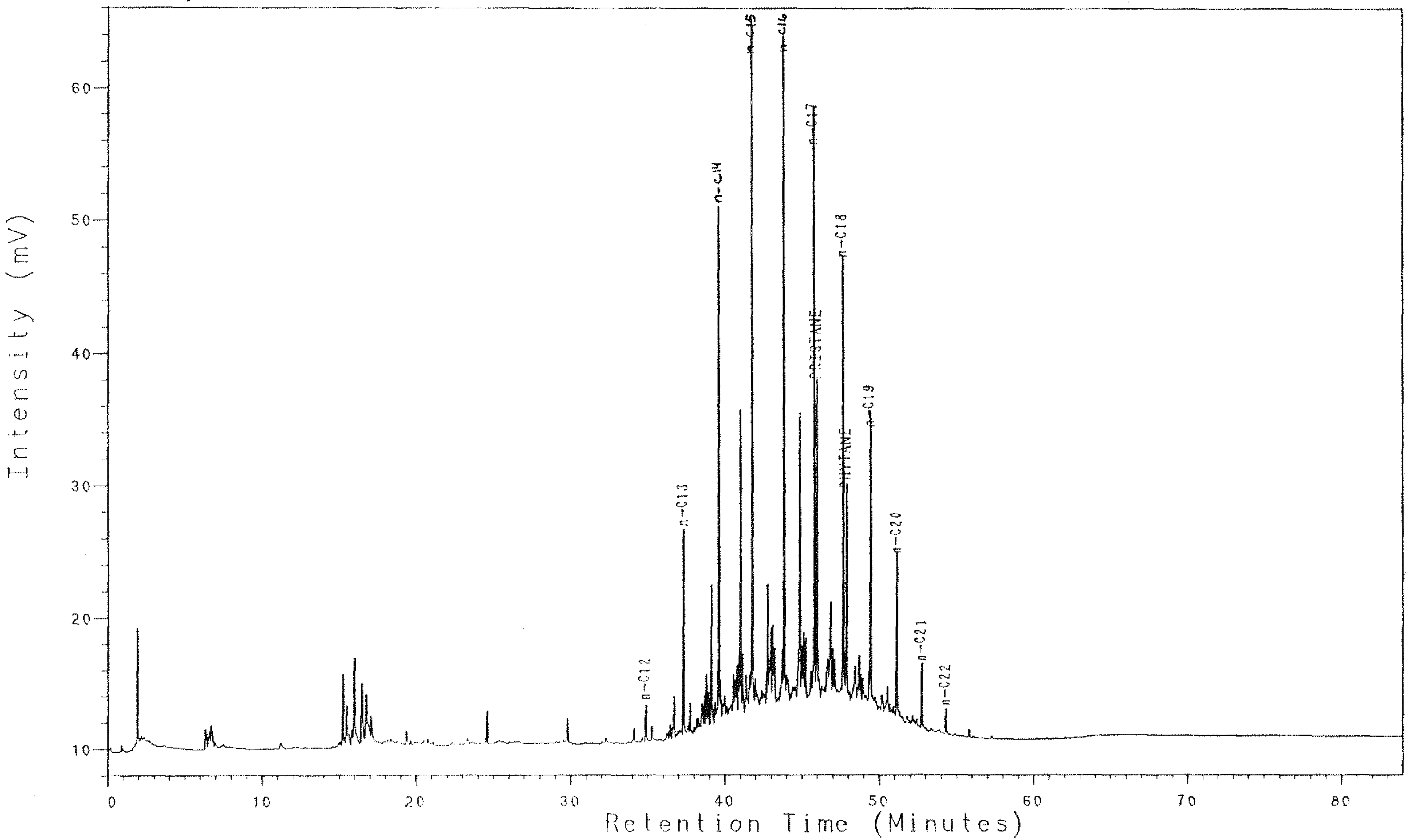
Analysis PV5901784 26, 1, 1 30/6-9, 3025m



NOCS 30/6-9 3025m
THERMAL EXTRACTION GC (S1)
S/SST:w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

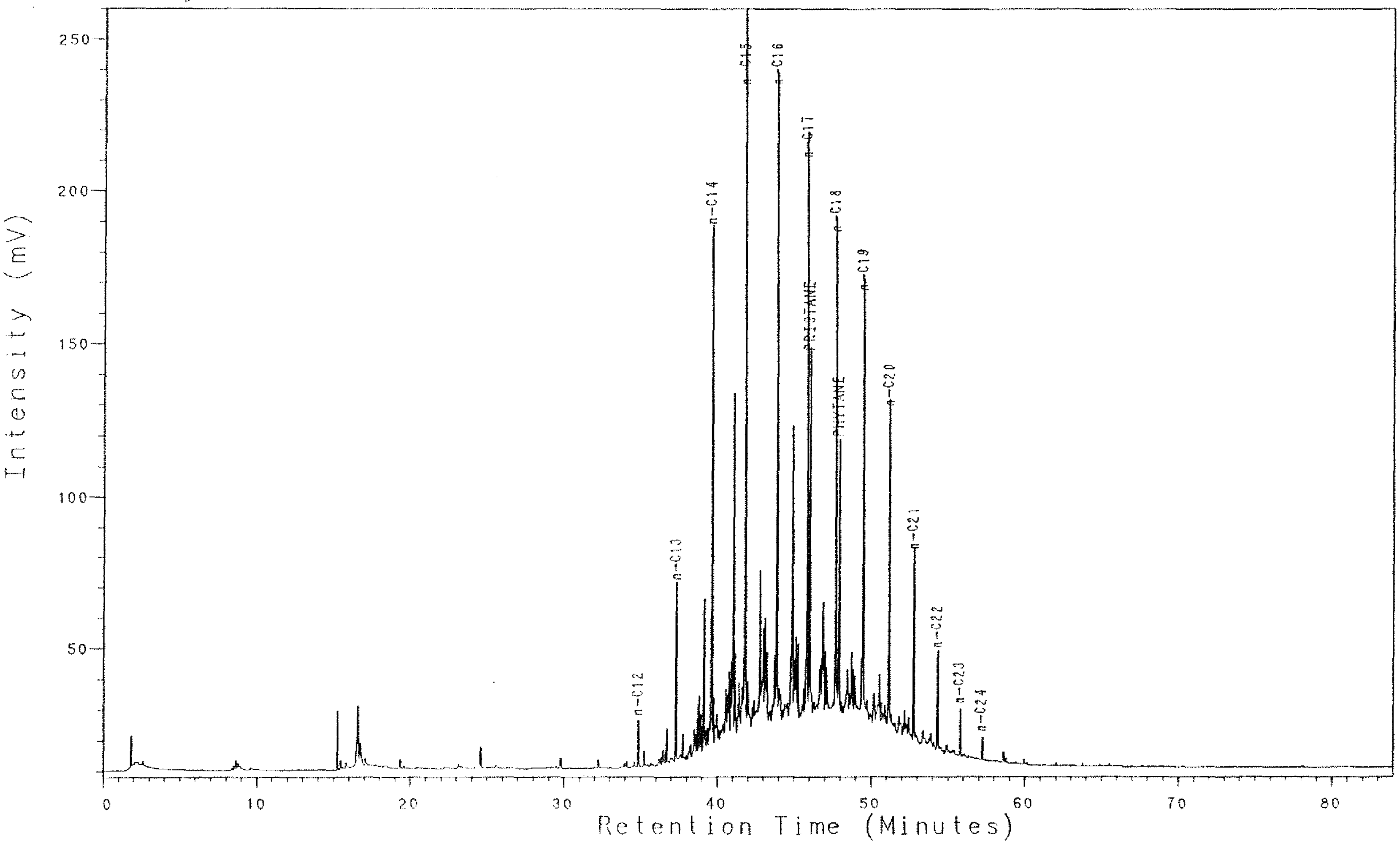
Analysis PV5901824   26, 1, 1   30/6-9, 3050m



NOCS 30/6-9 3050m
THERMAL EXTRACTION GC (S1)
S/SST:w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

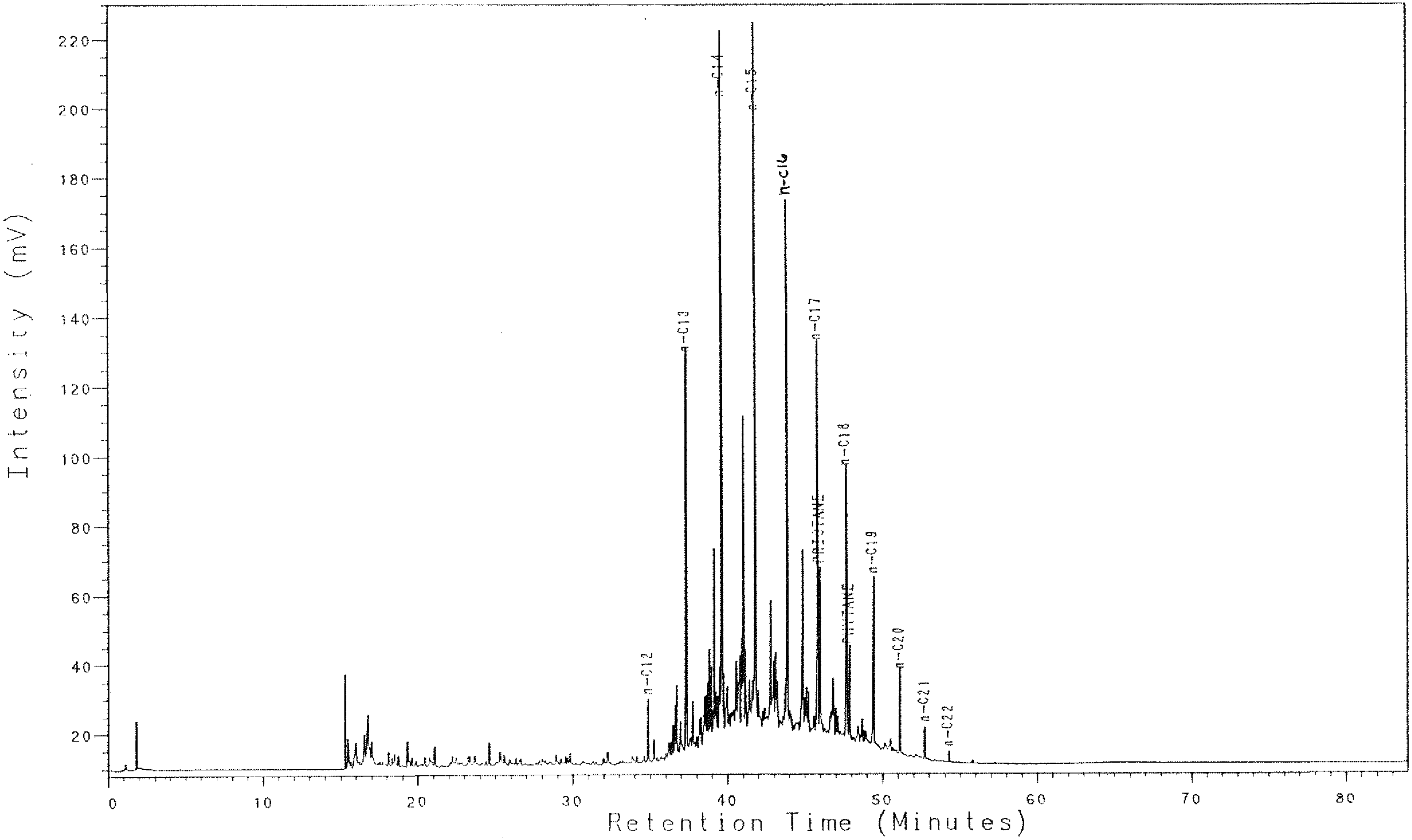
Analysis PV5901864 26, 1, 1 30/6-9, 3090m



NOCS 30/6-9 3090m
THERMAL EXTRACTION GC (S1)
S/SST:w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

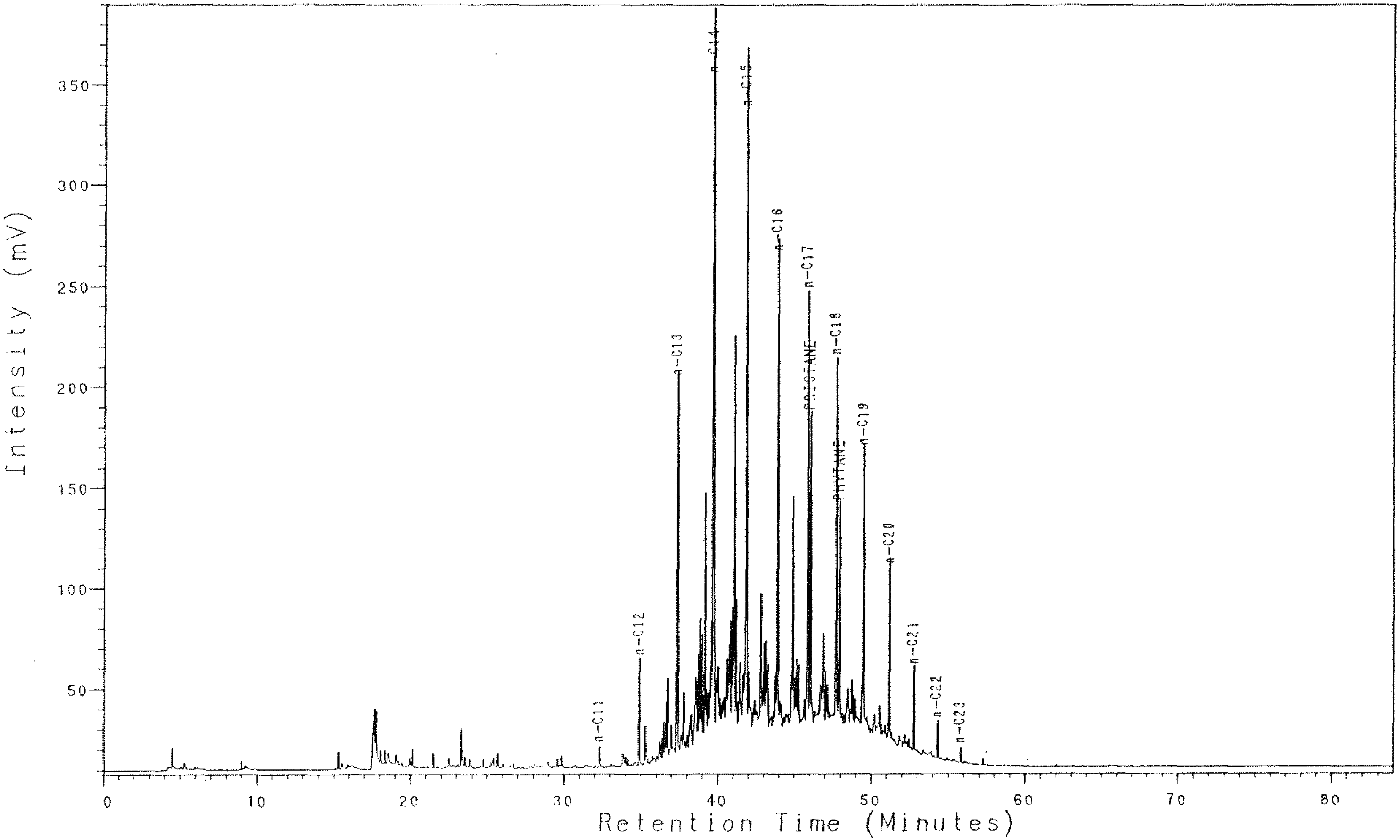
Analysis PV5901872   26, 1, 1   30/6-9, 3110m



NOCS   30/6-9   3110m
THERMAL EXTRACTION GC (S1)
CLST:brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

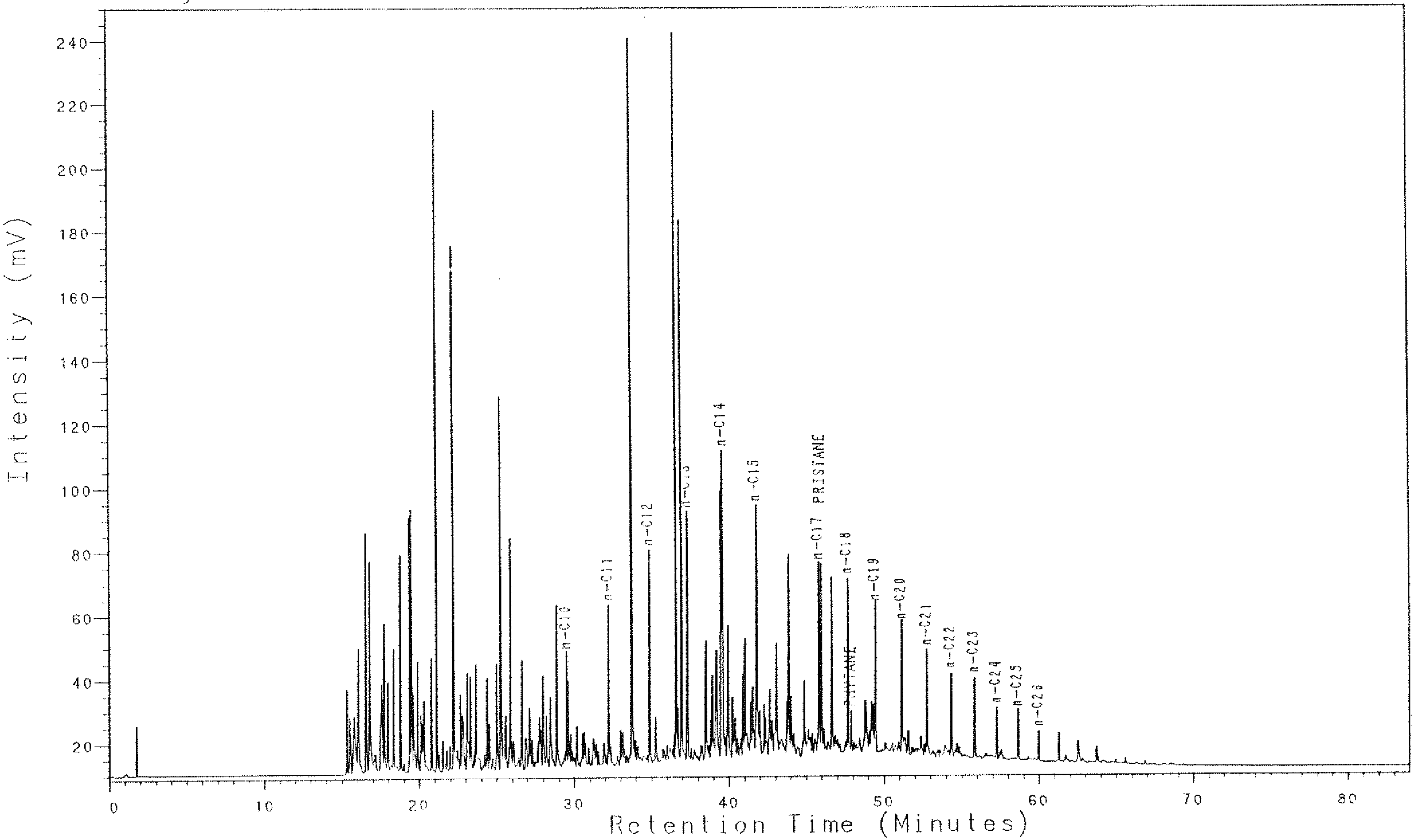
Analysis PV5901904 26, 1, 1 30/6-9, 3140m



NOCS 30/6-9 3140m
THERMAL EXTRACTION GC (S1)
S/SST: to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

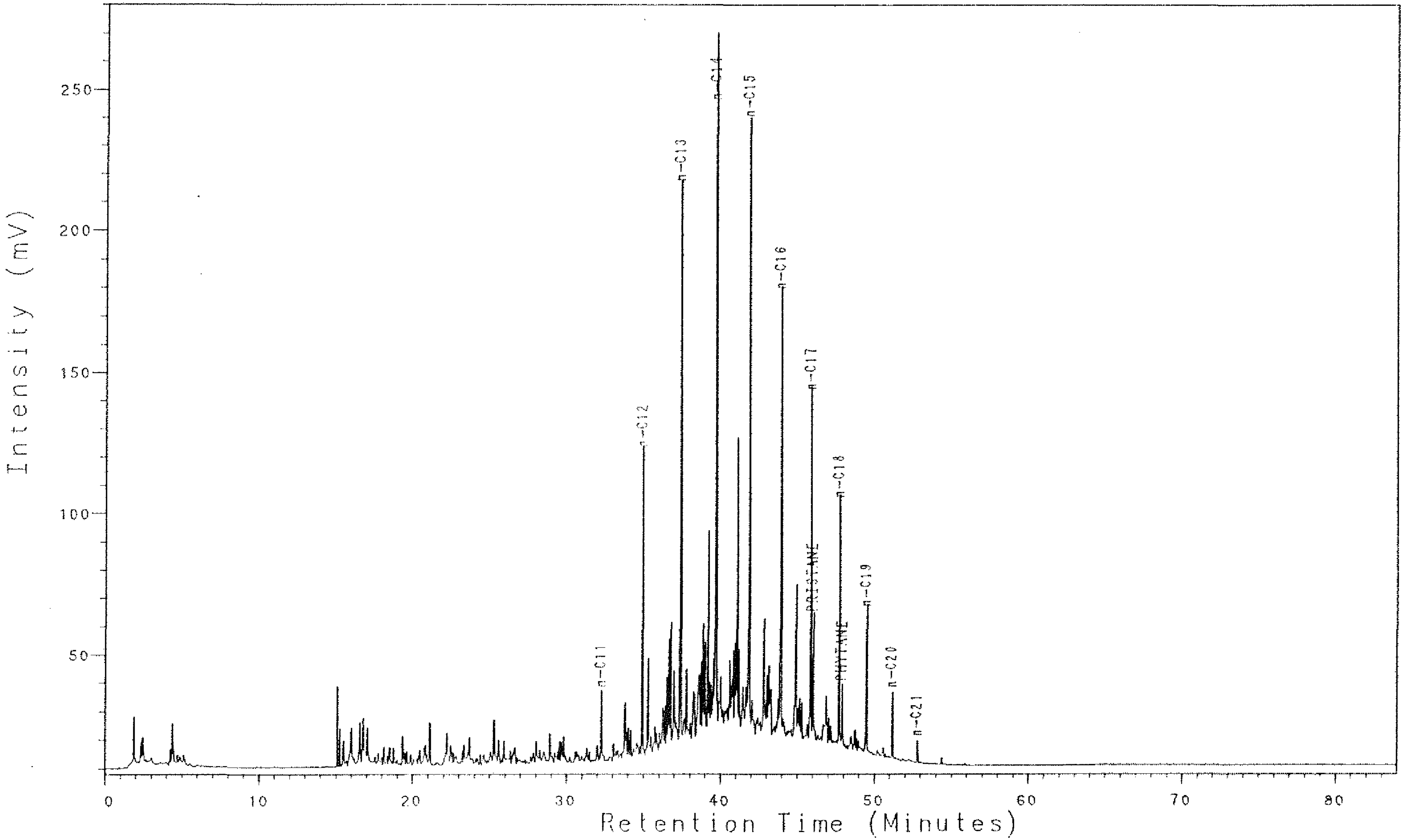
Analysis PV5901935 26, 1, 1 30/6-9, 3170m



NOCS 30/6-9 3170m
THERMAL EXTRACTION GC (S1)
COAL:blk

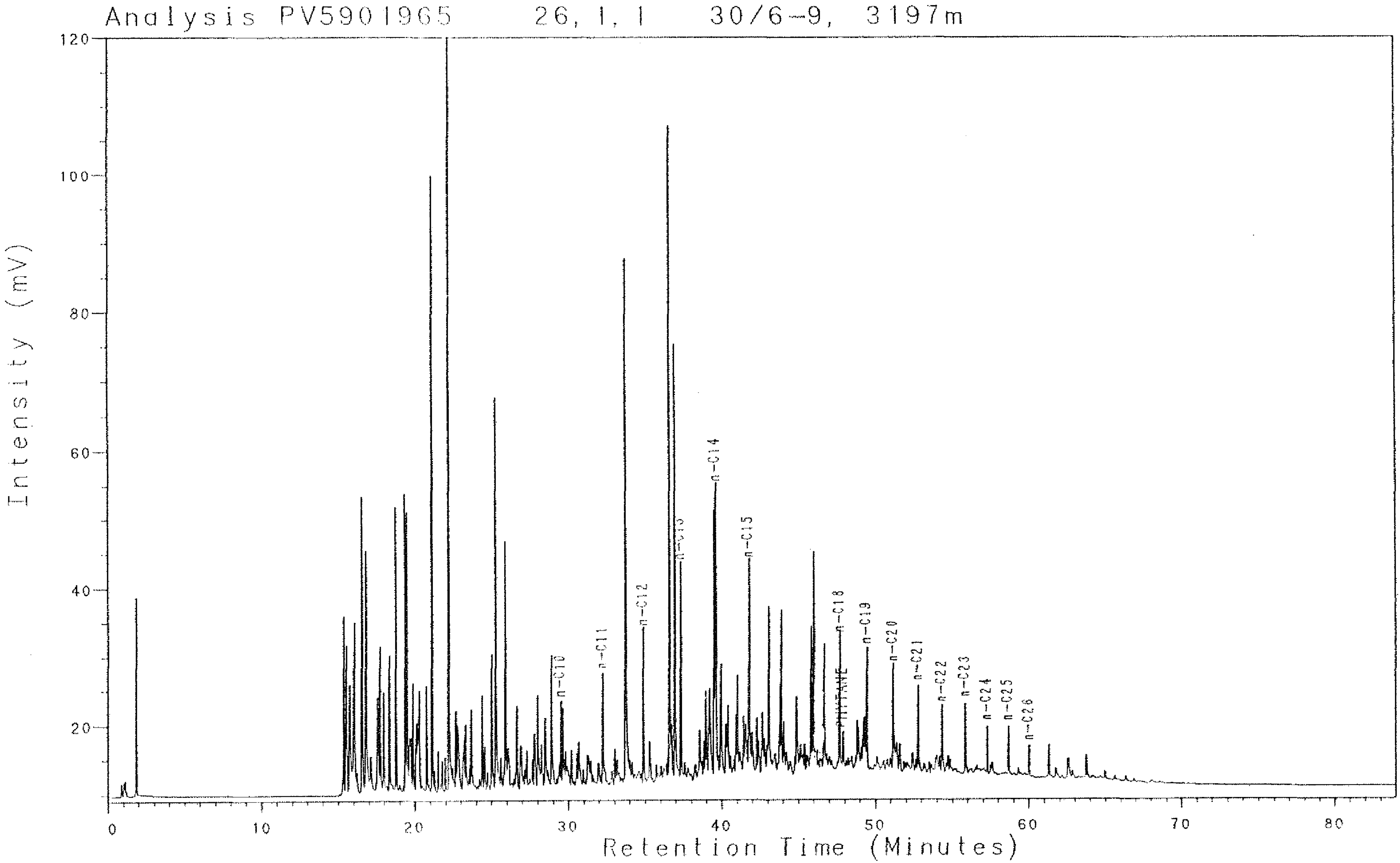
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5901942   26, 1, 1   30/6-9, 3180m



NOCS 30/6-9 3180m
THERMAL EXTRACTION GC (S1)
SLTST:brn gy to lt gy to m gy

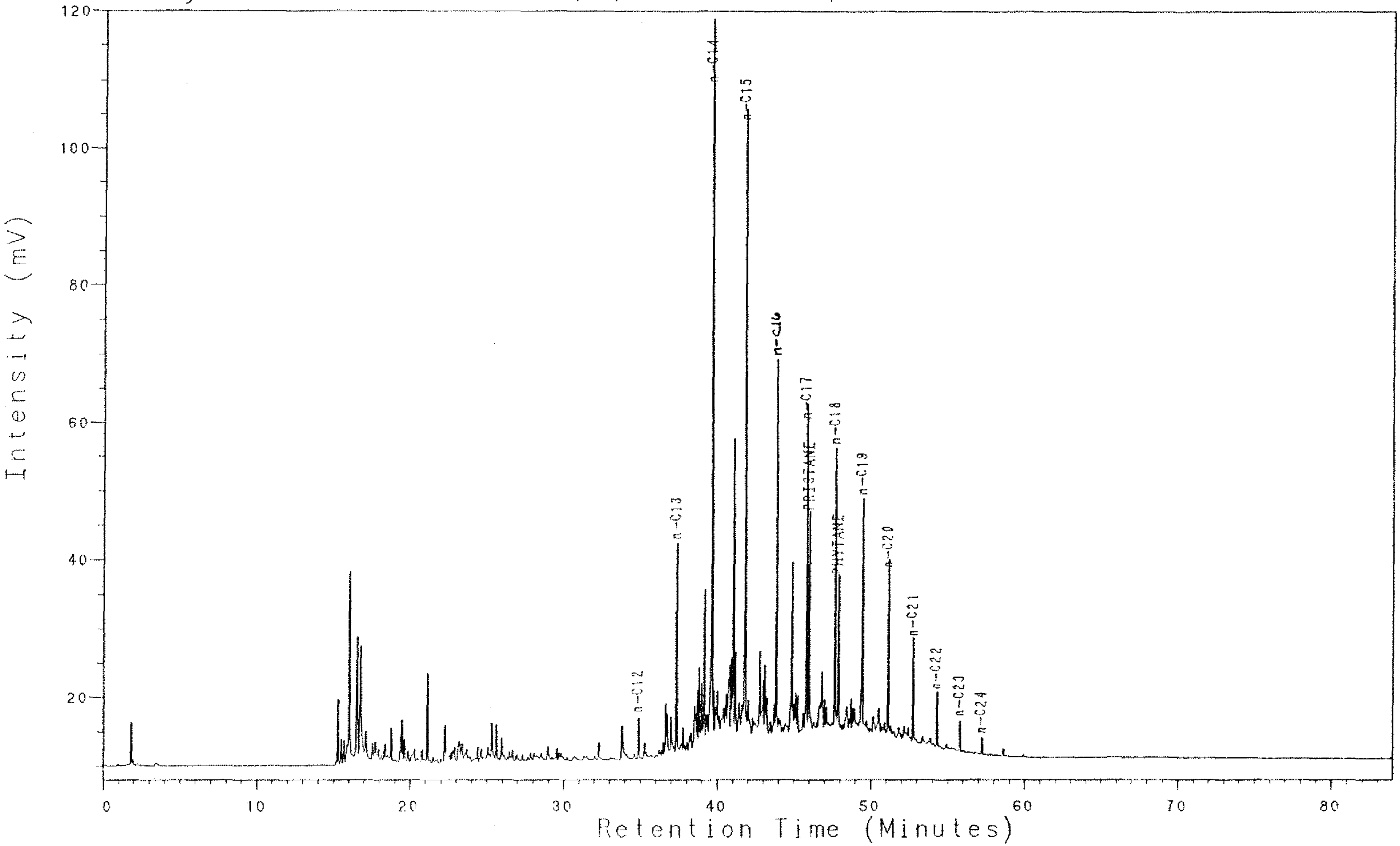
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 3197m
THERMAL EXTRACTION GC (S1)
COAL:blk to dsk y brn

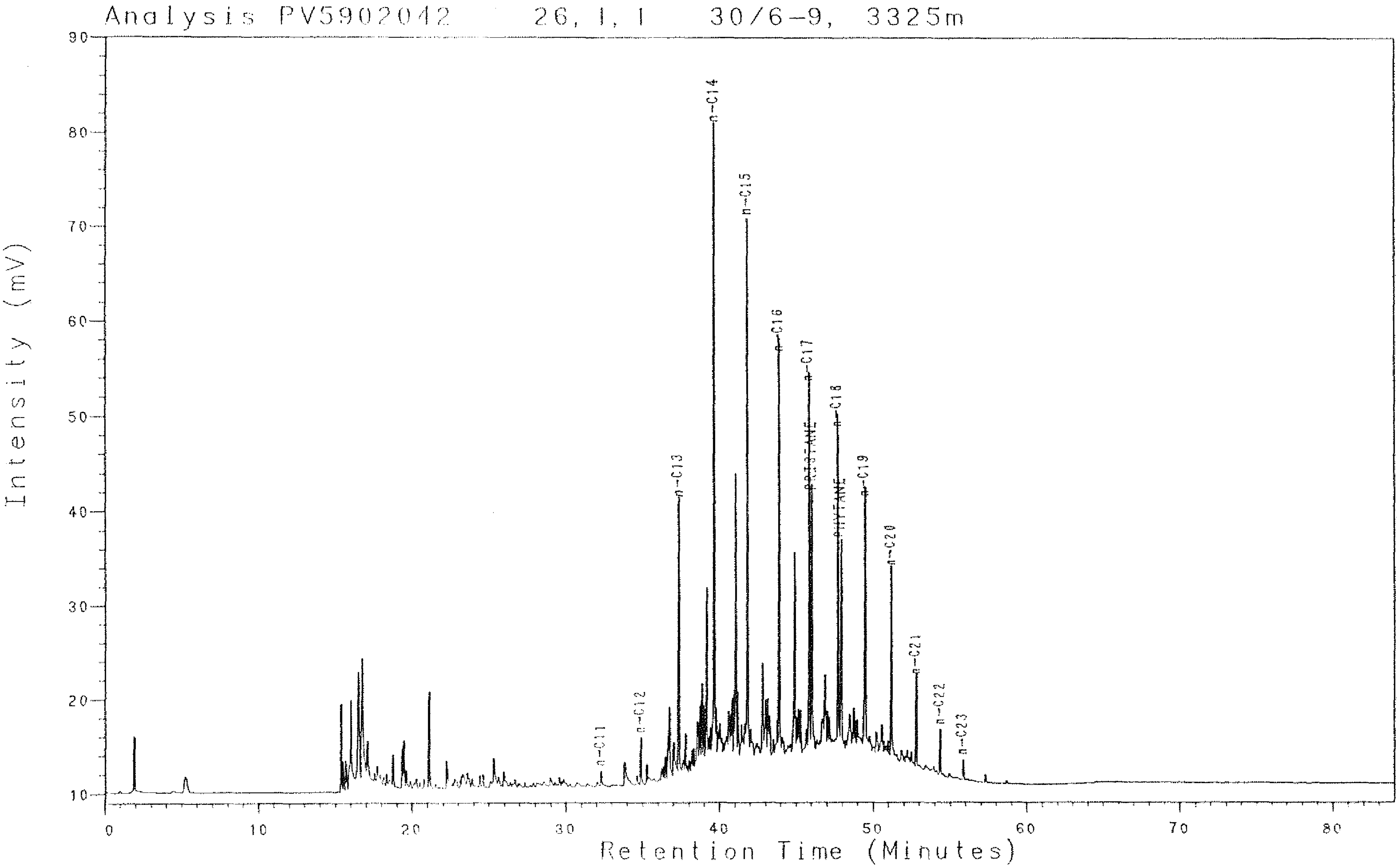
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Analysis PV5902003 26, I, I 30/6-9, 3265m



NOCS 30/6-9 3265m
THERMAL EXTRACTION GC (S1)
S/SST:w to lt gy

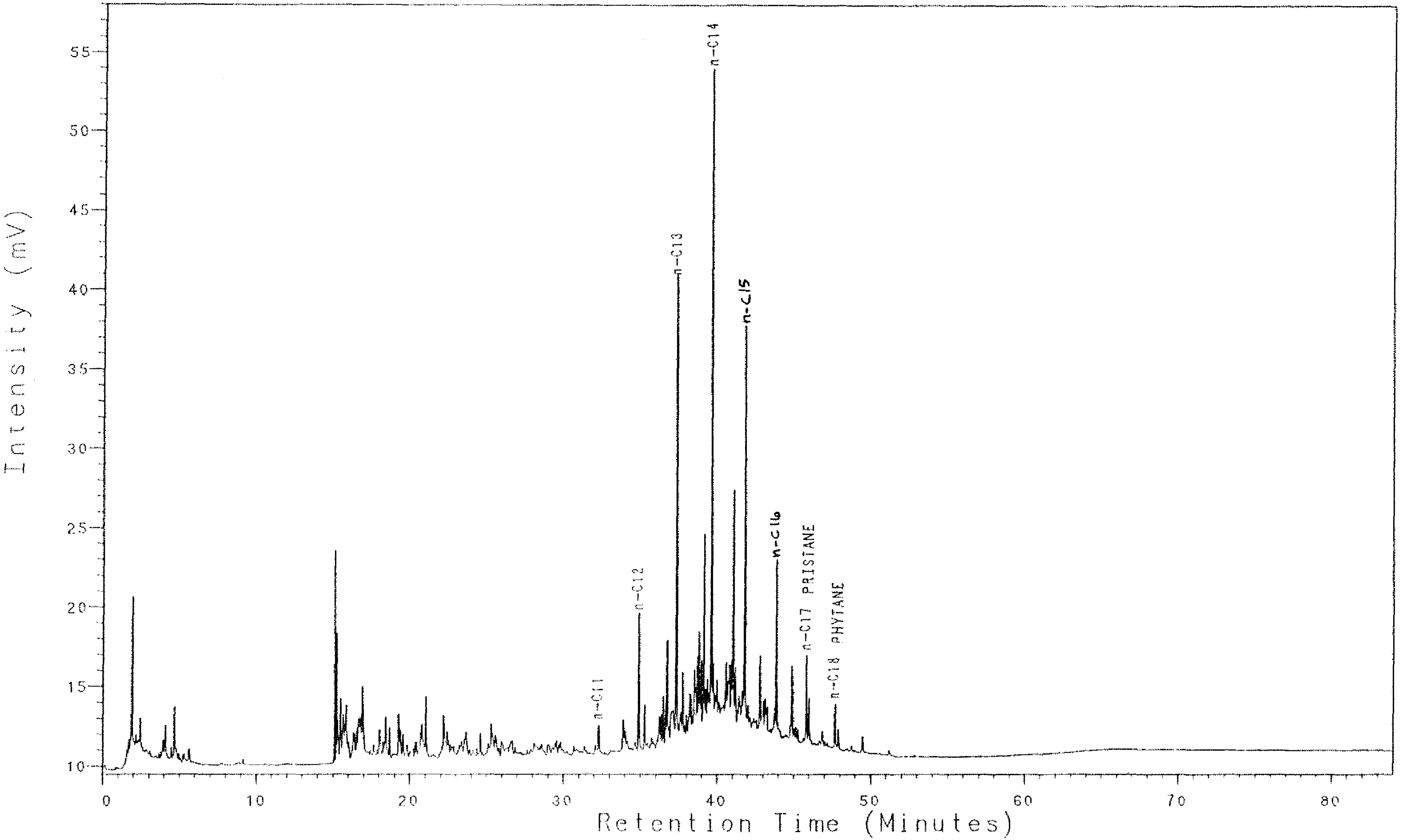
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 3325m
THERMAL EXTRACTION GC (S1)
CLST:brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

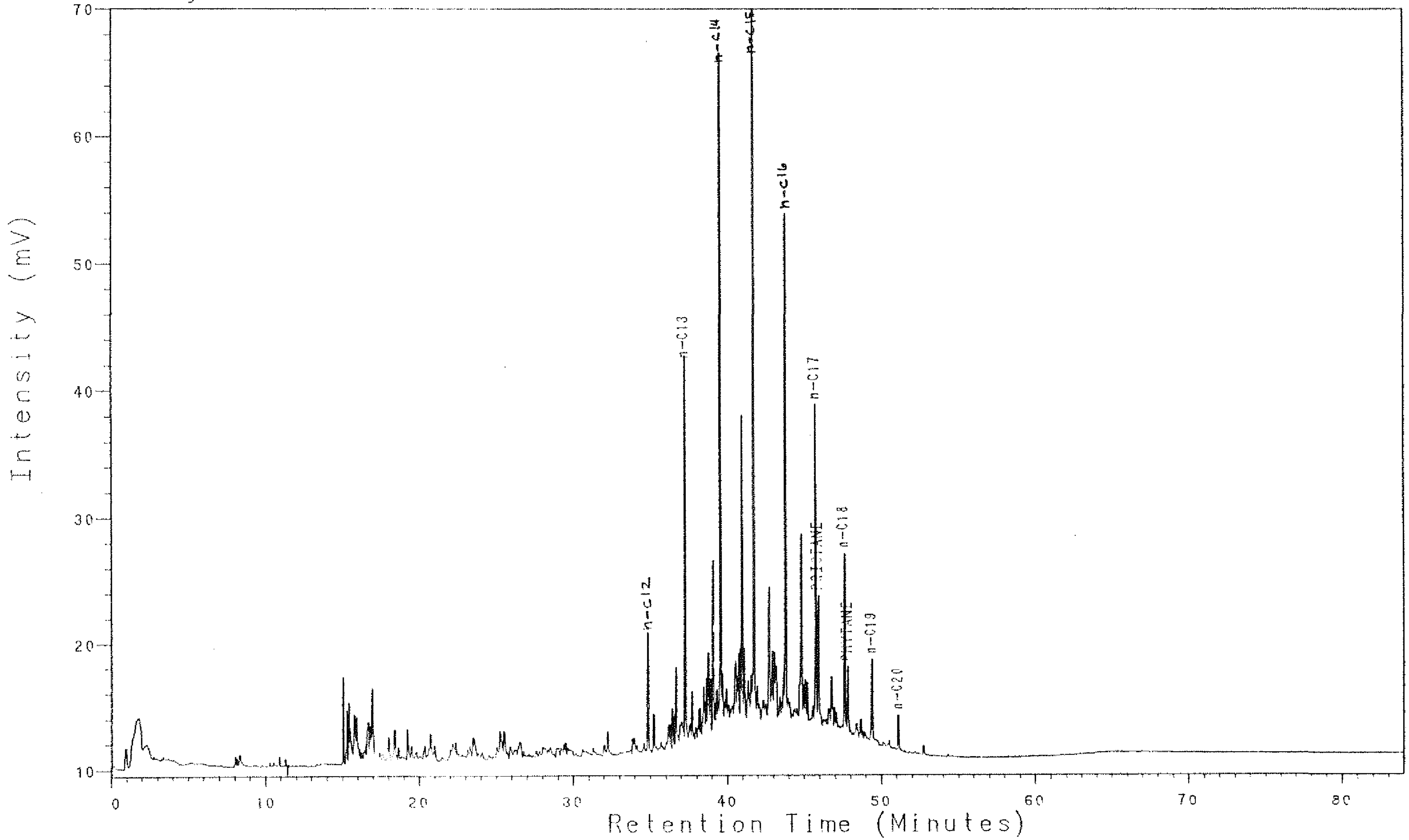
Analysis PV5902062   26, 1, 1   30/6-9, 3355m



NOCS   30/6-9   3355m
THERMAL EXTRACTION GC (S1)
CLST:brn gy to m gy to dsk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

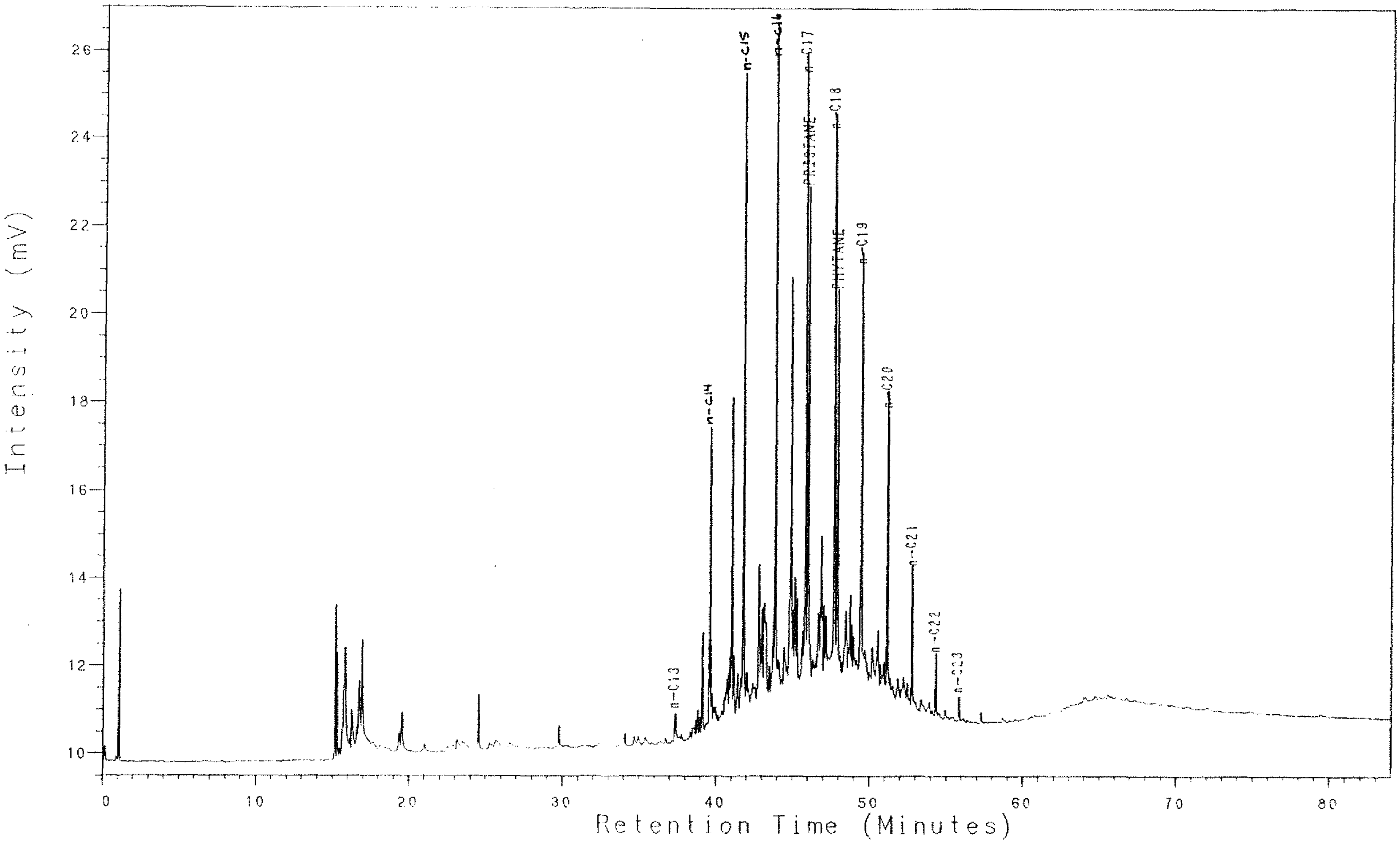
Analysis PV5902092 26, 1, 1 30/6-9, 3400m



NOCS 30/6-9 3400m
THERMAL EXTRACTION GC (S1)
CLST:brn gy to m gy to drk gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

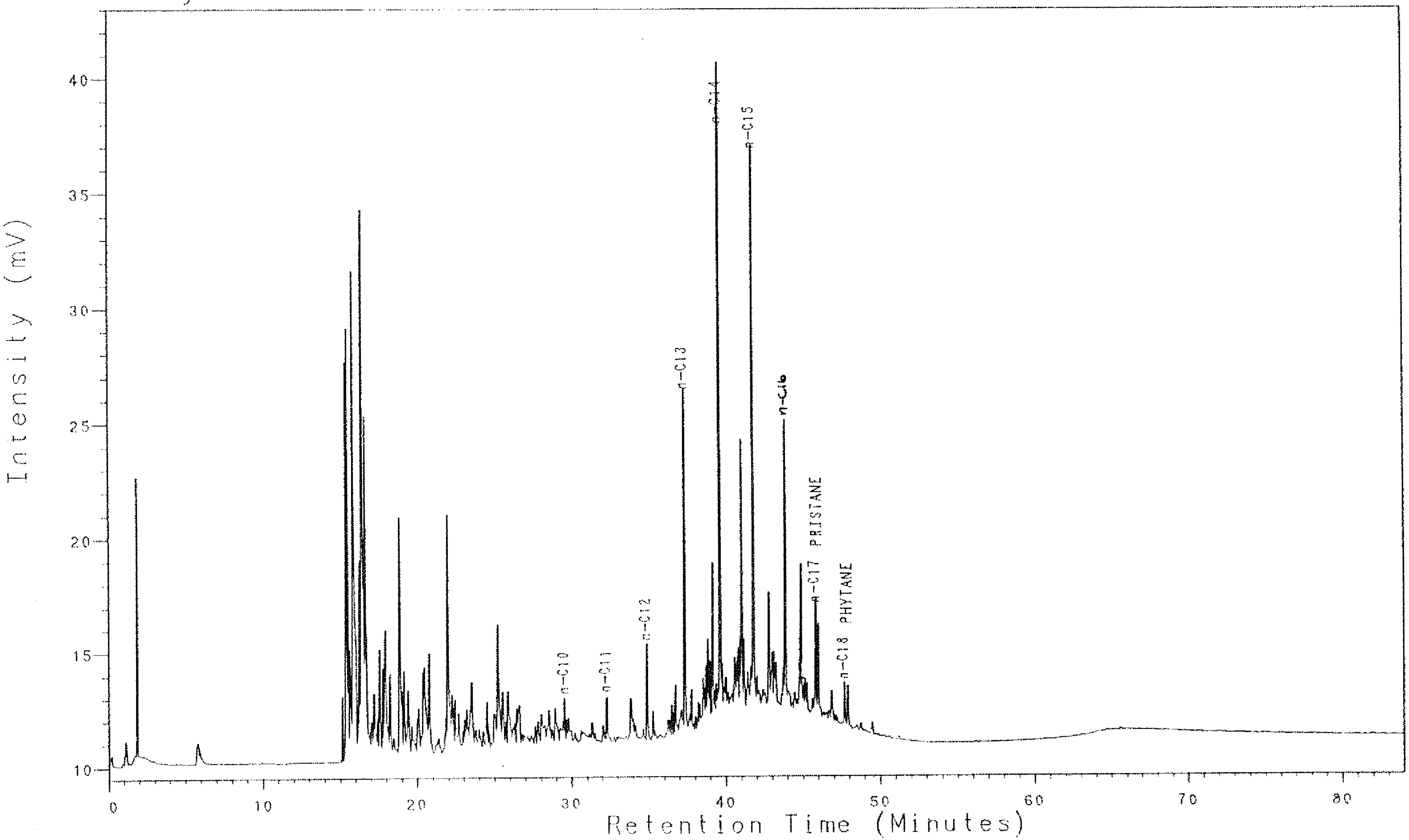
Analysis PV592113 26,1,1 30/6-9,3430m



NOCS 30/6-9 3430m
THERMAL EXTRACTION GC (S1)
S/SST:w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

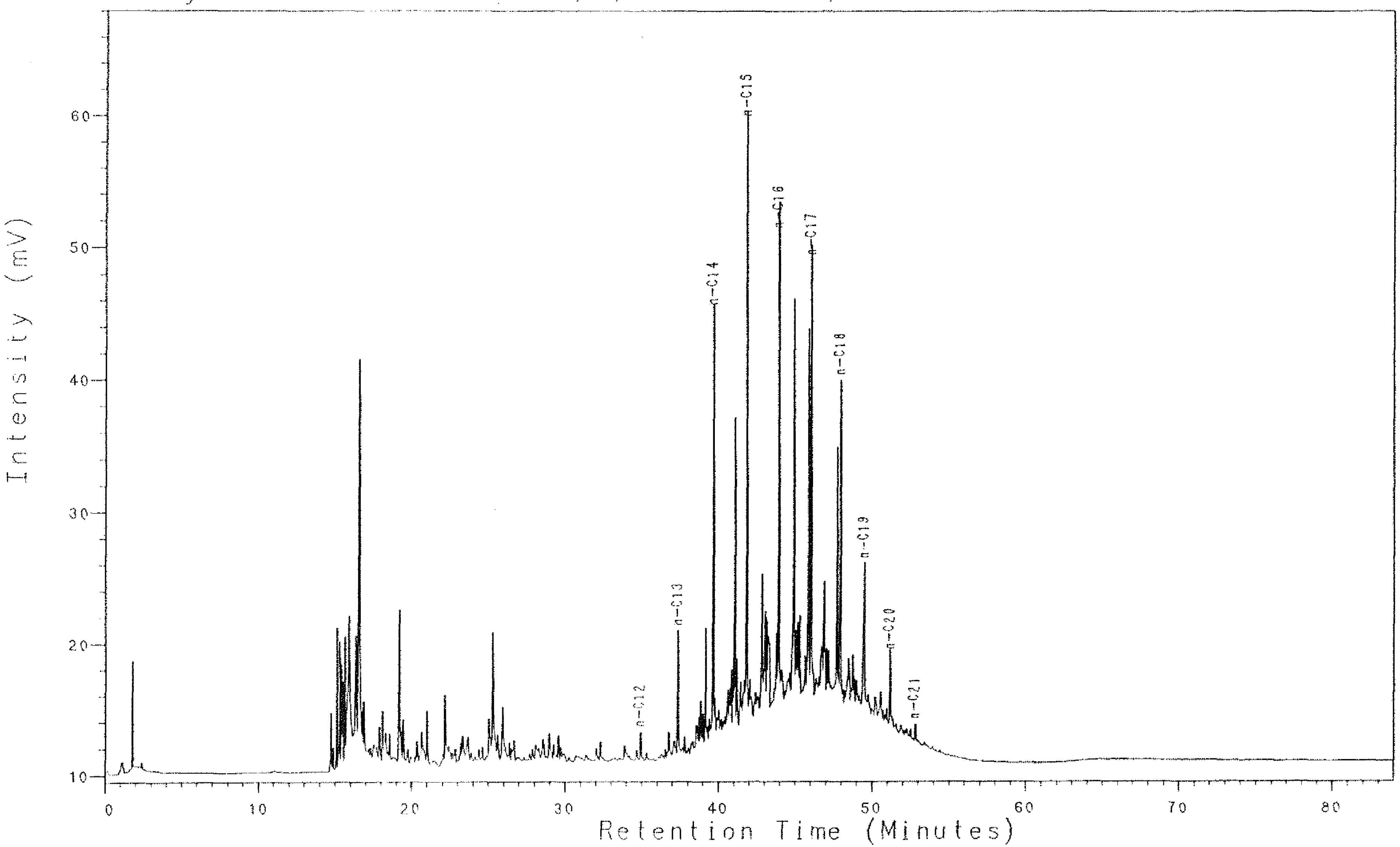
Analysis PV5902142   26, 1, 1   30/6-9, 3475m



