Geological Survey of Canada
Commission Geologique du Canada

Open File 2074

GAS CHROMATOGRAPHY AND GAS CHROMATOGRAPHY-MASS SPECTROMETRY DATA OF SOME JEANNE D'ARC BASIN OIL SATURATE FRACTIONS

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GSC Project Number 243-7654

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July 1989

GAS CHROMATOGRAPHY AND GAS CHROMATOGRAPHY-MASS SPECTROMETRY DATA OF SOME JEANNE D'ARC BASIN OIL SATURATE FRACTIONS

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This Open File Report contains C_{15}^{+} saturate fraction gas chromatograms and gas chromatography-mass spectrometry data of oils obtained from drillstem tests undertaken on wells drilled in the Jeanne d'Arc Basin. Little attempt is made here to explain the significance of these data. This will be done in a series of papers currently in preparation.

Most of the oils in the Jeanne d'Arc Basin are believed to have a common source, the Kimmeridgian-aged Egret Member of the Rankin Formation (Powell, 1985; Creaney and Allison, 1987; Fowler et al., 1988; von der Dick et al., 1989). A characteristic feature of the oils and Egret Member extracts is the high concentration of 4-methylsteranes which suggests that a significant proportion of the organic matter in the source rock is derived from dinoflagellates (Summons et al., 1987). These compounds are normally detected using m/z 231 mass fragmentograms. However, in the Jeanne d'Arc Basin oils and Egret Member extracts they are present in such high concentrations that they interfere with the regular sterane patterns normally observed using m/z 217 mass fragmentograms. While this makes oil-oil and oil-source correlations apparently straightforward, the co-elution of 4-methylsteranes (especially with the C_{29} regular steranes) makes the calculation of maturation and other parameters of interest almost impossible. These difficulties can be overcome using GC-MS-MS techniques because of their greater specificity. Data from the CAD-GC-MS-MS (see experimental) analysis of a sample from Hibernia K-18 DST 8 is provided as an example of such data. These traces result from the monitoring of parent to daughter transitions (i.e. m/z 372→217 for C_{27} 4-desmethylsteranes) rather than simply monitoring one fragment ion (i.e. m/z 217 for steranes). Also included for comparison with the GC-MS data are trace A, the sum of the C_{27}-C_{30} 4-desmethylsterane transitions; B, the sum of the C_{27} C_{30} 4-methylsteranes; and C the sum of the C_{27}-C_{35} hopane

transitions (roughly equivalent to a m/z 191 fragmentogram) which have been achieved by combining the individual traces obtained from GC-MS-MS analysis.

The improved quality of the data obtained from GC-MS-MS analysis led Fowler et al. (1988) to suggest a contribution from a second source, possibly from an interval within the Voyager Formation, to oils in one area of the basin (eg. West Ben Nevis B-75, Fortune G-57 and some oils from Ben Nevis I-45).

EXPERIMENTAL

Saturate fractions were obtained from de-asphalted oils (>210°C fraction) using open-column liquid chromatography (3/4 activated alumina and 1/4 activated silica gel with an adsorbent:sample mass ratio of 100:1) and eluting with 3.5 ml of pentane/g of adsorbent.

Saturate fraction gas chromatograms were run on a Varian 3700 FID gas chromatograph using a 30 m OV-1 or DB-1 colum. The column temperature was programmed from 60 to 260°C at 4°C min^{-1} and then held isothermal.

Gas chromatography-mass spectrometry was performed on a Carlo Erba 4200 gas chromatograph directly connected to a Kratos MS-80RF mass spectrometer (electron energy 70eV) under the control of a DS-55M data system. The GC was equipped with a 25 m x 0.3 mm id. fused-slica column coated with DB-5 (J and W Scientific). The temperature program employed was 50 to 325°C at 4°Cmin^{-1}. The carrier gas for both GC and GC-MS was He (1-1.5 ml/min). Data were collected by multiple ion detection (MID), monitoring ions at m/z 177.1638, 191.1794, 217.1950, 218.2028, 231.2106 and 259.2262.

The GC-MS-MS data were obtained using a VG70 SQ hybrid MS-MS controlled by a VG11-205J + data system. Gas chromatographic separation was carried out using a 25 m DB-5 (J and W Scientific) fused silica column programmed from 60 to 310°C at 4°Cmin^{-1} and then held isothermal. The column effluent was fed directly to the source of the mass spectrometer which was operated at 70eV electron energy, 100μA filament emission current and a temperature of 250°C. The data provided were obtained using a method called Collision Activated Decomposition MS-MS. This was carried out

using 10 Parent-Daughter ion relationships by focussing each parent ion into the collision cell (1st Quadropole) using electrostatic switching and then monitoring the appropriate daughter ion intensity by switching the quadrupole analyser RF and DC. Dwell time for each transition was 80 m sec with a 20 m sec reset time. Collision gas (N_2) was added to the collision chamber and the collision activation energy was 18eV.

SAMPLES

Gas chromatograms and GC-MS data are provided where indicated in the following table, in alphabetical order.

Well	DST No.	Depth (m)	GC	GC-MS	GSC Lab No.
Adolphus 2K-41	3	2609-2647	X	X	20149
Ben Nevis I-45	3	4426-4438	X	X	20185
Ben Nevis I-45	9	2890.5-2894	X		20186
Ben Nevis I-45	10	2428-2446	X		20184
Ben Nevis I-45	11	2420-2423	X	X	20183
Beothuk M-05	1	3057-3061	X		20445
Beothuk M-05	3	3022-3035	X	X	20446
Fortune G-57	1	4031-4040	X		20789
Fortune G-57	2	3989-4002	X		20788
Fortune G-57	3	3989-4002	X	X	20787
Fortune G-57	7	3786-4452	X		20773
Hebron I-13	1	4368-4381	X		20245
Hebron I-13	5	3842-3845	X	X	20246
Hebron I-13	6	2975-2986	X	X	20247
Hebron I-13	7	2923-2940	X	X	20250
Hebron I-13	9	1905.3-1915.5	X	X	20249
Hebron I-13	10	1866-1876	X		20248
Hibernia B-08	3	3705-3715	X		20189
Hibernia B-08	6	3604-3613.5	X		20190
Hibernia B-08	7	3581.5-3591	X		20222
Hibernia B-08	9	3557-3562	X		20221
Hibernia B-08	11	3530-3545	X		20220
Hibernia B-08	12	3485-3489	X		20219
Hibernia B-08	16	3018-3033	X		20218
Hibernia B-08	17	2954-2963	X		20217
Hibernia B-08	18	2648-2661	X		20216
Hibernia K-18	1	3850-3859	X		20251
Hibernia K-18	3	3831-3843	X	X	20253
Hibernia K-18	4	3804-3812	X		20254

Well	DST No.	Depth (m)	GC	GC-MS	GSC Lab No.
Hibernia K-18	5	3783-3788	X		20261
Hibernia K-18	6	3735-3740	X		20262
Hibernia K-18	8	3120-3135	X		20263
Hibernia K-18	11	2313-2330	X		20266
Hibernia K-18	13	2282-2293	X	X	20265
Hibernia O-35	2	2467-2476	X	X	20167
Hibernia O-35	6	2219-2226	X		20171
Hibernia O-35	8	2055-2066	X		20172
Hibernia P-15	2	4113-4134	X		20145
Hibernia P-15	8	3805-3822	X		20152
Hibernia P-15	11	2422-2443	X	X	20150
Mara M-54	1	2704-2708.5	X		20453
Mara M-54	2	2403-2408	X	X	20454
Mara M-54	3	1851-1857	X	X	20455
Nautilus C-92	3	3325-3336	X		20294
Nautilus C-92	4	3285-3300	X		20295
North Ben Nevis P-93	2	3091-3095	X		20483
North Ben Nevis P-93	3	3080-3085	X	X	20484
North Ben Nevis P-93	4	3062-3062	X		20482
North Dana J-43	2	4536.5-4548	X		20342
South Mara C-13	1	2952-2958	X		20433
South Mara C-13	2	2926-2932	X	X	20434
South Tempest G-88	1	4109-4117			20227
South Tempest G-88	2	4041-4049	X	X	20226
Terra Nova K-08	1	3530-3544	X	X	20783
Terra Nova K-08	2	3410-3423	X		20782
Terra Nova K-08	3	3380-3395	X		20781
Terra Nova K-08	4	3329-3336	X		20793
Trave E-87	1	2232-2237.5	X		20416

Well	DST No.	Depth (m)	GC	GC-MS	GSC Lab No.
Trave E-87	2	2144-2150	X		20417
West Ben Nevis B-75	6	2445-2465	X	X	20775
West Ben Nevis B-75	8	2002-2015	X		20774
Whiterose J-49	2	3212-3218.5	X		20477
Whiterose J-49	6	3124-3131	X	X	20479
Whiterose J-49	7	3093.5-3106	X	X	20480
Whiterose J-49	8	3063-3067	X	X	20478
Whiterose L-61	3	2527.5-2534	X	X	20769

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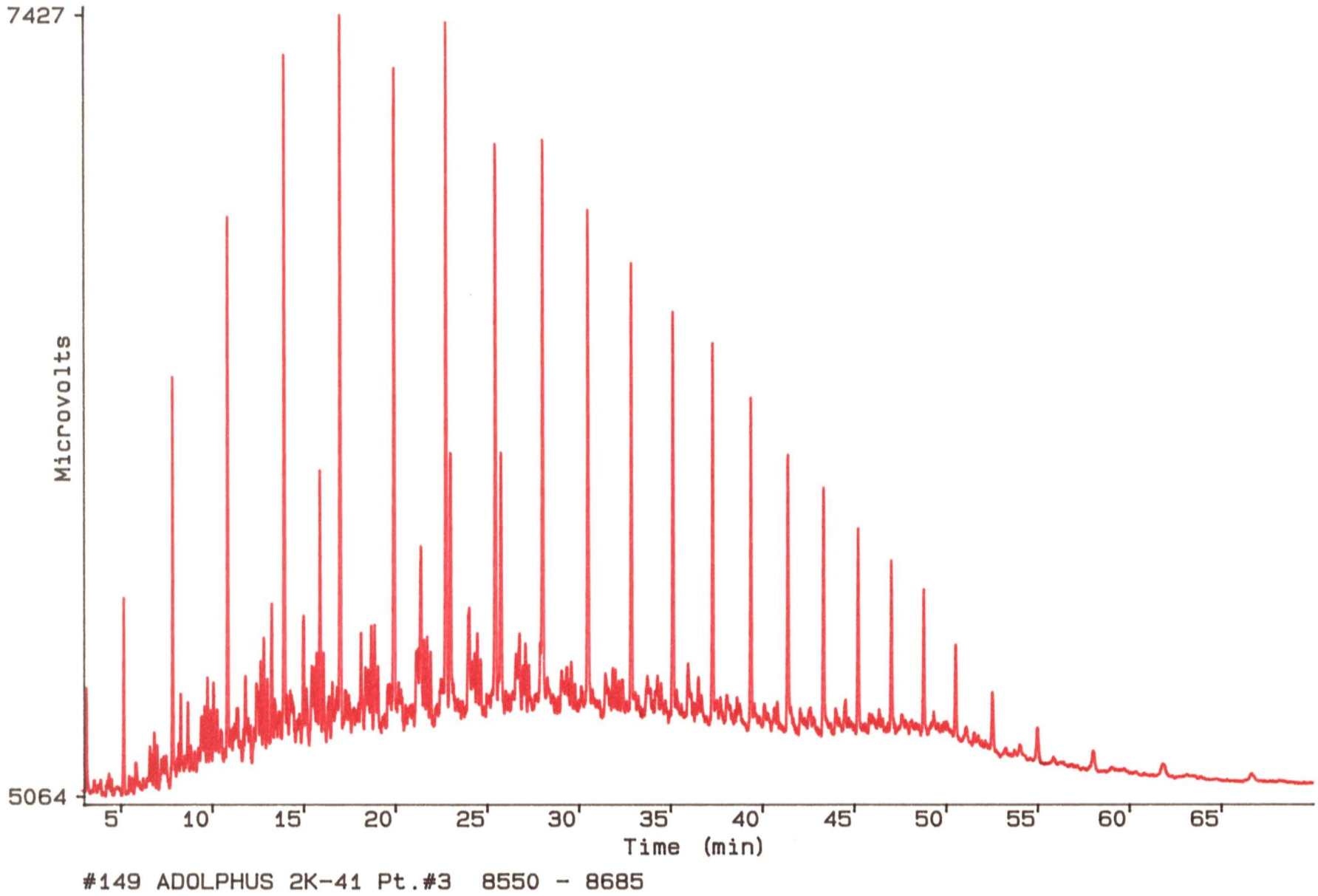
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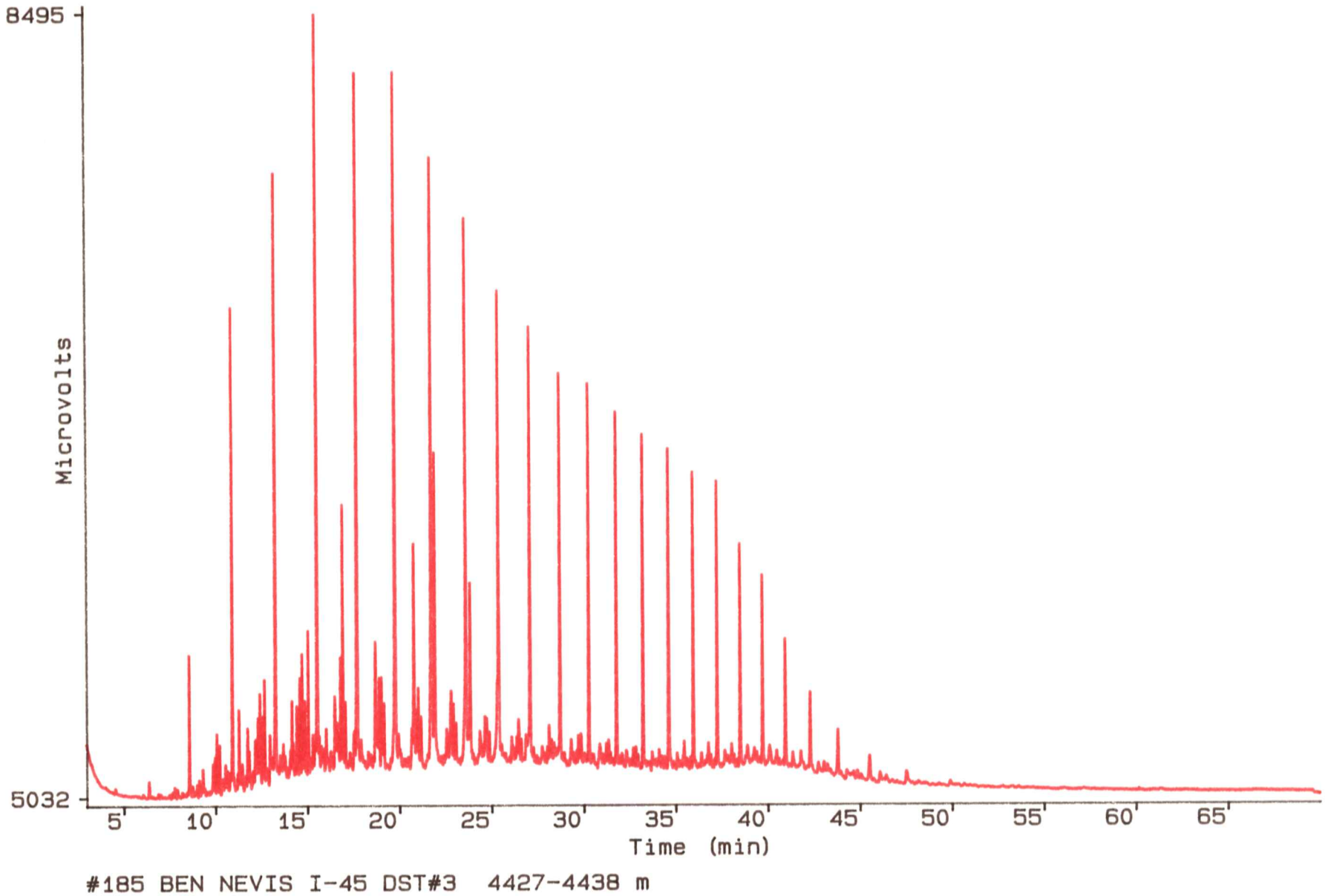
5064
Microvolts
5
10
15
20
25
30
35
40
45
50
55
60
65
Time (min)
#149 ADOLPHUS 2K-41 Pt.#3 8550 - 8685



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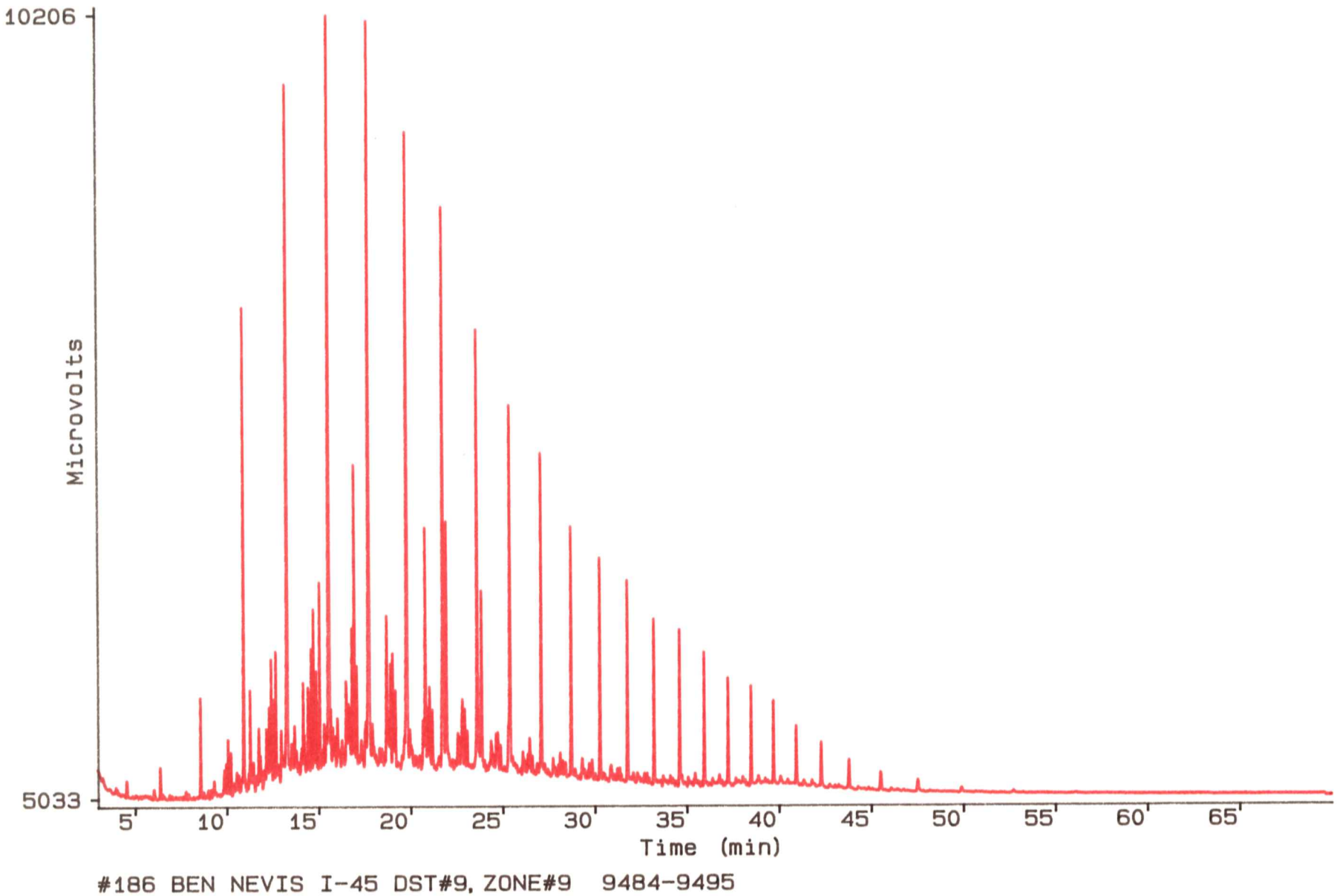

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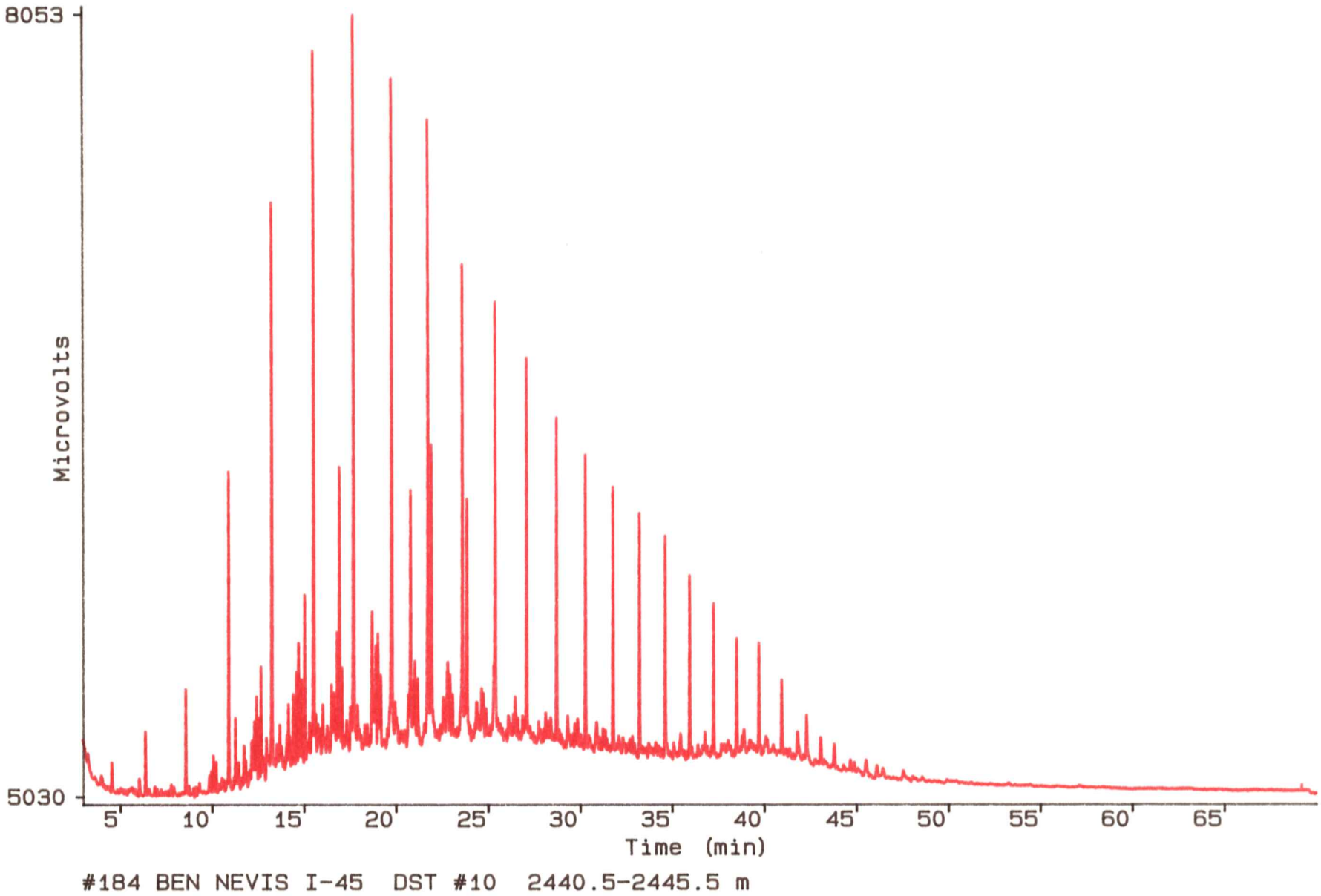

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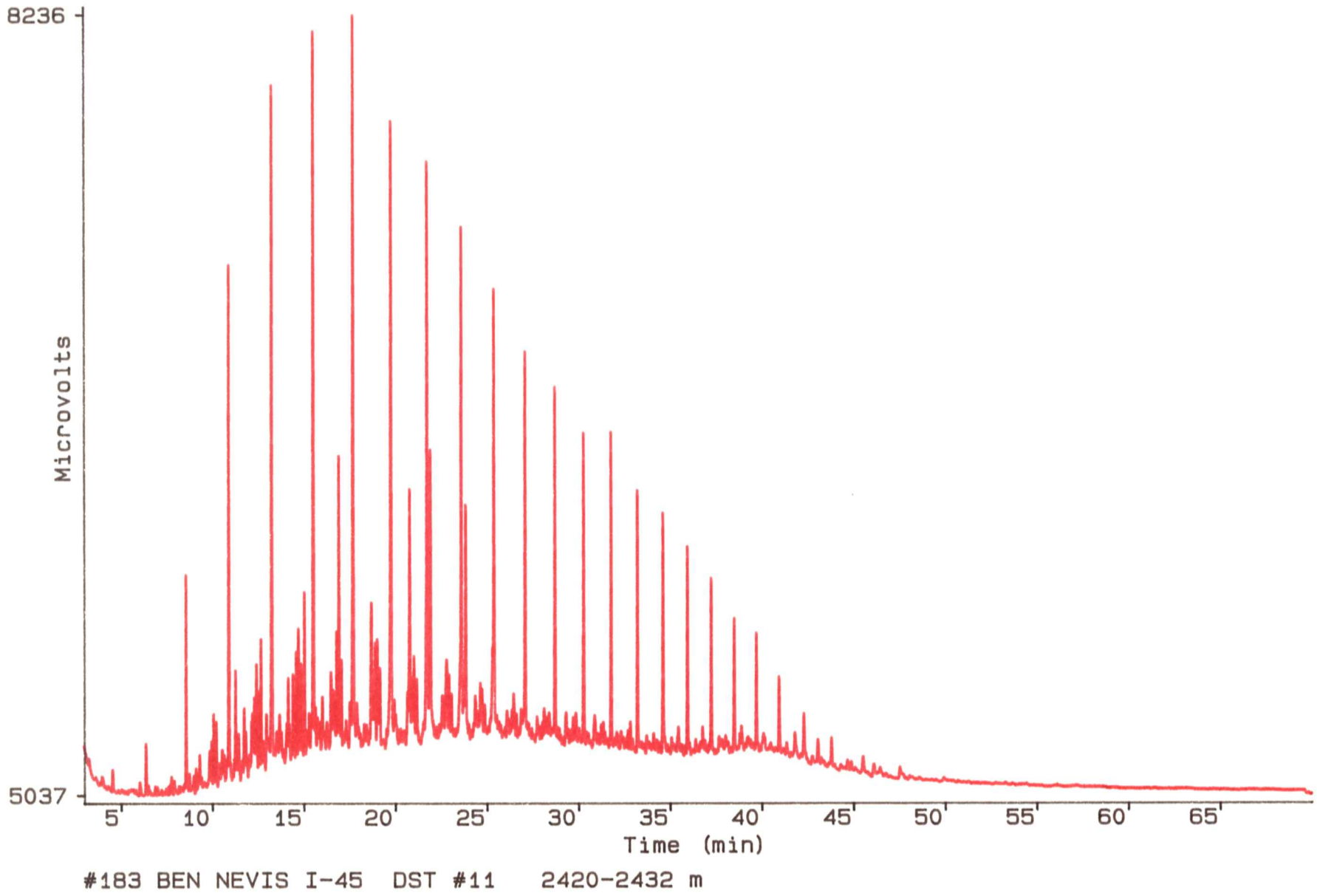

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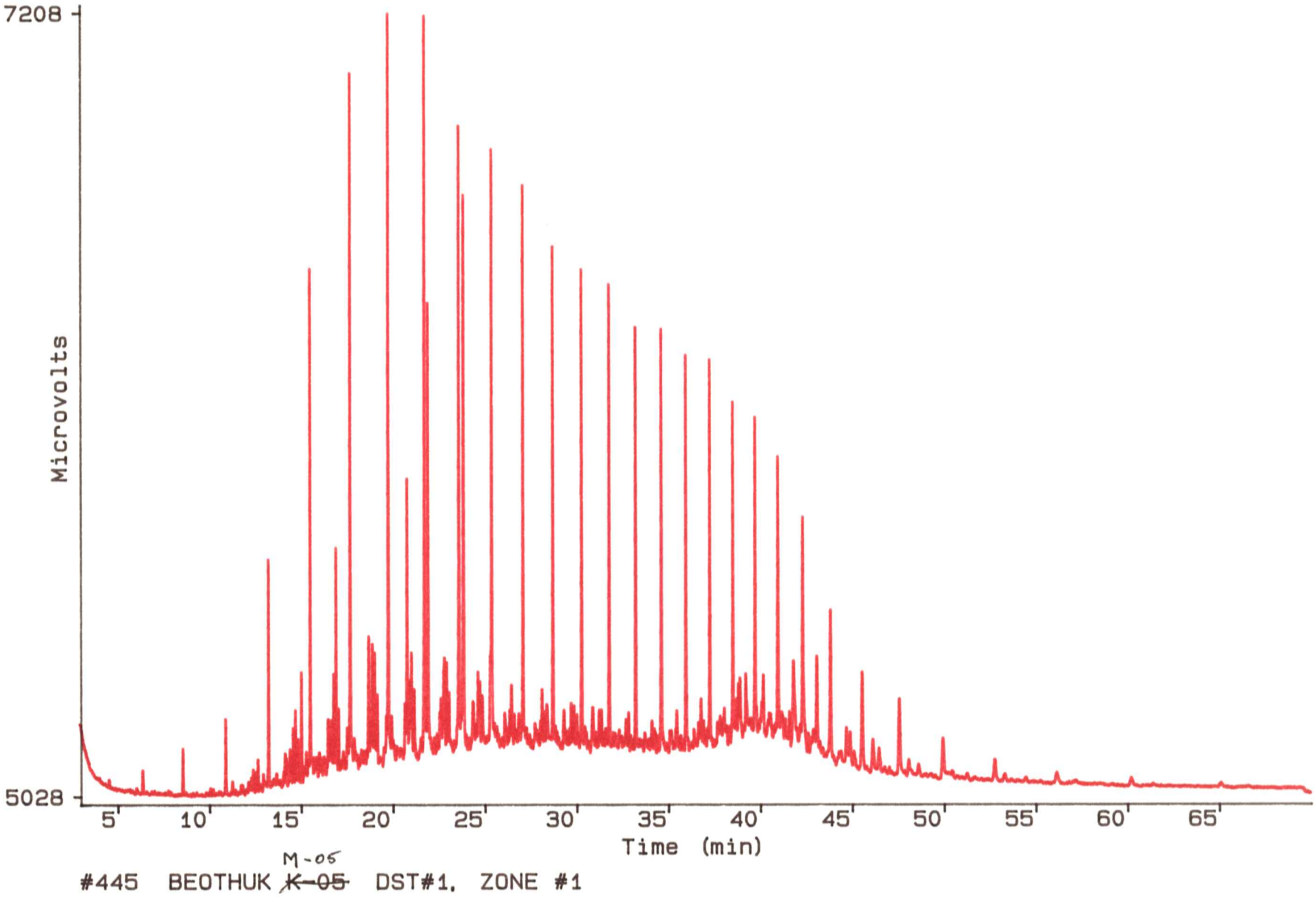

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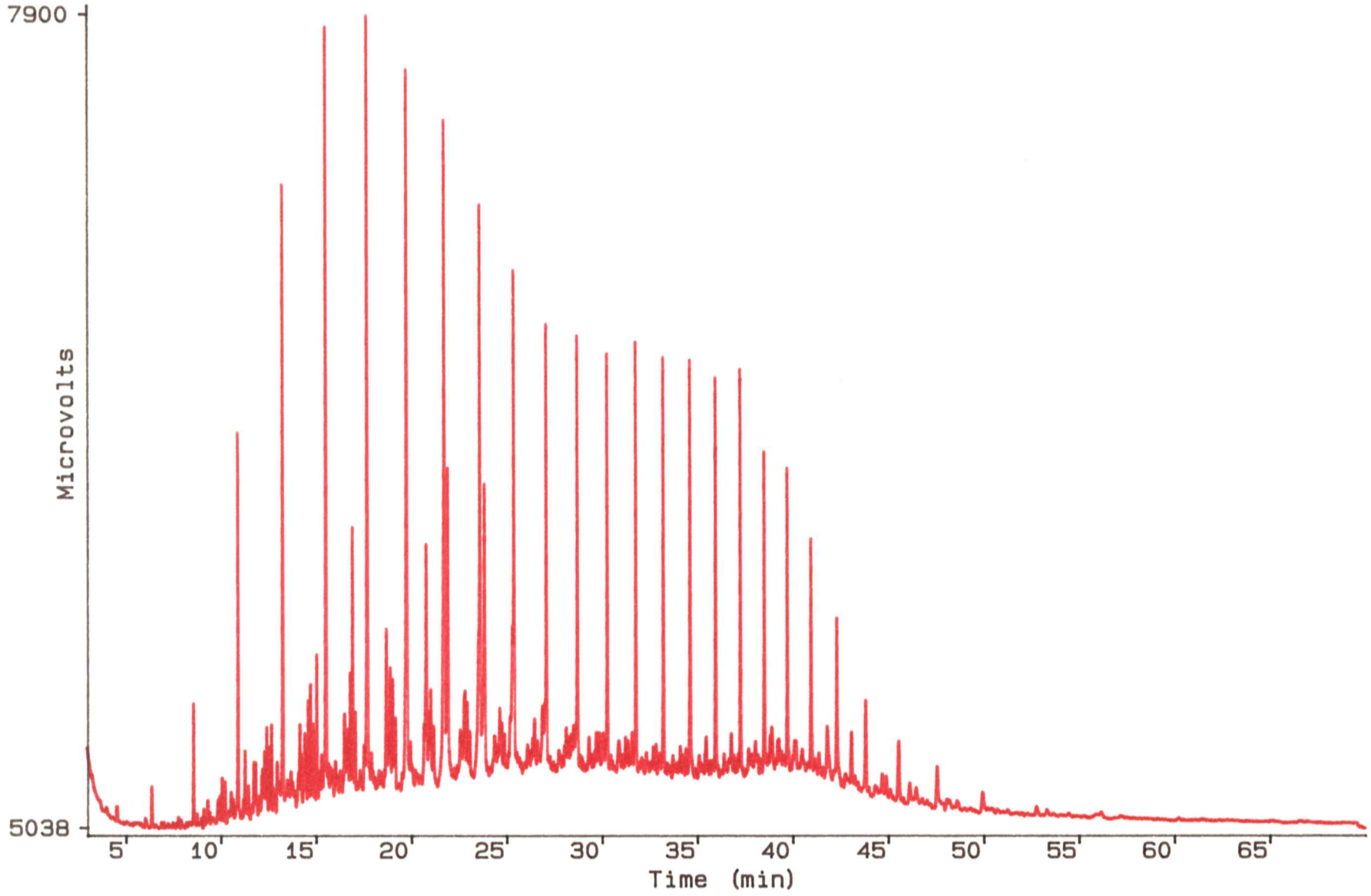

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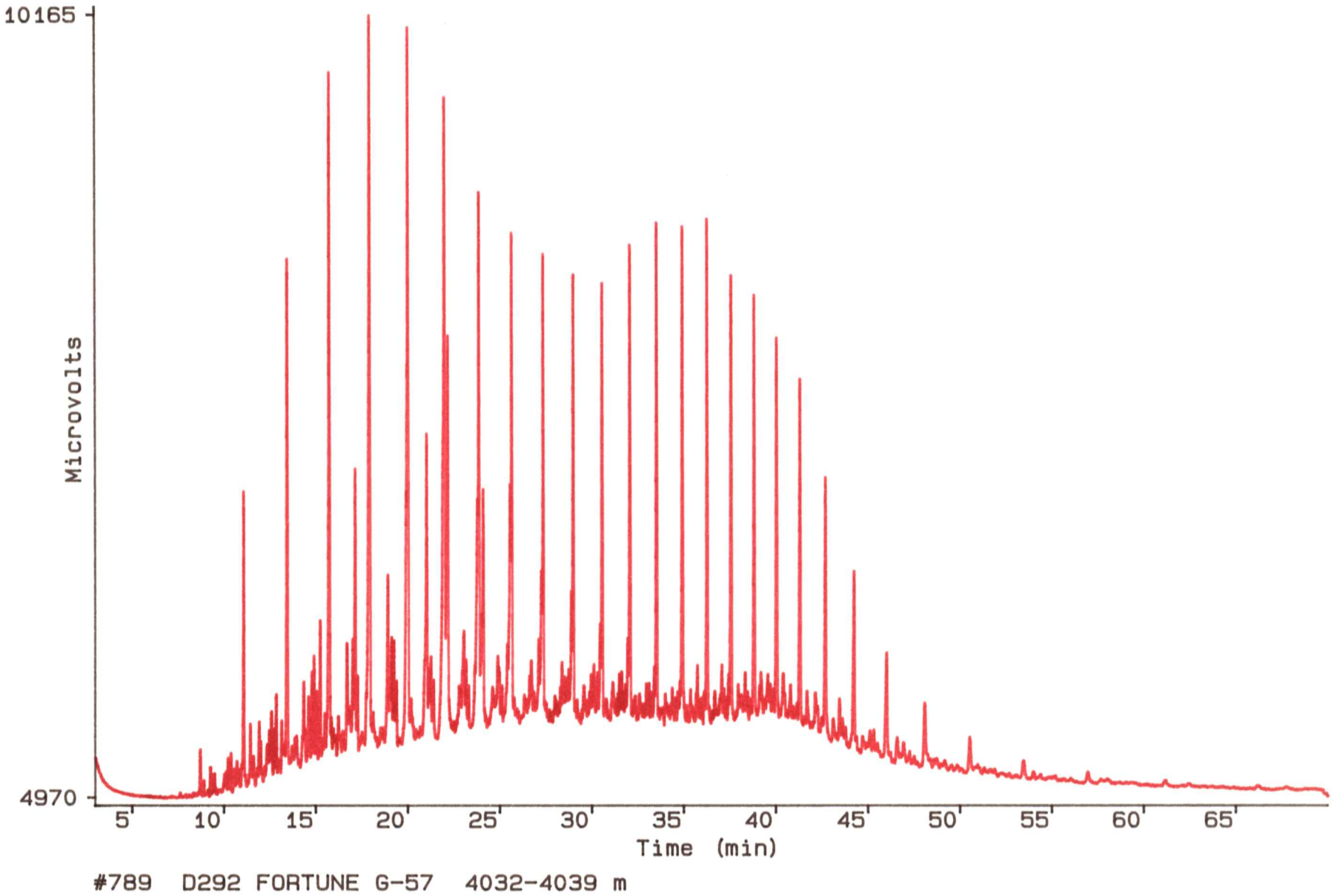
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4970
Microvolts
5
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15
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35
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60
65
Time (min)
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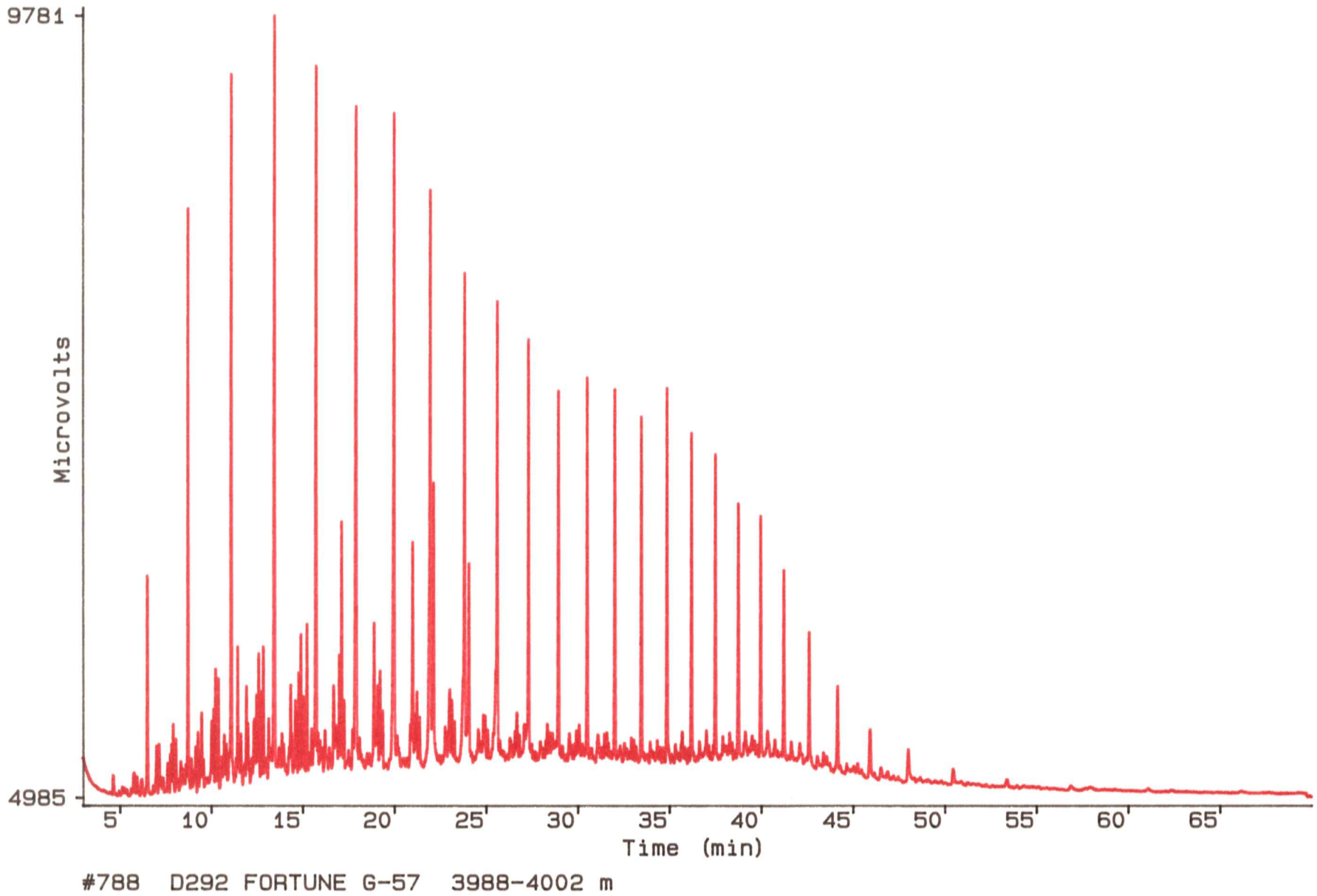

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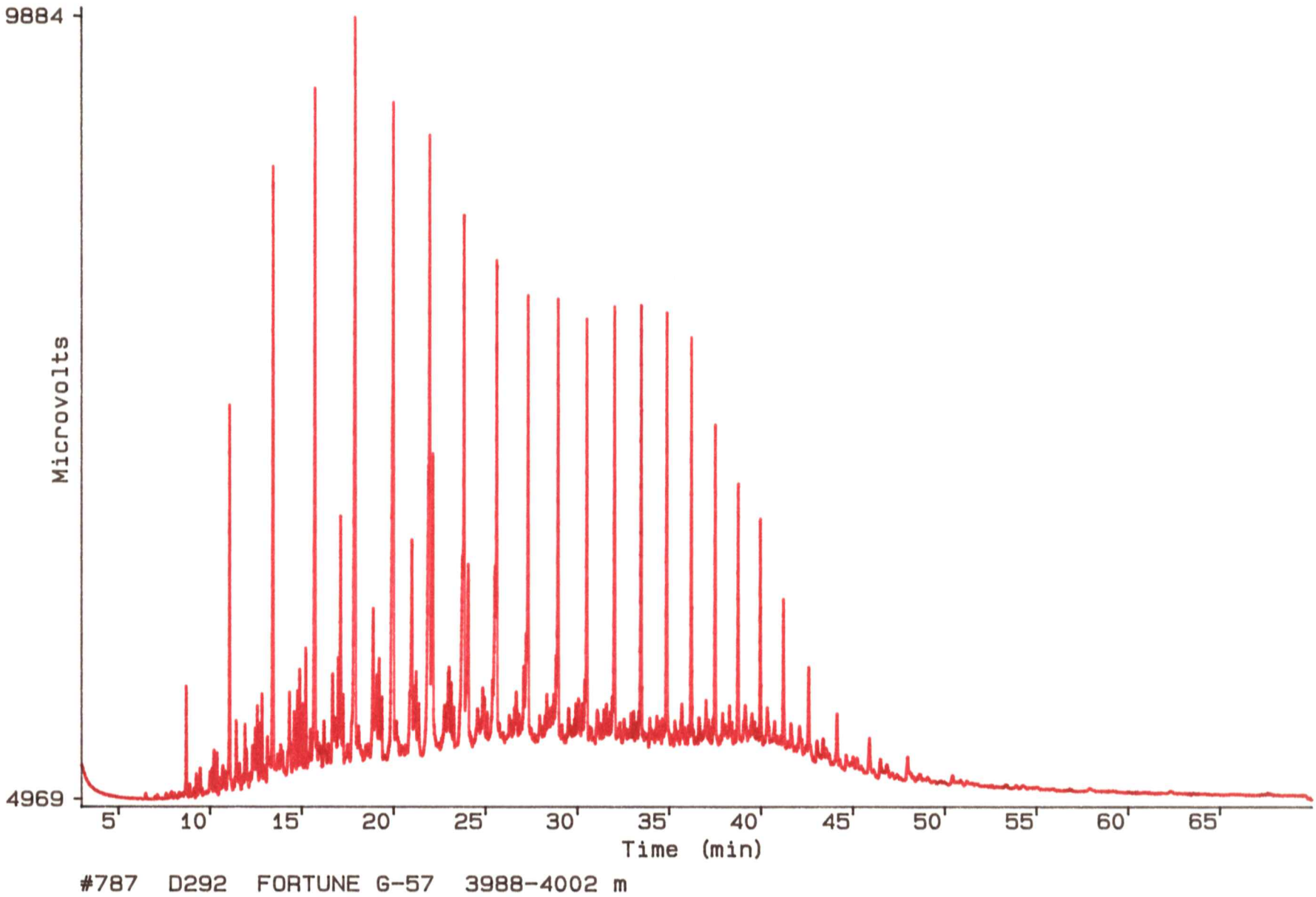
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4969
Microvolts
5
10
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Time (min)
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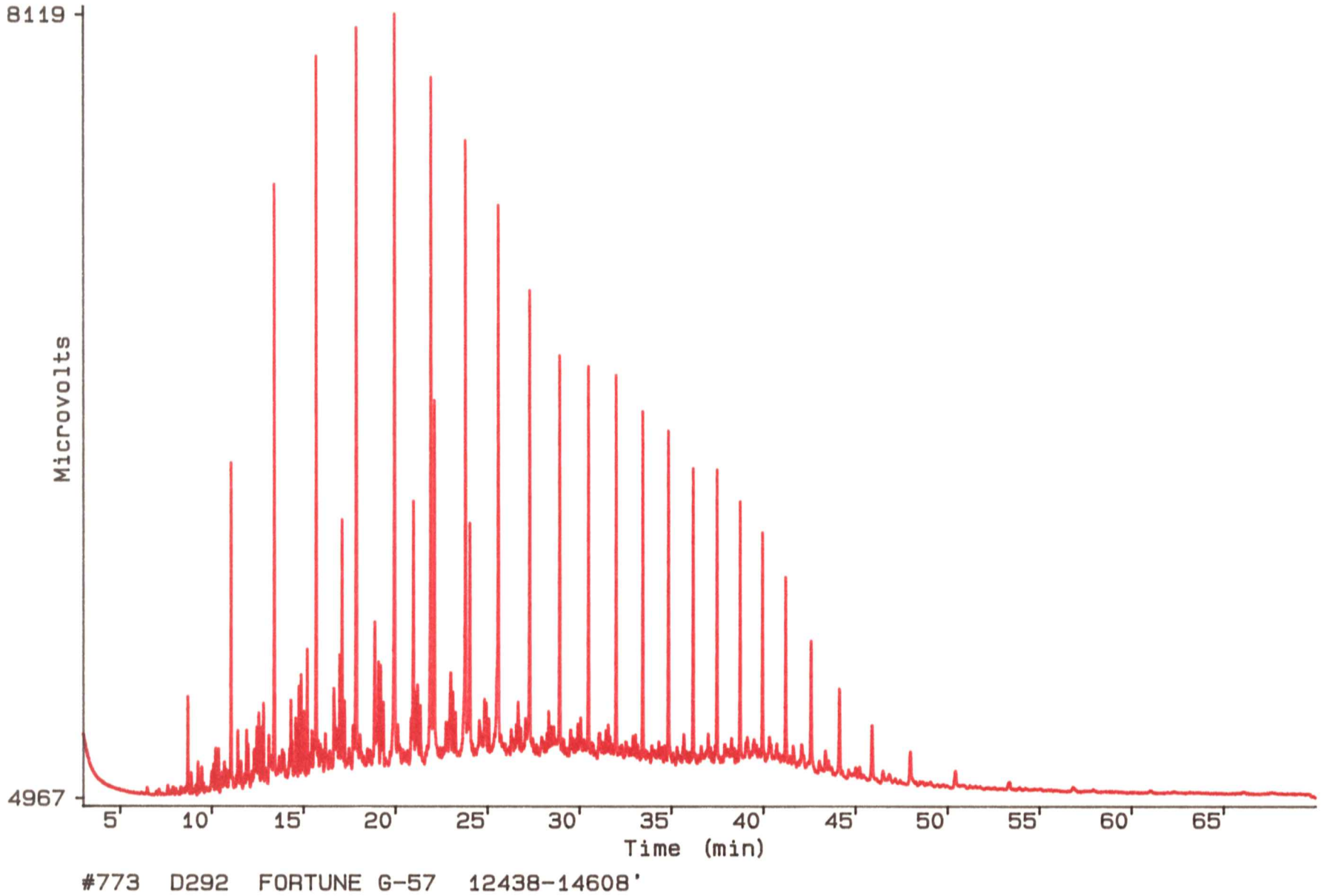
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4967
Microvolts
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Time (min)
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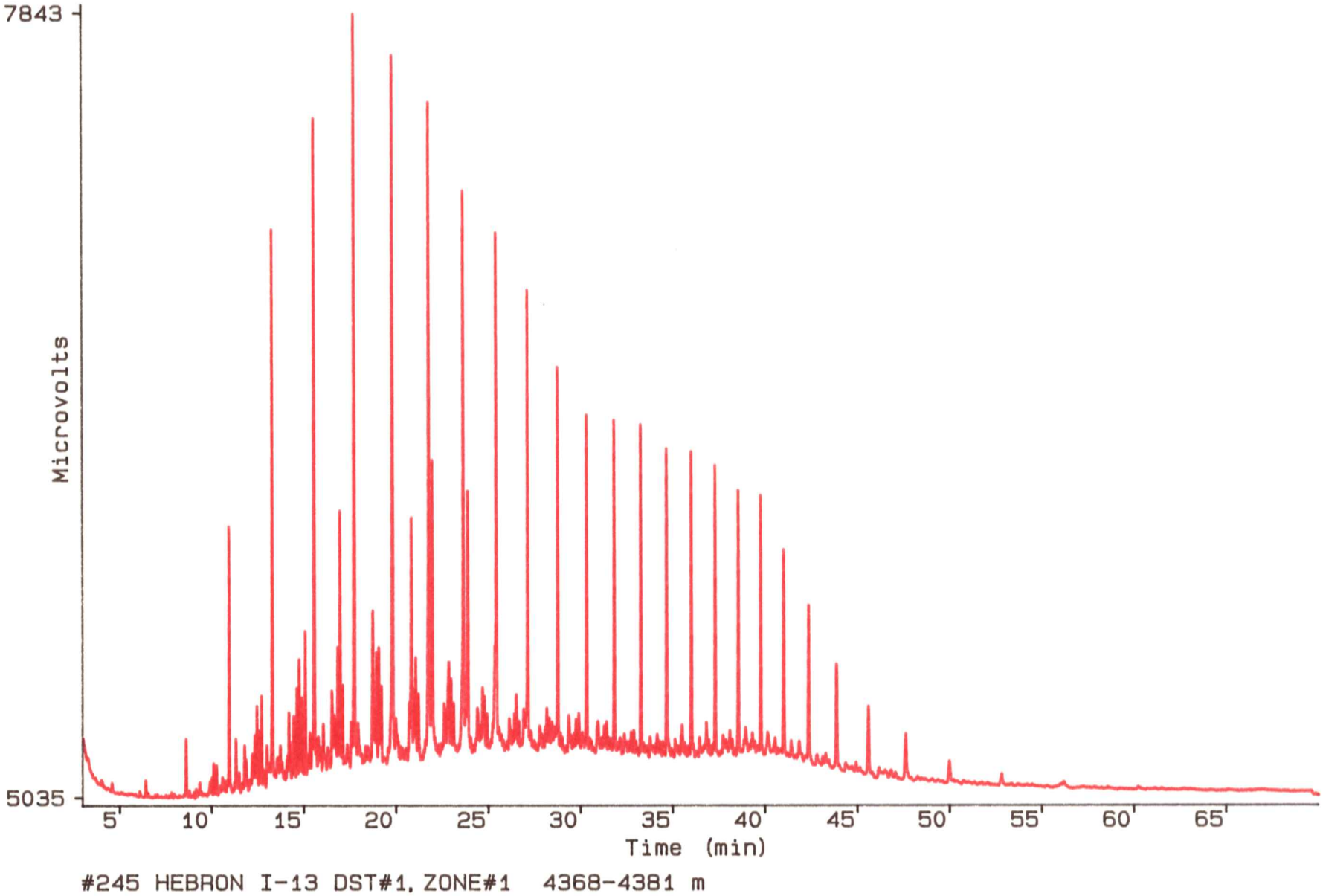

