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Geochemical investigation of a source rock extract
from well 12/28-2, United Kingdom
by

J.M.A. Buiskool Toxopeus and P.J.R. Nederlof
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Investigation 812204212

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GEOCHEMICAL INVESTIGATION OF A SOURCE ROCK EXTRACT
FROM WELL 12/28-2, UNITED KINGDOM

1.0 INTRODUCTION

A geochemical investigation has been carried out on a combined set of Devonian sidewall samples (6520 + 6530 + 6540 + 6560 + 6570 ft) in well 12/28-2, U.K. As a result of this it was requested to mature the 12/28-2 sample. The results are shown in Table 1 and in Figures 1-8.

2.0 RESULTS AND CONCLUSIONS

The low SRI value (120 units), low organic carbon content (0.8%), maceral description (Fig. 8) and the high extract/organic carbon ratio point all to a marginal, impregnated source rock. Maceral description indicates an inhomogeneous sample that contains few excellent, just-mature algal source rock particles (Fig. 8). It is therefore plausible that the impregnation was derived from the same source rock. In order to check this presumption, the extracted sample has been heated. Upon heating the sample shows a good oil generation capacity.

The extract of the original sample has a just-mature character (gaschromatogram, Fig. 1; sterane fragmentogram showing nearly complete isomerisation features, Fig. 6). The high amounts of rearranged steranes (Fig. 6), indicate a shaly character of the source rock.

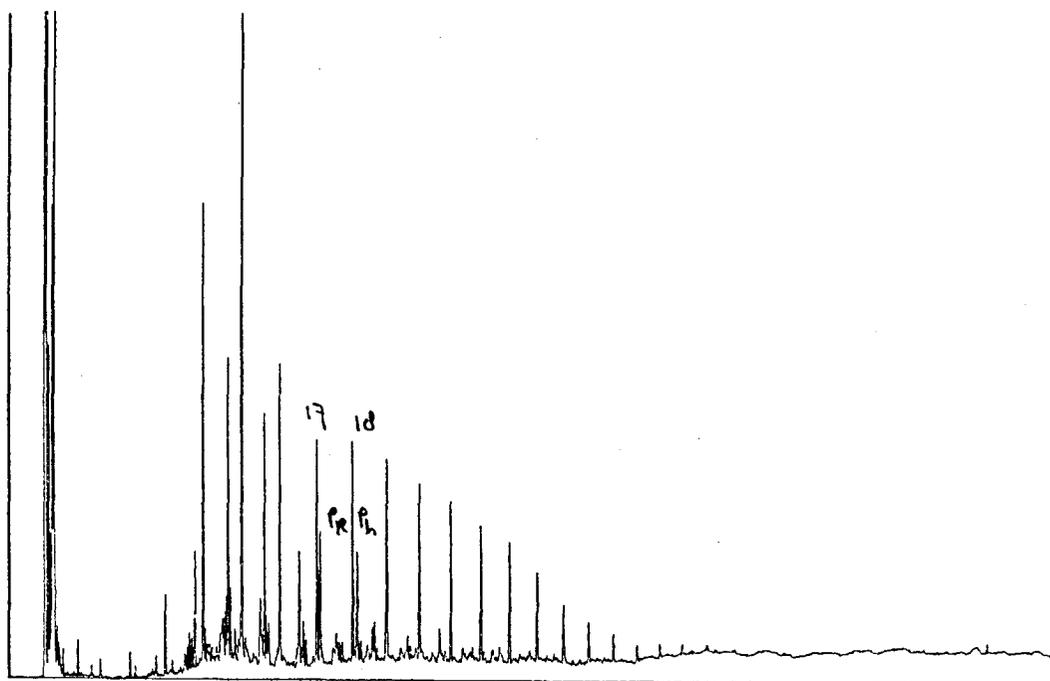
Apart from a high maturity, the sterane/triterpane fragmentograms of the heated sample do not significantly deviate from the original sample (Fig. 7). The C27-predominance in both the original and heated samples (Figs. 6-7) may indicate algal matter. Therefore, the impregnation in the original source rock was most probably derived from the same source rock.

TABLE 1 - GEOCHEMICAL DATA OF EXTRACTS

Sample	UK 12/28-2 6520-6570 ft	
	original	heated
% ethyl acetate extract	0.3	0.4
% organic carbon after ethyl acetate extraction	0.8	0.5
extract/original carbon (after extraction)	0.38	0.50
% sulphur	-	-
ppm V as metals	-	-
ppm Ni as metals	-	-
pristane/phytane	1.2	1.1
pristane/nC17	0.8	0.1
phytane/nC18	0.7	0.1
C ₁₅ distribution		
1-ring		85
2-ring		14
3-ring		1
C ₃₀ distribution		
3-ring		41
4-ring		33
5-ring		26
C ₂₉ VR/E		-
% saturates*	33	15
% aromatics	17	32
% heterocompounds	51	50
% asphaltenes	0	3.5
$\delta^{13}\text{C}^{\text{o}}$ /oo (whole extract)	NEM	-30.5
" (saturates)	-29.2	-30.4
" (aromatics)	-28.6	-29.5