NOCS   30/6-9   3475m
THERMAL EXTRACTION GC (S1)
CLST:brn gy to m gy

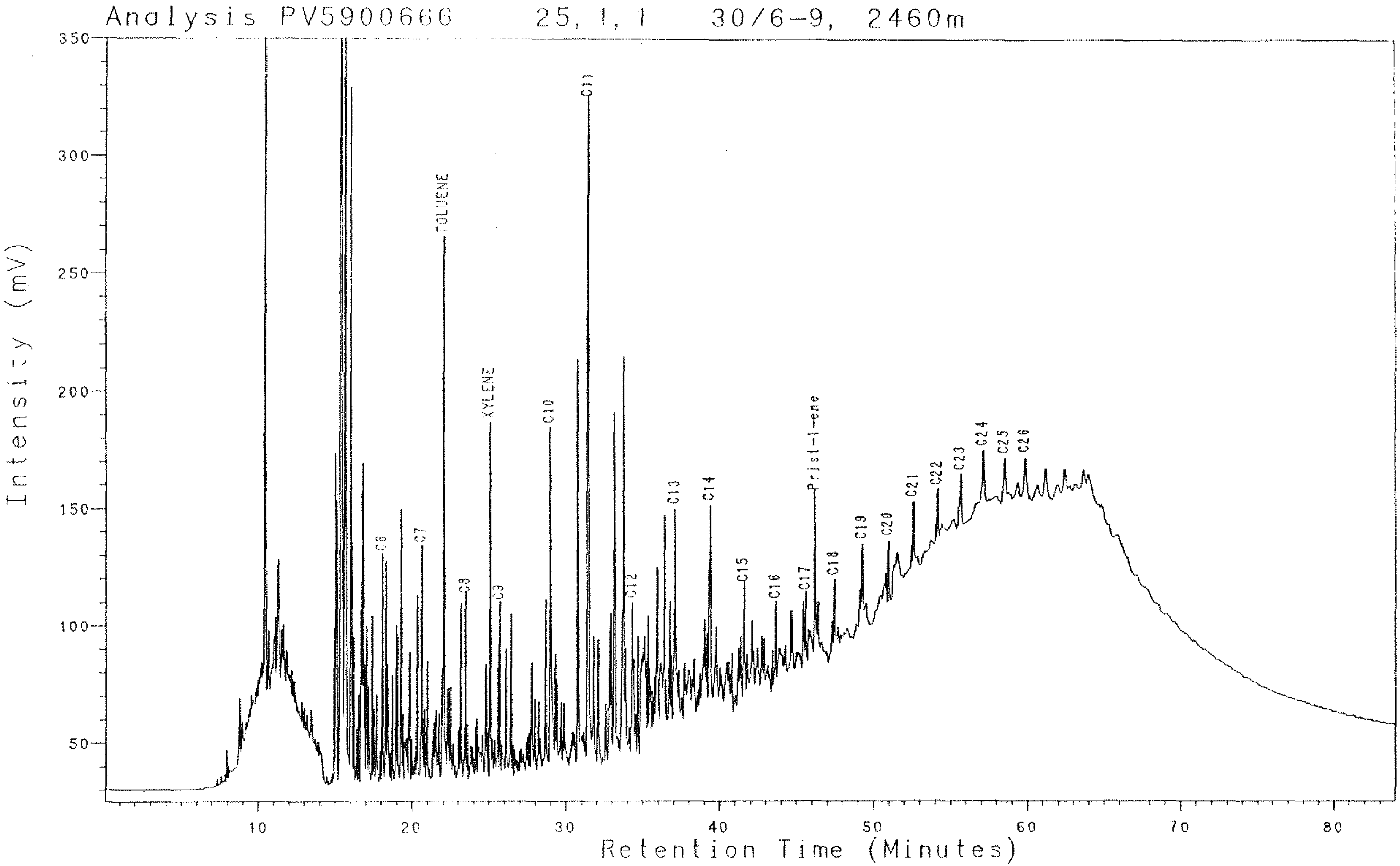
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

Analysis PV5902143   26, 1, 1   30/6-9, 3475m



NOCS 30/6-9 3475m
THERMAL EXTRACTION GC (S1)
S/SST:w to lt gy

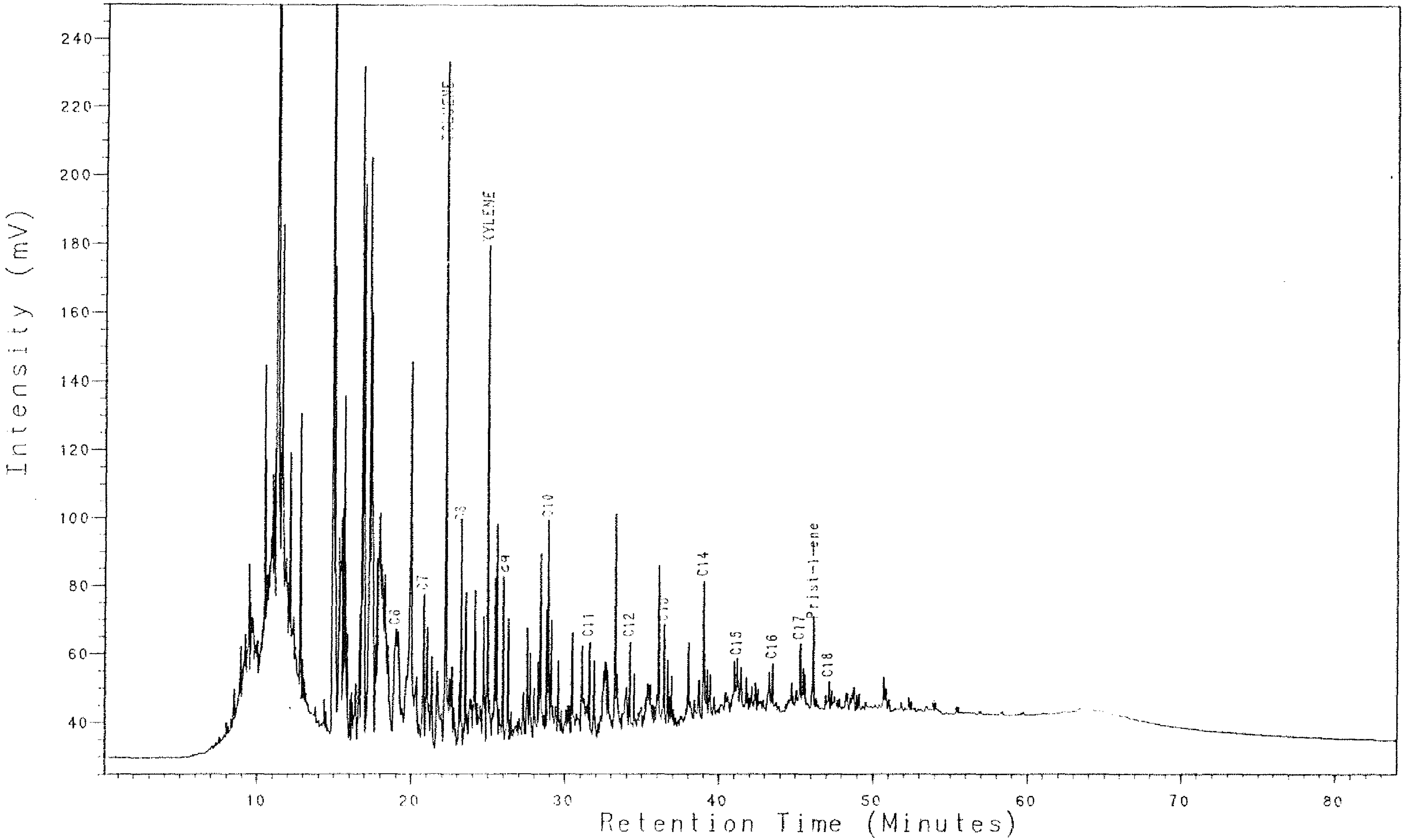
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 2460m
PYROLYSIS GC (S2)
COAL:blk

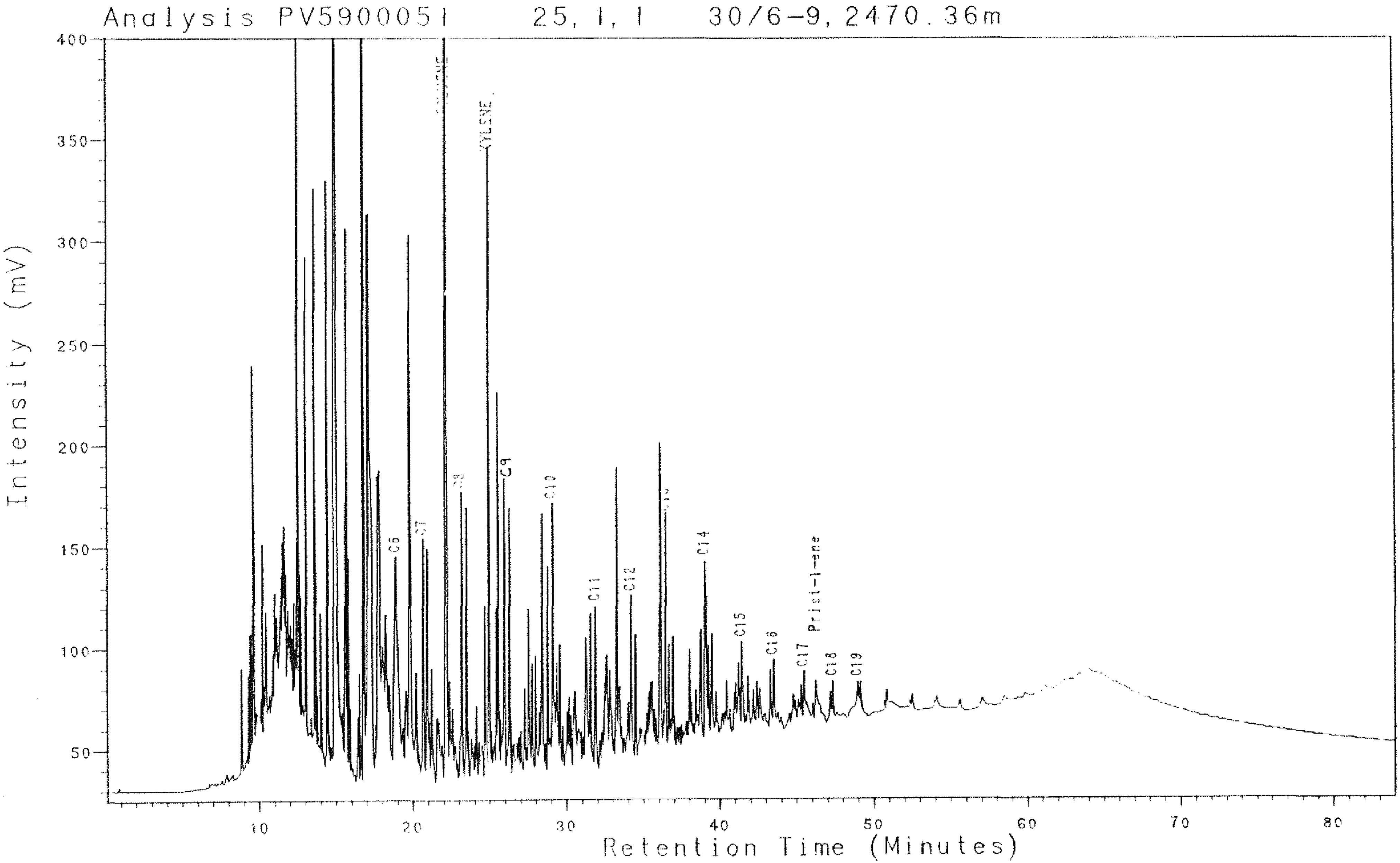
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Analysis PV5900021 25, 1, 1 30/6-9, 2462.74m



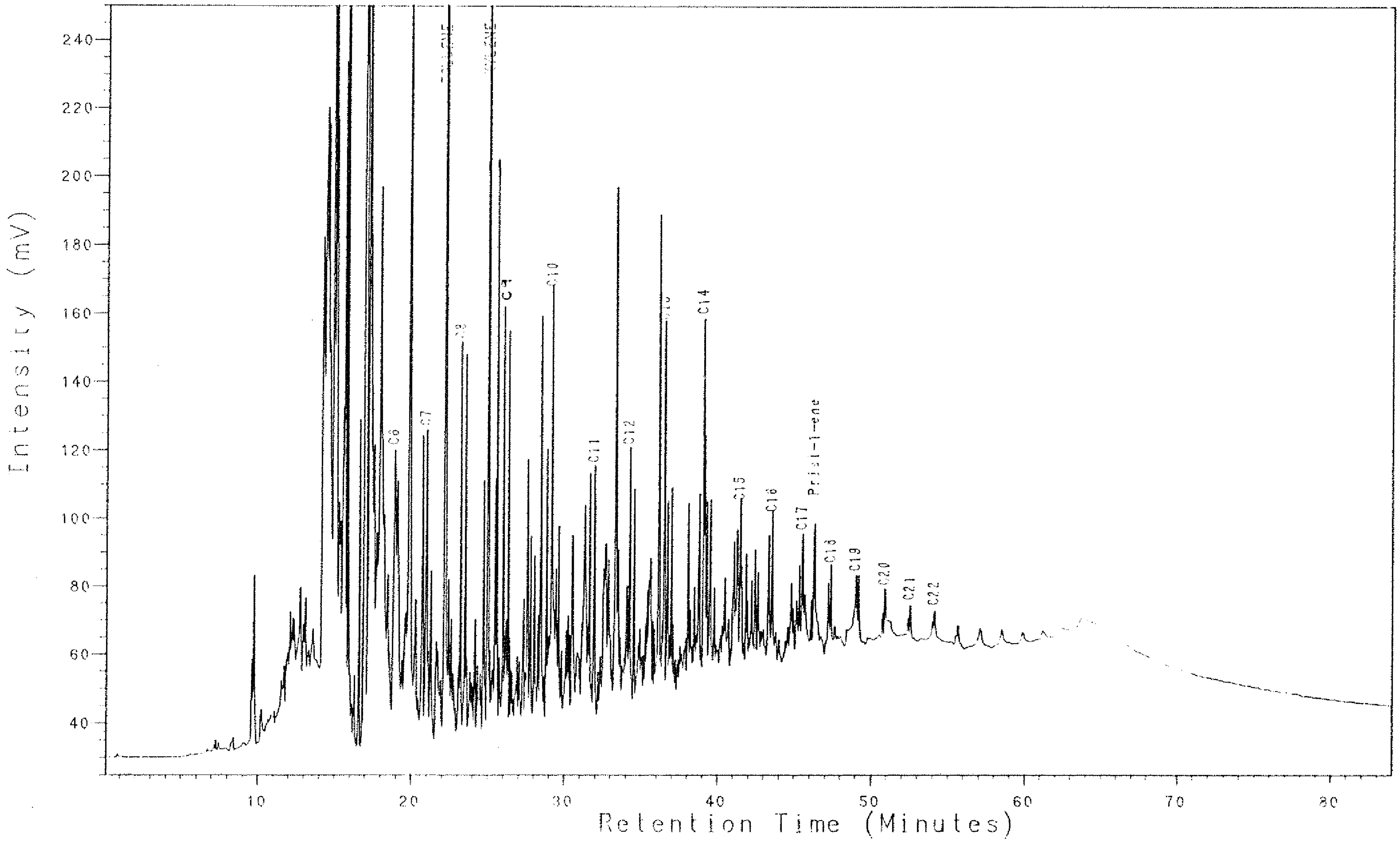
NOCS 30/6-9 2462.74m
PYROLYSIS GC (S2)
SST: ~1 brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S



NOCS 30/6-9 2470.36m
PYROLYSIS GC (S2)
SLTST: pl y brn to lt gy
to drk gy

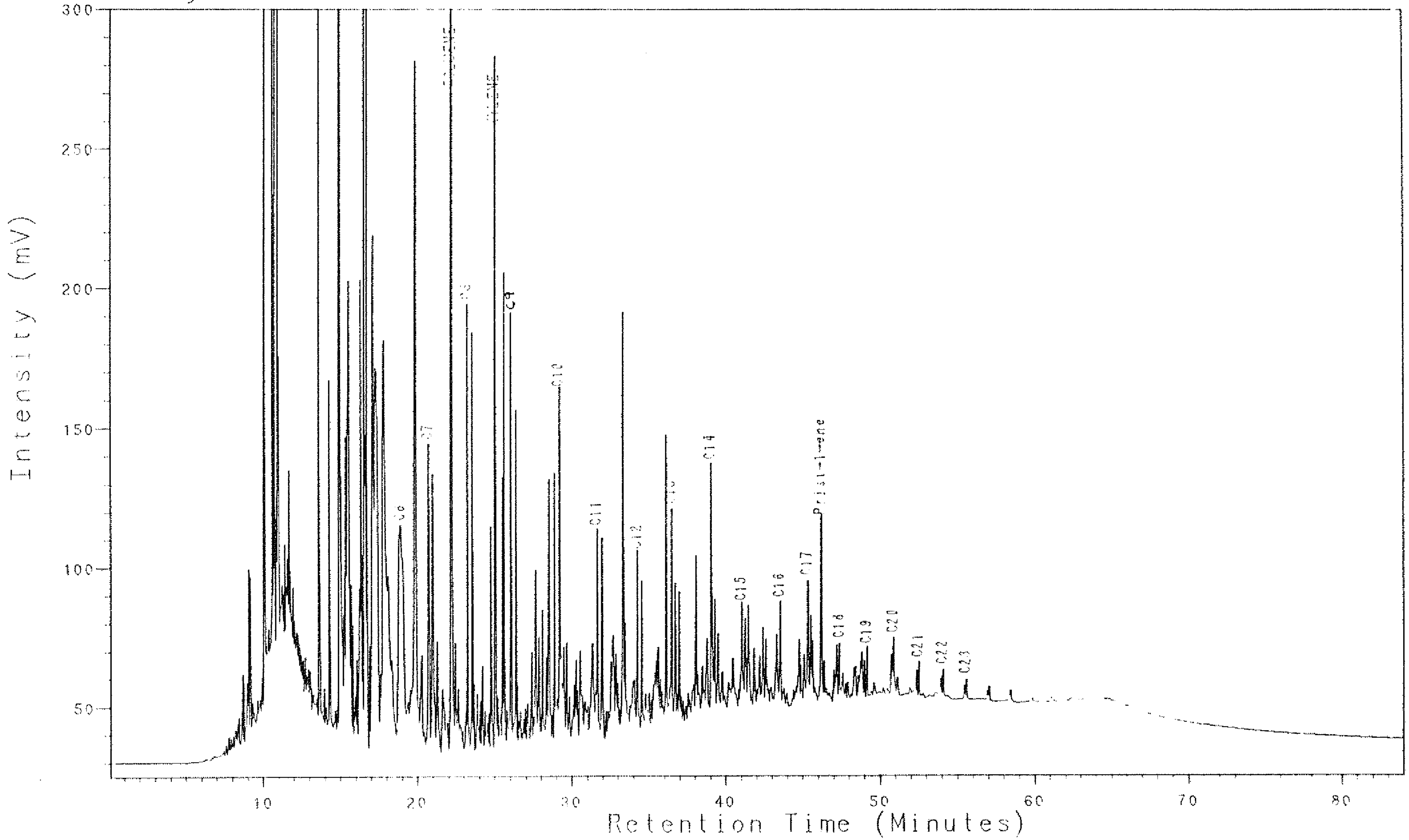
Analysis PV5900061 25, 1, 1 30/6-9, 2472.94m



NOCS 30/6-9 2472.94m
PYROLYSIS GC (S2)
SLTST: drk gy to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

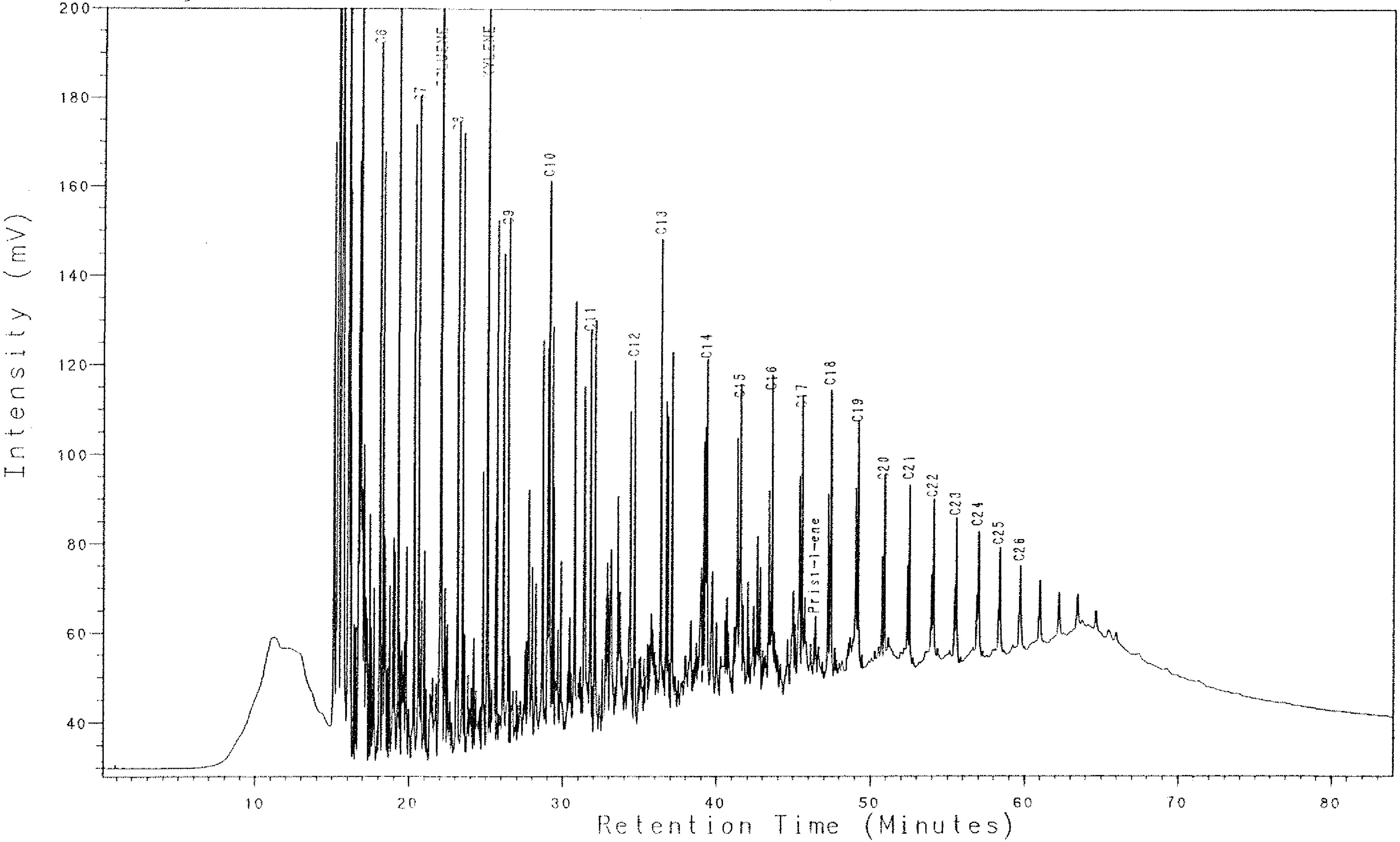
Analysis PV5900071 25, 1. 1 30/6-9, 2474m



NOCS 30/6-9 2474m
PYROLYSIS GC (S2)
CLST: drk gy to brn blk

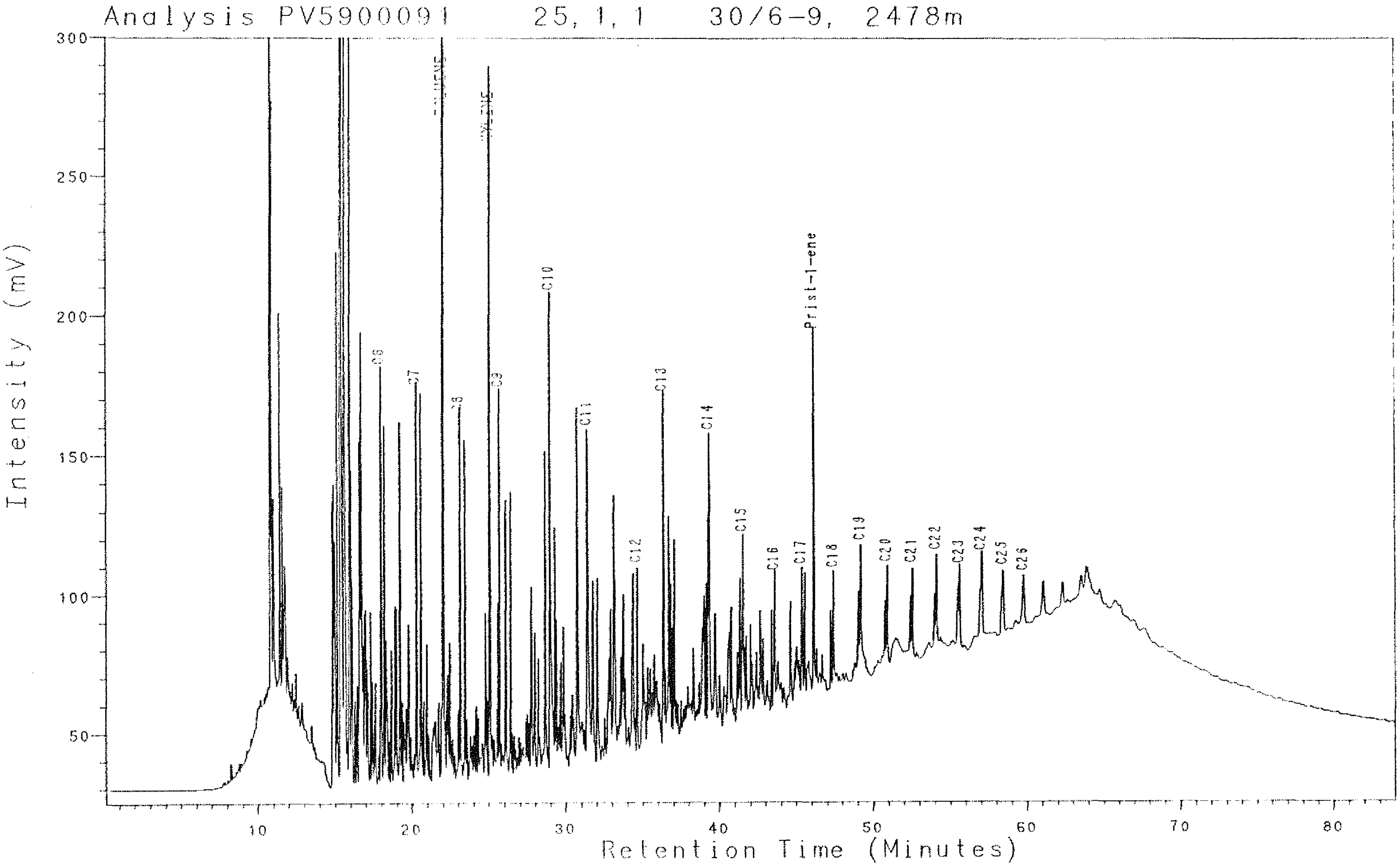
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5900081 25, 1, 1 30/6-9, 2476m



NOCS 30/6-9 2476m
PYROLYSIS GC(S2)
COAL: blk

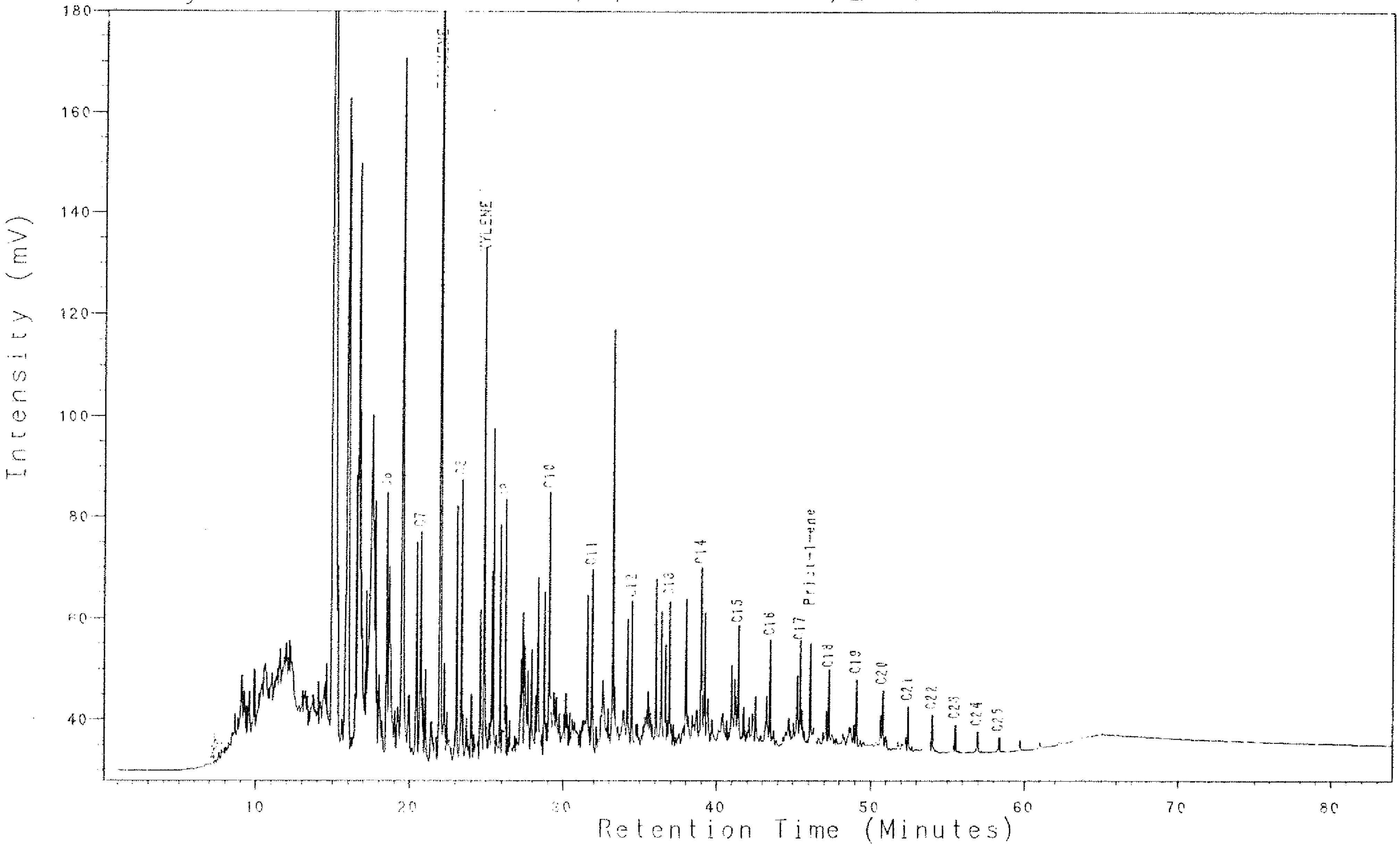
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



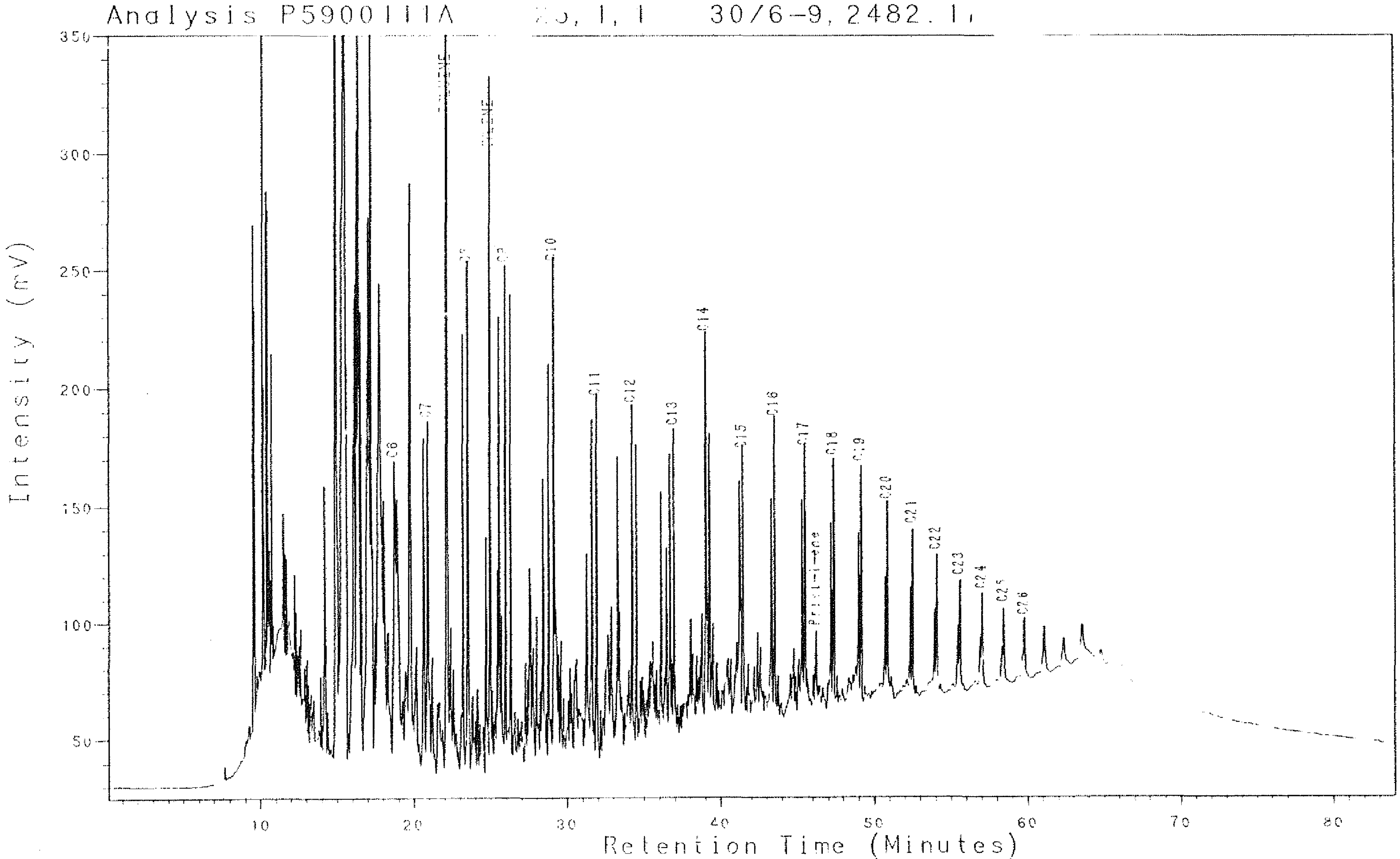
NOCS 30/6-9 2478m
PYROLYSIS GC (S2)
COAL:blk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5900101 25, 1, 1 30/6-9, 2480m



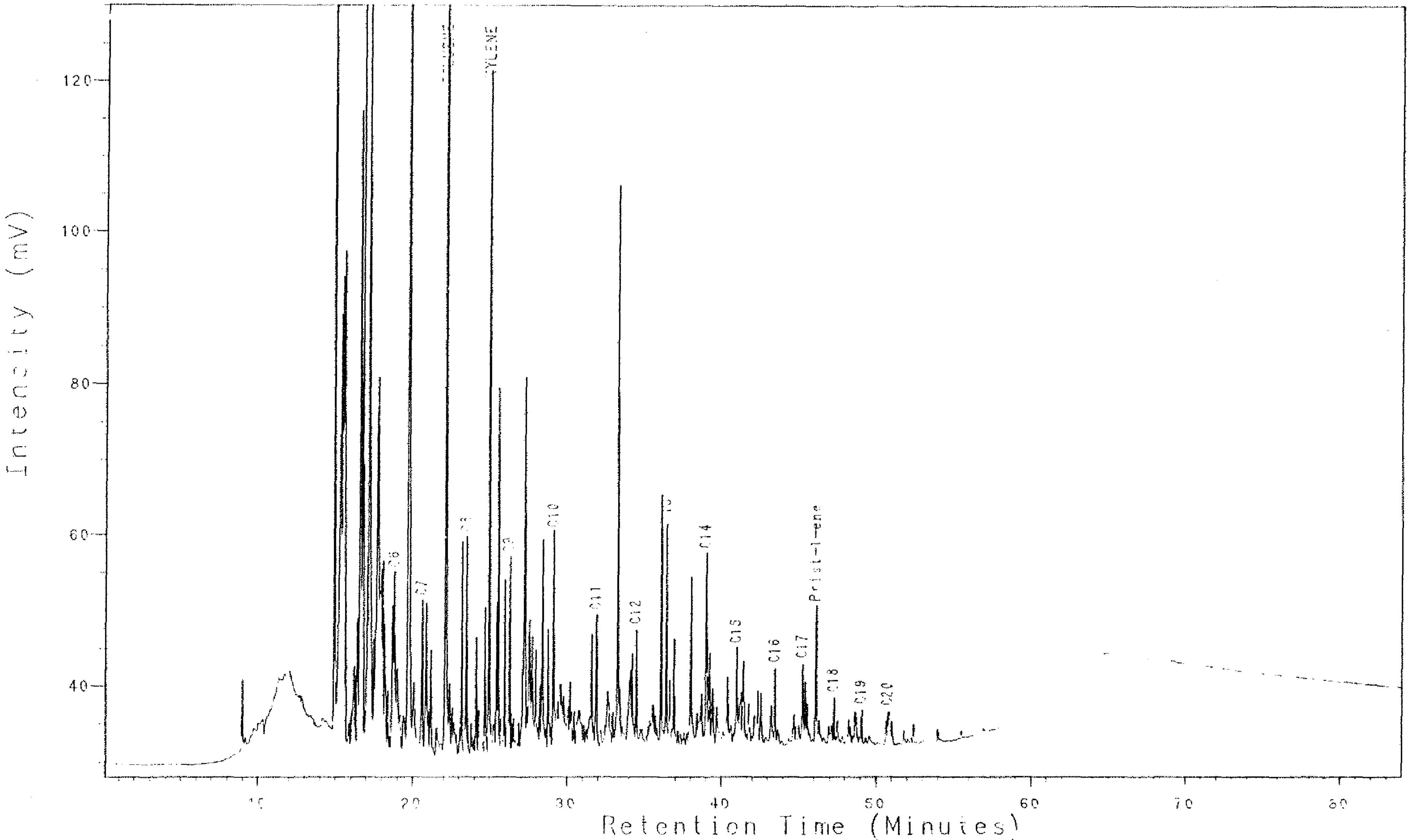
NOCS 30/6-9 2480m
PYROLYSIS GC (S2)
SLTST: lt brn gy to brn gy



NOCS 30/6-9 2482.17m
PYROLYSIS GC (S2)
CLST: drk gy to brn blk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

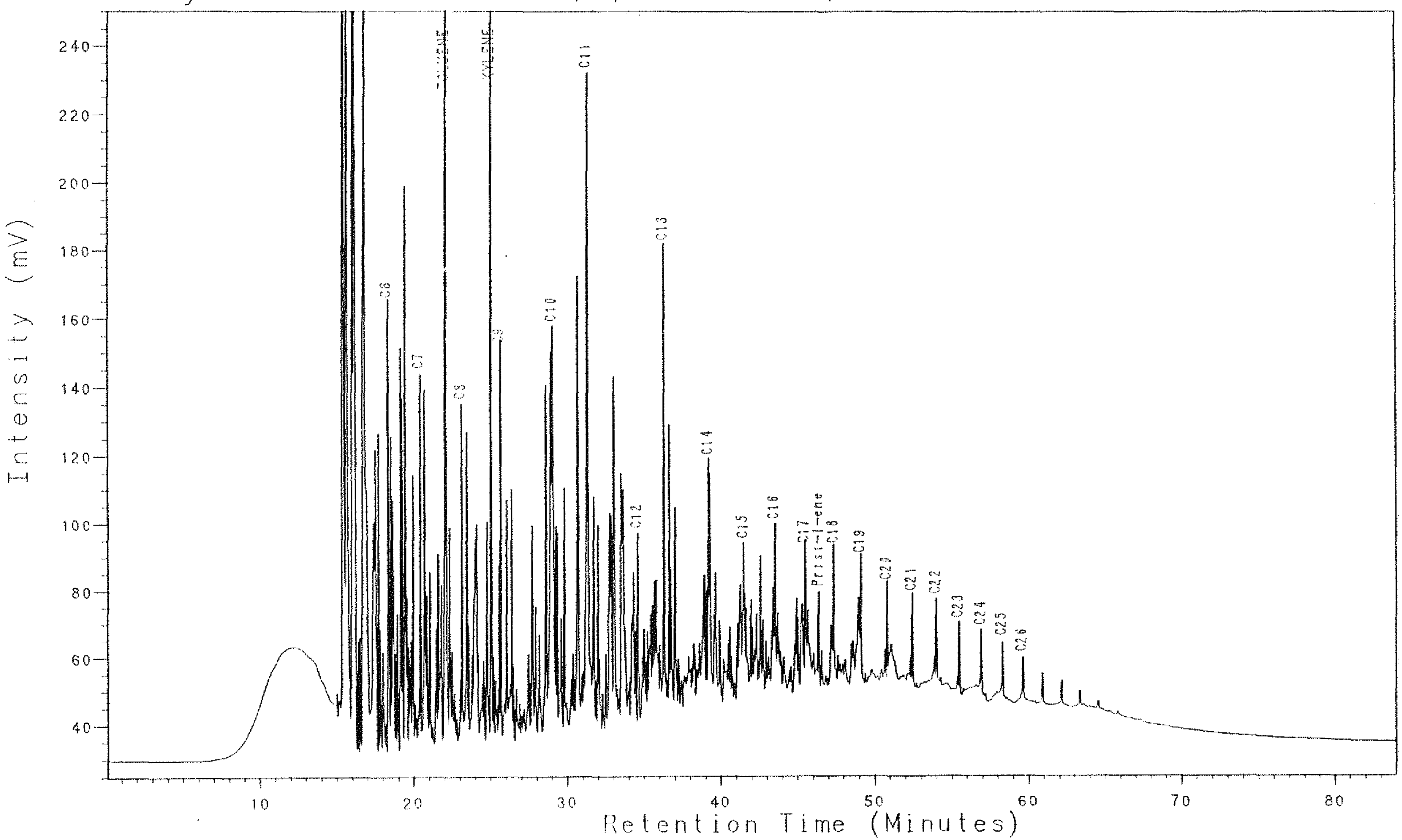
Analysis PV5900121   25, i, 1   30/6-9, 2484m



NOCS 30/6-9 2484m
PYROLYSIS GC (S2)
CLST: drk gy to dsk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

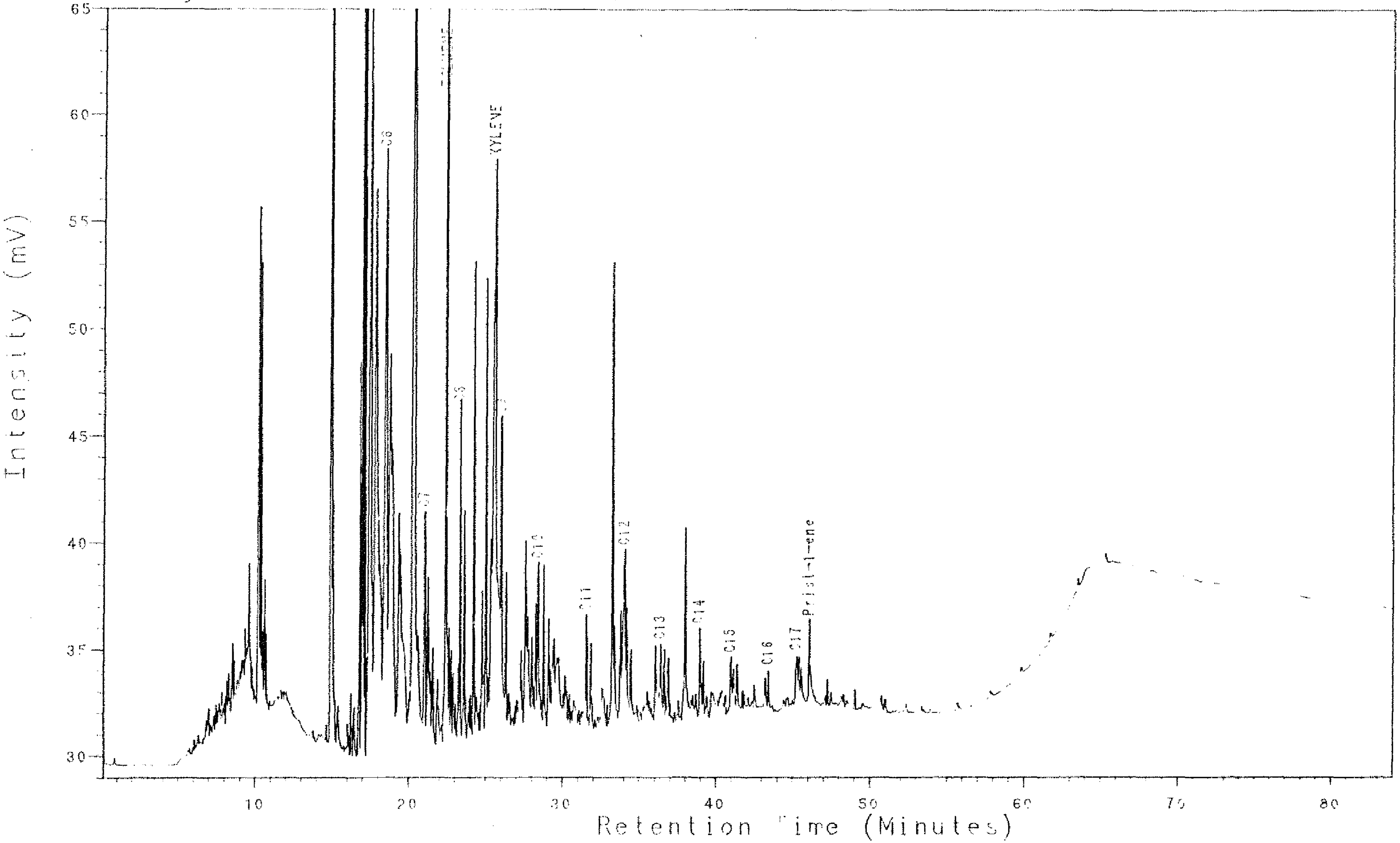
Analysis PV5900131 25, 1, 1 30/6-9, 2486.39m



NOCS 30/6-9 2486.39m
PYROLYSIS GC (S2)
[illegible]:brn gy

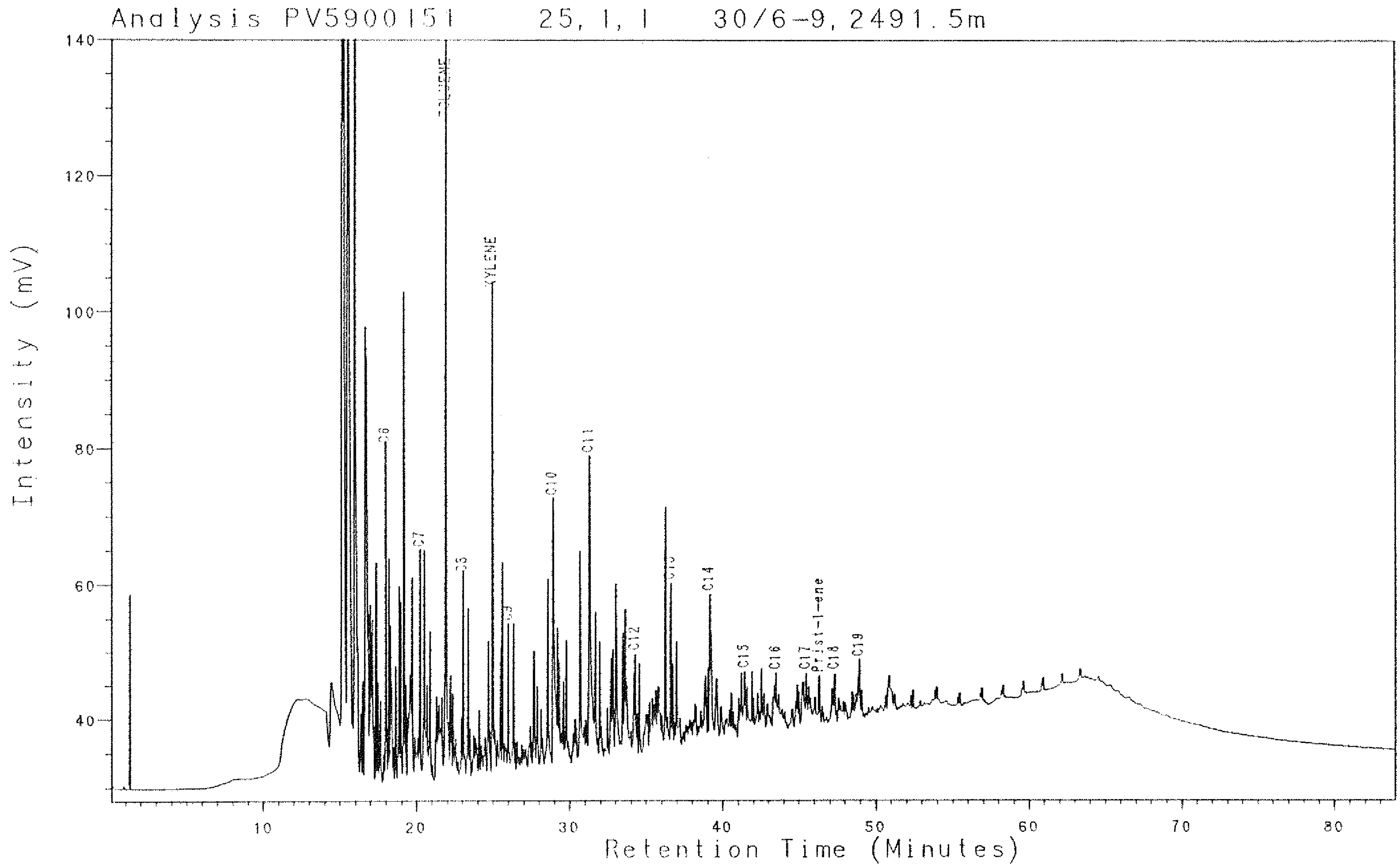
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5900141   25, 1, 1   30/6-9, 2488.4m



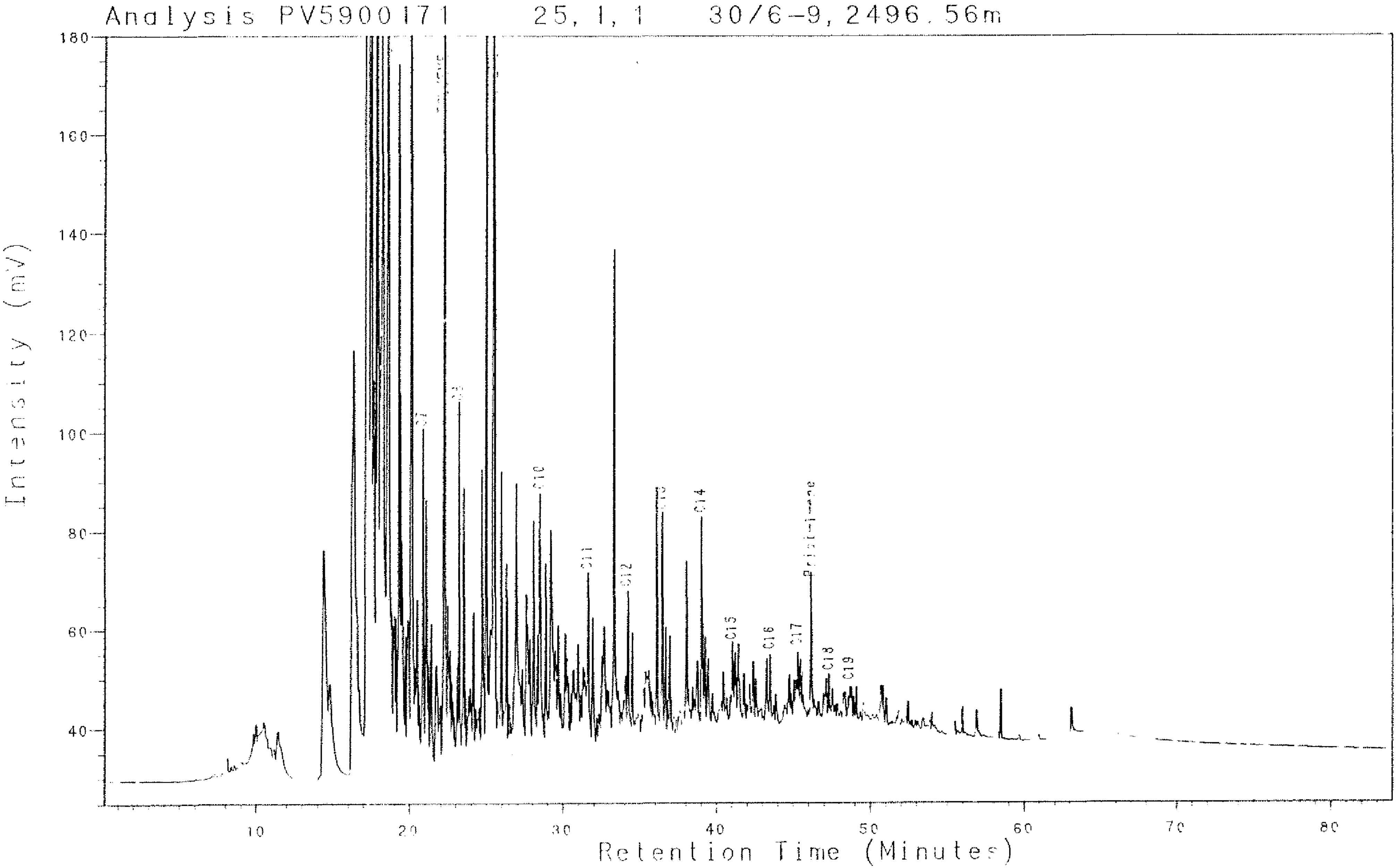
NOCS 30/6-9 2488.40m
PYROLYSIS GC (S2)
SST: lt or

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



HOC3 30/6-9 2491.5m
PYROLYSIS GC (S2)
3/SST:lt or to or gy

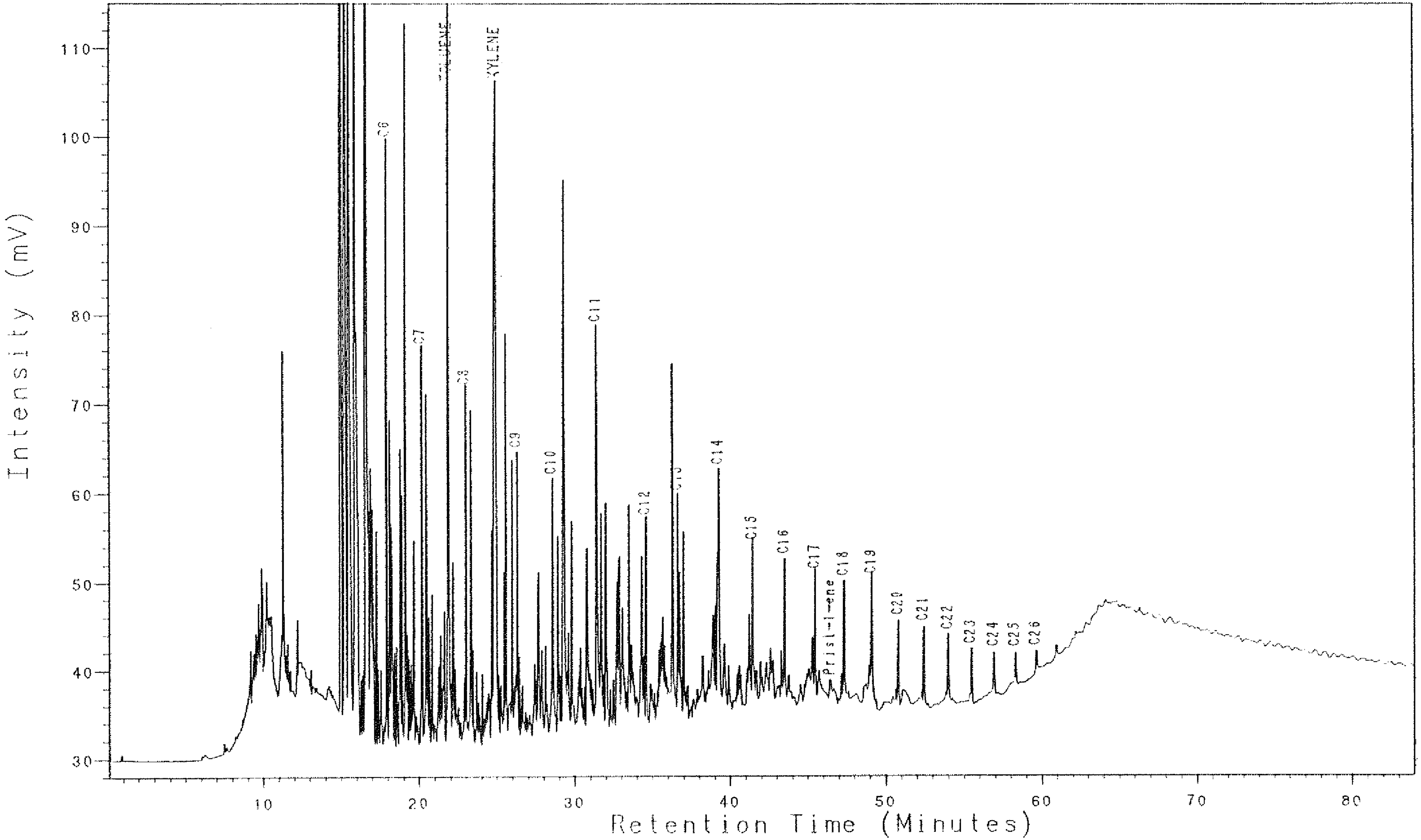
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.