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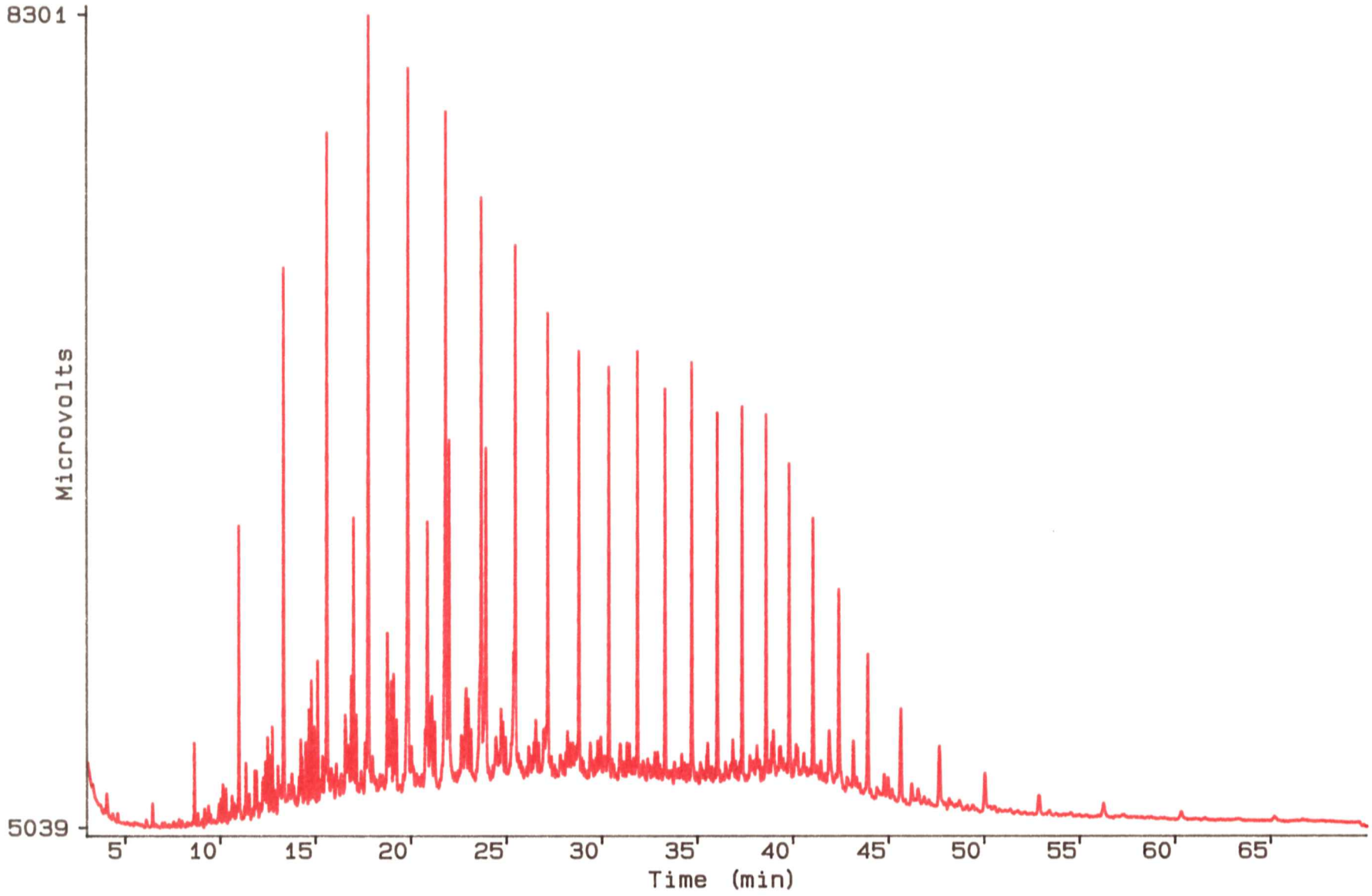

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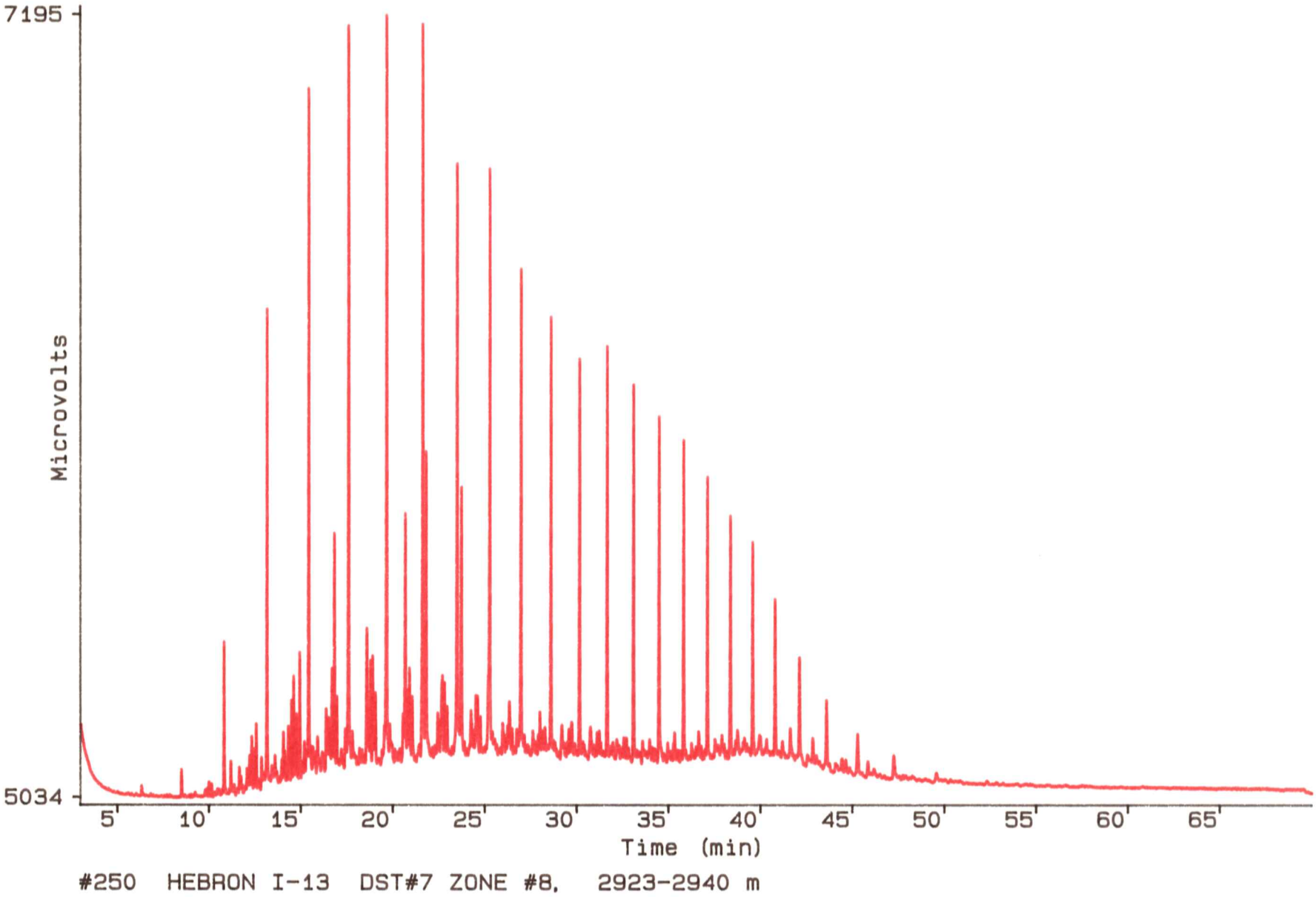

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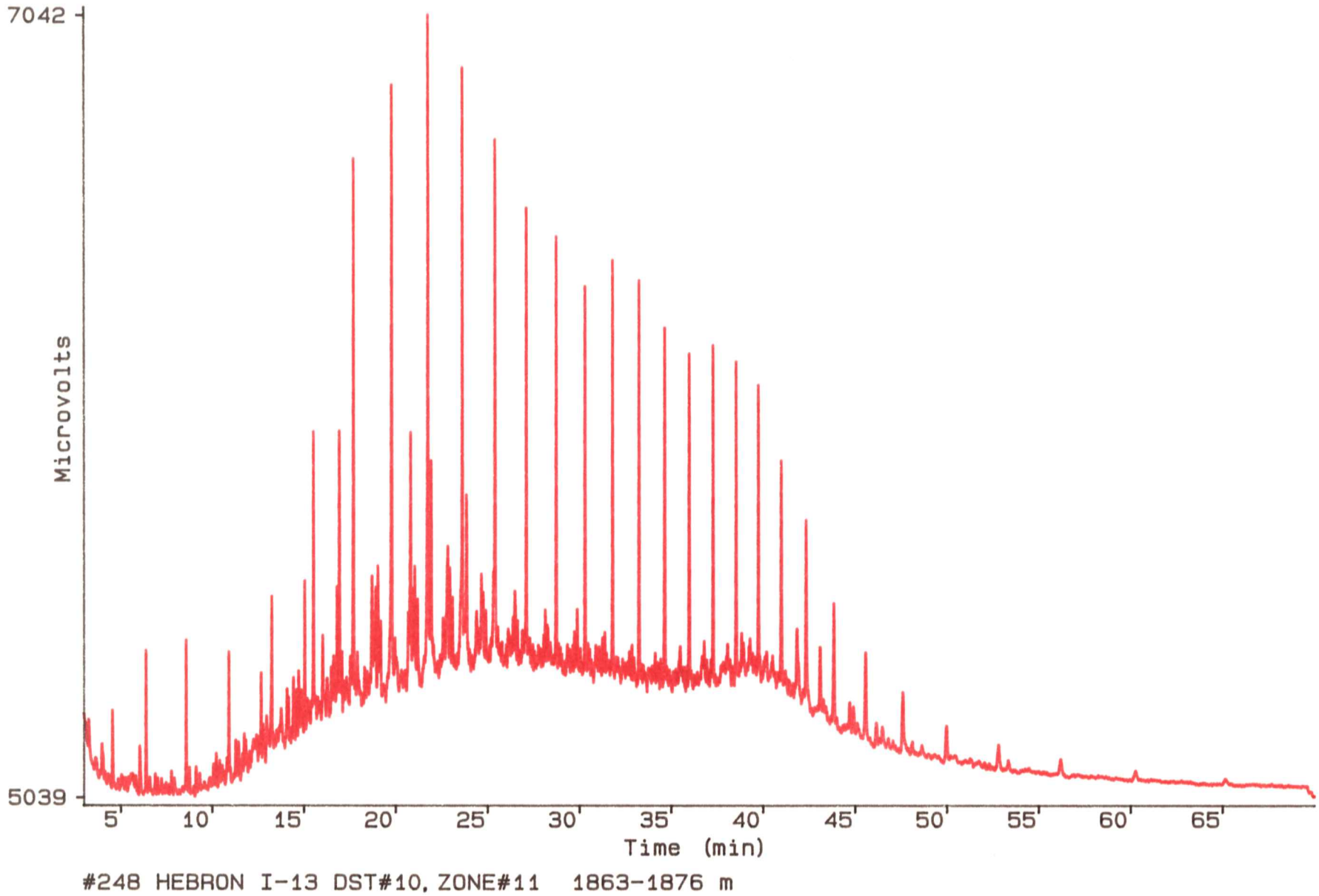

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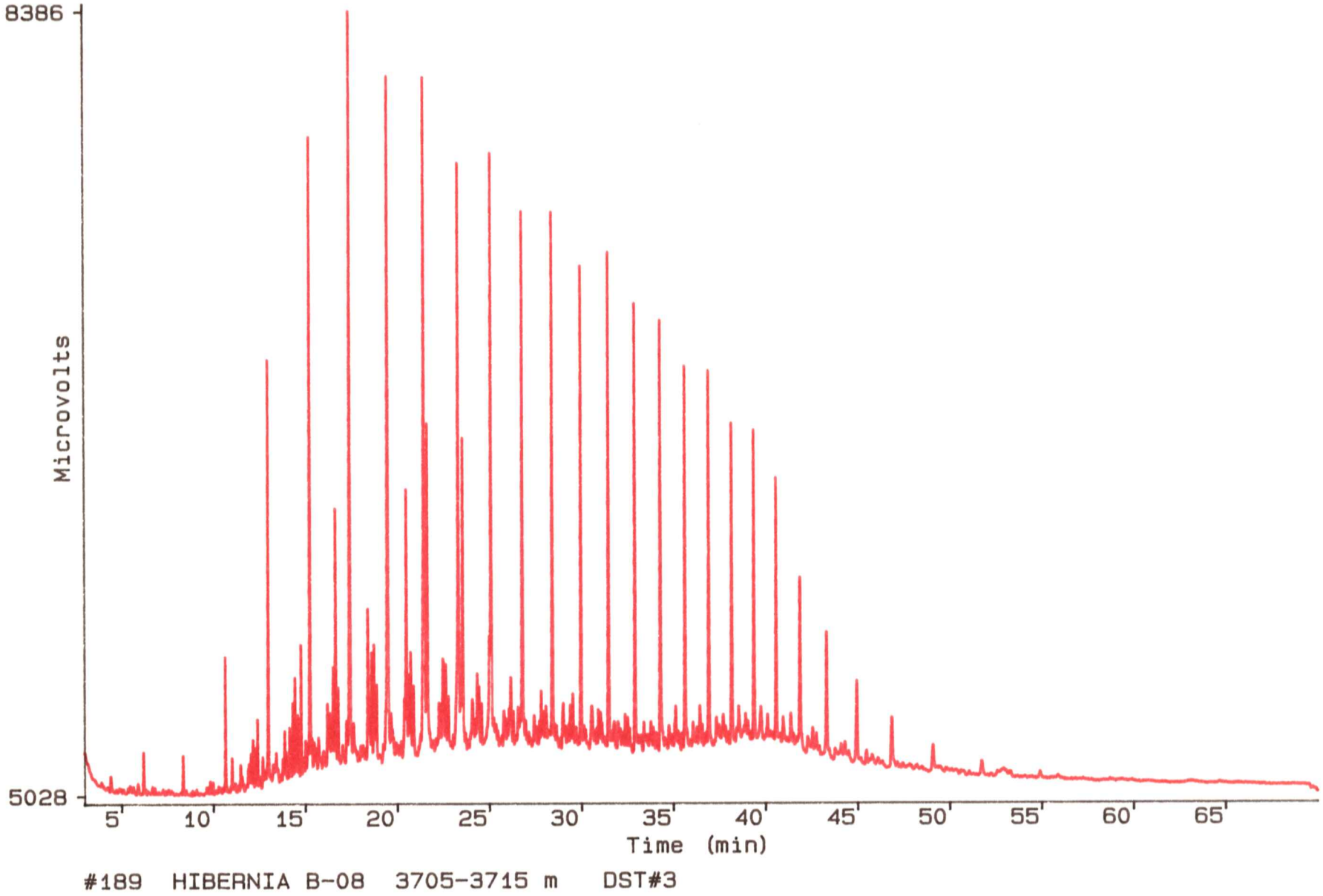

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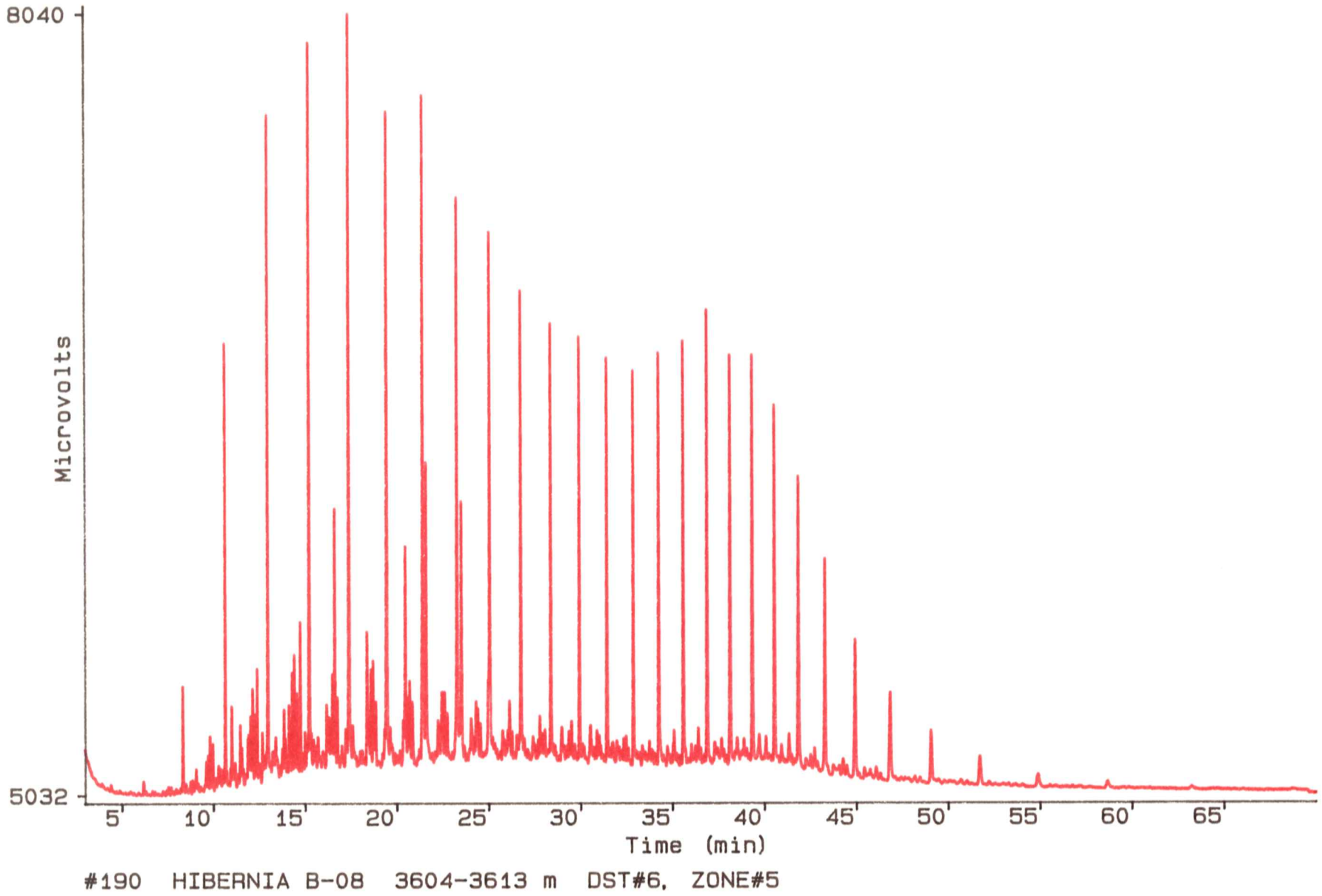

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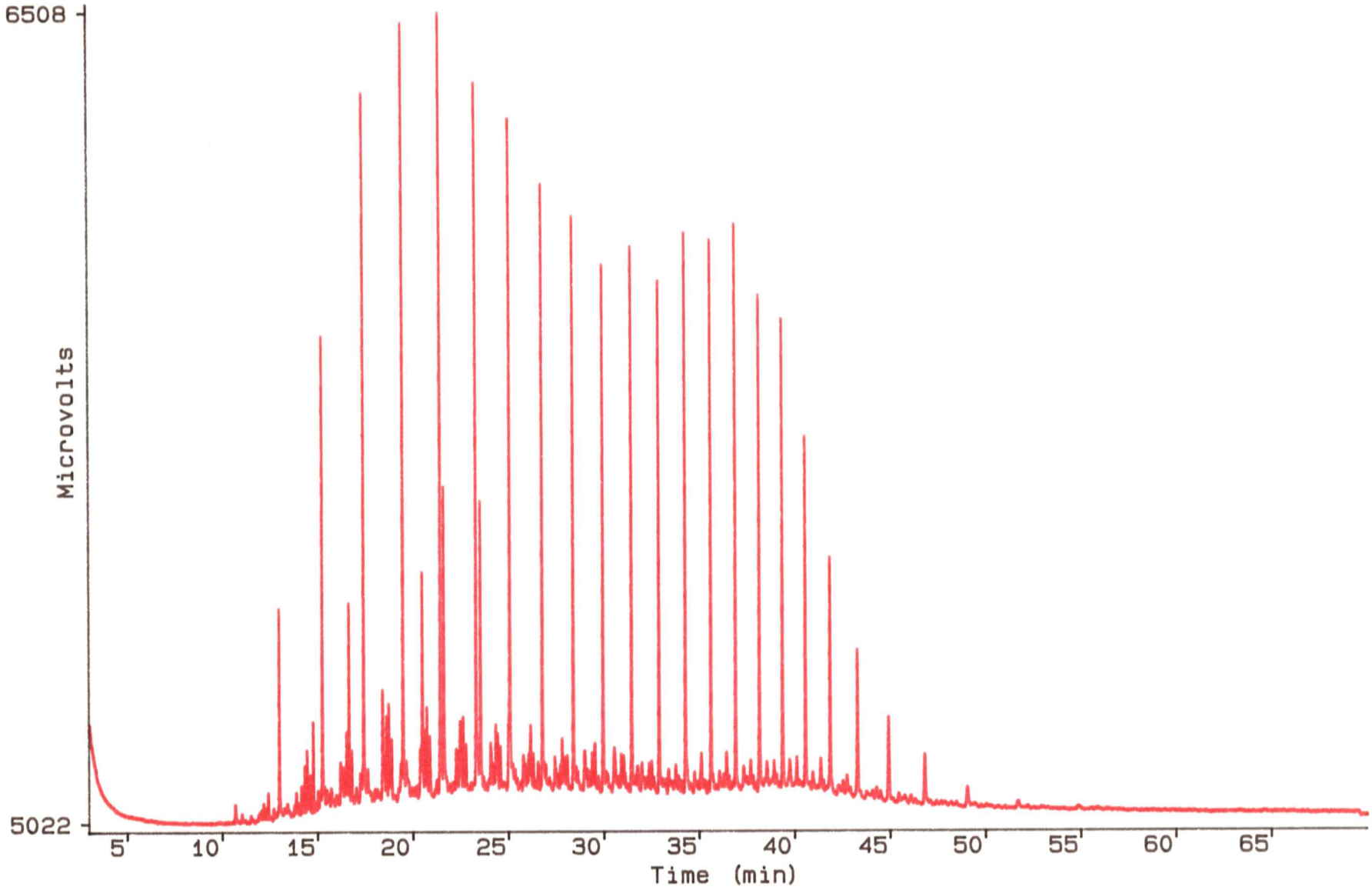

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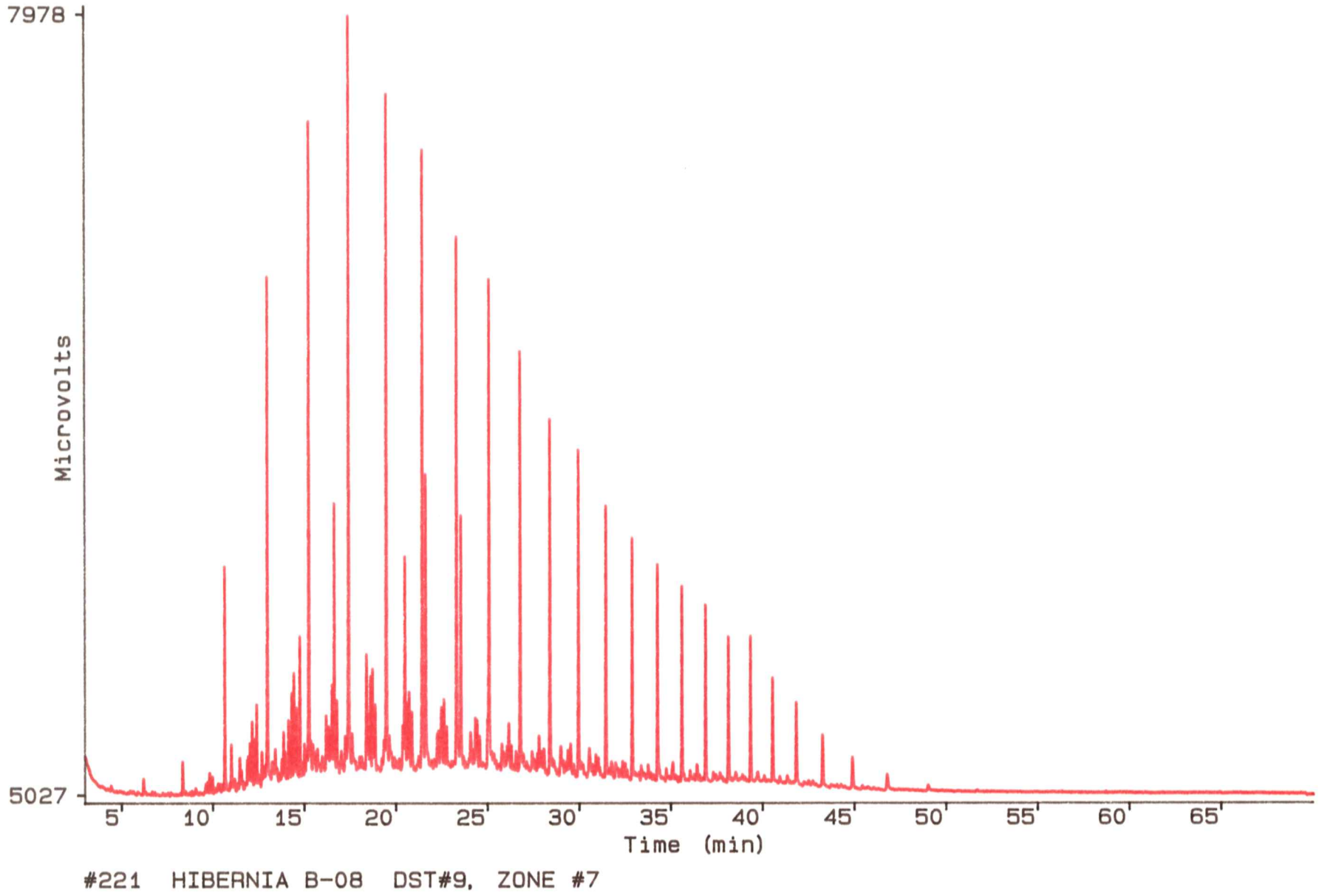

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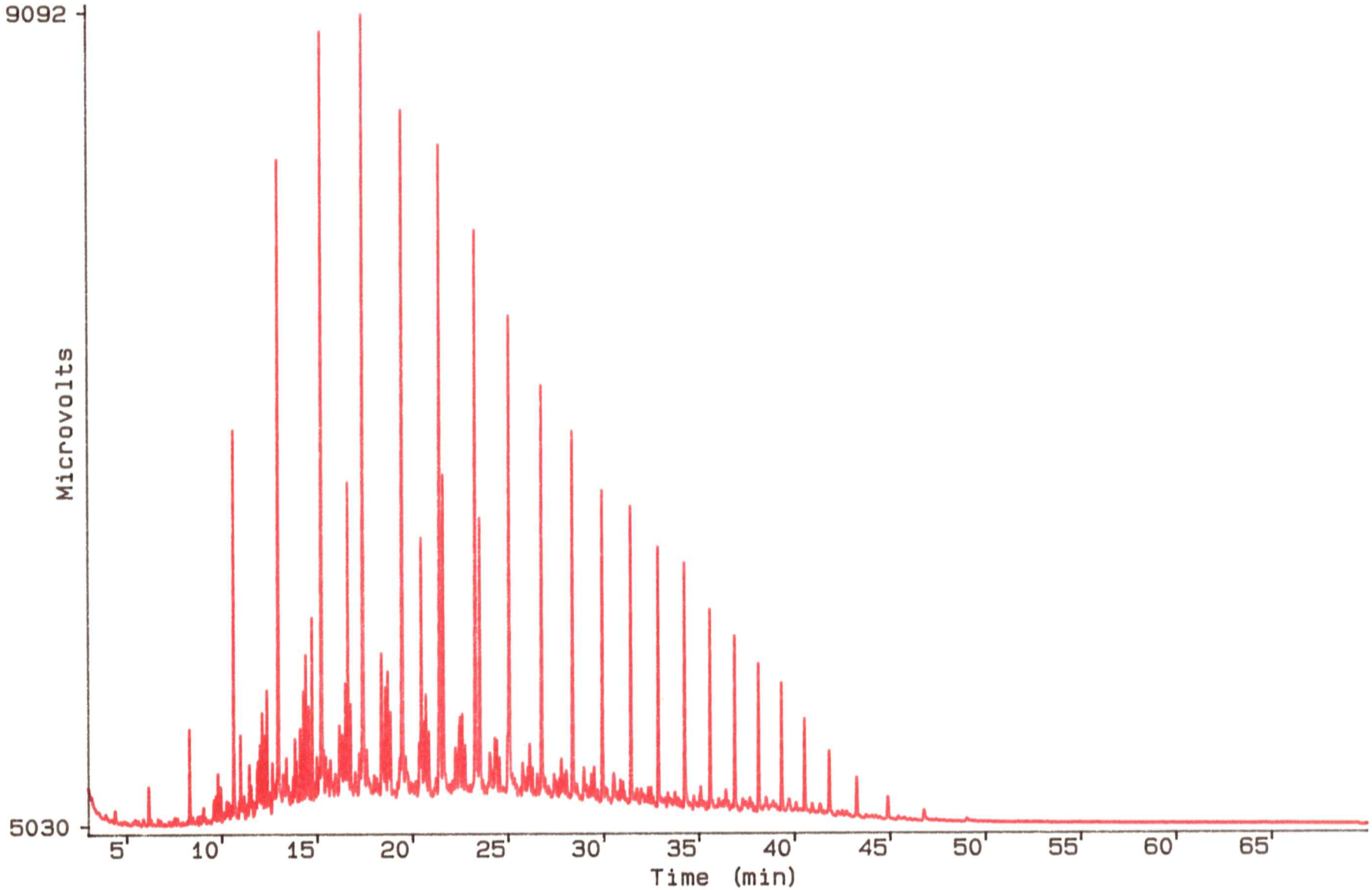

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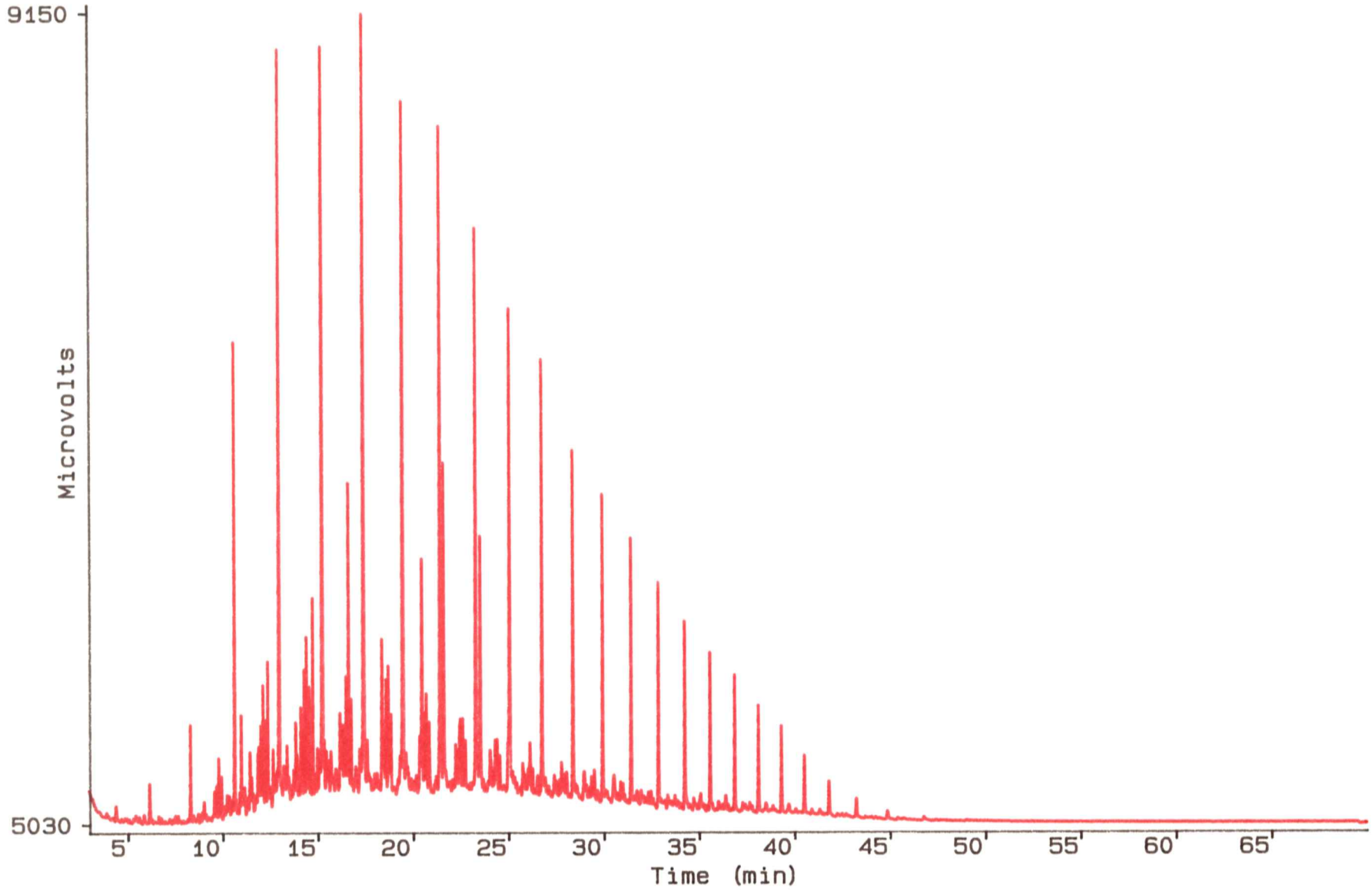

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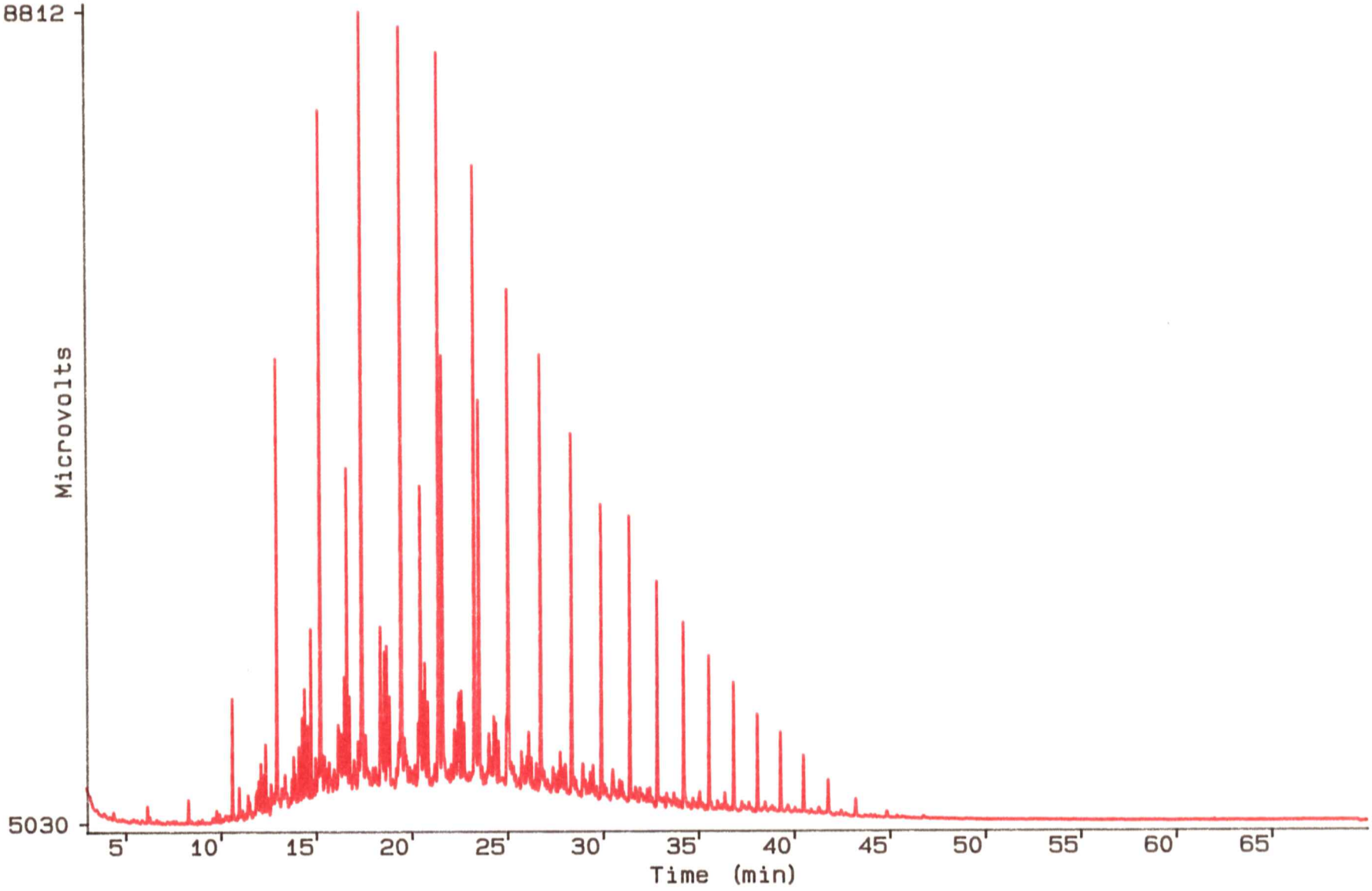

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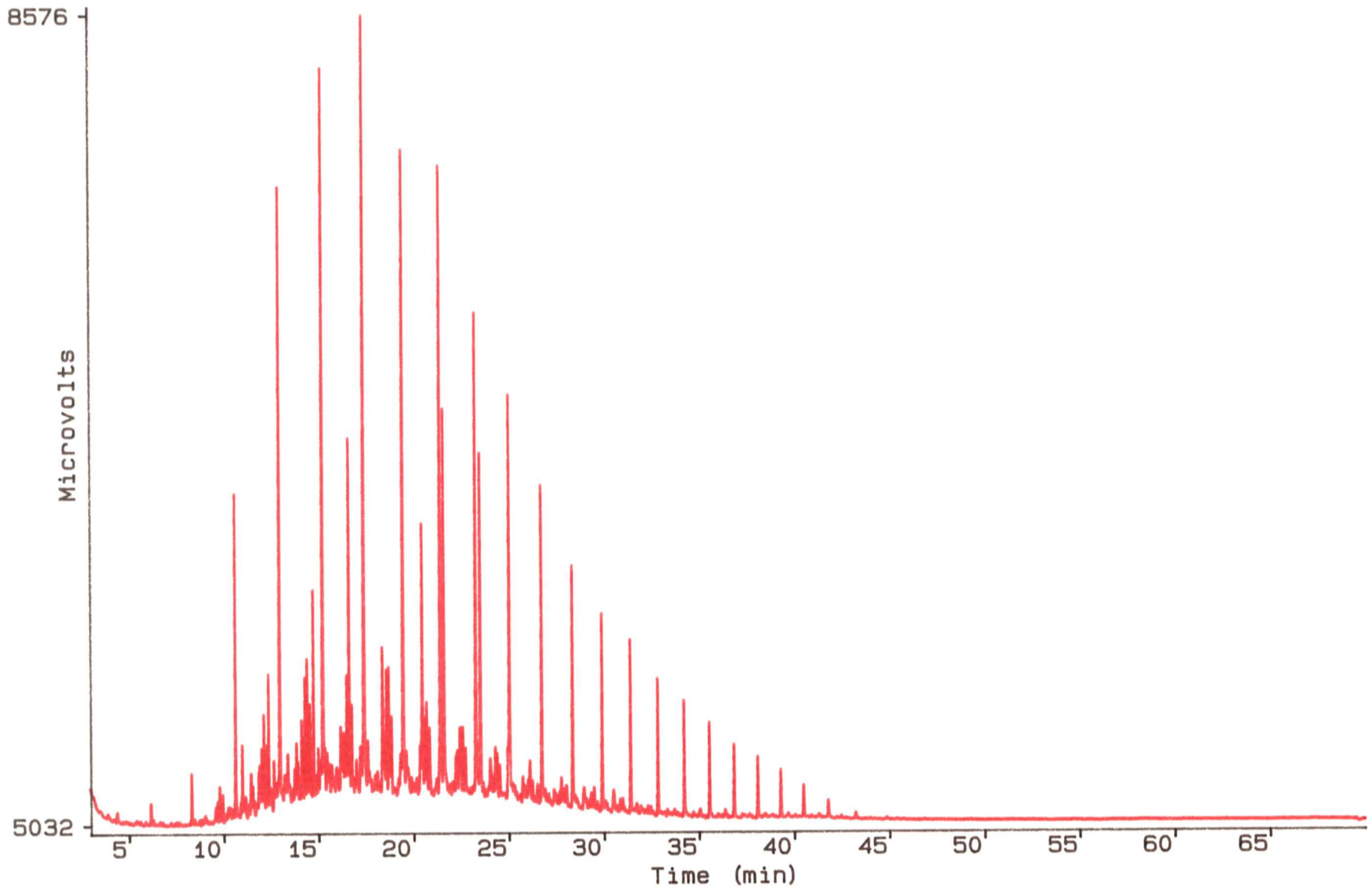

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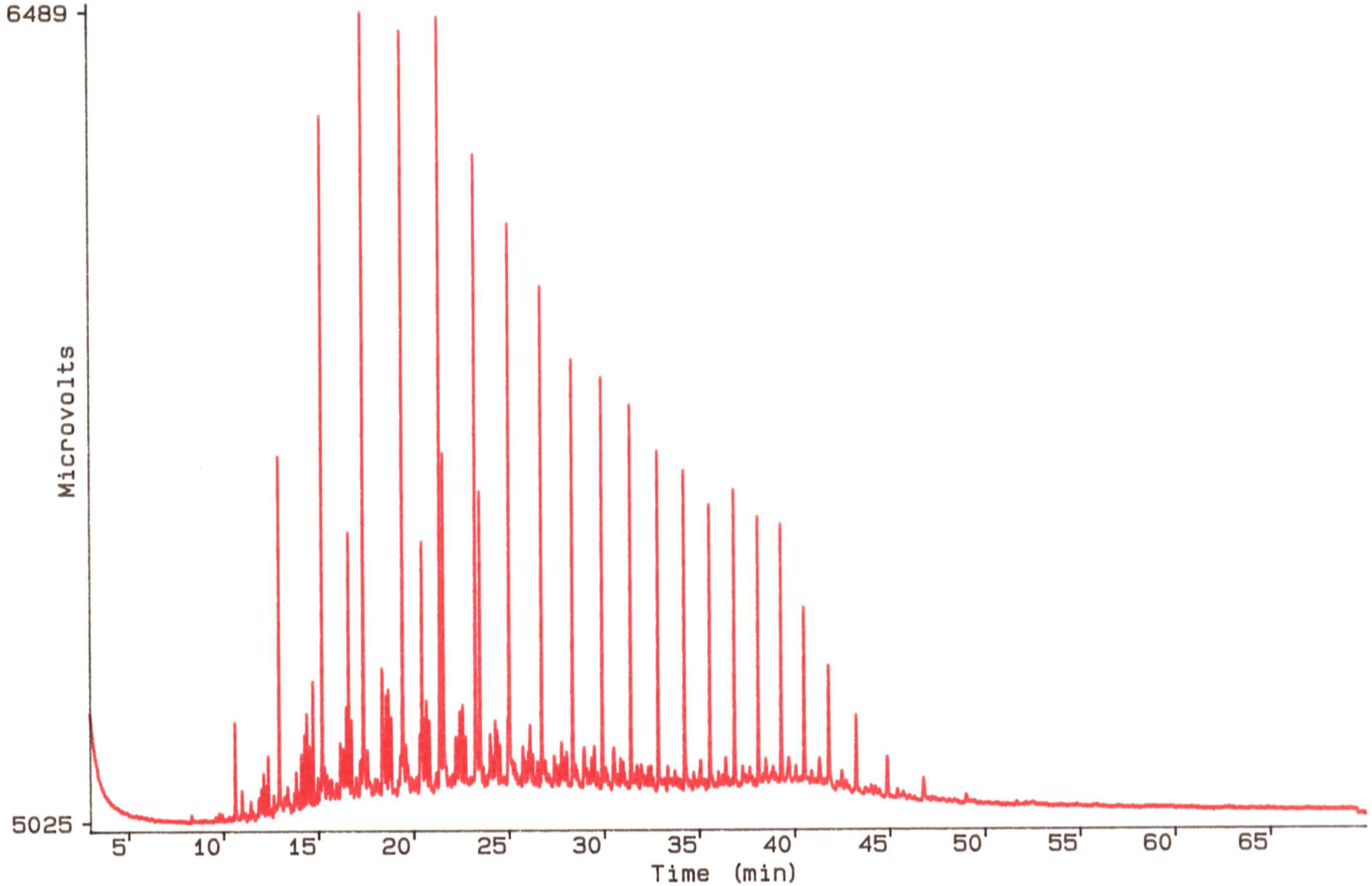

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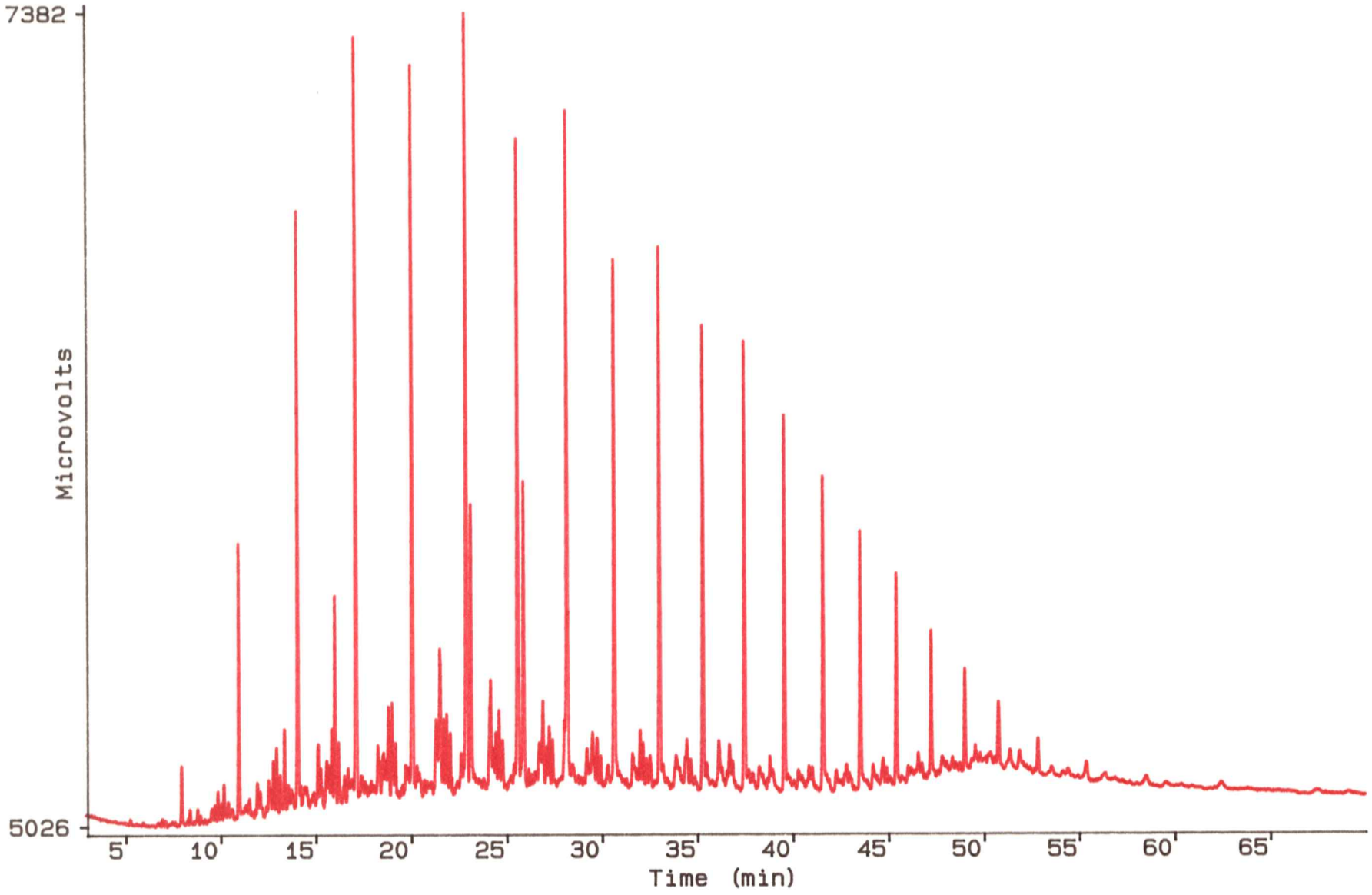

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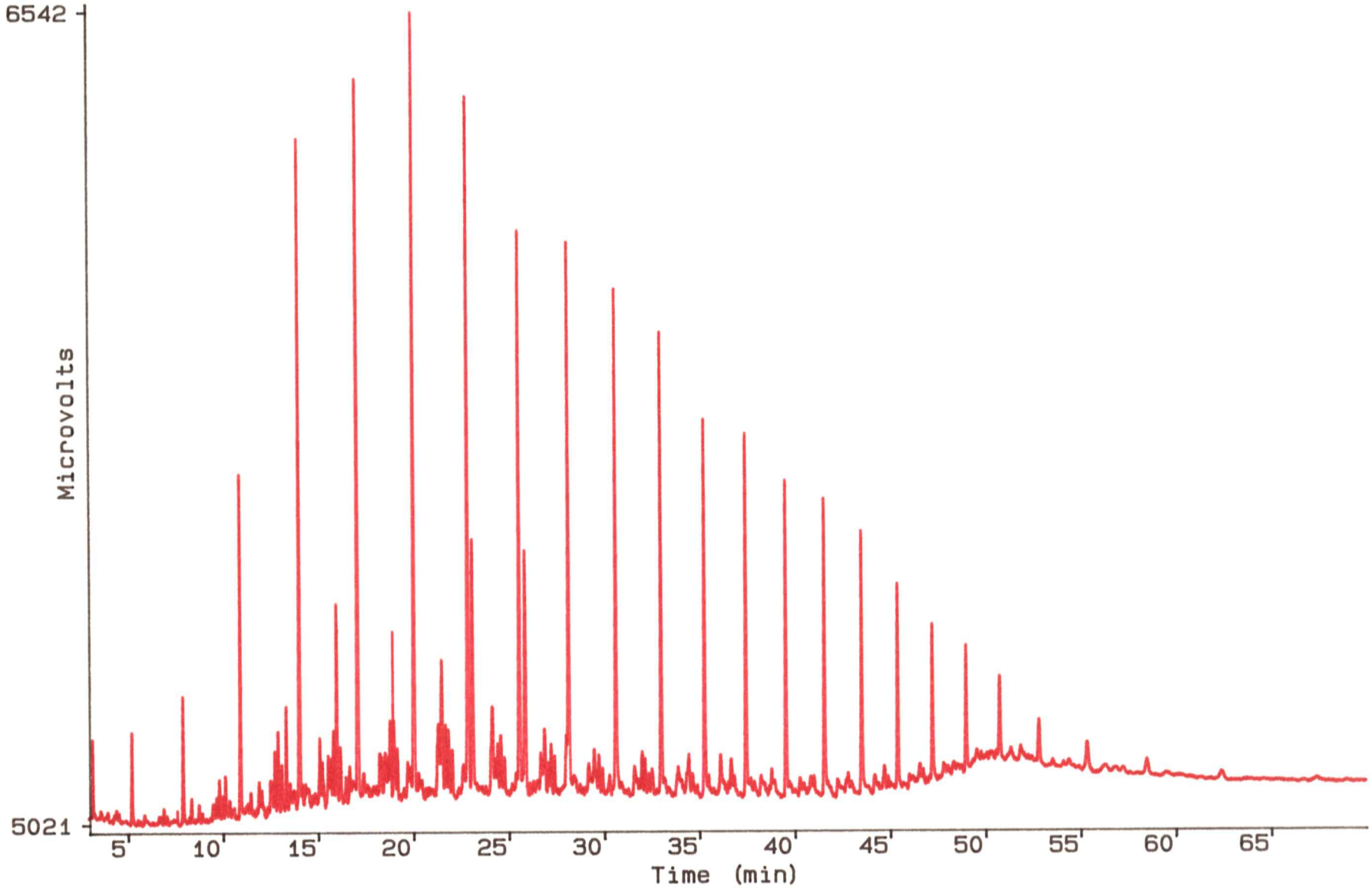