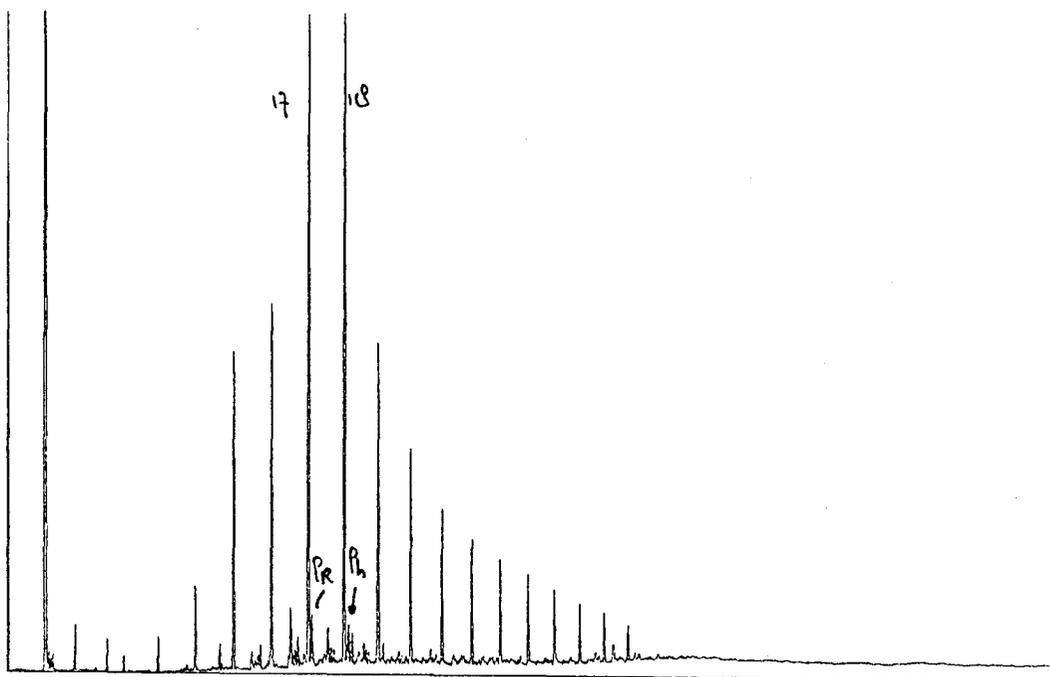
* Determined by thin layer chromatography