NOCS 30/6-9 2496.56m
PYROLYSIS GC (S2)
SST: lt or to pl y brn

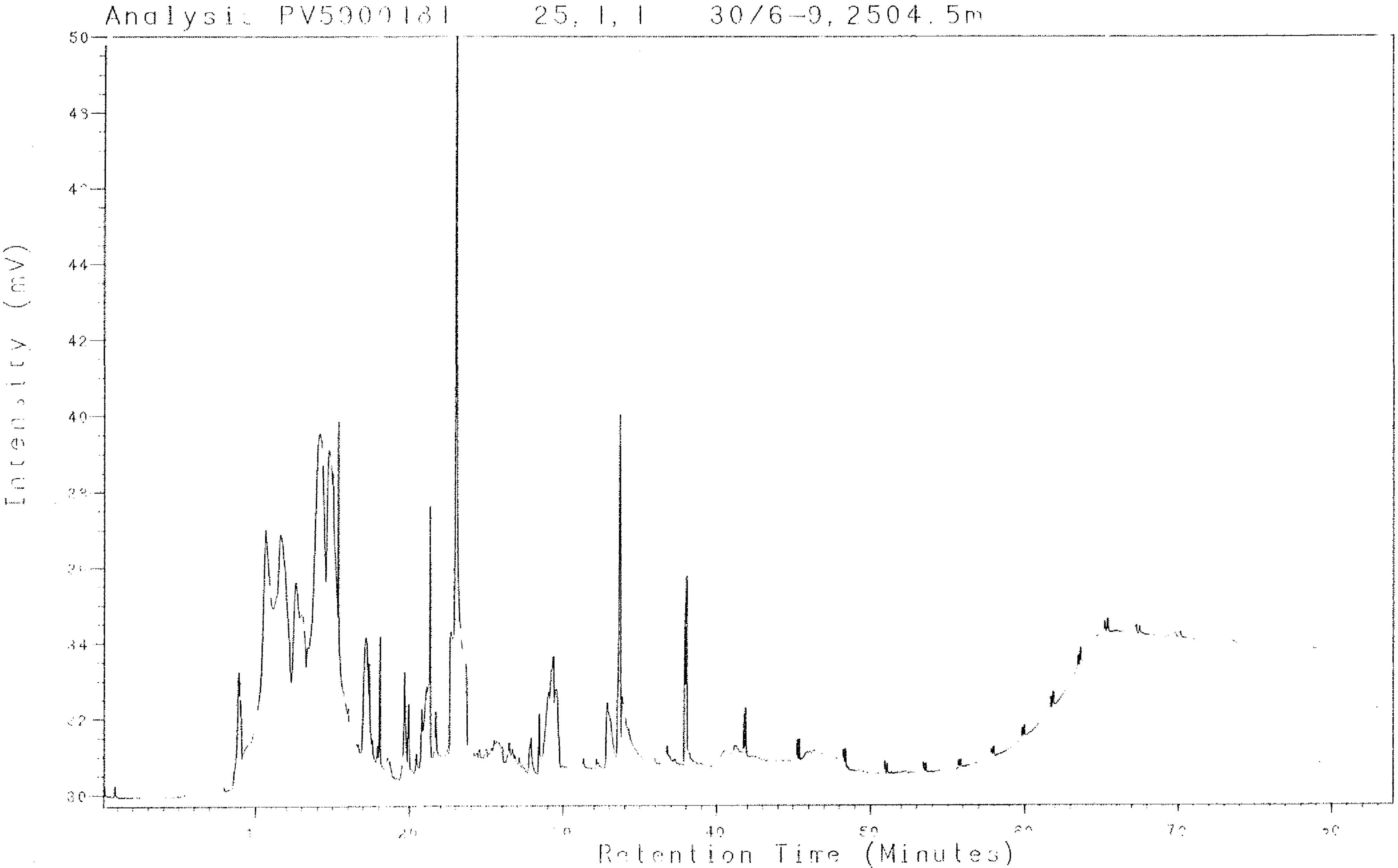
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

Analysis PV5900221 25, 1, 1 30/6-9, 2501.5m



NOCS 30/6-9 2501.5m
PYROLYSIS GC (GC)
SLTST: lt brn gy

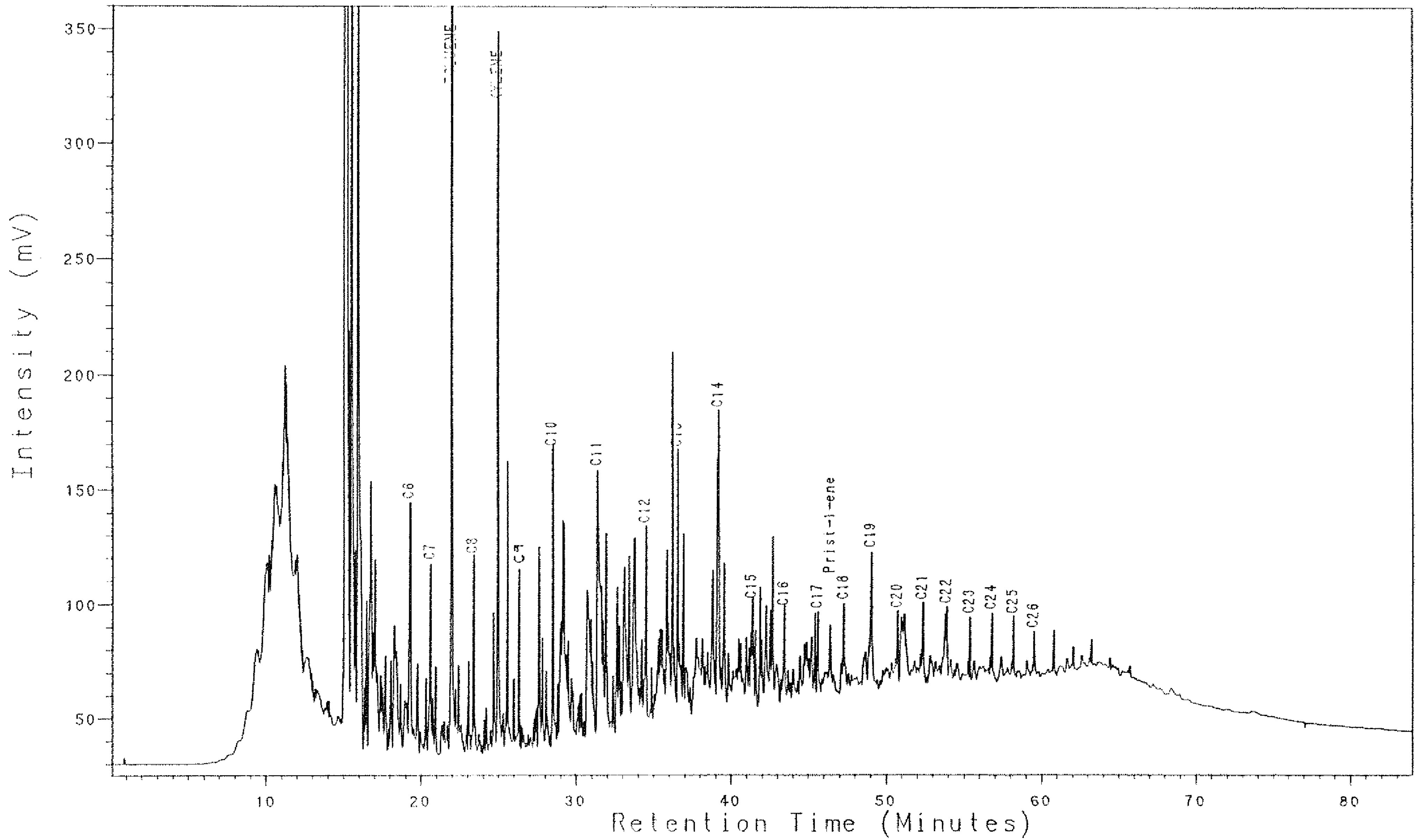
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S



NOCS 30/6-9 2504.50m
PYROLYSIS GC (S2)
CLST: lt brn gy to brn gy

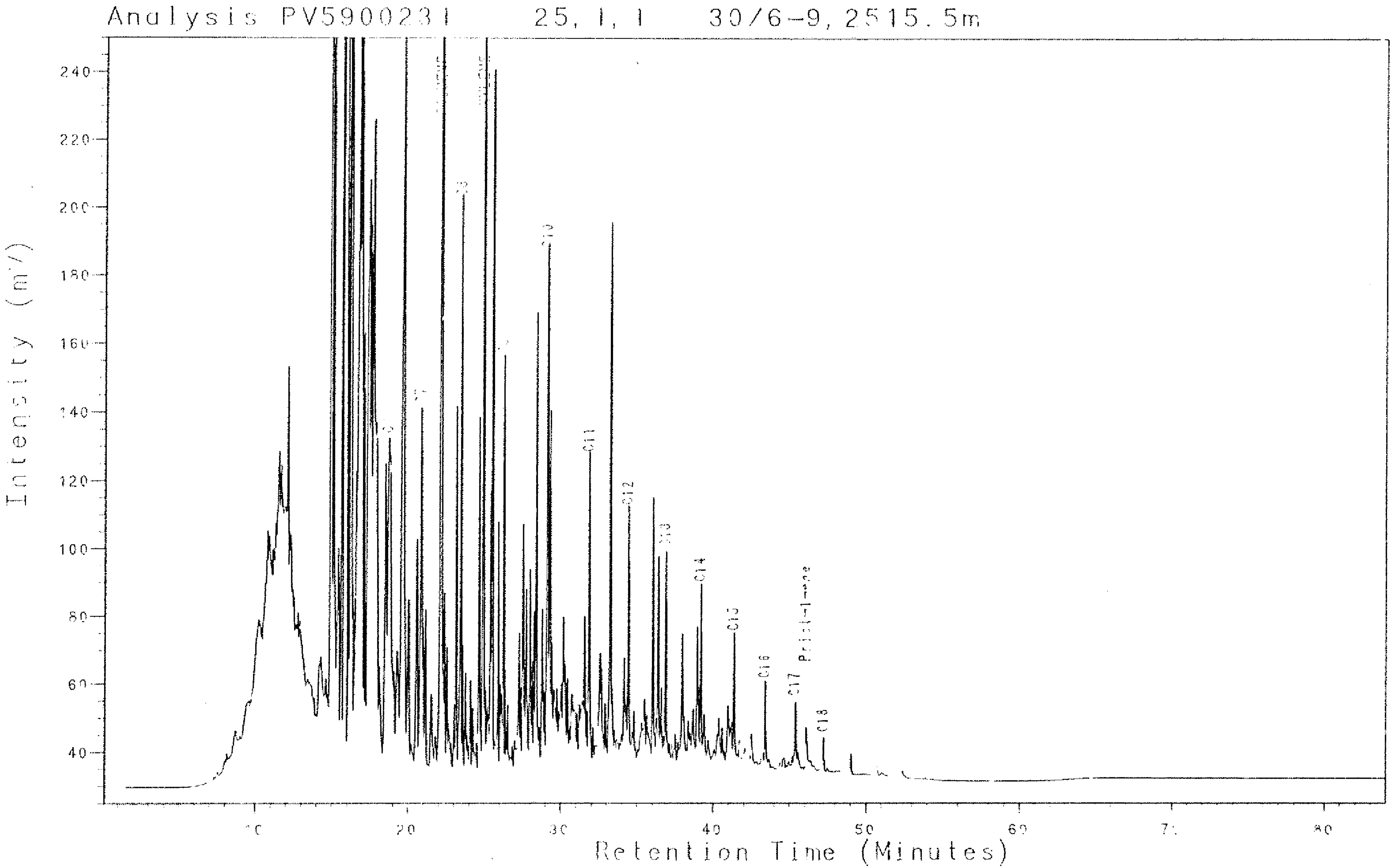
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5900191   25, 1, 1   30/6-9, 2507.5m



HOCS 30/6-9 2507.5m
PYROLYSIS GC (S2)
COAL;blk to brn blk

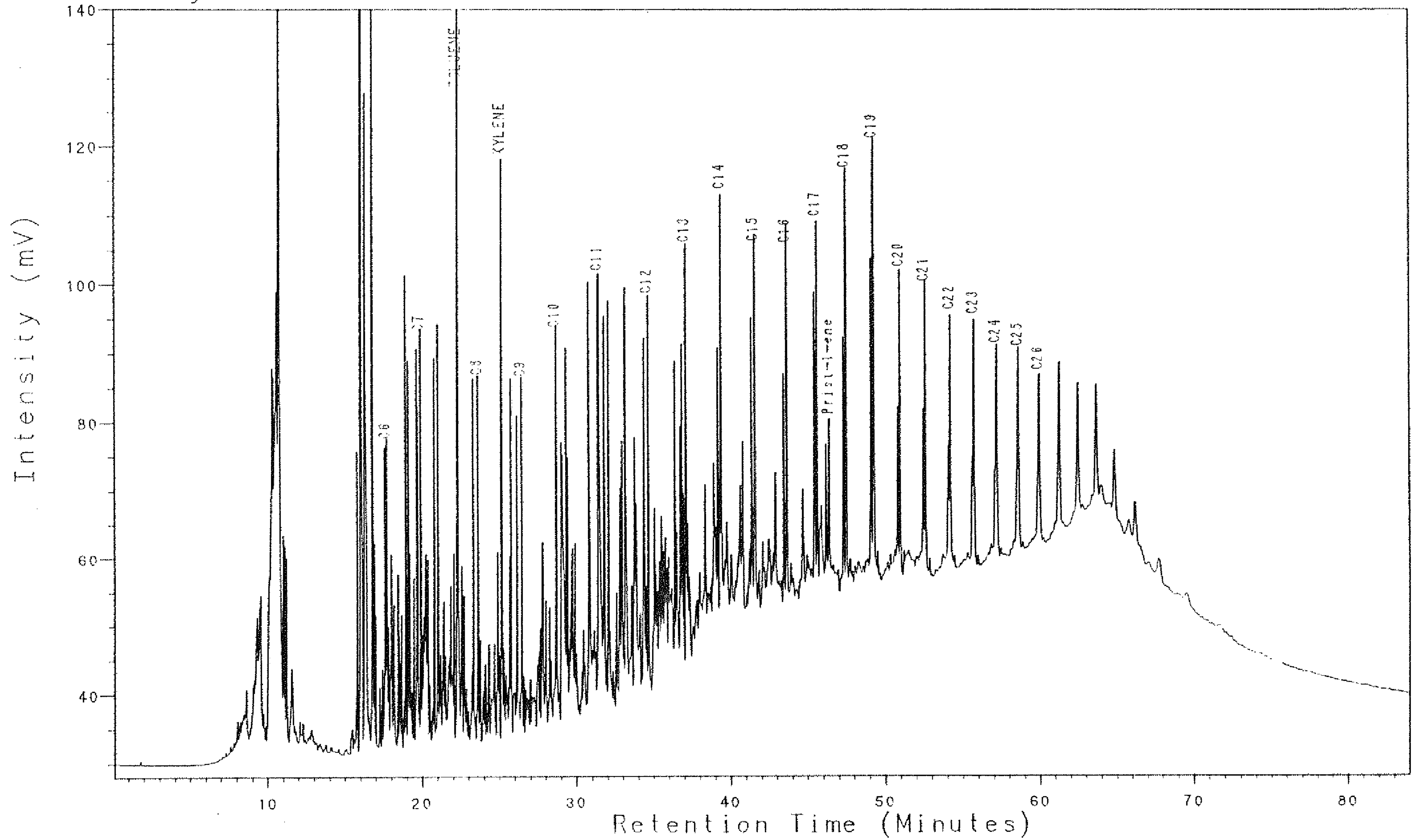
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 2515.50m
PYROLYSIS GC (S2)
CLST: brn gy

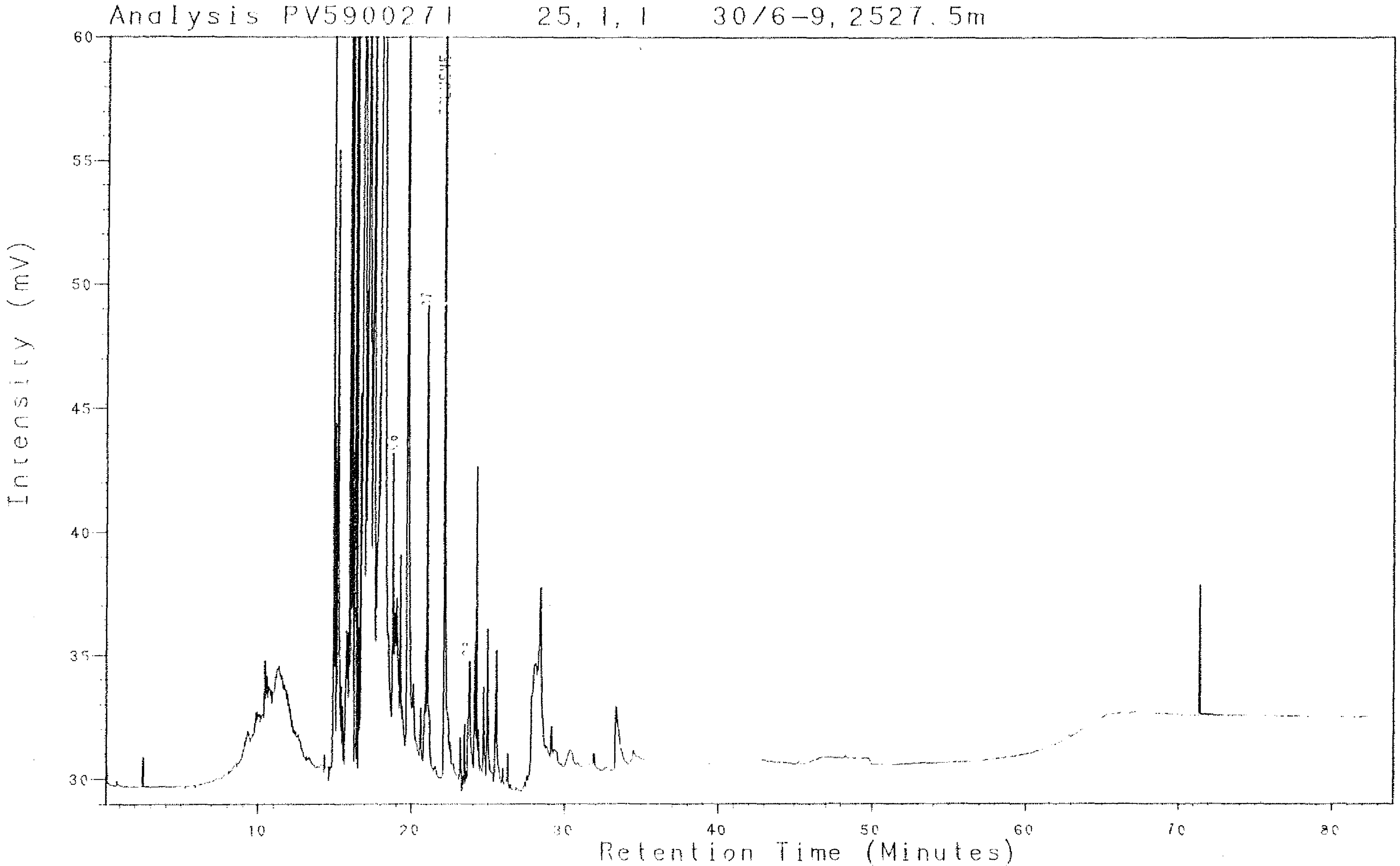
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5900241 25, 1, 1 30/6-9, 2518.5m



NOCS 30/6-9 2518.5m
PYROLYSIS GC (S2)
CLST:drk gy to brn gY

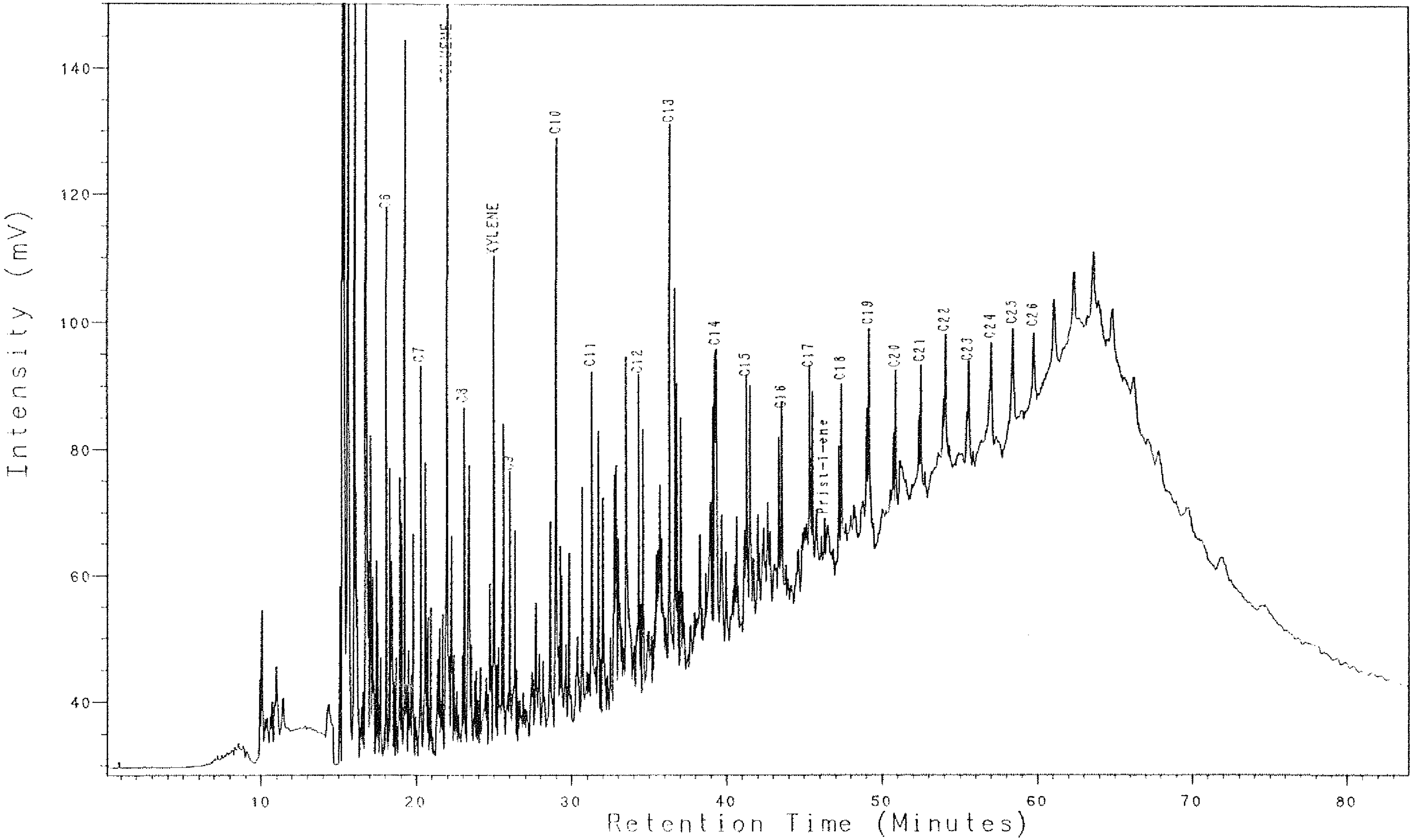
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 2527.50m
PYROLYSIS GC (S2)
CLST: brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

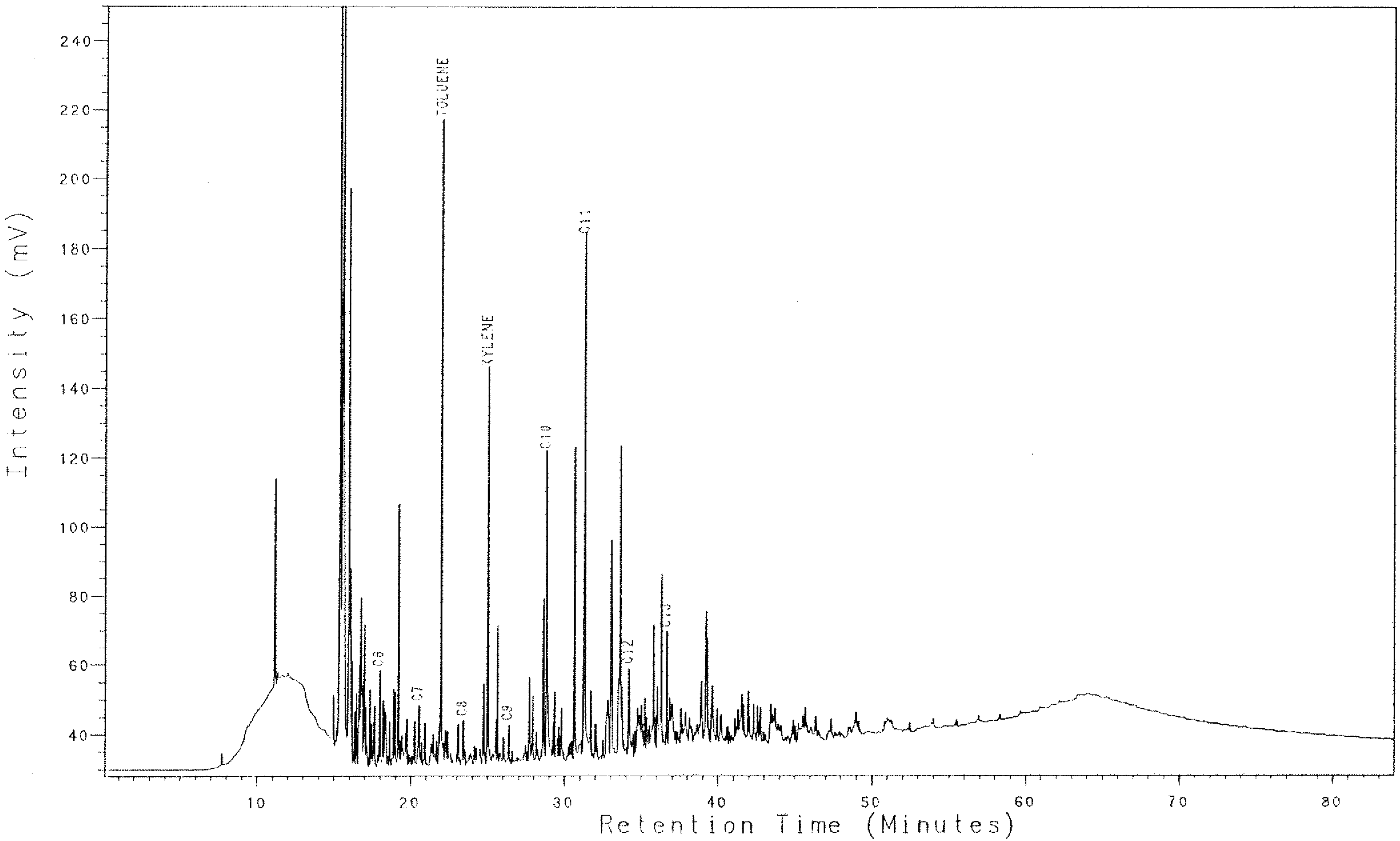
Analysis PV5900291 25, I, I 30/6-9, 2532, 26m



HOCS 30/6-9 2532.26m
PYROLYSIS GC (S2)
S/SST:brn gy, lt or

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

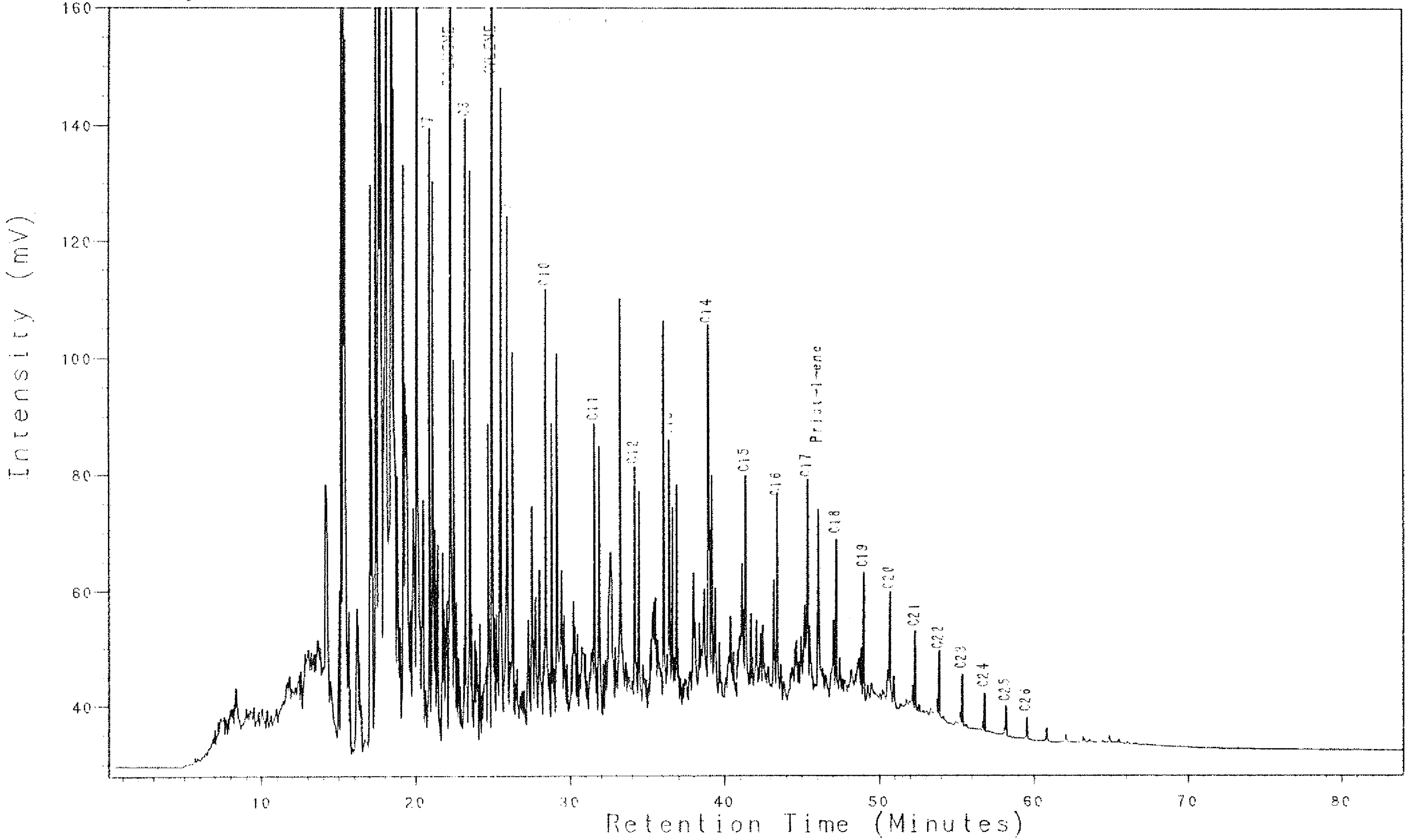
Analysis PV5900300 25, 1, 1 30/6-9, 2535m



NOCS 30/6-9 2535m
PYROLYSIS GC(S2)
BULK

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

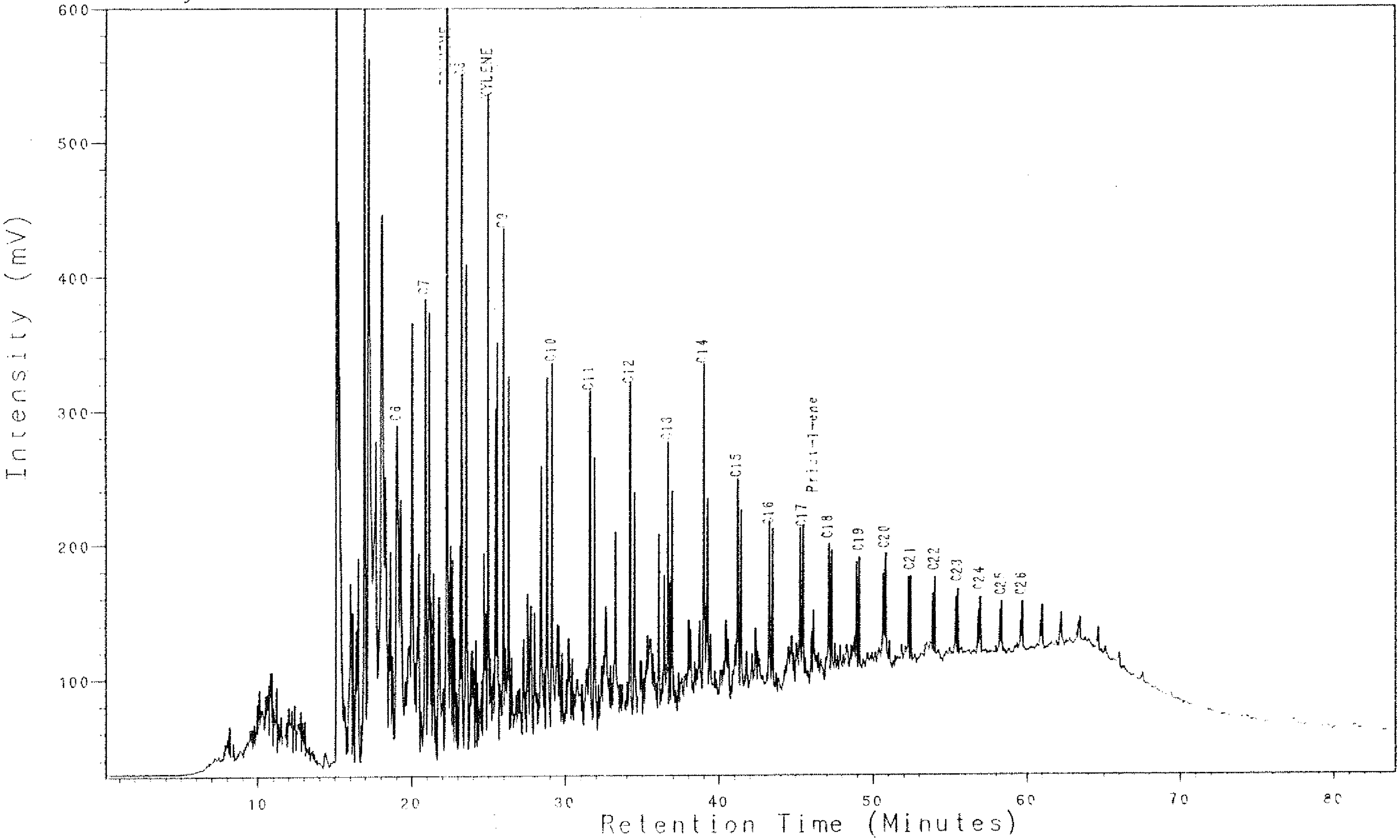
Analysis PV5900341   25, 1, 1   30/6-9, 2541m



NOCS 30/6-9 2541m
PYROLYSIS GC (S2)
SLTST: brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

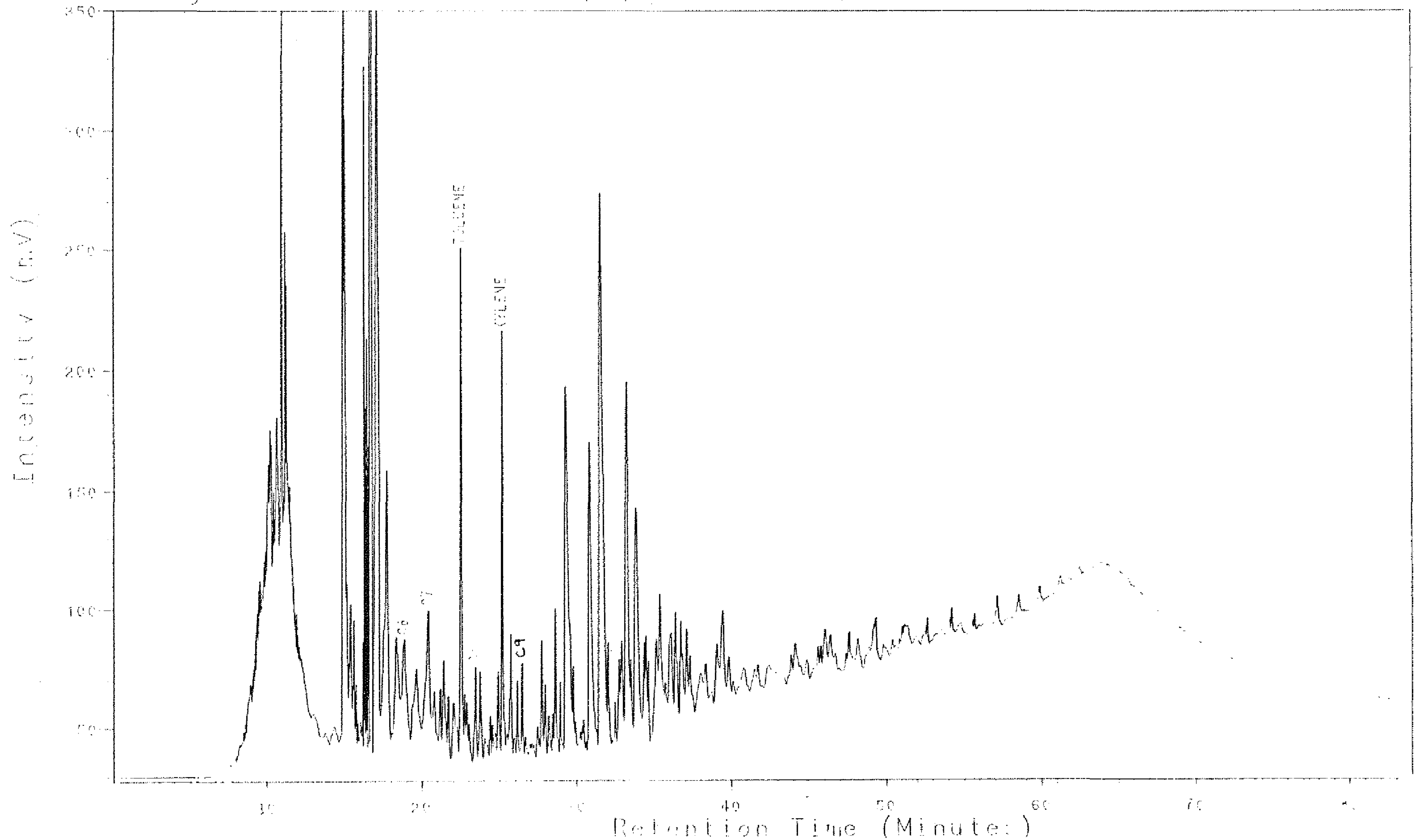
Analysis PV5900571 25, 1, 1 30/6-9, 2544m



NOCS 30/6-9 2544m
PYROLYSIS GC (S2)
SST: drk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

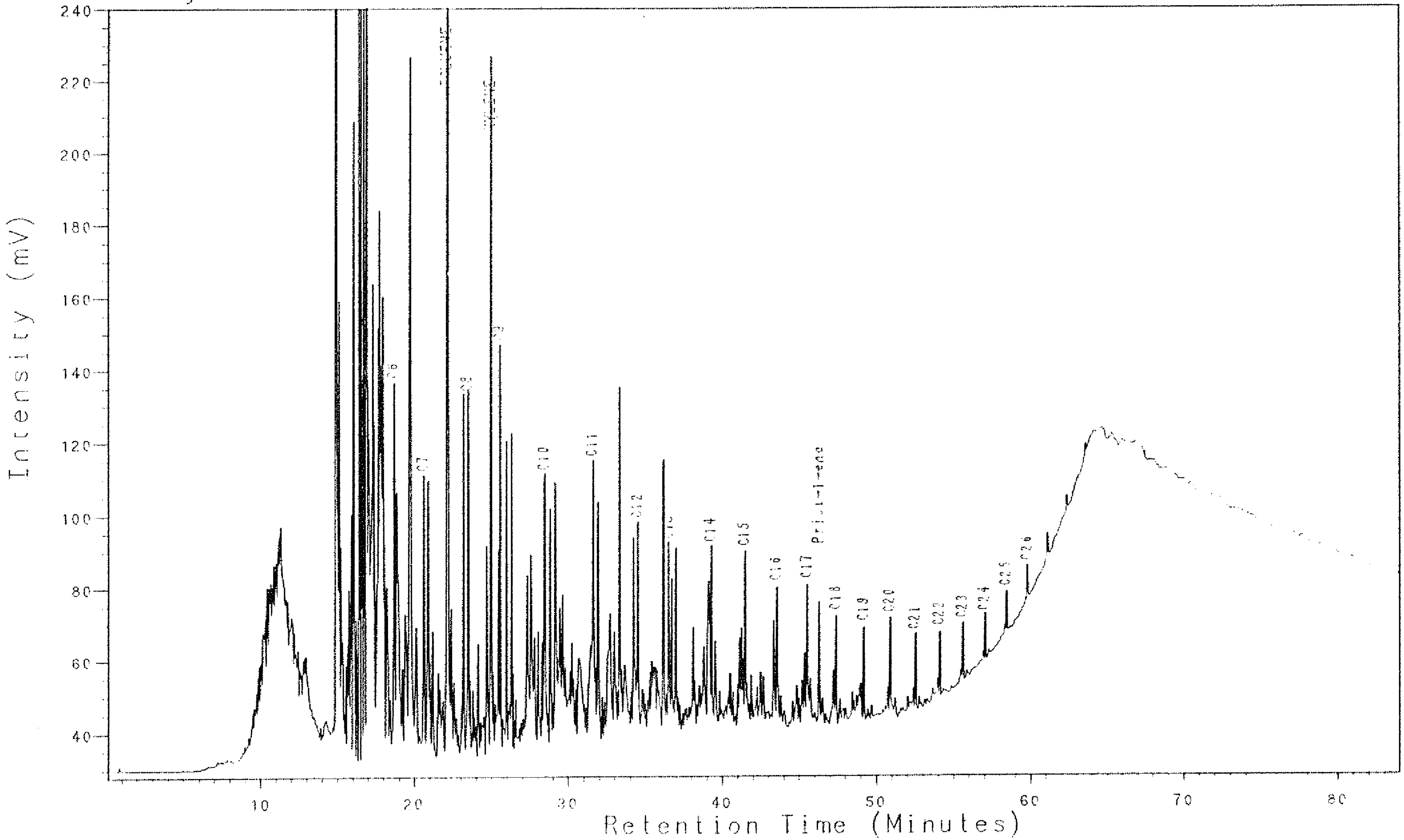
Analysis PV5900321 25, 1, 1 30/6-9, 2546.4m



NOCS 30/6-9 2546.40m
PYROLYSIS GC(S2)
SST: lt or to pl y brn

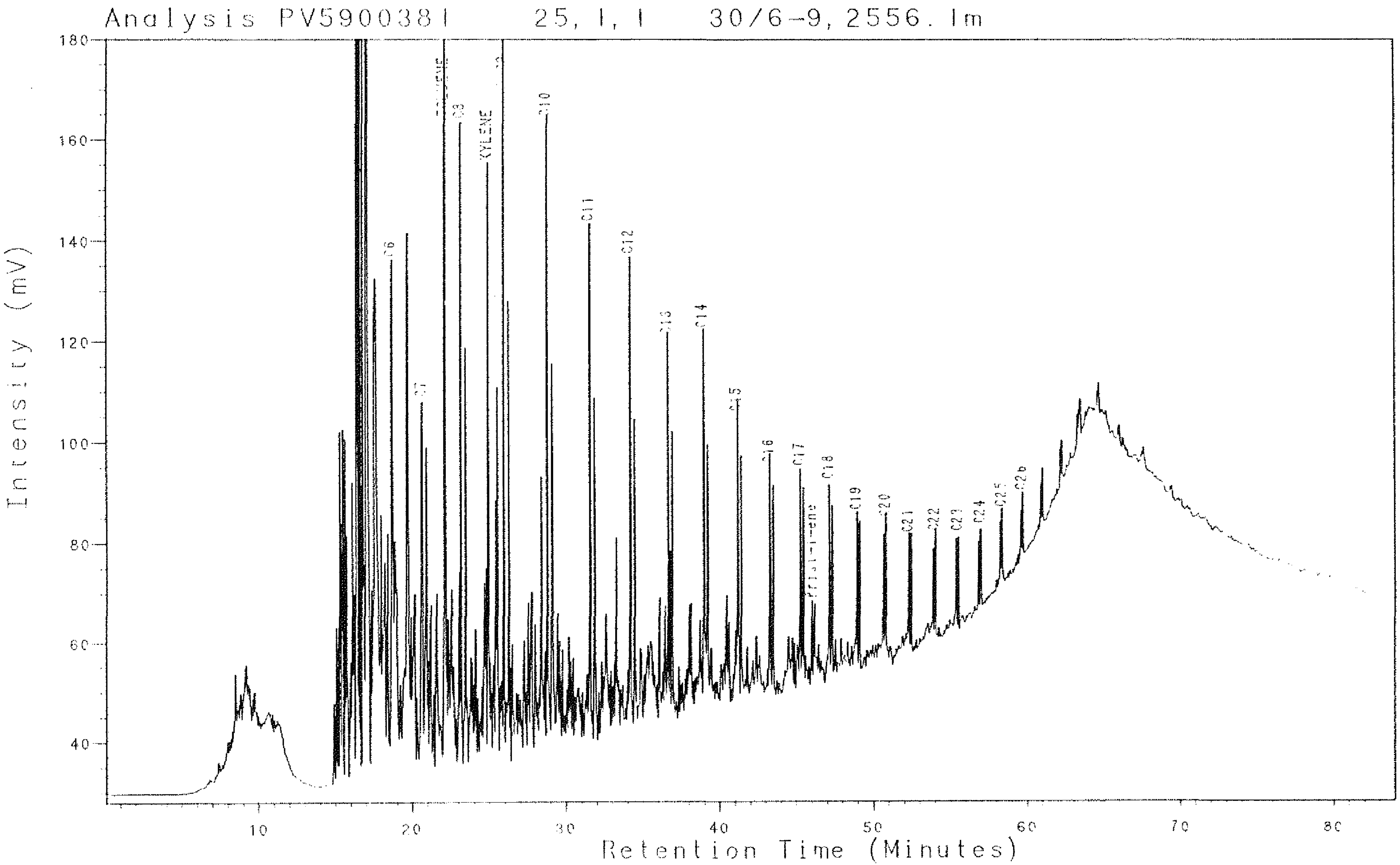
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Analysis PV5900361 25, 1, 1 30/6-9, 2551m



NOCS 30/6-9 2551m
PYROLYSIS GC (S2)
SLTST: brn gy

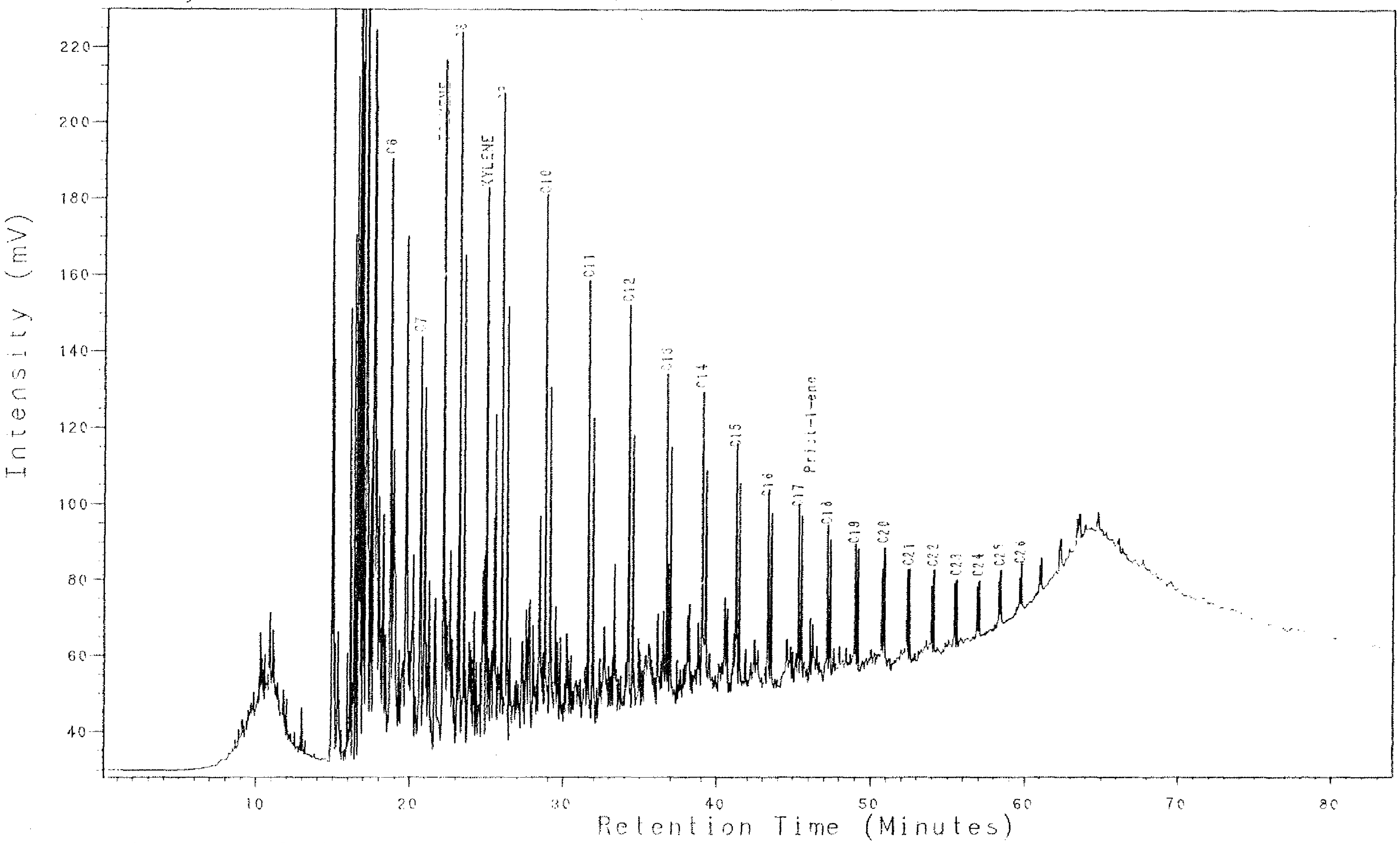
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 2556.10m
PYROLYSIS GC (S2)
SST: or gy to lt y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