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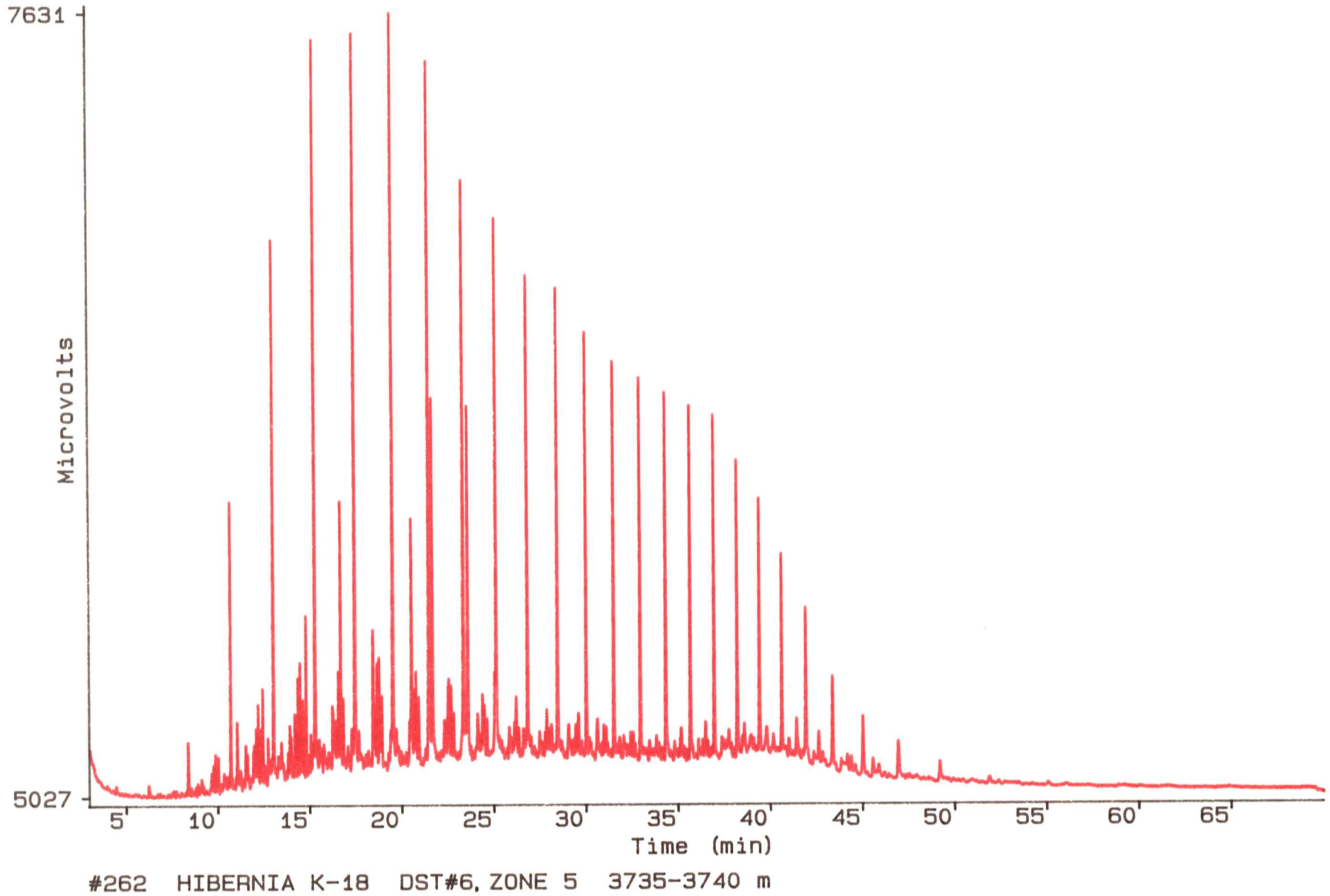

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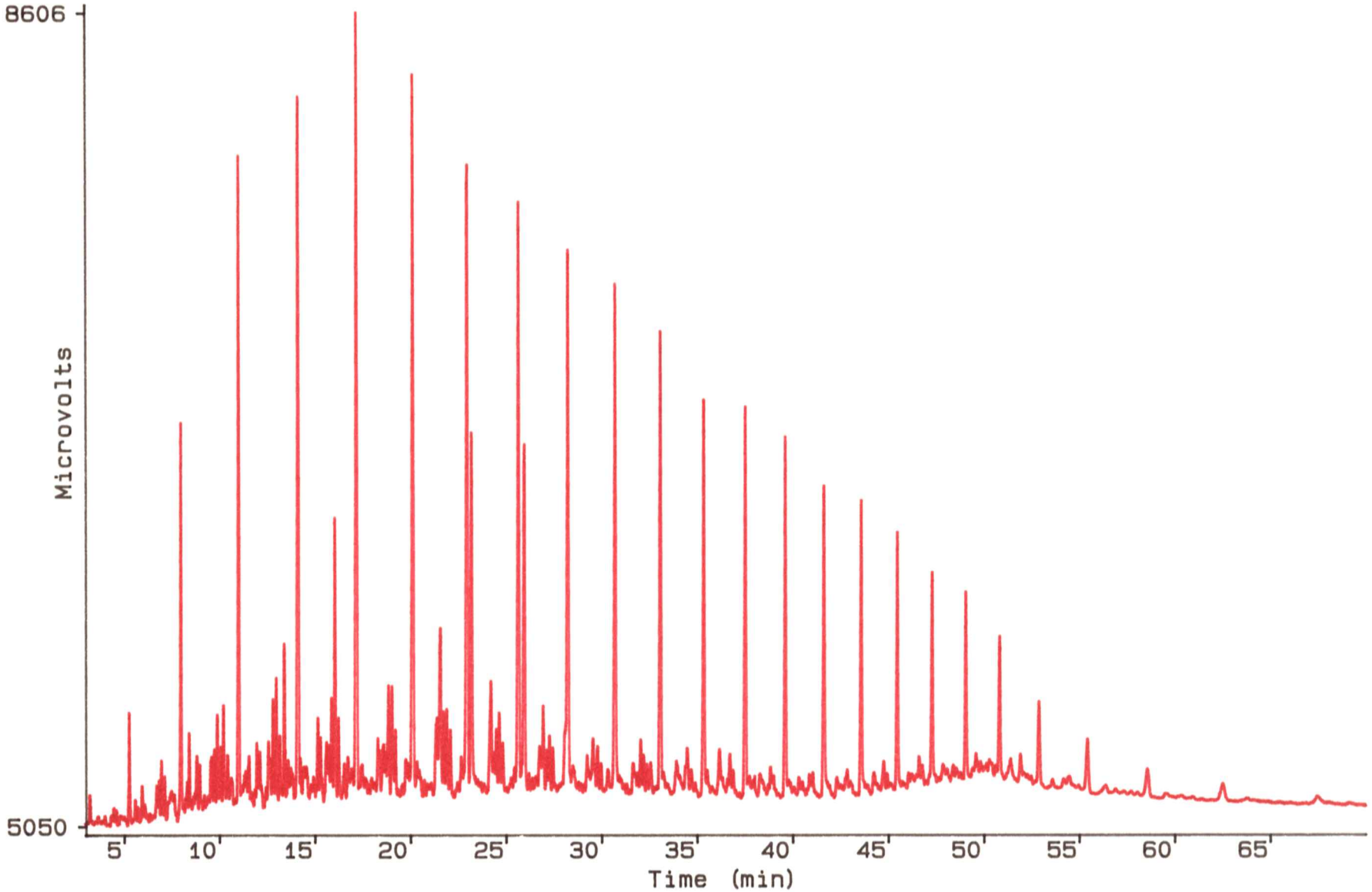

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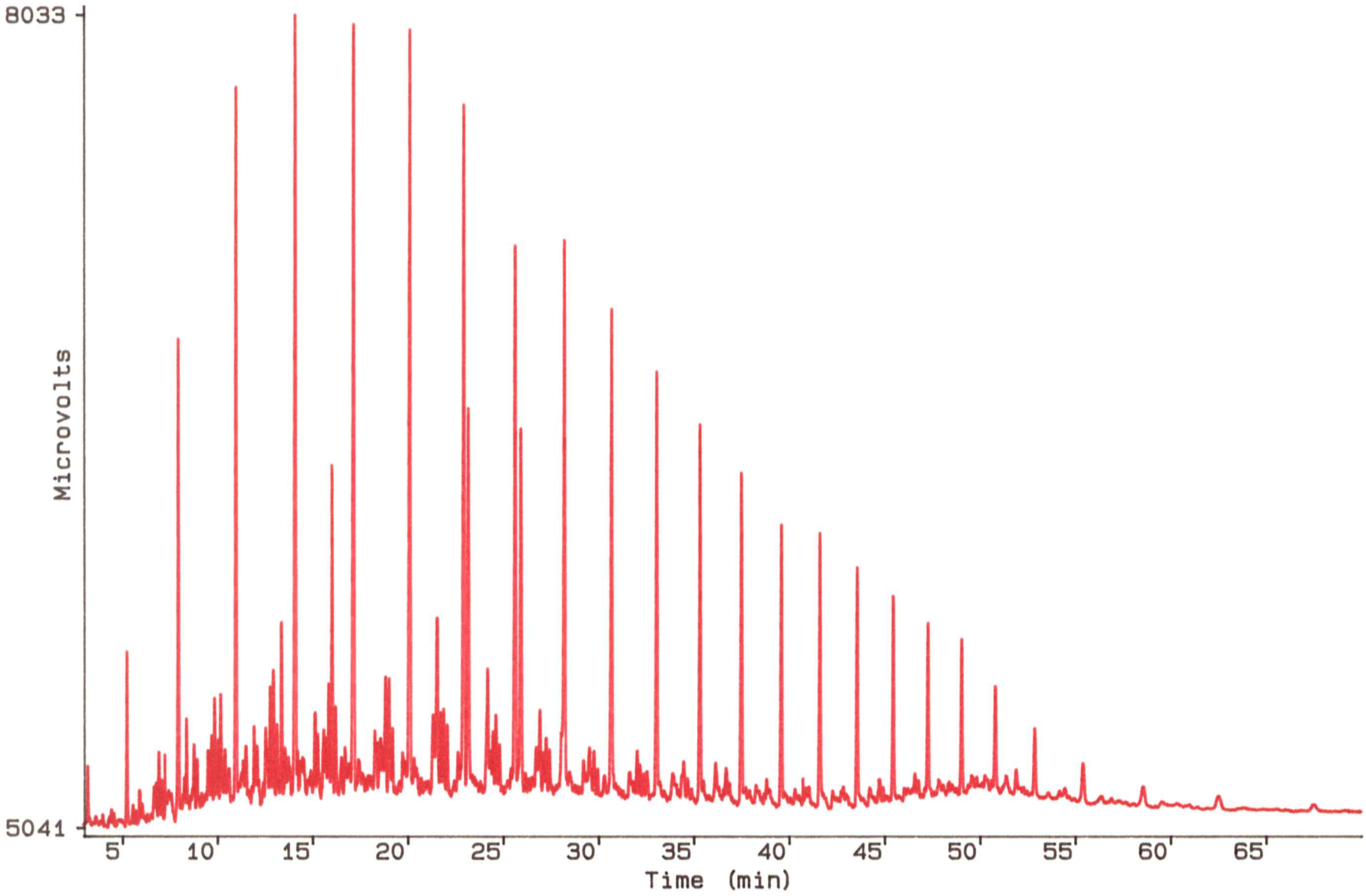

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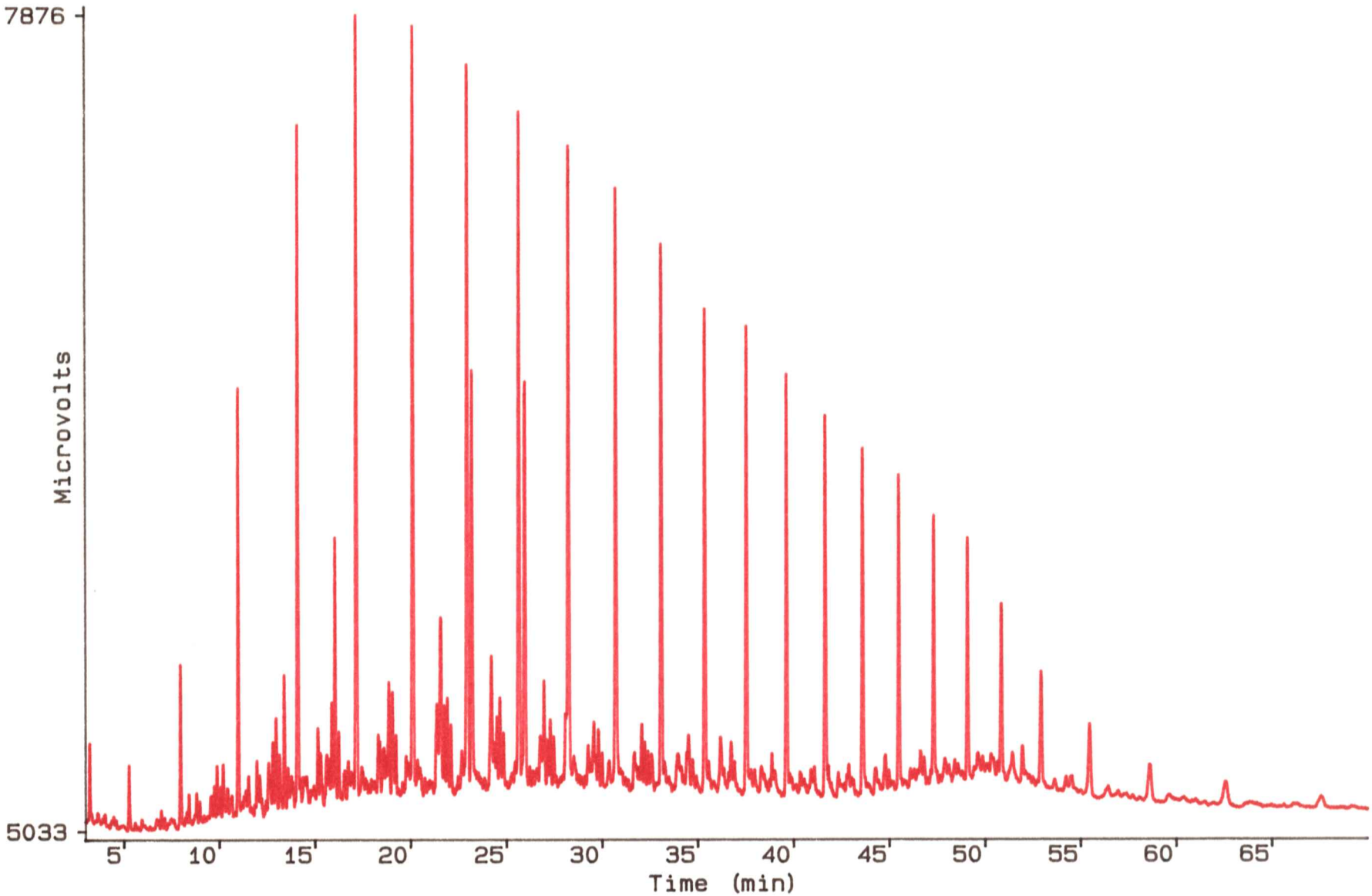

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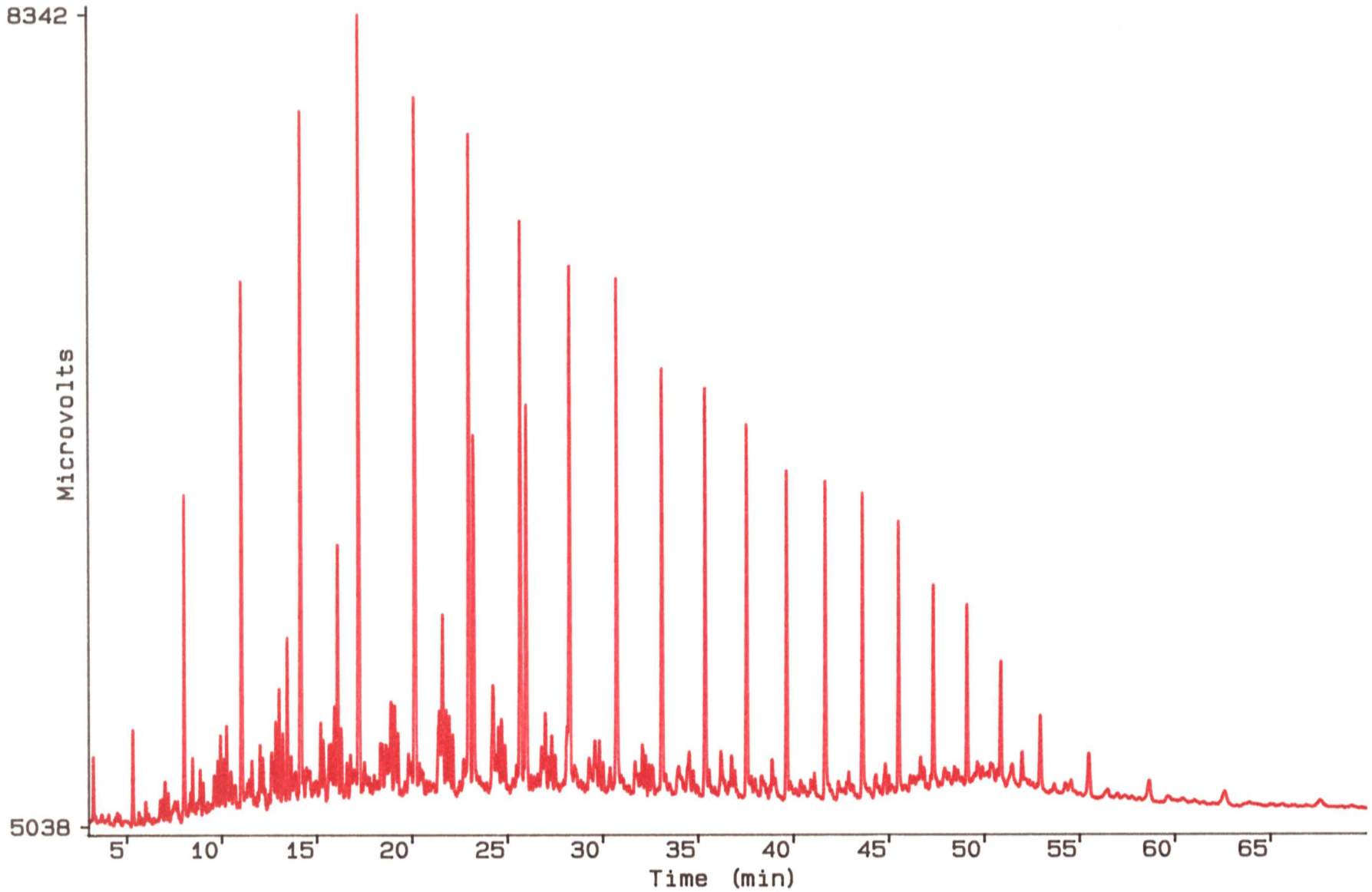
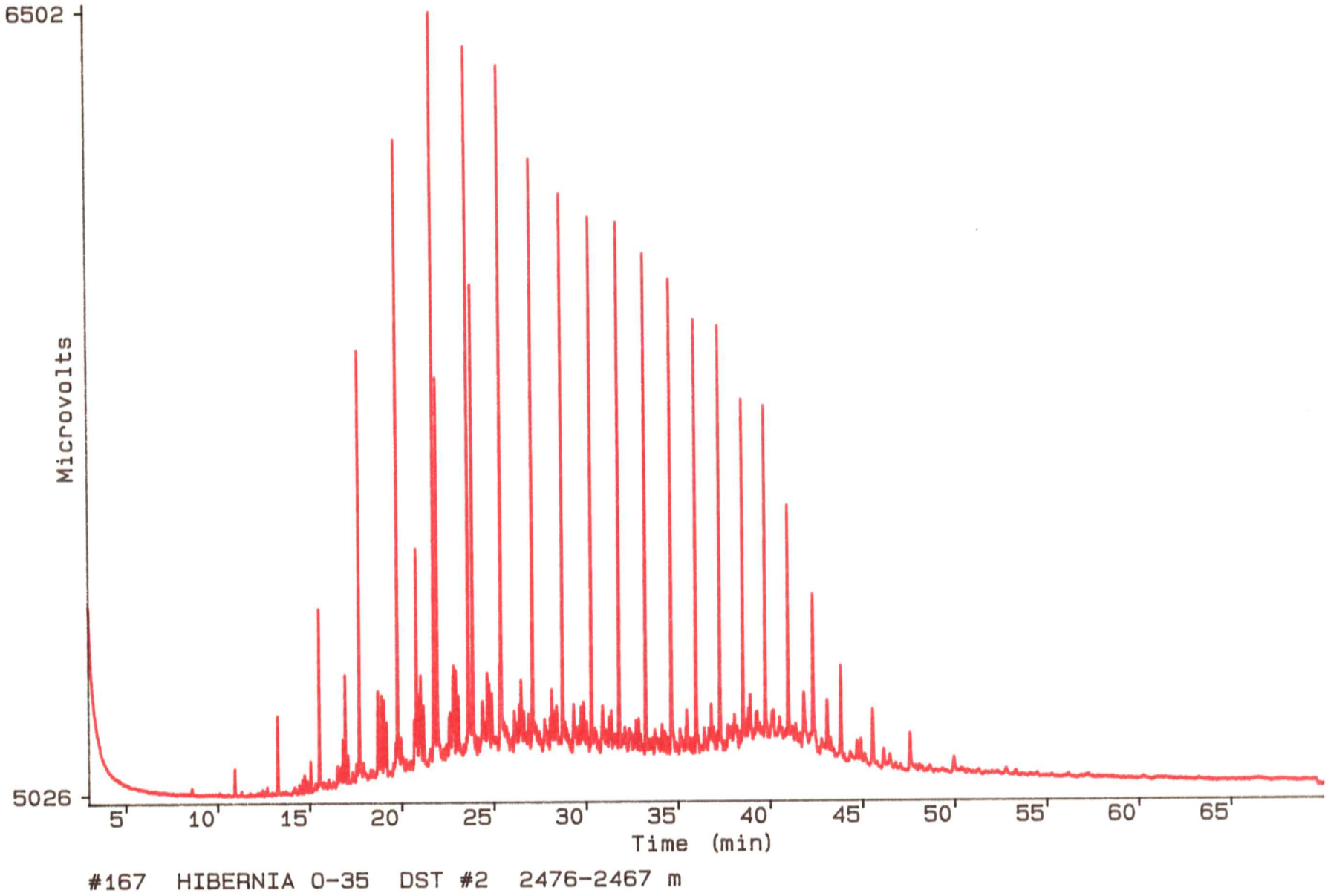
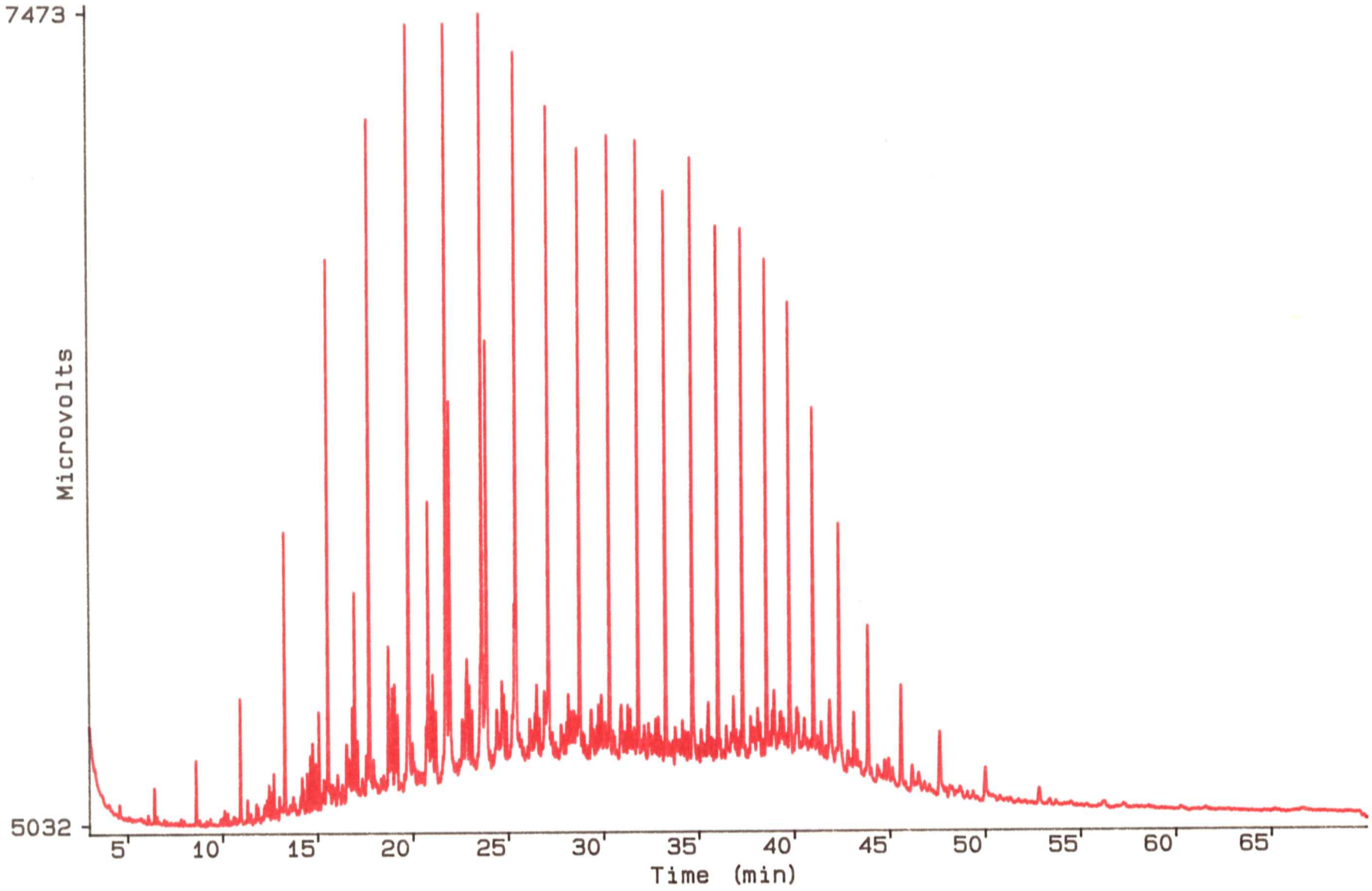


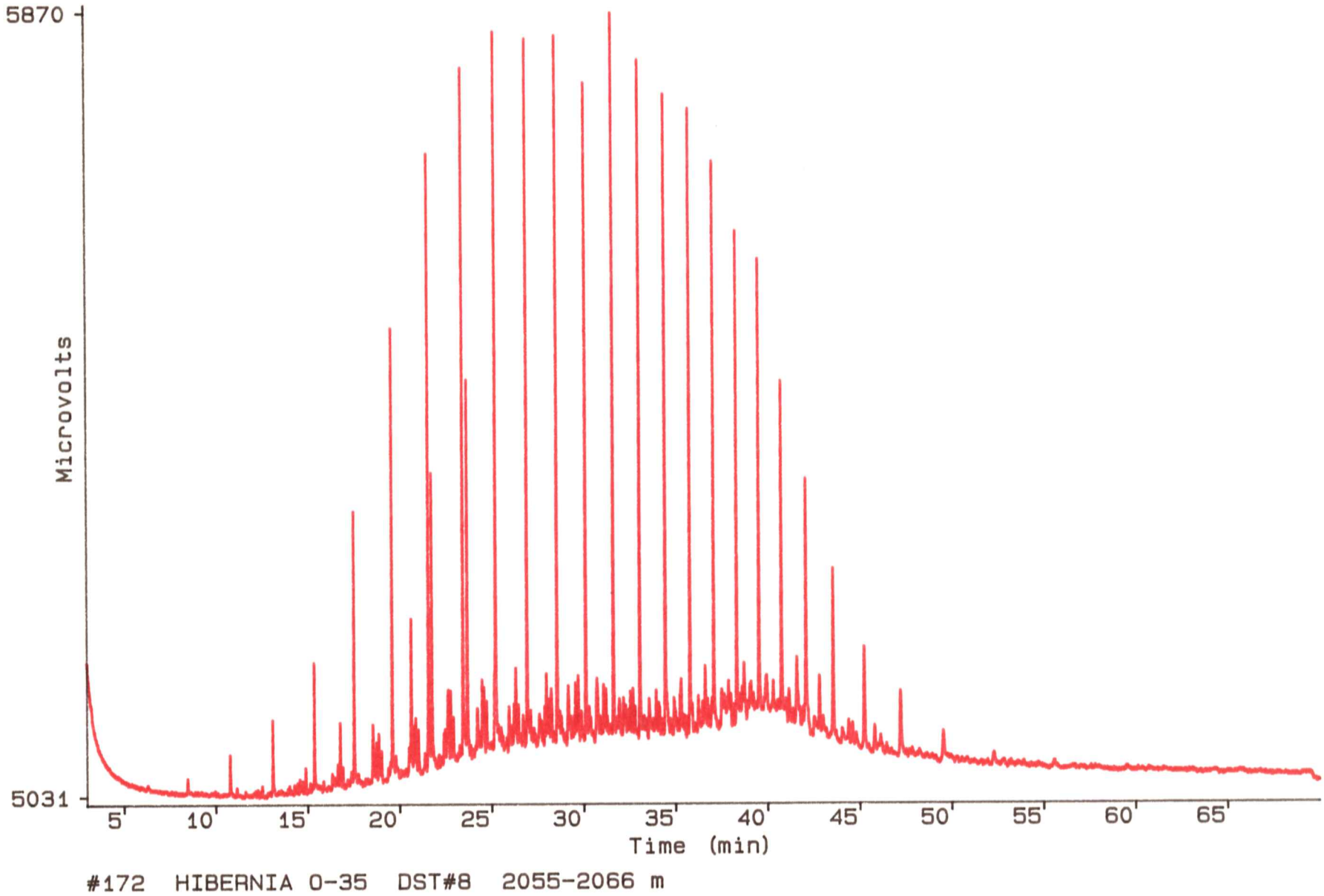
#265 HIBERNIA K-18 DST#13, ZONE#9, 2285-2294 m



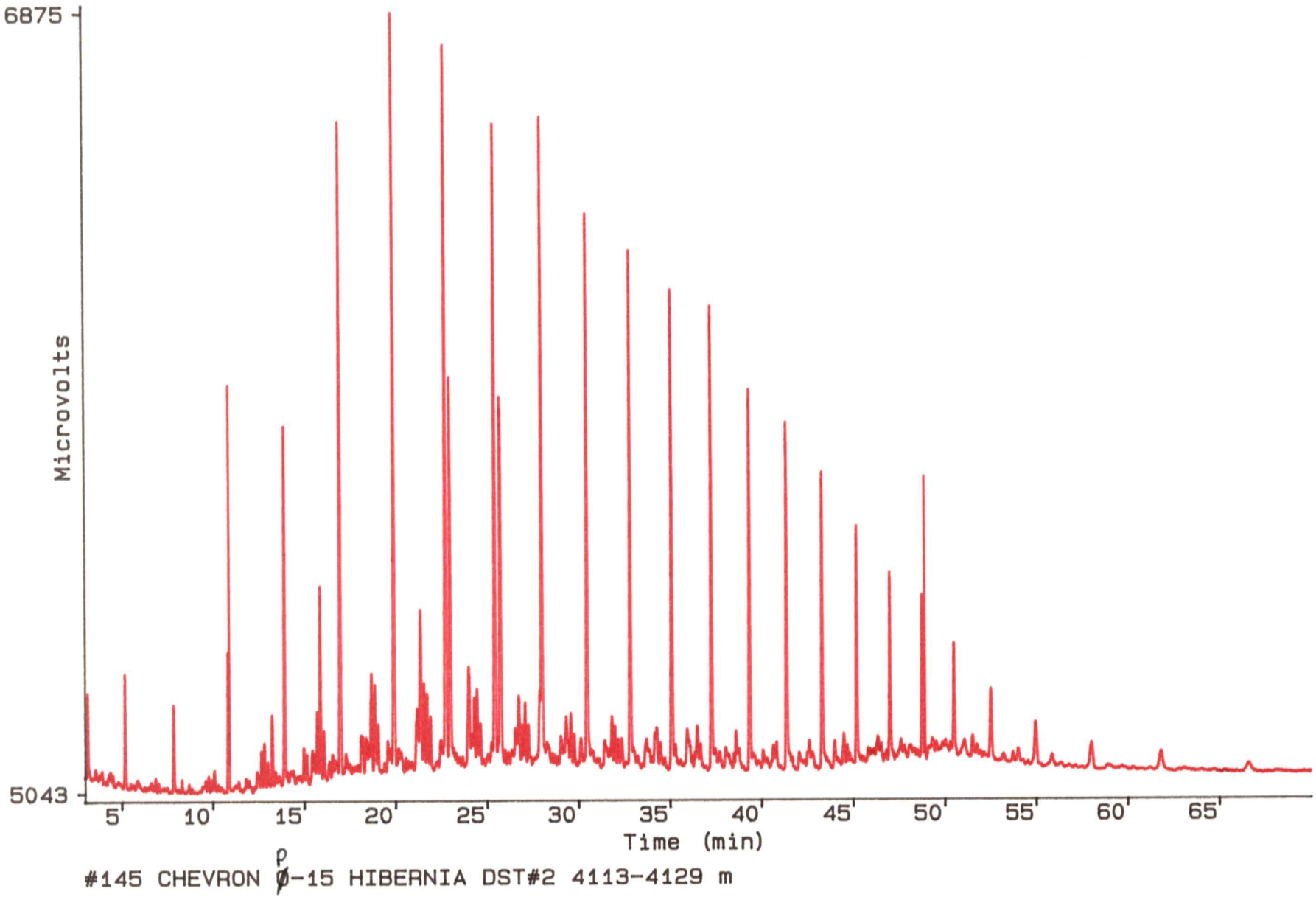
#167 HIBERNIA O-35 DST #2 2476-2467 m



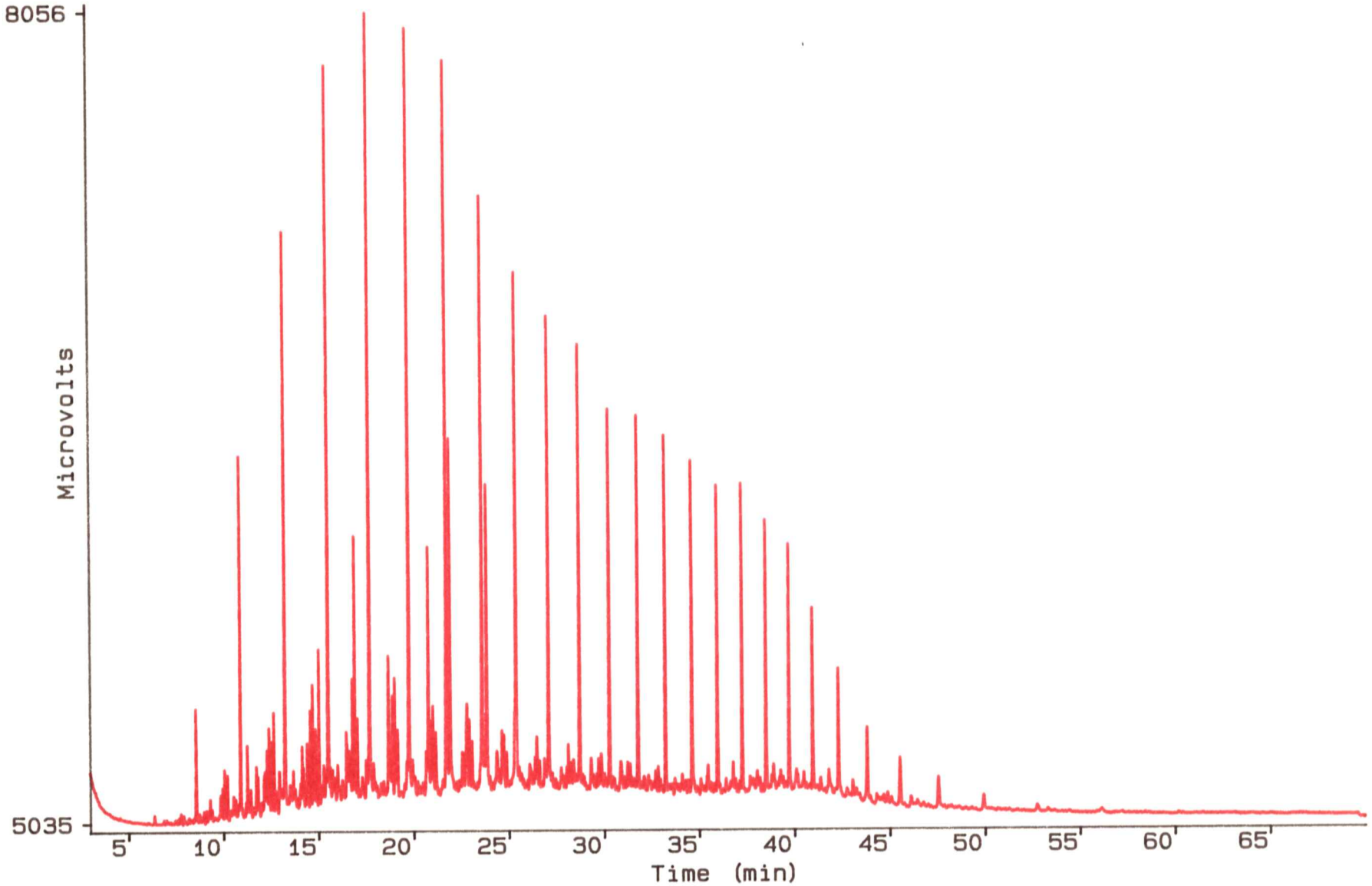
#171 HIBERNIA O-35 DST #6 2218.7-2226.3 m



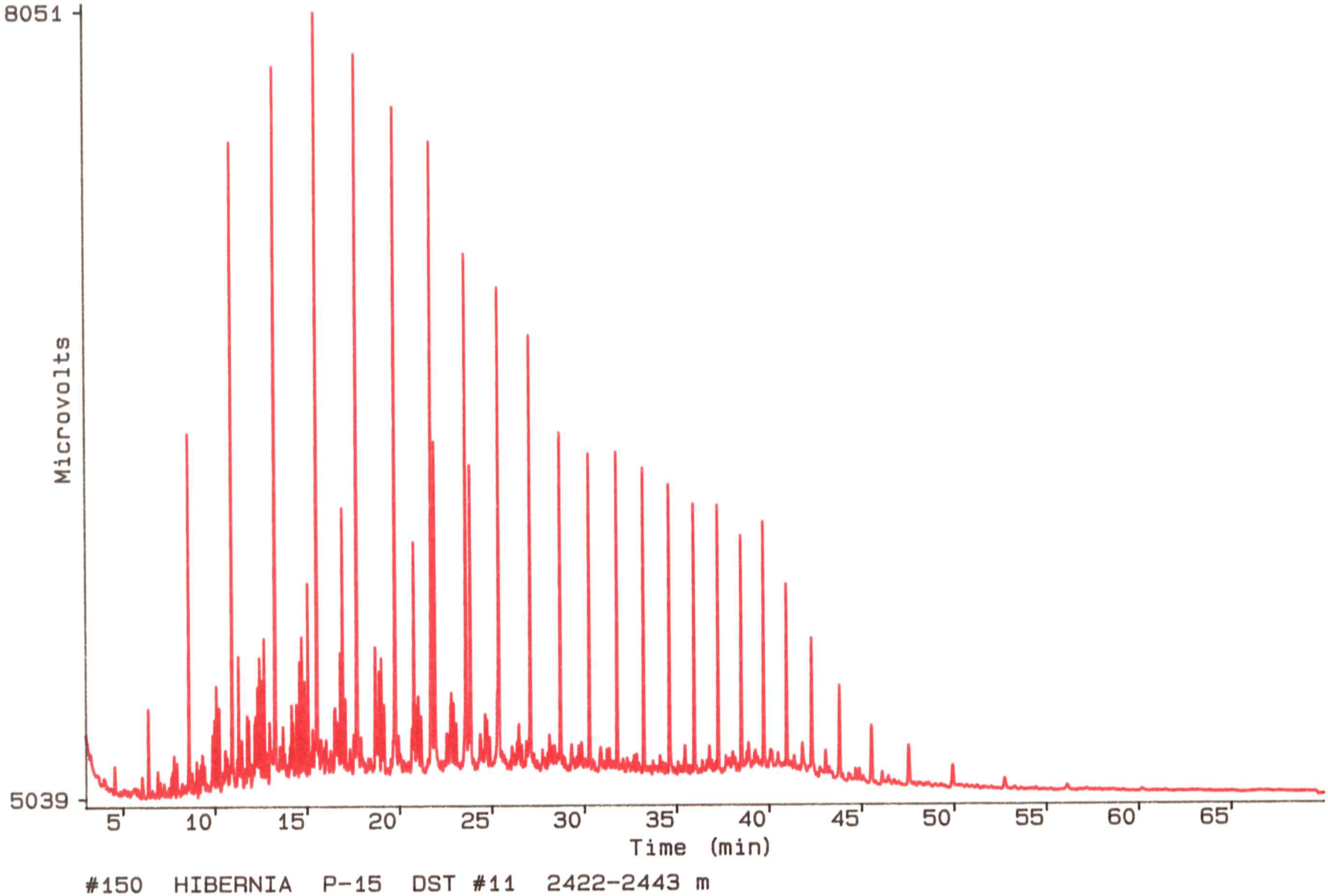
#172 HIBERNIA O-35 DST#8 2055-2066 m



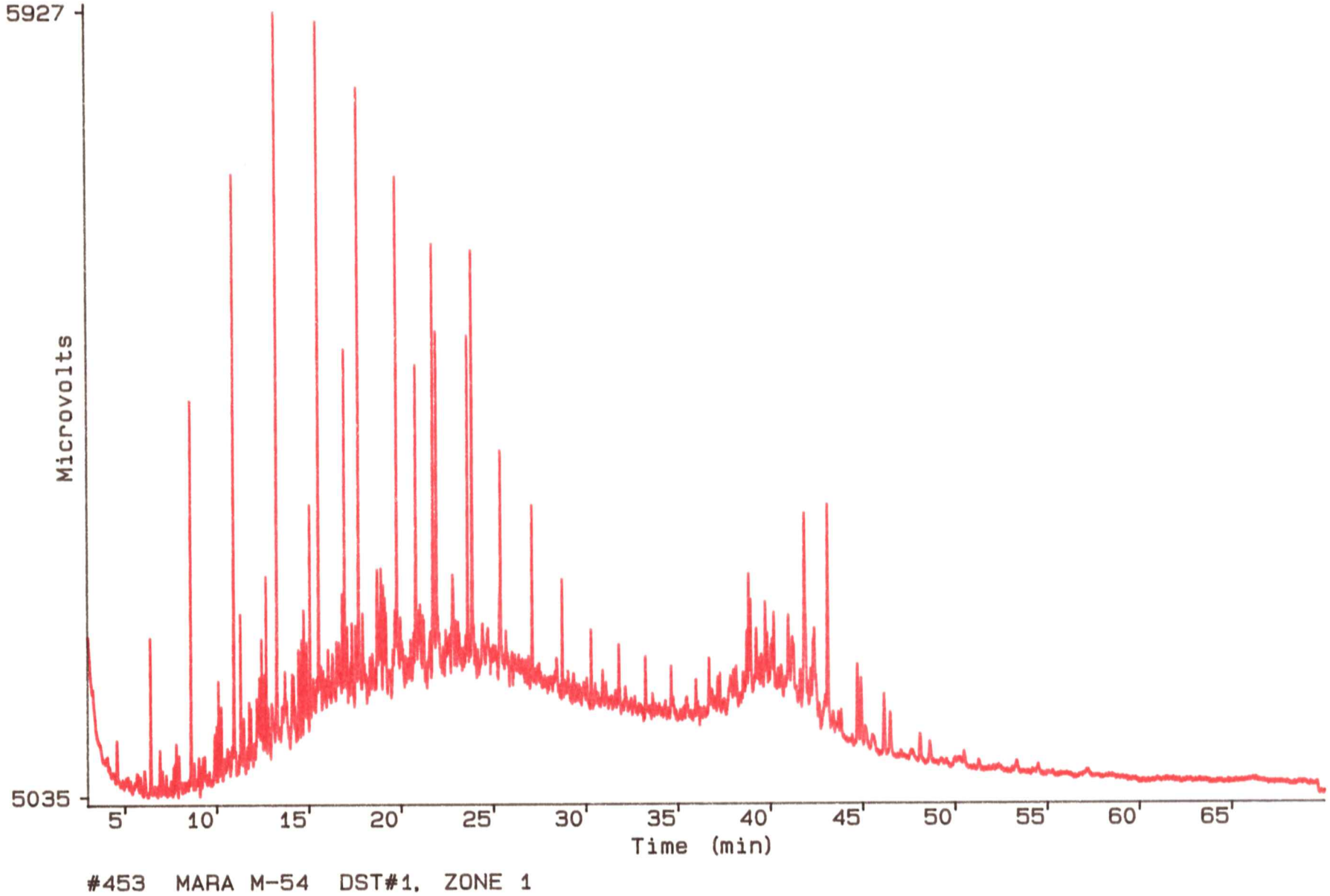
#145 CHEVRON Ø-15 HIBERNIA DST#2 4113-4129 m