N.D. = not detectable



GAS CHROMATOGRAM OF SATURATED HYDROCARBONS

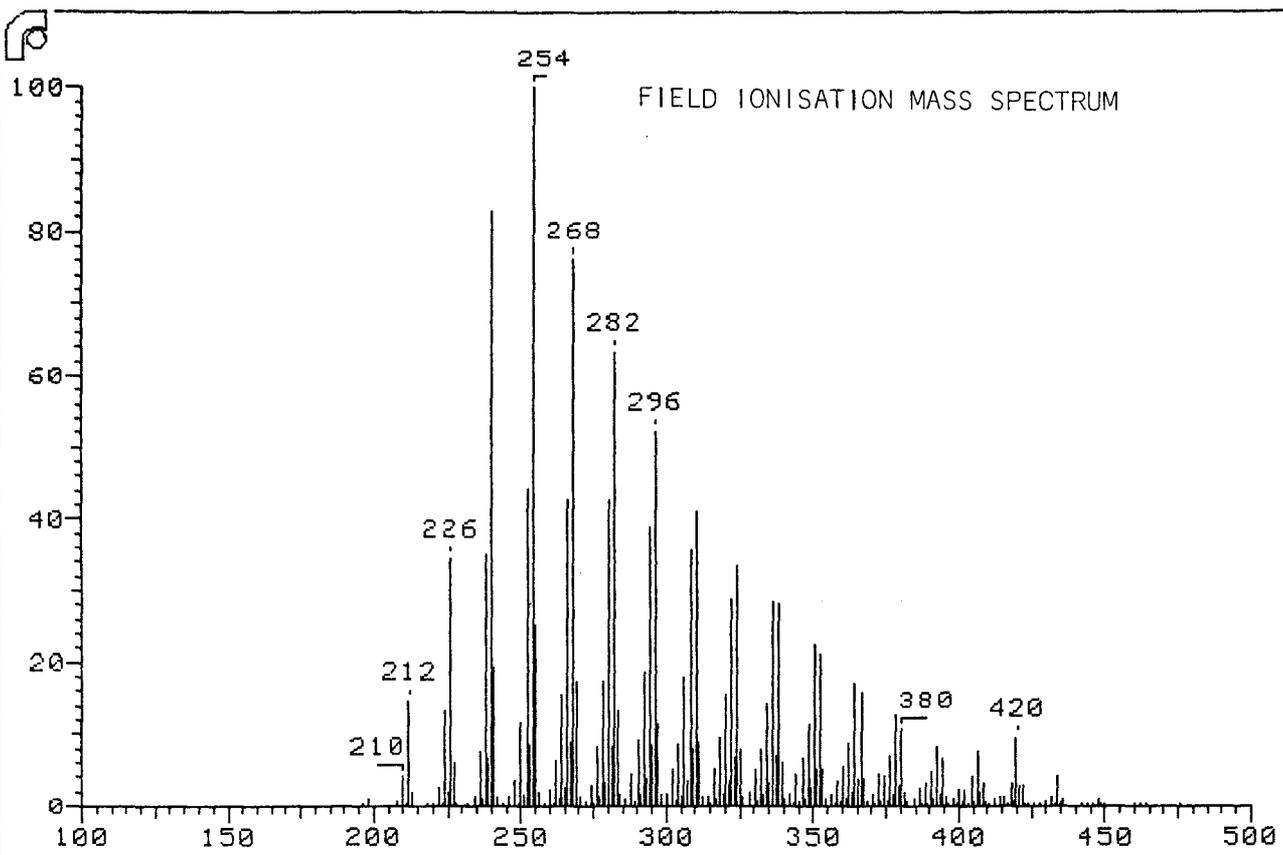
FIG. 1. U.K. 12/28-2 6530-6570 F1



GAS CHROMATOGRAM OF SATURATED HYDROCARBONS

FIG. 2. U.K. 12/28-2 6520-6570F1 HEATED.

FIELD IONISATION MASS SPECTRUM