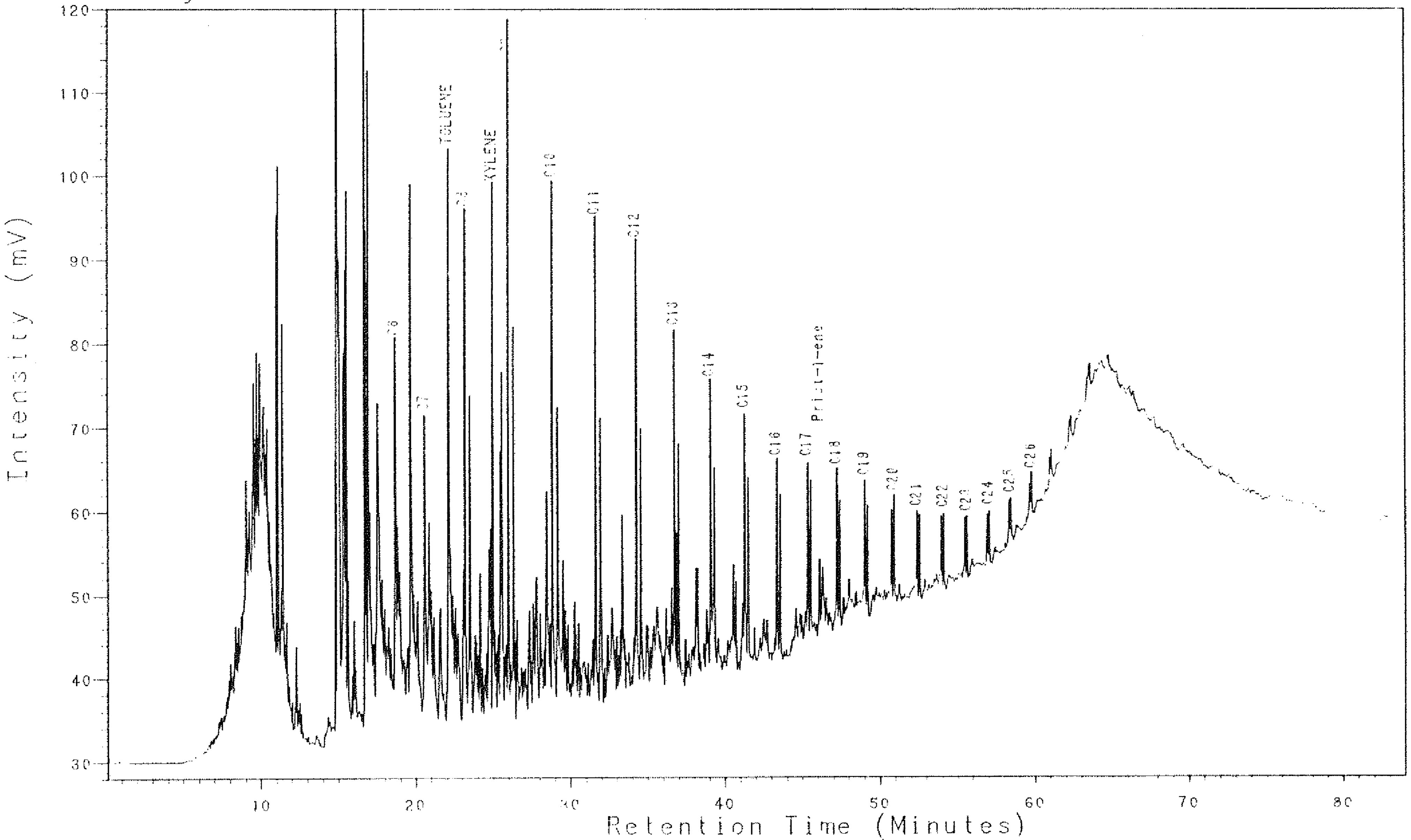
Analysis PV5900411 25, I, I 30/6-9, 2566.24m



NOCS 30/6-9 2566.24m
PYROLYSIS GC (S2)
SST: m y brn to drk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

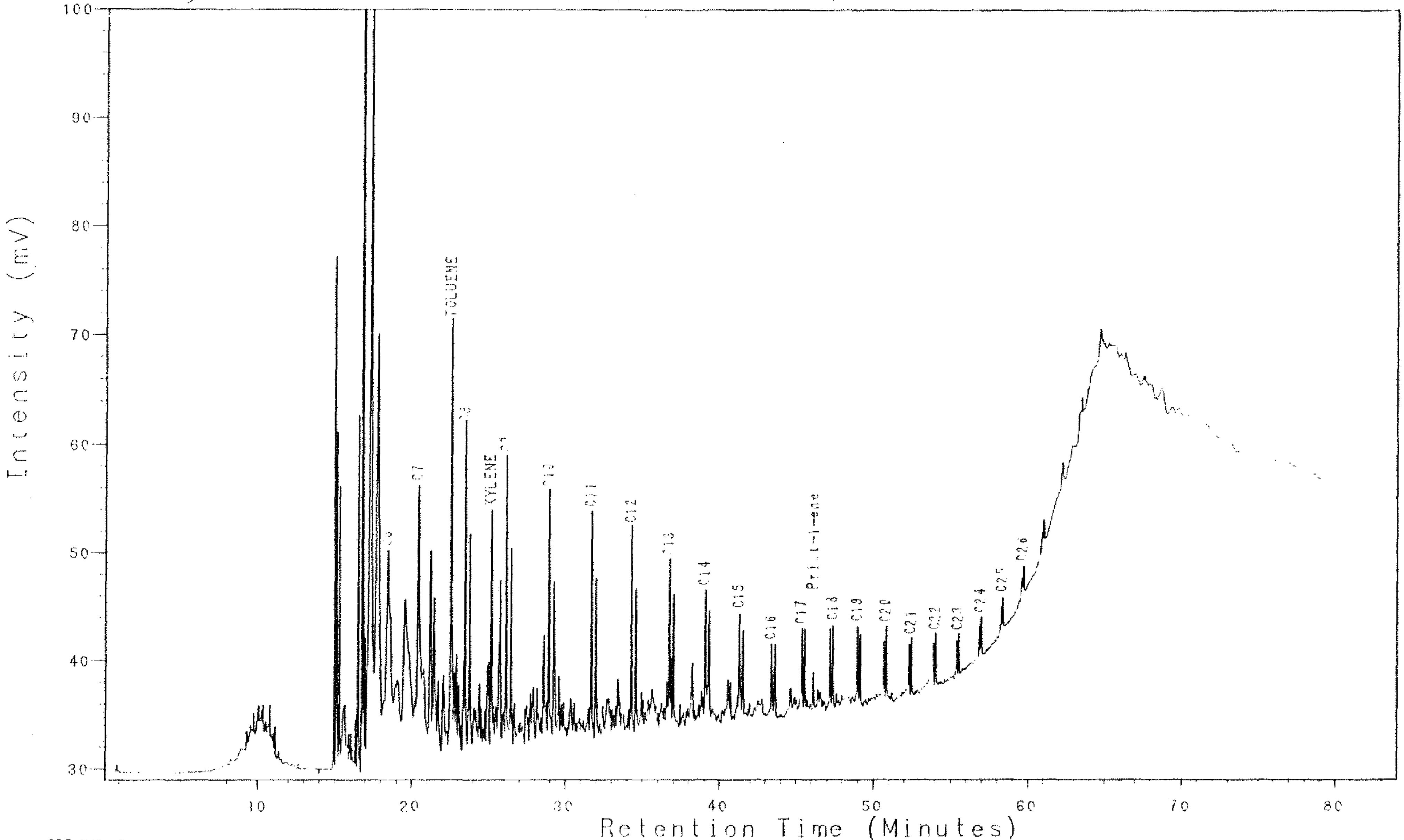
Analysis PV5900431 25, I, I 30/6-9, 2576.4m



NOCS 30/6-9 2576.40m
PYROLYSIS GC (S2)
SST: m y brn to drk y brn

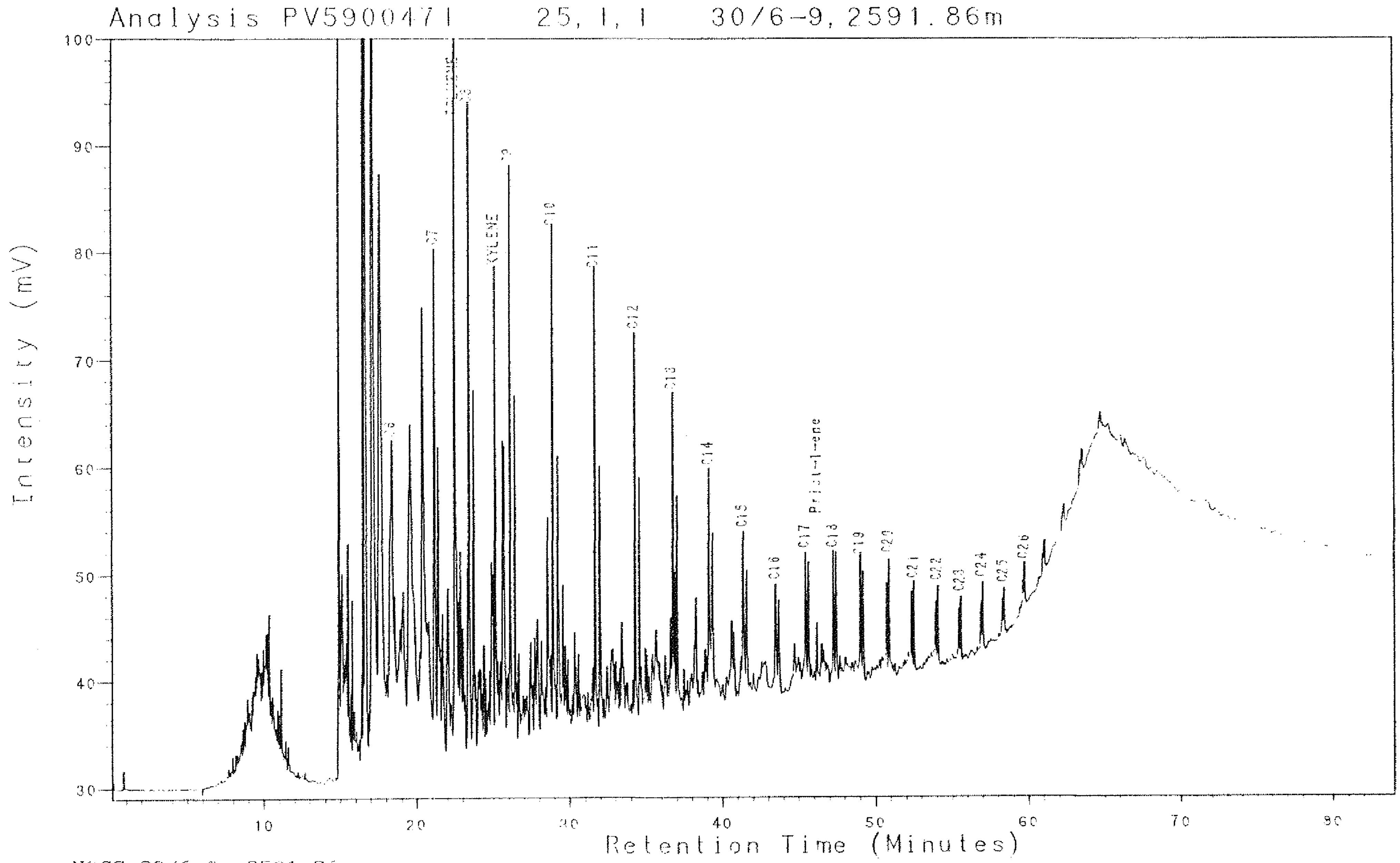
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

Analysis PV5900461 25, 1, 1 30/6-9, 2588.27m



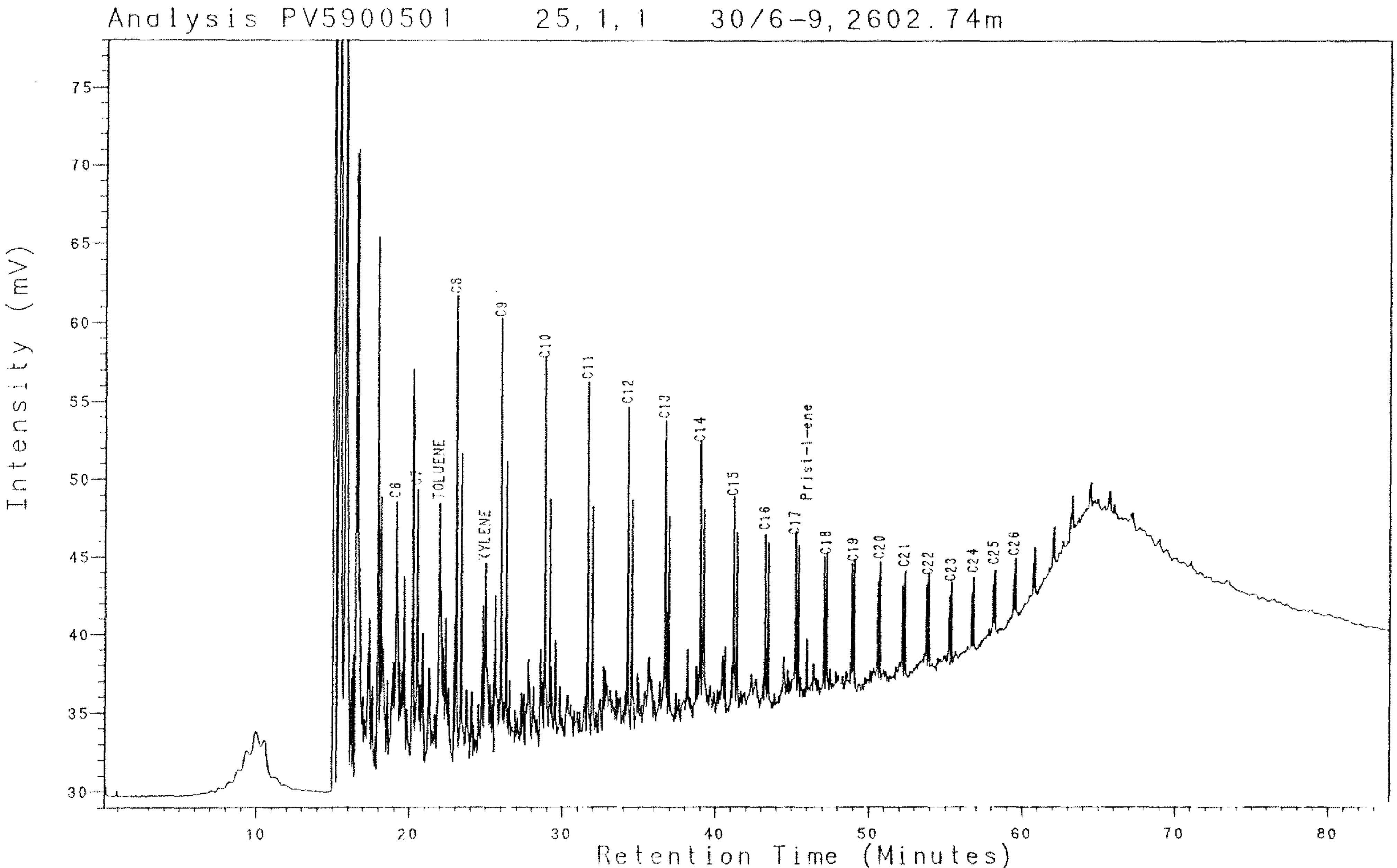
NOCS 30/6-9 2588.27m
PYROLYSIS GC (S2)
SST: m y brn to drk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



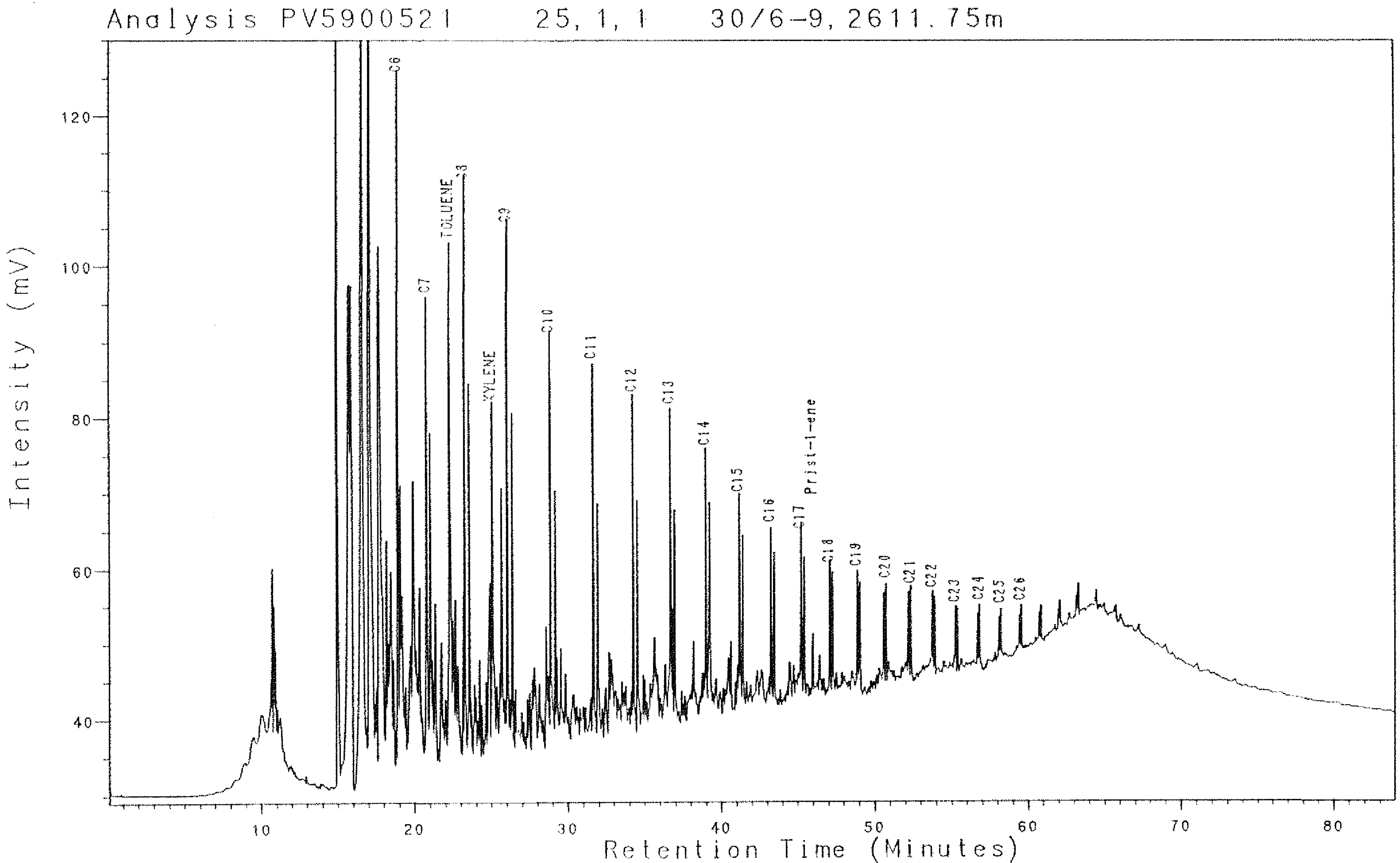
NOCS 30/6-9 2591.86m
PYROLYSIS GC (S2)
SST: drk gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



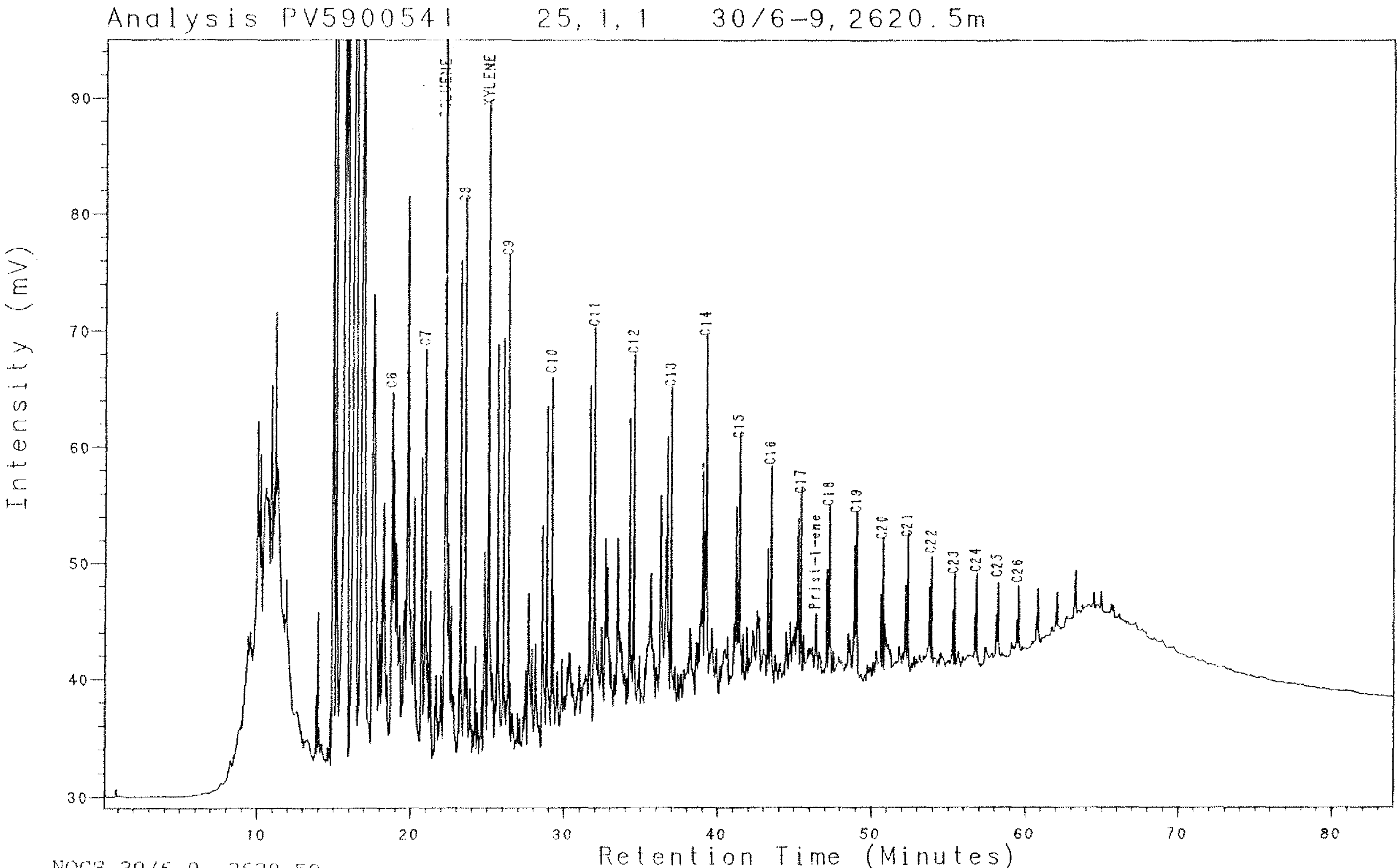
NOCS 30/6-9 2602.74m
PYROLYSIS GC(S2)
SST: k y brn to dsk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



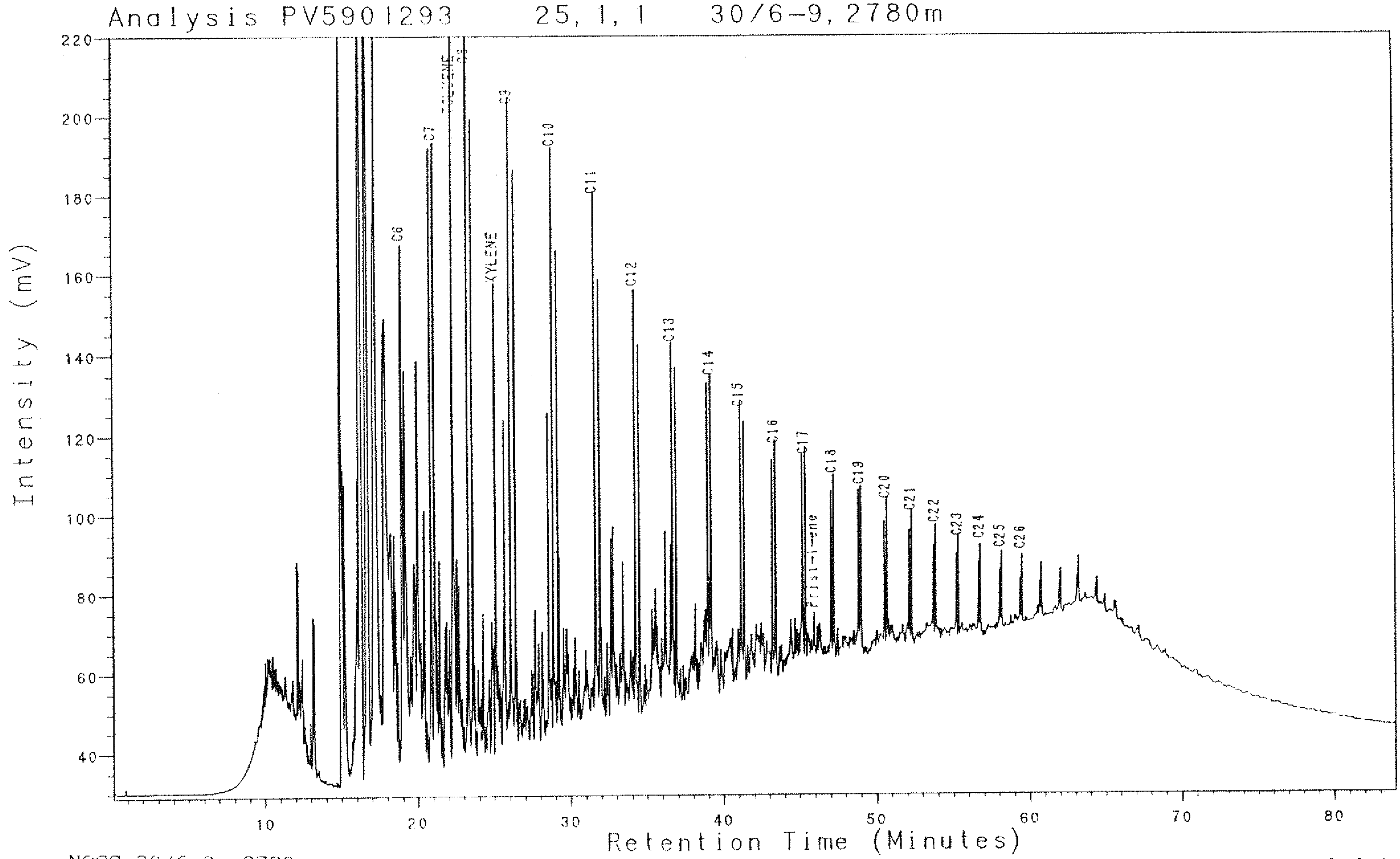
NOCS 30/6-9 2611.75m
PYROLYSIS GC(S2)
SST: lt v brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



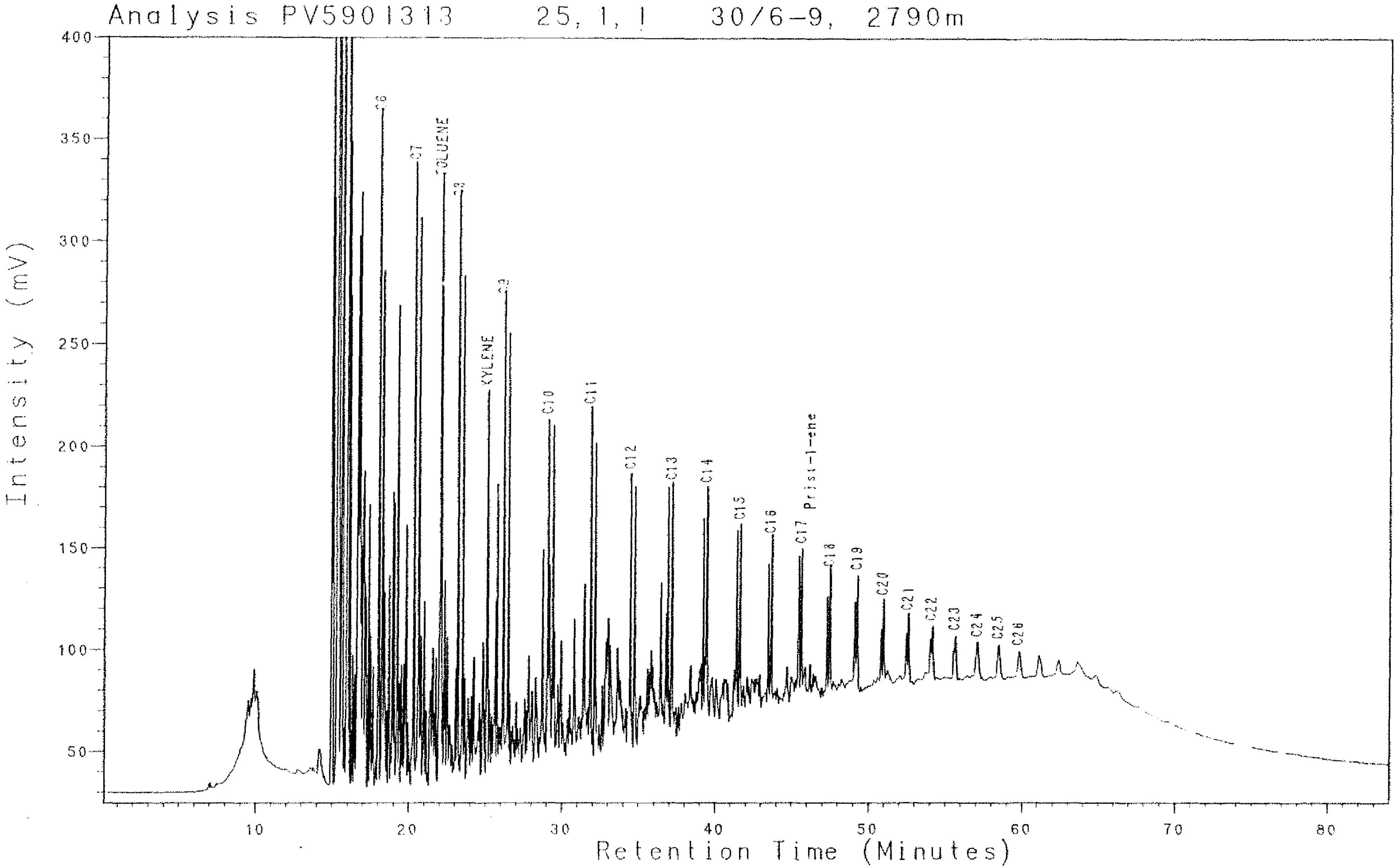
NOCS 30/6-9 2620.50m
PYROLYSIS GC(S2)
SLTST—brn gy to dsk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S



NOCS 30/6-9 2780m
PYROLYSIS GC(S2)
SLTST: brn gy to m gy

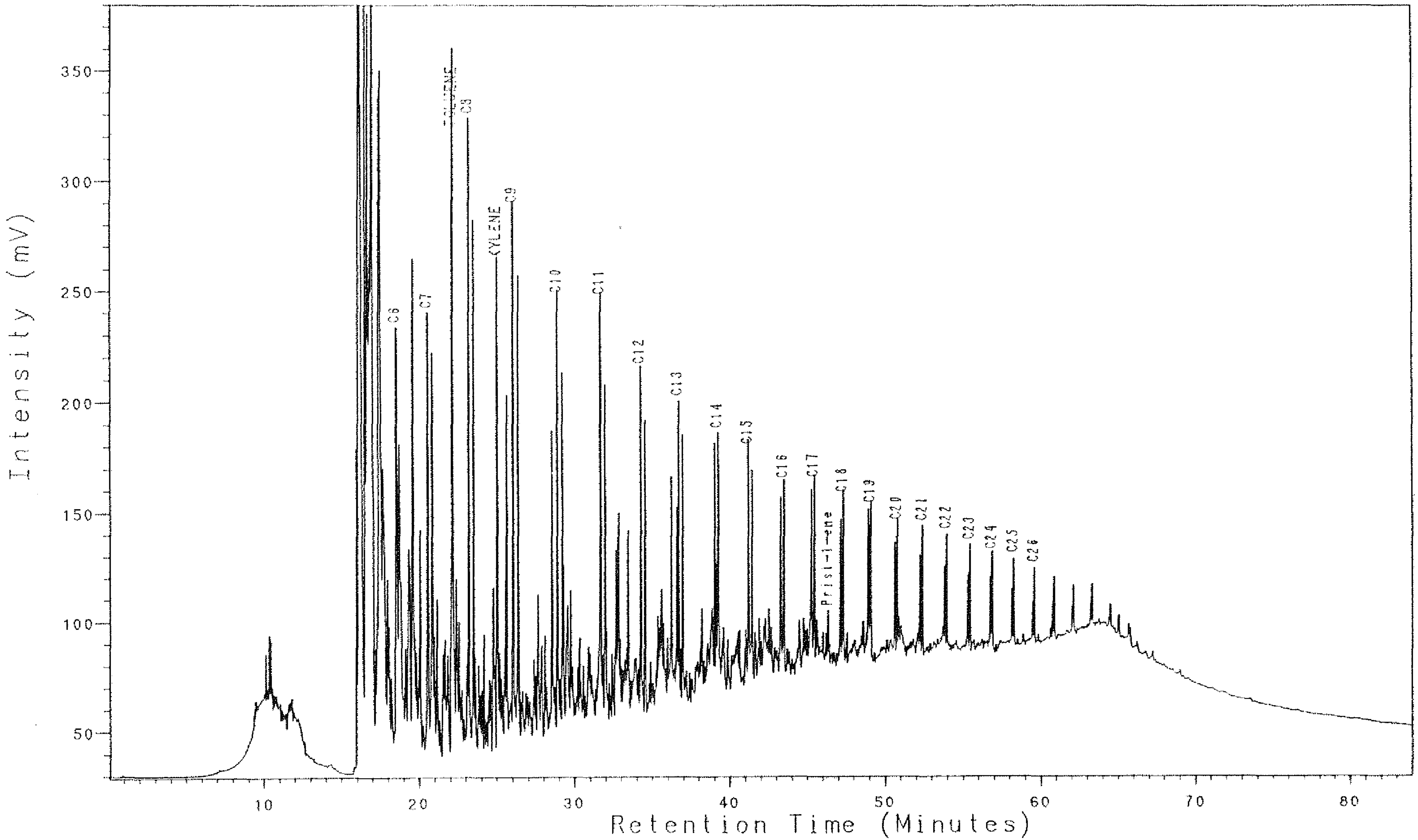
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S



NOCS 30/6-9 2790m
PYROLYSIS GC (S2)
CLST brn to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

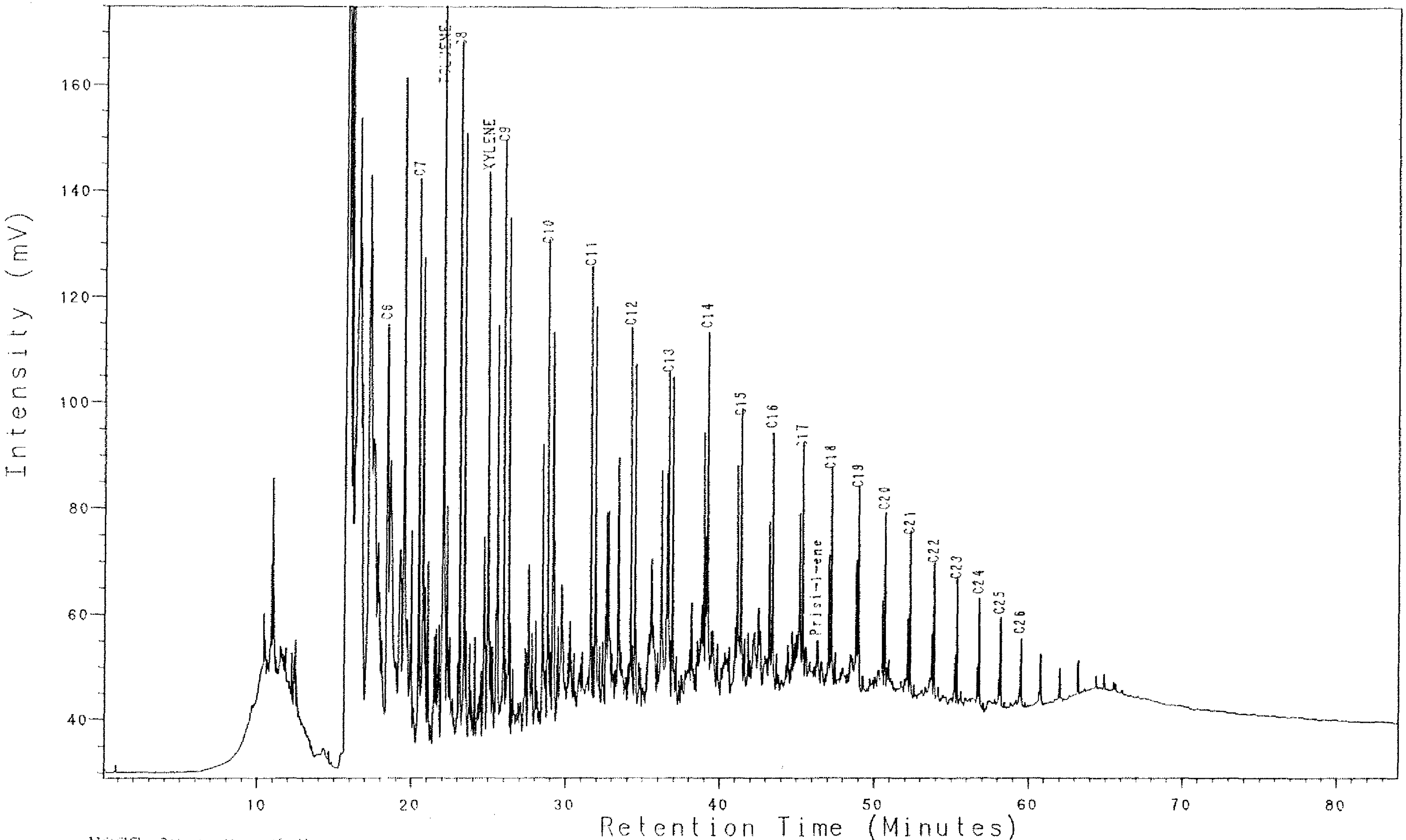
Analysis PV5901382 25, 1, 1 30/6-9, 2825m



NOCS 30/6-9 2825m
PYROLYSIS GC(S2)
SLTST: brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

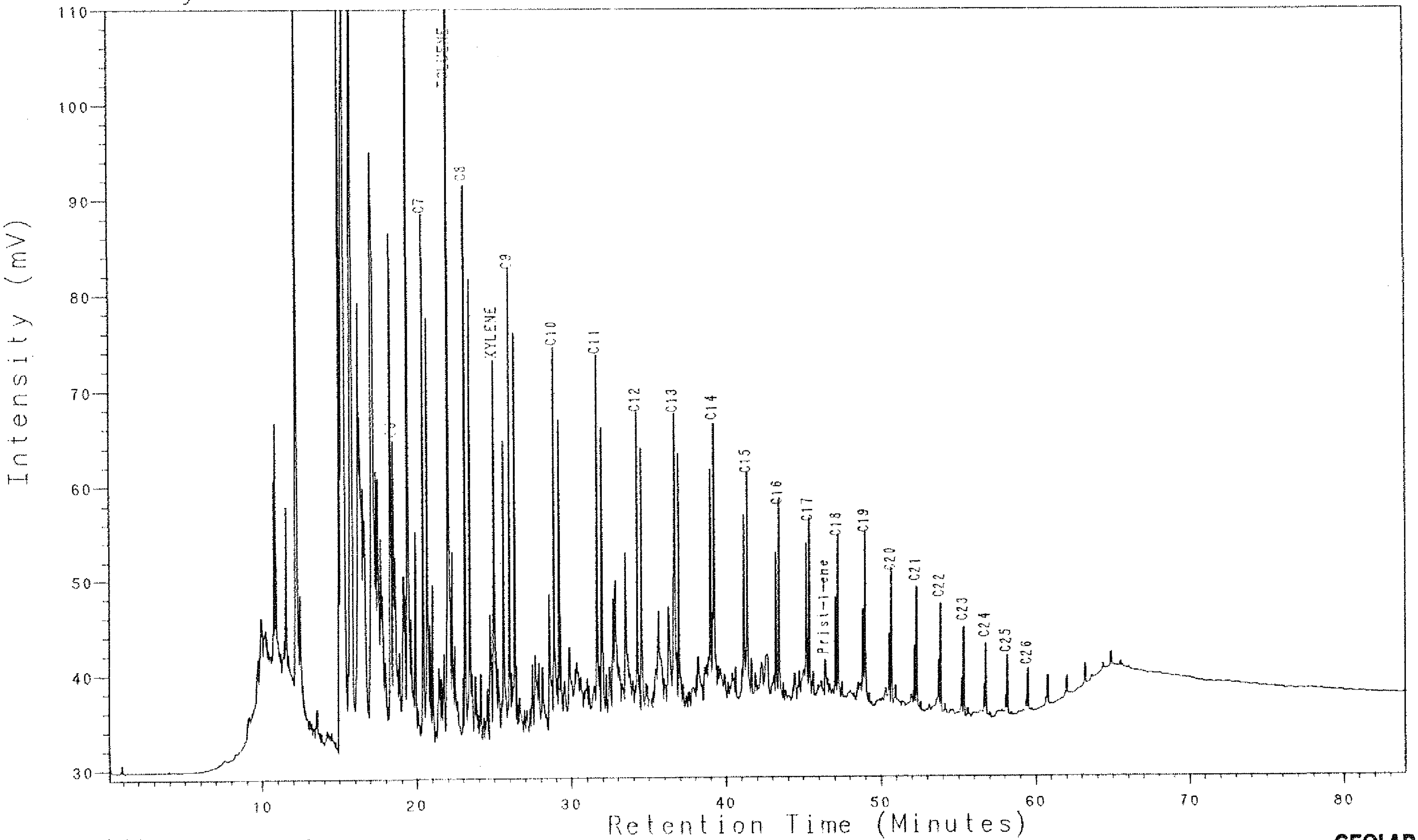
Analysis PV5901422 25, 1, 1 30/6-9, 2845m



NOCS 30/6-9 2845m
PYROLYSIS GC(S2)
SL T: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

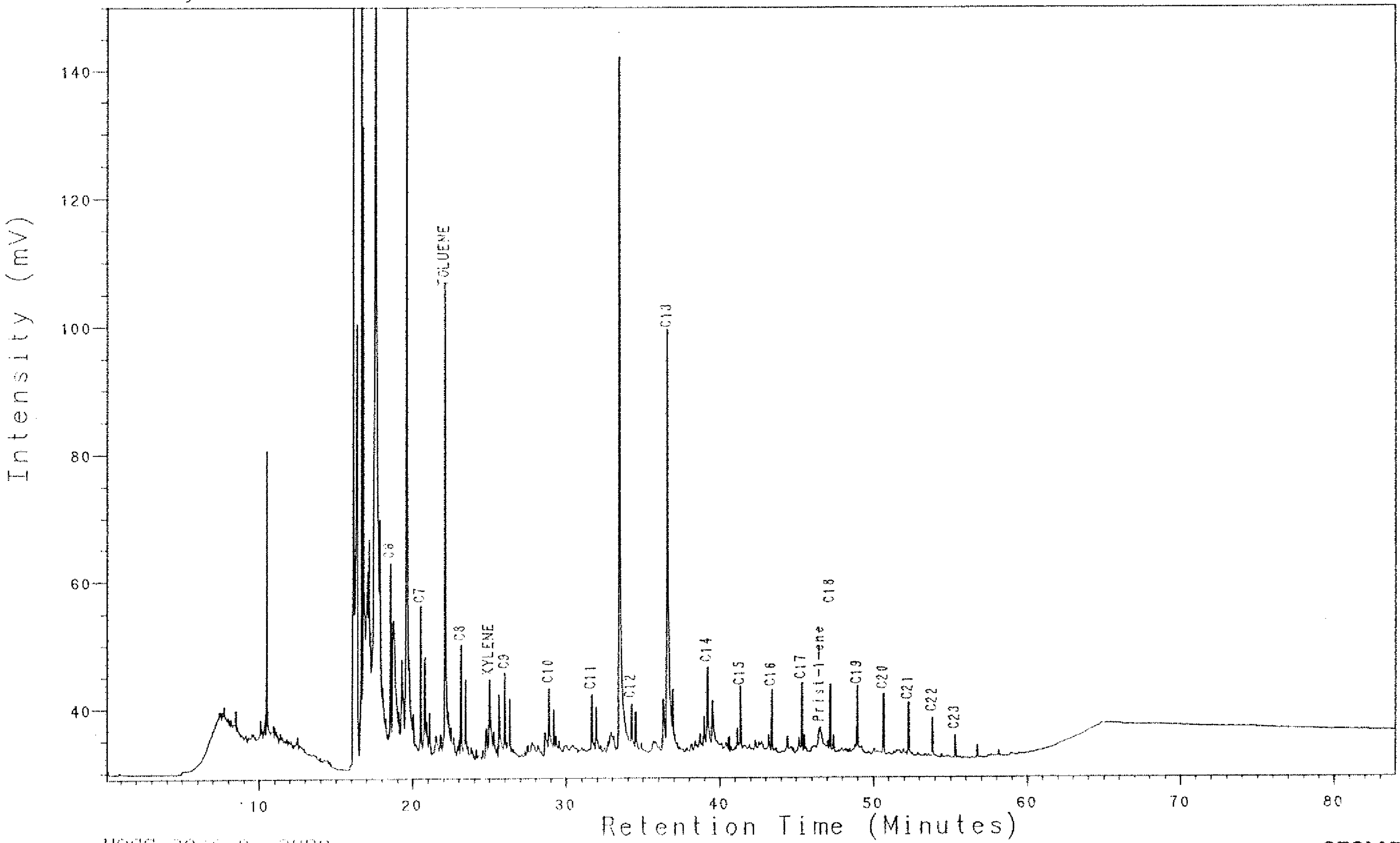
Analysis PV5901462 25, 1, 1 30/6-9, 2865m



NOCS 30/6-9 2865m
PYROLYSIS GC(S2)
CLST: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

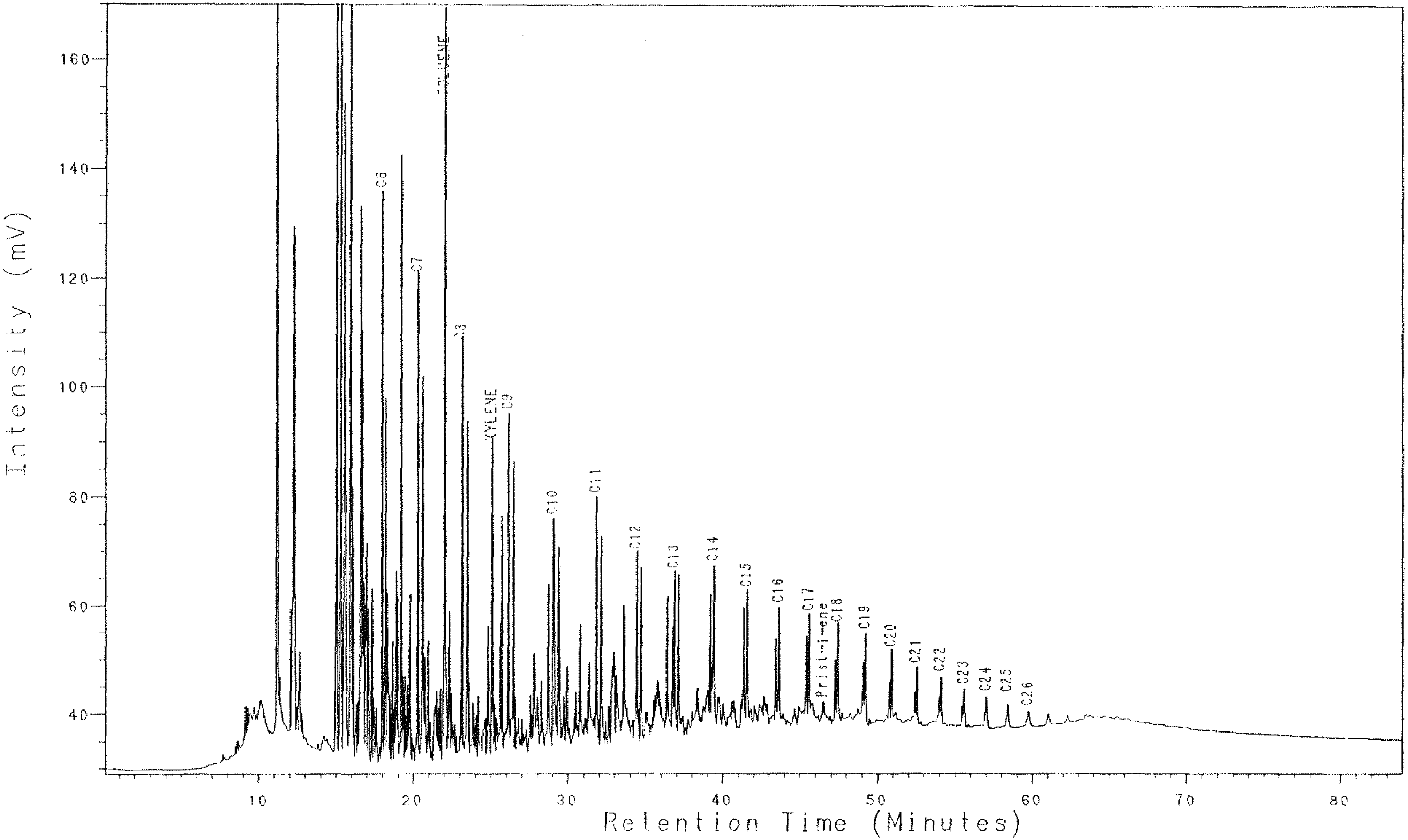
Analysis PV5901494   25, 1, 1   30/6-9, 2880m



NOCS 30/6-9 2880m
PYROLYSIS GC(S2)
S... w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

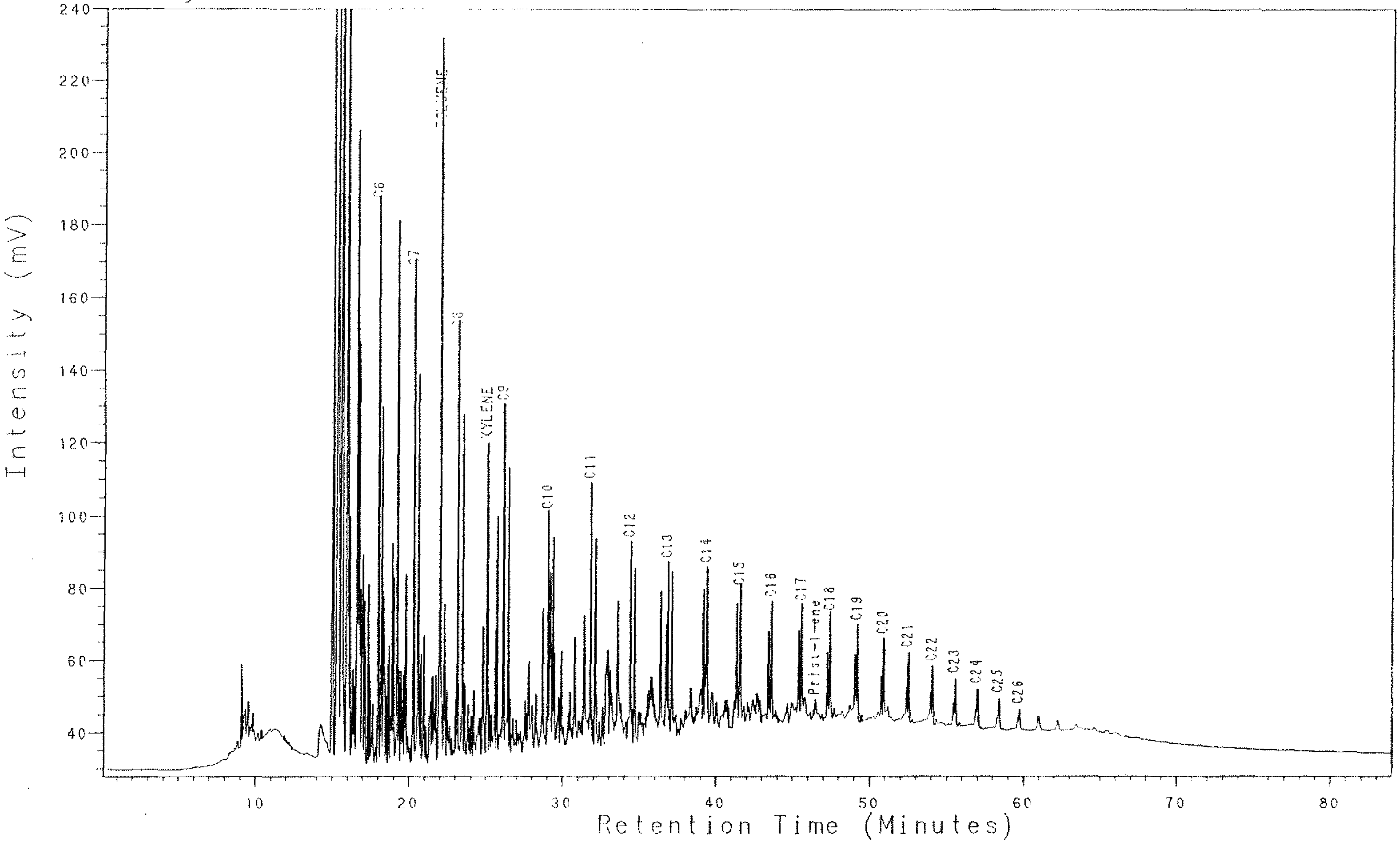
Analysis PV5901522   25, 1, 1   30/6-9, 2895m