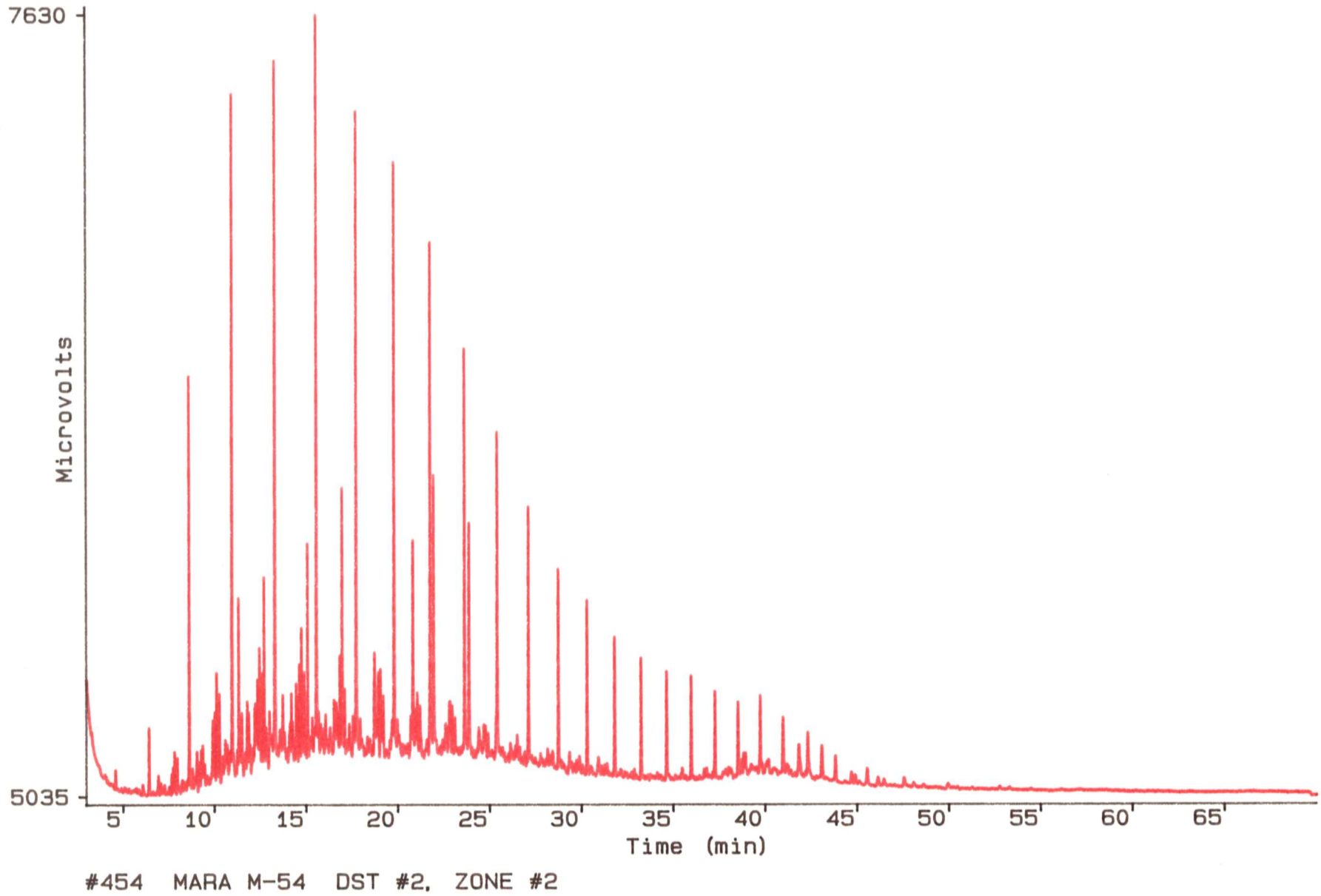
#152 HIBERNIA P-15 DST #8 3805-3822



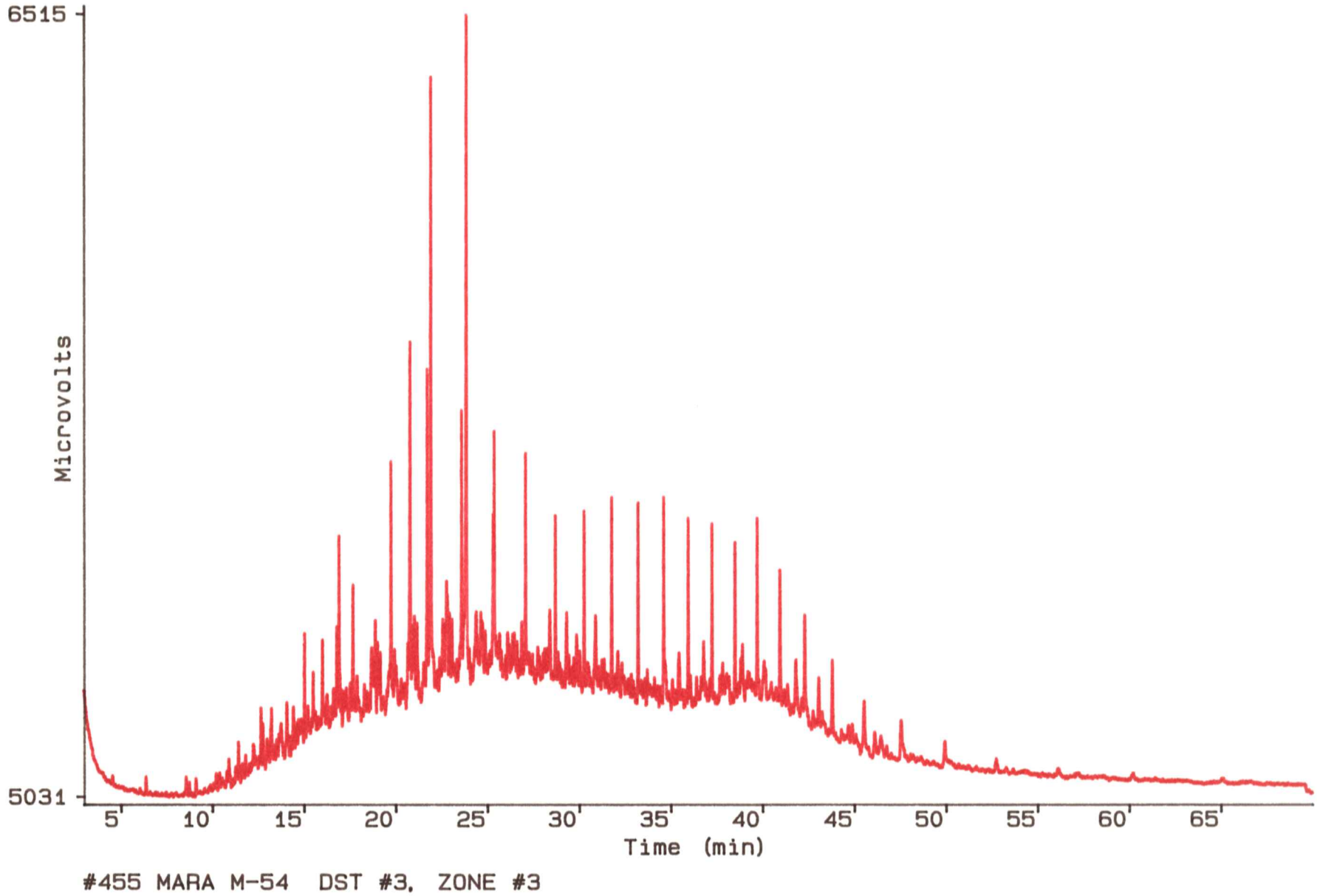
#150 HIBERNIA P-15 DST #11 2422-2443 m



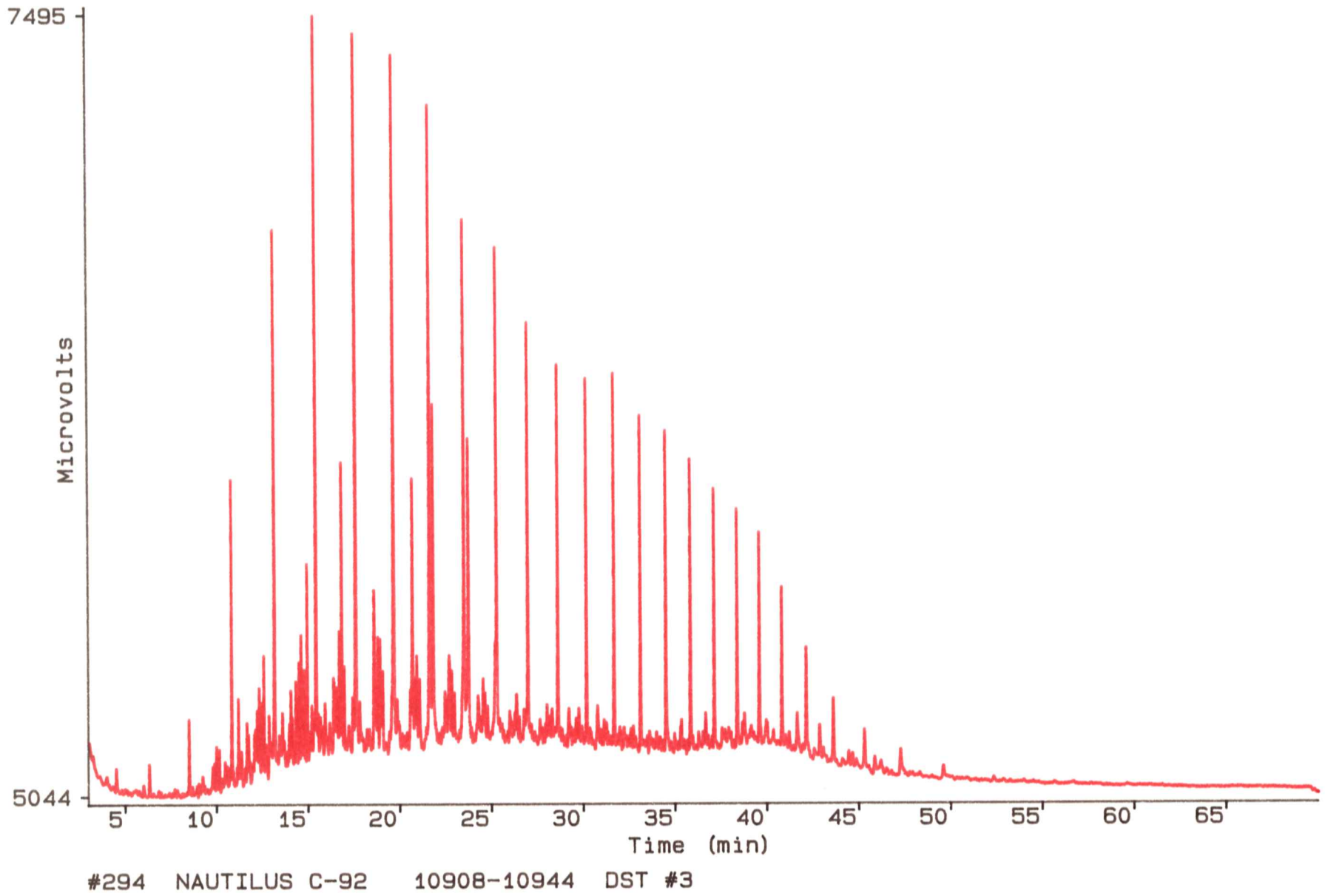
#453 MARA M-54 DST#1, ZONE 1

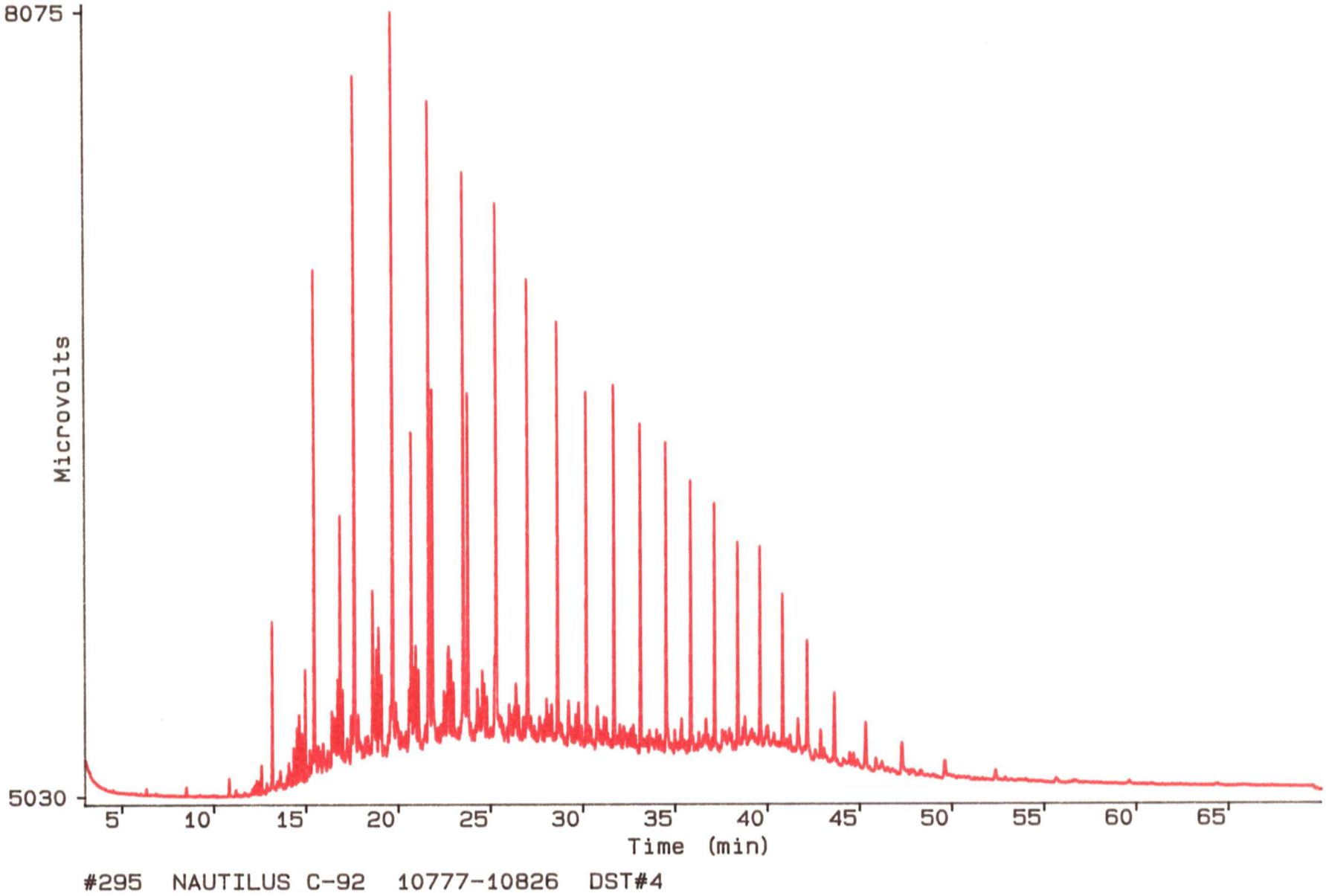


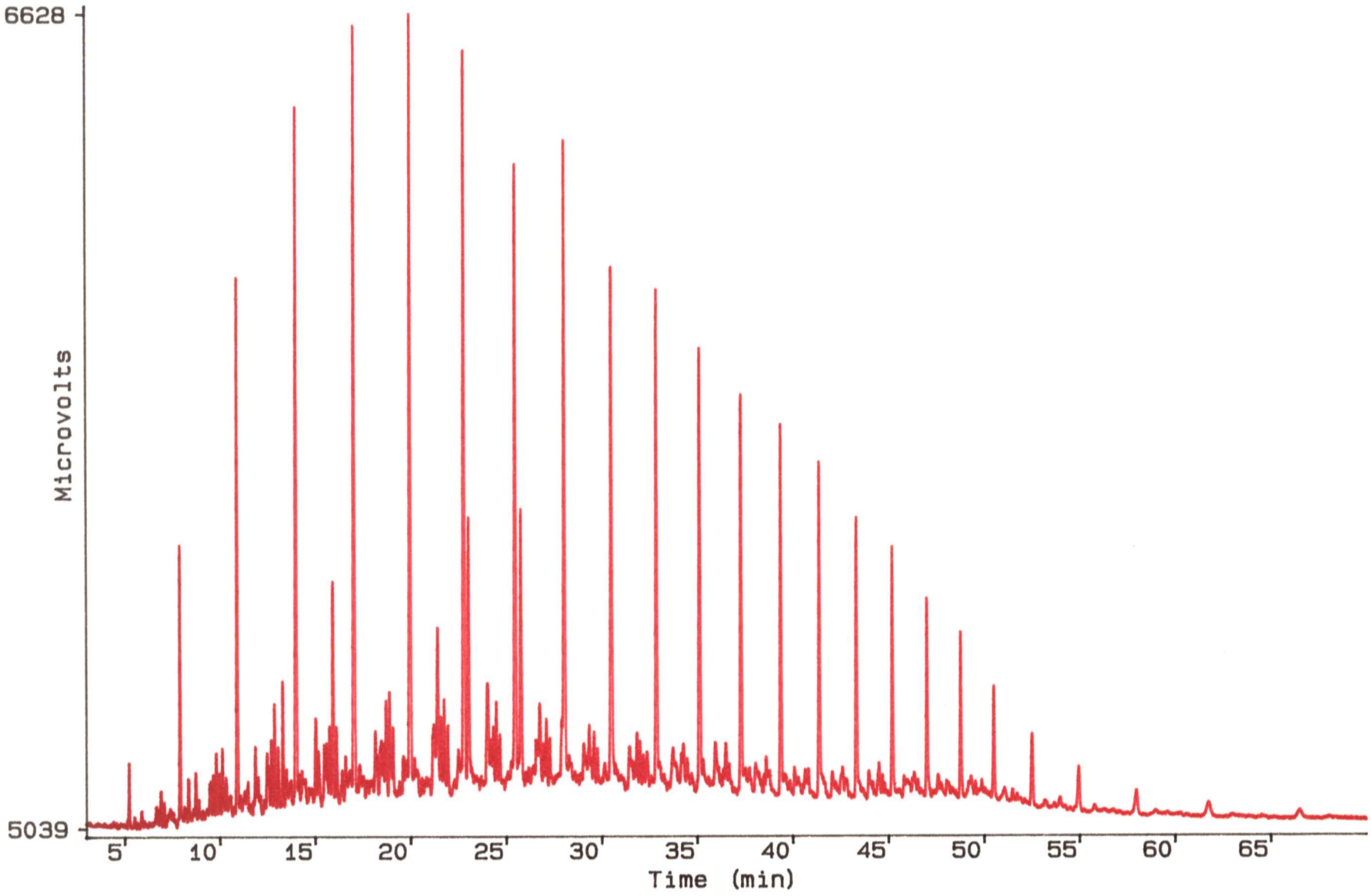
#454 MARA M-54 DST #2, ZONE #2



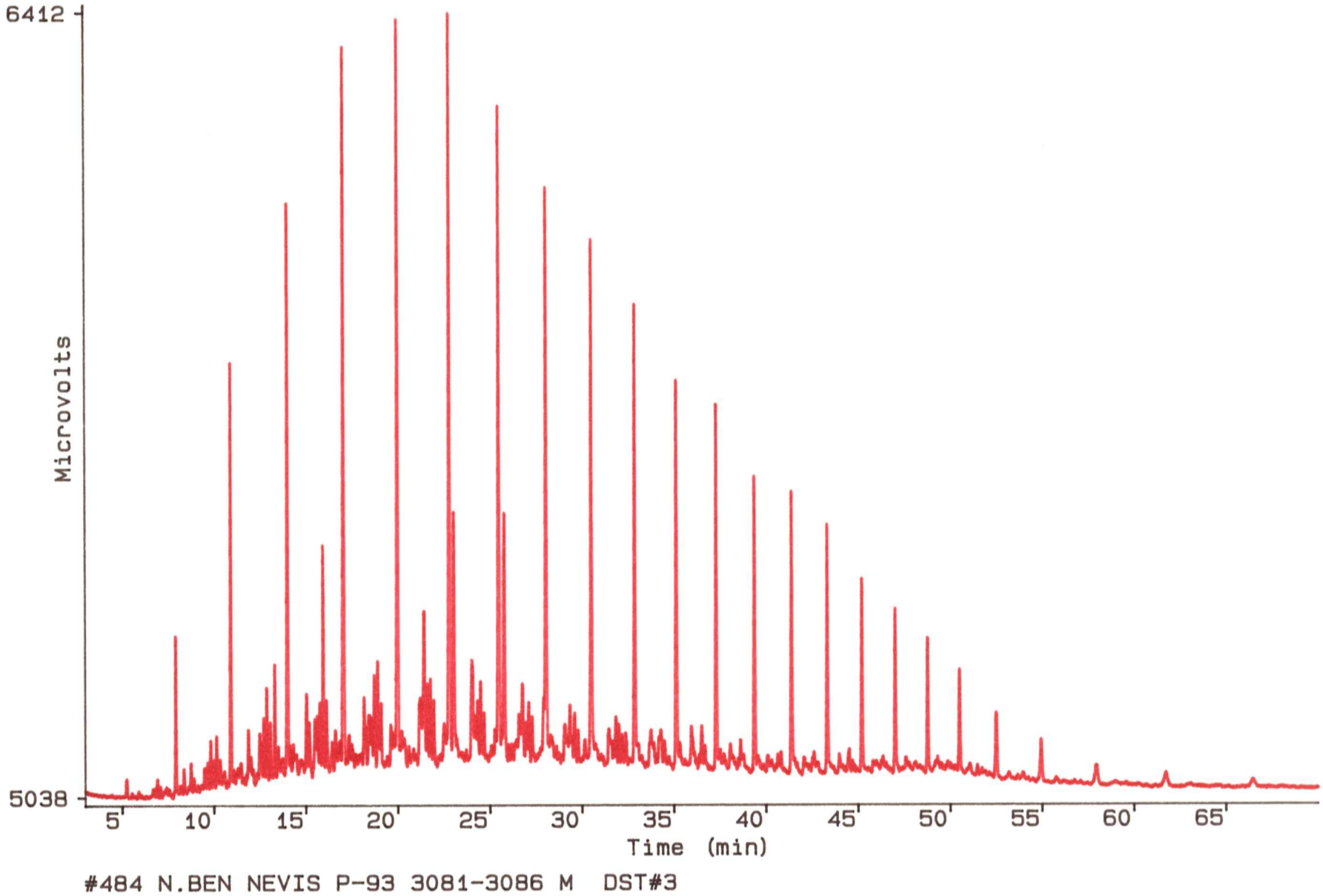
#455 MARA M-54 DST #3, ZONE #3

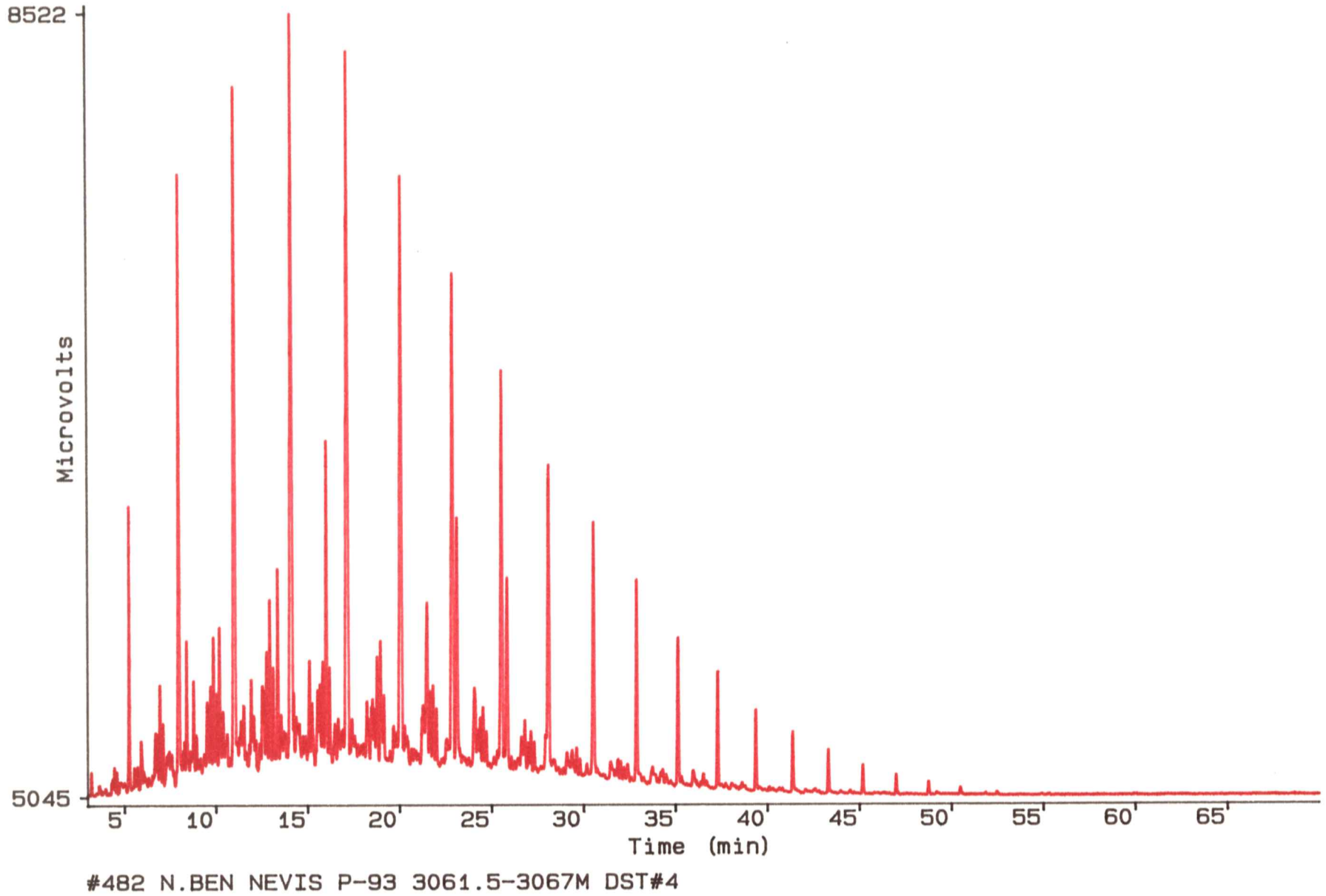

7495
5044
Microvolts
5
10
15
20
25
30
35
40
45
50
55
60
65
Time (min)
#294 NAUTILUS C-92 10908-10944 DST #3


8075
5030
Microvolts
5
10
15
20
25
30
35
40
45
50
55
60
65
Time (min)
#295 NAUTILUS C-92 10777-10826 DST#4

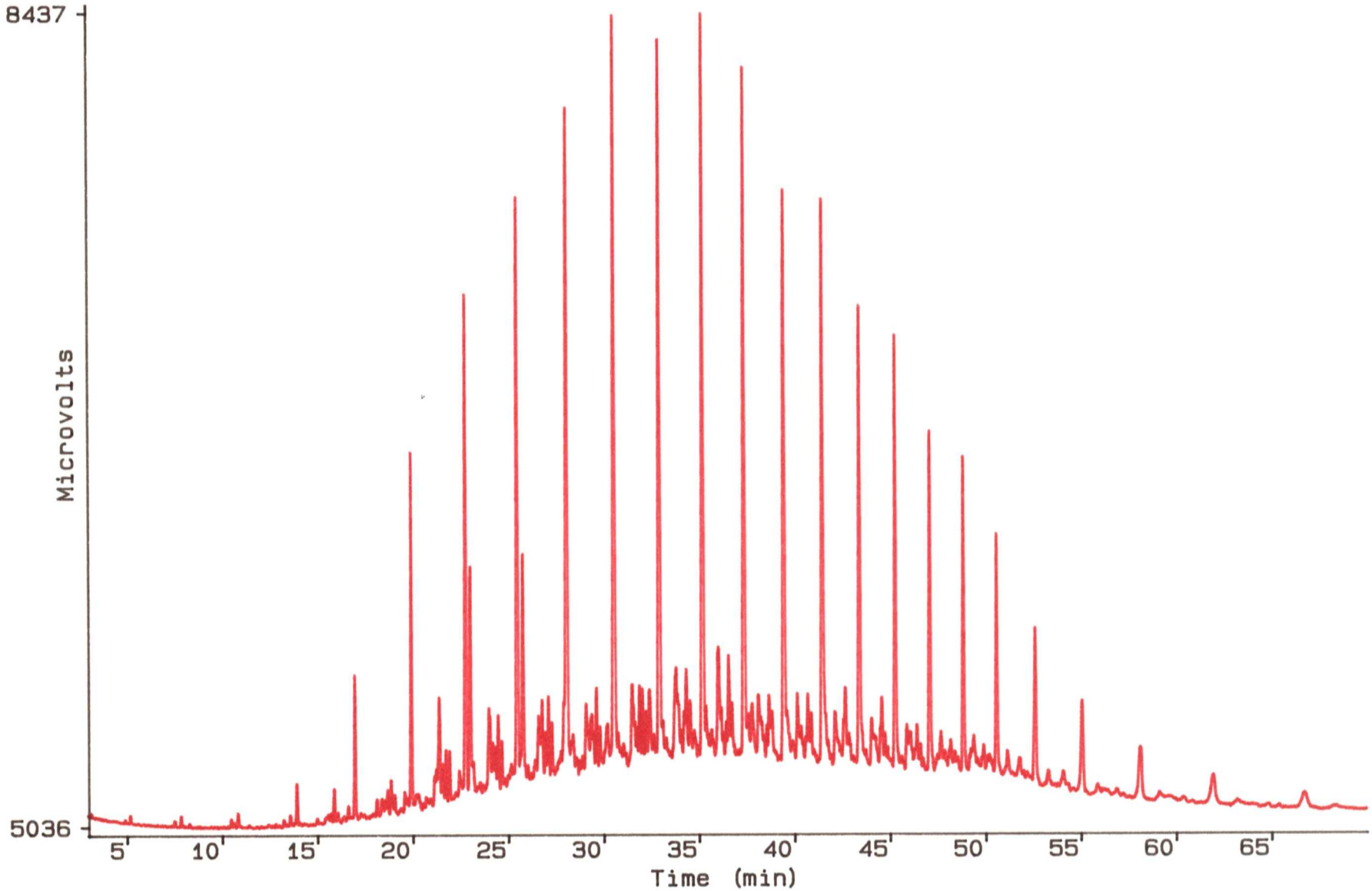


#483 N.BEN NEVIS P-93 3090-3095 M DST#2A

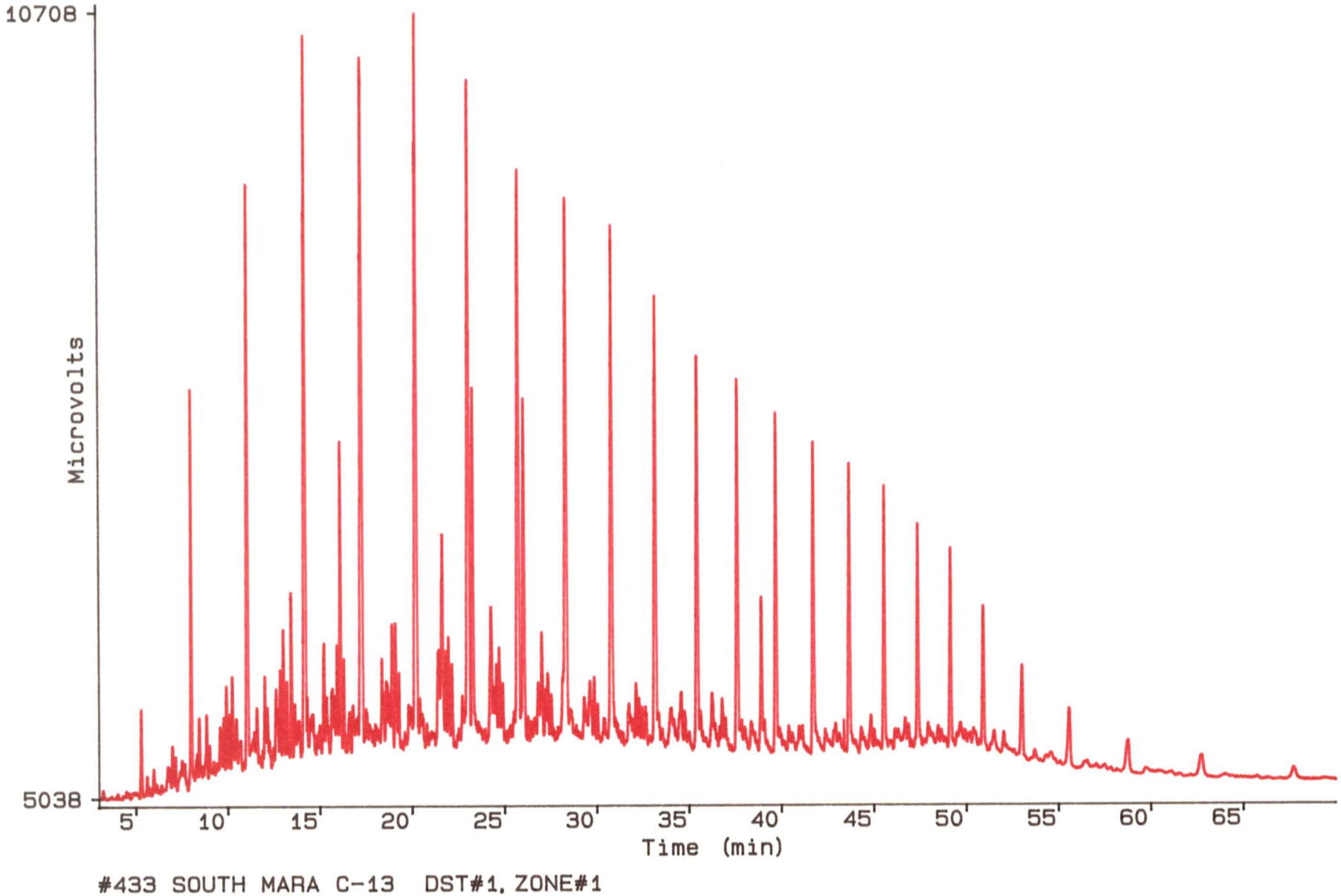

6412
5038
Microvolts
5
10
15
20
25
30
35
40
45
50
55
60
65
Time (min)
#484 N.BEN NEVIS P-93 3081-3086 M DST#3



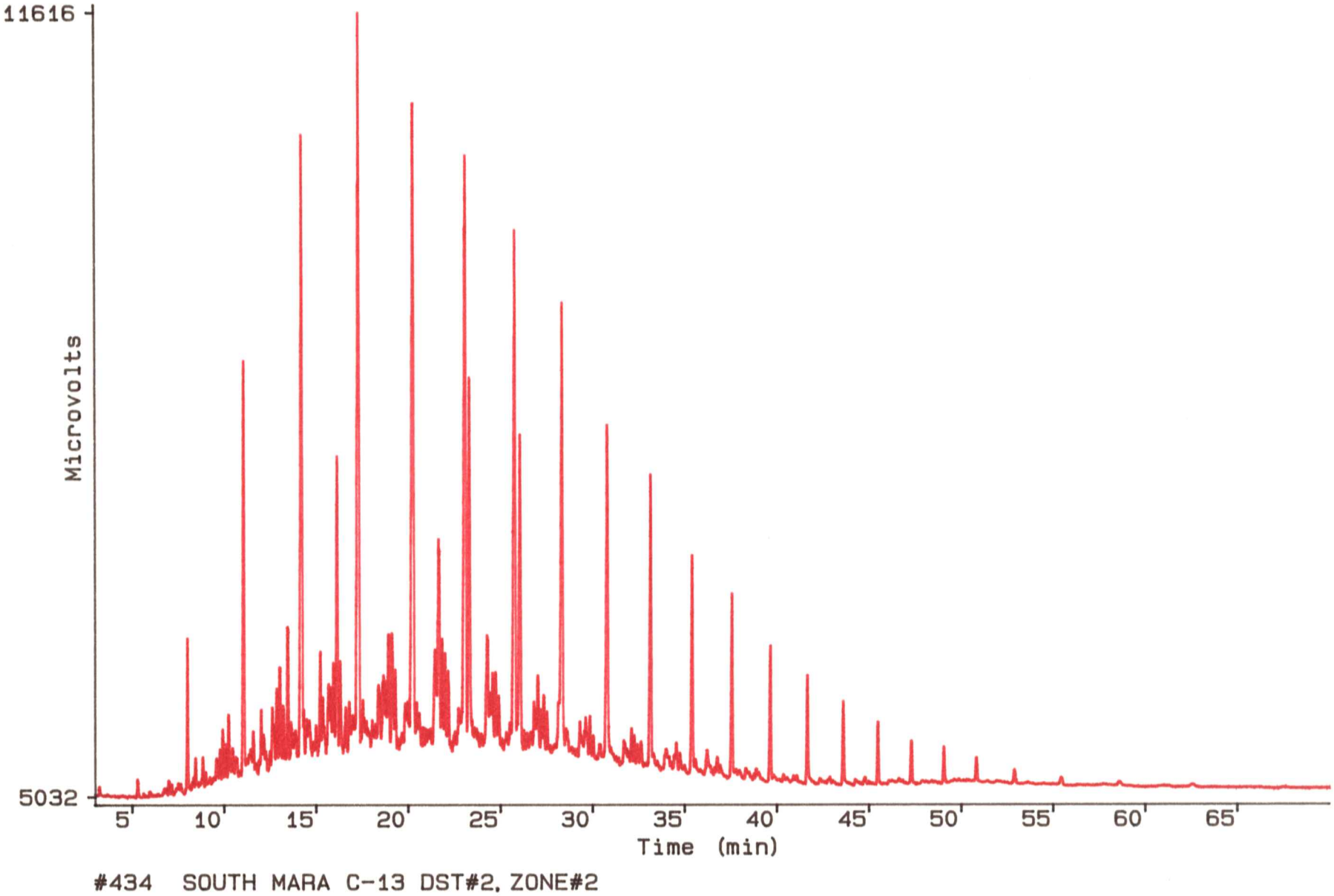
#482 N.BEN NEVIS P-93 3061.5-3067M DST#4



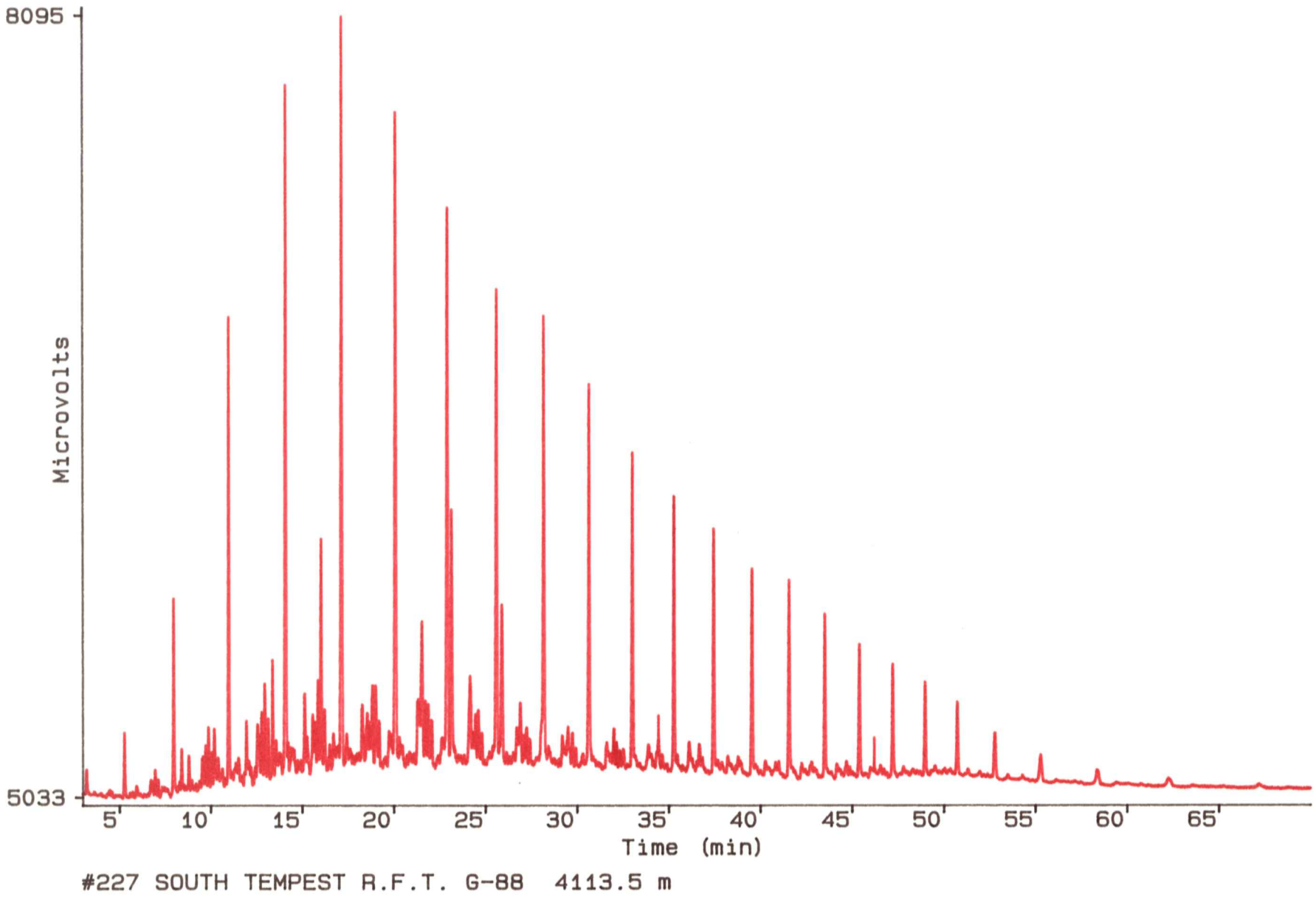
#342 NORTH DANA I-43 14885 - 14921 FT.



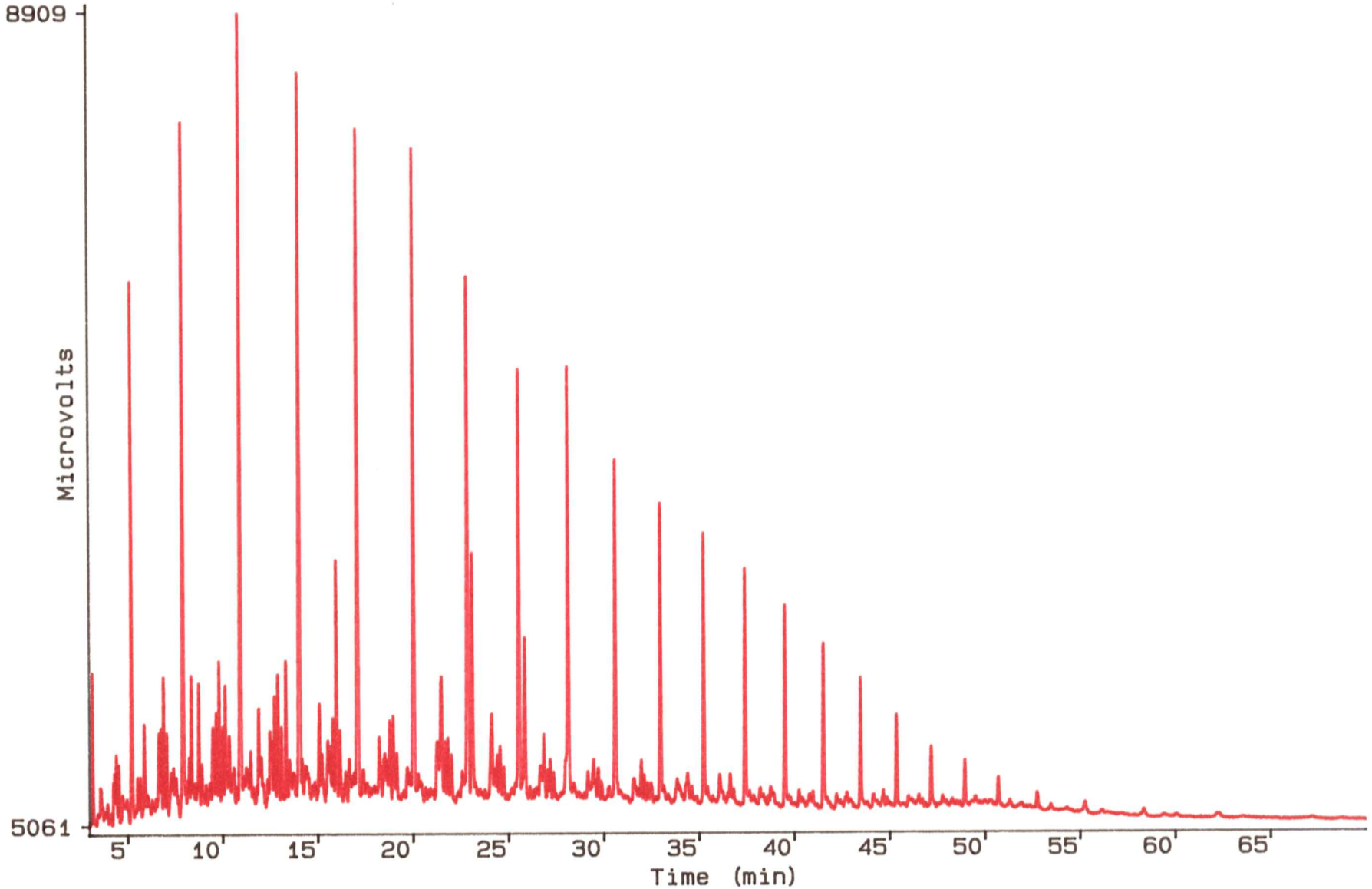
#433 SOUTH MARA C-13 DST#1, ZONE#1



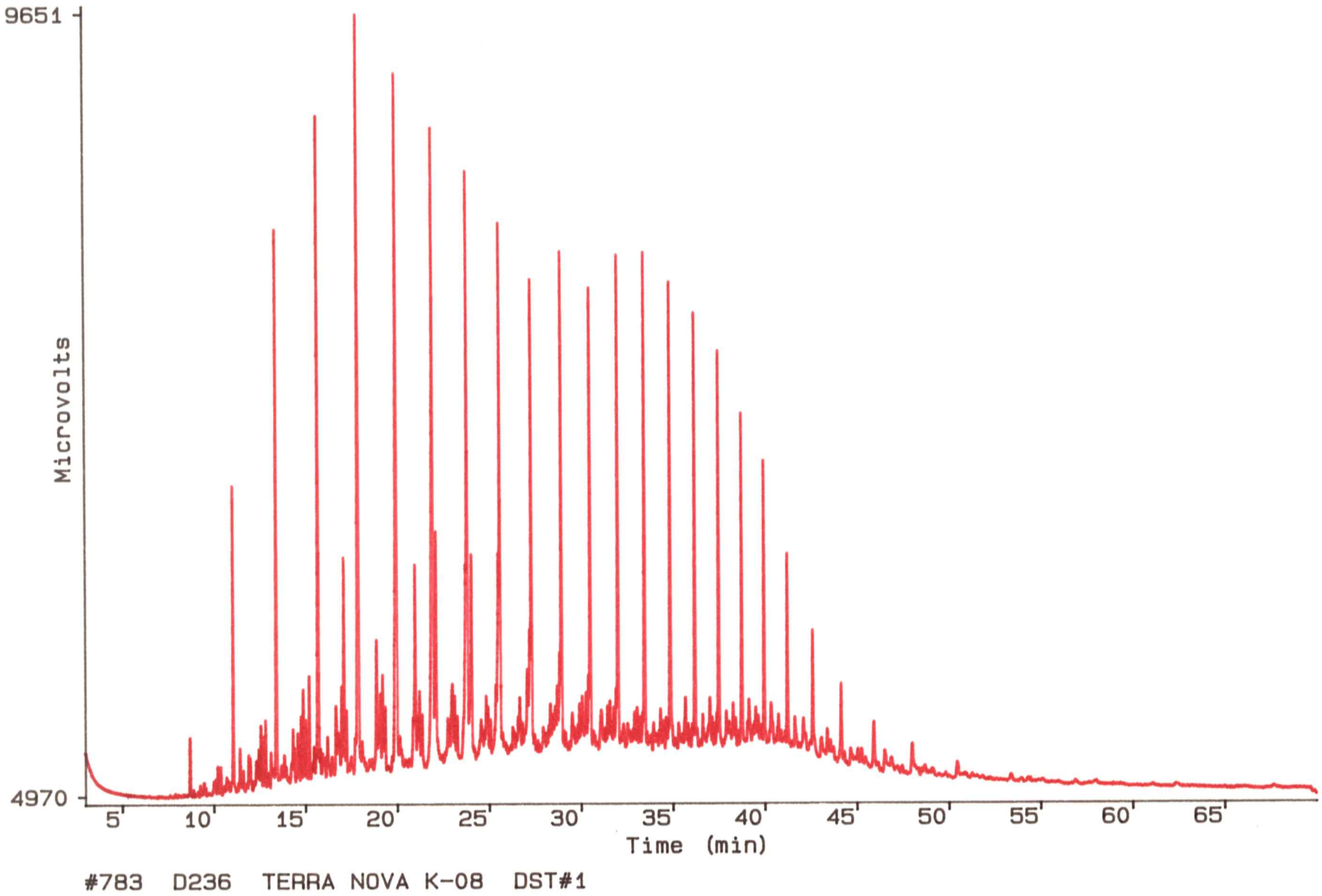
#434 SOUTH MARA C-13 DST#2, ZONE#2

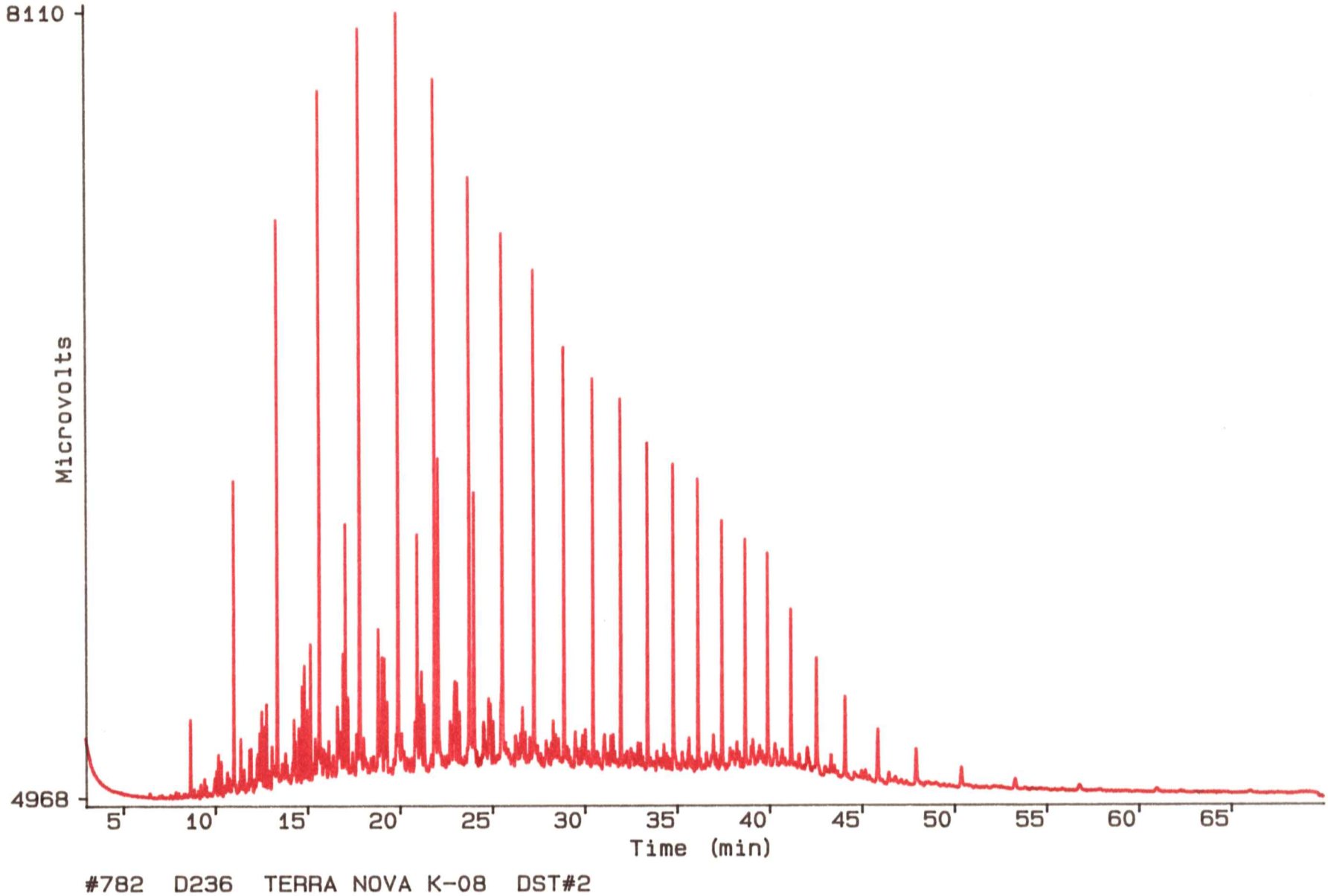


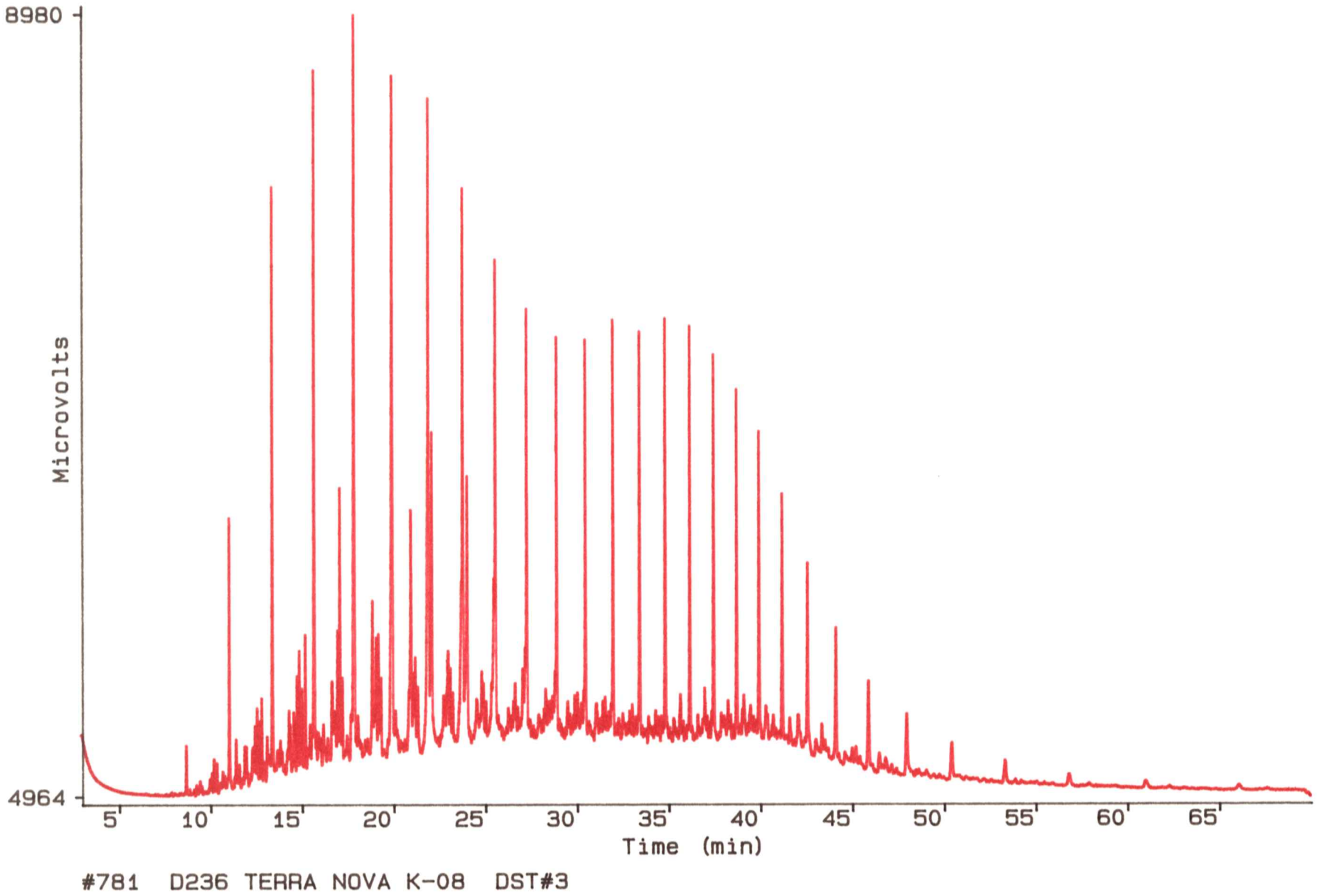
#227 SOUTH TEMPEST R.F.T. G-88 4113.5 m



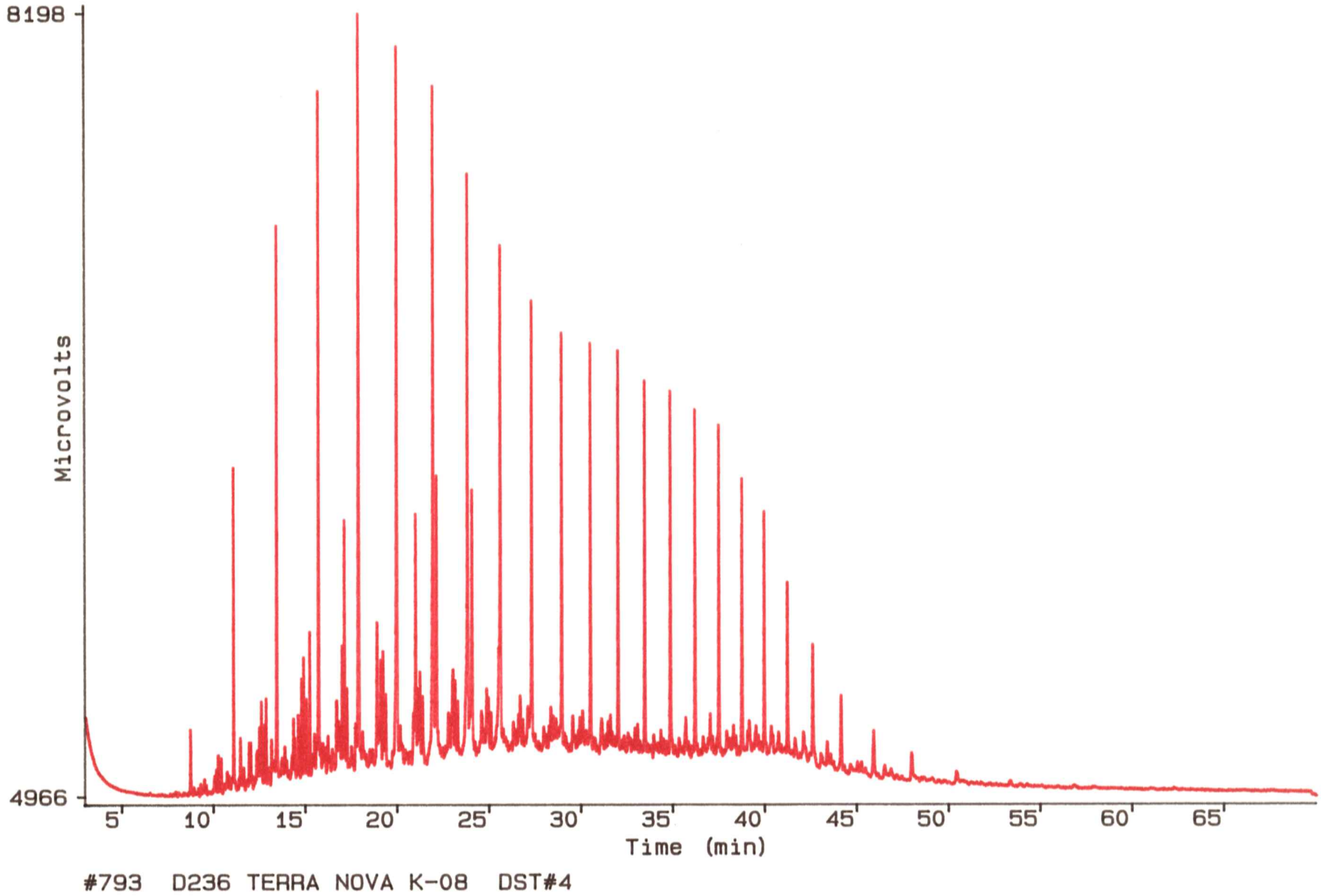
#226 SOUTH TEMPEST G-33 R.F.T. 4043 m

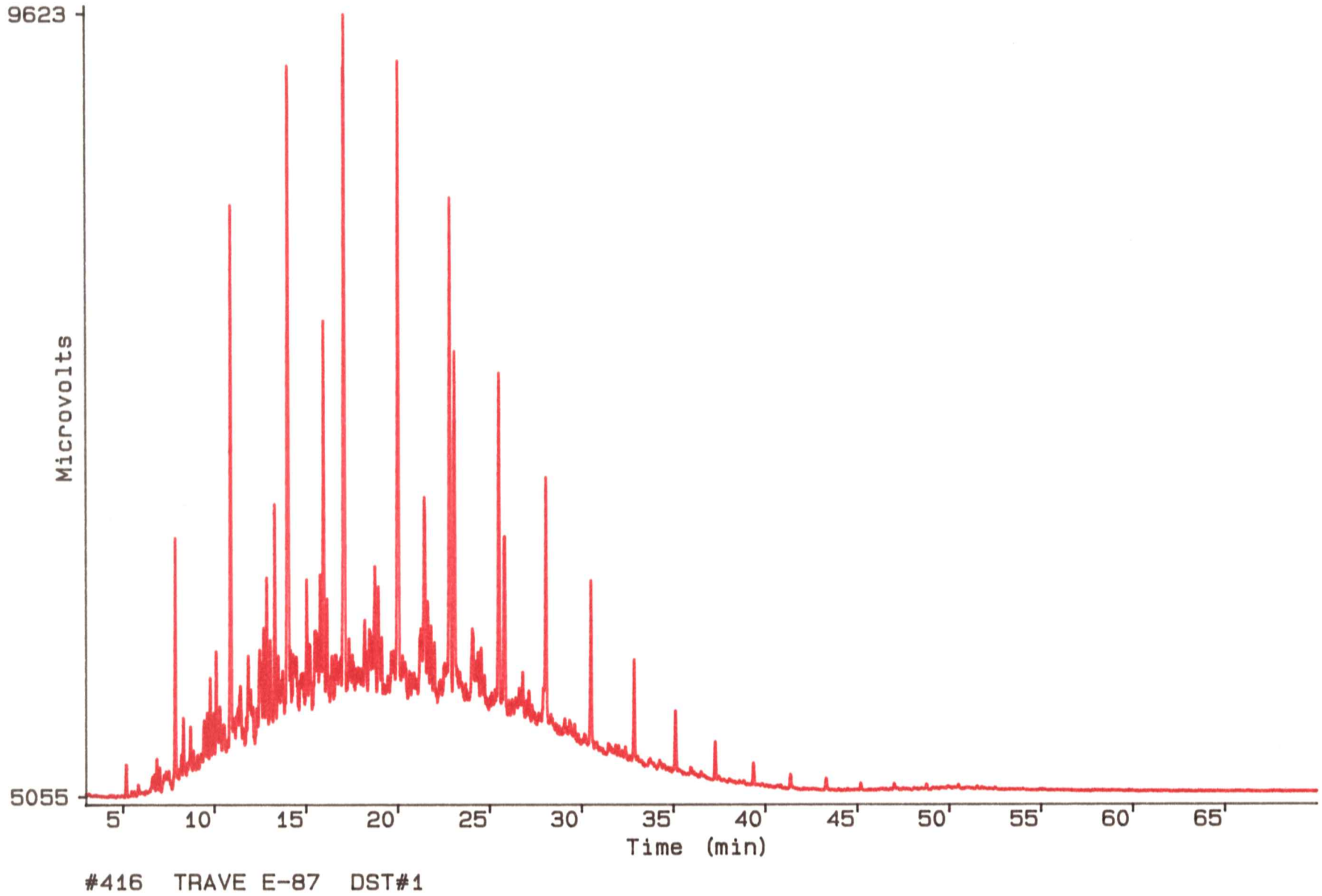

9651
4970
Microvolts
5
10
15
20
25
30
35
40
45
50
55
60
65
Time (min)
#783 D236 TERRA NOVA K-08 DST#1