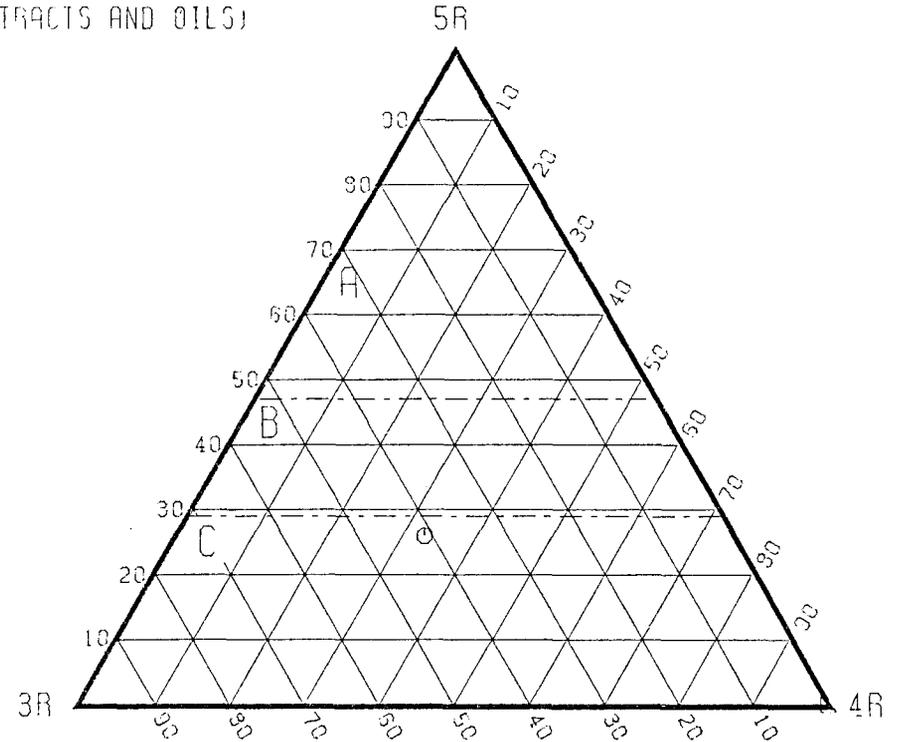
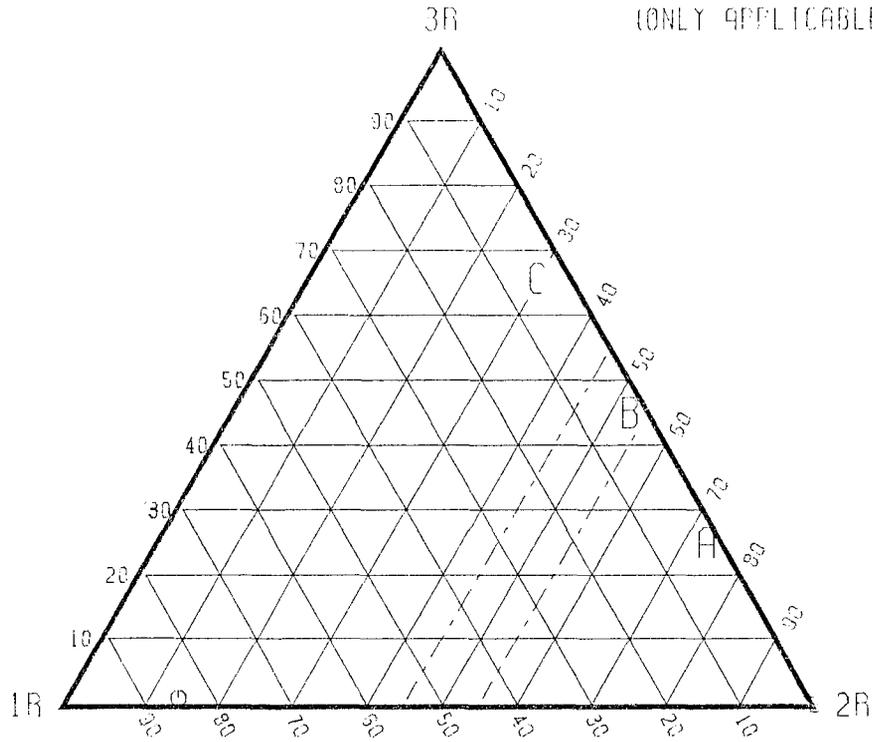
UK 12/28-2 6520-6570 FT 6D-330
 Analysis Name: SP7070.AVE;1 Spec# 180 Norm: B /Scale: 6736
 Date: MAR 25 87 23:20:30 Nmparam: 0.5:0.5 Tolerance: 500:MMU