UOCS 30/6-9 2895m
PYROLYSIS GC(S2)
SLTST: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

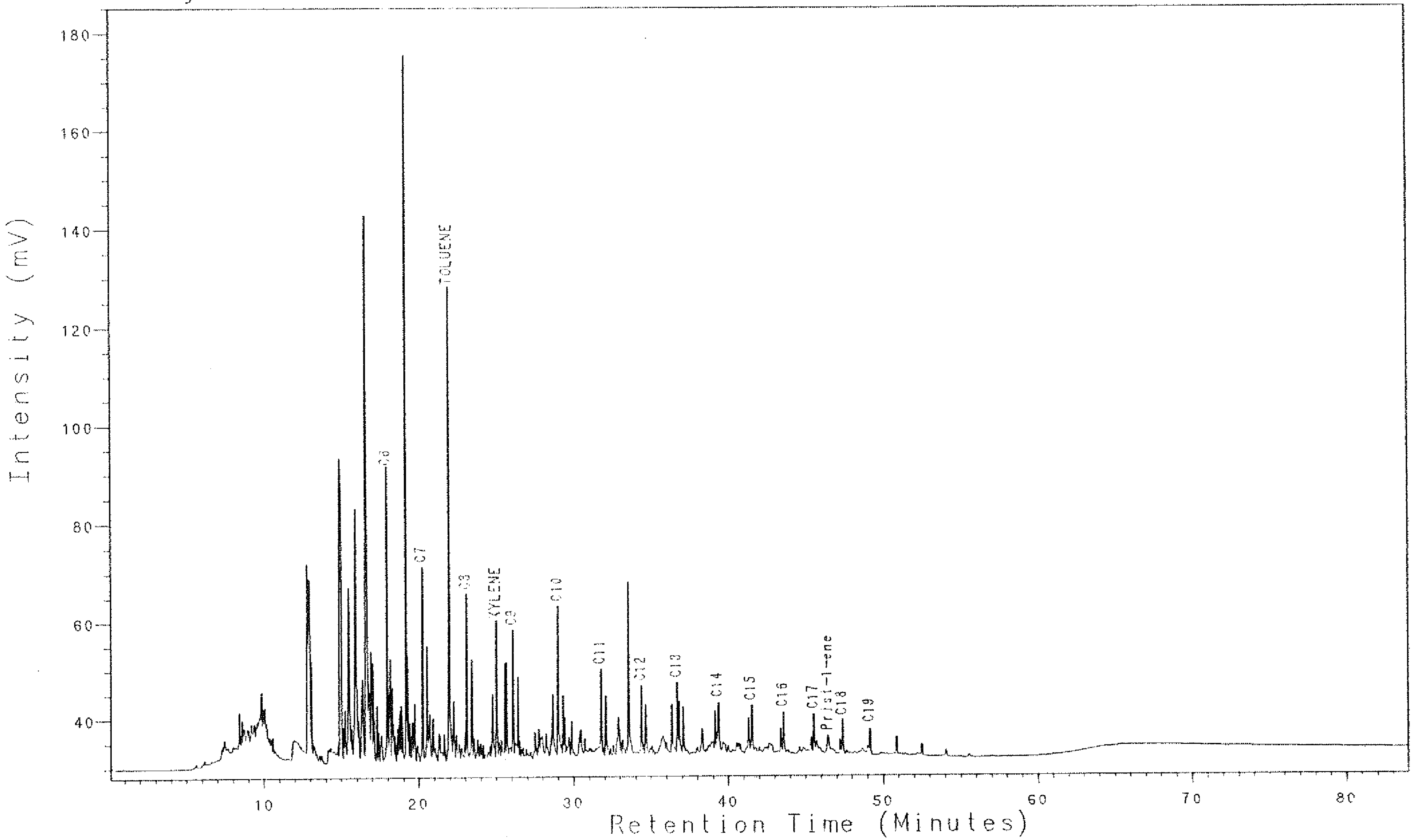
Analysis PV5901562 25, 1, 1 30/6-9, 2915m



NOCS 30-6-9 2915m
PYROLYSIS GC(S2)
SLTST: brn gy to m gy

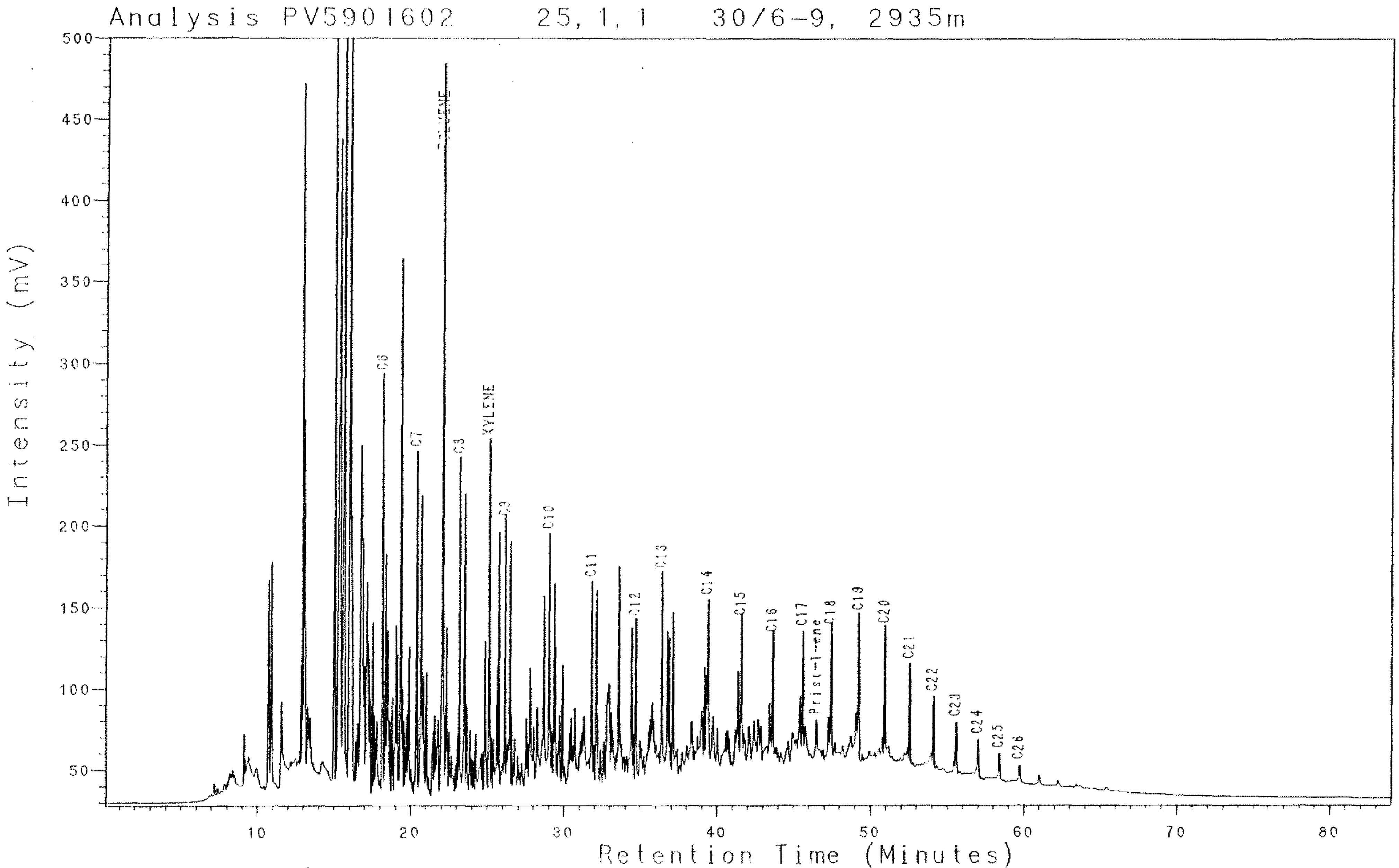
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Analysis PV5901574   25, 1, 1   30/6-9, 2920m



NOCS 30/6-9 2920m
PYROLYSIS GC(S2)
SST: w to lt gy

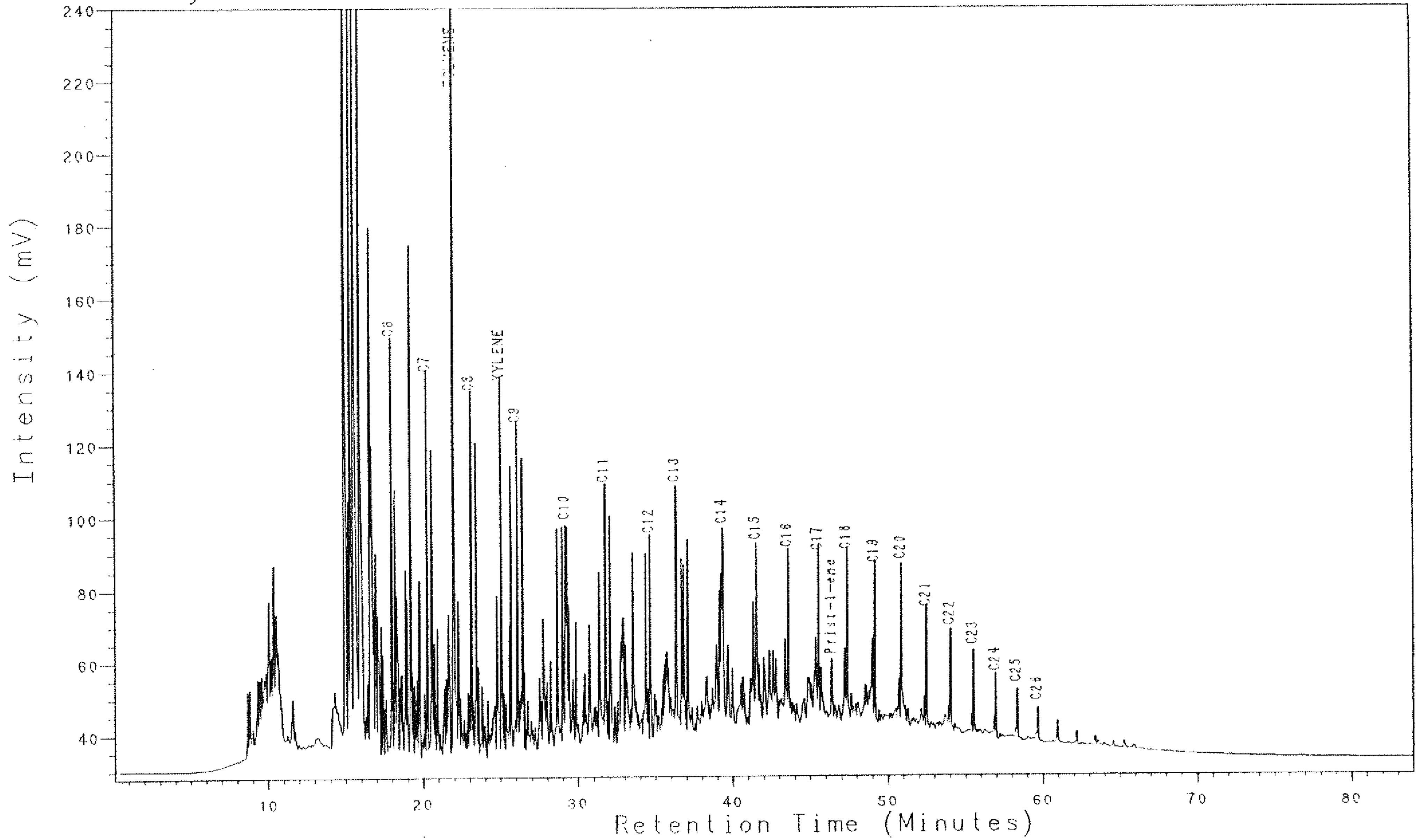
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S



GOCS 30/6-9 2935m
PYROLYSIS GC(S2)
CLST: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

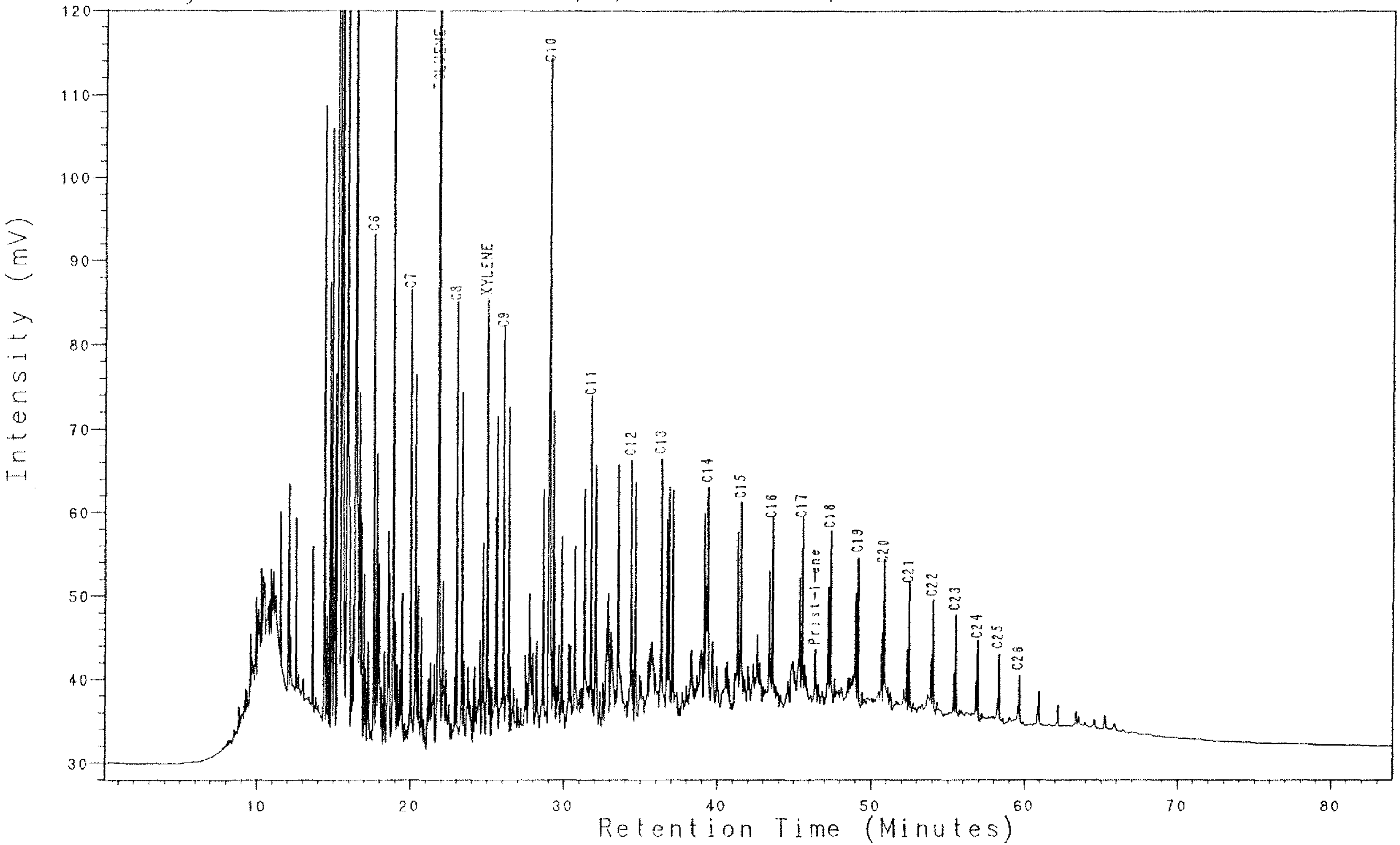
Analysis PV5901622 25, 1, 1 30/6-9, 2945m



NOCS 30/6-9 2945m
PYROLYSIS GC(S2)
CLST: brn gy to m gy

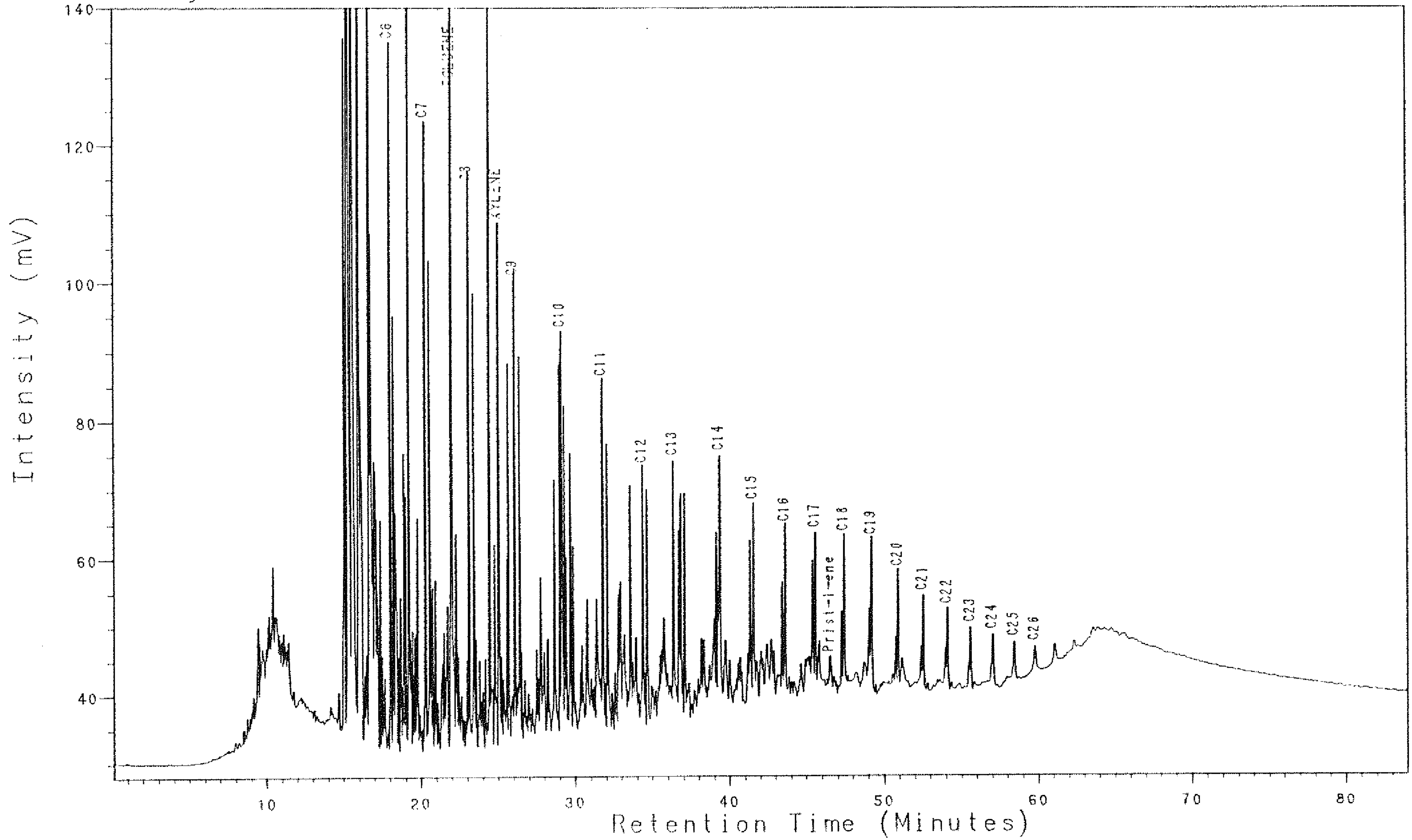
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis PV5901662   25, 1, 1   30/6-9, 2965m



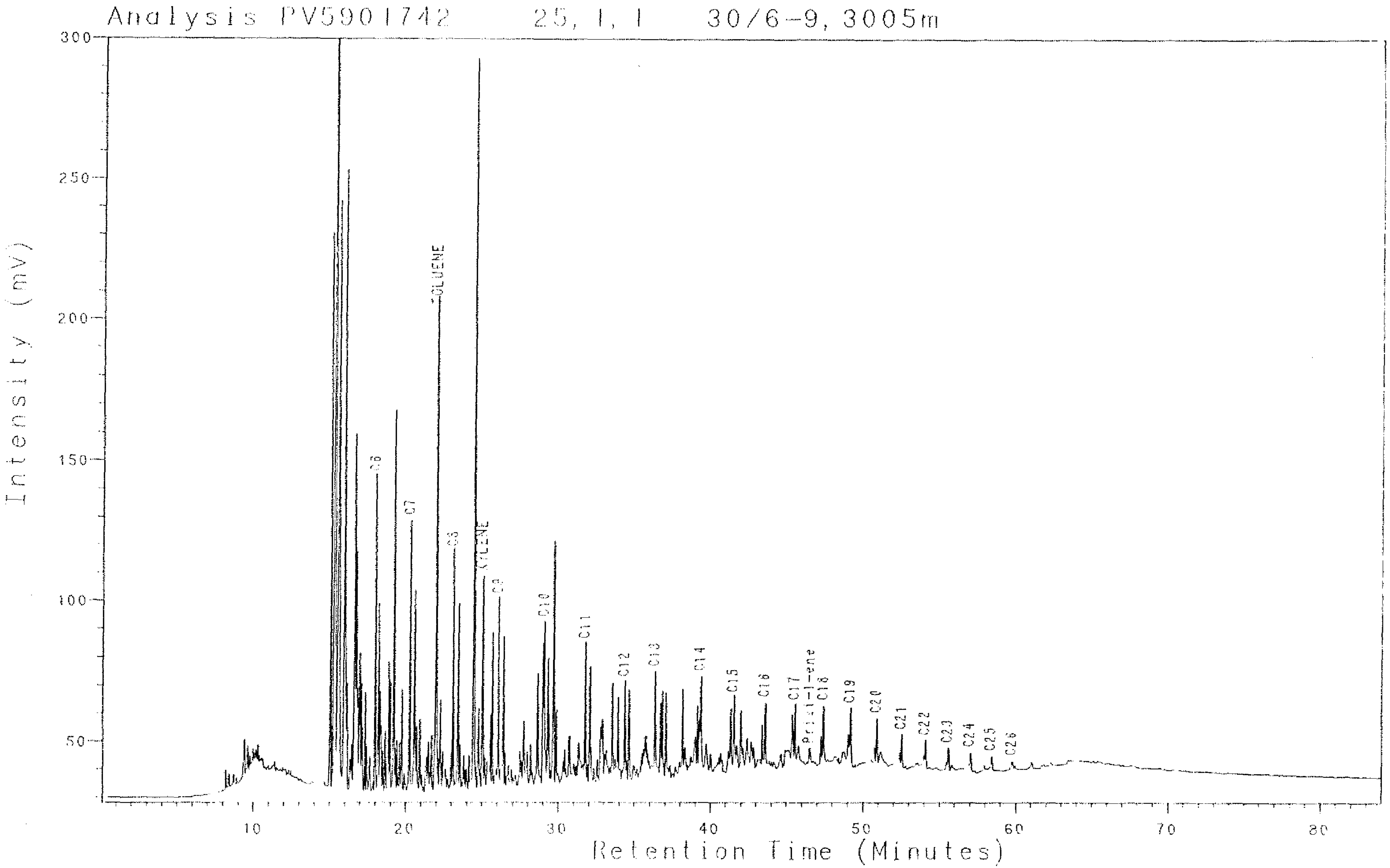
NOCS 30/6-9 2965m
PYROLYSIS GC(S2)
CLST: brn gy to m gy

Analysis PV5901702 25, 1, 1 30/6-9, 2985m



NOCS 30/6-9 2985m
PYROLYSIS GC(S2)
SLTST: brn gy to m gy

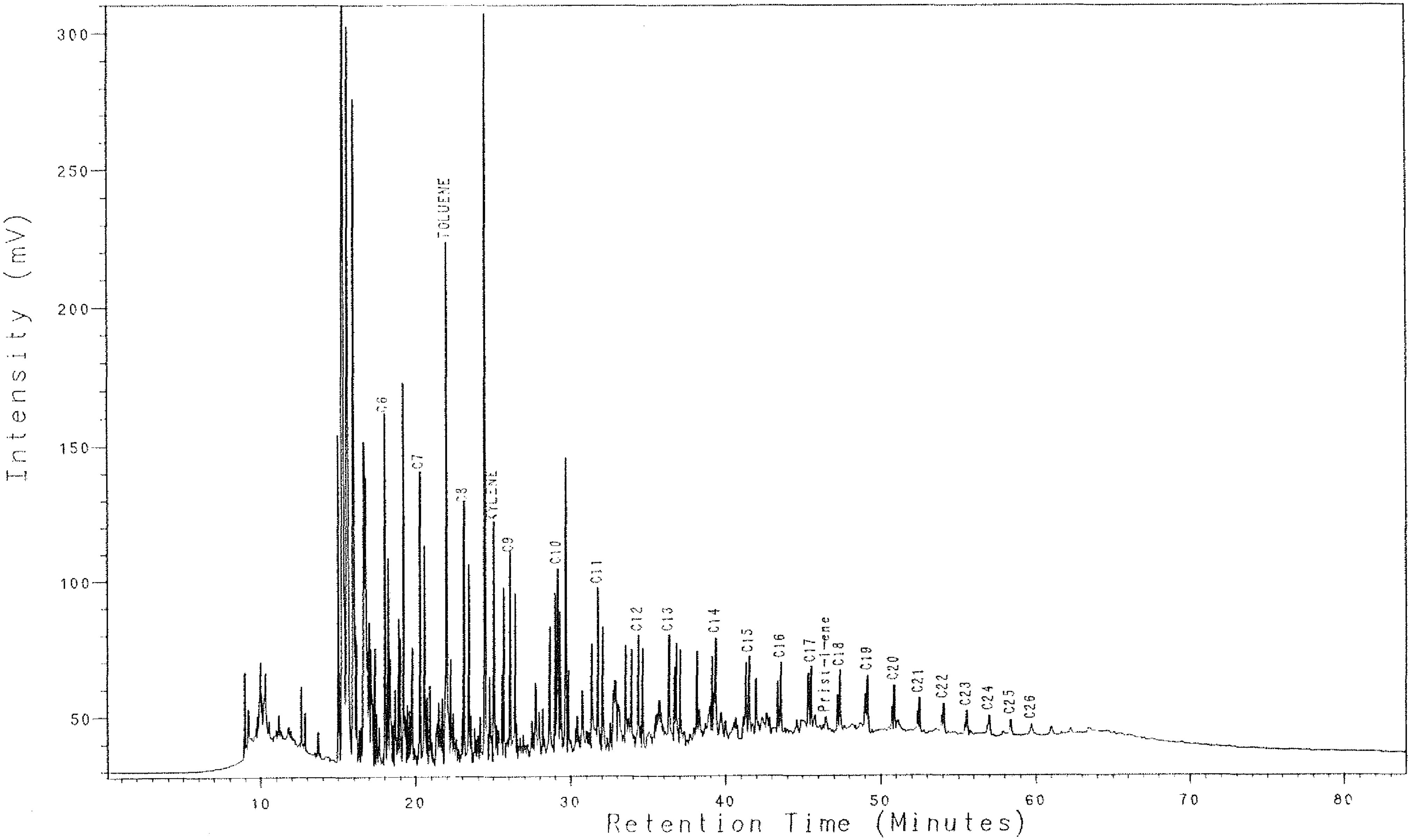
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S



NOCS 30/6-9 3005m
PYROLYSIS GC(S2)
SLTST: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

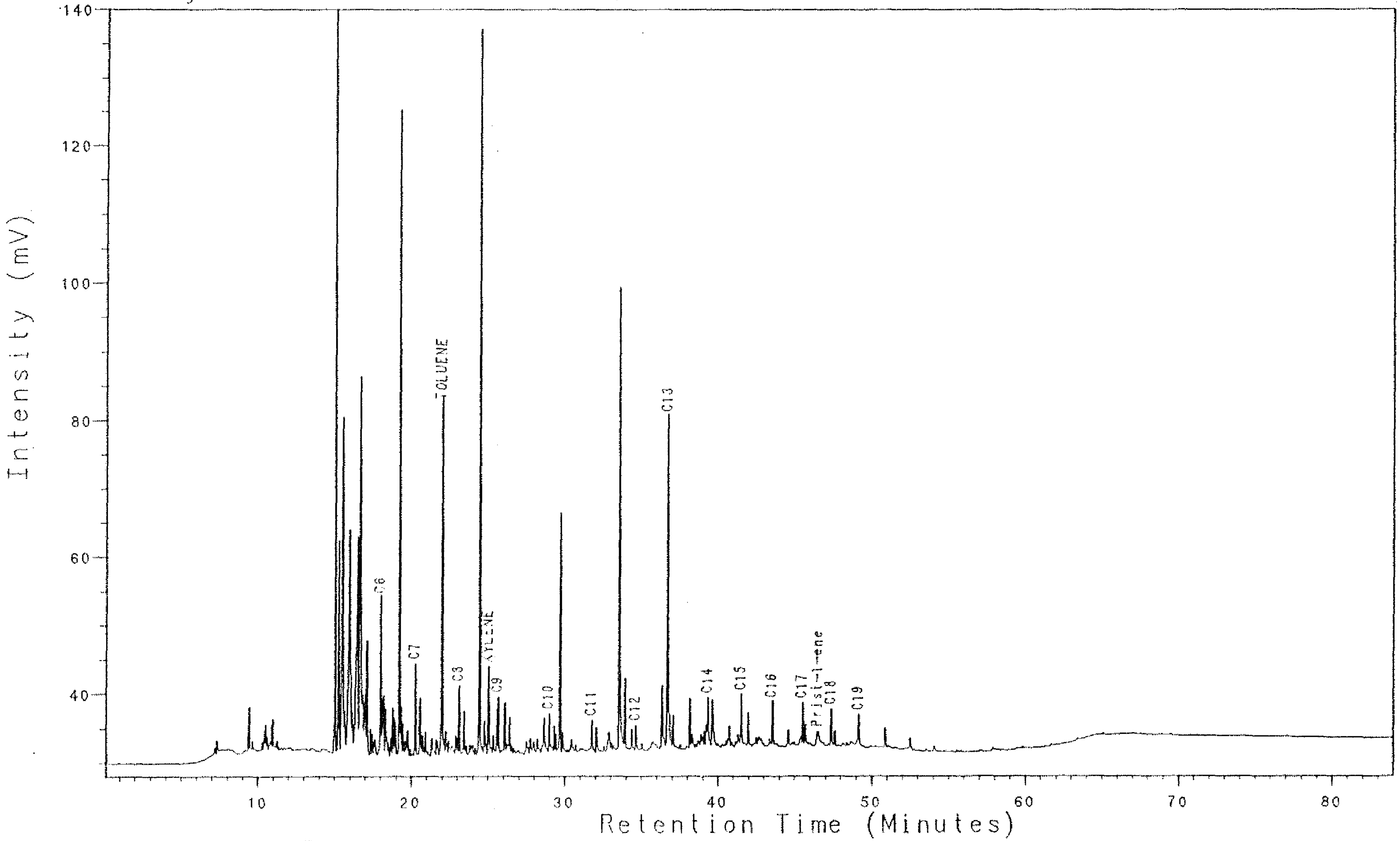
Analysis PV5901772   25, 1, 1   30/6-9, 3020m



NOCS 30-6-9 3030m
PYROLYSIS GC(S2)
SLTST: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

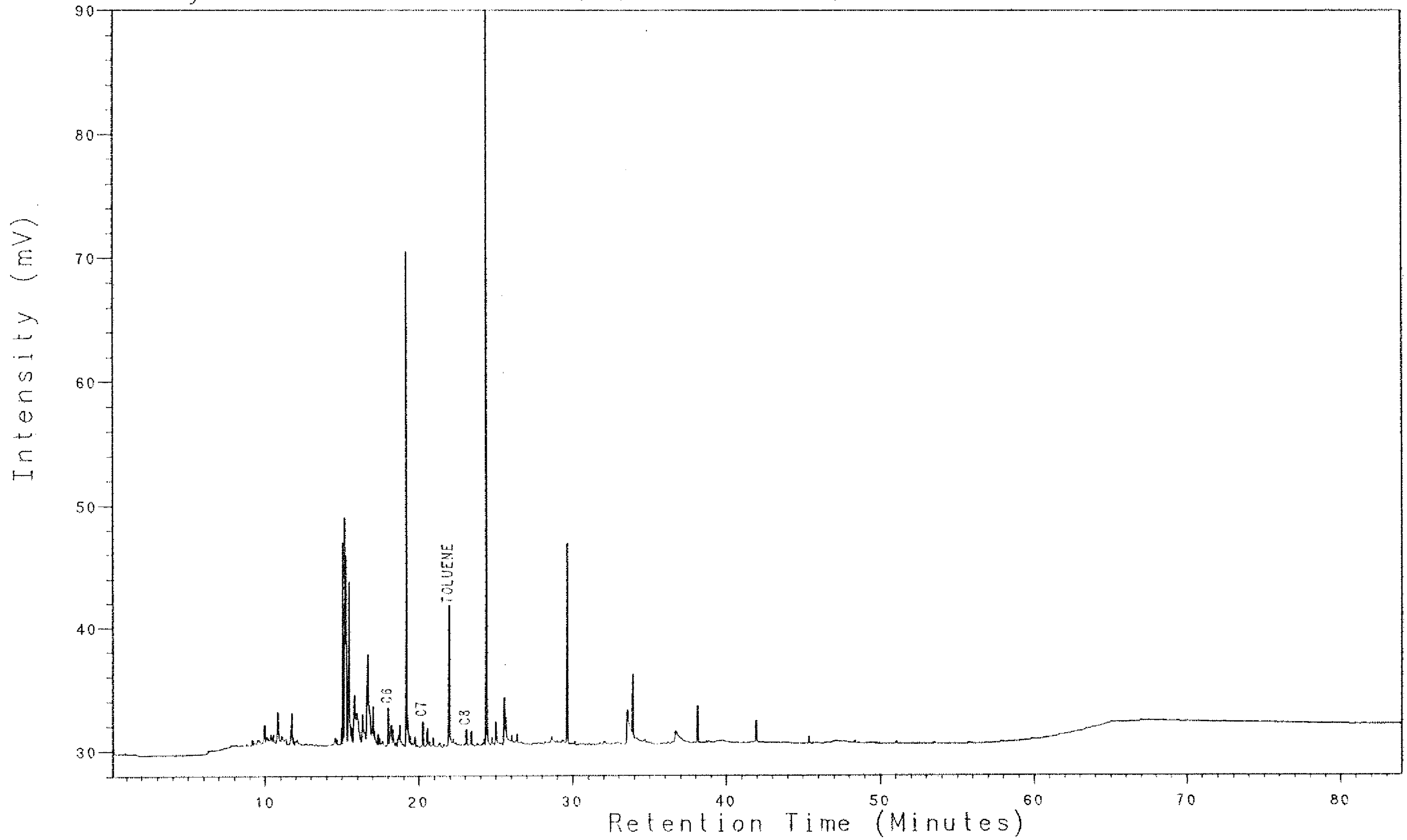
Analysis PV5901784 25, 1, 1 30/6-9, 3025m



NOCS 30/6-9 3025m
PYROLYSIS GC(S2)
SST: w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

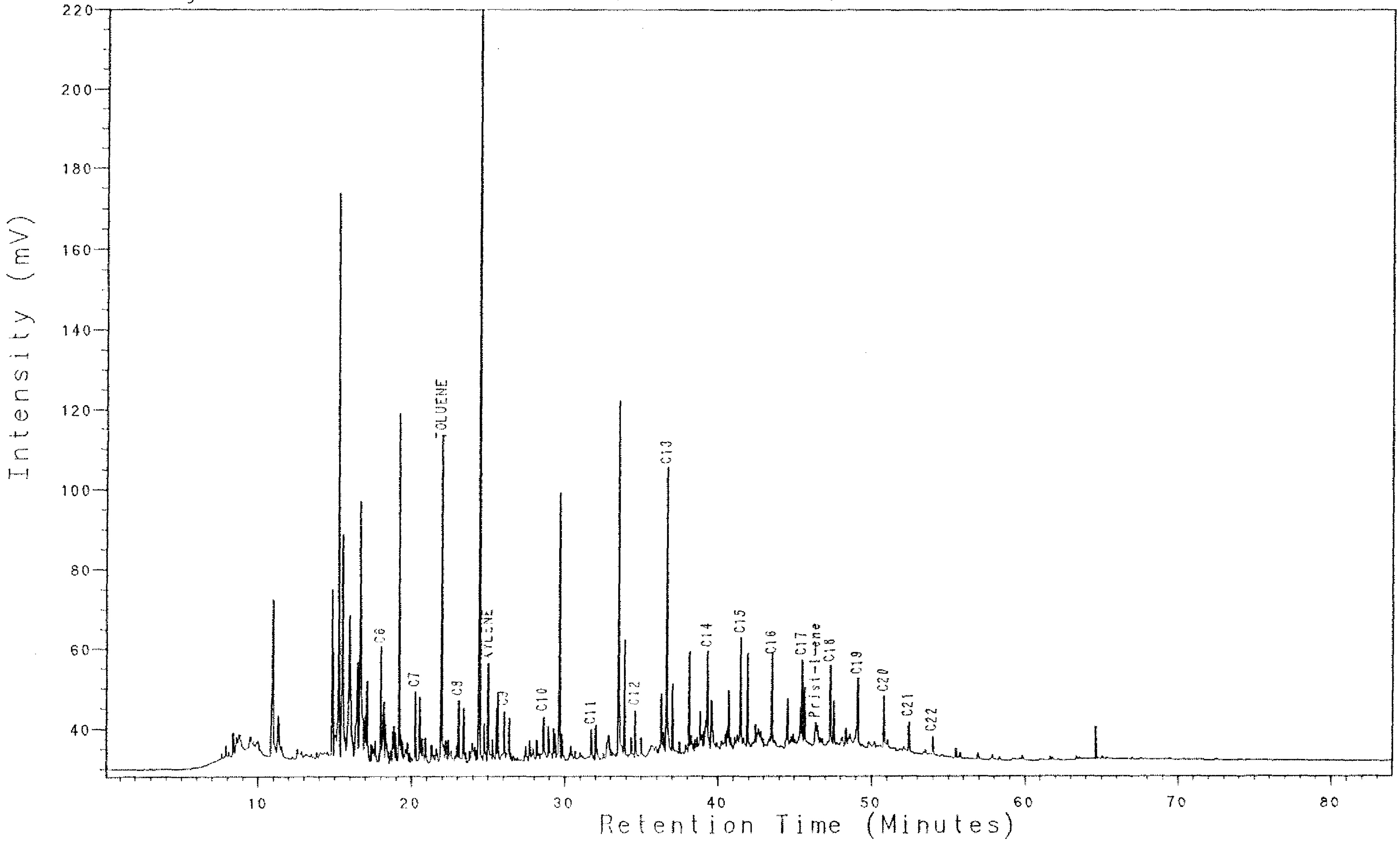
Analysis PV5901824 25, 1, 1 30/6-9, 3050m



NOCS 30/6-9 3050m
PYROLYSIS GC(S2)
SST: w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

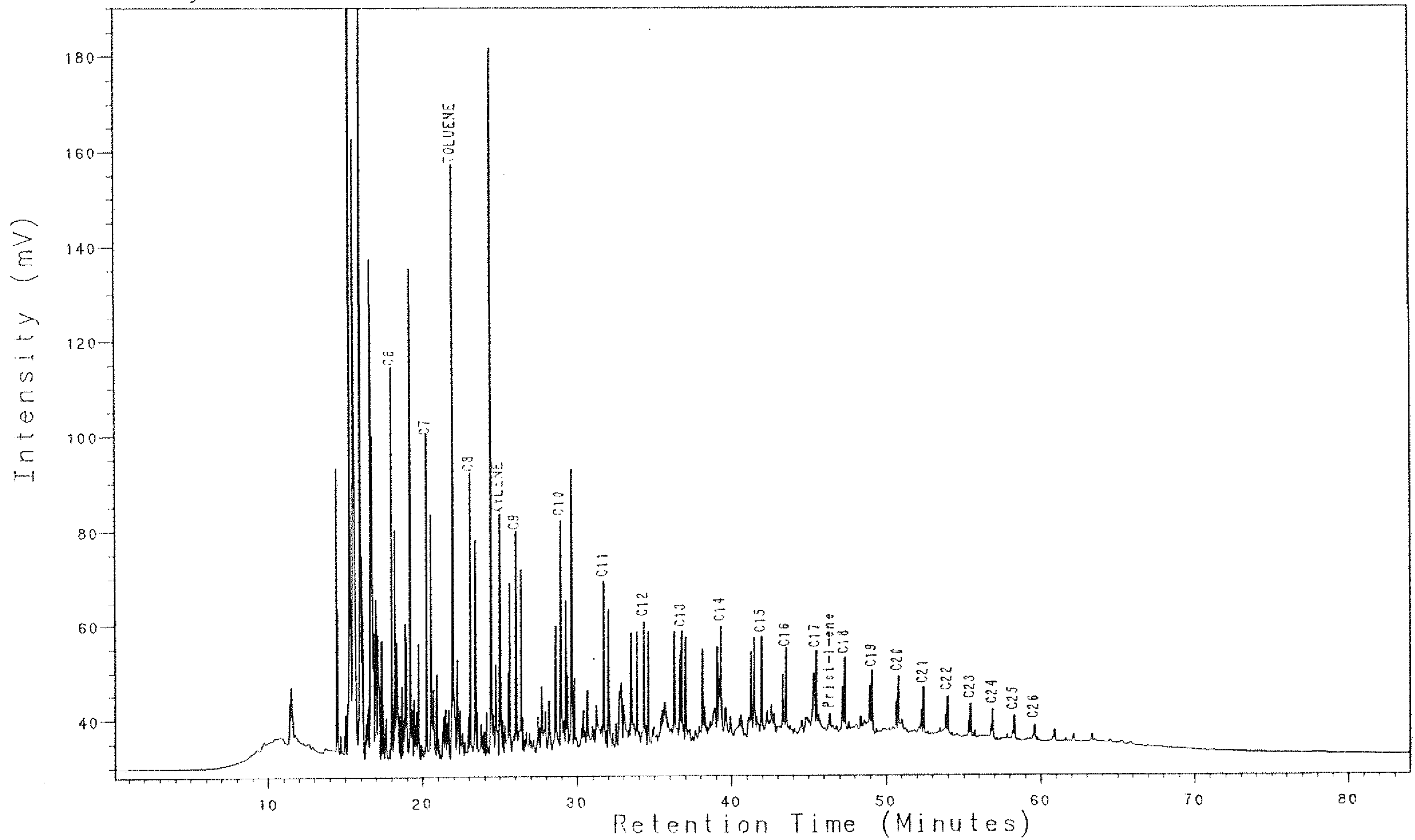
Analysis PV5901864 25, 1, 1 30/6-9, 3090m



NOCS 30/6-9 3090m
PYROLYSIS GC(S2)
SST: w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

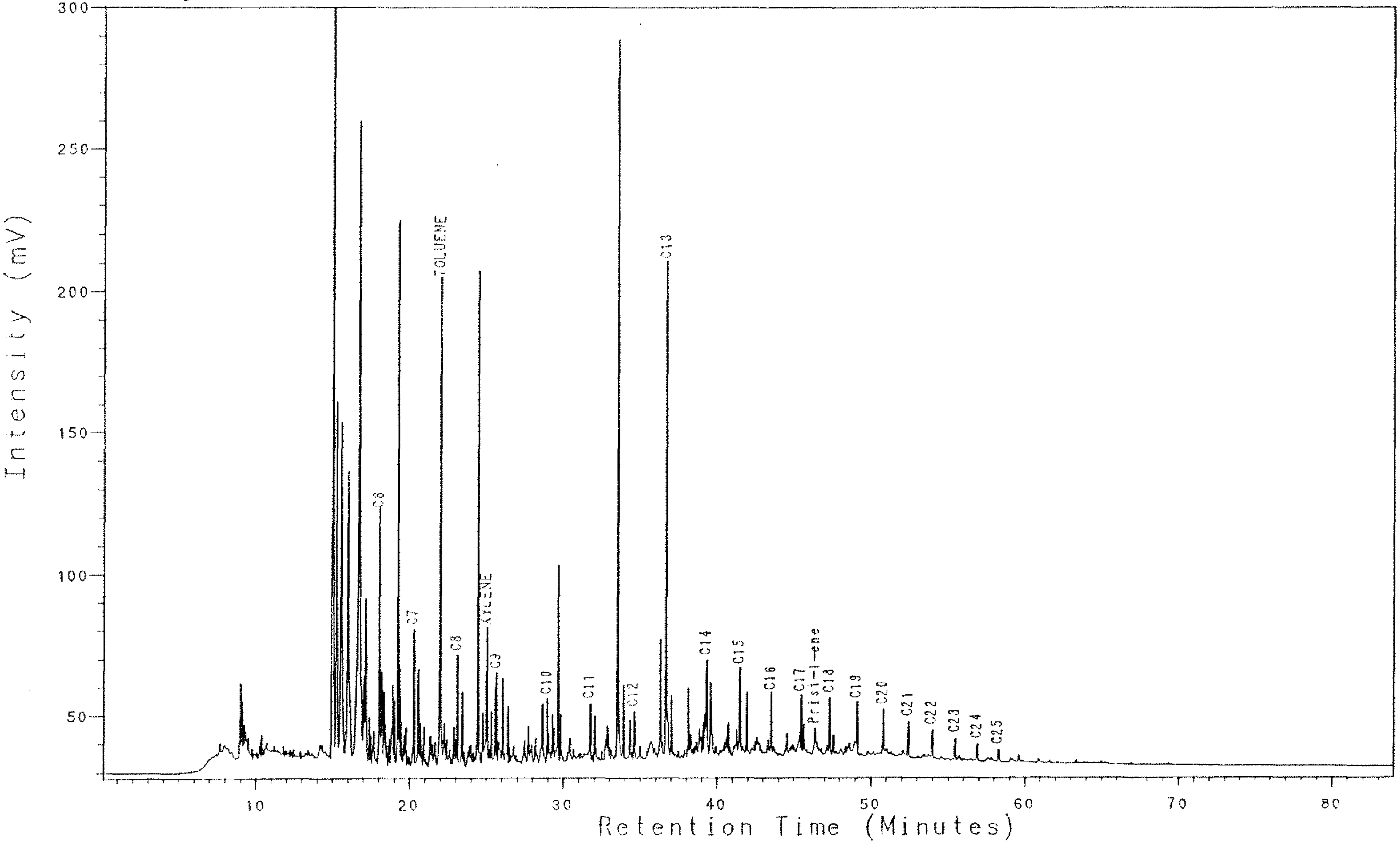
Analysis PV5901872   25, 1, 1   30/6--9, 3110m



NOCS 30/6-9 3110m
PYROLYSIS GC(S2)
CLST: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

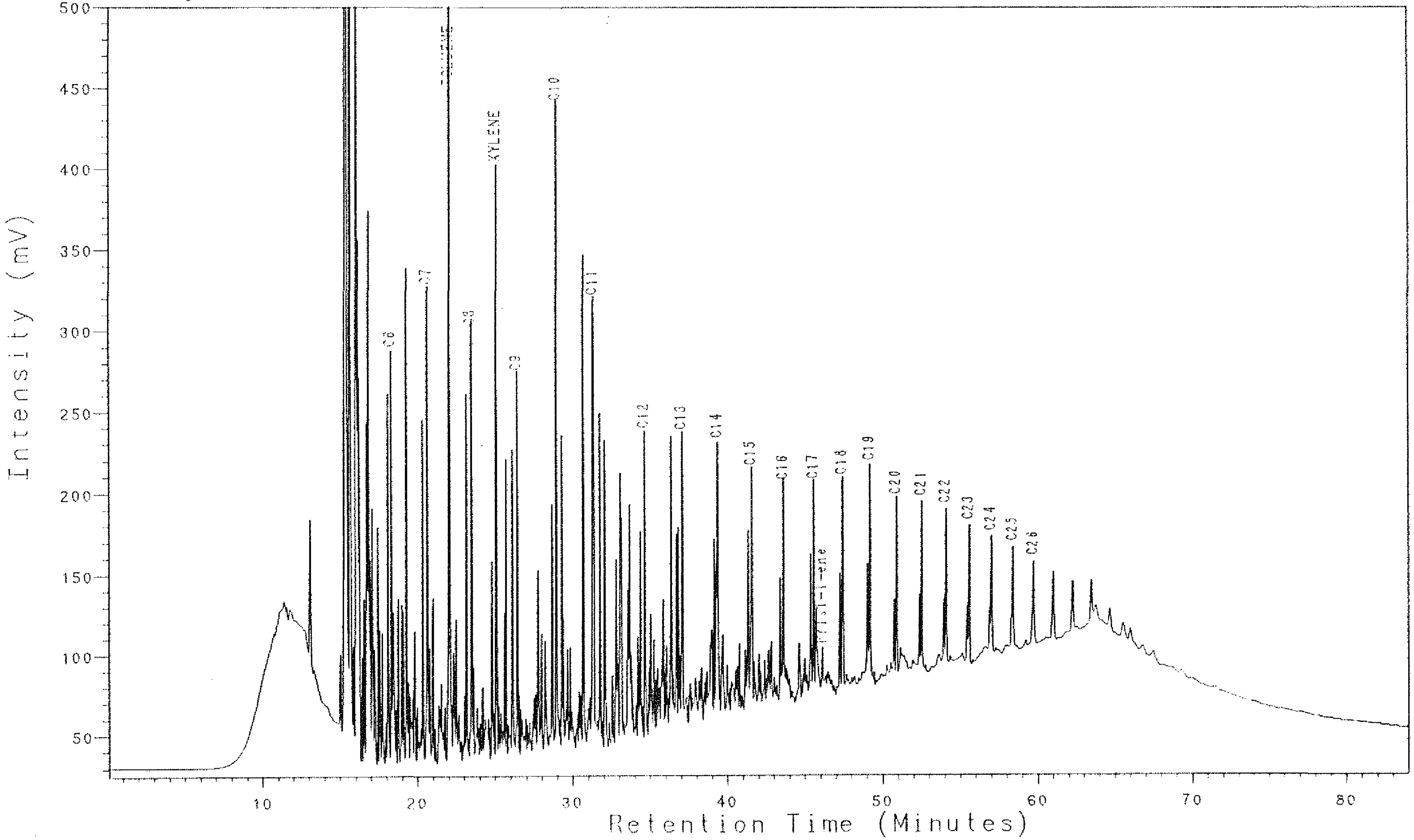
Analysis PV5901904 25, 1, 1 30/6-9, 3140m



NOCS 30/6-9 3140m
PYROLYSIS GC(S2)
SST: w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