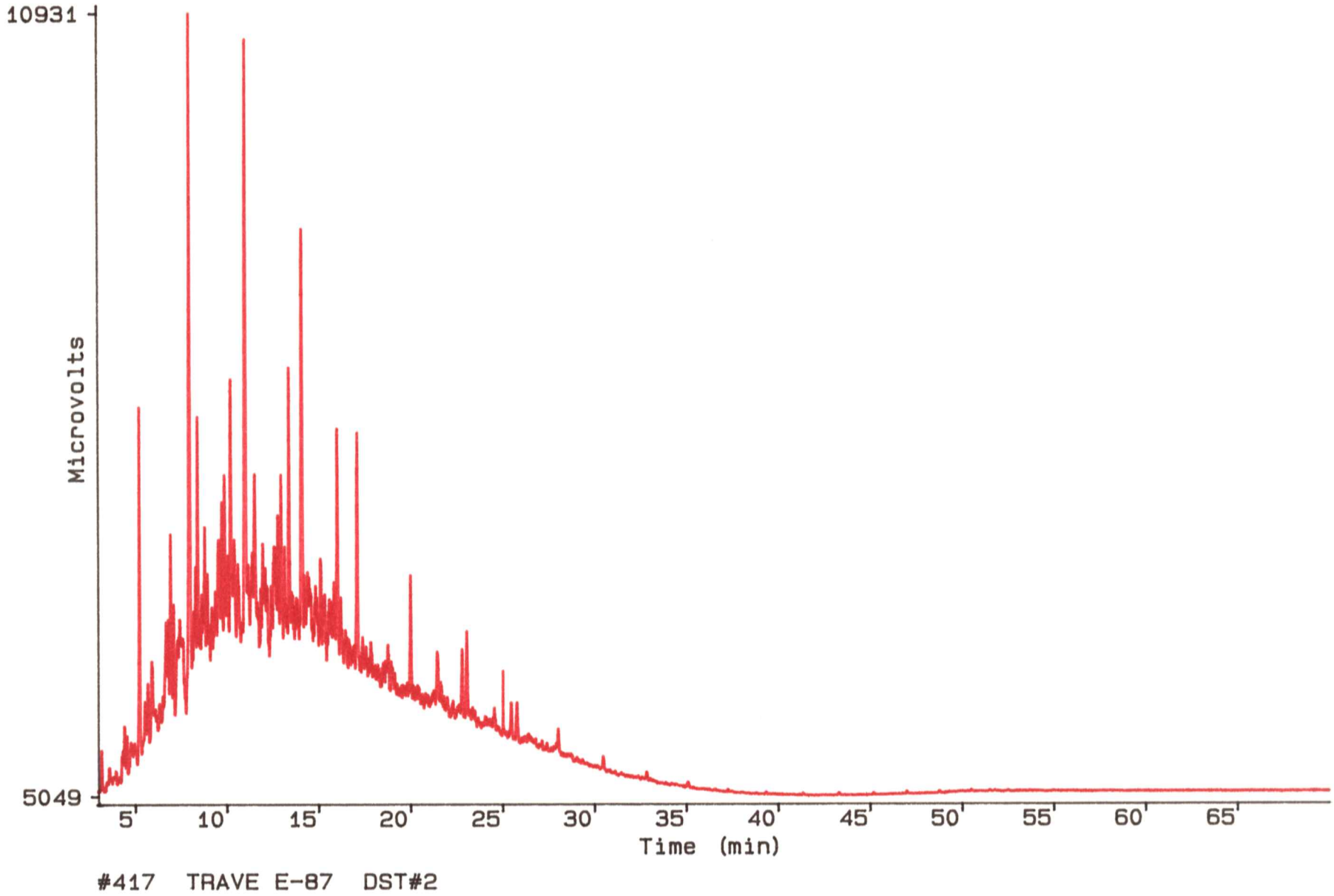

8110
4968
Microvolts
5
10
15
20
25
30
35
40
45
50
55
60
65
Time (min)
#782 D236 TERRA NOVA K-08 DST#2

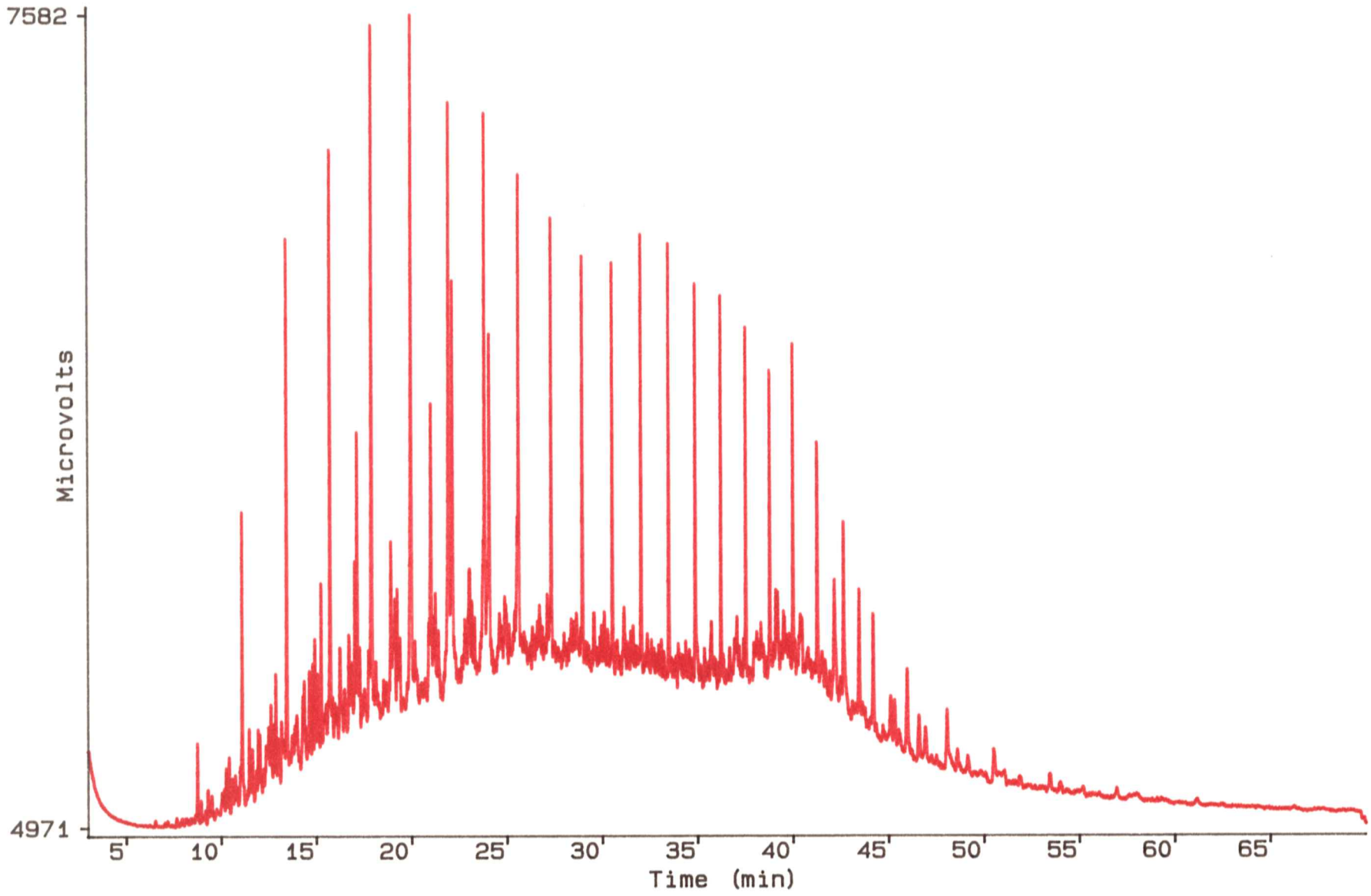


#781 D236 TERRA NOVA K-08 DST#3

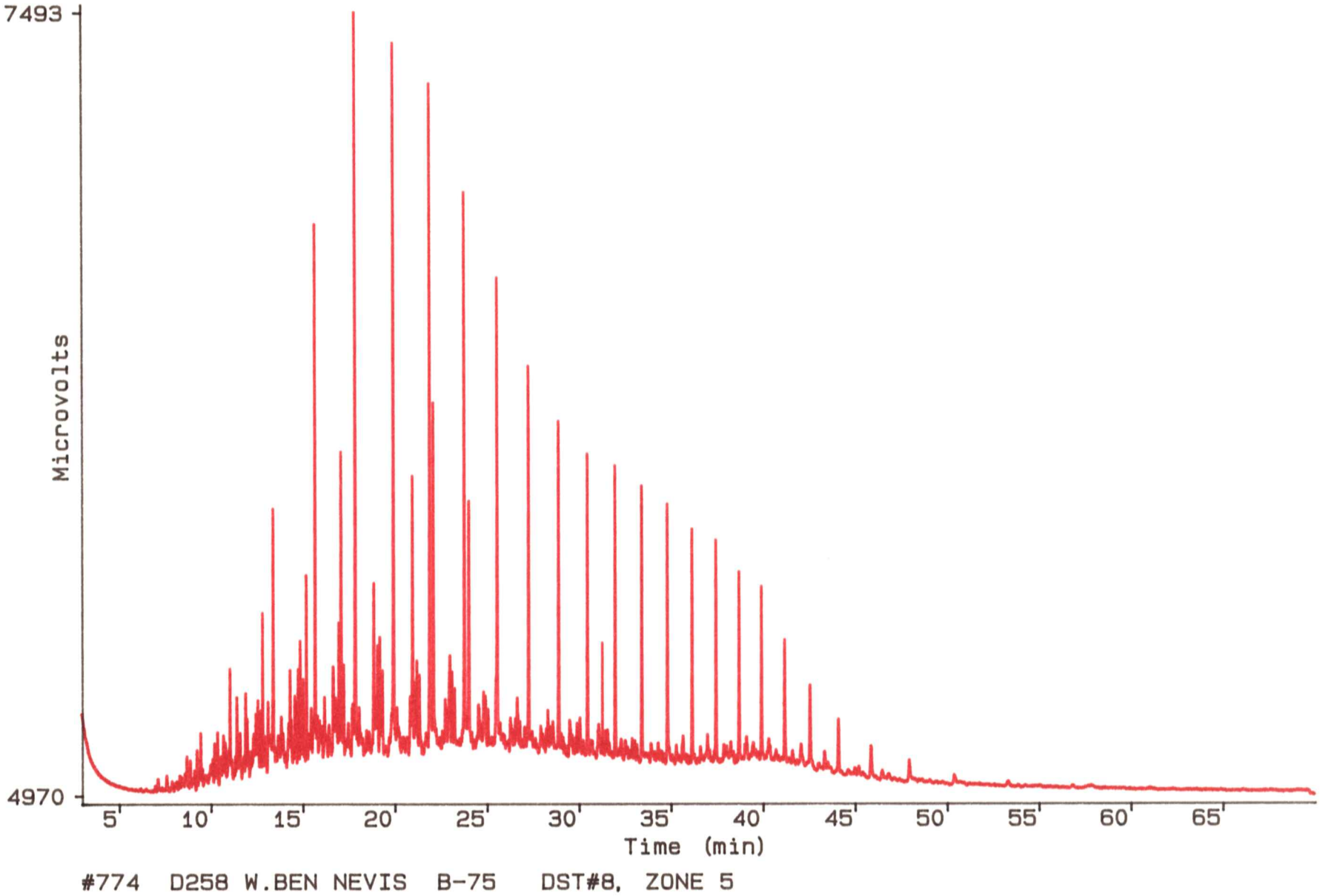

8198
4966
Microvolts
5
10
15
20
25
30
35
40
45
50
55
60
65
Time (min)
#793 D236 TERRA NOVA K-08 DST#4


9623
5055
Microvolts
5
10
15
20
25
30
35
40
45
50
55
60
65
Time (min)
#416 TRAVE E-87 DST#1


10931
5049
Microvolts
5
10
15
20
25
30
35
40
45
50
55
60
65
Time (min)
#417 TRAVE E-87 DST#2