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C₃₀-RING DISTRIBUTION

(ONLY APPLICABLE FOR MATURE EXTRACTS AND OILS)

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- A. ORGANIC MATTER WITH SUBSTANTIAL LANDPLANT RESIN CONTRIBUTION
- B. MIXED LANDPLANT RESIN/SOM OR MIXED ALGAL/SOM
- C. STRUCTURELESS ORGANIC MATTER (SOM)

LEGEND	
◻	12/29-2, 6520-6570 F1
⊙	12/29-2, 6520-6570 F1, HEATED

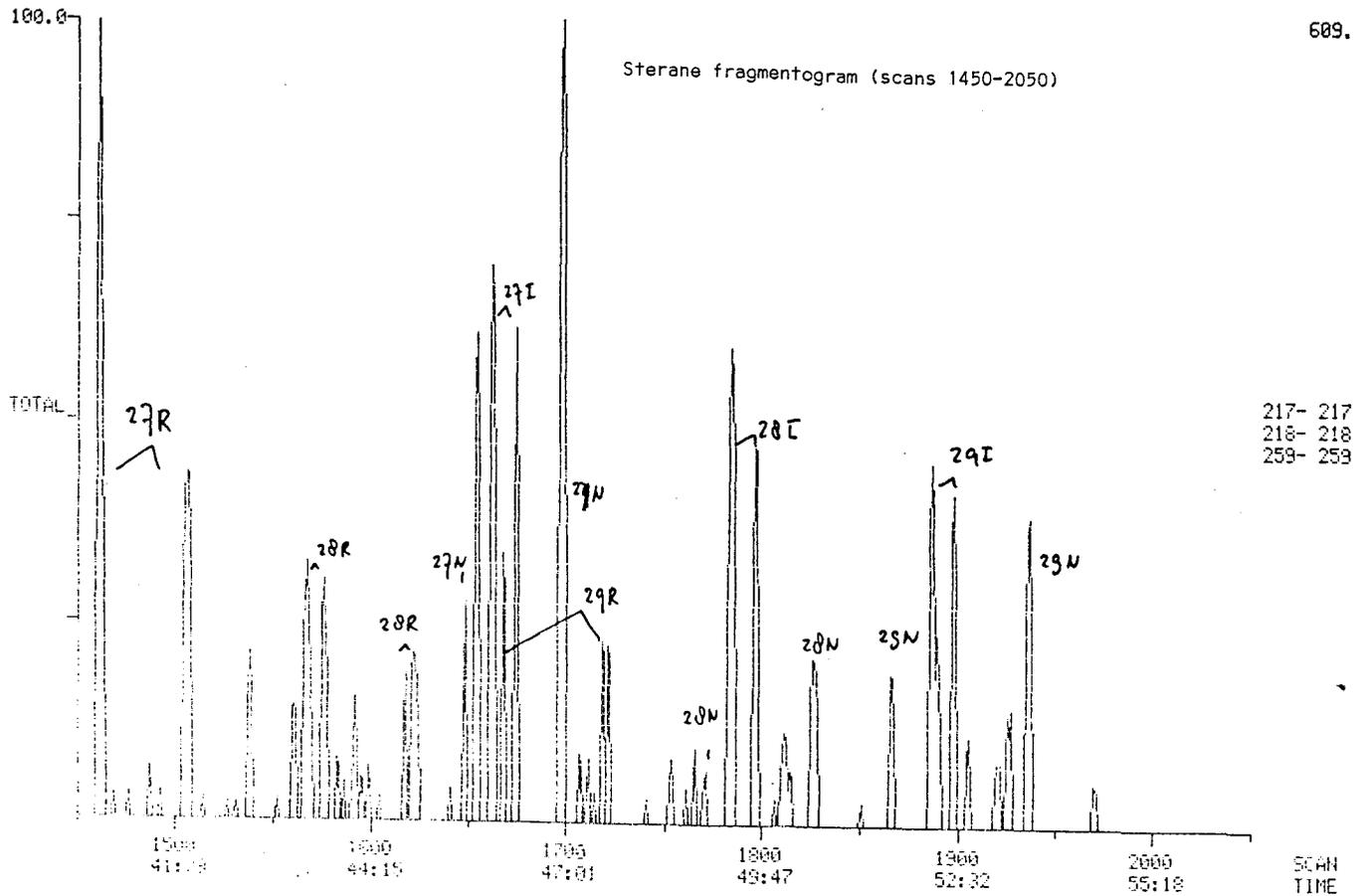
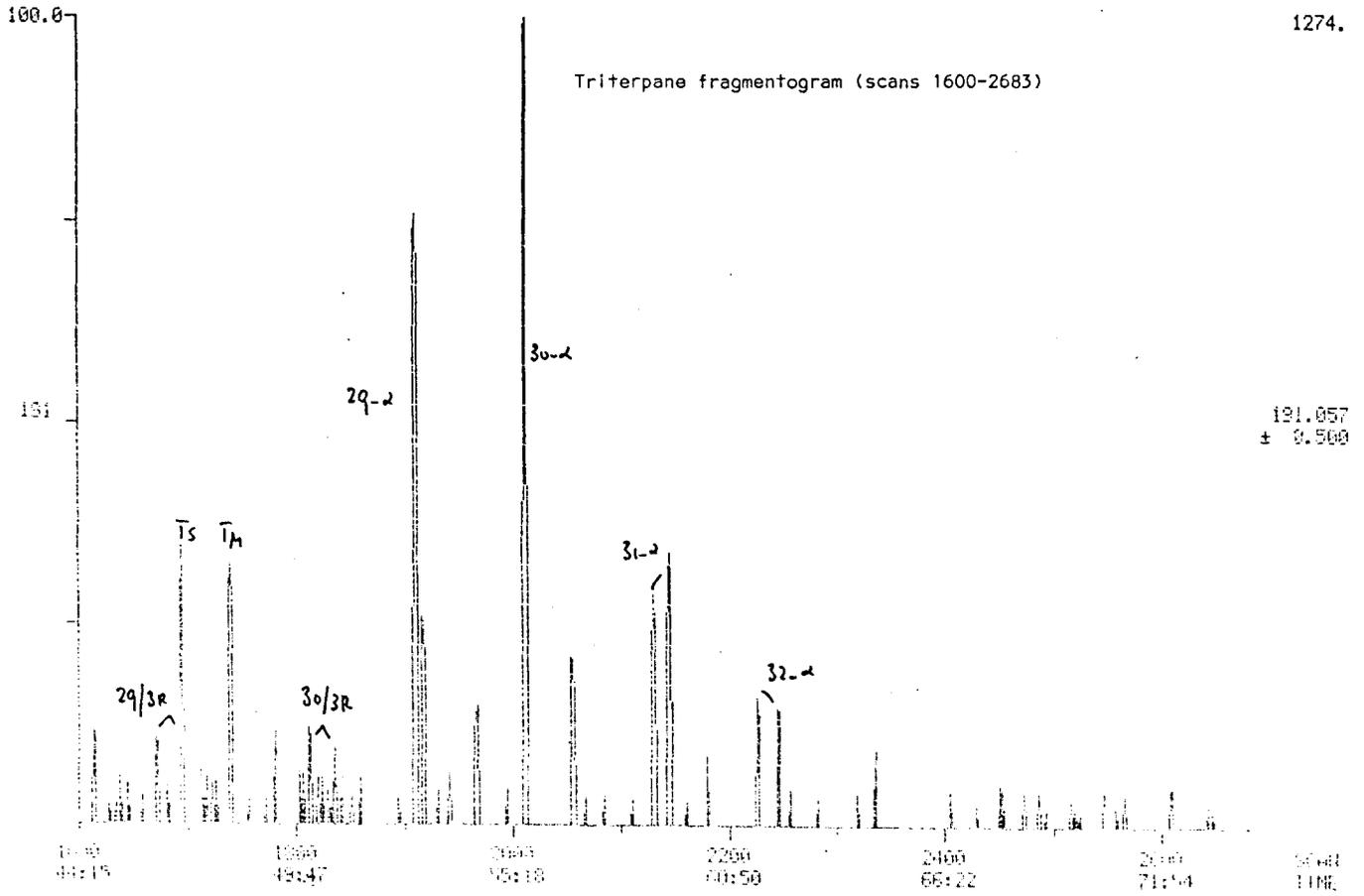


FIG. 6A. GC-MS analysis 12/28-2, 6520-6570 ft, source rock.