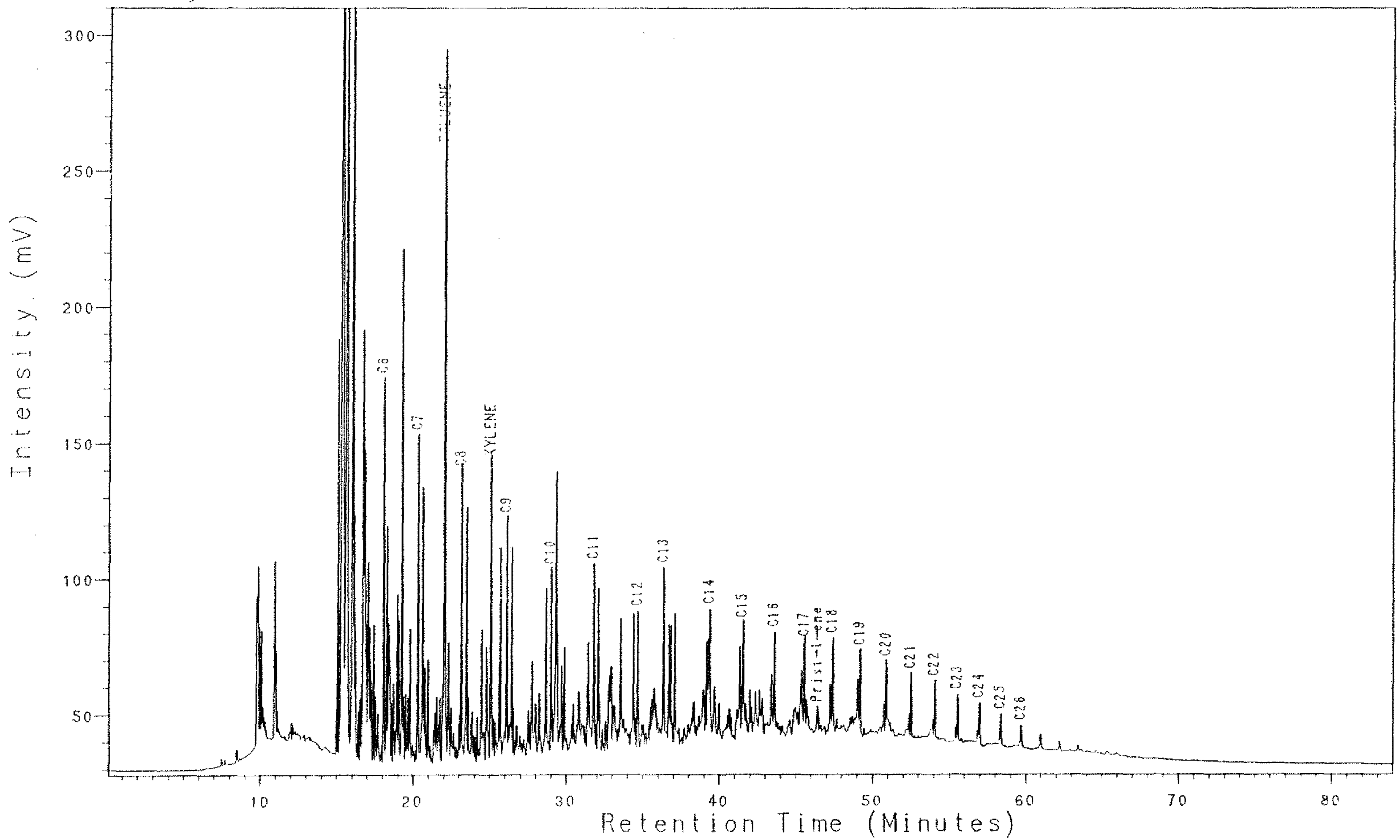
Analysis PV5901935 25, 1, 1 30/6-9, 3170m



NOCS 30/6-9 3170m
PYROLYSIS GC(S2)
COAL: blk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

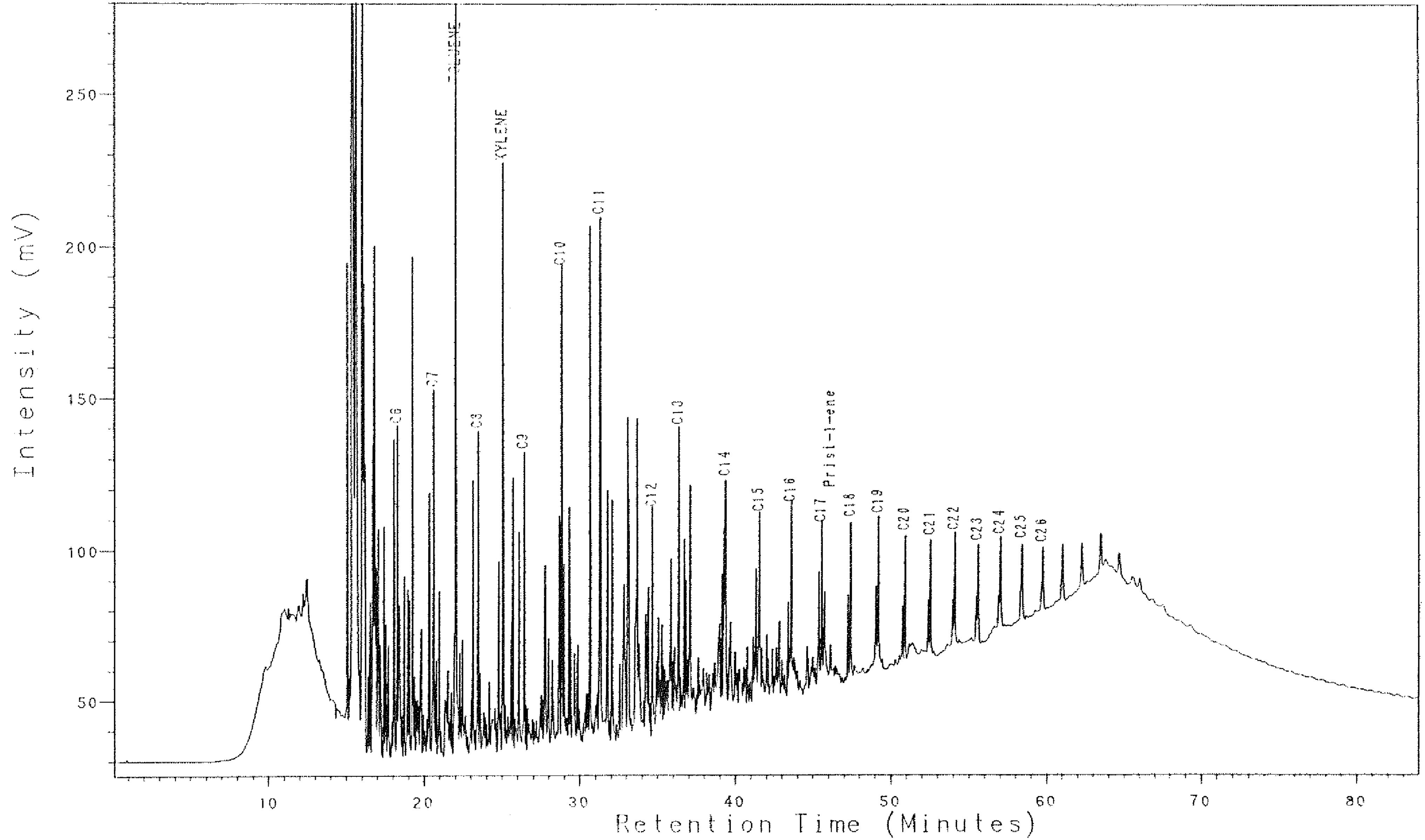
Analysis PV5901942   25, 1, 1   30/6-9, 3180m



NOCS 30/6-9 3180m
PYROLYSIS GC(S2)
SLTST: brn gy to lt gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

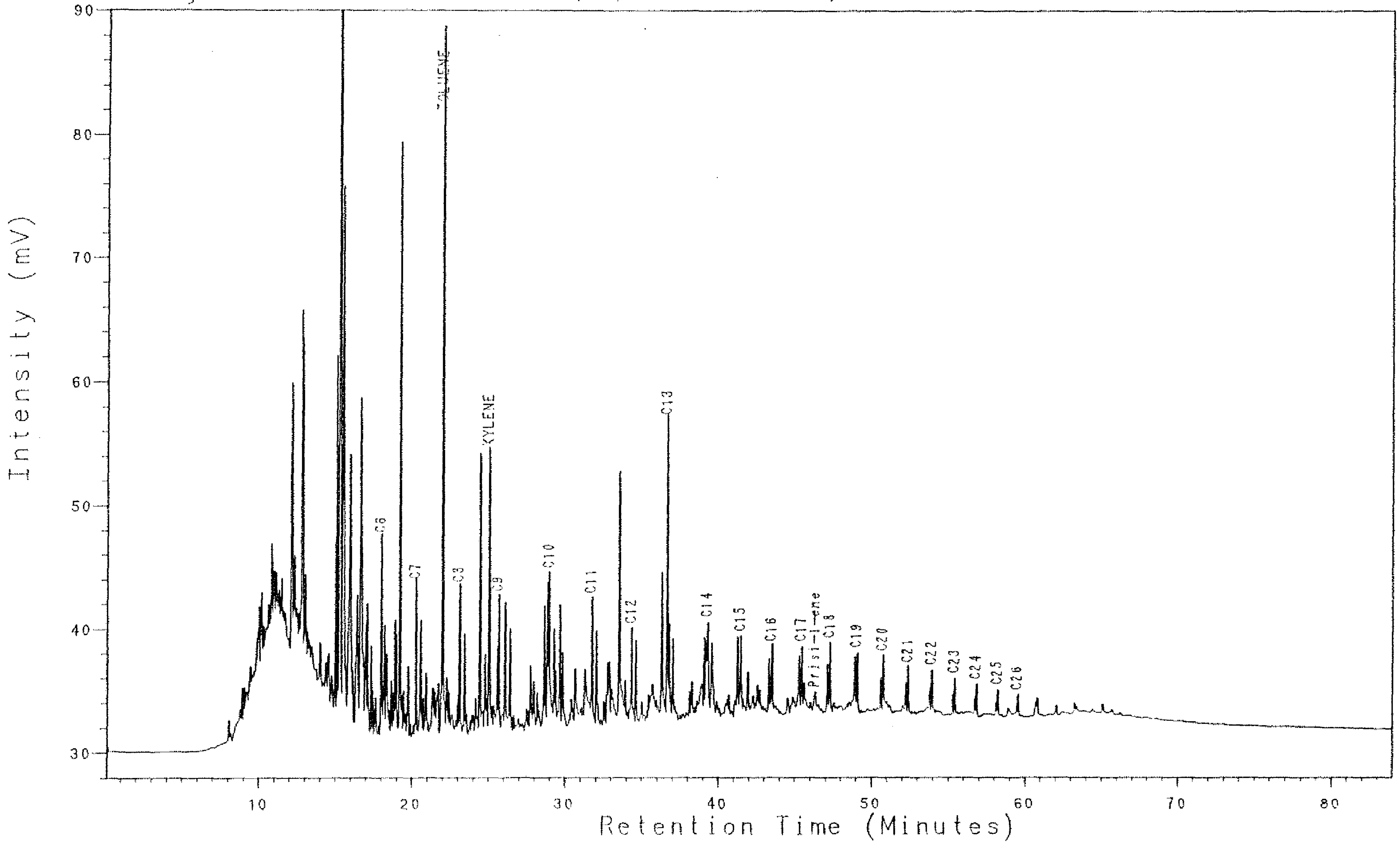
Analysis PV5901965 25, 1, 1 30/6-9, 3197m



NOCS 30/6-9 3197m
PYROLYSIS GC(S2)
COAL: blk to dsk v brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

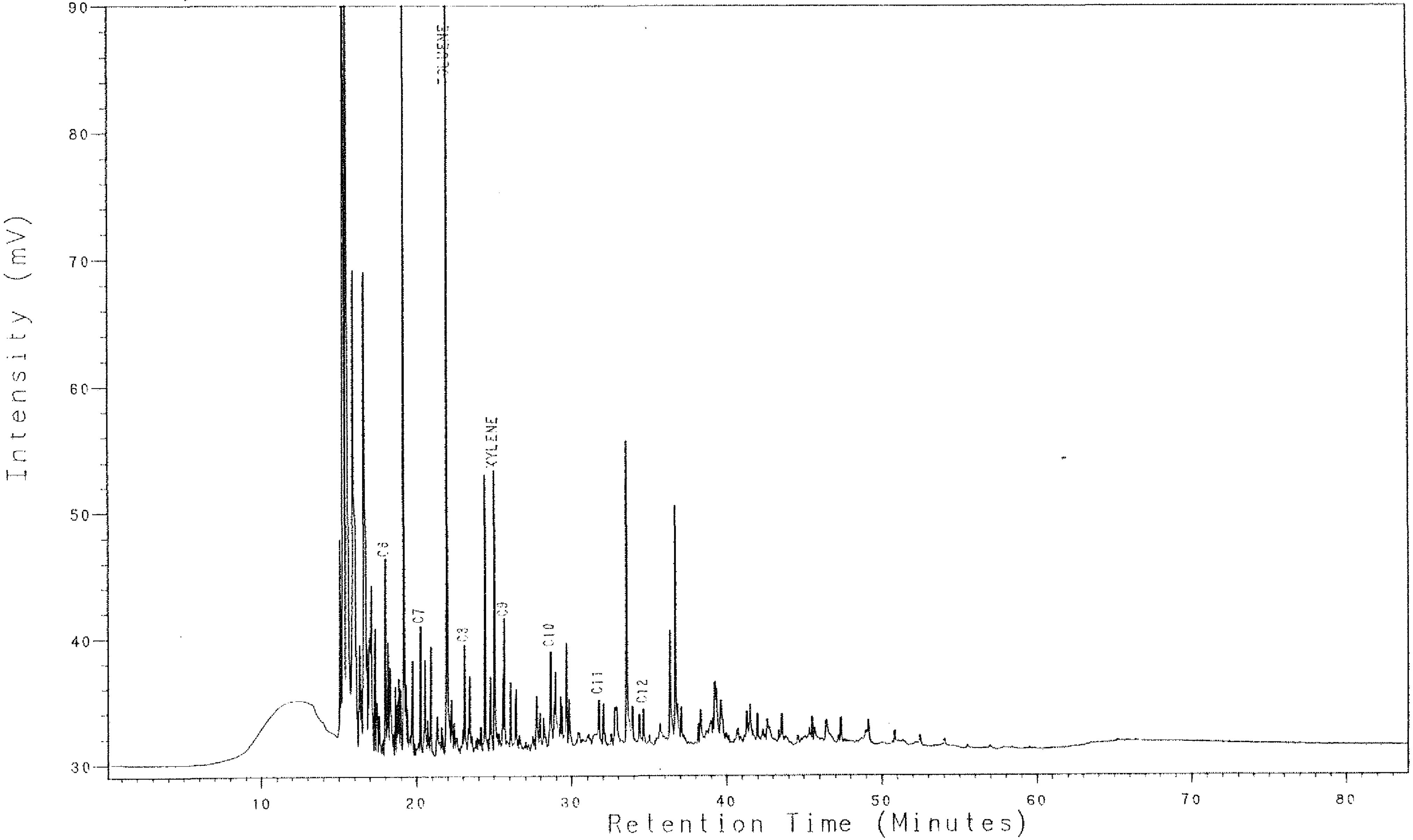
Analysis PV5902003 25, 1, 1 30/6-9, 3265m



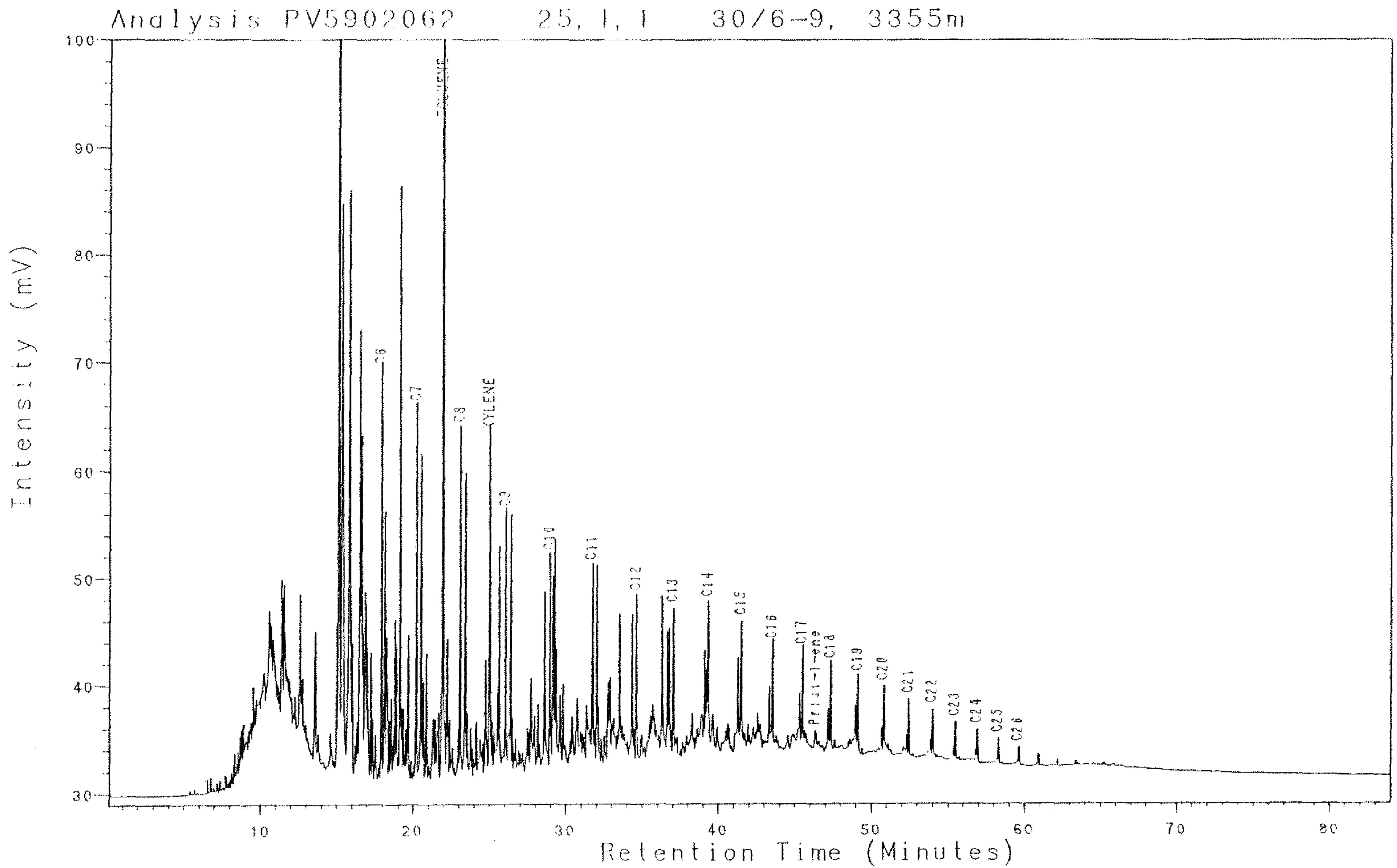
NOCS 30/6-9 3265m
PYROLYSIS GC(S2)
SST: w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Analysis PV5902042 25, 1, 1 30/6-9, 3325m



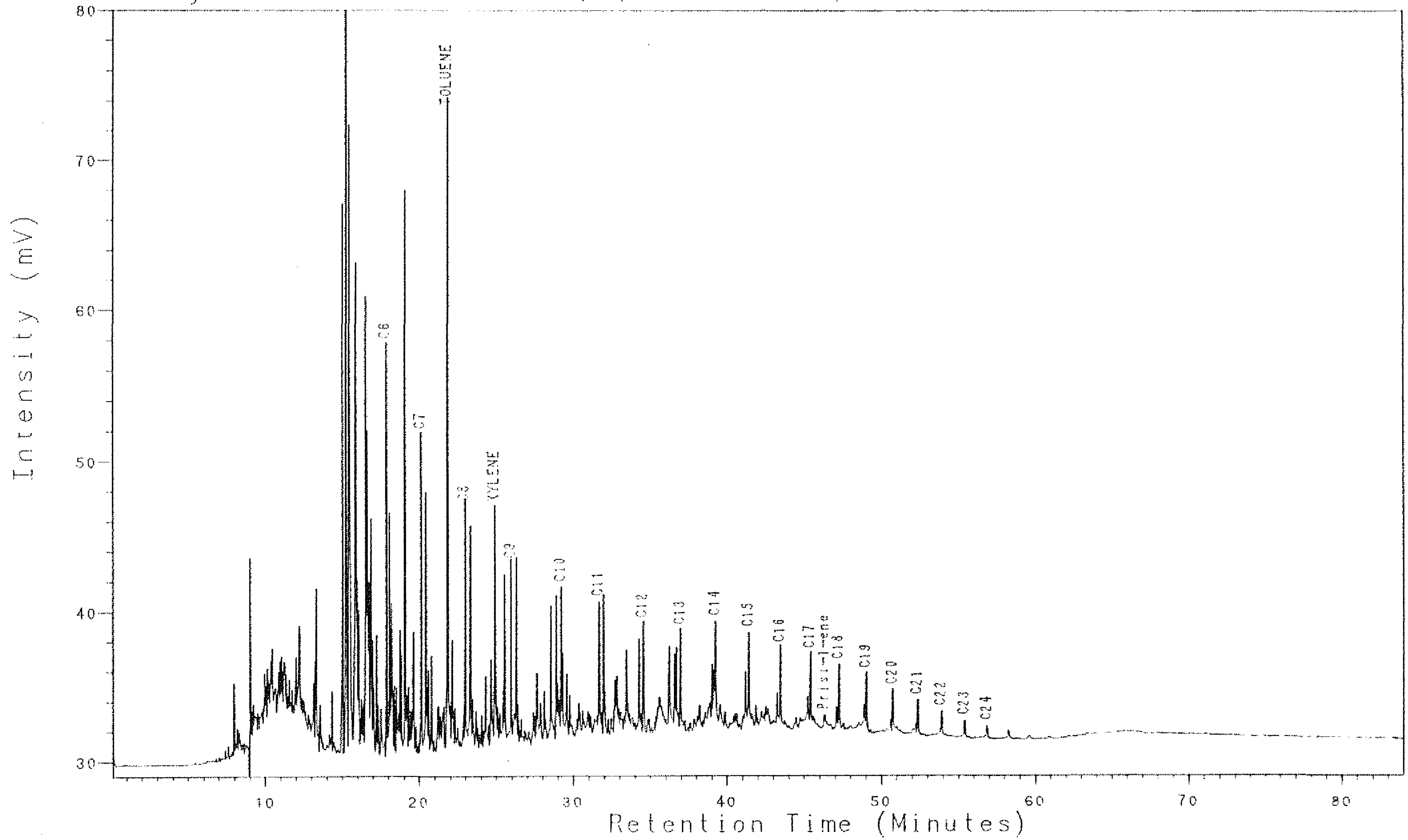
NOCS 30/6-9 3325m
PYROLYSIS GC(S2)
CLST: brn gy to m gy



NOCS 30/6-9 3355m
PYROLYSIS GC(S2)
CLST: brn gy to m gy to
dsk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

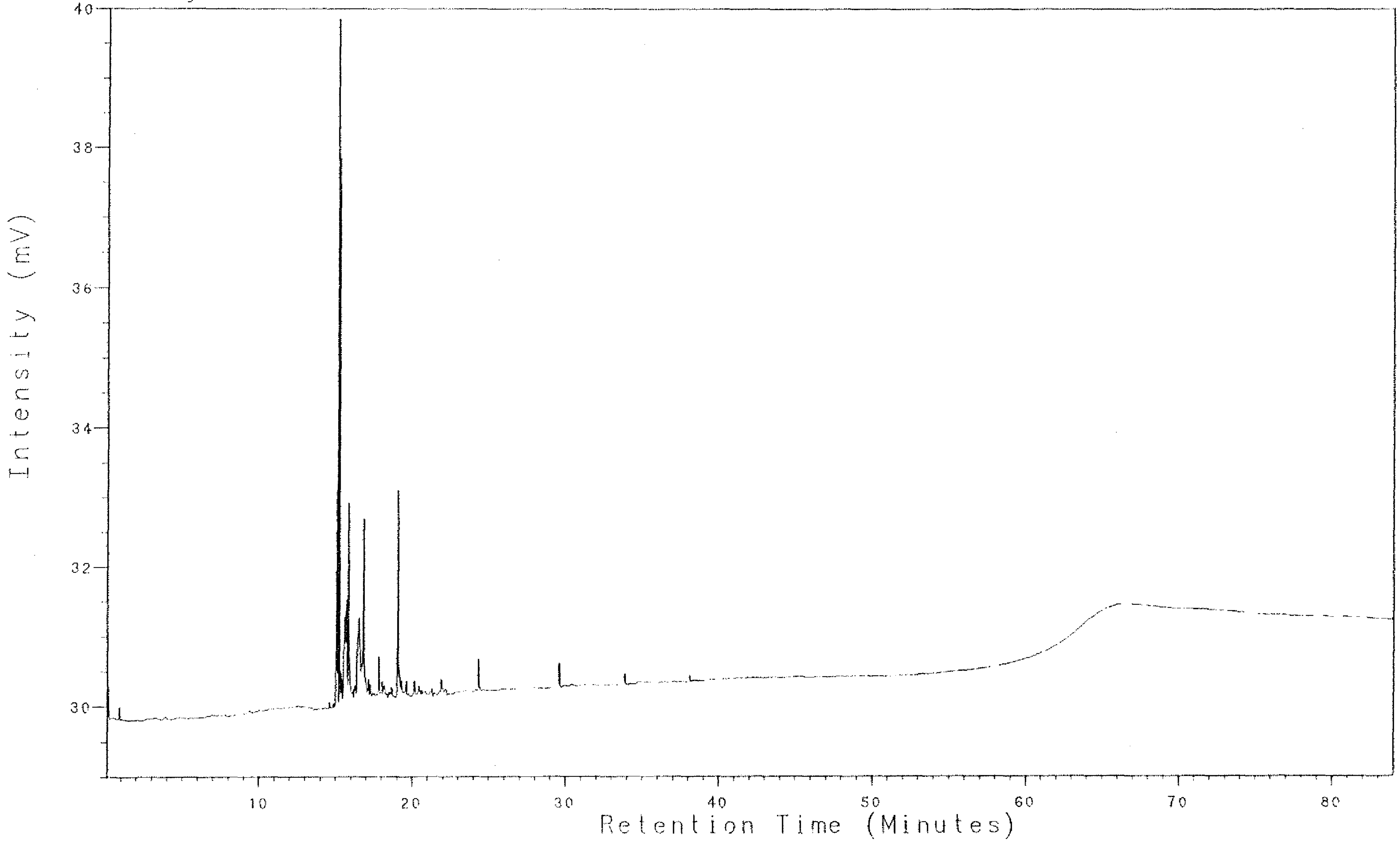
Analysis PV5902092   25, 1, 1   30/6-9, 3400m



NOCS 30/6-9 3400m
PYROLYSIS GC(S2)
CLST: brn gy to m gy to dk gy

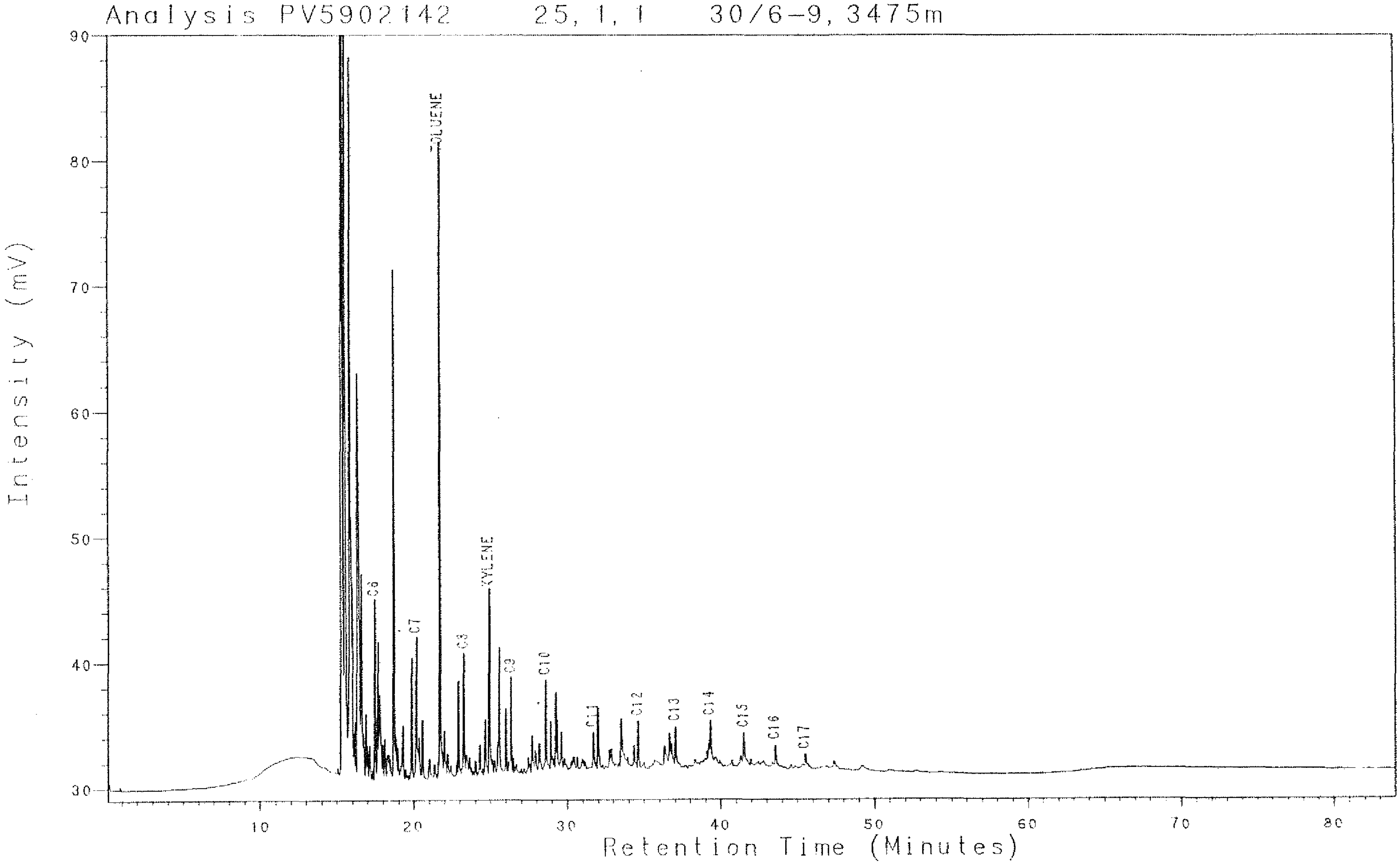
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Analysis PV592113 25, 1, 1 30/6-9, 3430m



[illegible] 30/6-9 3430m
PYROLYSIS GC(S2)
SST: w to lt gy

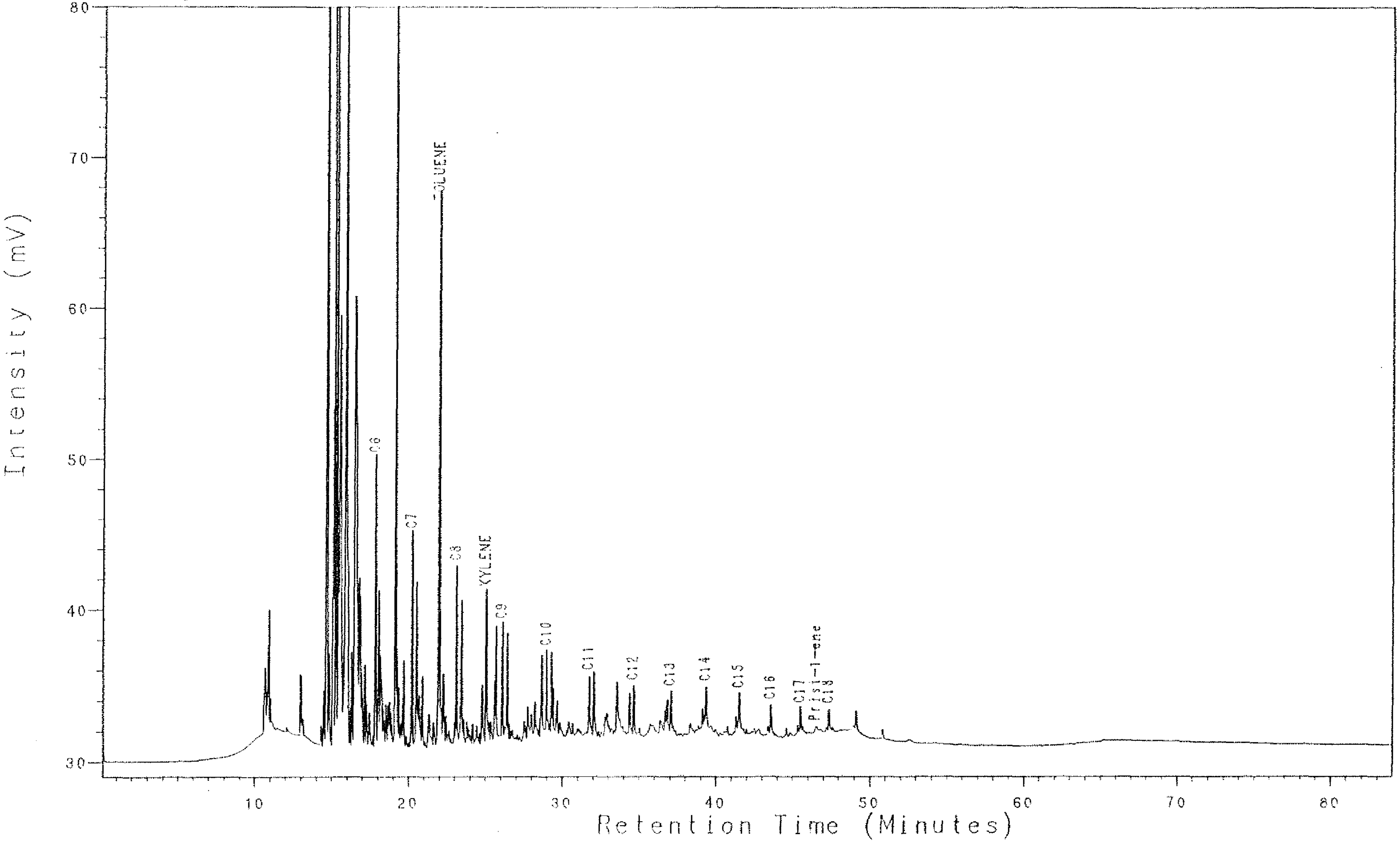
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 3475m
PYROLYSIS GC(S2)
CLST: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

Analysis PV5902143 25, 1, 1 30/6-9, 3475m

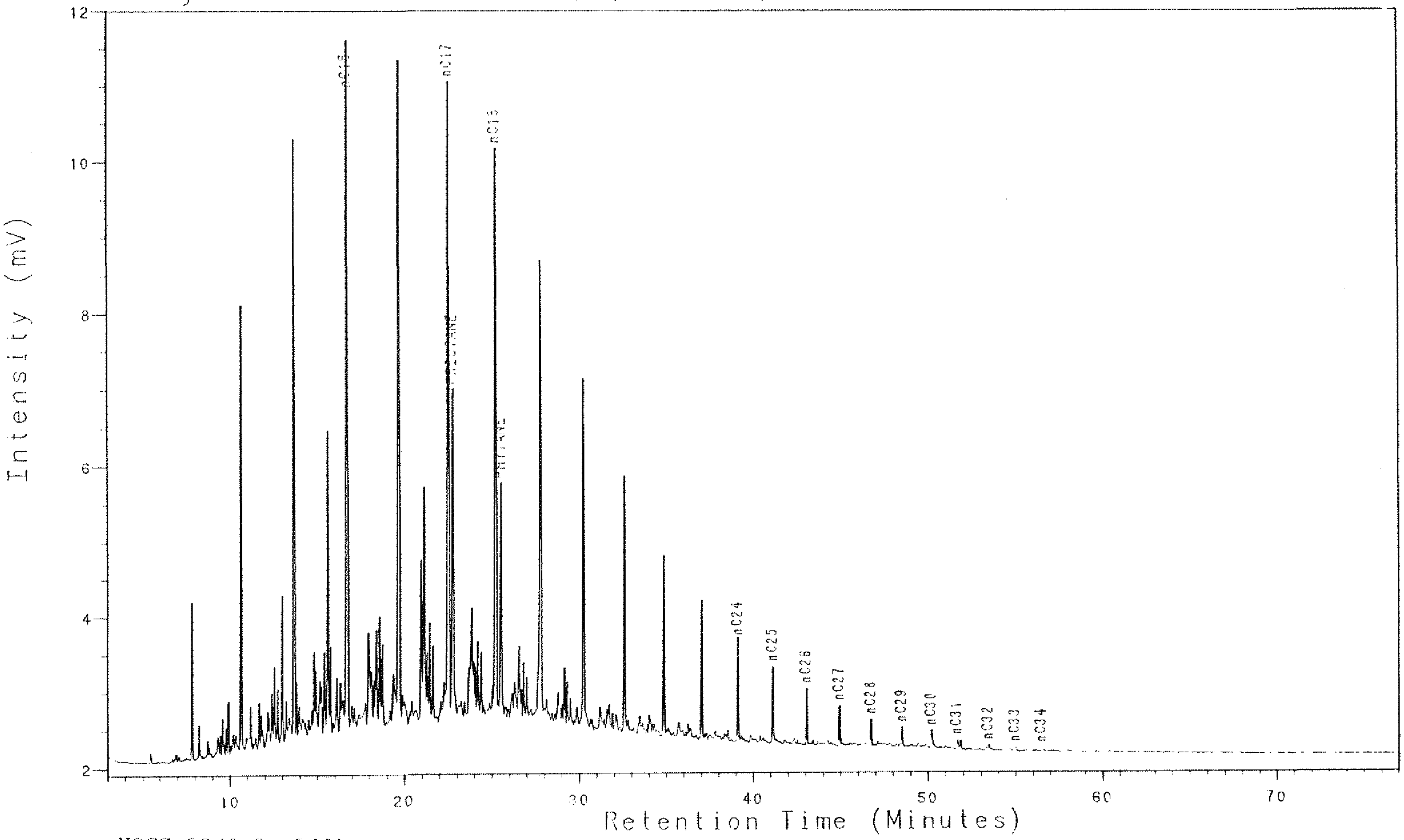


NOCS 30/6-9 3475m
PYROLYSIS GC(S2)
SST: w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Saturated Fraction Chromatograms (FID)

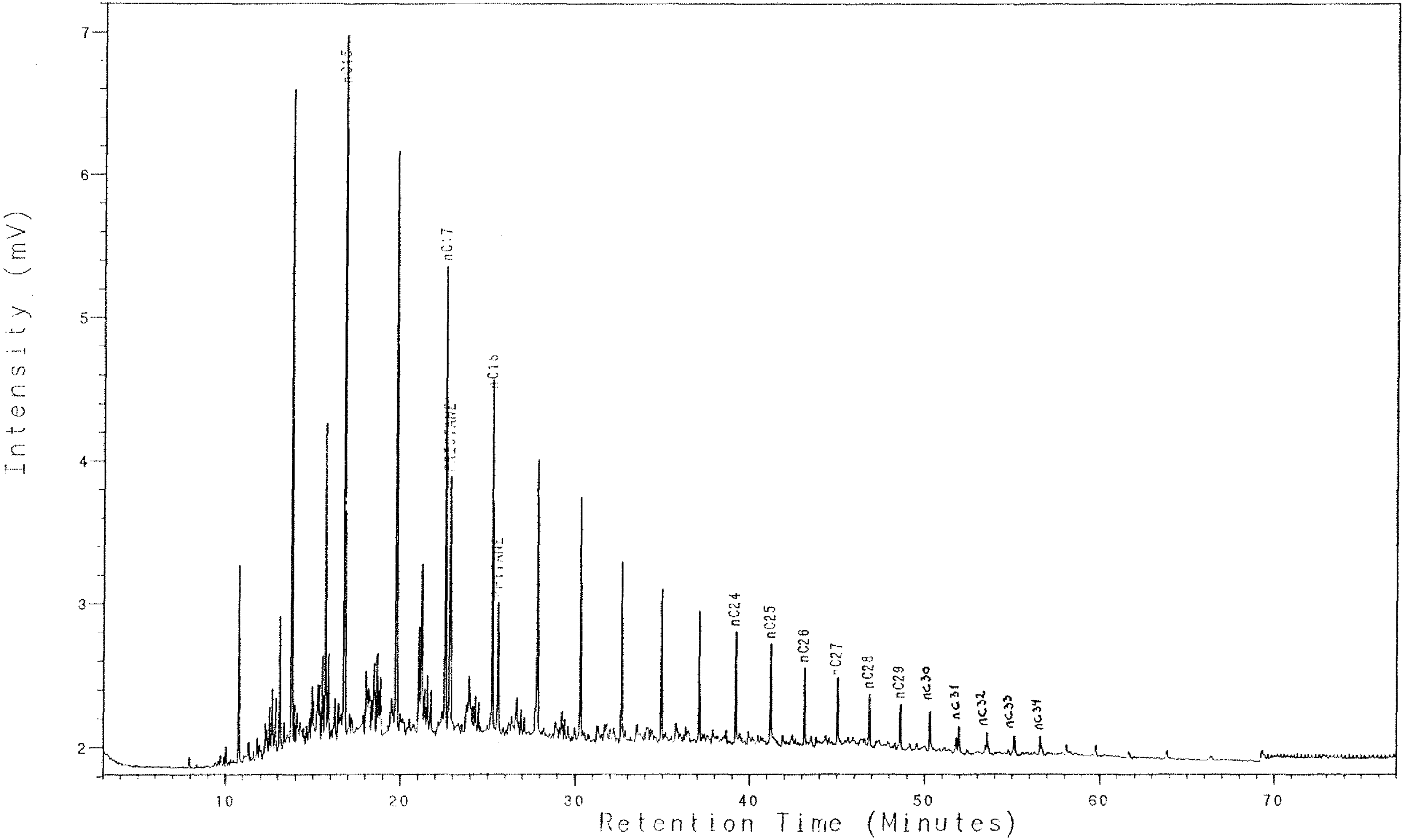
Analysis SB2412460 5, I, J **30/6-9** 2460m SAT



NOCS 30/6-9 2460m
SATURATED GC
COAL: blk

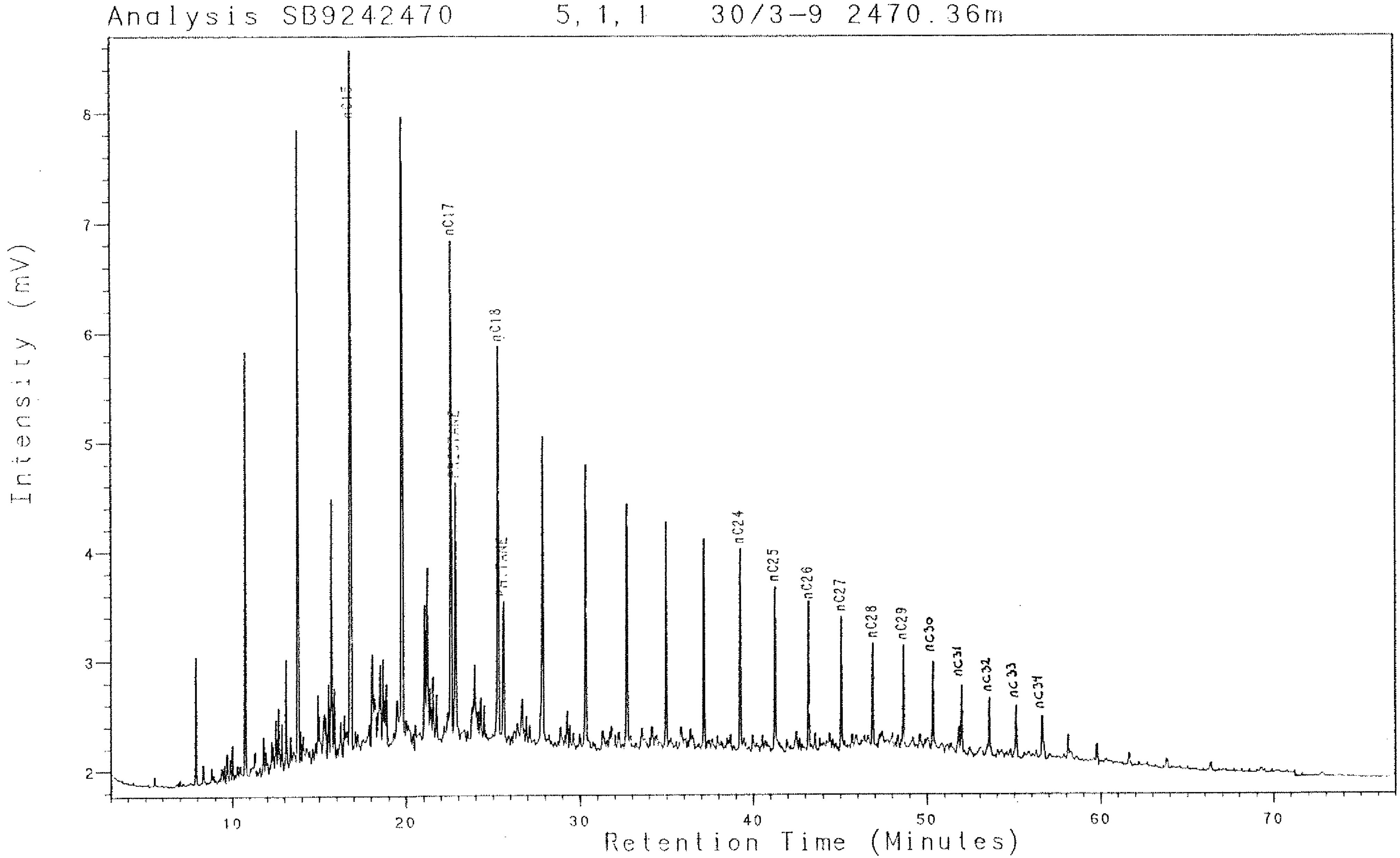
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

Analysis SB9242468 5, 1, 1 30/6-9 2462.75-68.30



NOCS 30/6-9 2462.75-2468.30m
SATURATED GC
[illegible]st: pl brn

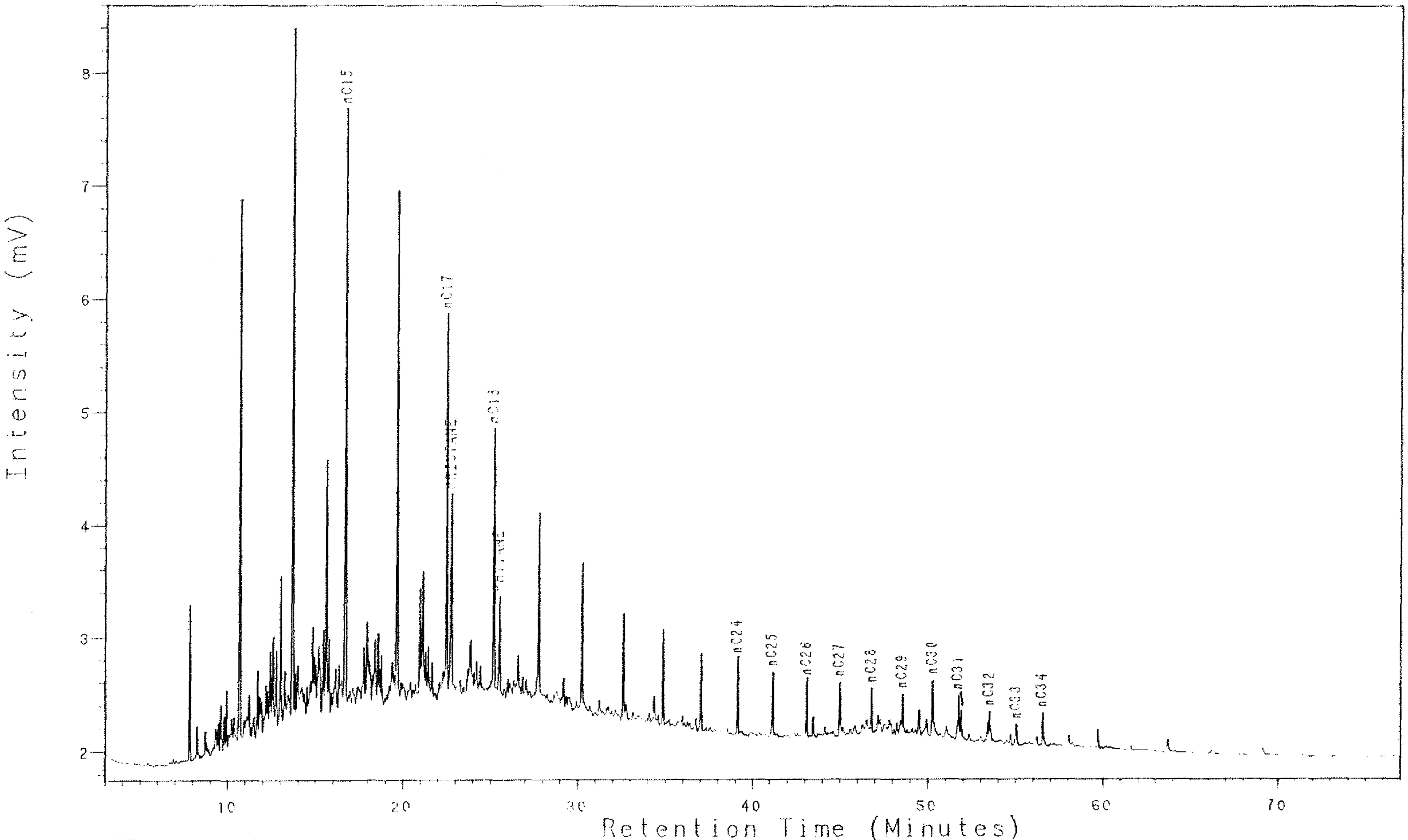
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 2470.36m
SATURATED GC
Sltst: pl y brn to lt gy to

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

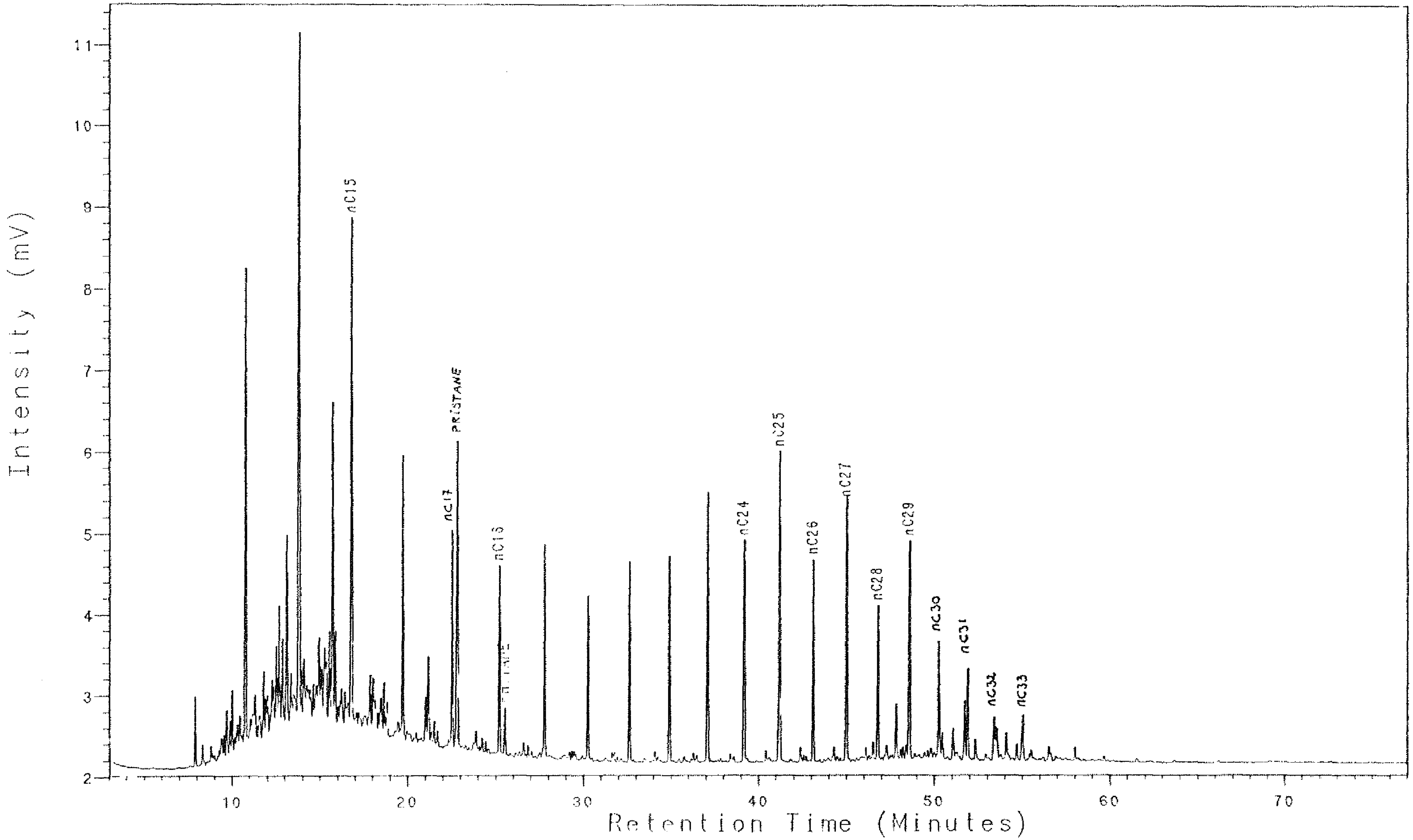
Analysis SB2412474 5, 1, 1 30/6-9 2474m SAT