#775 D258 W.BEN NEVIS B-75 DST#6, ZONE 2

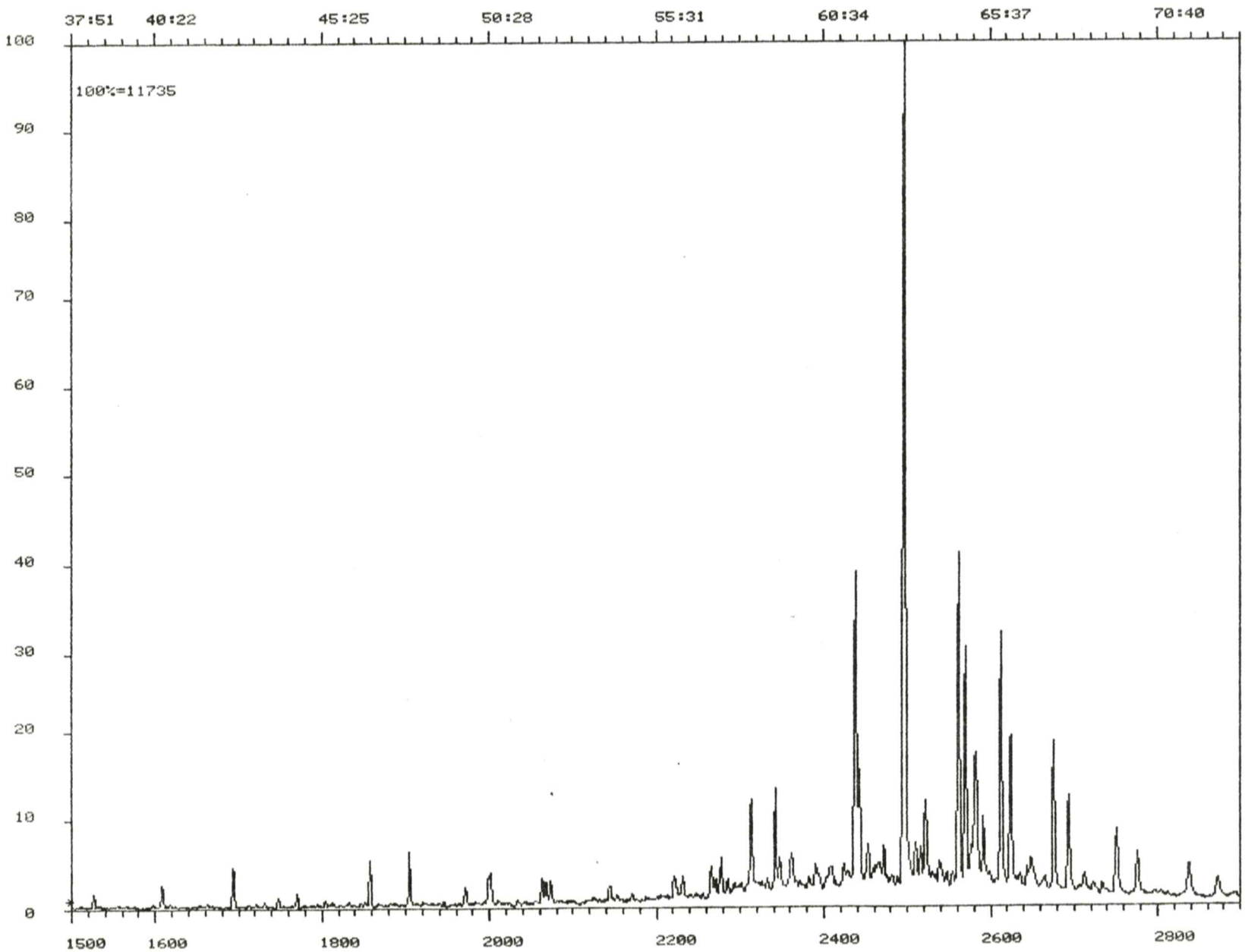


#774 D258 W.BEN NEVIS B-75 DST#8, ZONE 5

DS-55 CROSS SCAN REPORT, RUN: 202650001

HIBERNIA K-18 DST 13 2285-2294

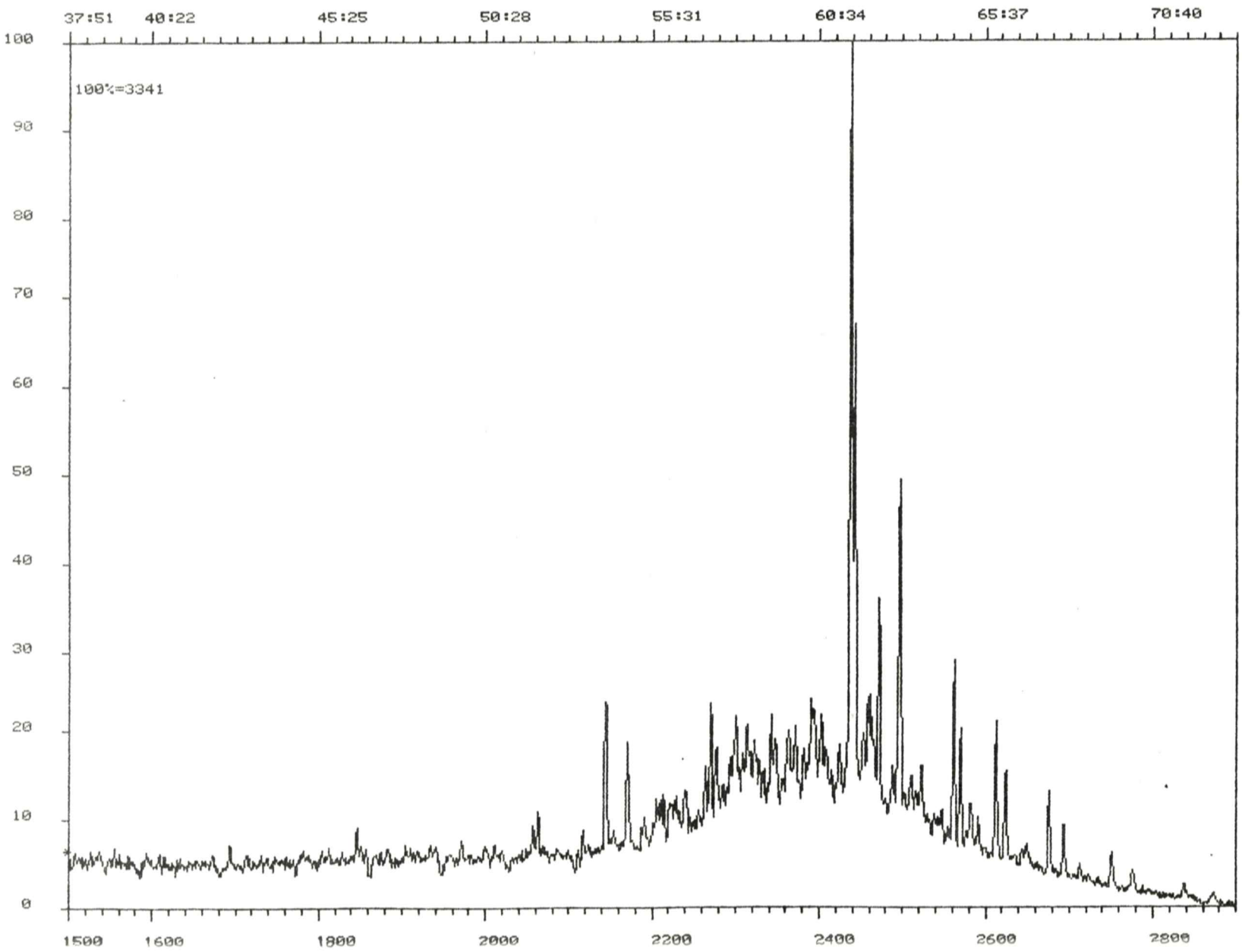
* 191



DS-55 CROSS SCAN REPORT, RUN: 202650001

HIBERNIA K-18 DST 13 2285-2294

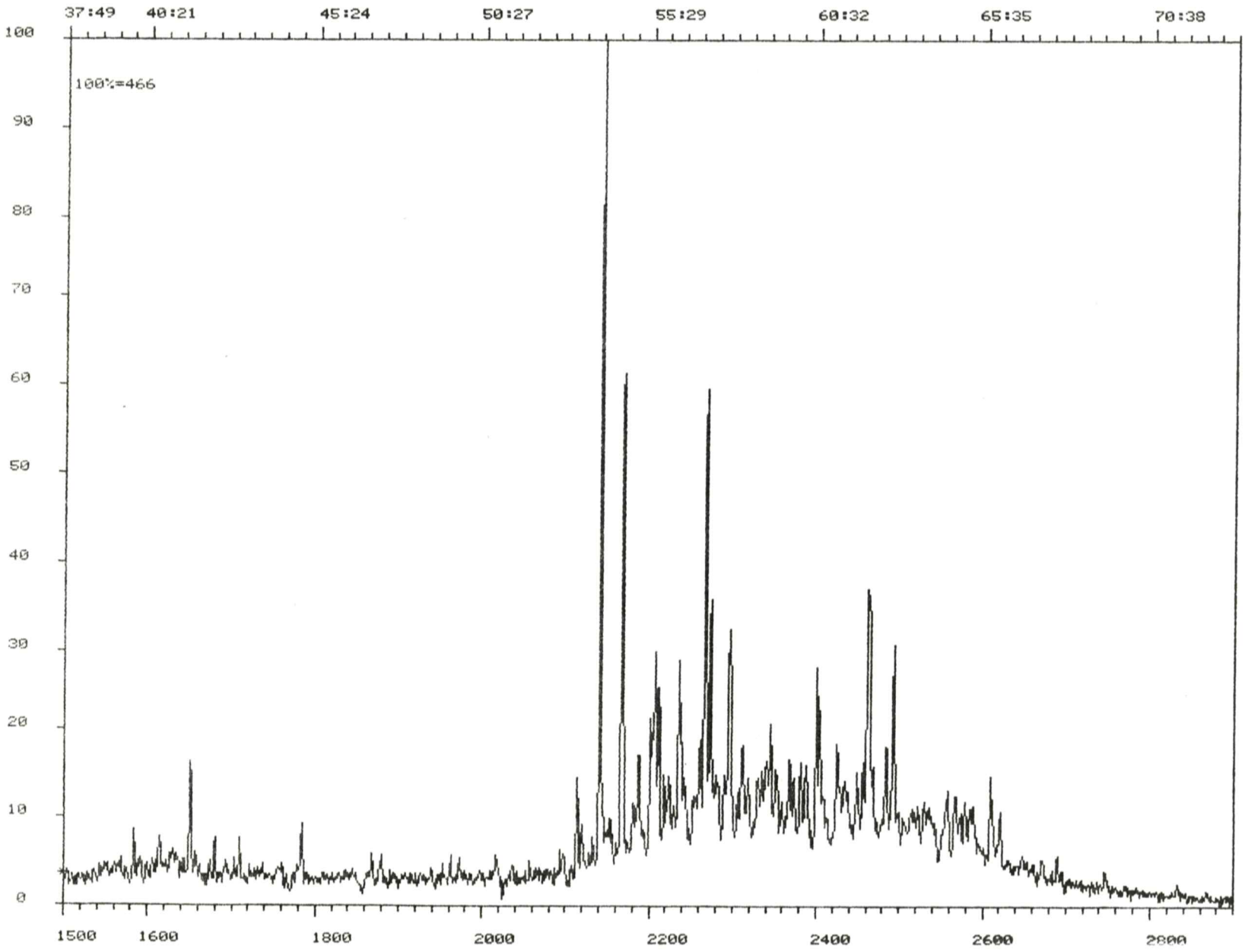
* 177



DS-55 CROSS SCAN REPORT, RUN: 201670001

HIBERNIA O-35 DST#2 2476-2467M

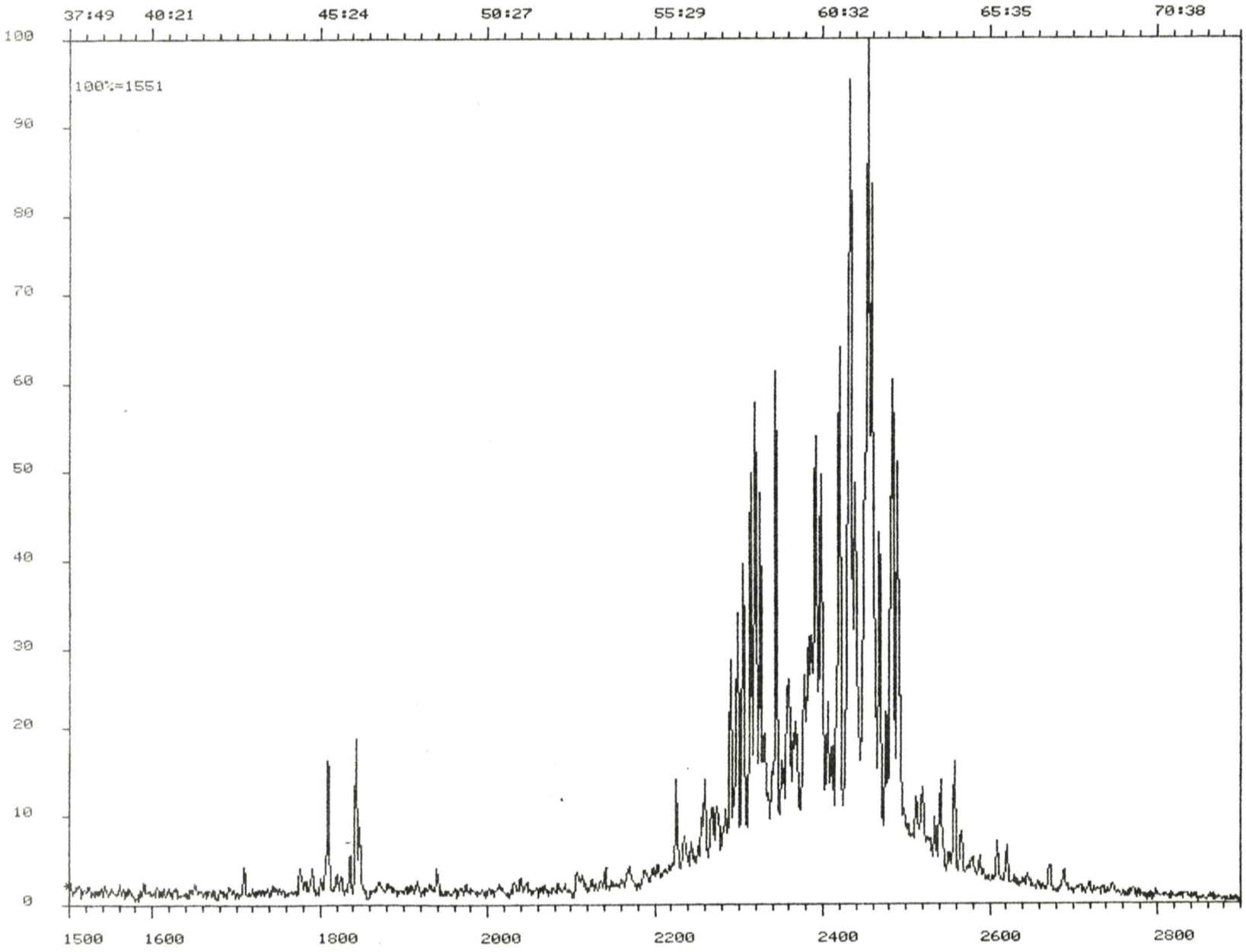
* 259



DS-55 CROSS SCAN REPORT, RUN: 201670001

HIBERNIA O-35 DST#2 2476-2467M

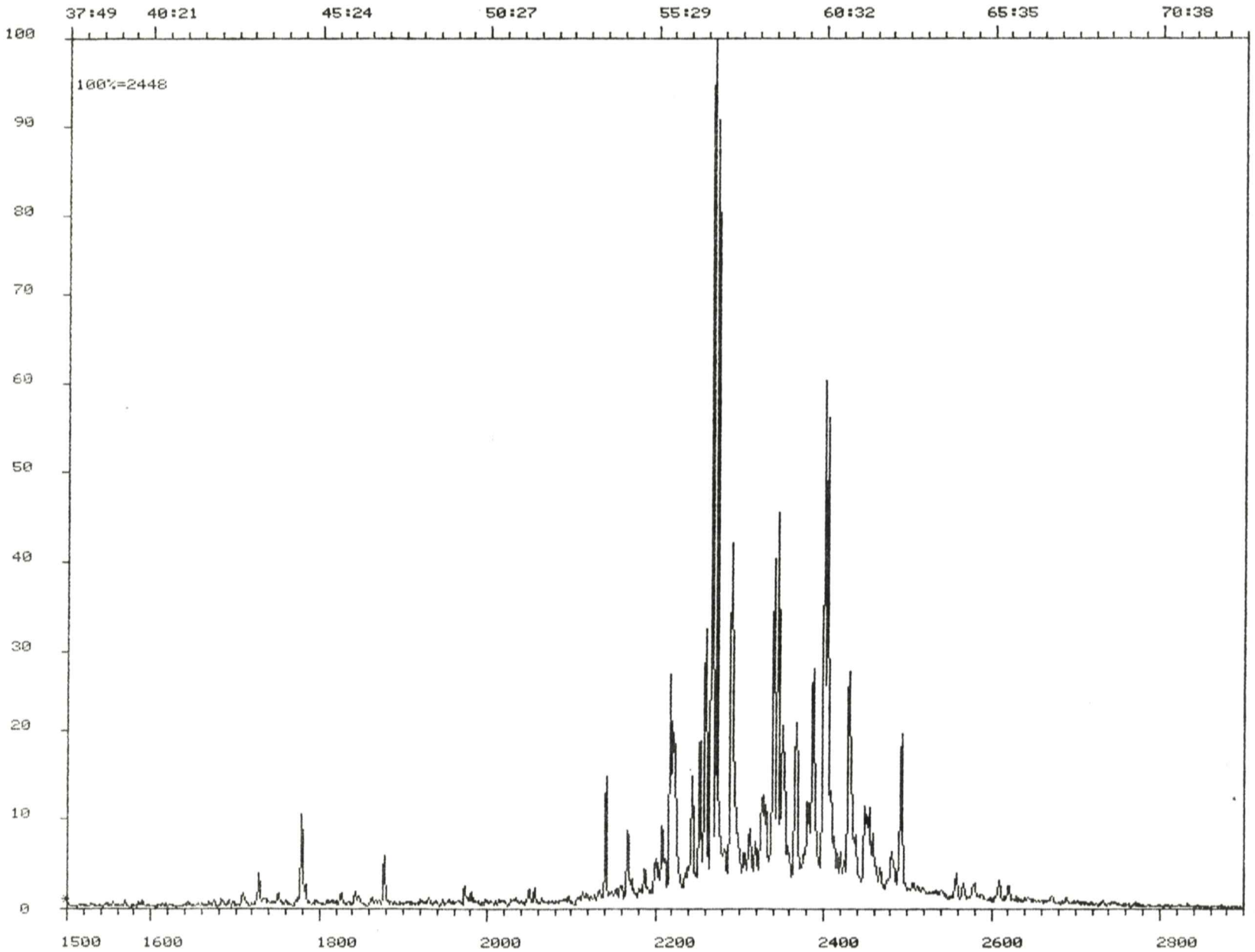
* 231



DS-55 CROSS SCAN REPORT, RUN: 201670001

HIBERNIA O-35 DST#2 2476-2467M

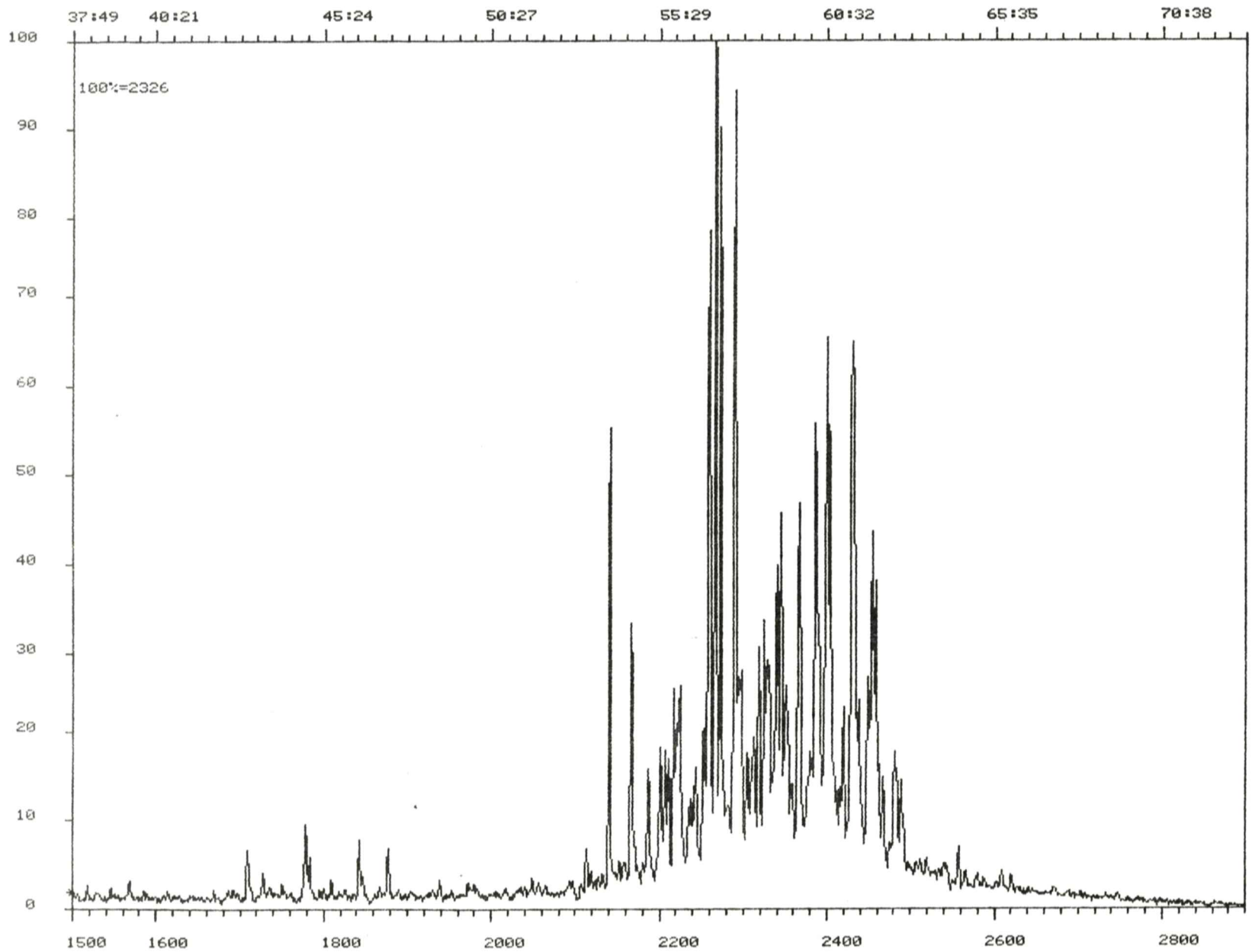
* 218



DS-55 CROSS SCAN REPORT, RUN: 201670001

HIBERNIA O-35 DST#2 2476-2467M

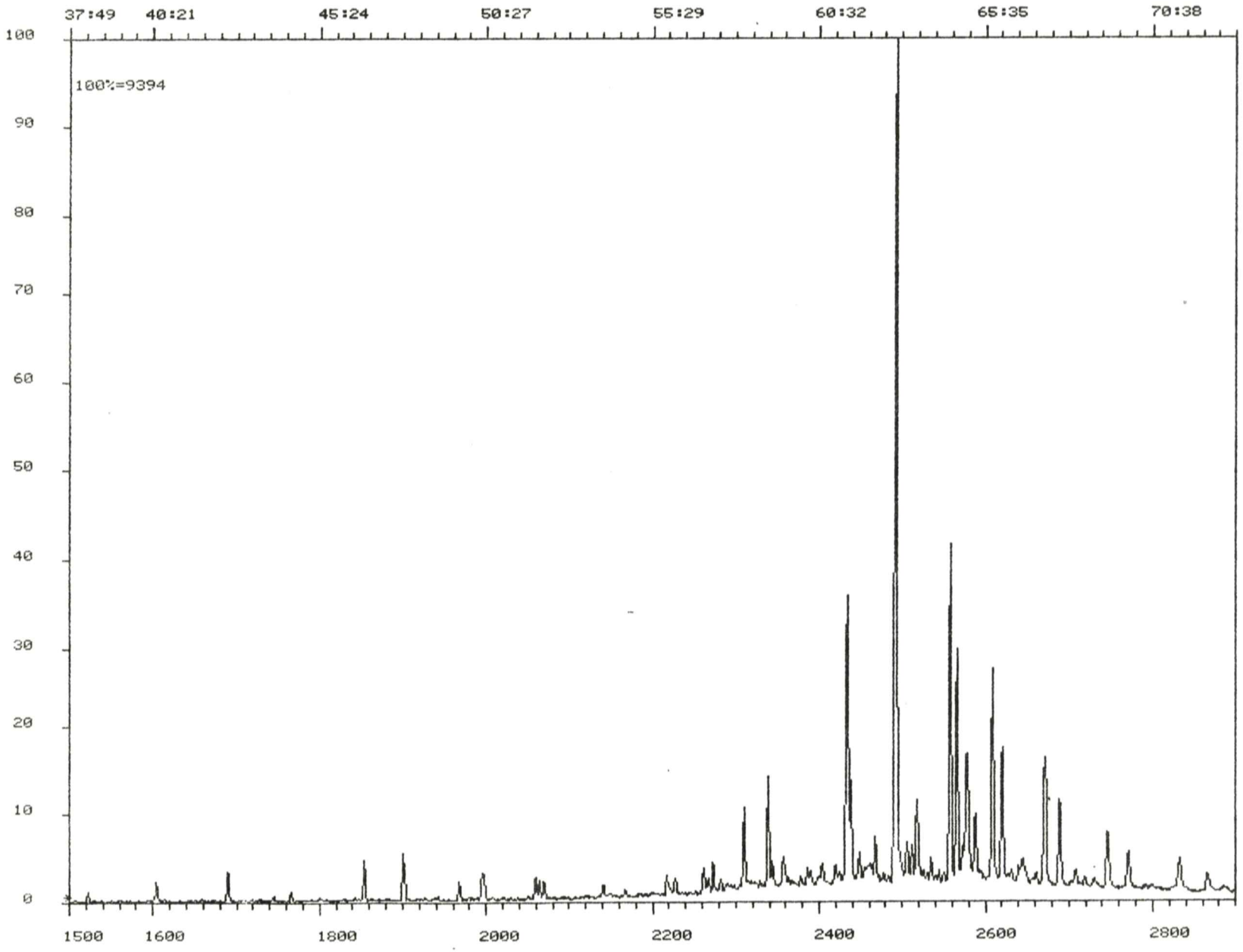
* 217



DS-55 CROSS SCAN REPORT, RUN: 201670001

HIBERNIA O-35 DST#2 2476-2467M

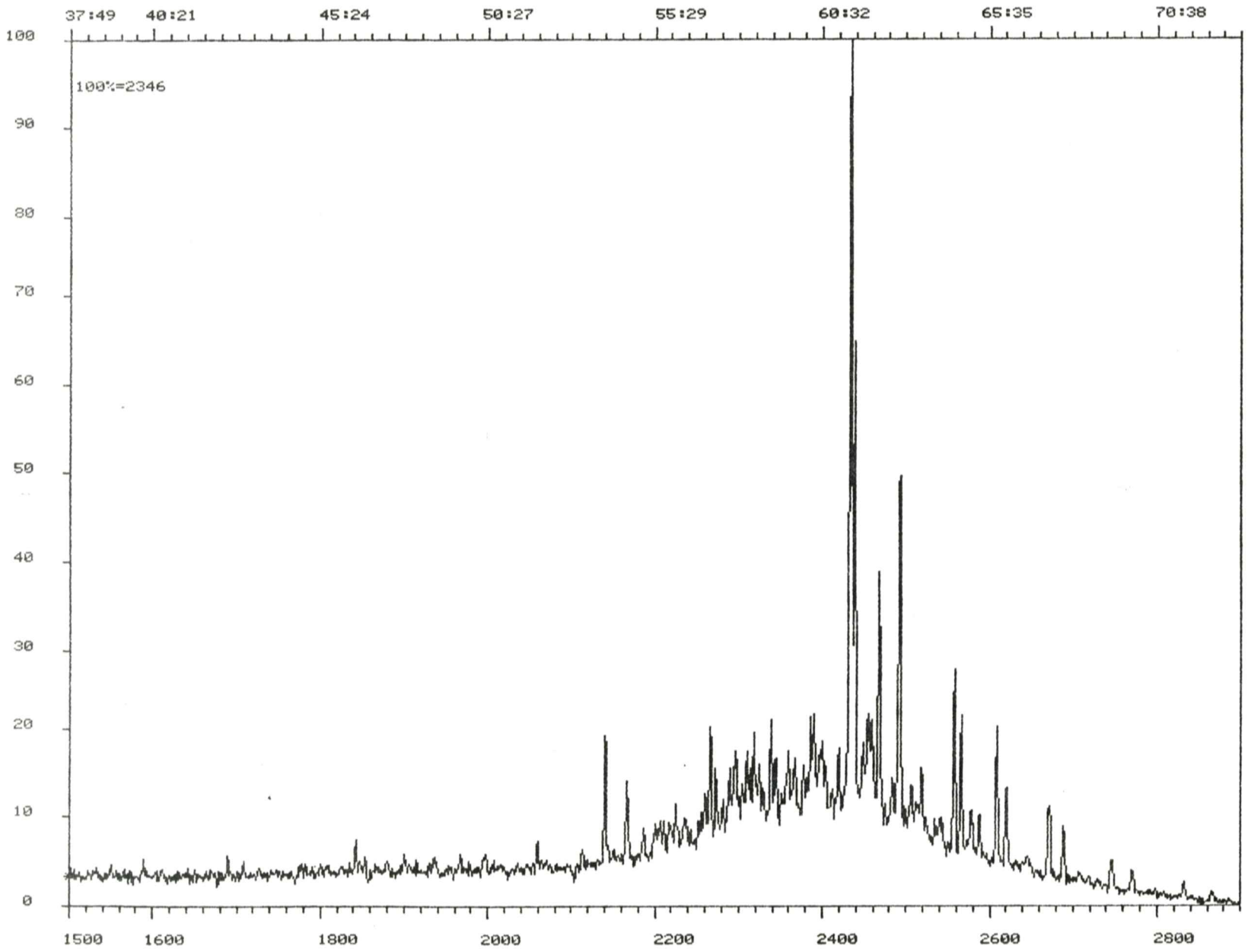
* 191



DS-55 CROSS SCAN REPORT, RUN: 201670001

HIBERNIA O-35 DST#2 2476-2467M

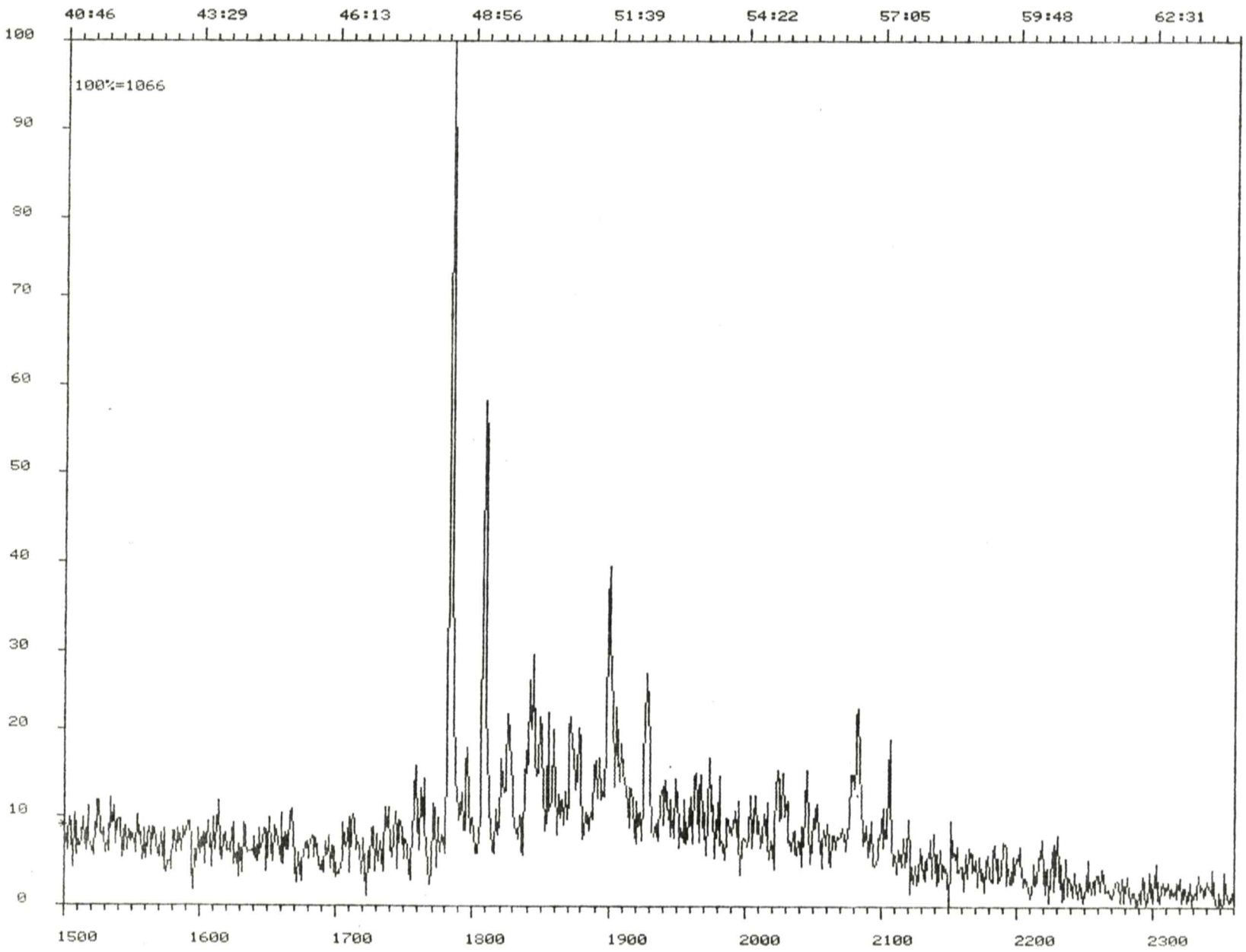
* 177



DS-55 CROSS SCAN REPORT, RUN: HIB110001

HIBERNIA P-15 DST#11 2422-2443M

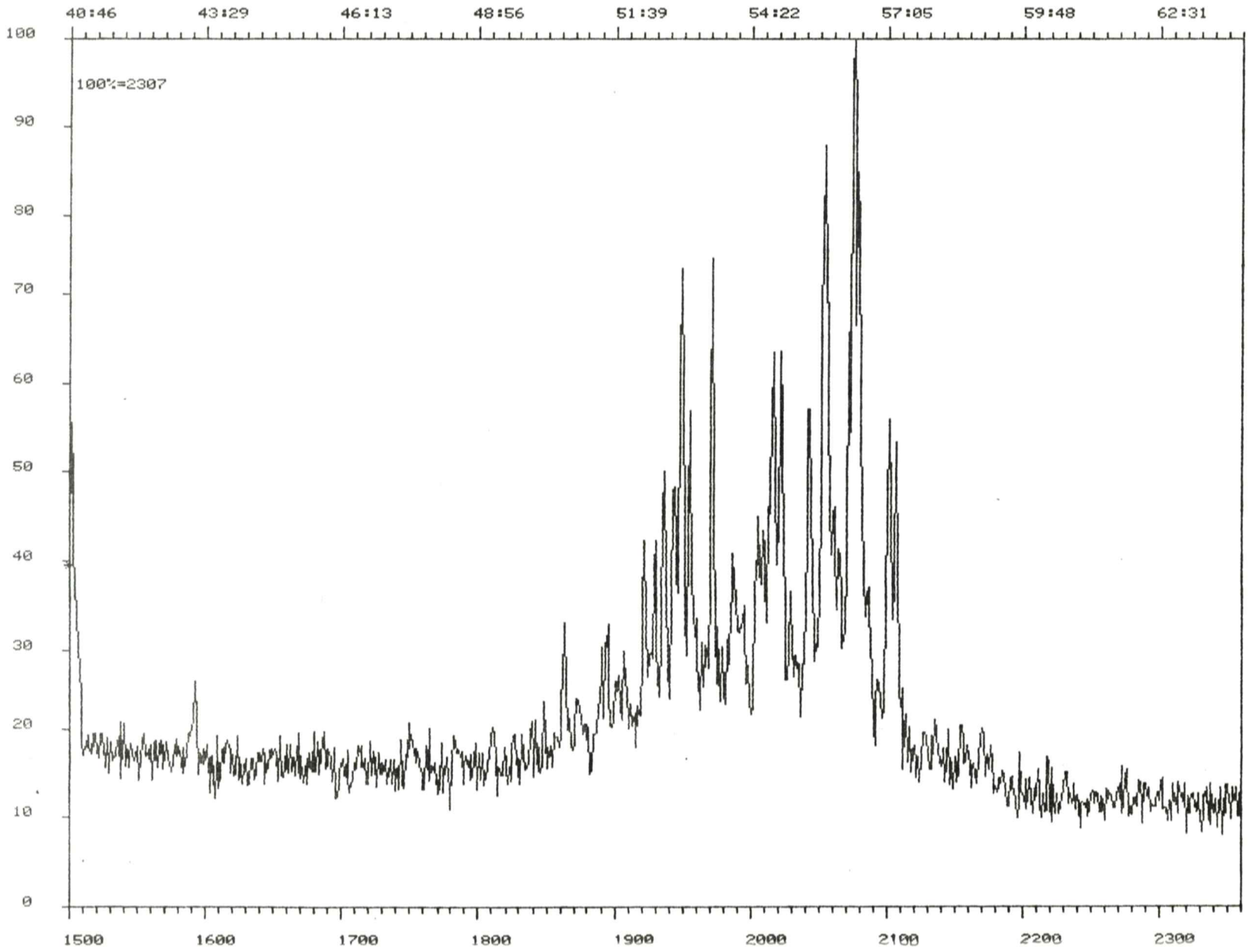
* 259



DS-55 CROSS SCAN REPORT, RUN: HIB110001

HIBERNIA P-15 DST#11 2422-2443M

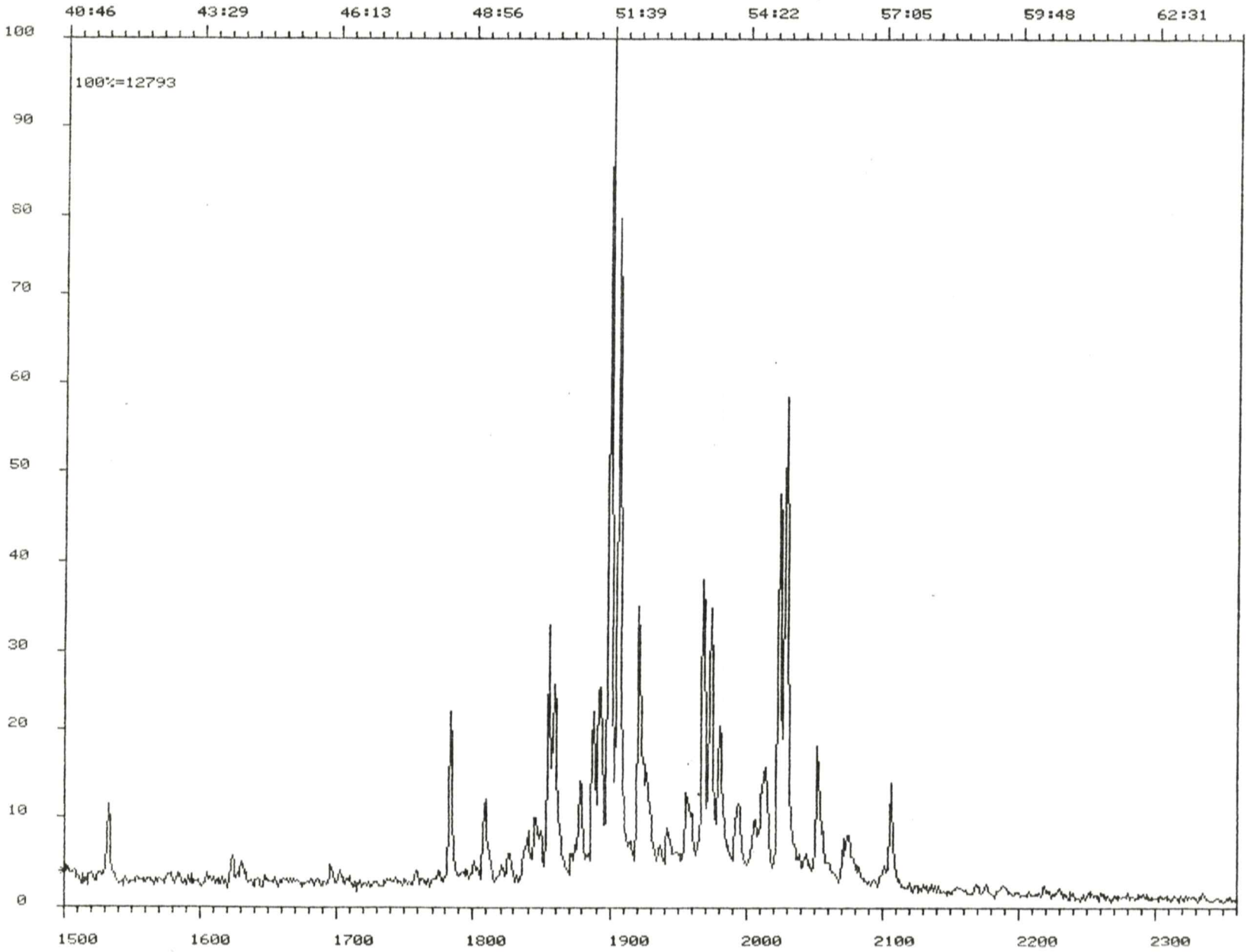
* 231



DS-55 CROSS SCAN REPORT, RUN: HIB110001

HIBERNIA P-15 DST#11 2422-2443M

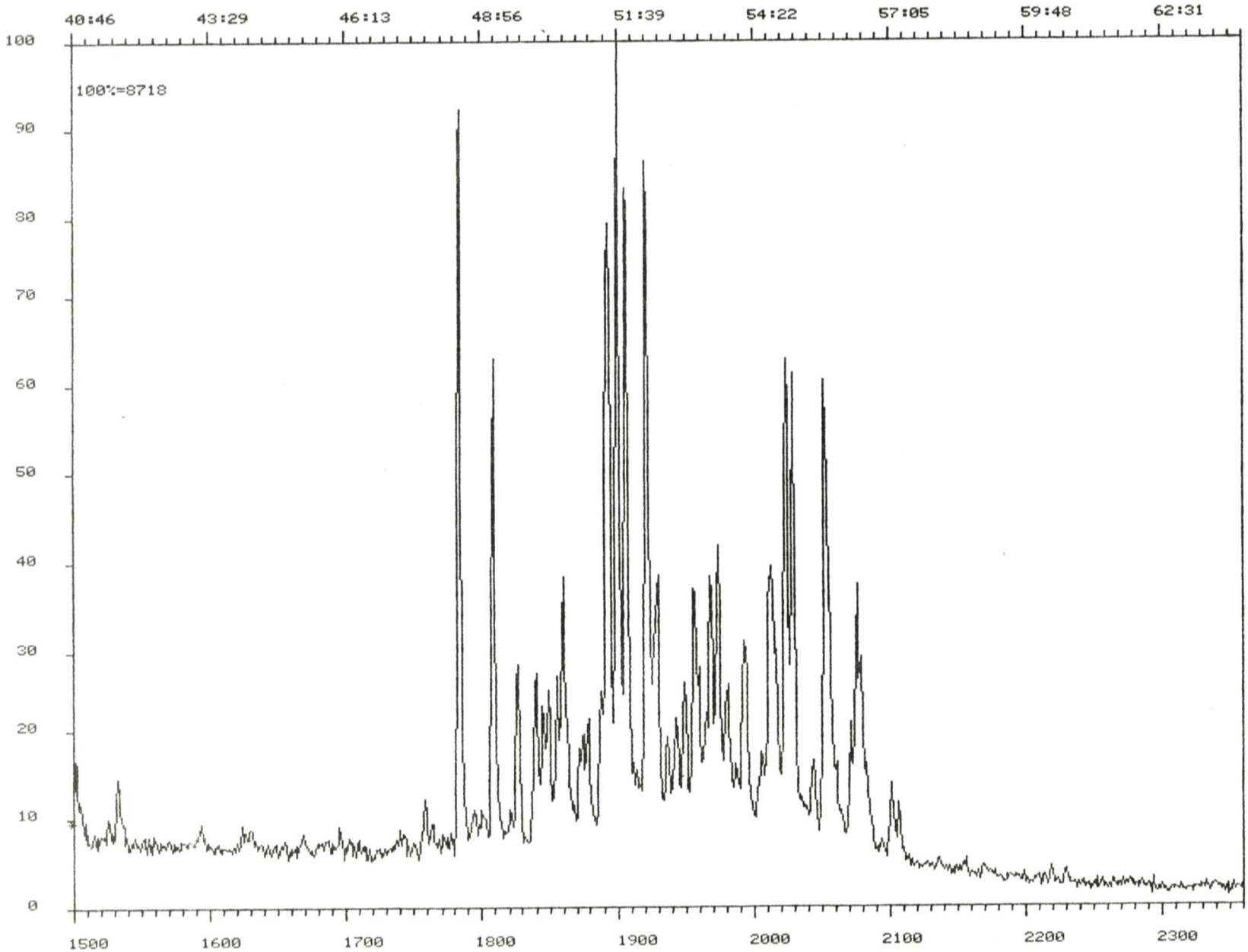
* 218



DS-55 CROSS SCAN REPORT, RUN: HIB110001

HIBERNIA P-15 DST#11 2422-2443M

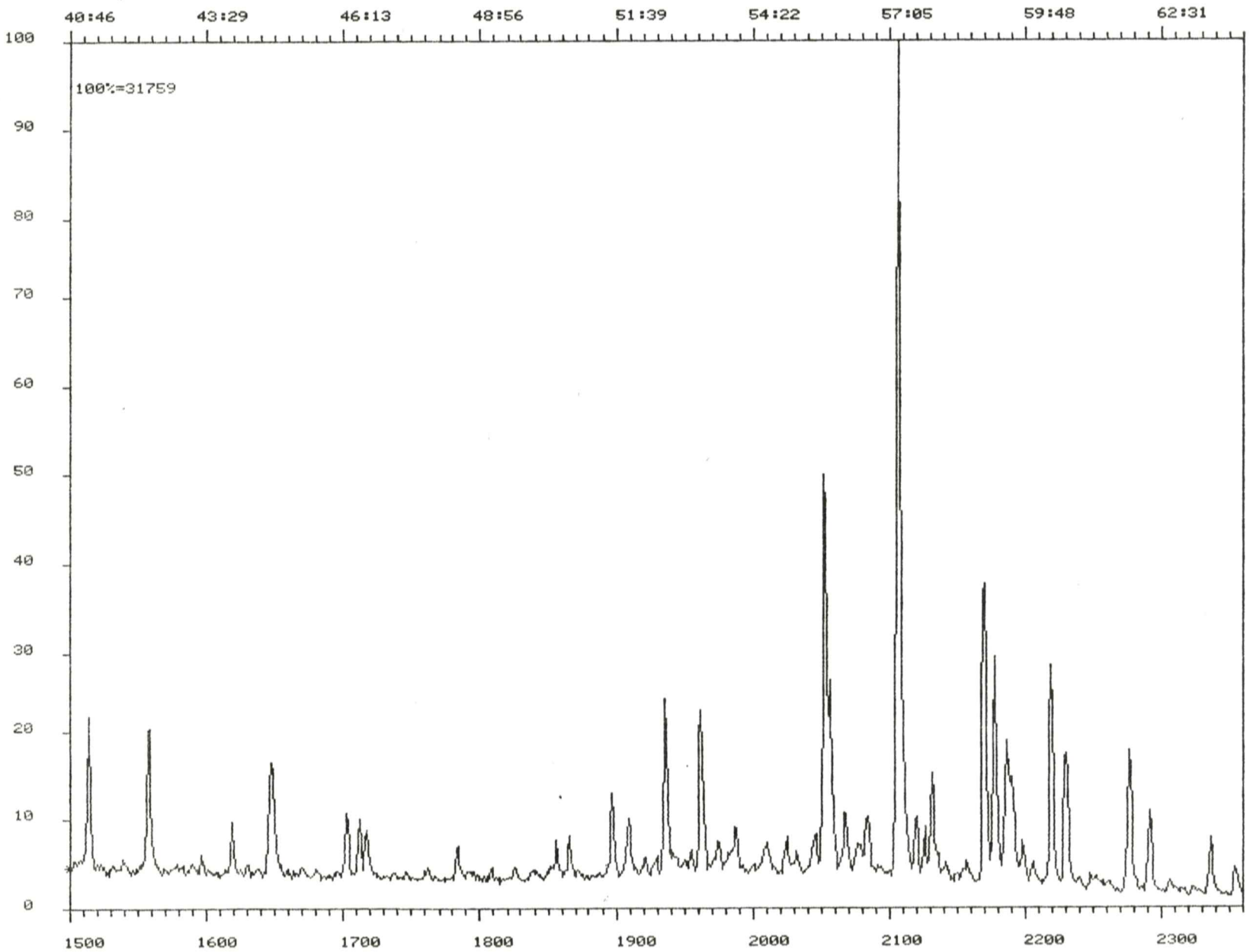
* 217



DS-55 CROSS SCAN REPORT, RUN: HIB110001

HIBERNIA P-15 DST#11 2422-2443M

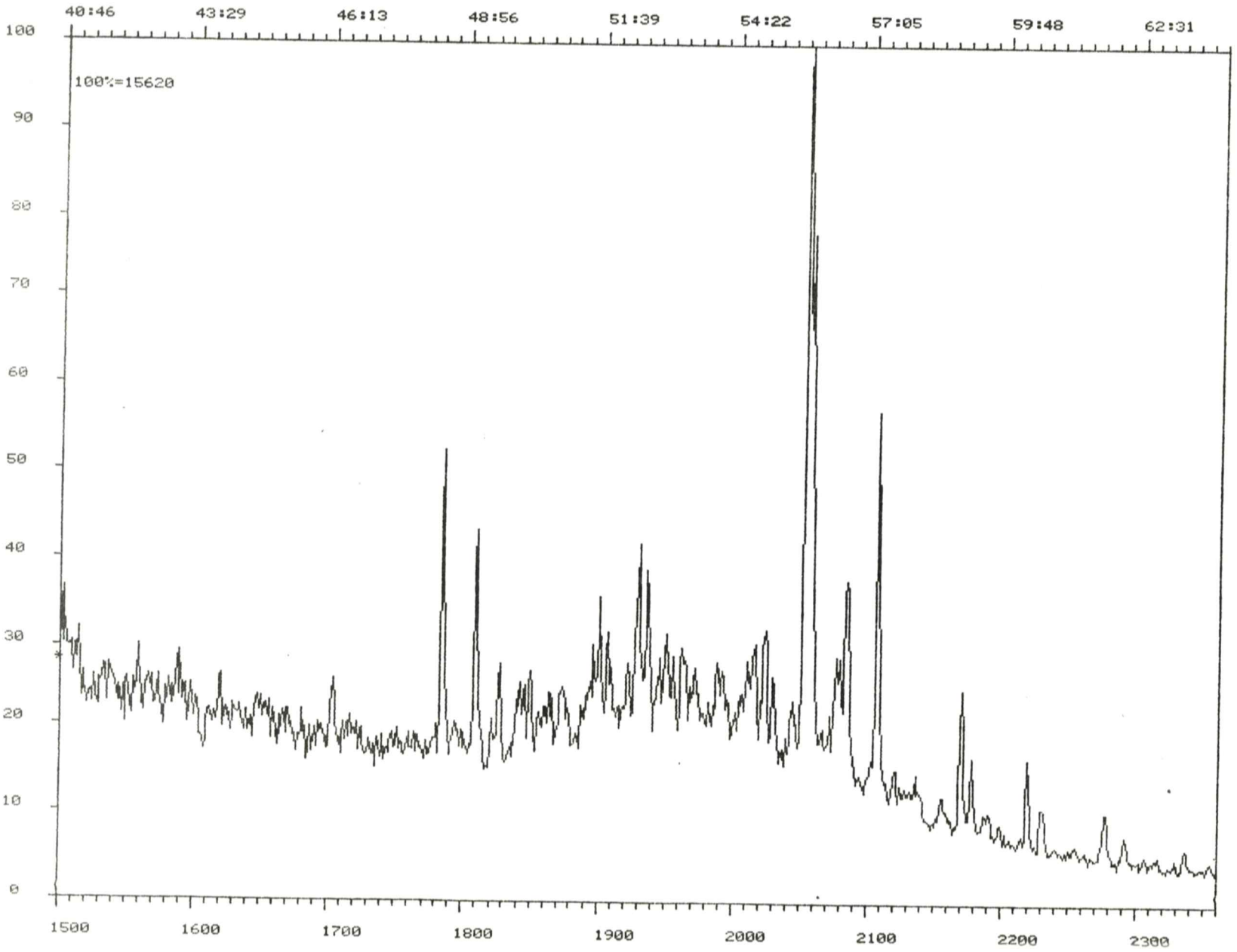
* 191



DS-55 CROSS SCAN REPORT, RUN: HIB110001

HIBERNIA P-15 DST#11 2422-2443M

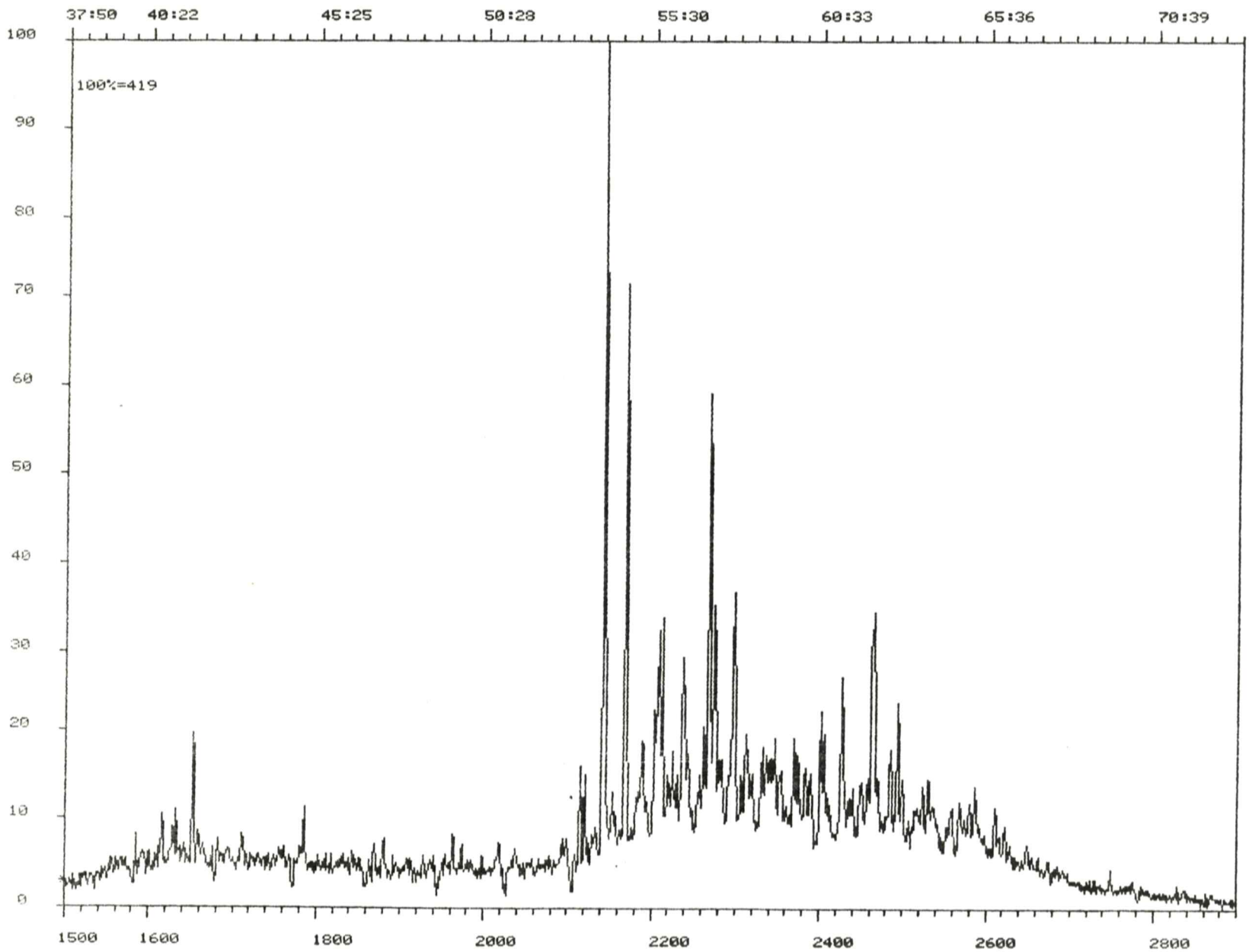
* 177



DS-5S CROSS SCAN REPORT, RUN: 202610001

HIBERNIA K-18 DST5 3783-3788M

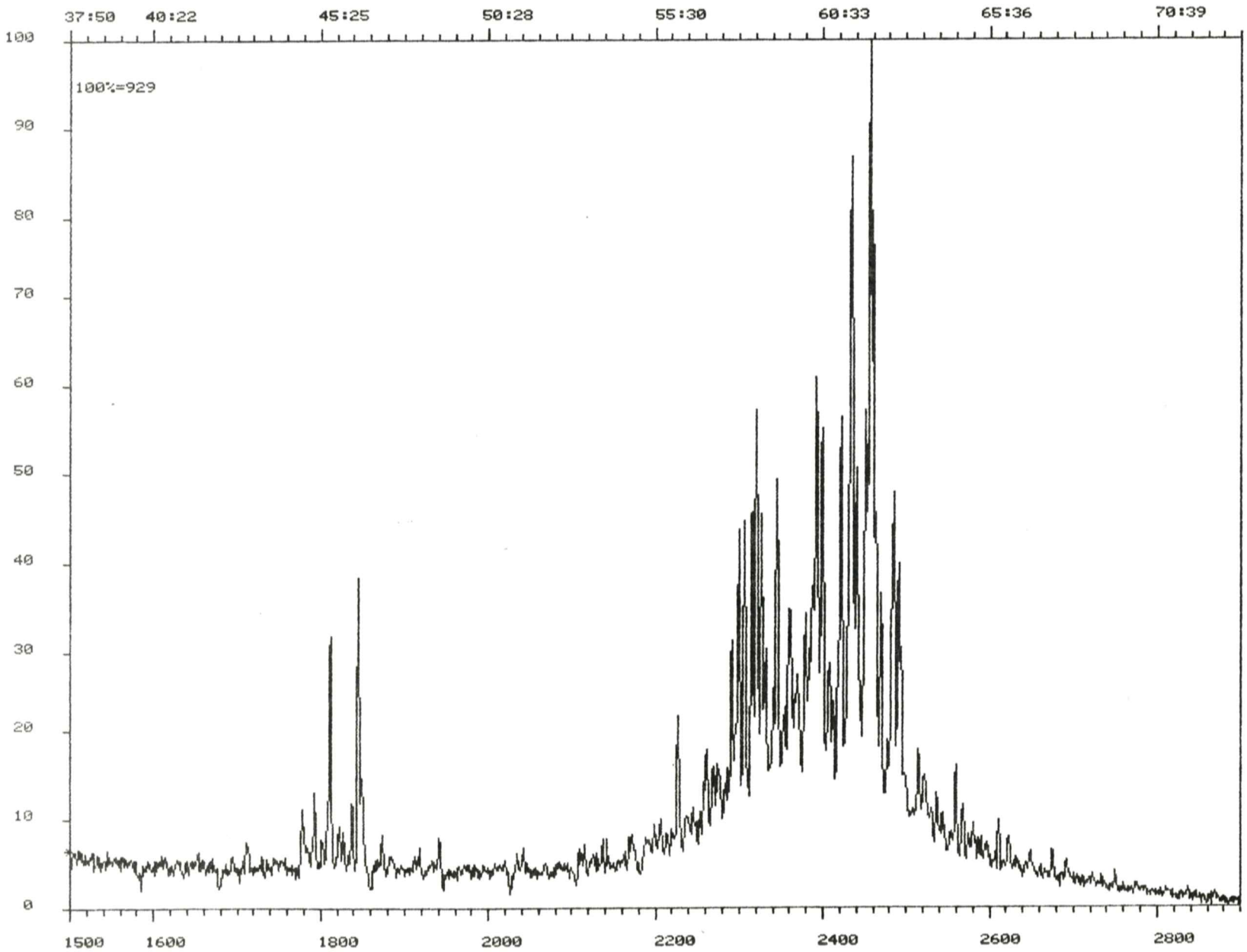
* 259



DS-55 CROSS SCAN REPORT, RUN: 202610001

HIBERNIA K-18 DST5 3783-3788M

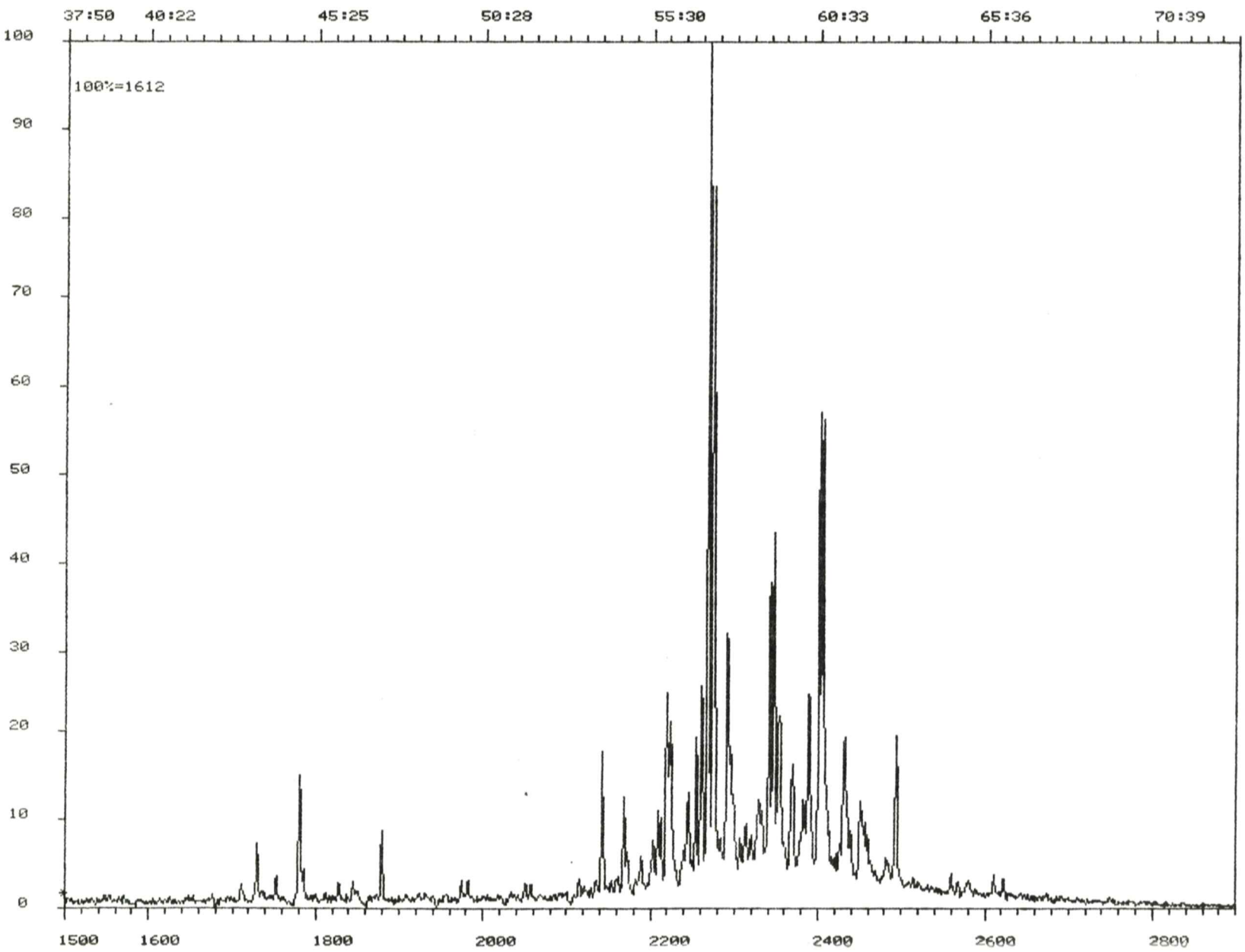
* 231



DS-55 CROSS SCAN REPORT, RUN: 202610001

HIBERNIA K-18 DST5 3783-3788M

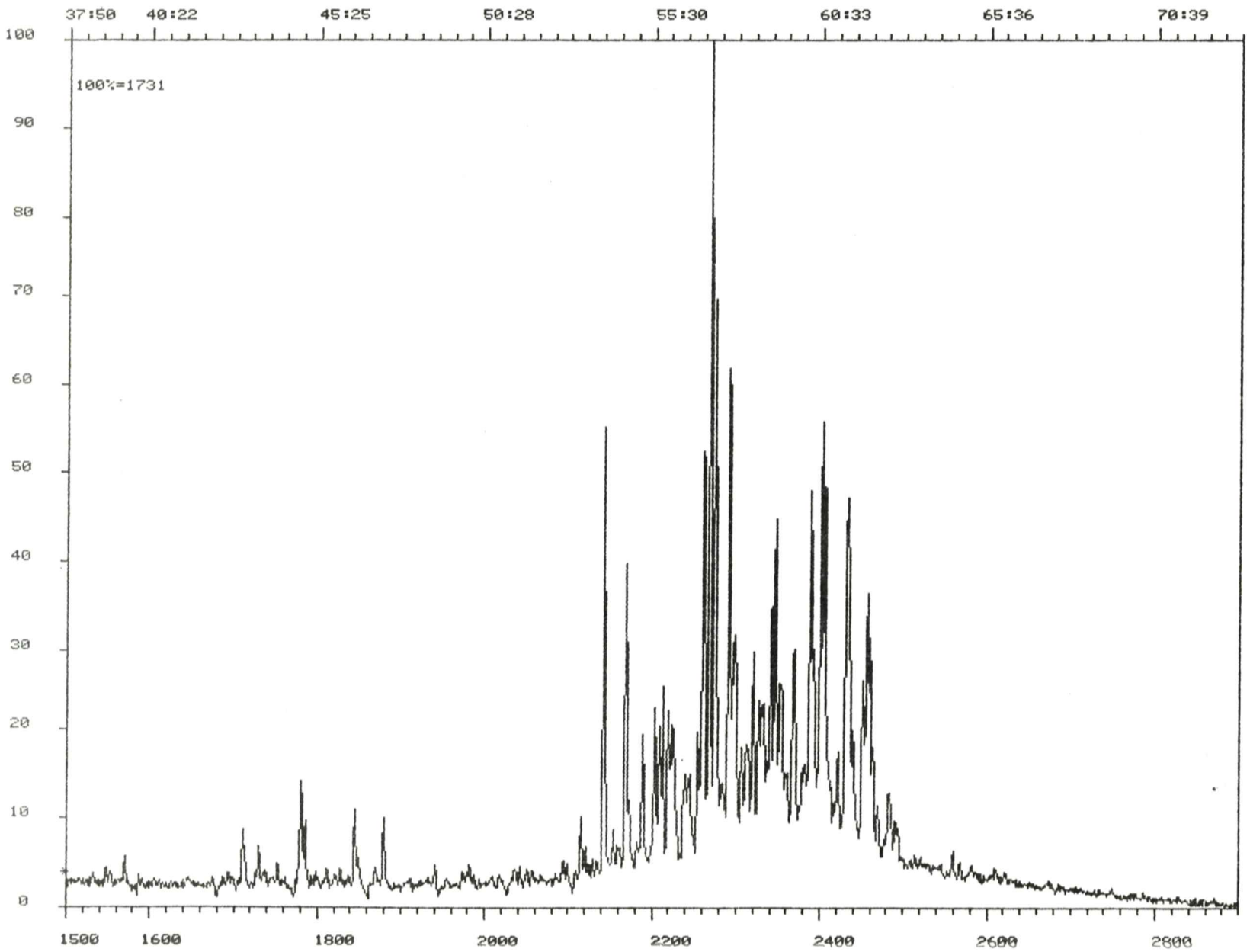
* 218



DS-55 CROSS SCAN REPORT, RUN: 202610001

HIBERNIA K-18 DST5 3783-3788M

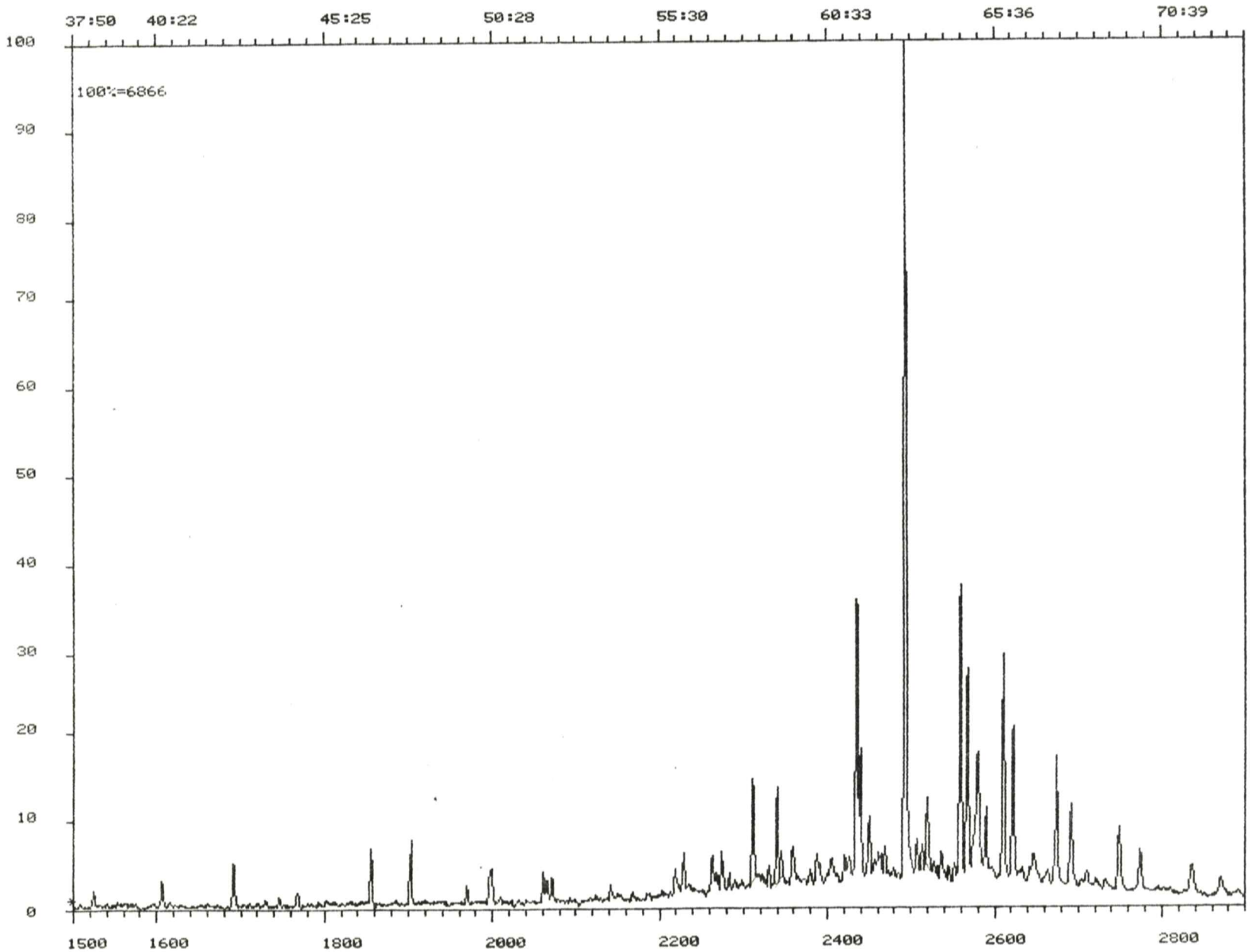
* 217



DS-55 CROSS SCAN REPORT, RUN: 202610001

HIBERNIA K-18 DST5 3783-3788M

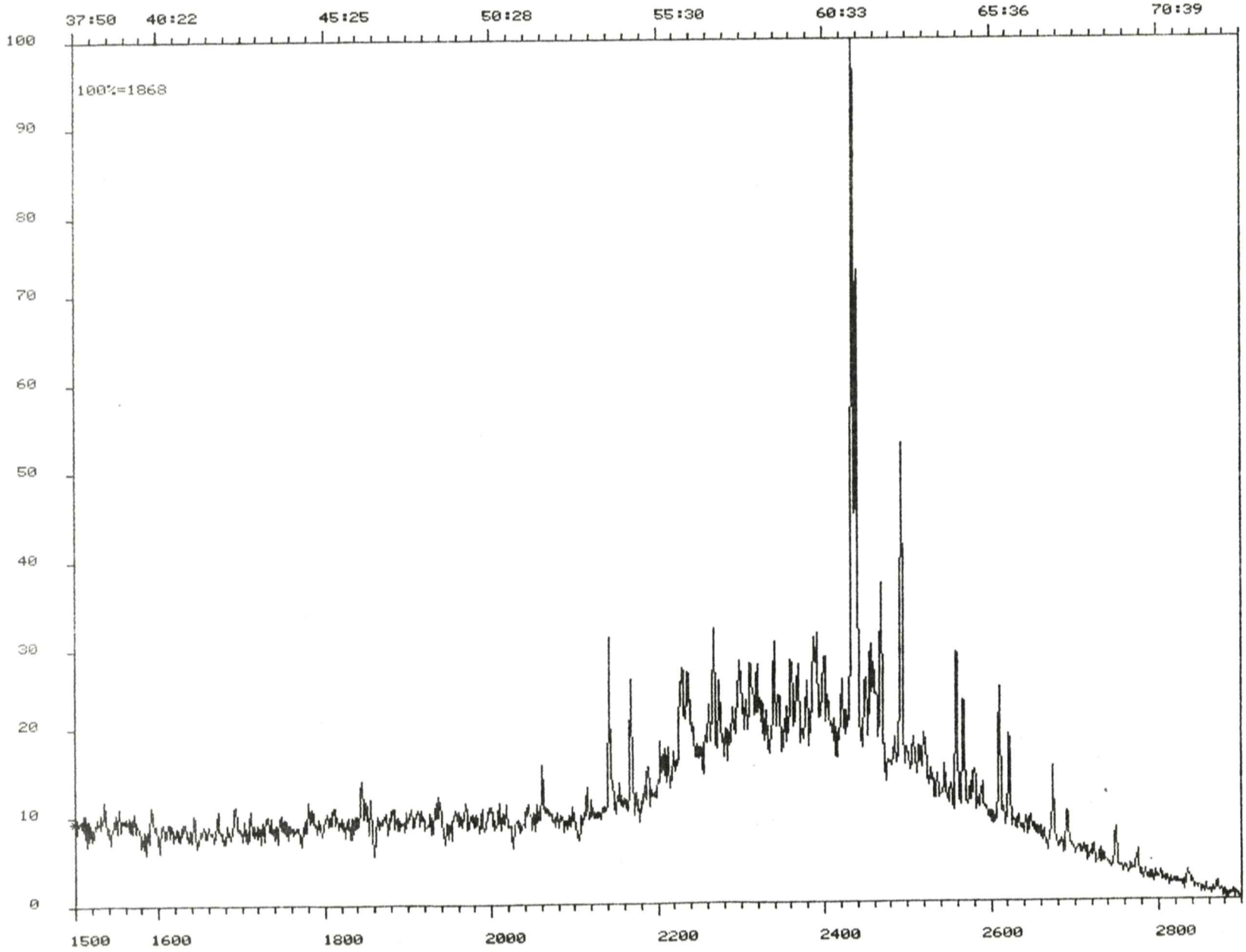
* 191



DS-55 CROSS SCAN REPORT, RUN: 202610001

HIBERNIA K-18 DST5 3783-3788M

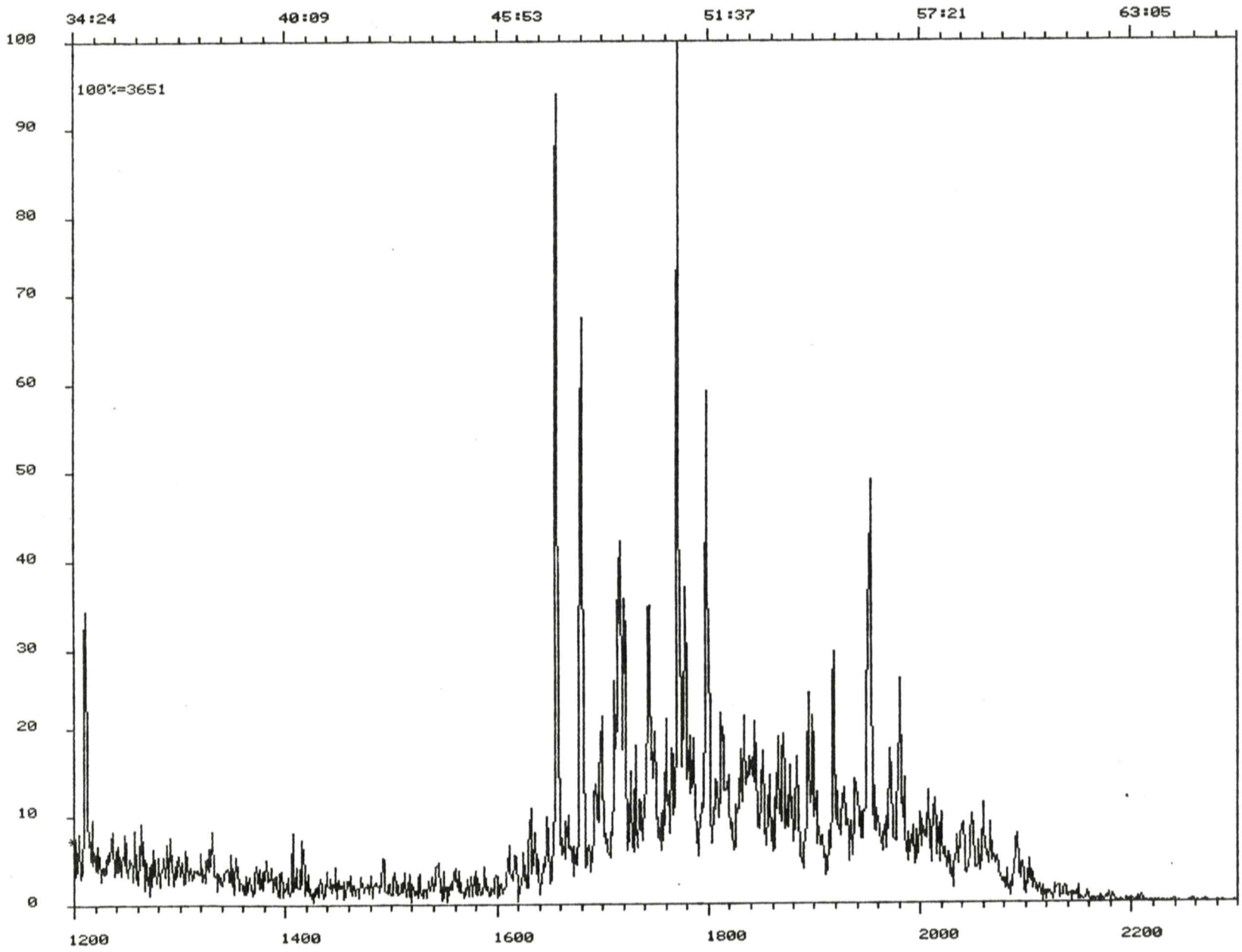
* 177



DS-55 CROSS SCAN REPORT, RUN: 249B0001

HEBRON DST#9 1905-1915M

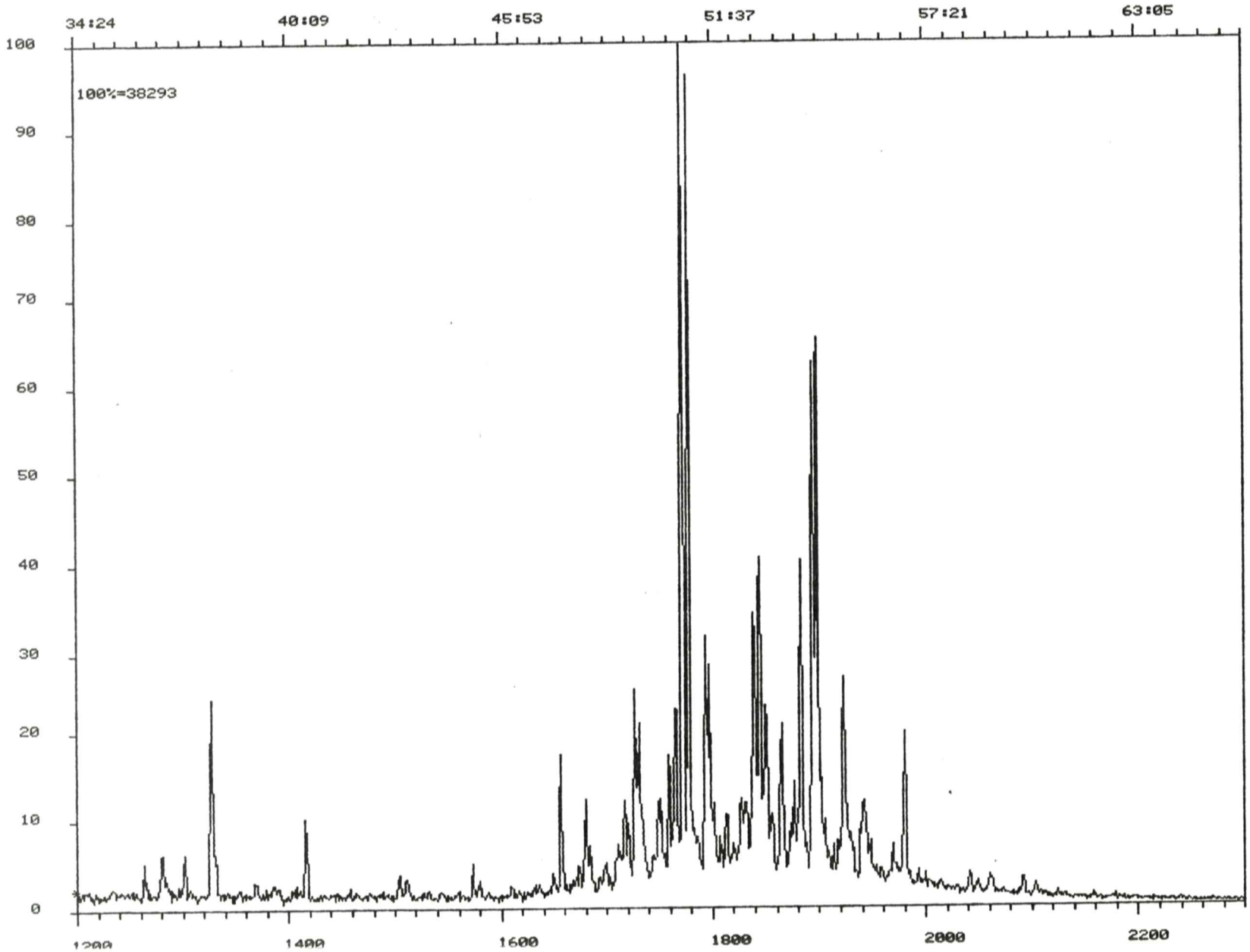
* 259



DS-55 CROSS SCAN REPORT, RUN: 249B0001

HEBRON DST#9 1905-1915M

* 218



DS-55 CROSS SCAN REPORT, RUN: 249B0001

HEBRON DST#9 1905-1915M

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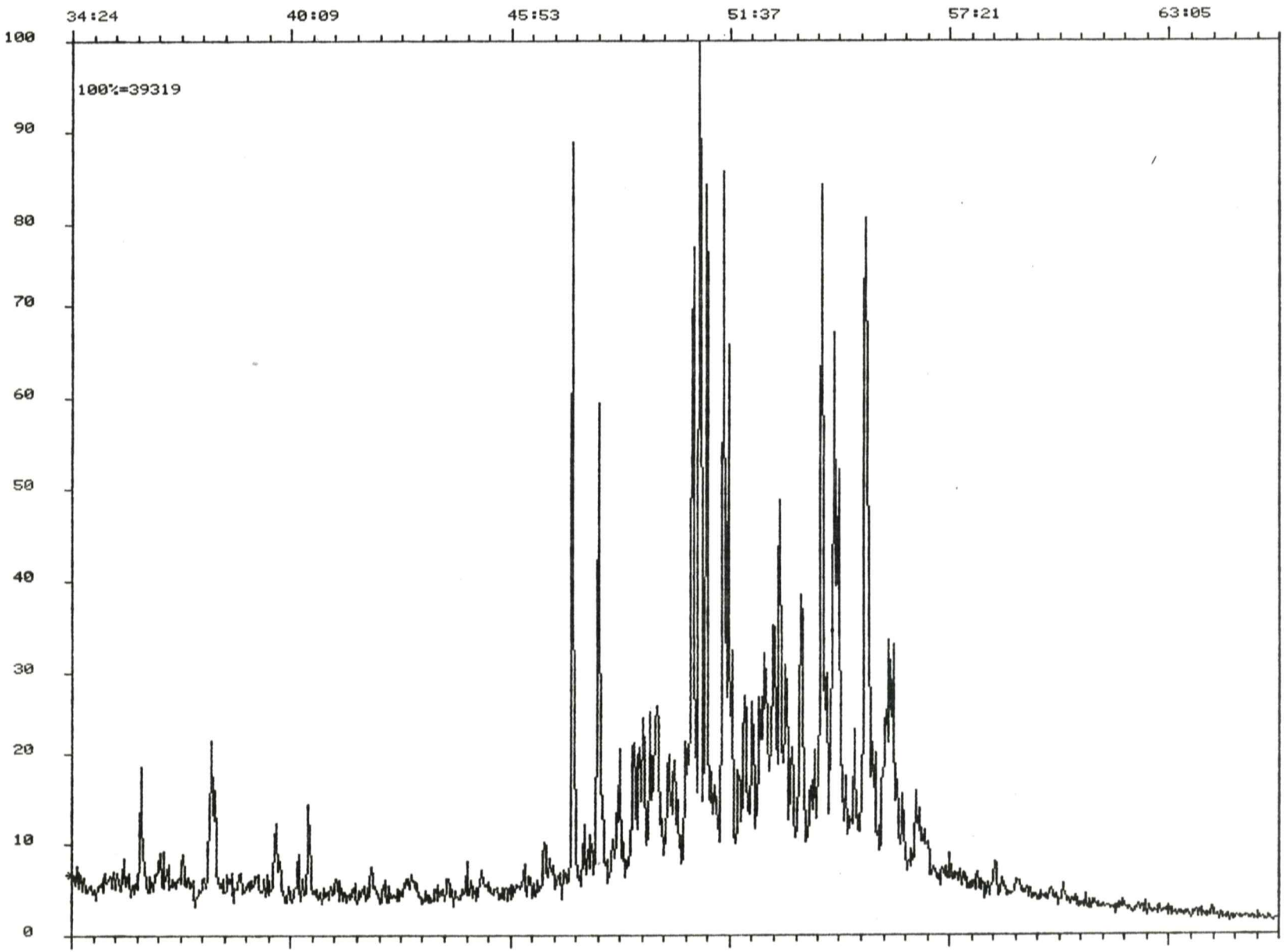