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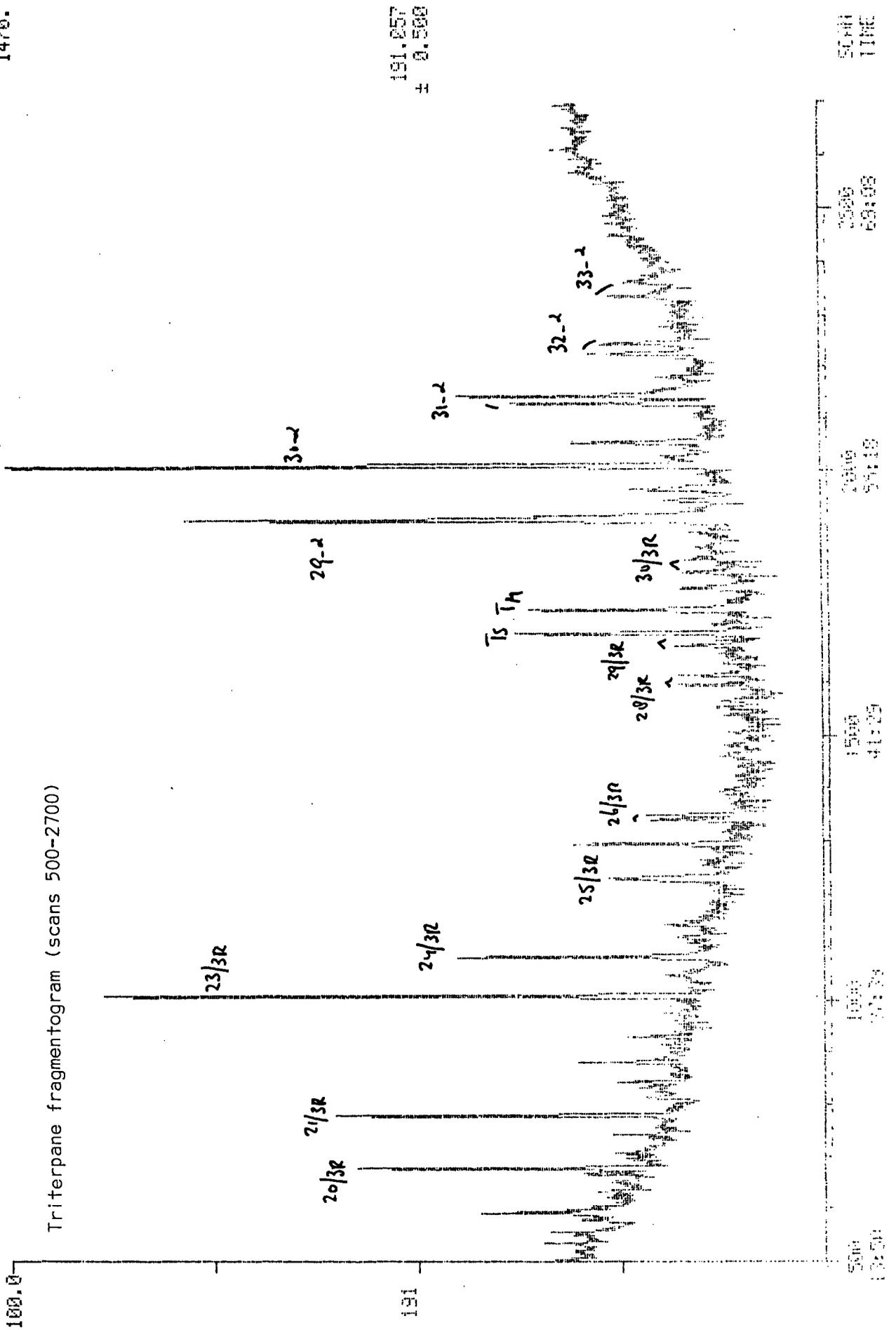


FIG. 6B. GC-MS analysis 12/28-2, 6520-6570 ft, source rock.