NOCS 30/6-9 2474m
SATURATED GC
ST: drk gy to brn blk

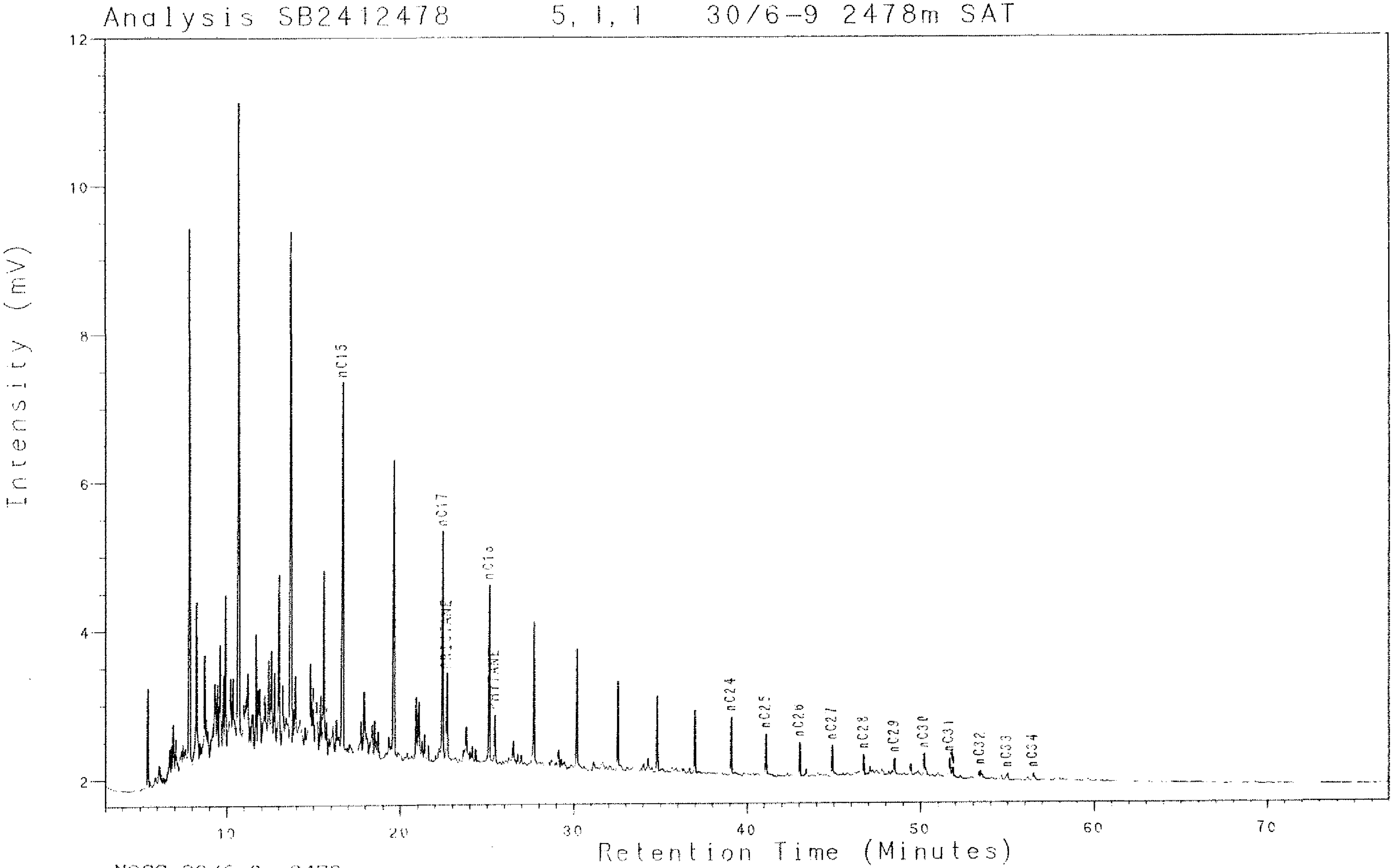
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis SB9242476 5, 1, 1 30/6-9 2476m



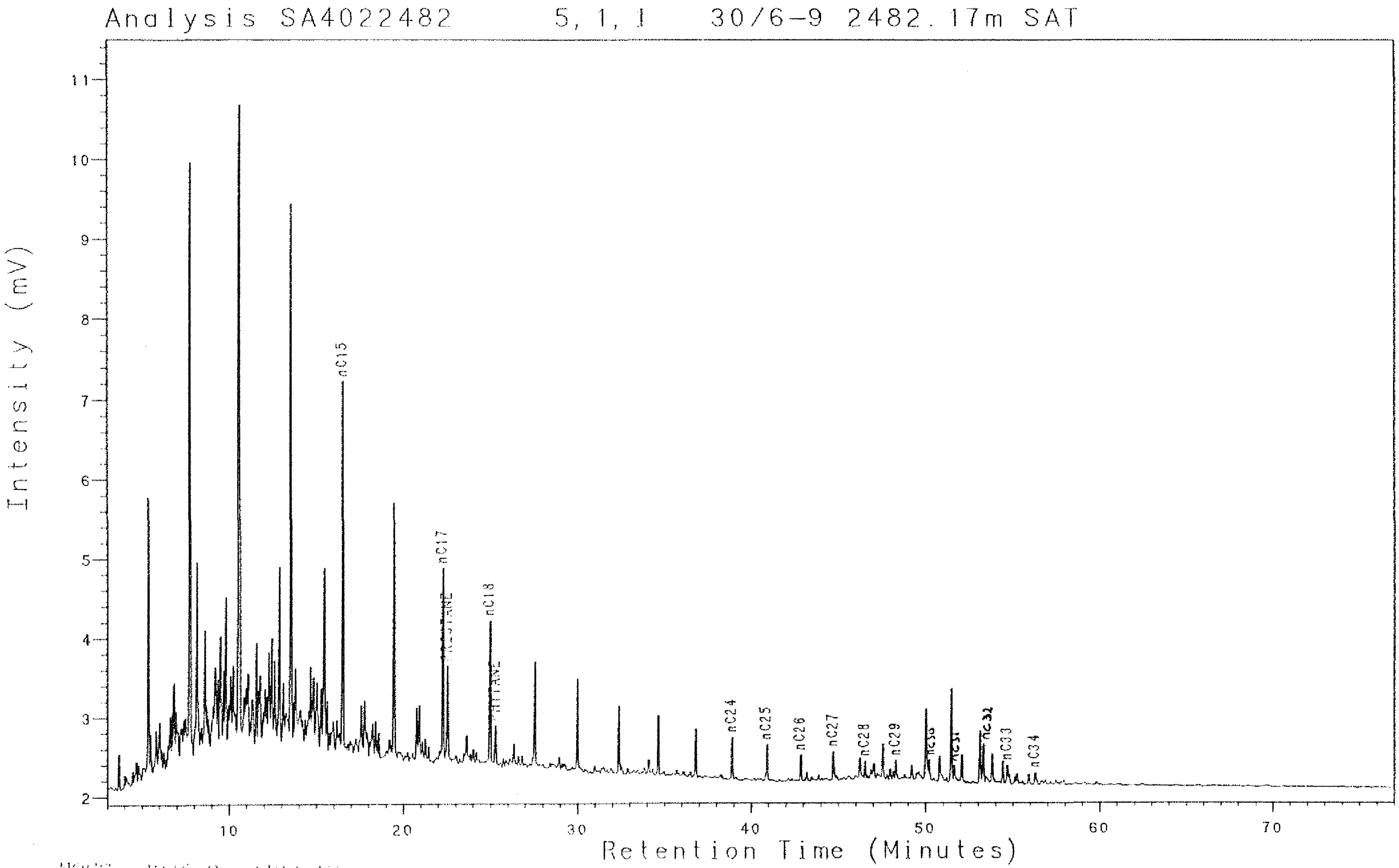
NOCS 30/6-9 2476.00m
SATURATED GC
Coal: blk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S



NOCS 30/6-9 2478m
SATURATED GC
COAL: blk

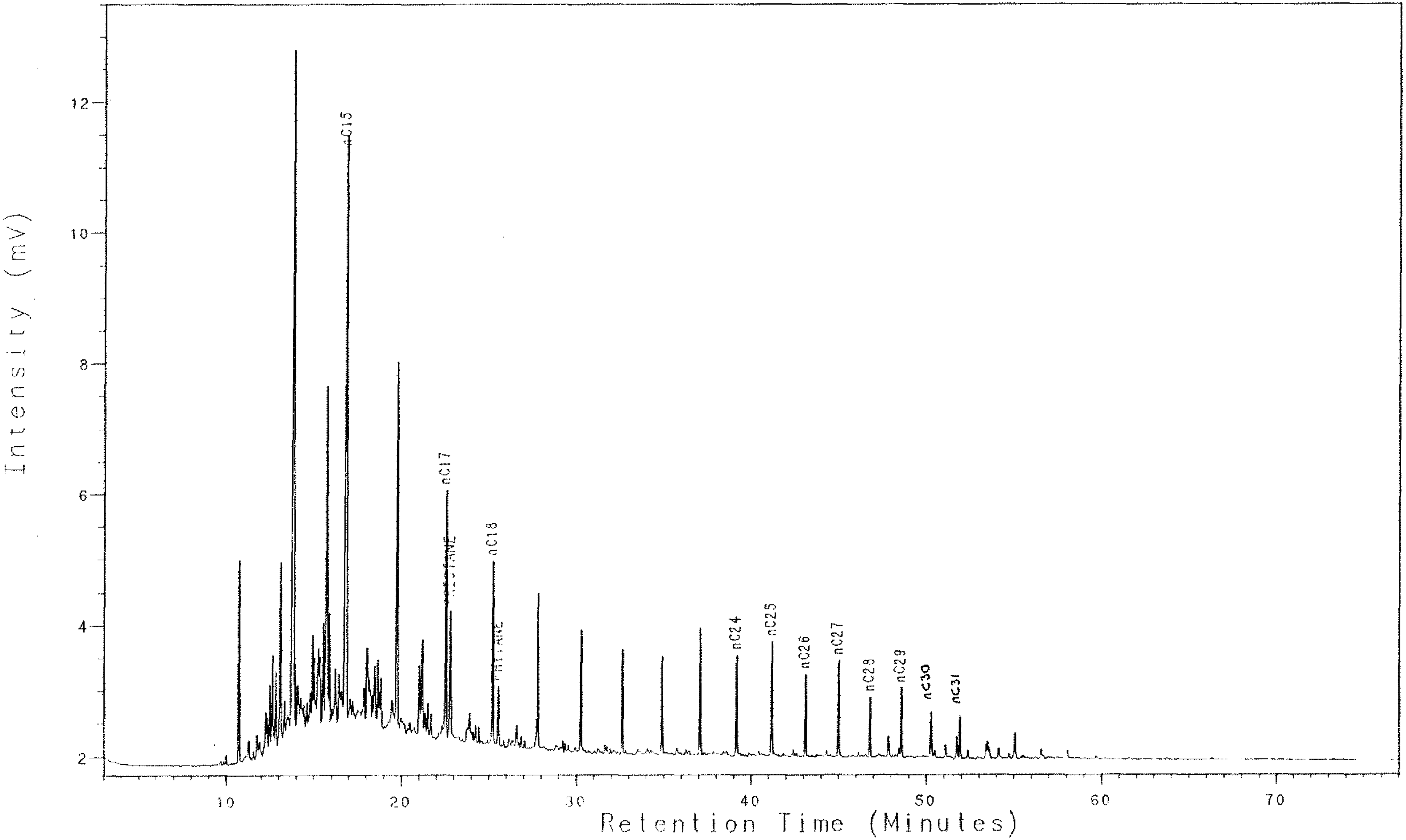
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 2482.17m
SATURATED GC
CLST:drk gy to brn blk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

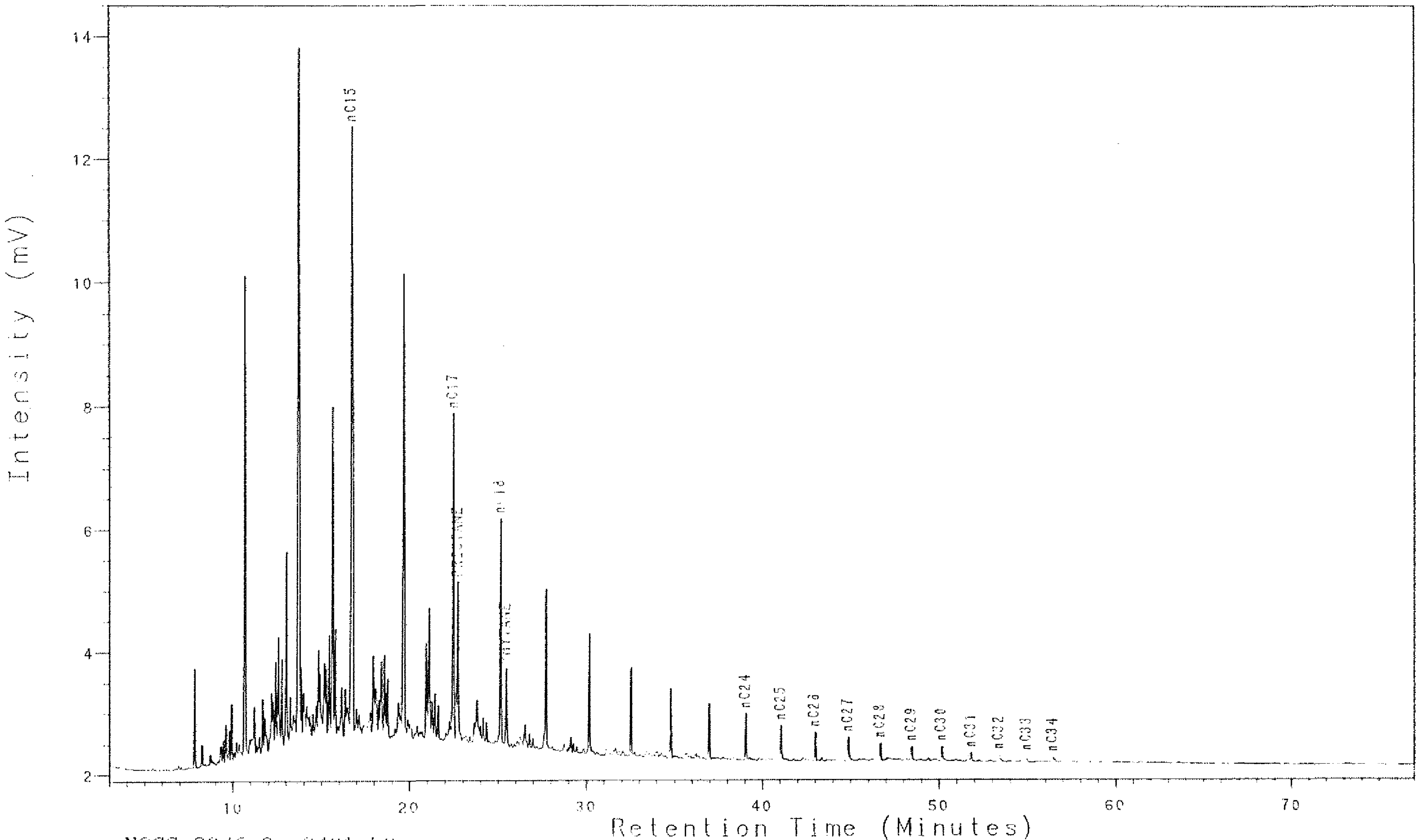
Analysis SB9242484   5, 1, 1   30/6-9 2484m SAT



NOCS 30/6-9 2484.00m
SATURATED GC
C t: drk gy to dsk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

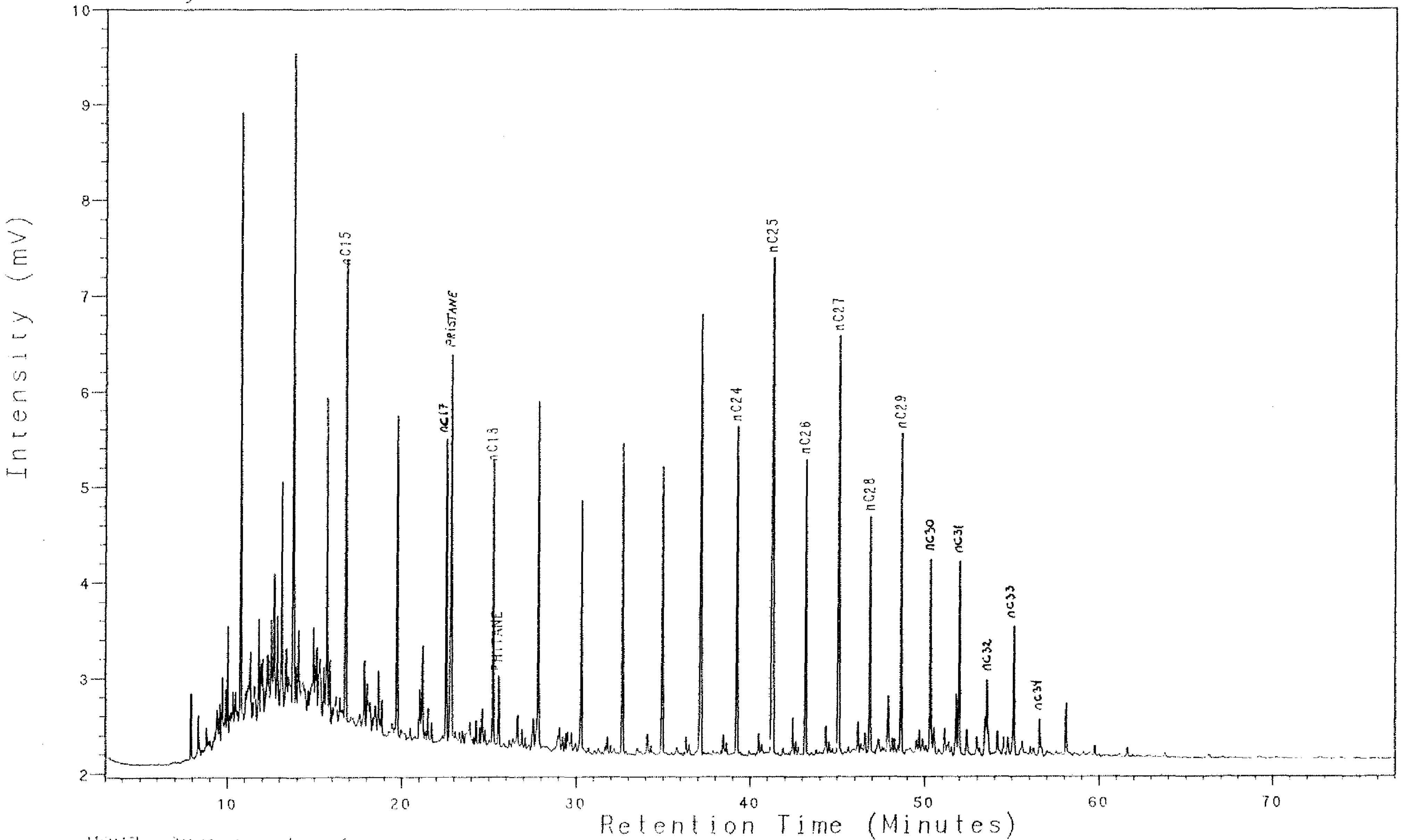
Analysis SB2412491 5, 1, 1 30/6-9 2491.5m SAT



NOCS 30/6-9 2491.50m
SATURATED GC
SST: lt or to or gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

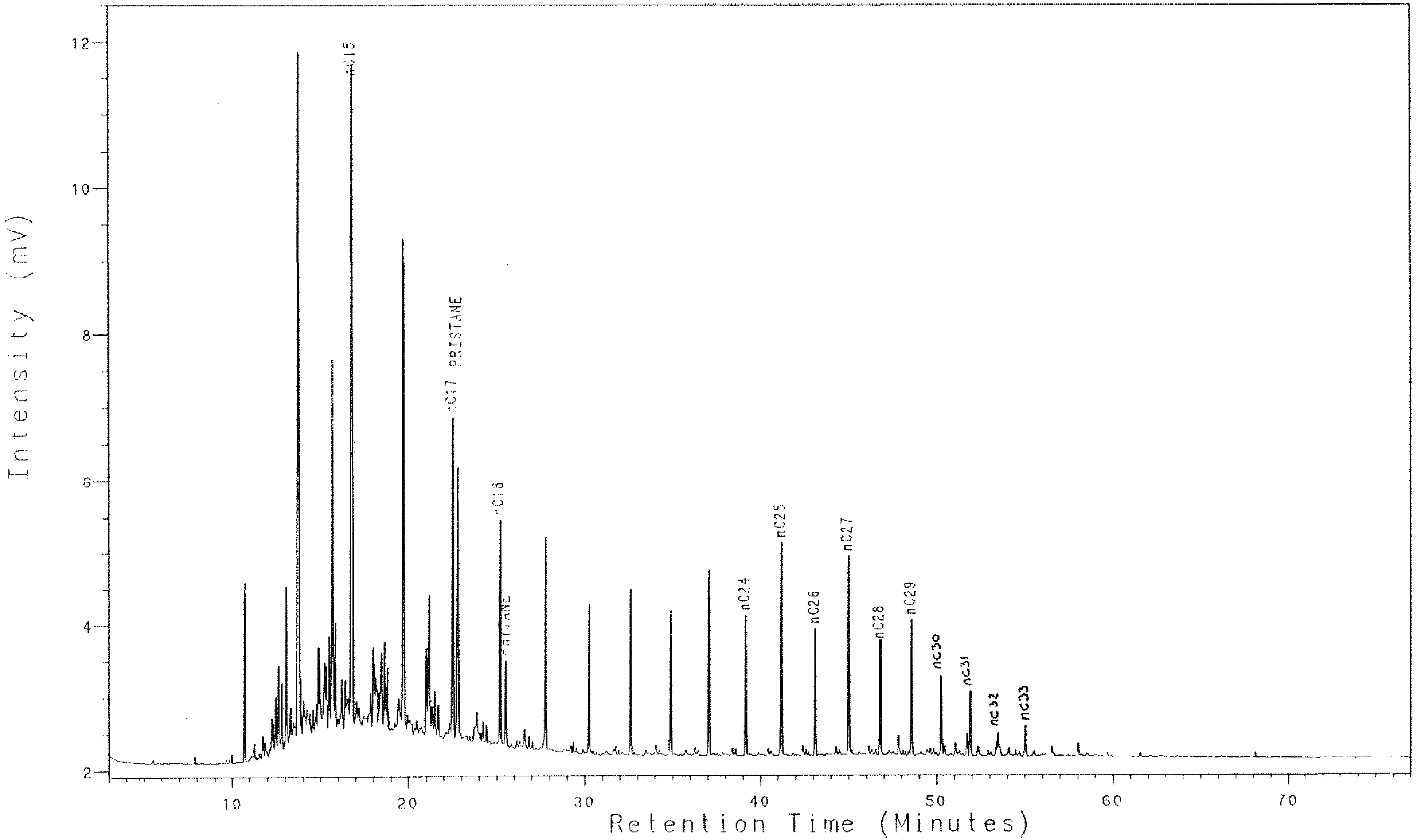
Analysis SB9242507 5, 1, 1 30/6-9 2507.50m



HOCS 30/6-9 2507.50m
SATURATED GC
COAL blk to brn blk

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

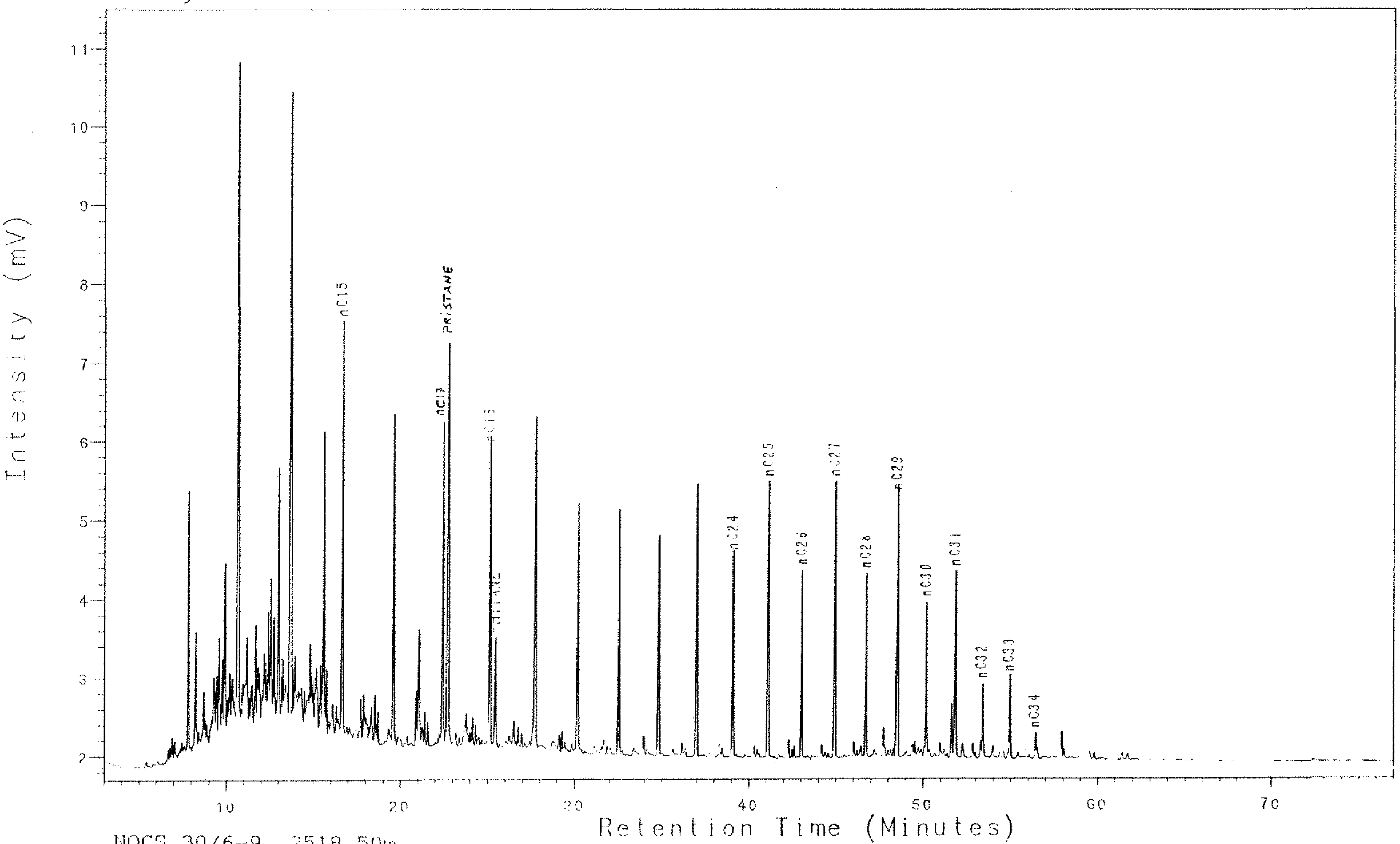
Analysis SB9242515 5, 1, 1 30/6-9 2515.50m



NOCS 30/6-9 2515.50m
SATURATED GC
Clst: brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

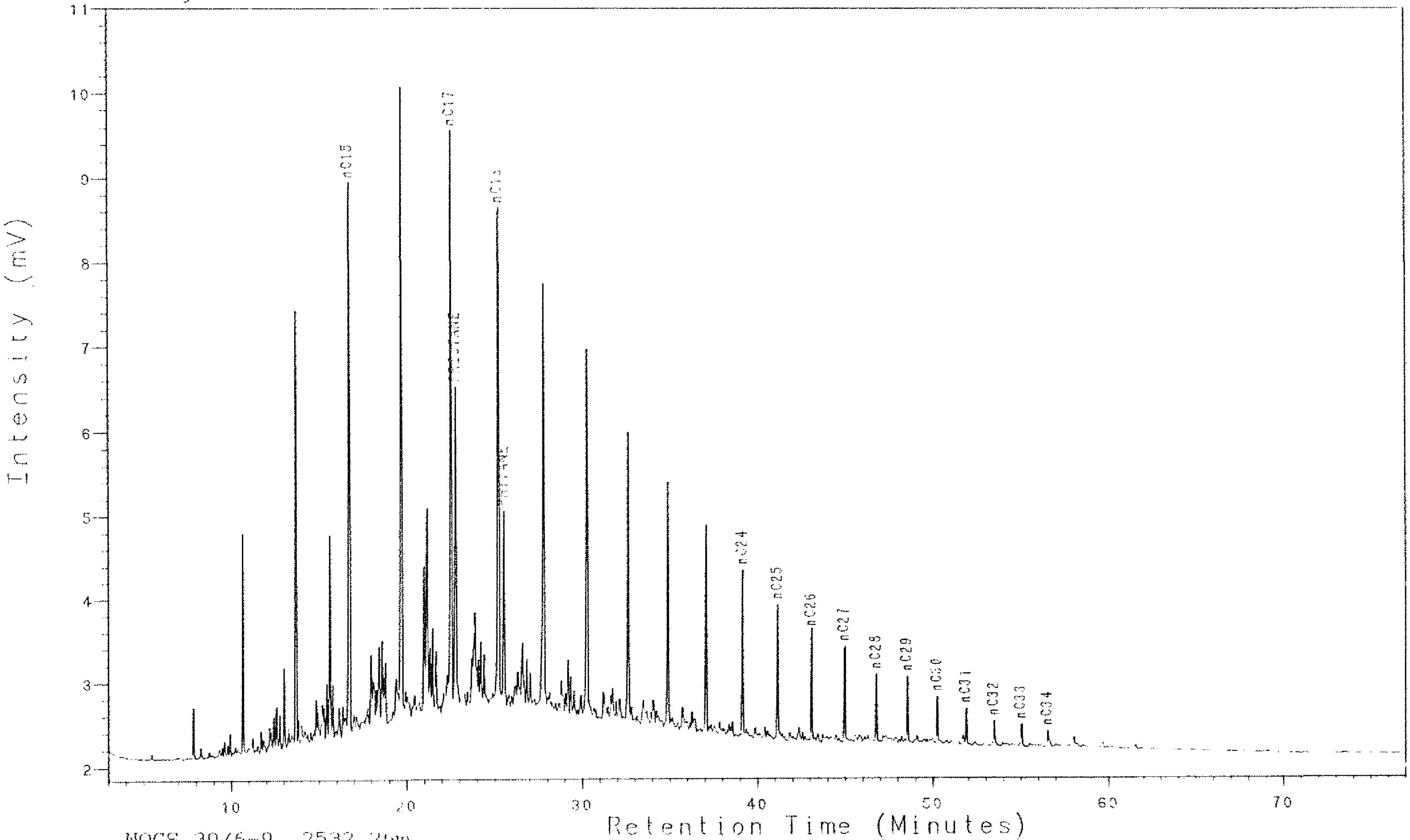
Analysis SB2412518 5, 1, 1 30/6-9 2518.5m SAT



NOCS 30/6-9 2518.50m
SATURATED GC
CLST: drk gy to brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

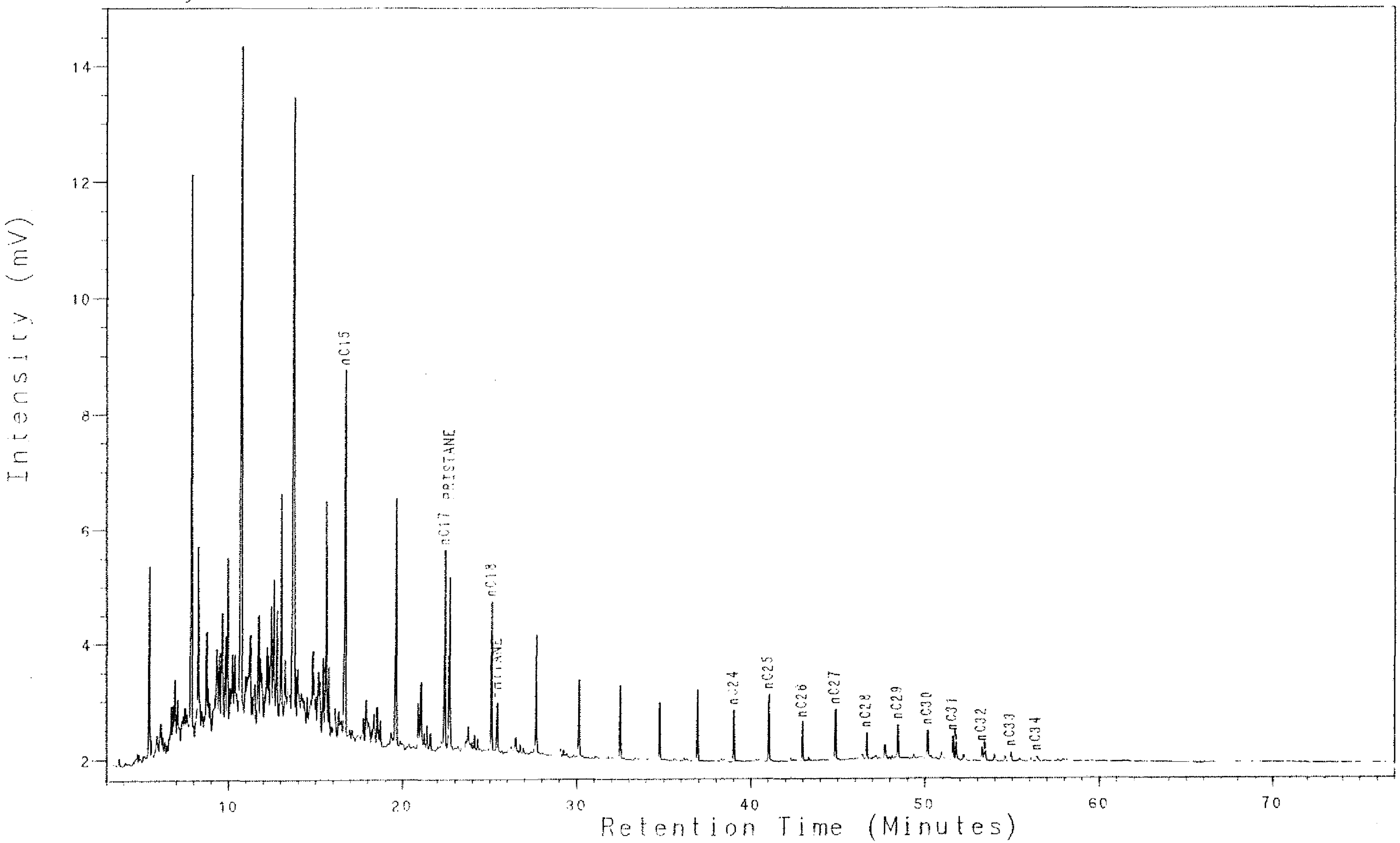
Analysis SB2412532 5, 1, 1 30/6-9 2532.26m SAT



NOCS 30/6-9 2532.26m
SATURATED GC
SST: brn gy, lt or

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

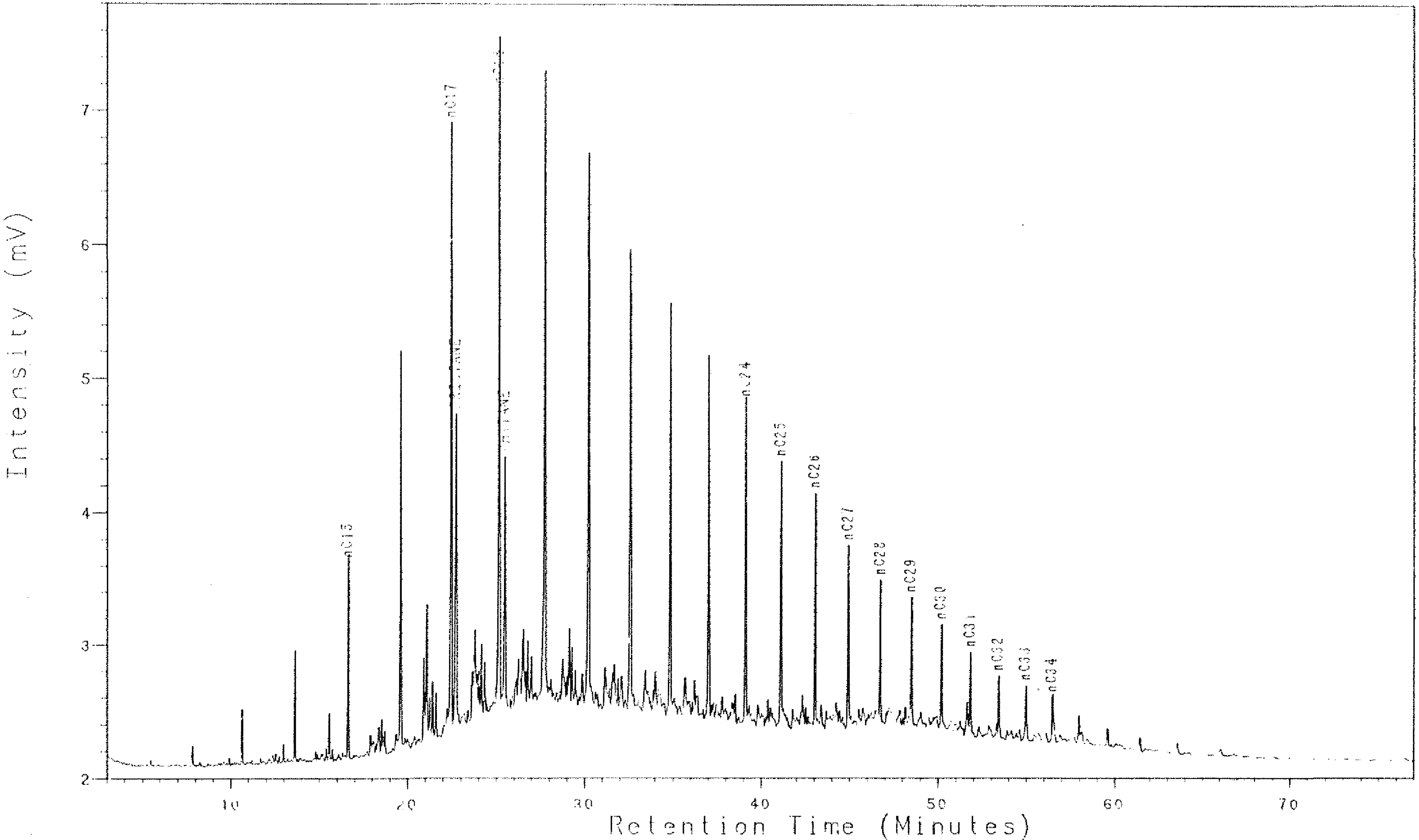
Analysis SB2412535 5, I, I 30/6-9 2535m SAT



NOCS 30/6-9 2535m
SATURATED GC
LK

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

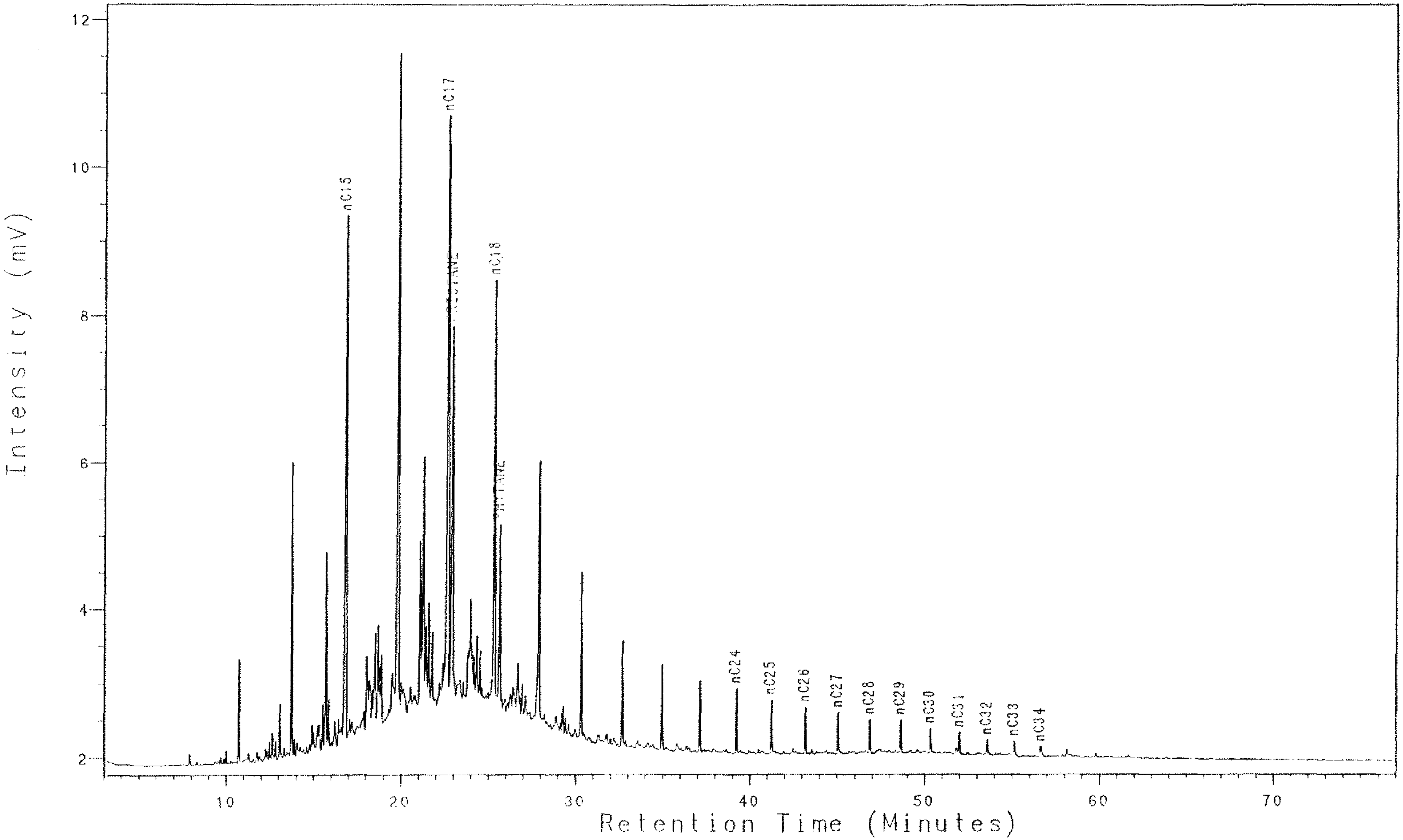
Analysis SB2412537 5, 1, 1 30/6-9 2537.65m SAT



NOCS 30/6-9 2537.65m
SATURATED GC
SST: lt or to pl y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

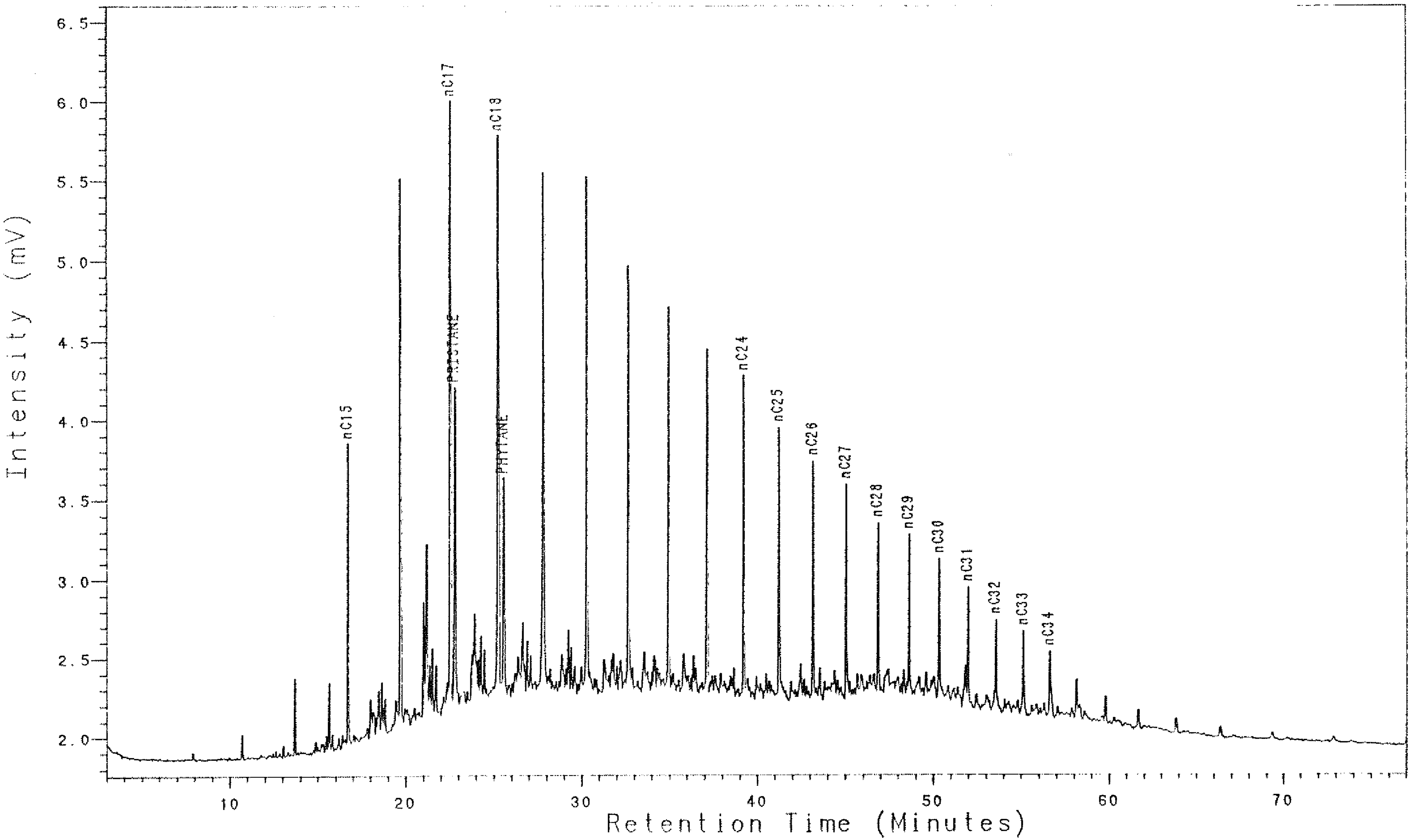
Analysis SB9242541 5, 1, 1 30/6-9 2541m SAT



NOCS 30/6-9 2541.00m
SATURATED GC
S st: brn gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

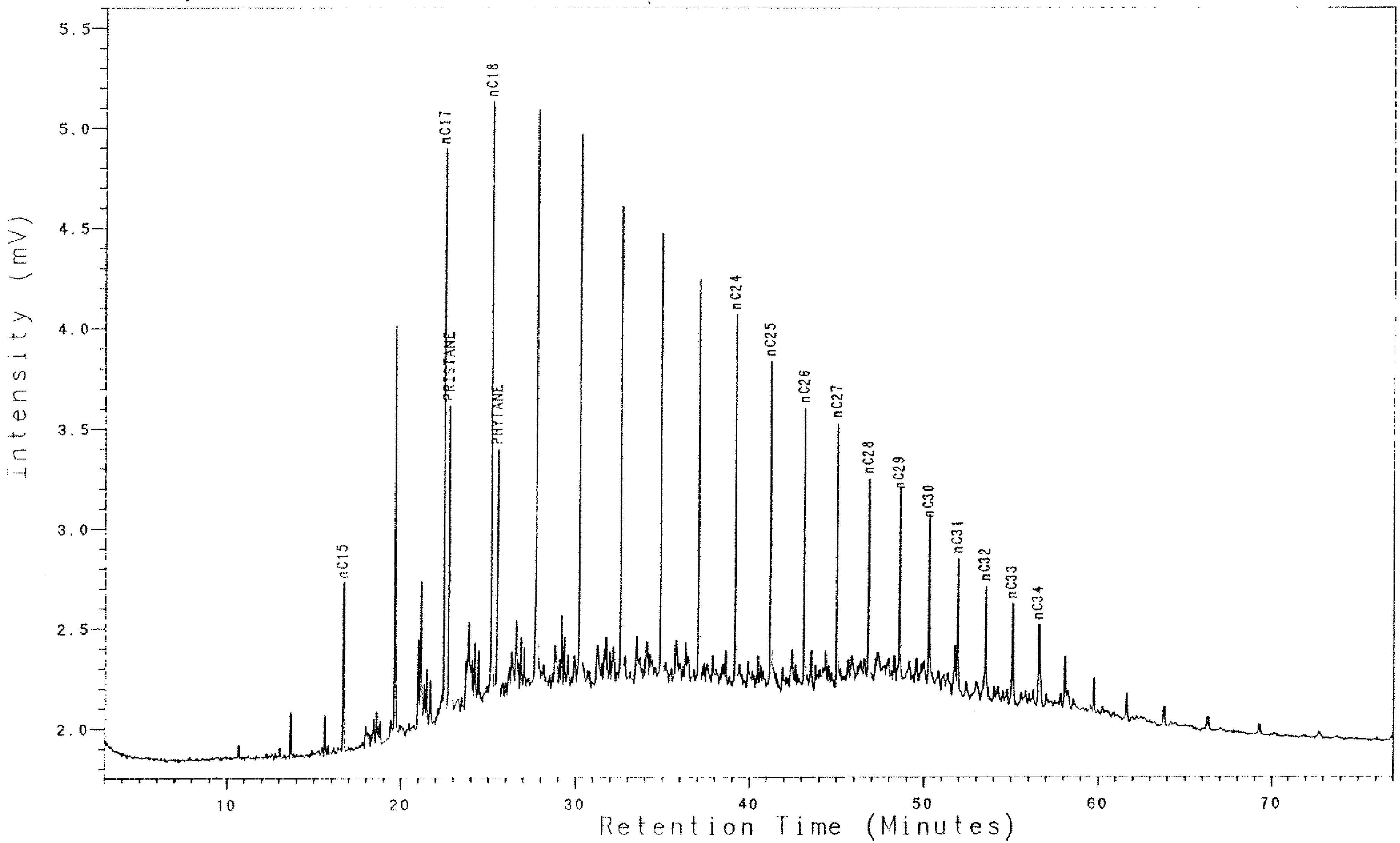
Analysis SB9242544 5, 1, 1 30/6-9 2544m SAT



NOCS 30/6-9 2544.00m
SATURATED GC
S/Sst: drk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

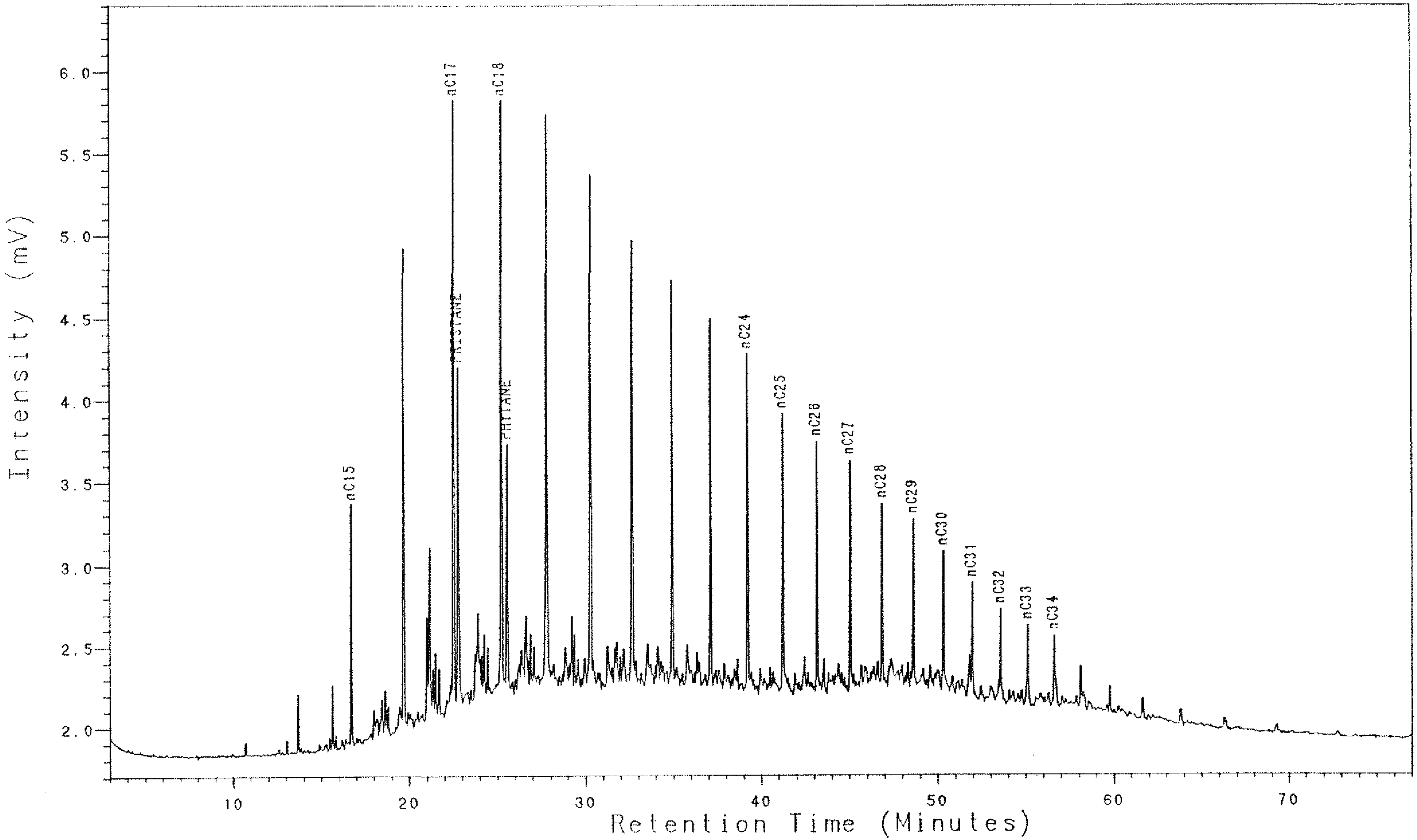
Analysis SB9242560 5, 1, 1 30/6-9 2556.1-60.11m



NOCS 30/6-9 2556.10-2560.11m
SATURATED GC
S/Sst: or gy to lt y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