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HEBRON DST#9 1905-1915M

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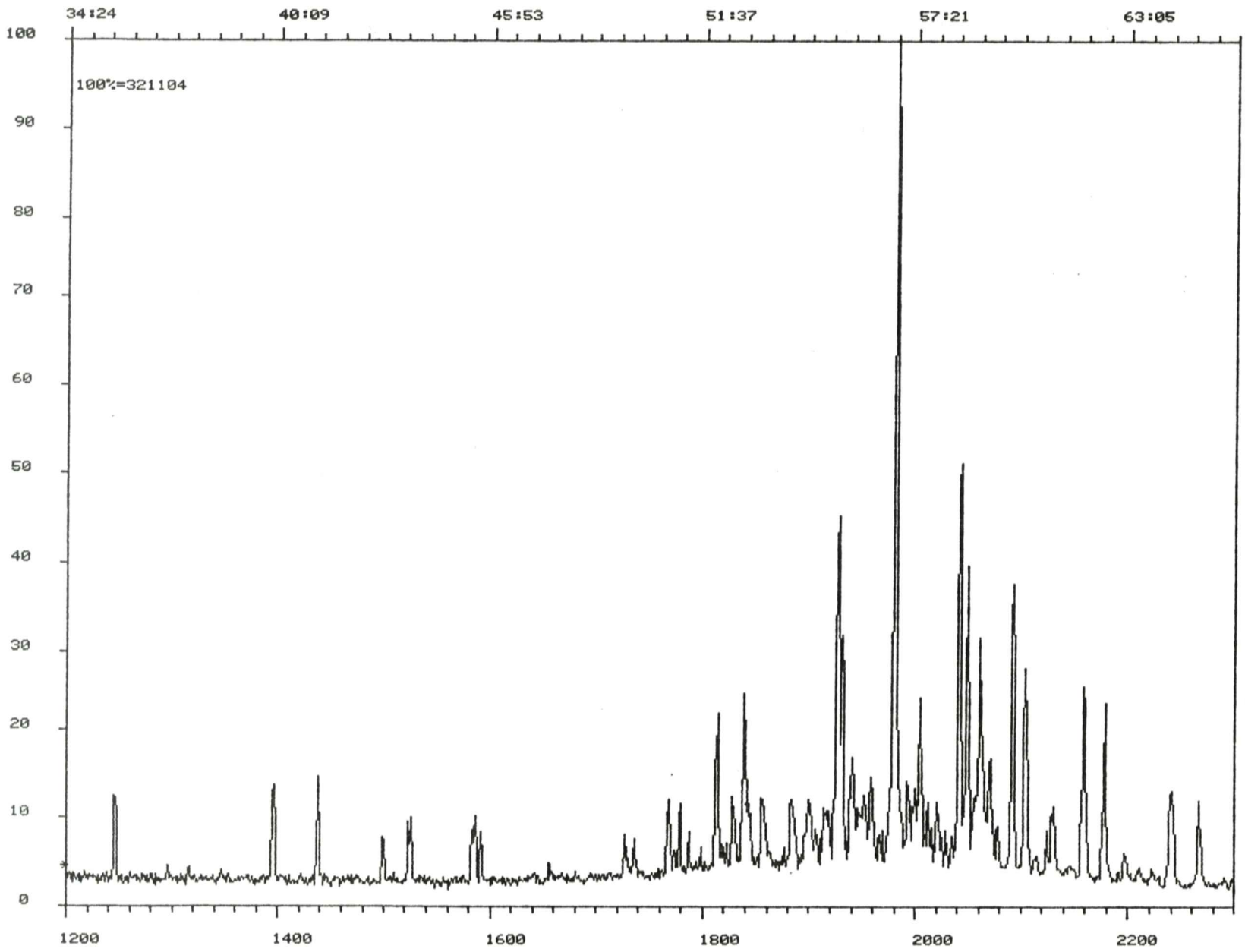

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HEBRON DST#9 1905-1915M

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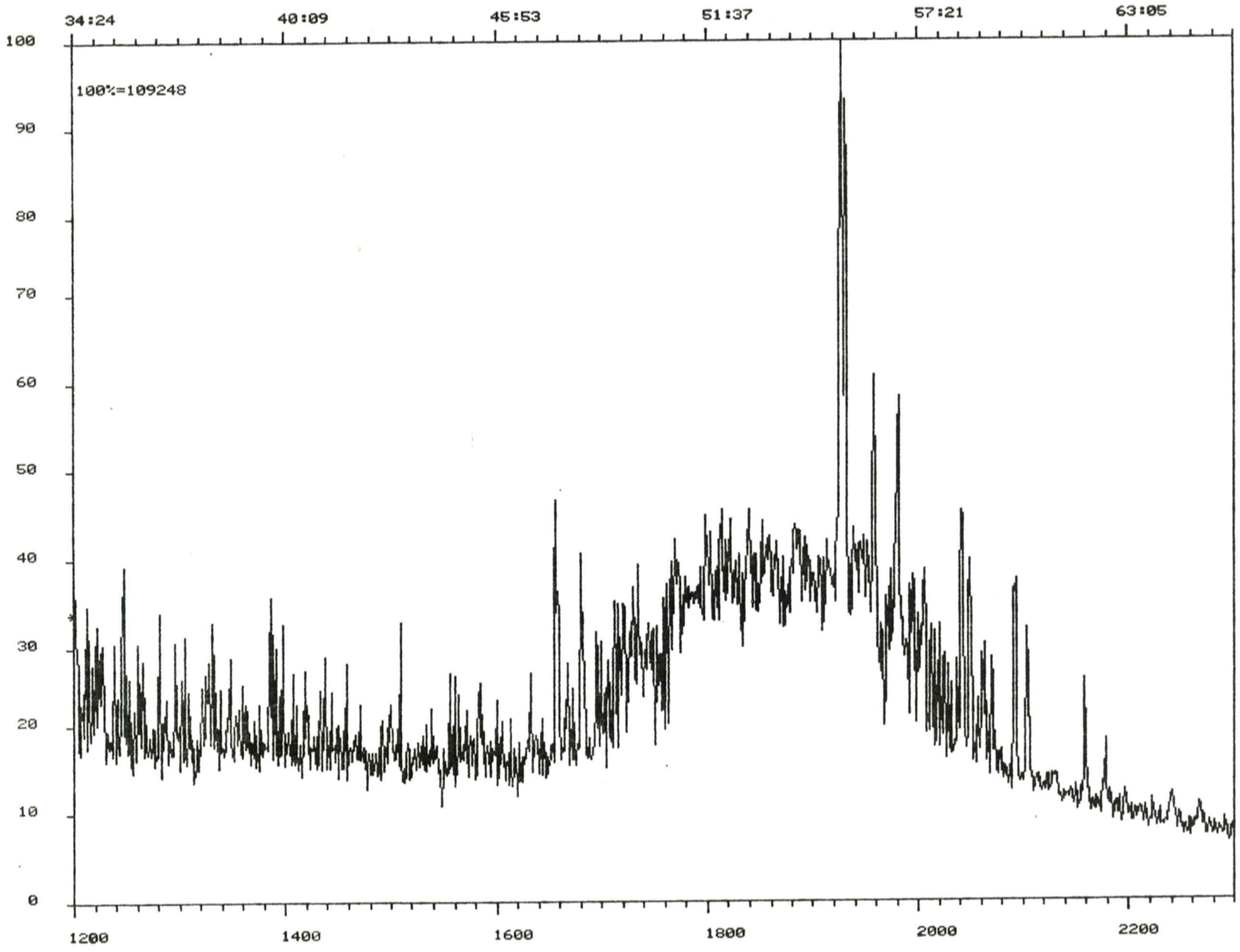
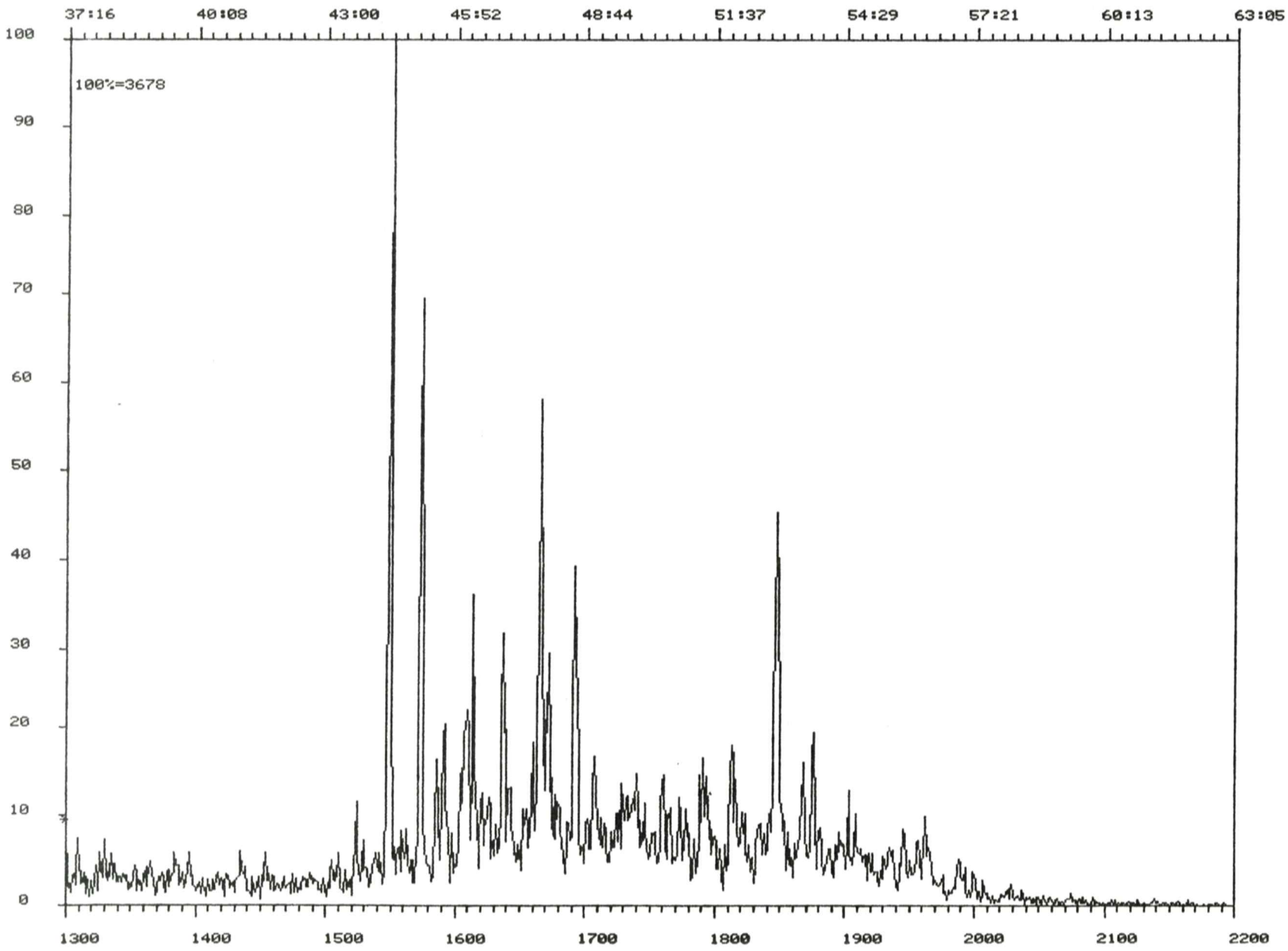


DS-55 CROSS SCAN REPORT, RUN: 2500001

HEBRON I-13 DST#7 ZONE 8

* 259



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HEBRON I-13 DST#7 ZONE 8

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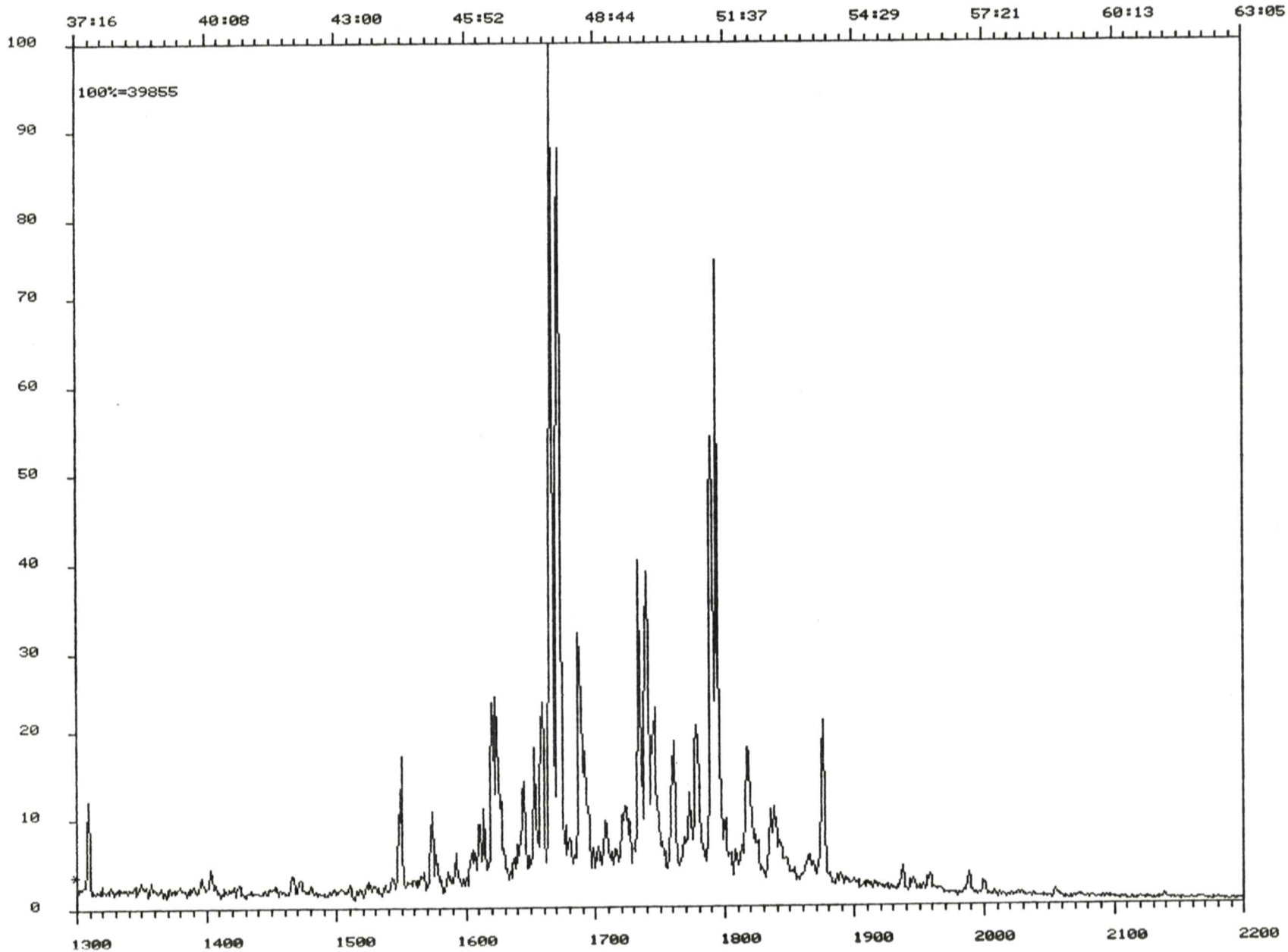

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HEBRON I-13 DST#7 ZONE 8

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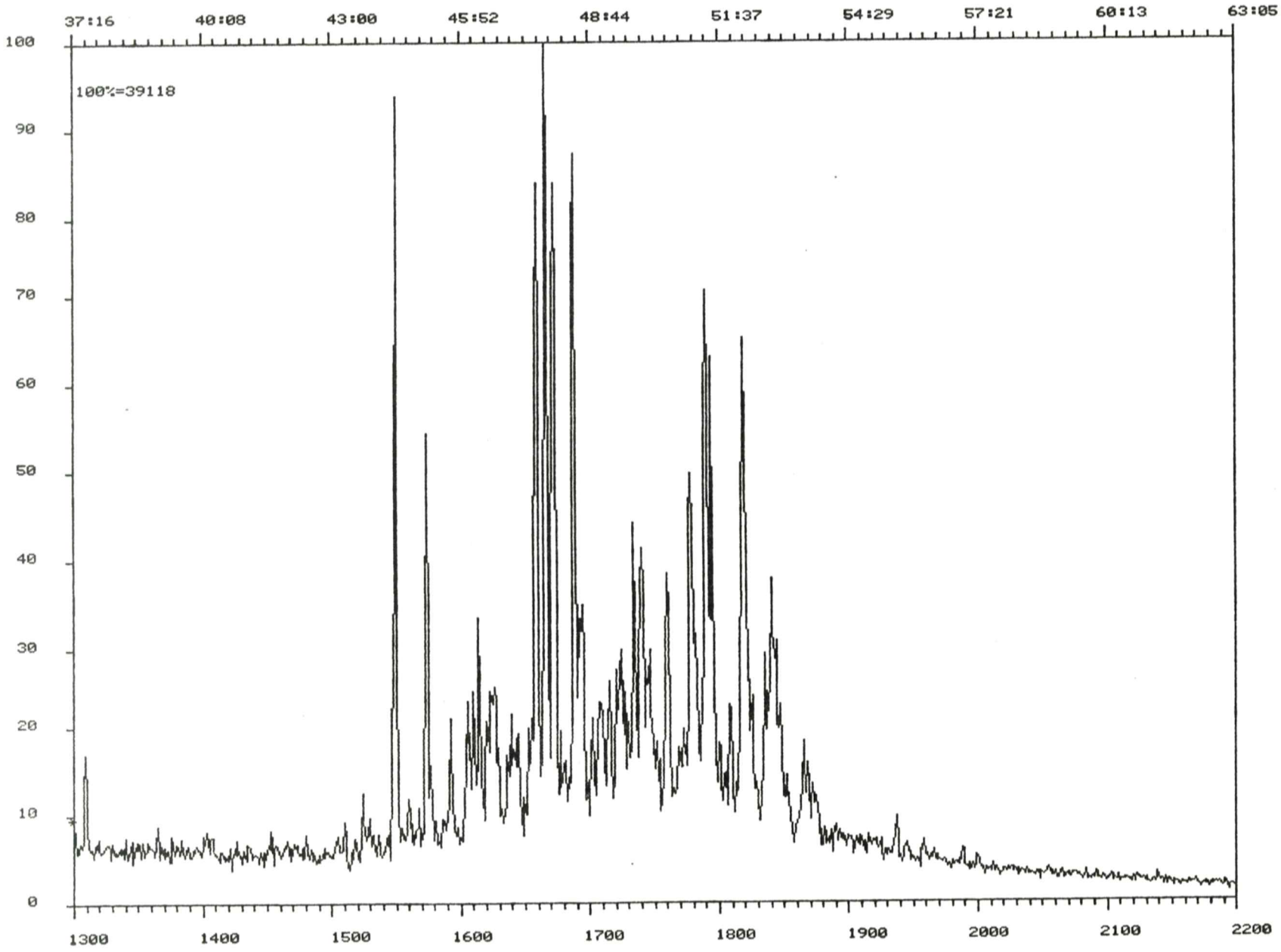

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HEBRON I-13 DST#7 ZONE 8

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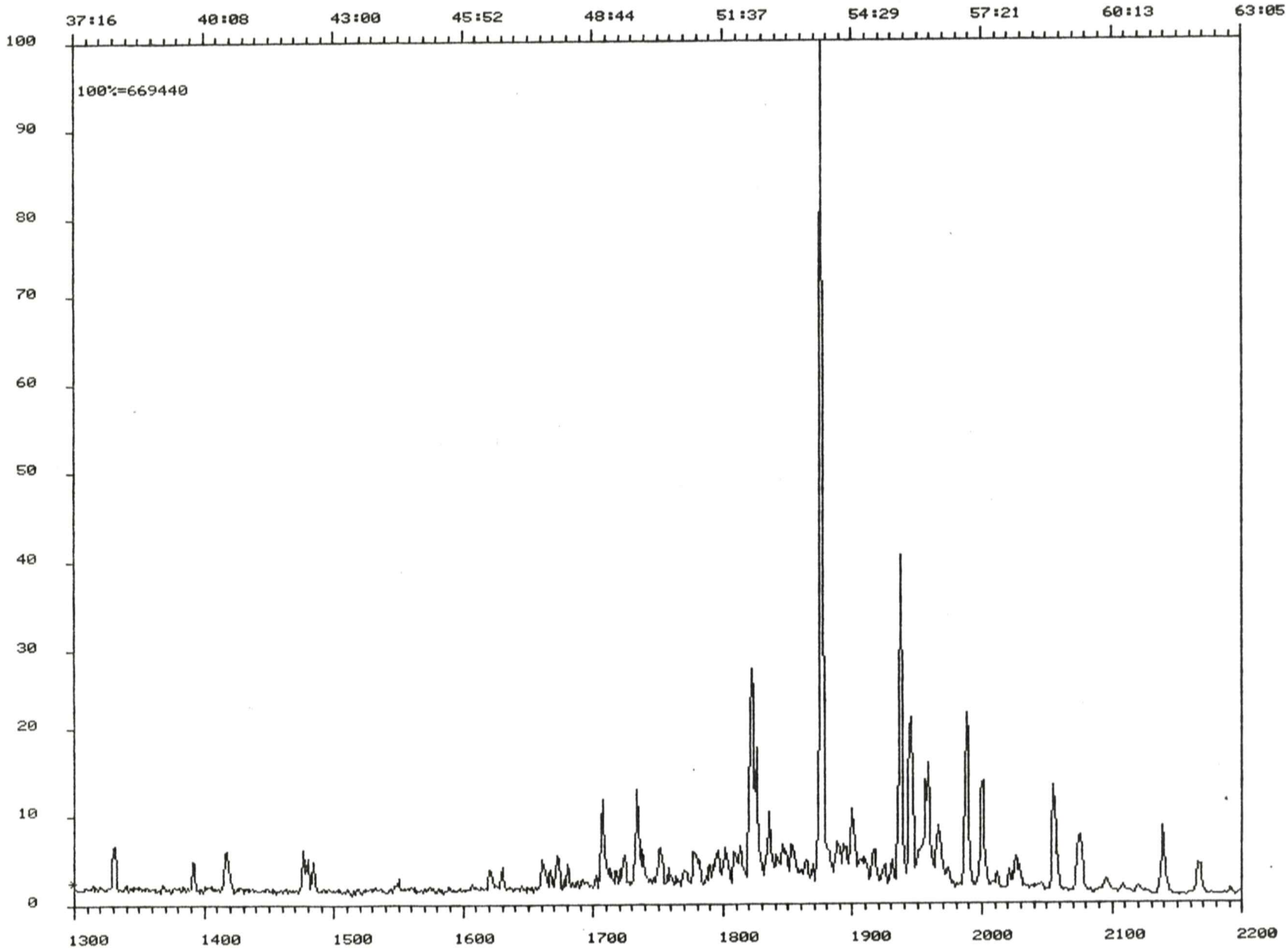

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HEBRON I-13 DST#7 ZONE 8

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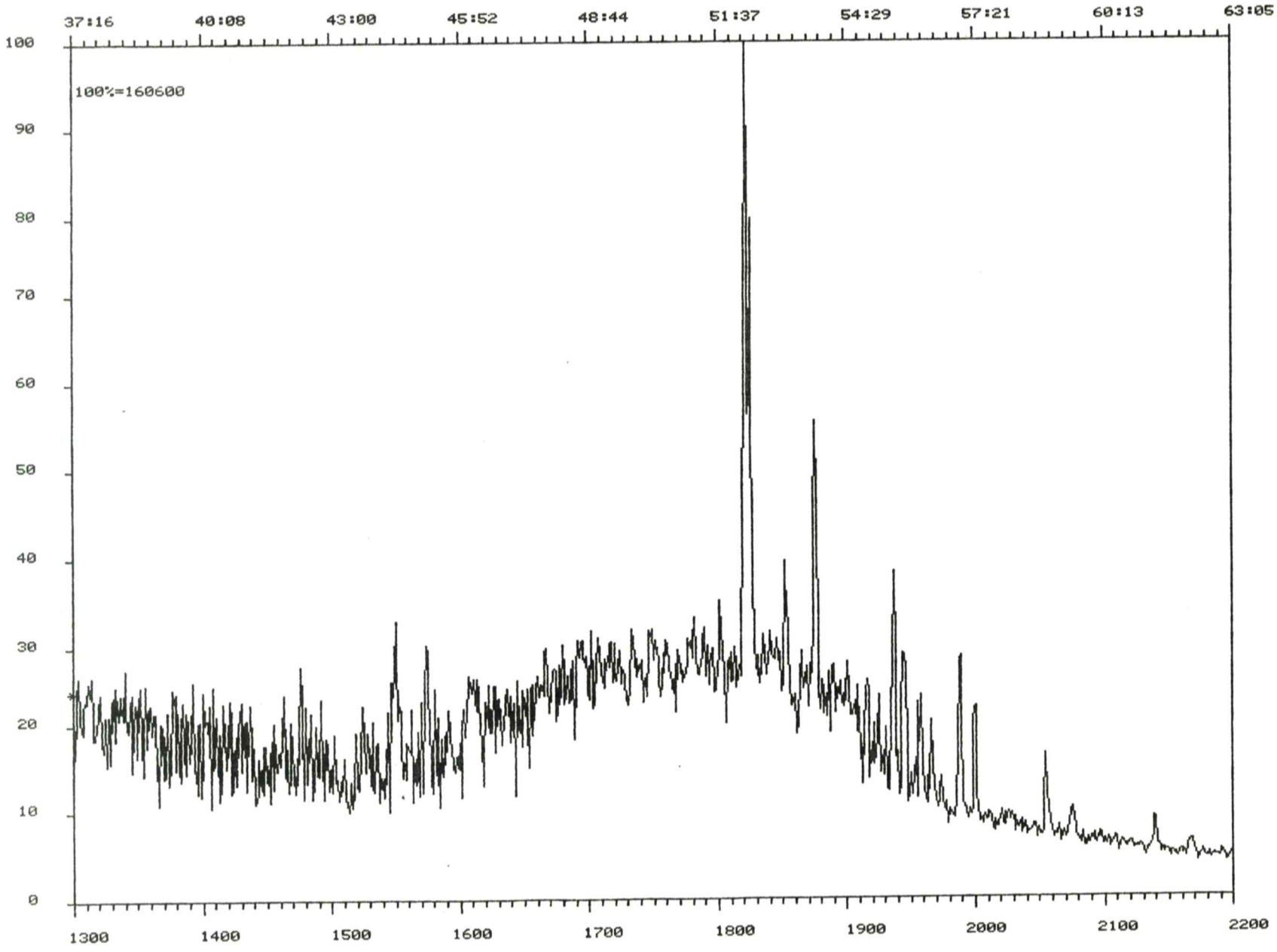

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HEBRON I-13 DST#6 2975-2986M

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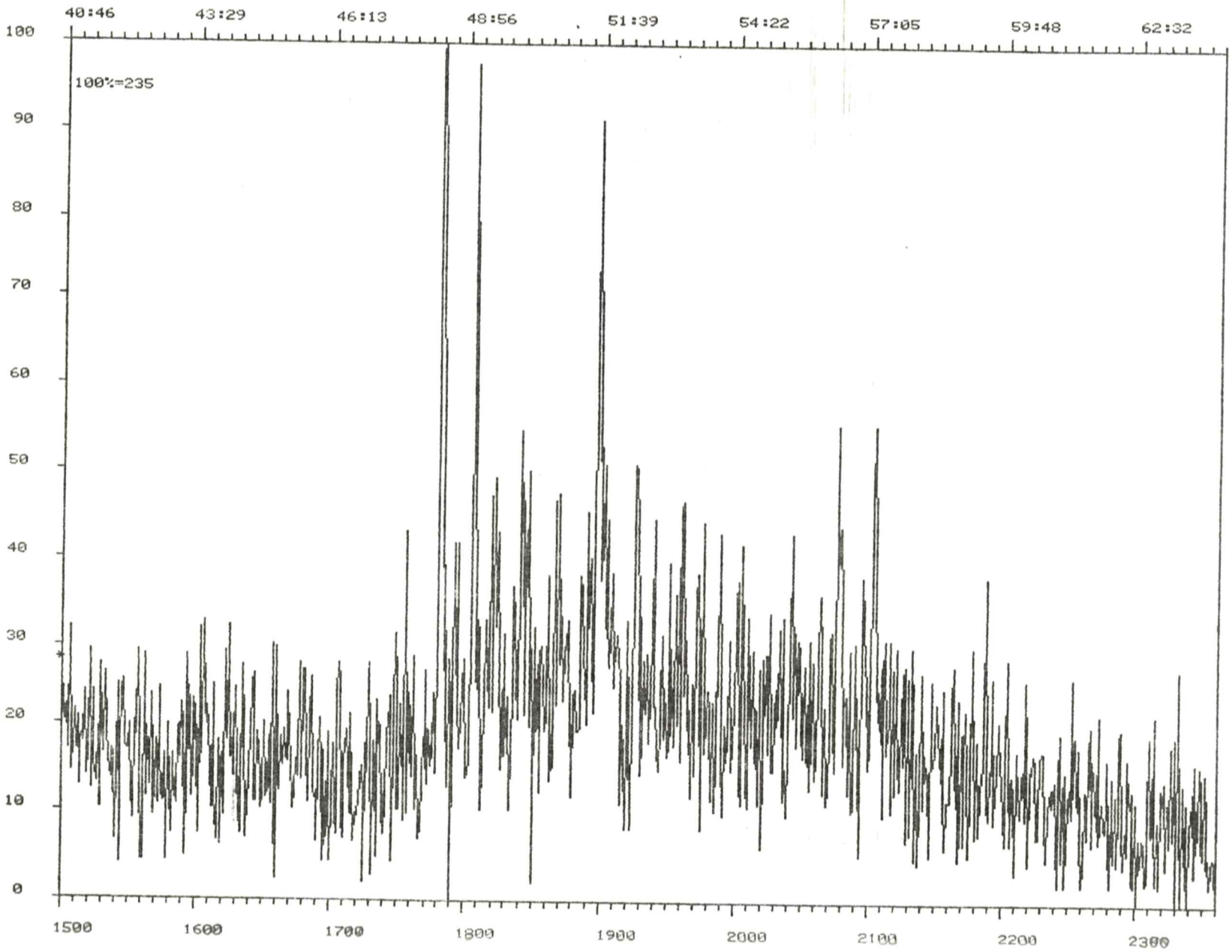

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HEBRON I-13 DST#6 2975-2986M

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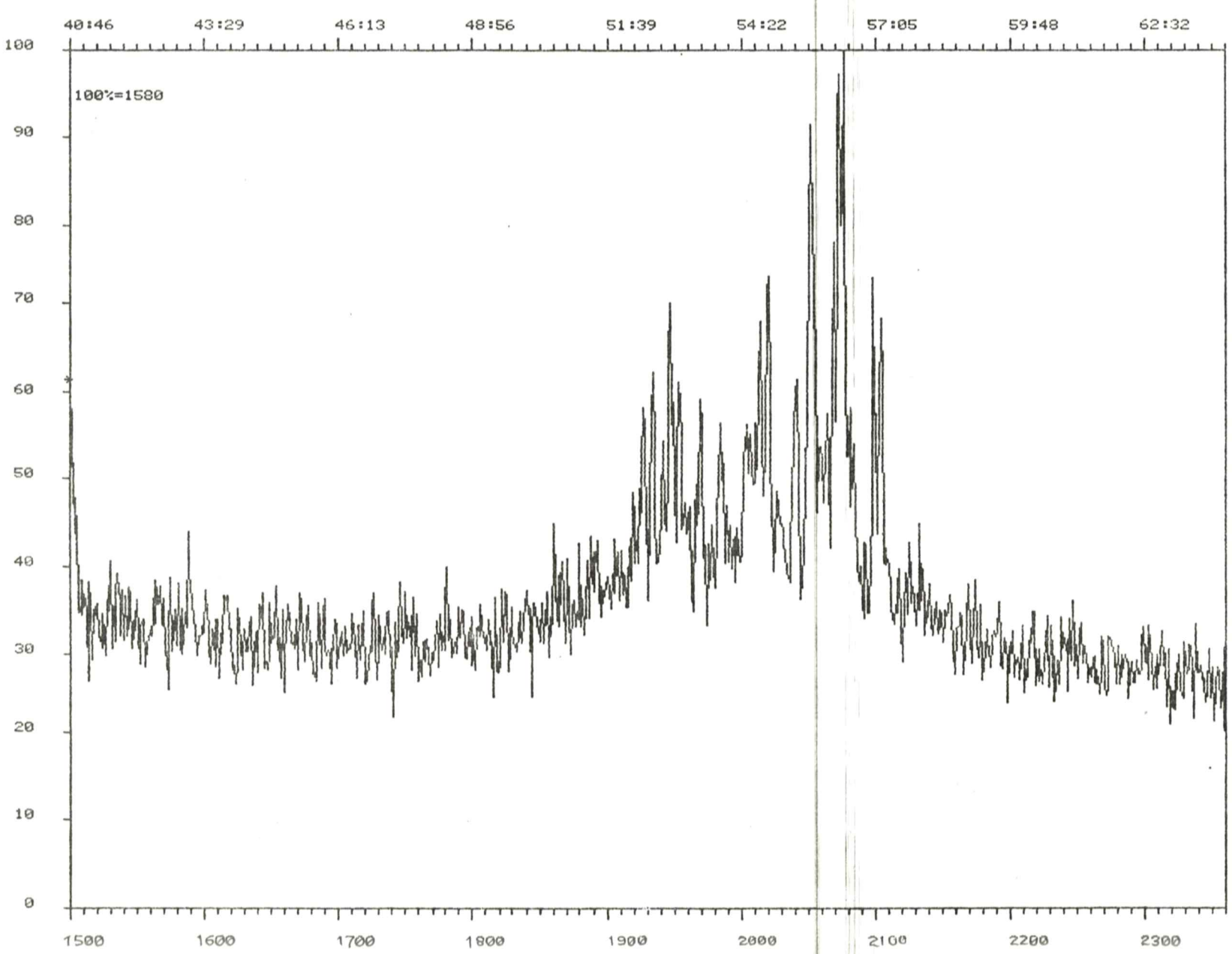

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HEBRON I-13 DST#6 2975-2986M

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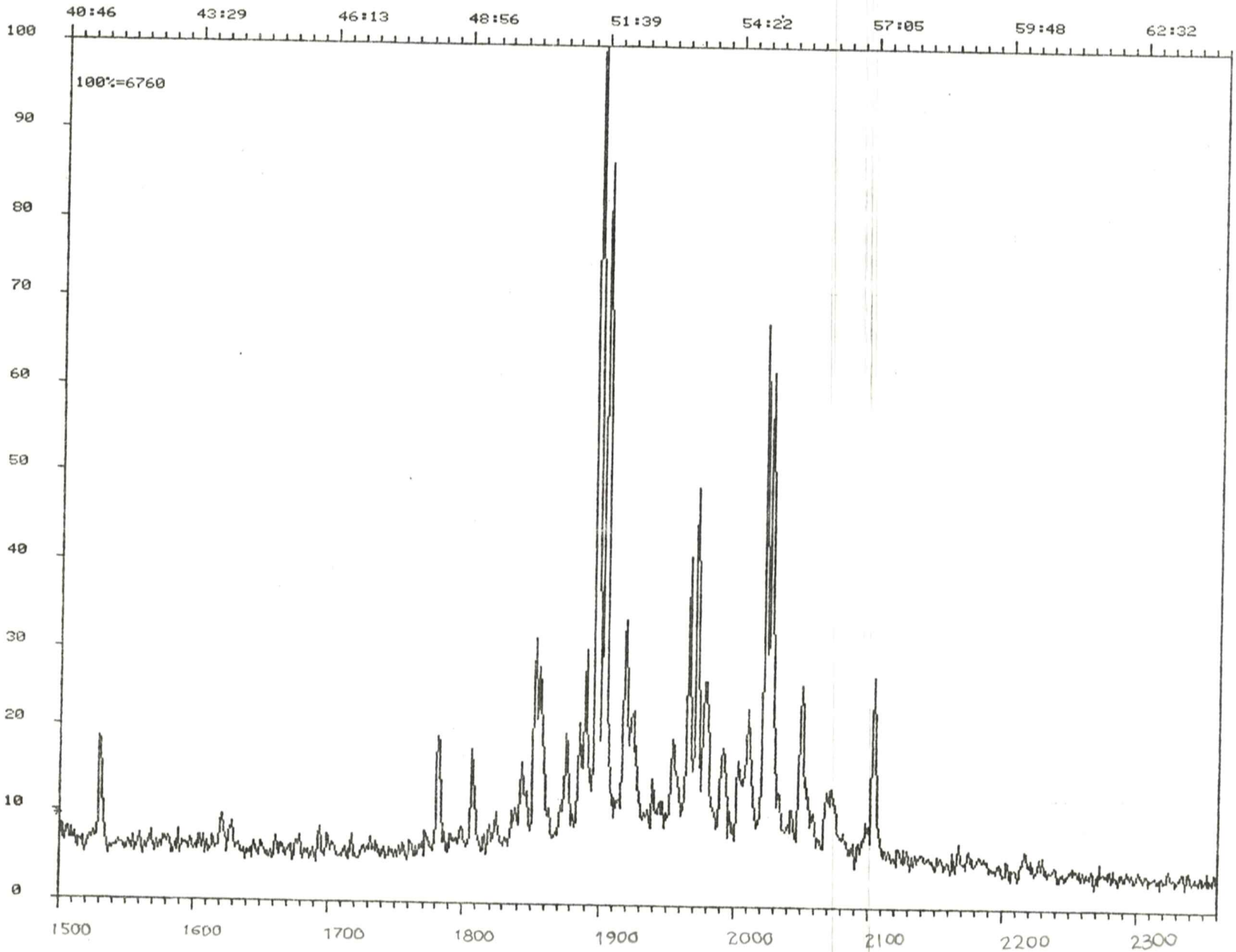

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HEBRON I-13 DST#6 2975-2986M

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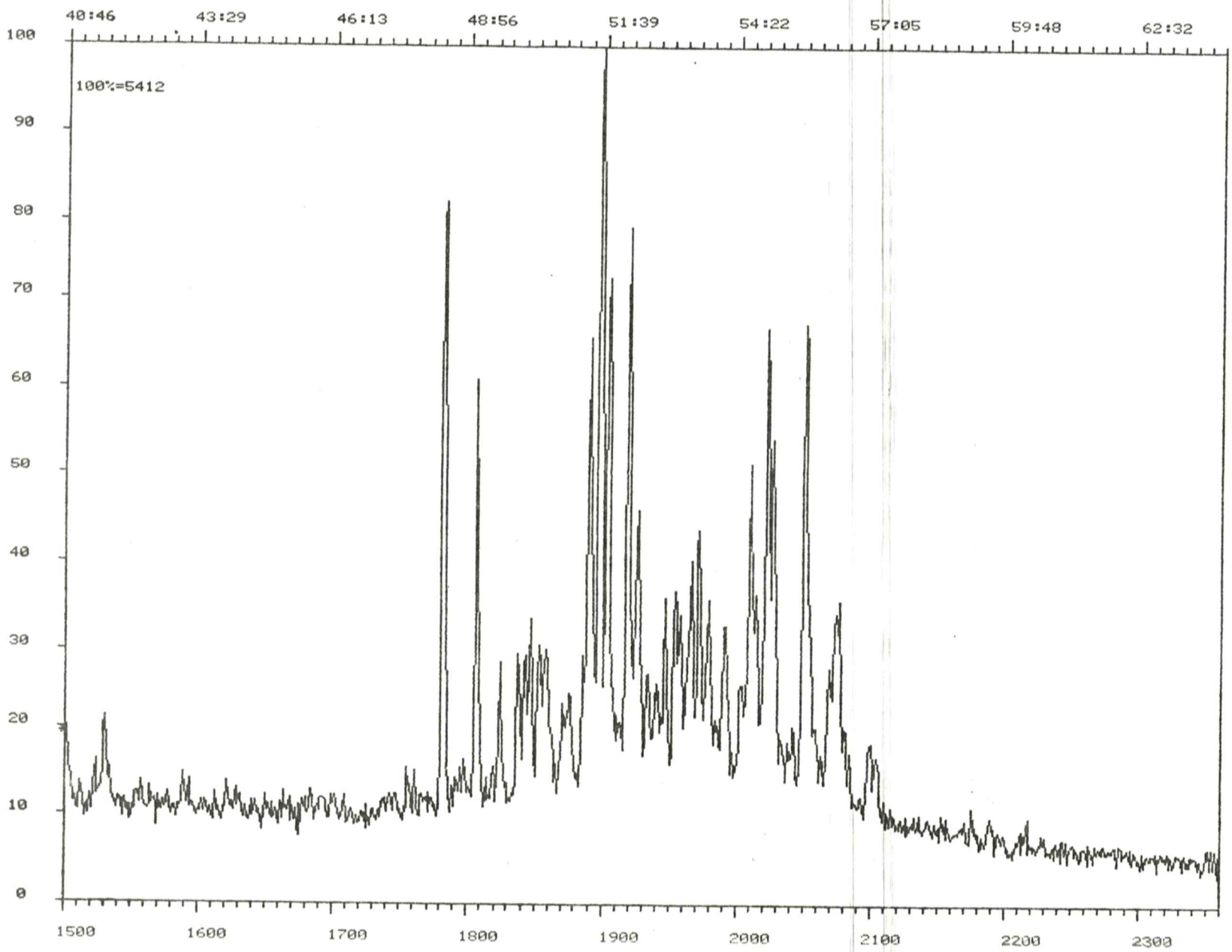

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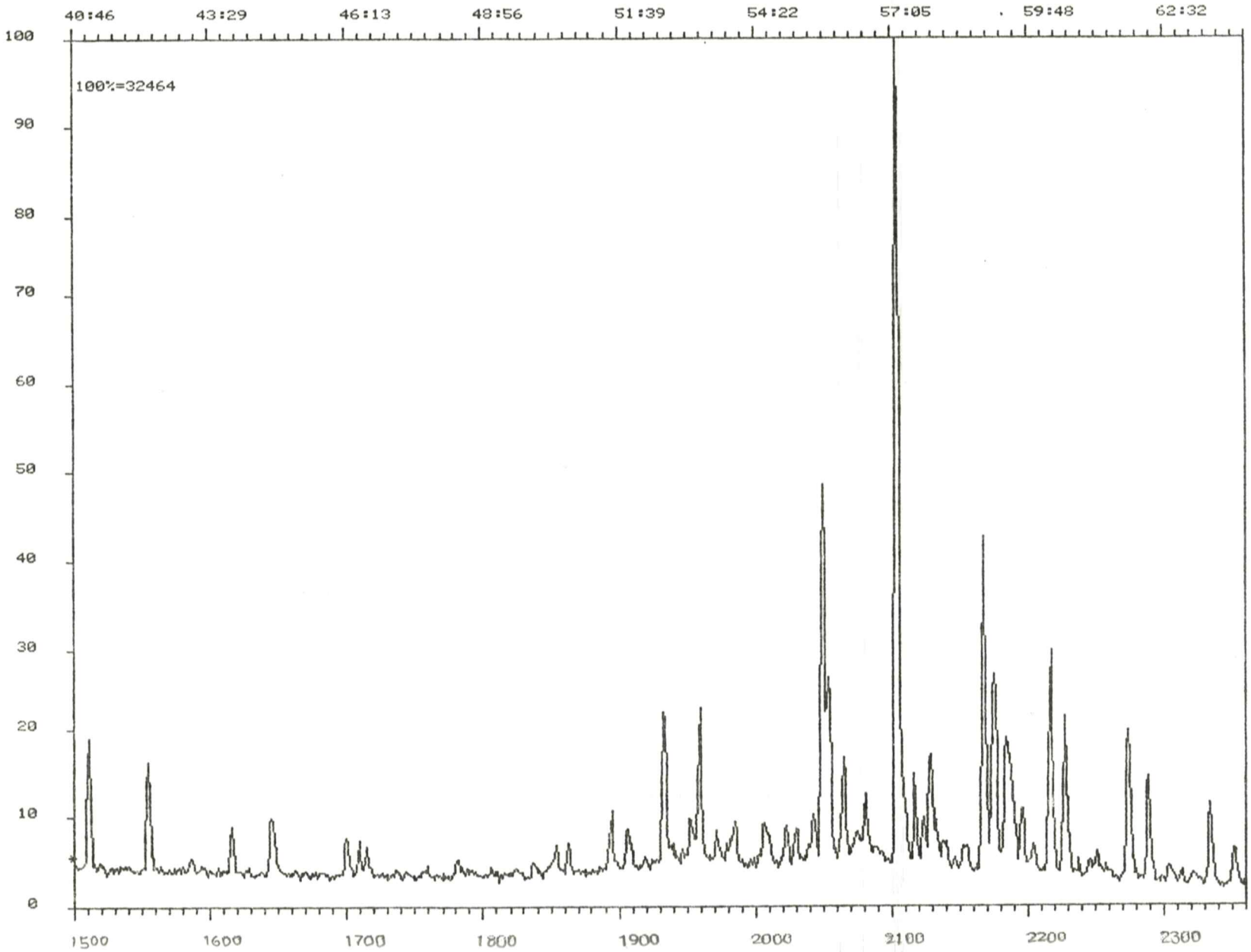

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HEBRON I-13 DST#6 2975-2986M

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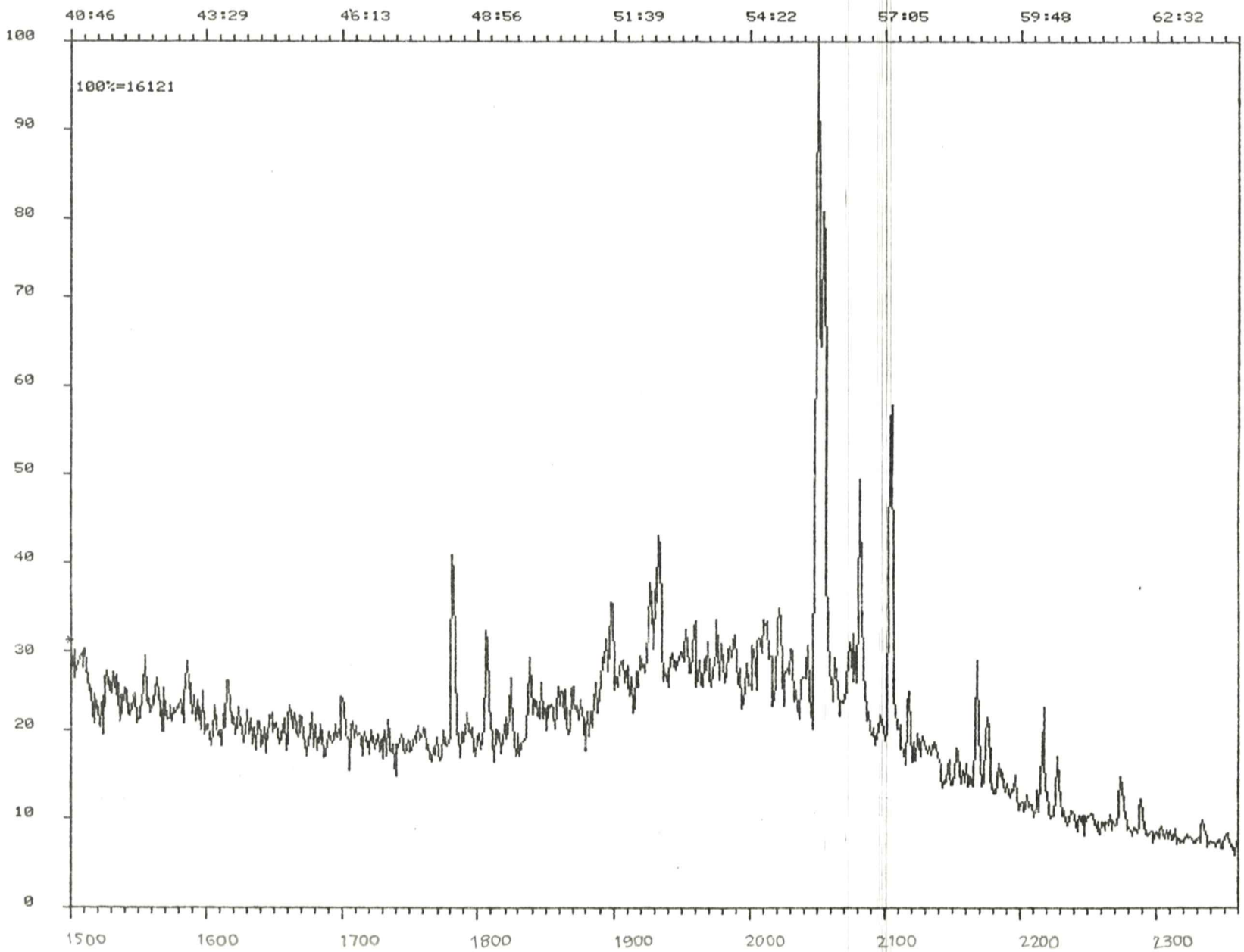
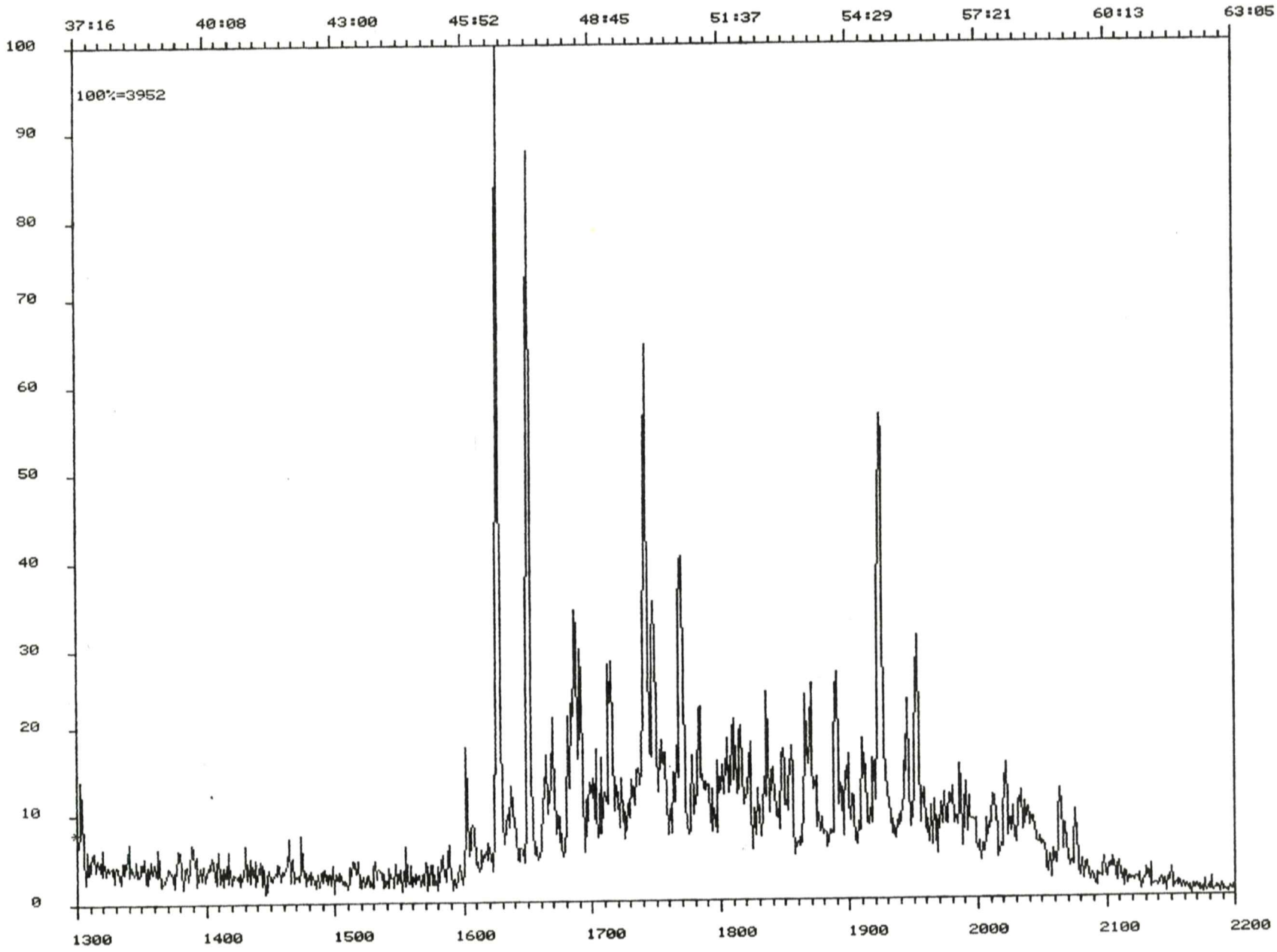