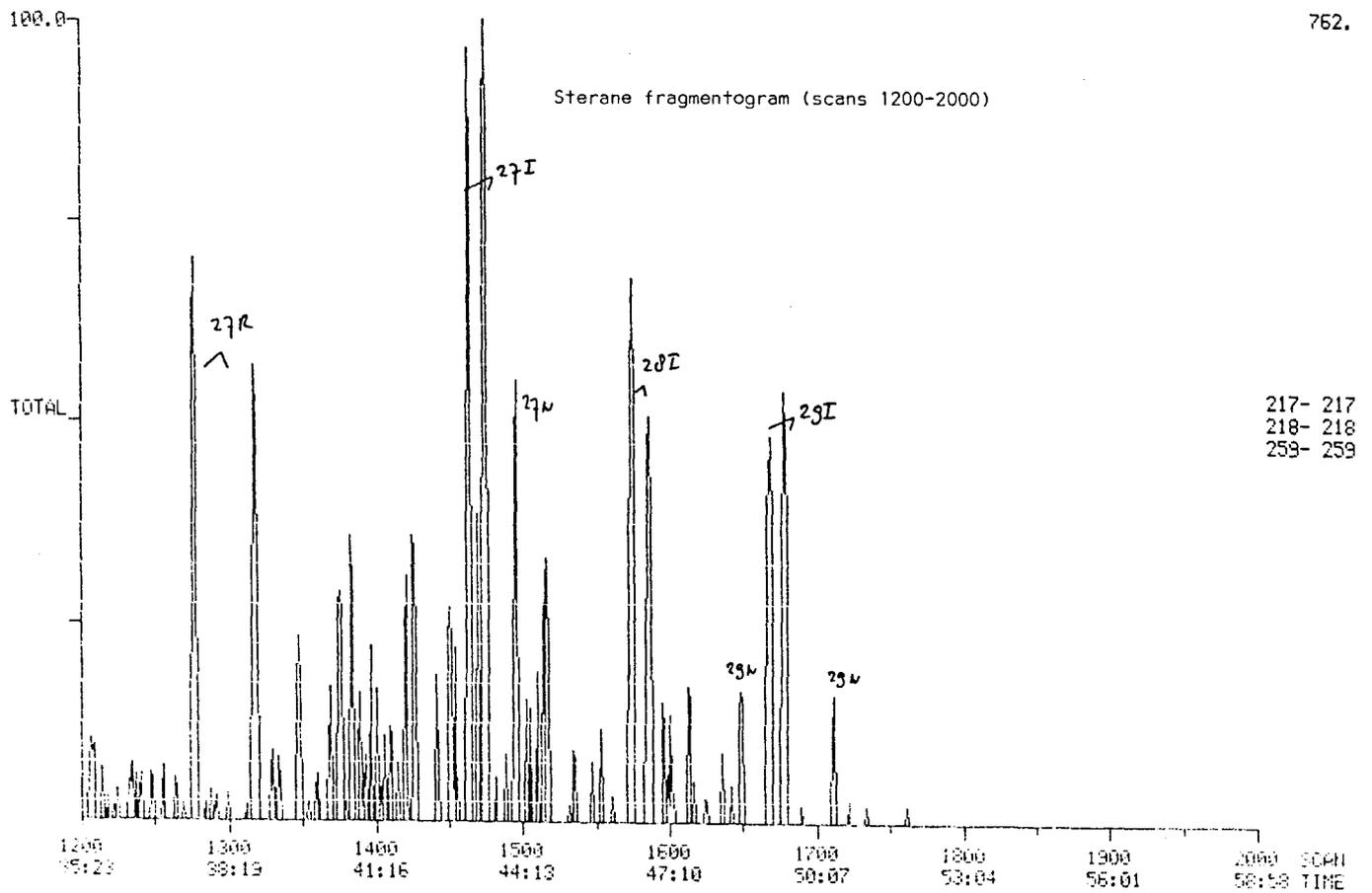
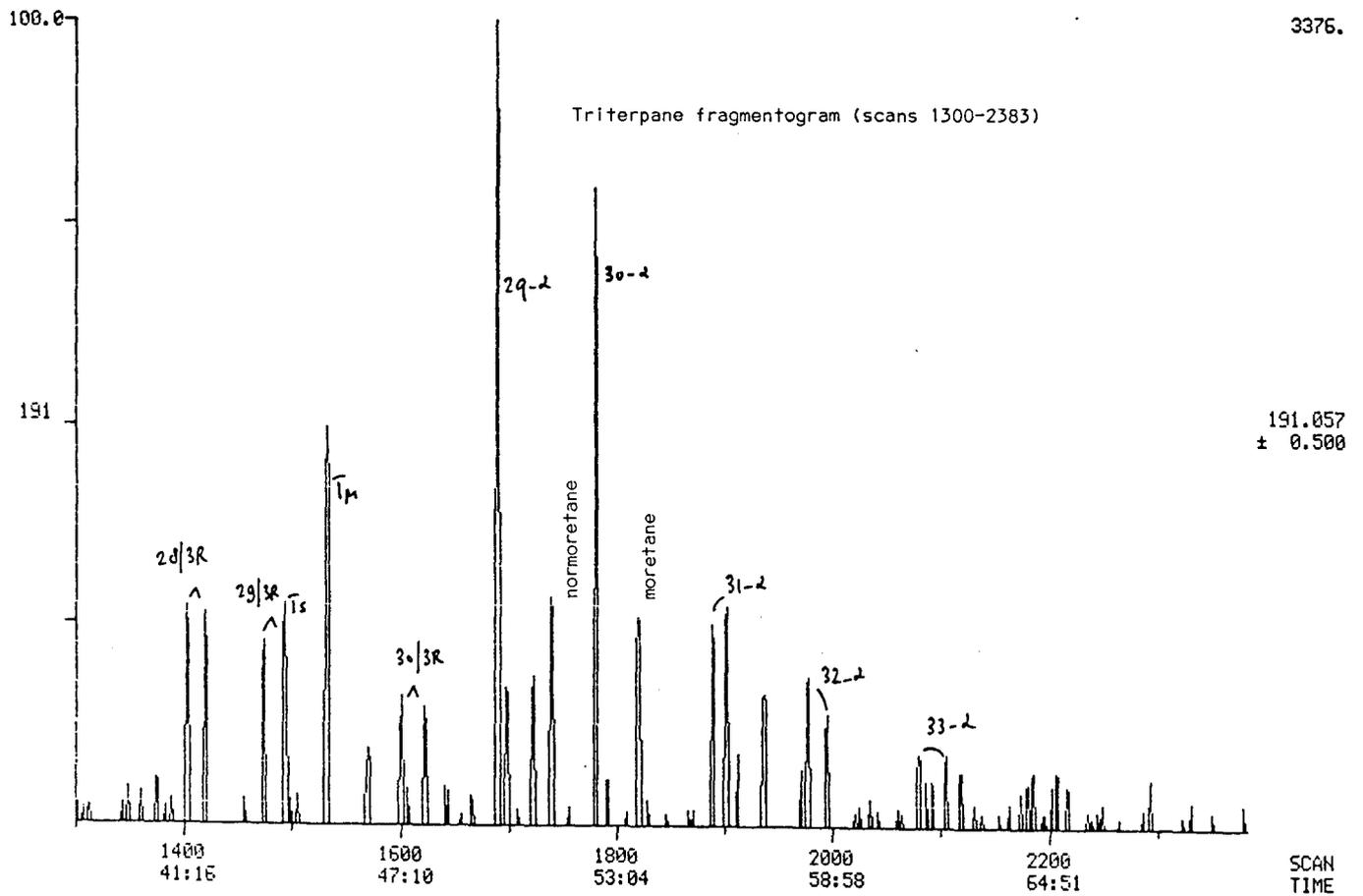
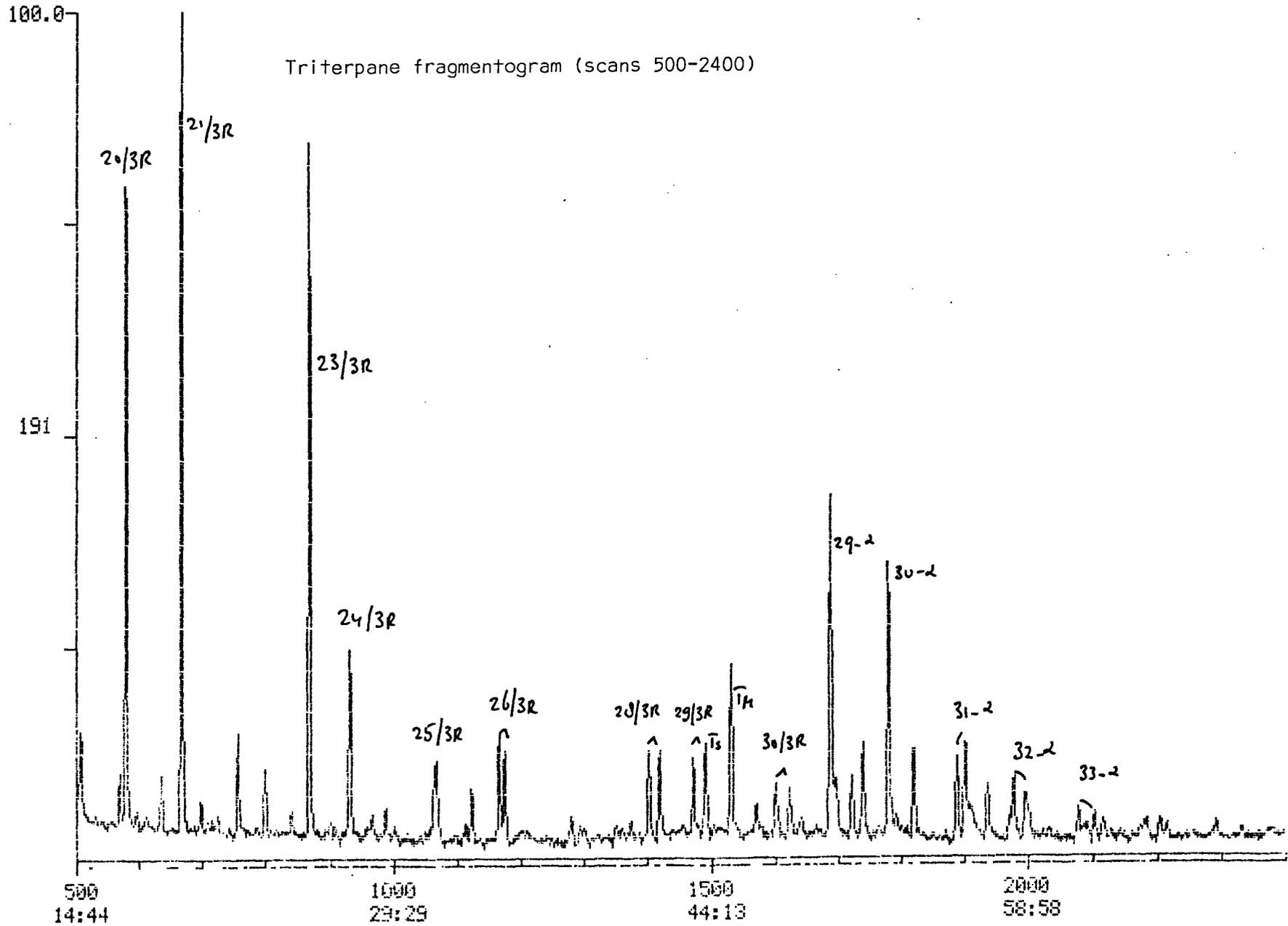


FIG. 7A. GC-MS analysis 12/28-2, 6520-6570 ft, heated source rock.

Triterpane fragmentogram (scans 500-2400)



191.057
± 0.500

FIG. 7B. GC-MS analysis 12/28-2, 6520-6570 ft, heated source rock.

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