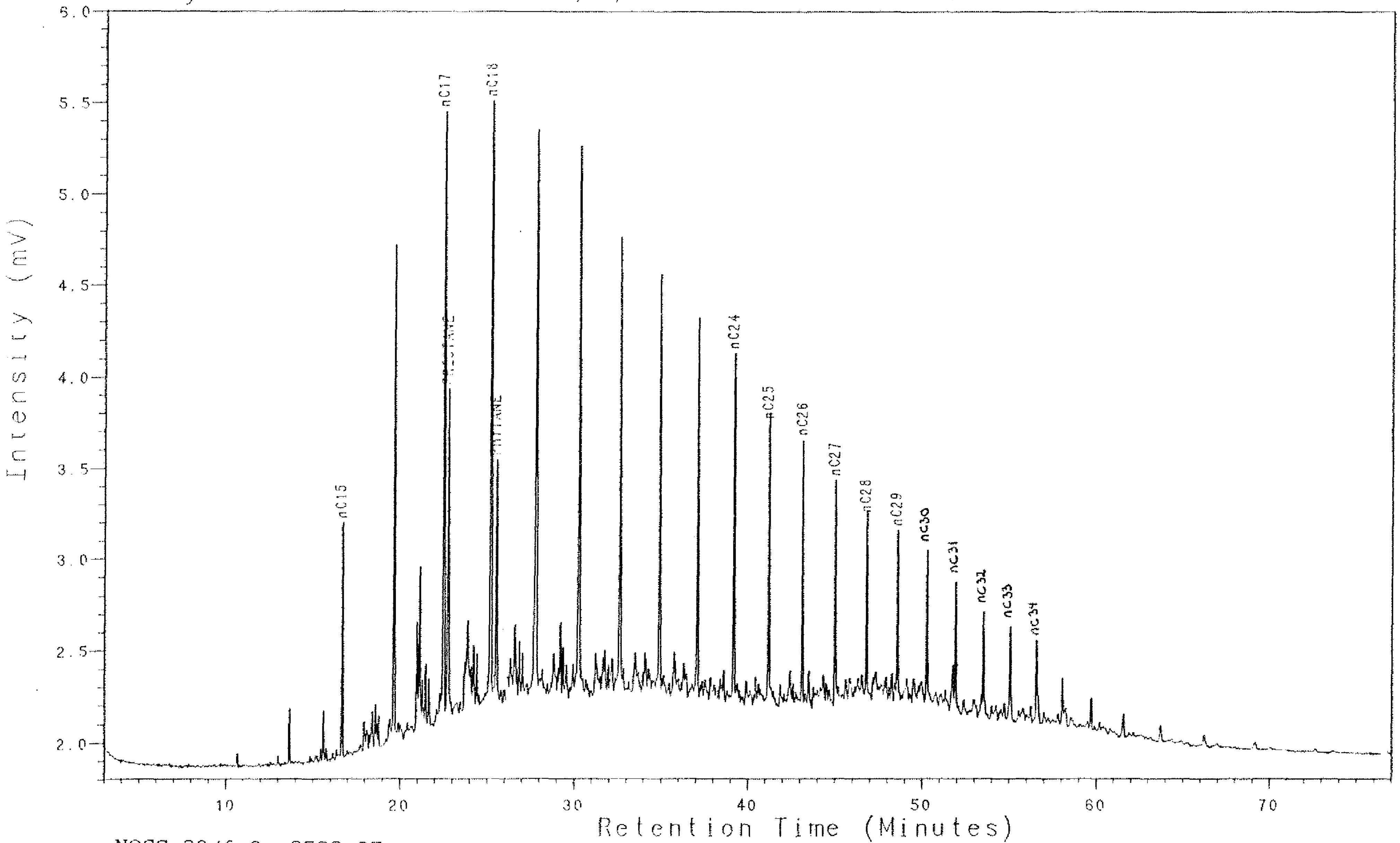
Analysis SB9242576 5, 1, 1 30/6-9 2576.4m SAT



NOCS 30/6-9 2576.40m
SATURATED GC
S/Sst: m y brn to drk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

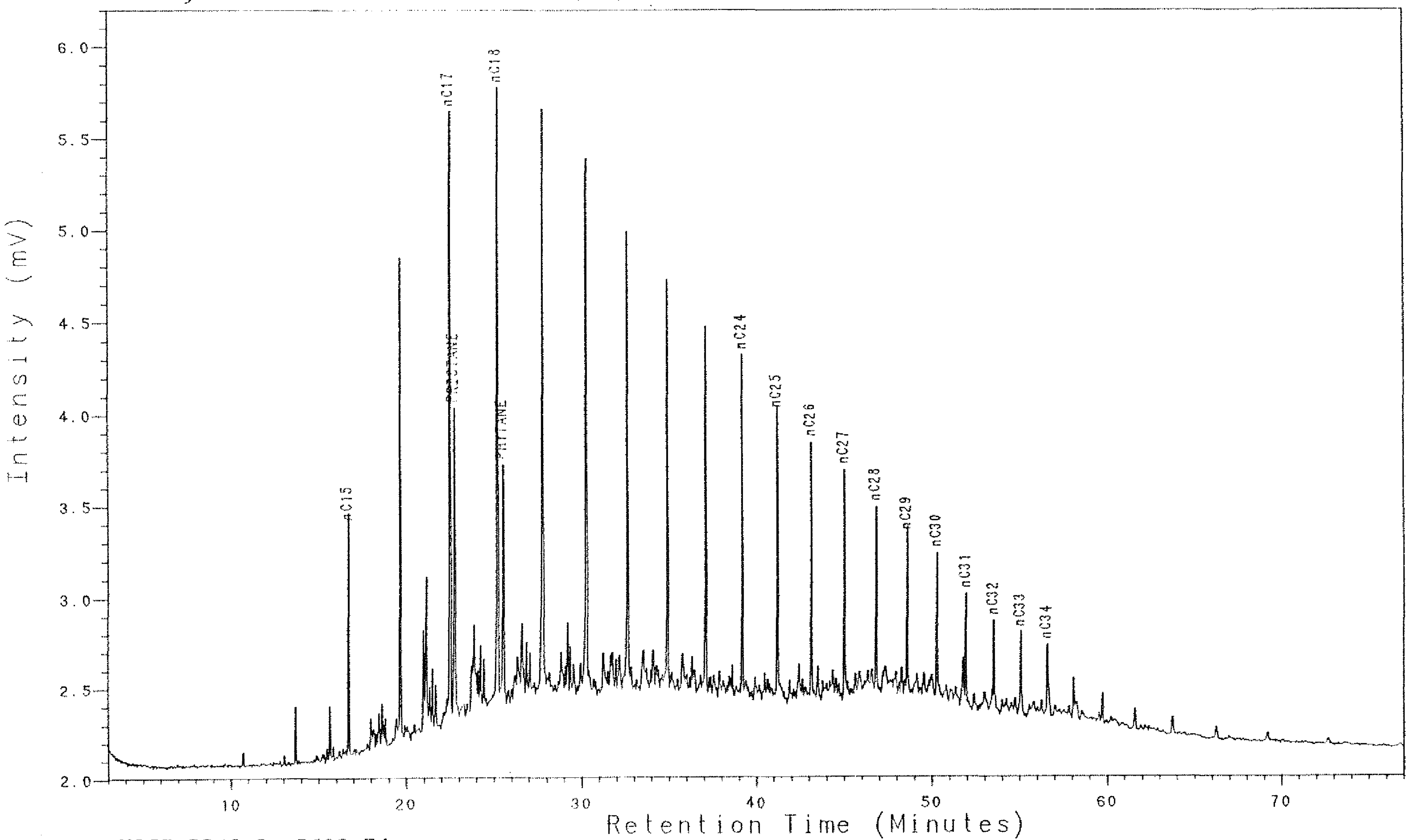
Analysis SB9242588 5, 1, 1 30/6-9 2588.27m



NOCS 30/6-9 2588.27m
SATURATED GC
S/Sst: m y brn to drk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

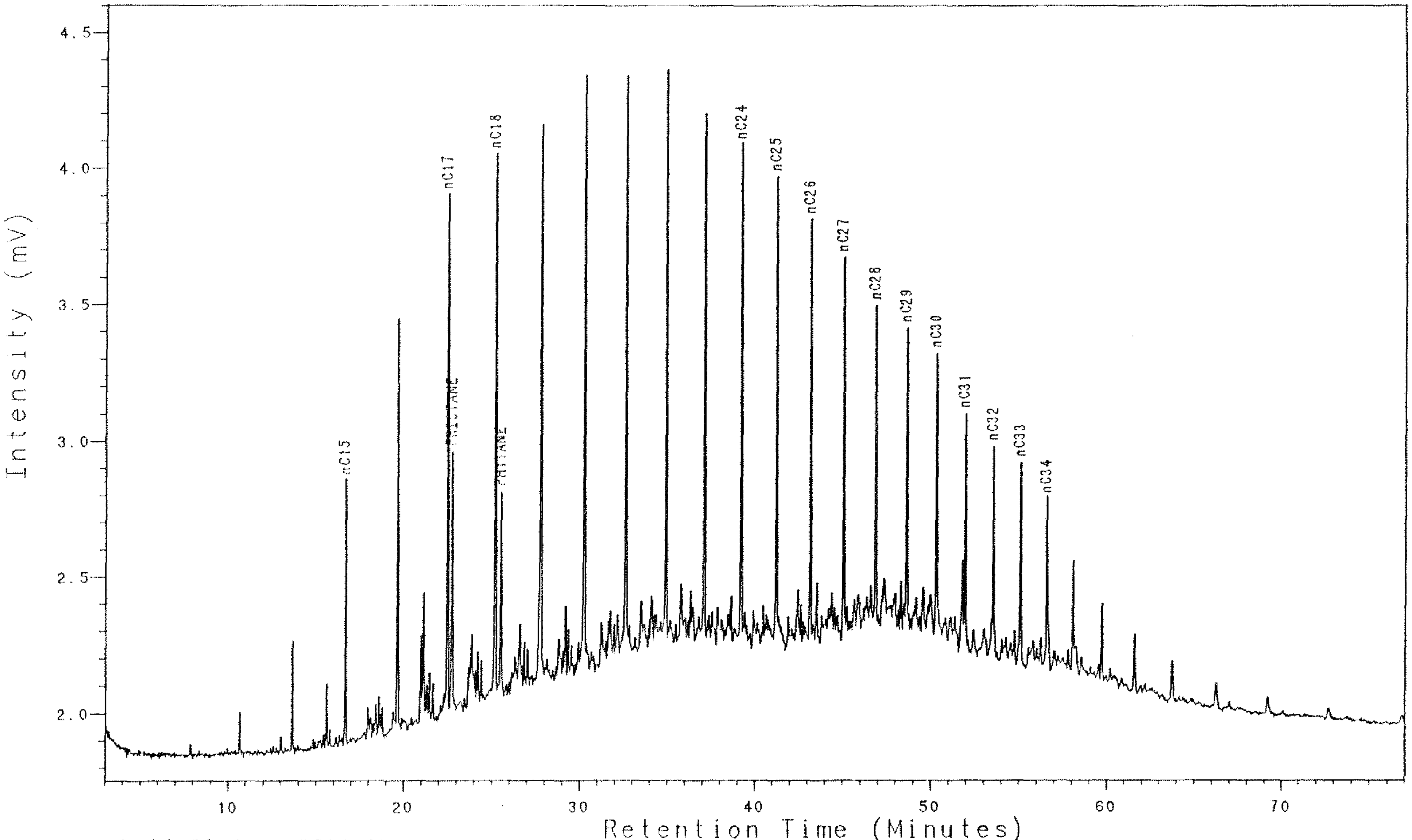
Analysis SB9242602 5, 1, 1 30/6-9 2602.74m SAT



NOCS 30/6-9 2602.74m
SATURATED GC
S/Sst: drk y brn to dsk y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

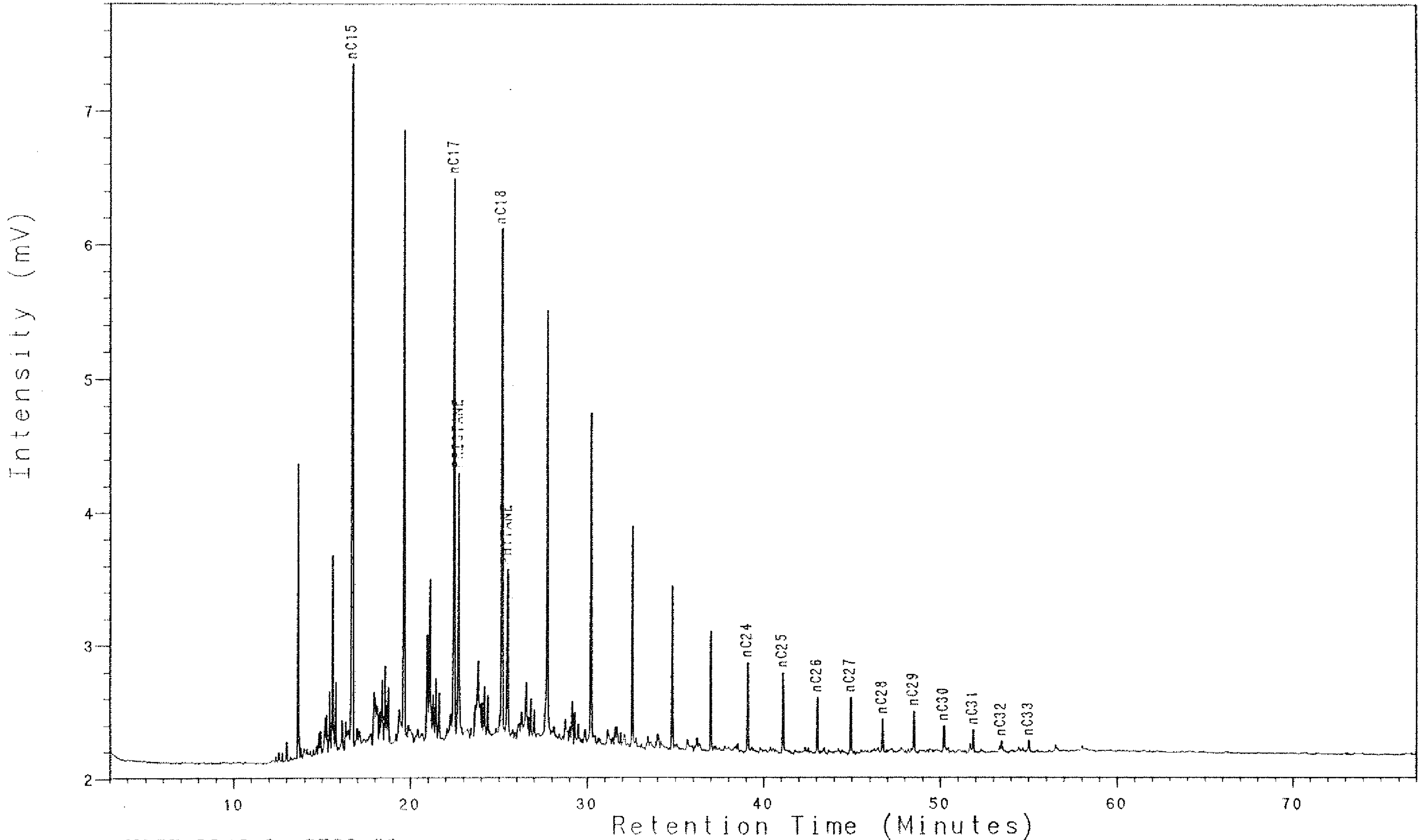
Analysis SB9242616 5, 1, 1 30/6-9 2616.33m SAT



NOCS 30/6-9 2616.33m
SATURATED GC
S/Sst: lt gy to lt y brn

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

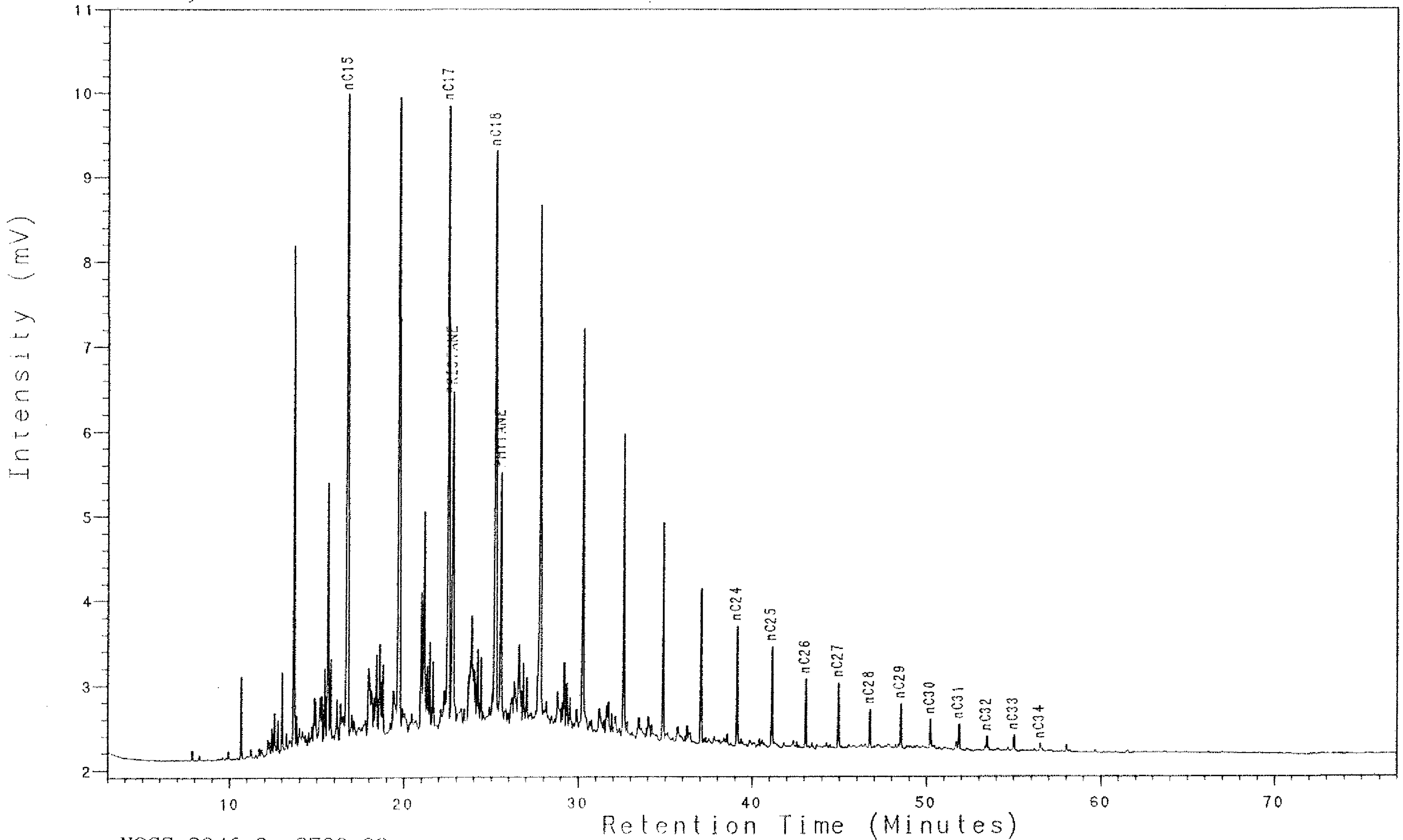
Analysis SB9242780 5, 1, 1 30/6-9 2780m SAT



NOCS 30/6-9 2780.00m
SATURATED GC
Sltst: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

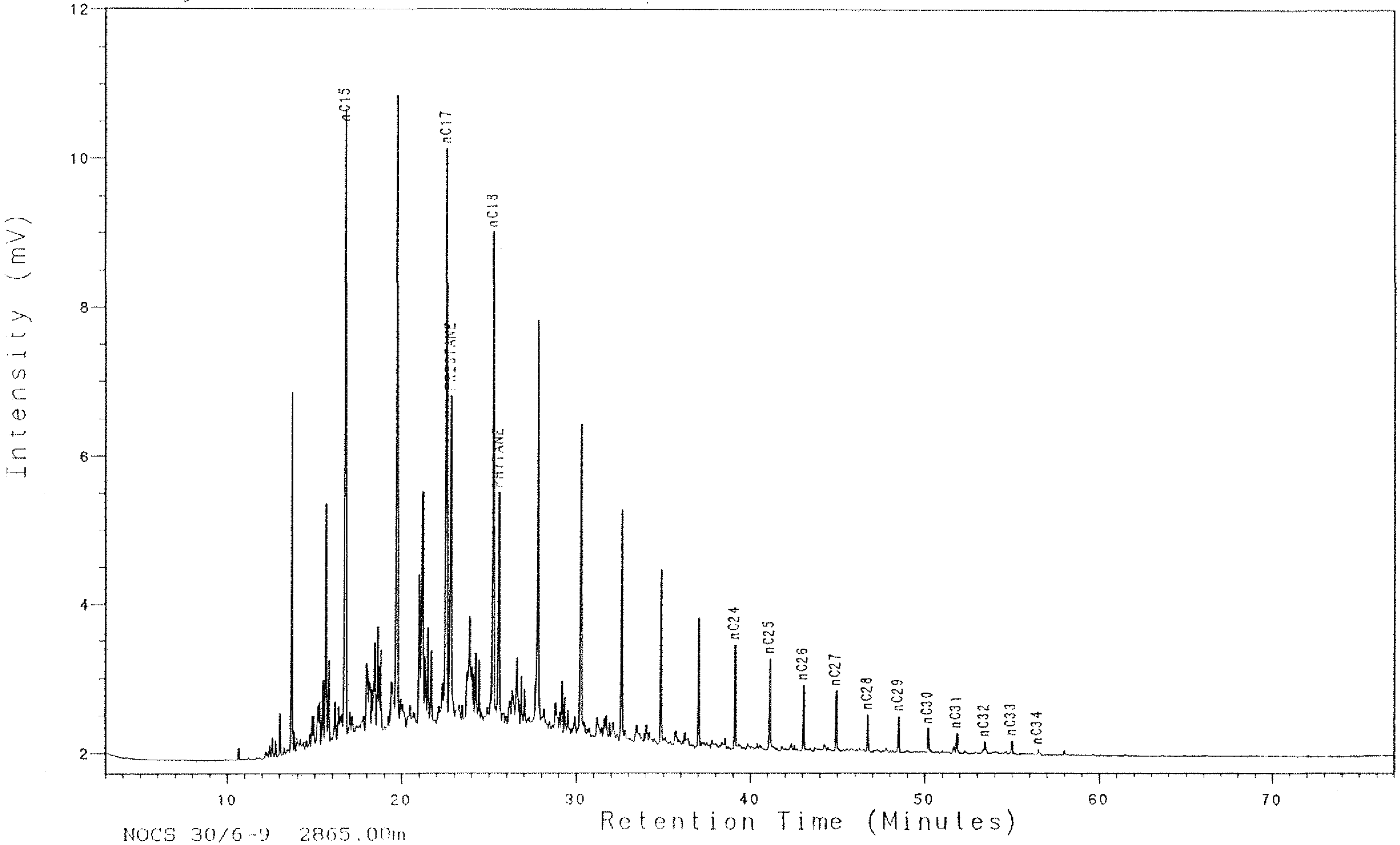
Analysis SB9242790 5, 1, 1 30/6-9 2790m SAT



NOCS 30/6-9 2790.00m
SATURATED GC
Clst: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

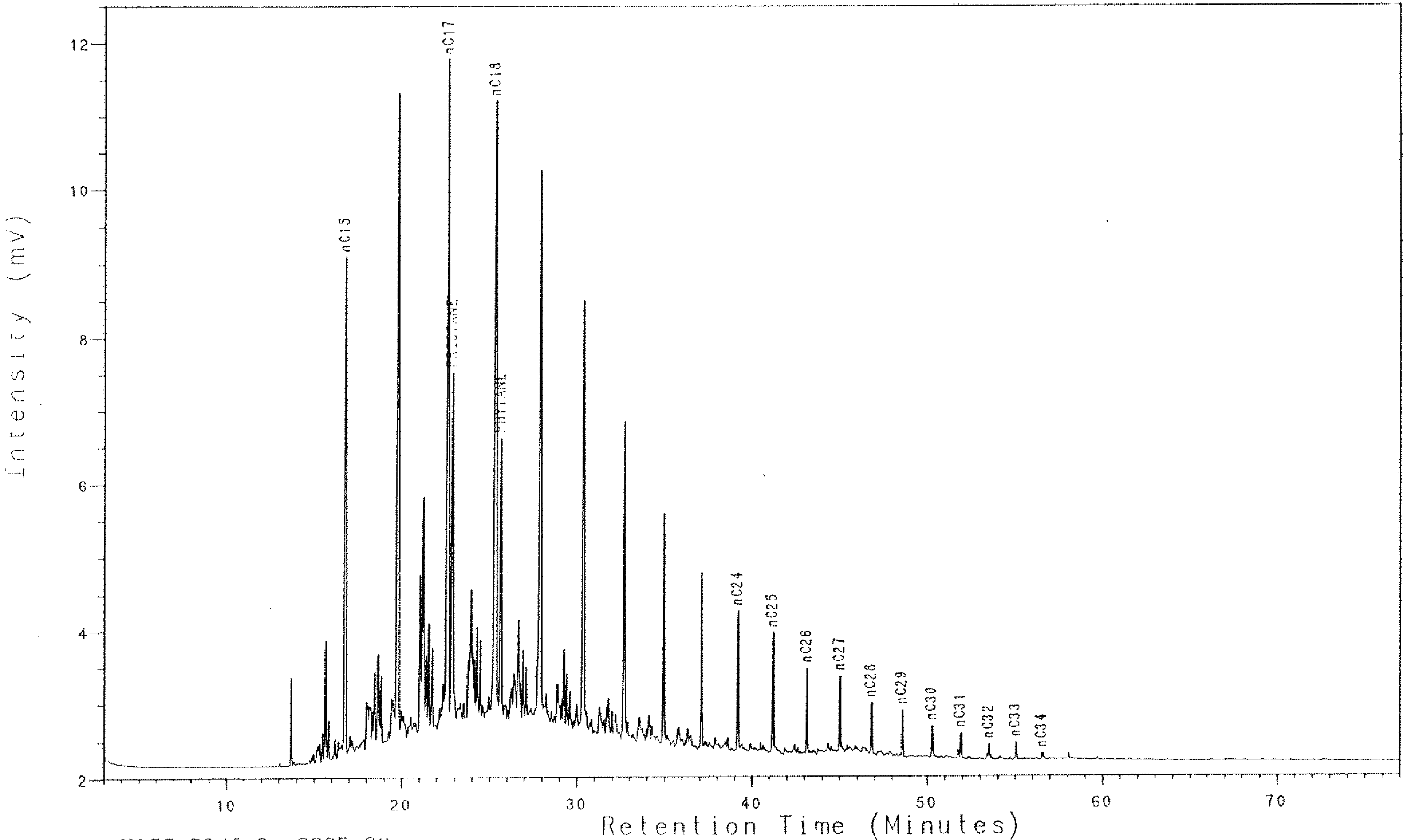
Analysis SB9242865 5, 1, 1 30/6-9 2865m SAT



NOCS 30/6-9 2865.00m
SATURATED GC
Clst: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

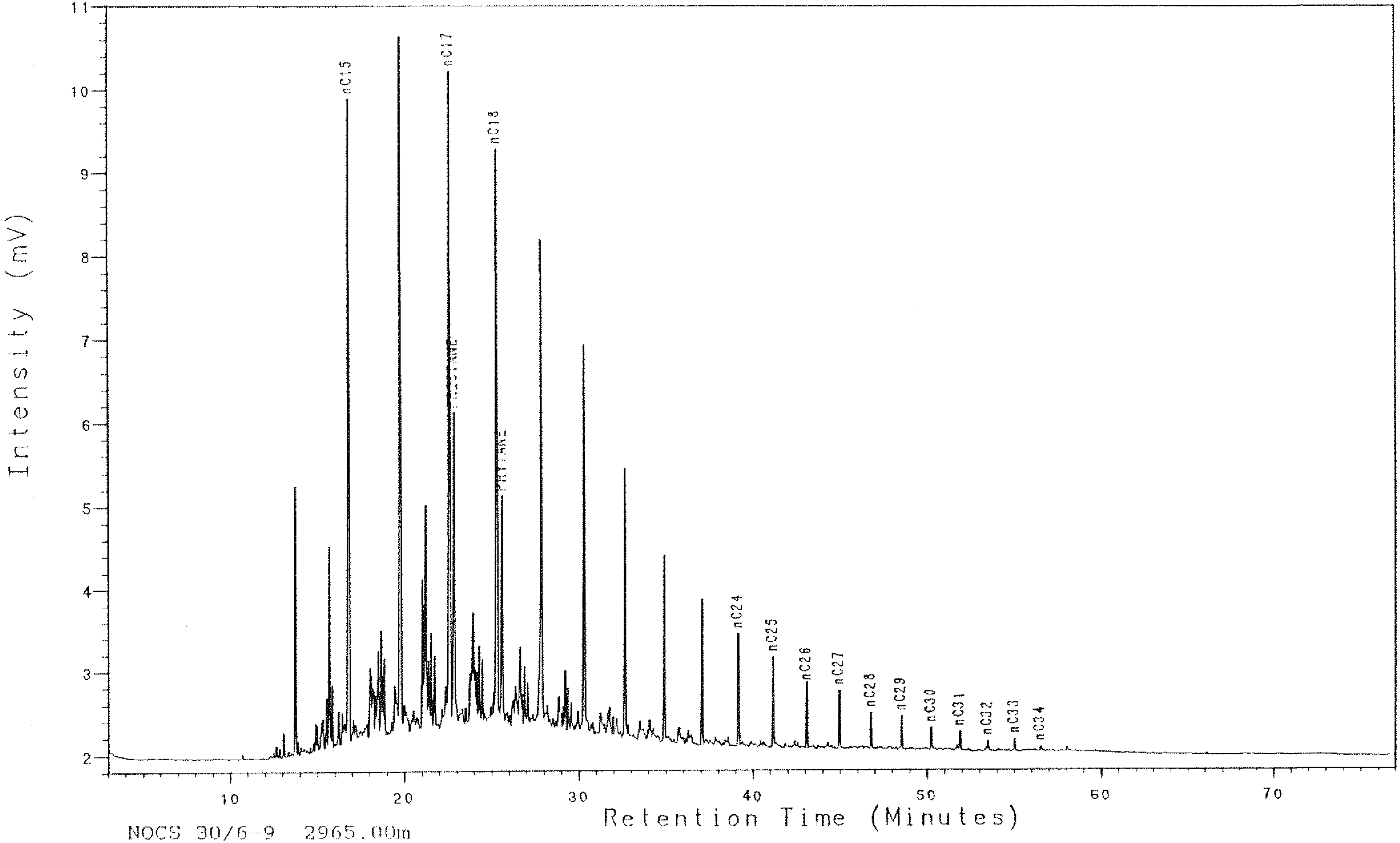
Analysis SB9242895 5, 1, 1 30/6-9 2895m SAT



NOCS 30/6-9 2895.00m
SATURATED GC
Sltst: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

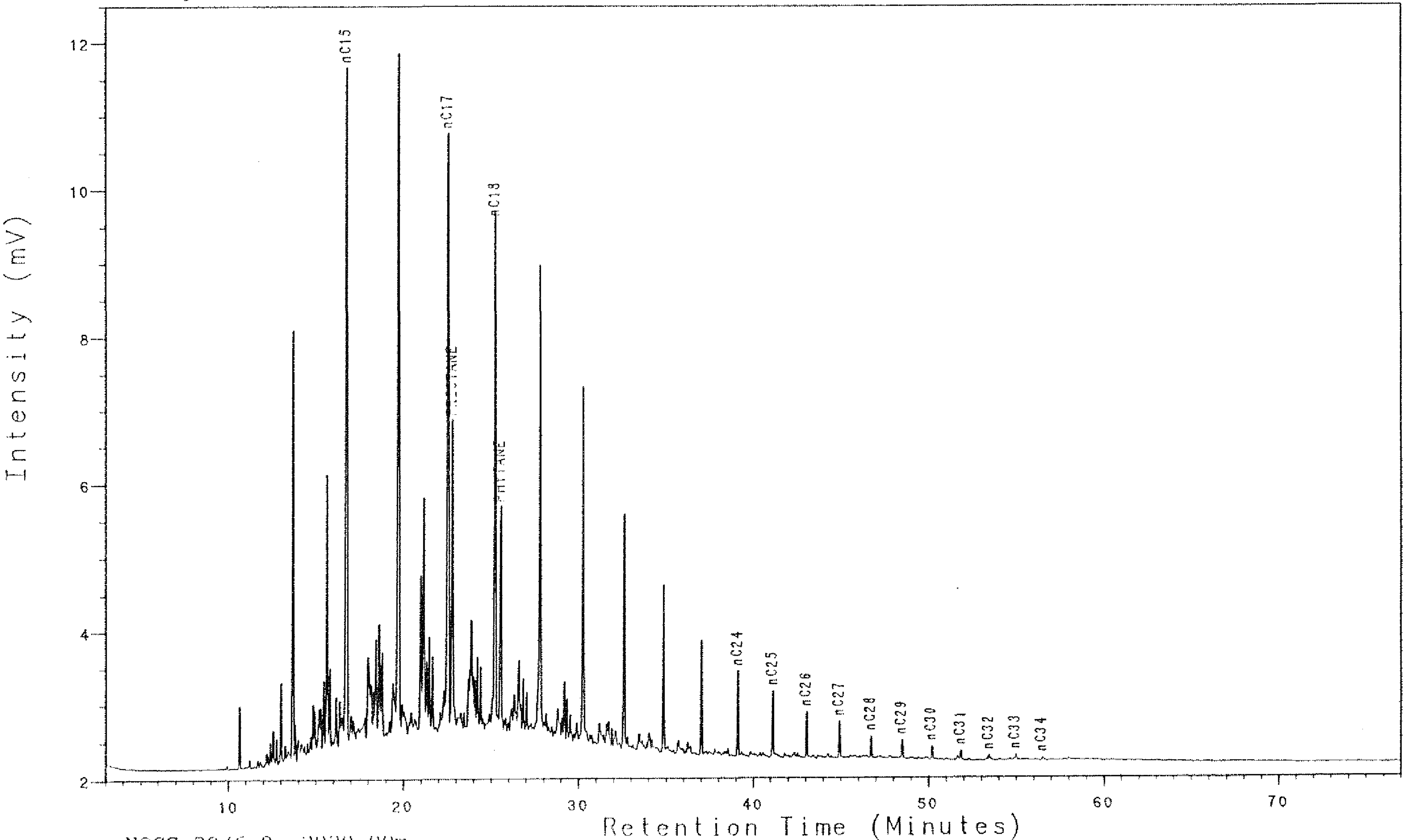
Analysis SB9242965 5, 1, 1 30/6-9 2965m SAT



NOCS 30/6-9 2965.00m
SATURATED GC
Clst: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

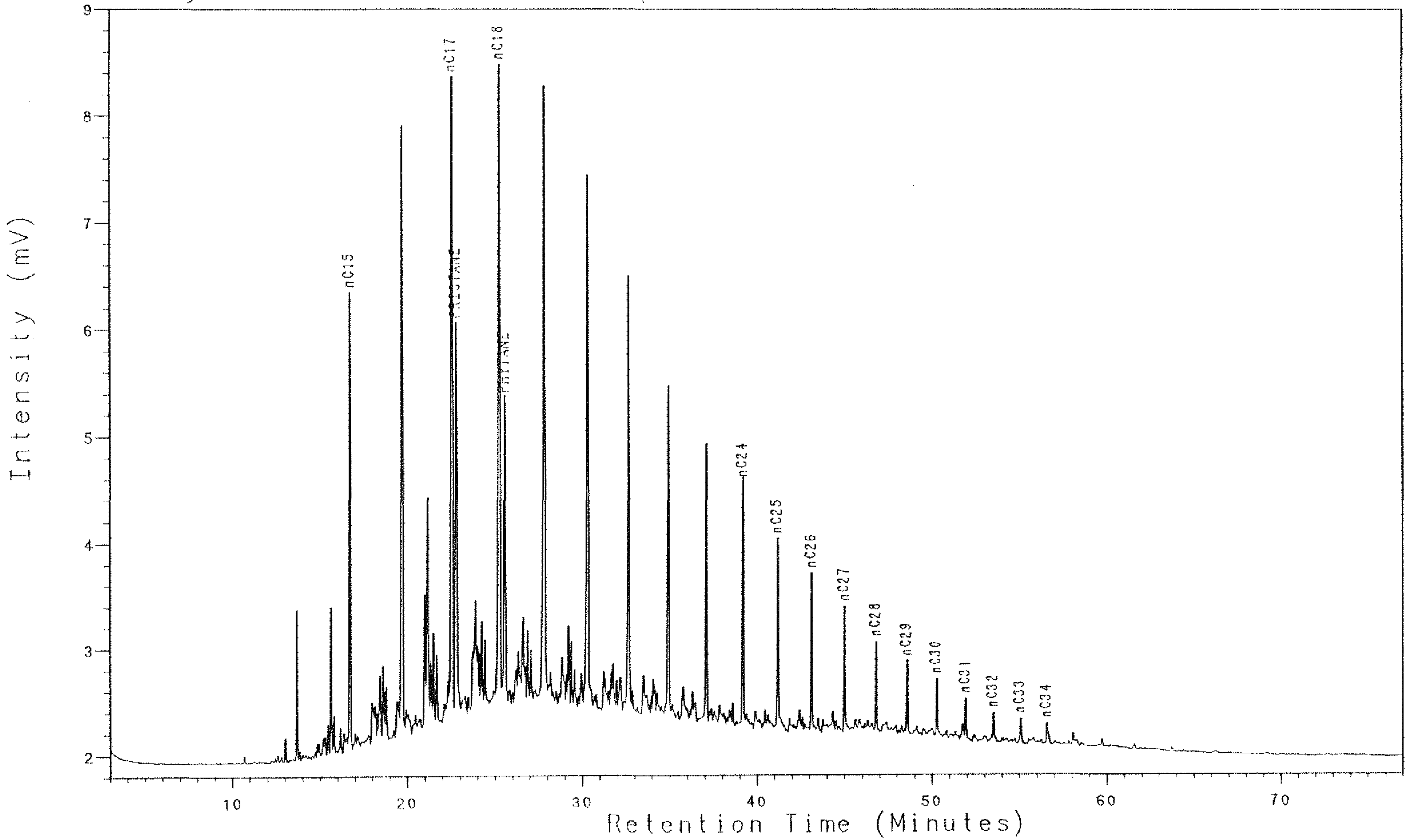
Analysis SB9243020 5, 1, 1 30/6-9 3020m SAT



NOCS 30/6-9 3020.00m
SATURATED GC
Sltst: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A/S

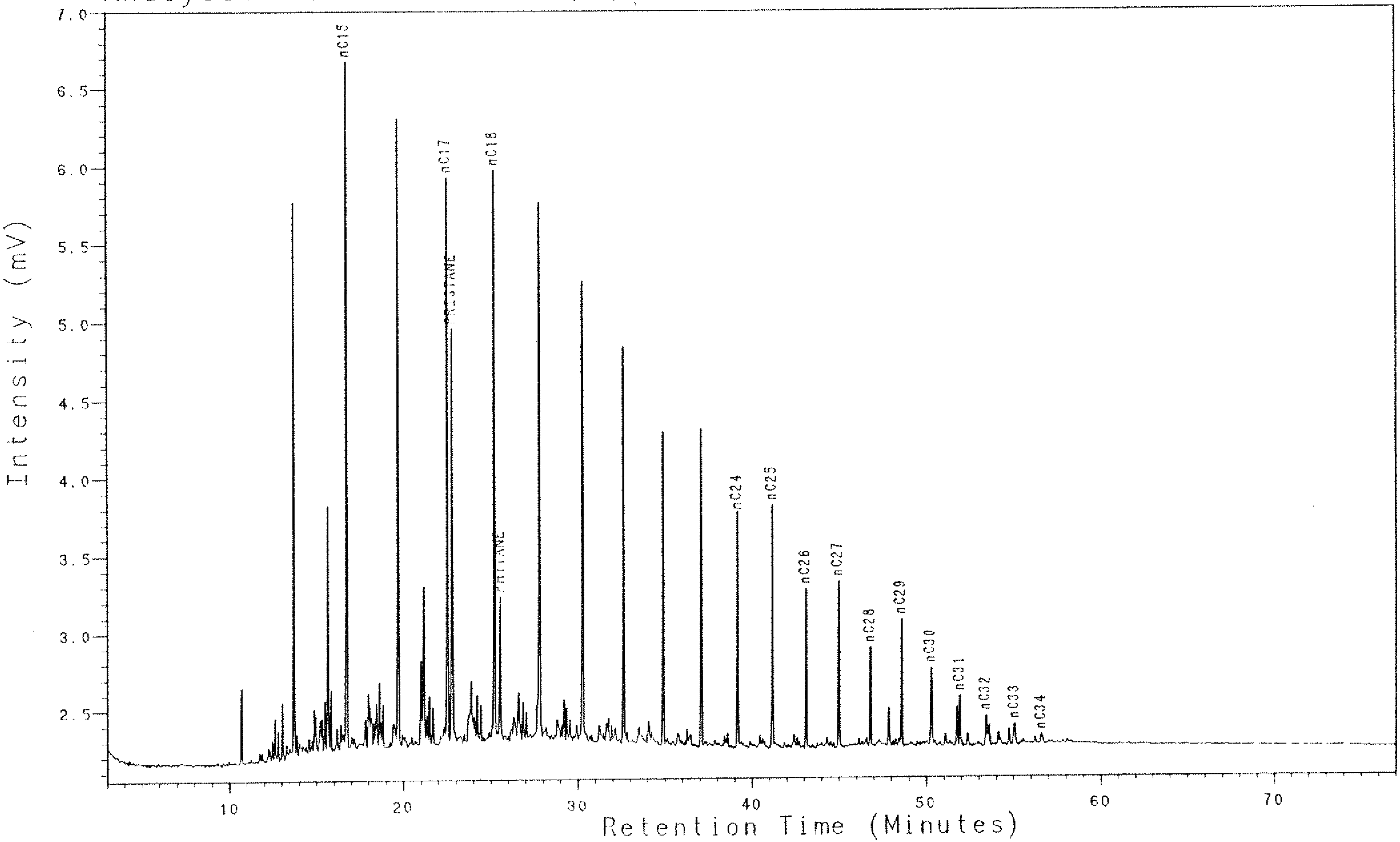
Analysis SB9243090 5, 1, 1 30/6-9 3090m SAT



NOCS 30/6-9 3090.00m
SATURATED GC
S/Sst: w to lt gy

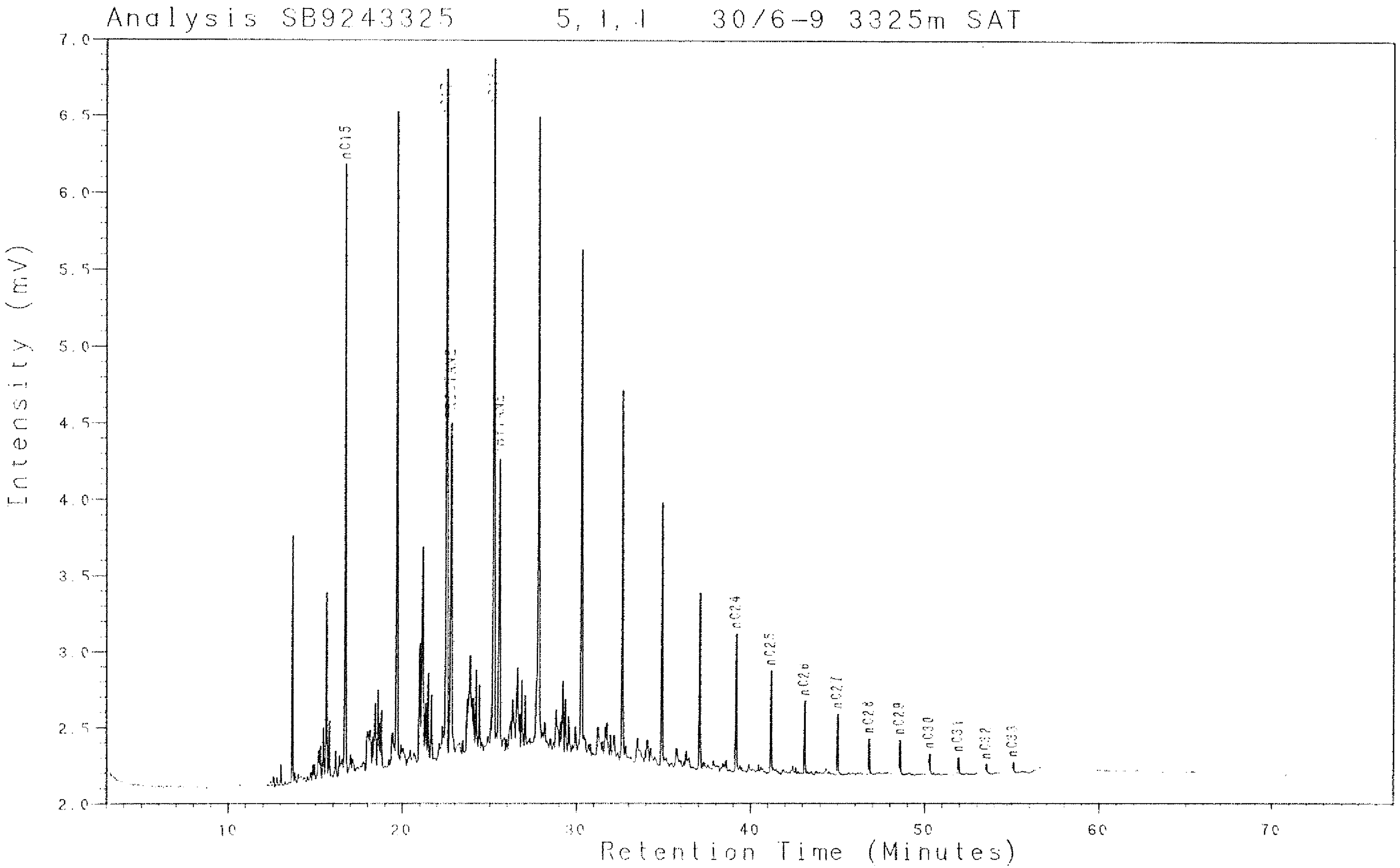
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S.

Analysis SA9243170 5, 1, 1 30/6-9 3170m SAT



NOCS 30/6-9 3170.00m
SATURATED GC
al: blk

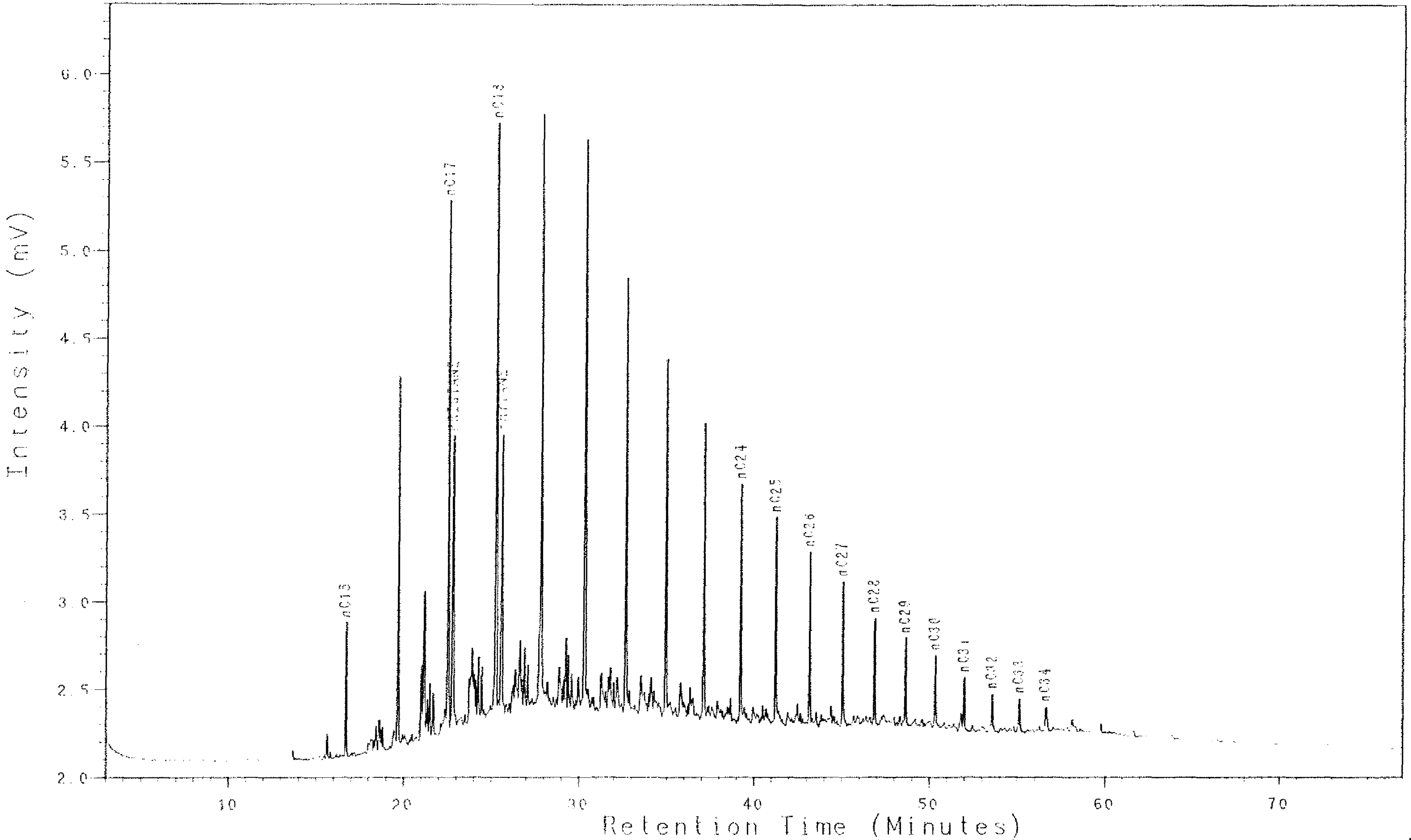
GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S



NOCS 30/6-9 3325.00m
SATURATED GC
Clst: brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

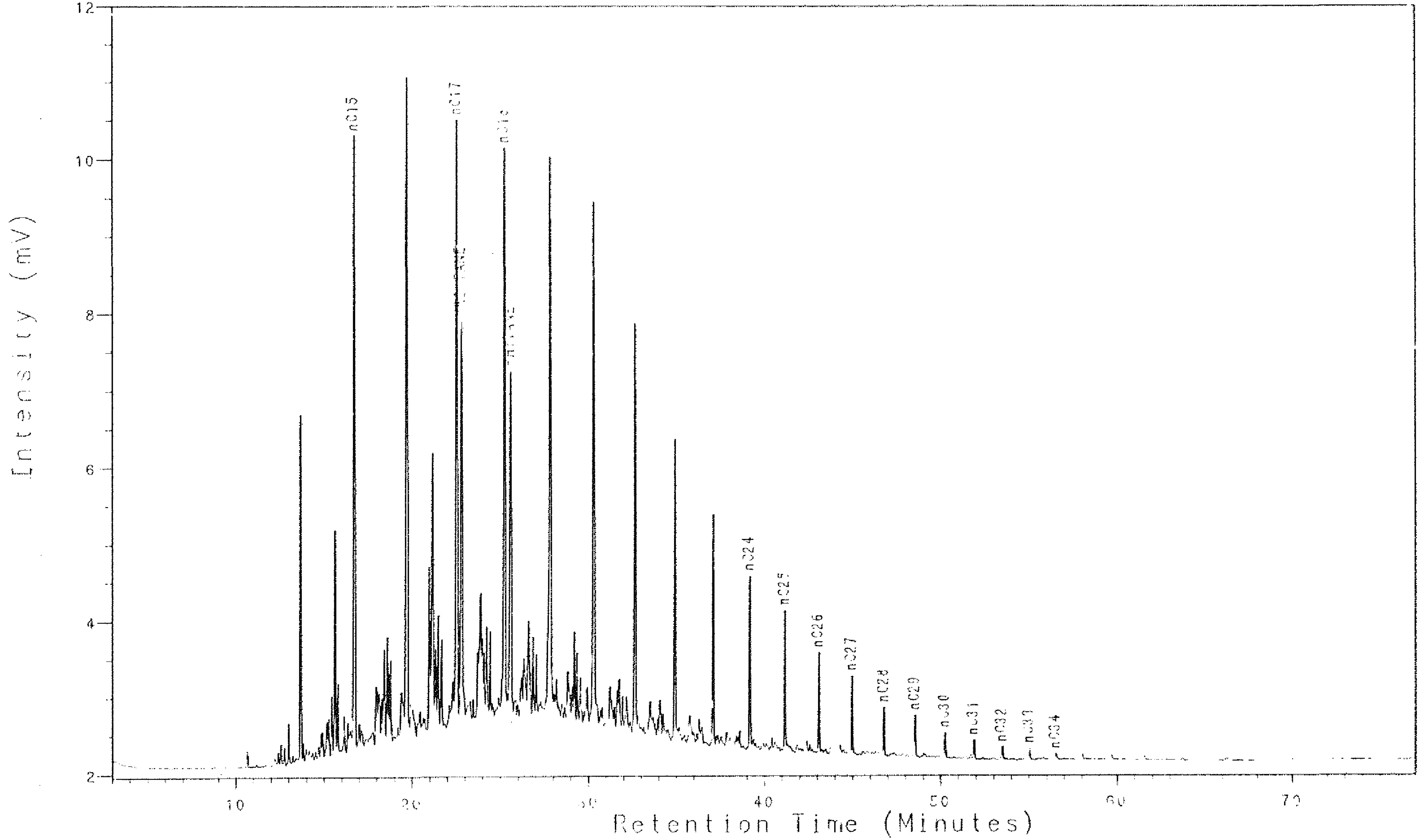
Analysis SB9243430 5, 1, 1 30/6-9 3430m SAT



NOCS 30/6-9 3430.00m
SATURATED GC
'Sst: w to lt gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S

Analysis SB9243475   5, 1, 1   30/6-9 3475m SAT



UOCS 30/6-9 3475m
SATURATED GC
CLST:brn gy to m gy

GEOLAB NOR
GEOCHEMICAL LABORATORIES OF NORWAY A.S