DS-55 CROSS SCAN REPORT, RUN: 2460001

HEBRON I-13 DST#5

* 259



DS-55 CROSS SCAN REPORT, RUN: 2460001

HEBRON I-13 DST#5

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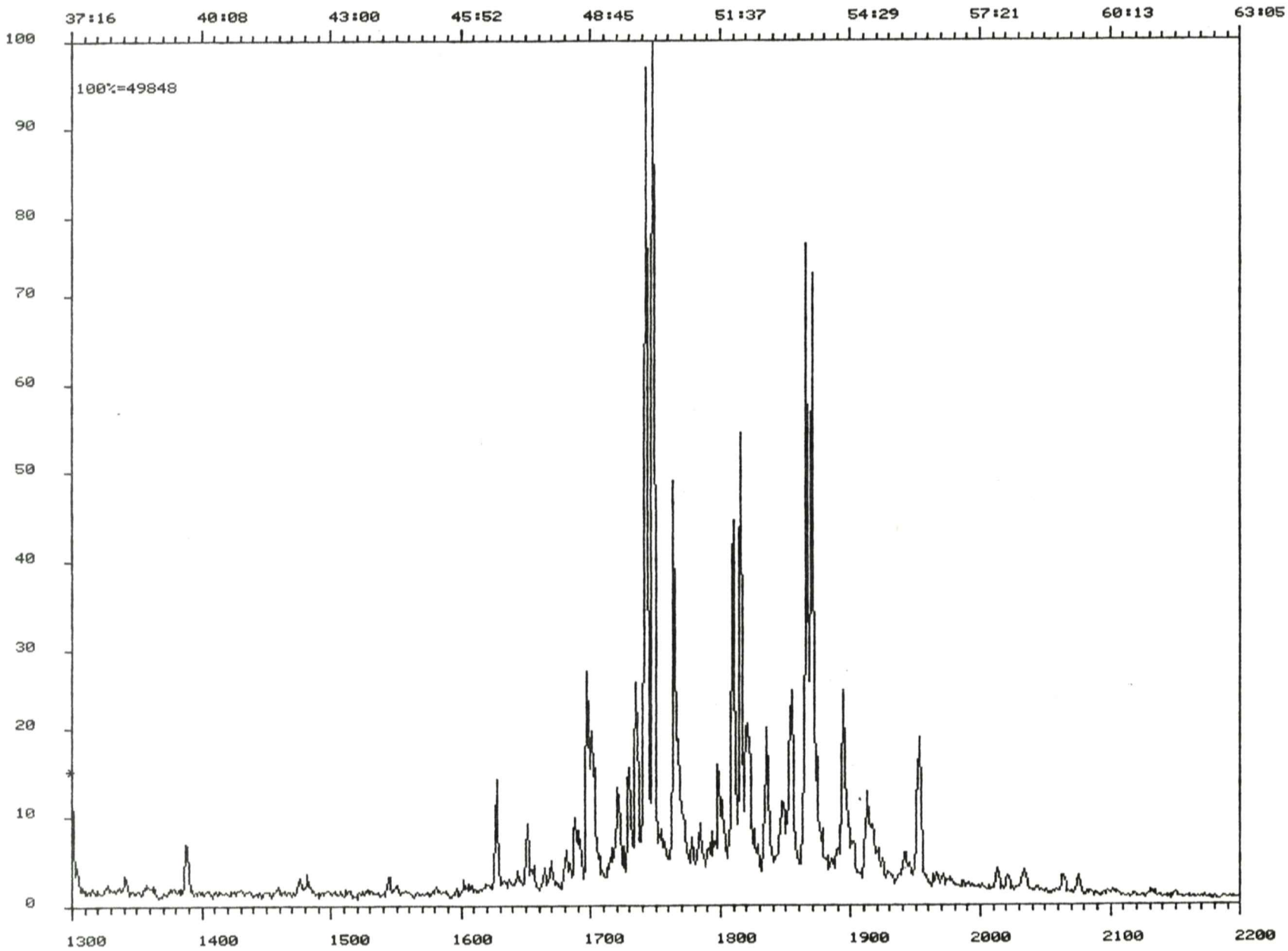

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HEBRON I-13 DST#5

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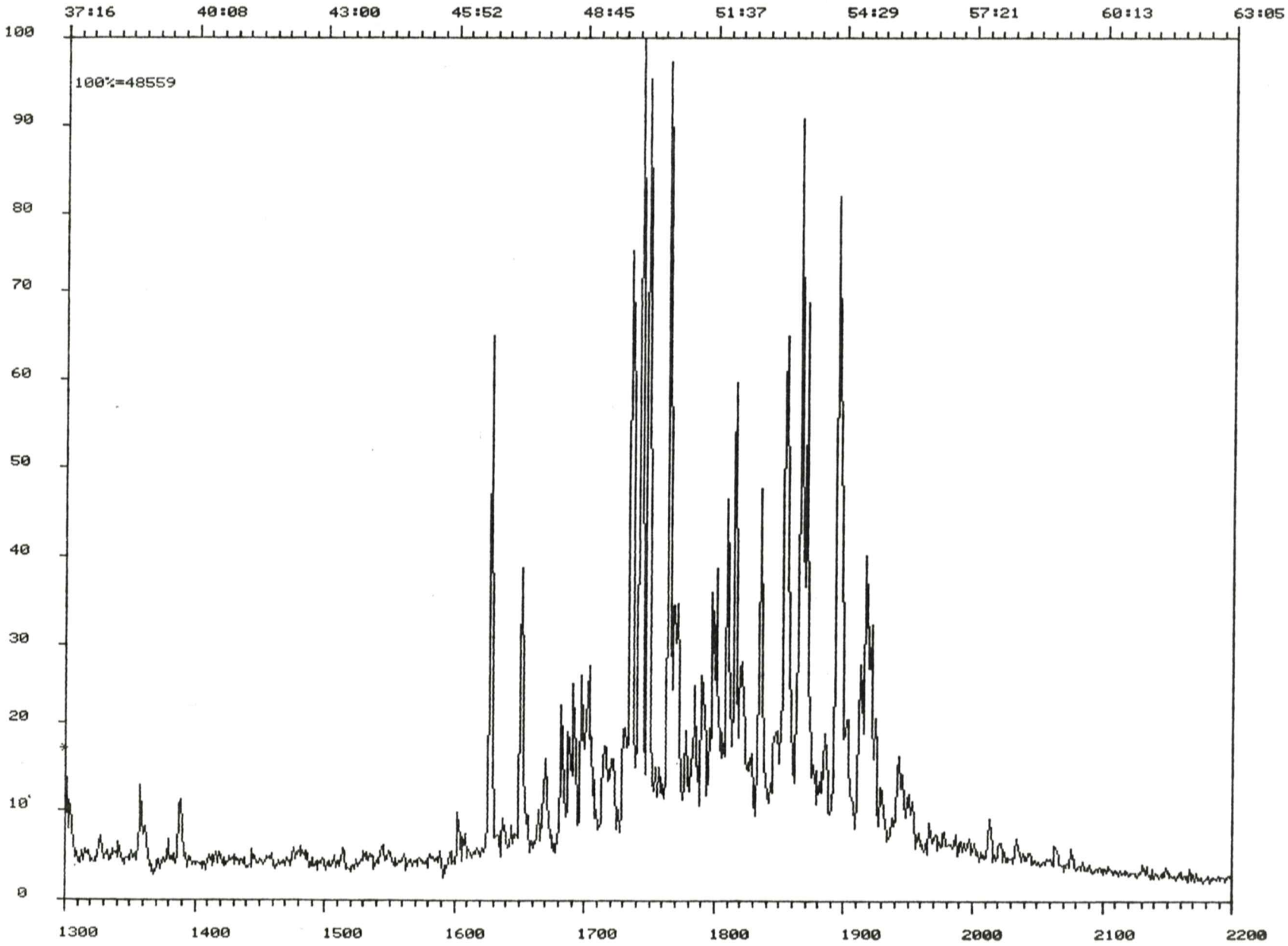

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HEBRON I-13 DST#5

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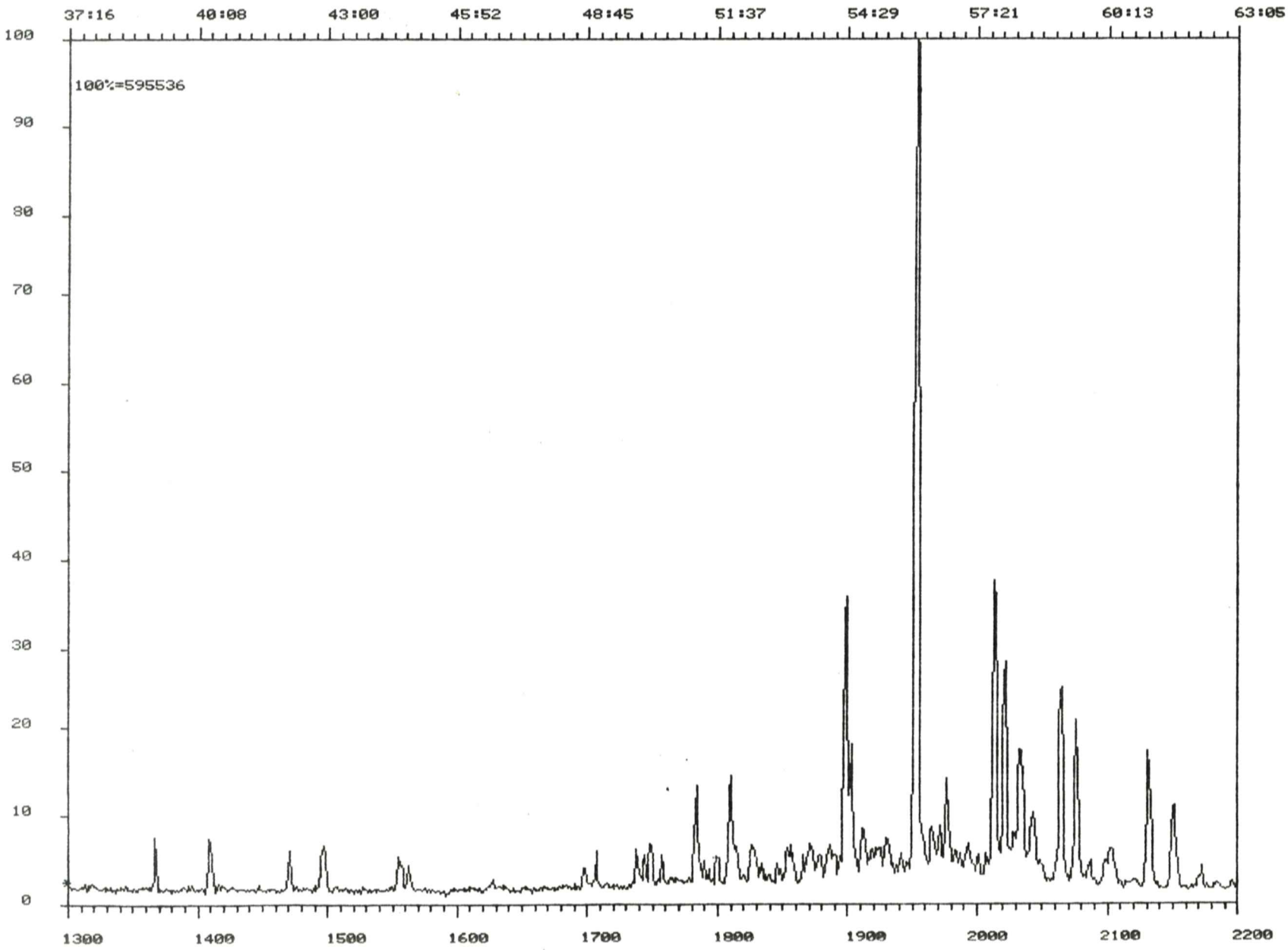

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HEBRON I-13 DST#5

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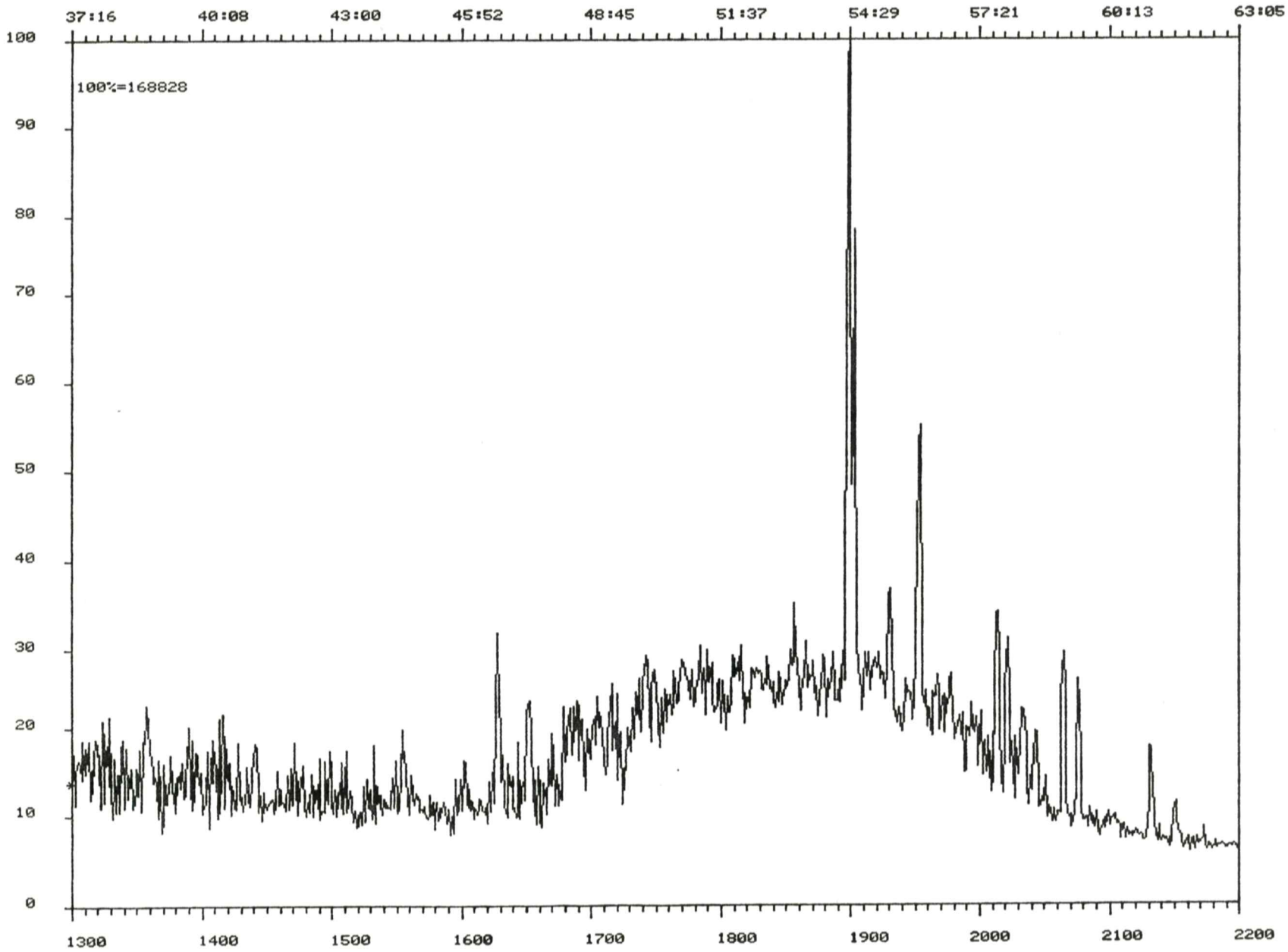
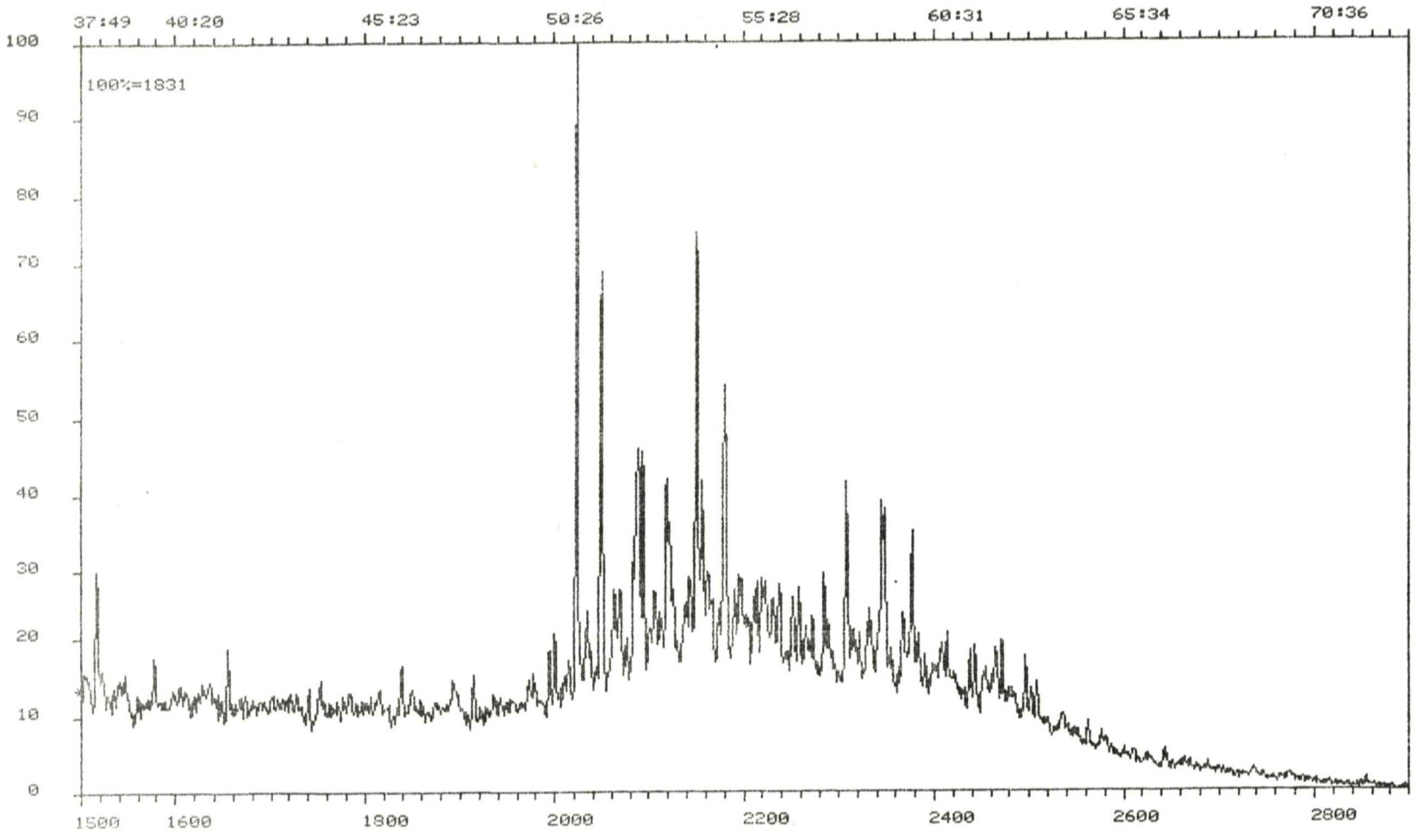


DS-55 CROSS SCAN REPORT, RUN: 207870002

FORTUNE G-57 DST#3

* 259



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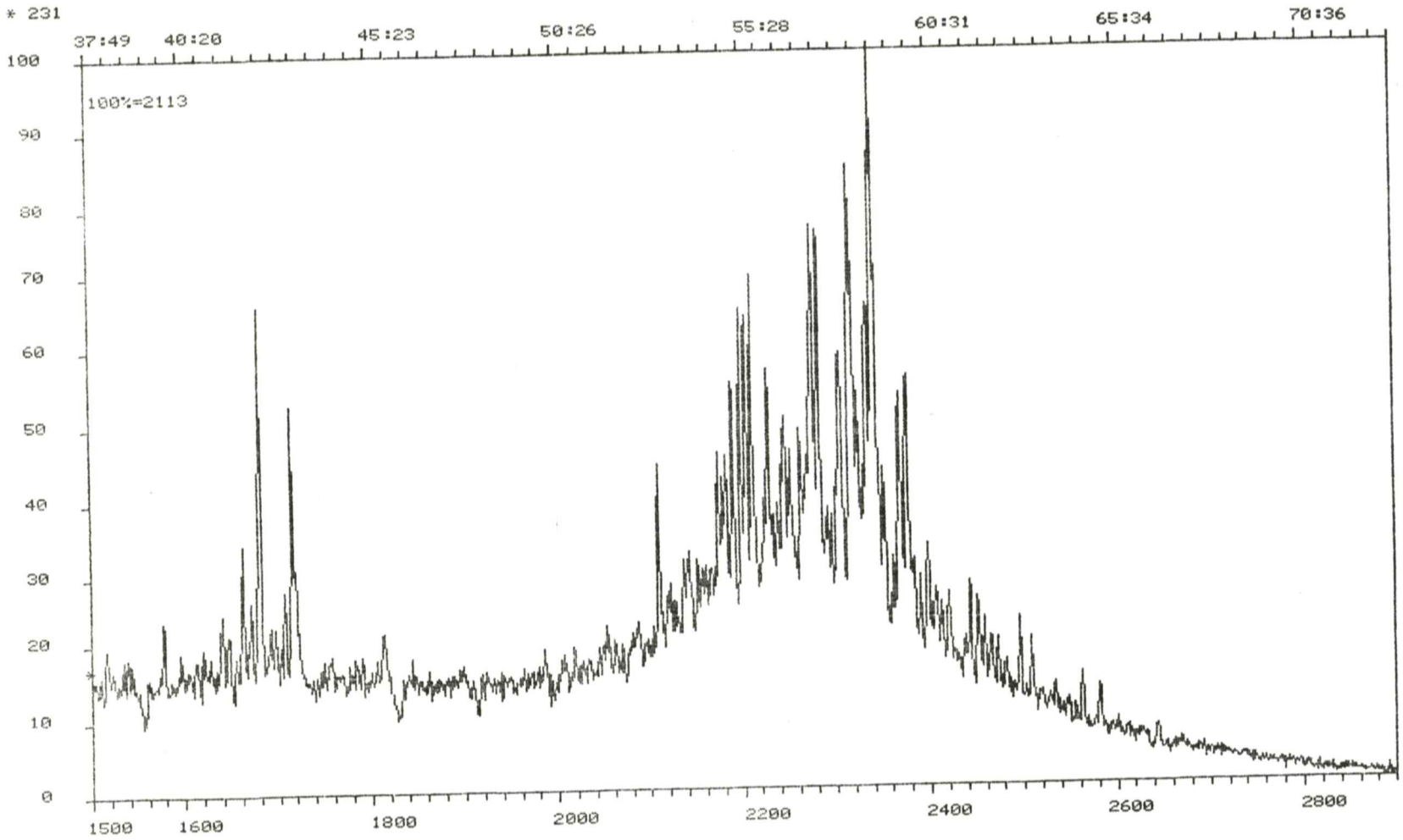
FORTUNE G-57 DST#3



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FORTUNE G-57 DST#3

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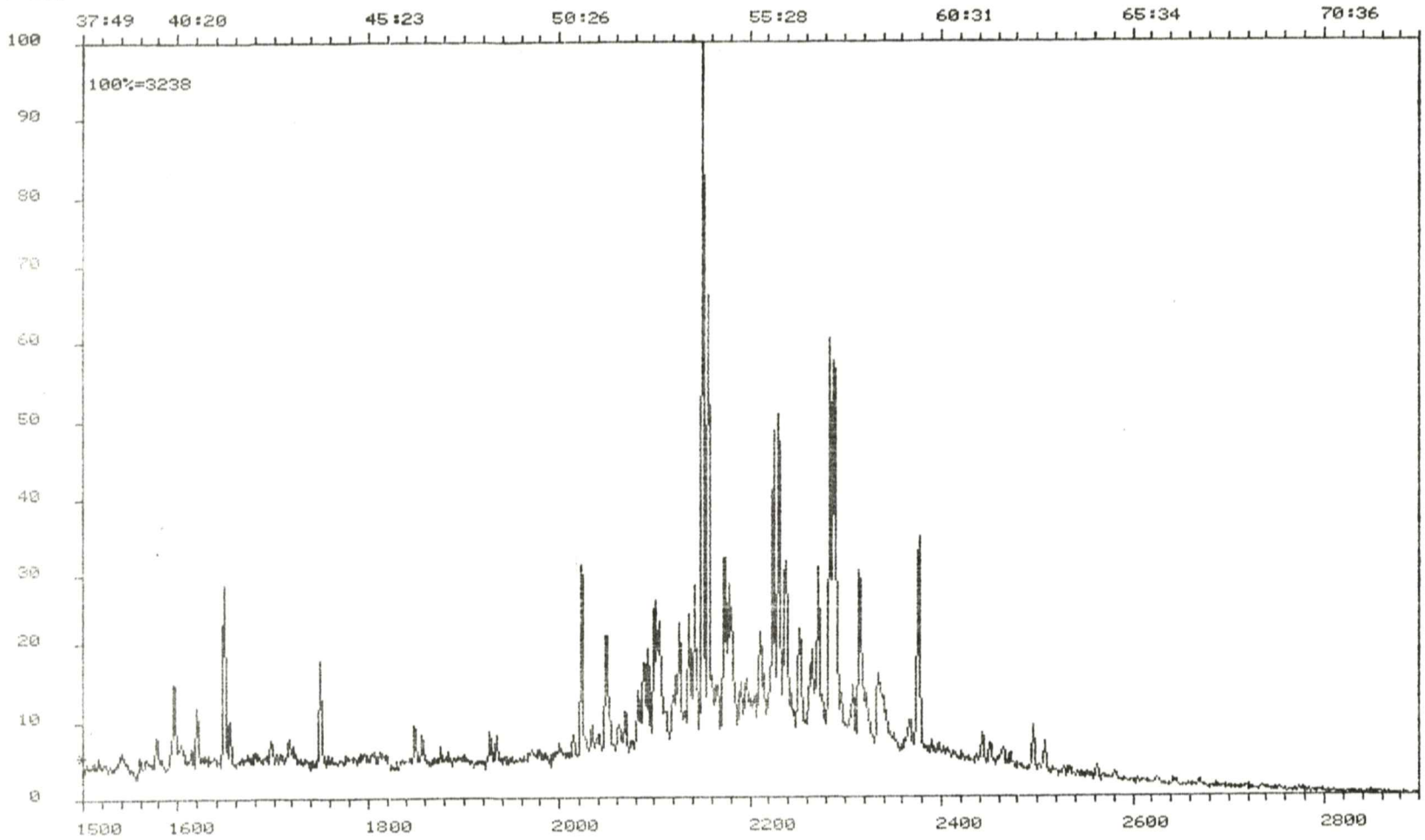

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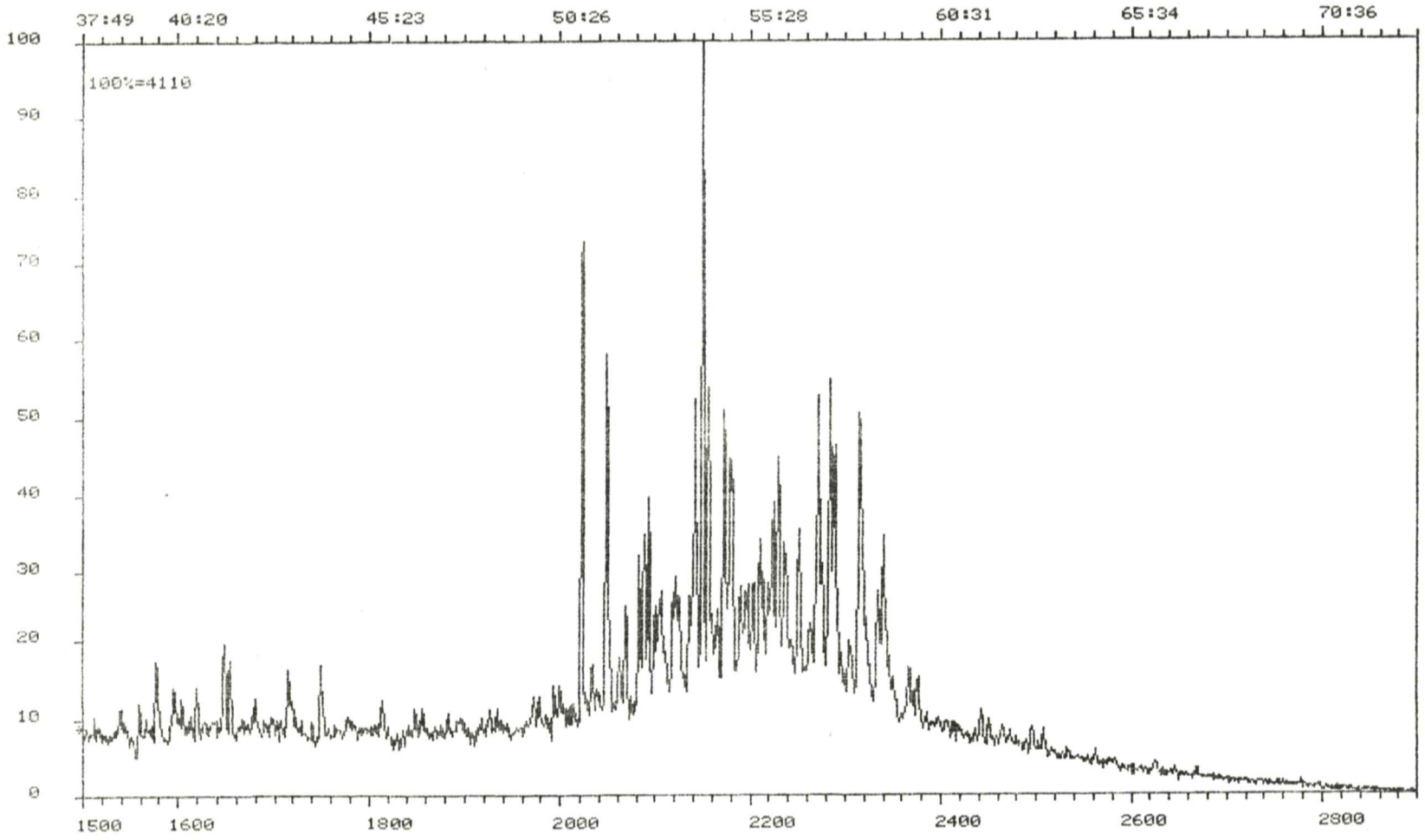

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FORTUNE G-57 DST#3

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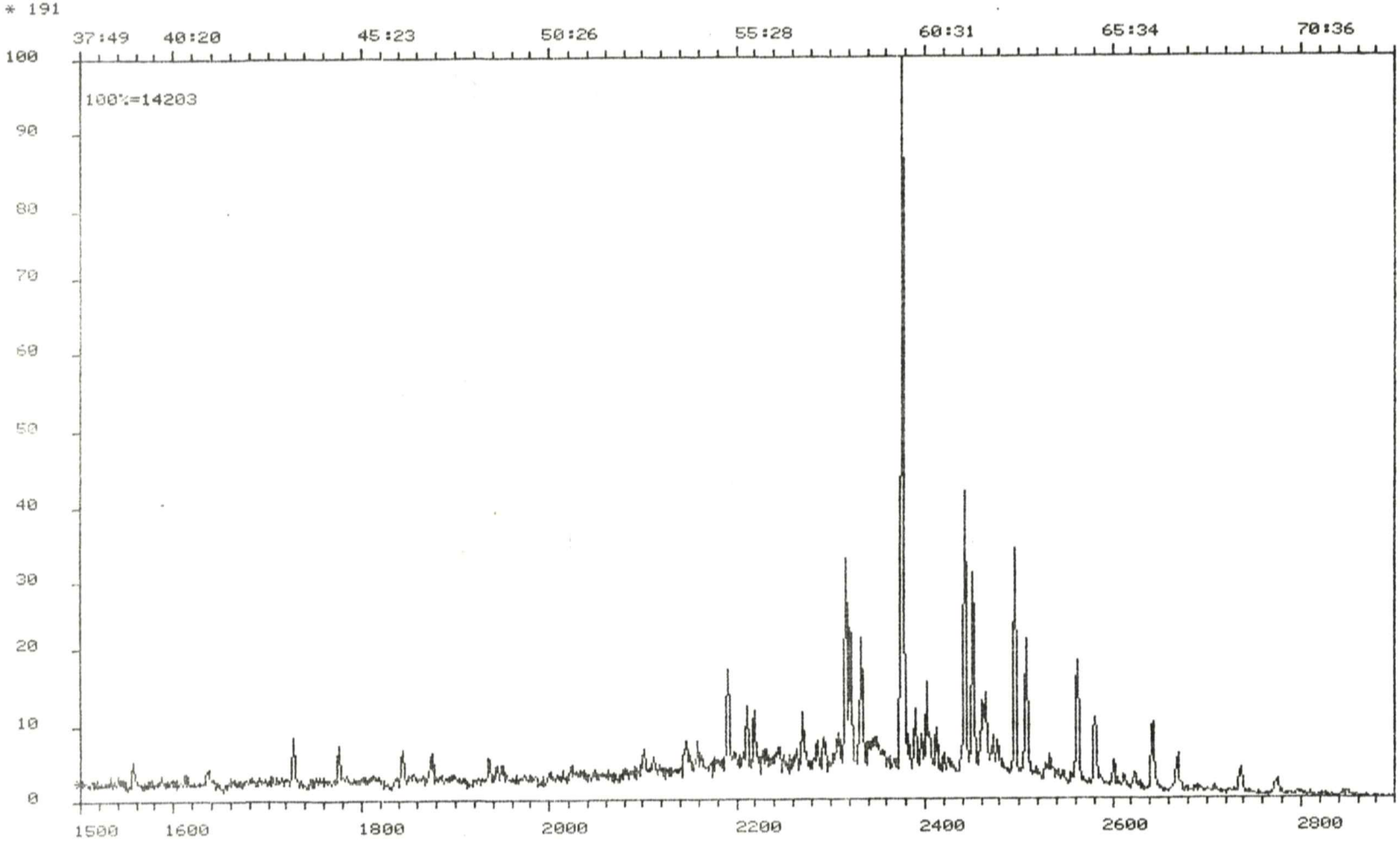

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FORTUNE G-57 DST#3

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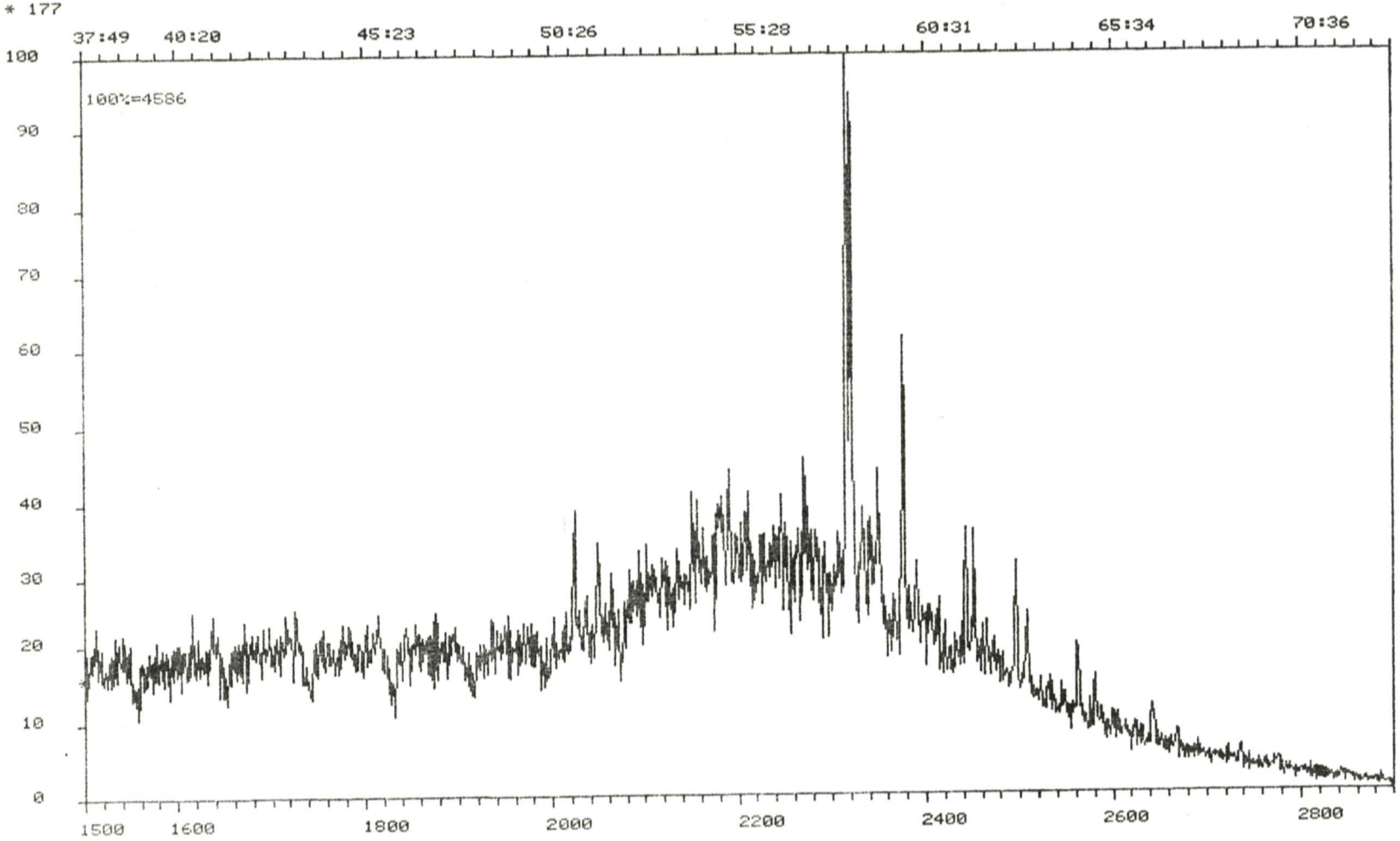

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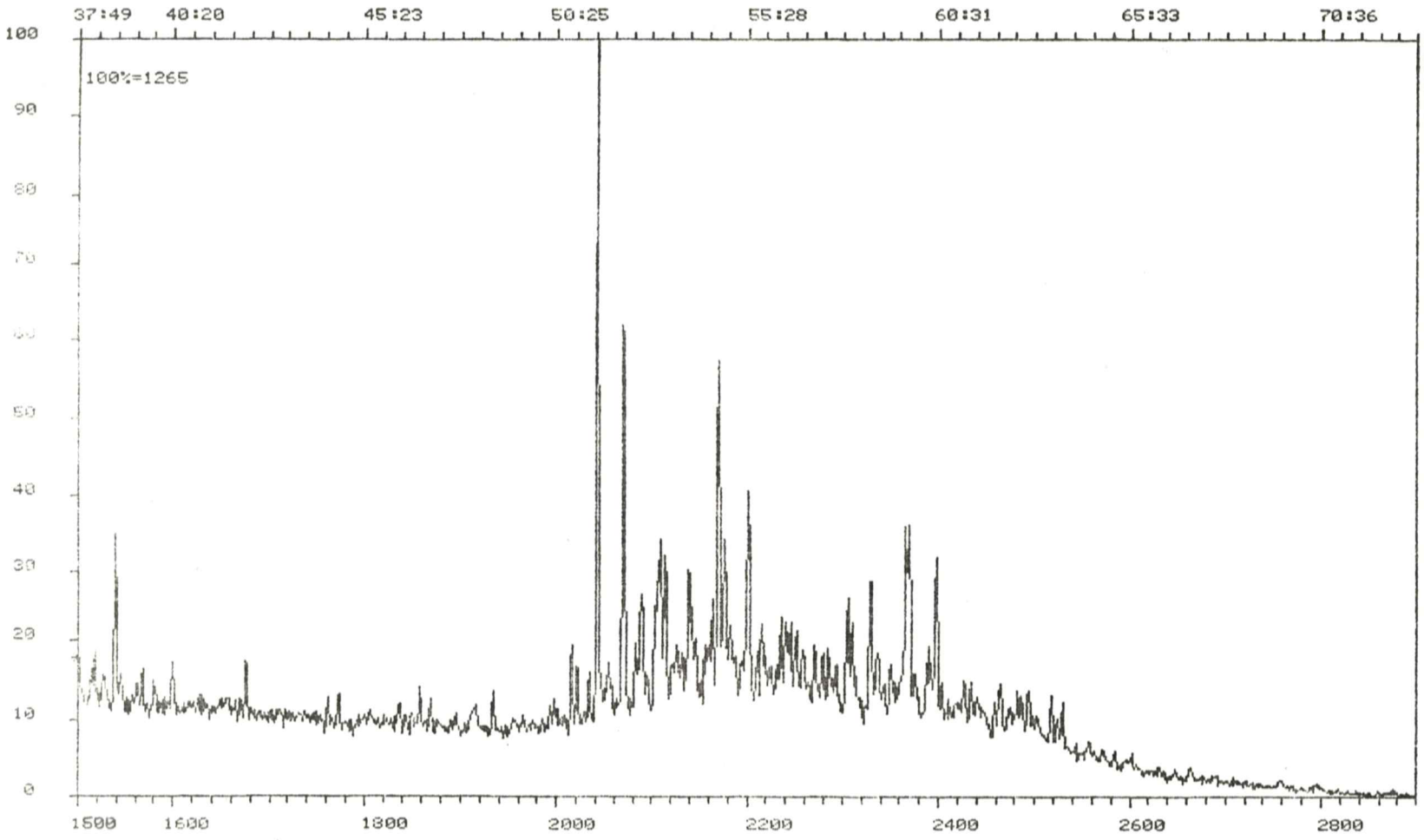
BEN NEVIS I-45 DST#11

* 259



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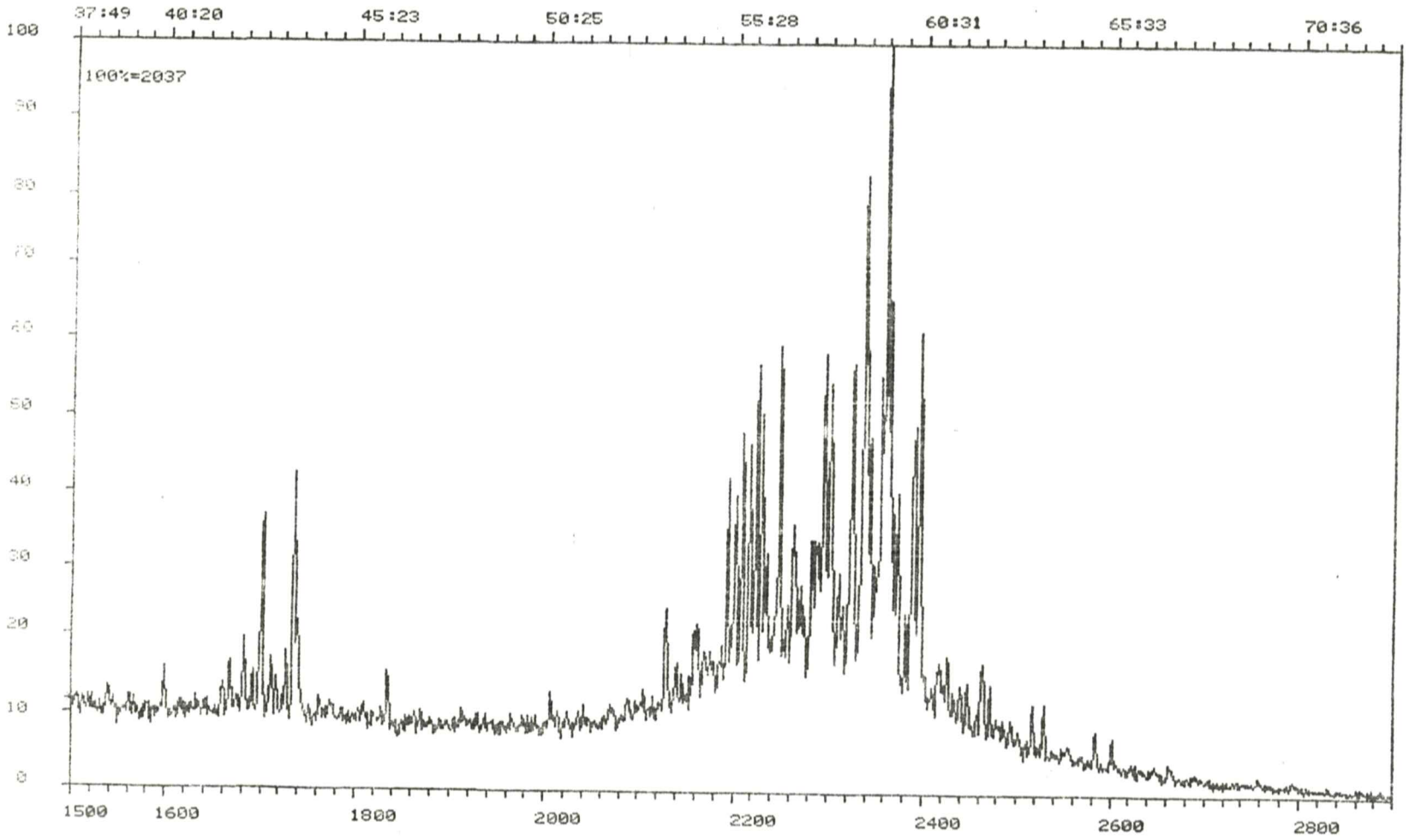
BEN NEVIS I-45 DST#11

* 231



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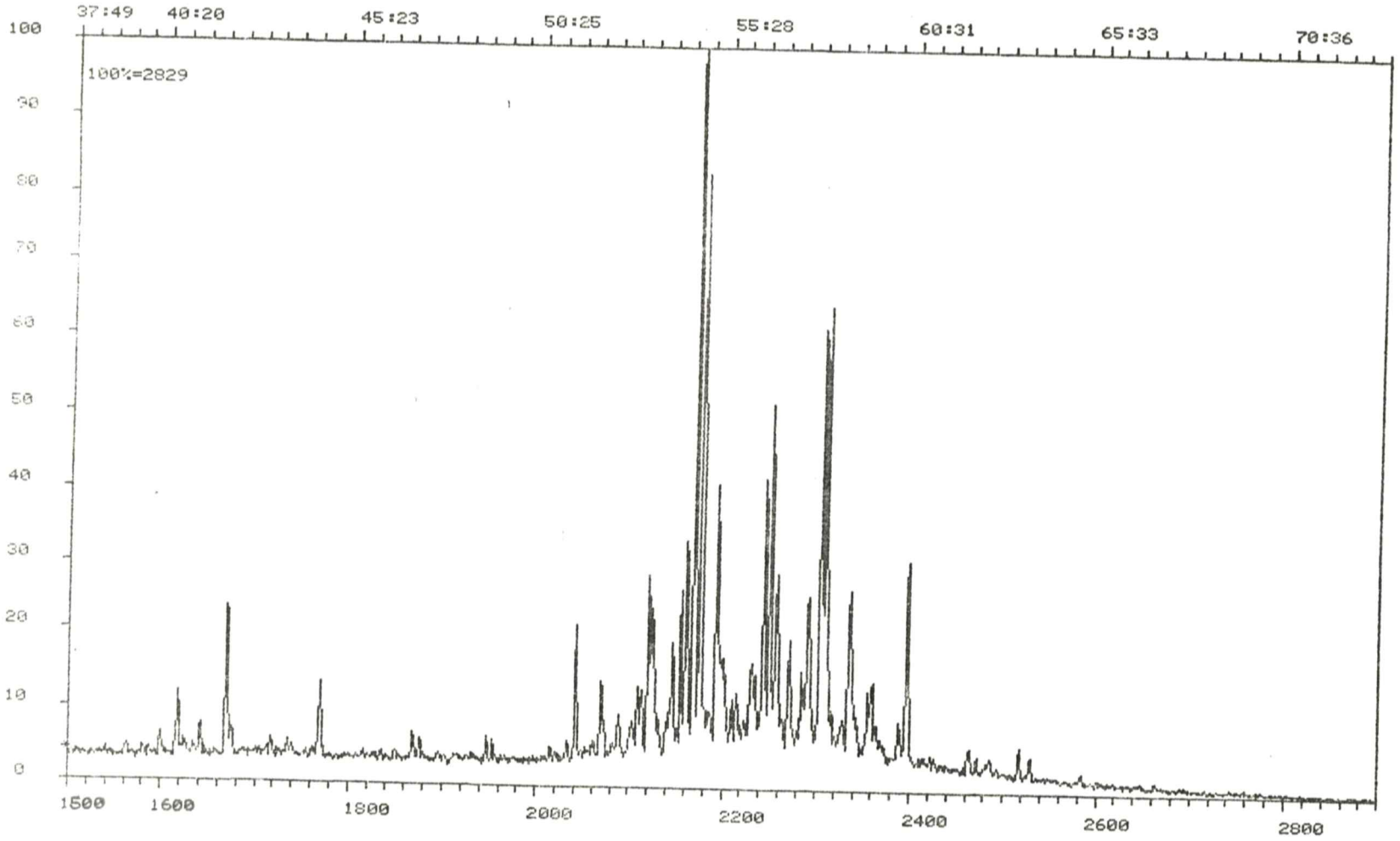
BEN NEVIS I-45 DST#11
* 218



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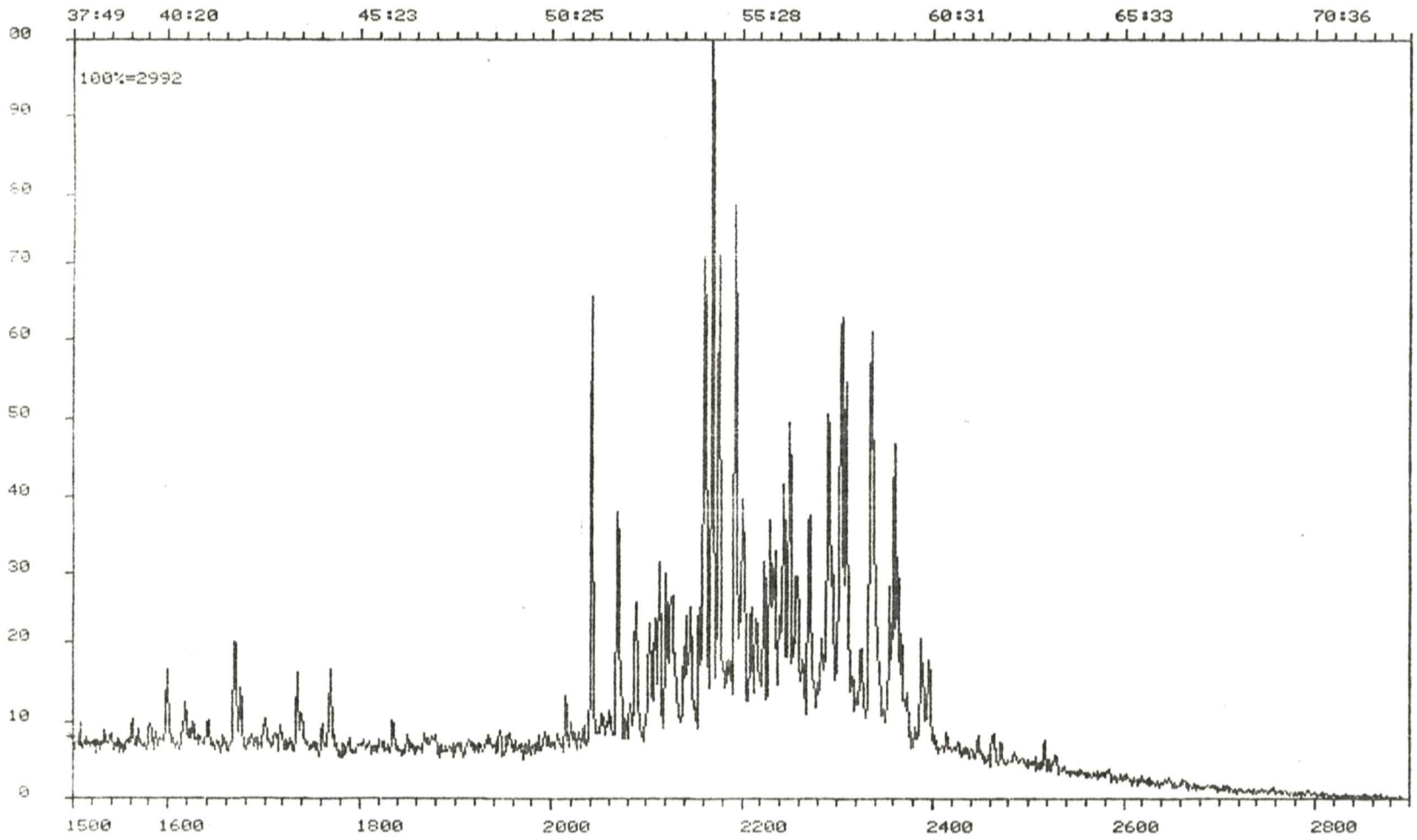
EN NEVIS I-45 DST#11

217



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BEN NEVIS I-45 DST#11

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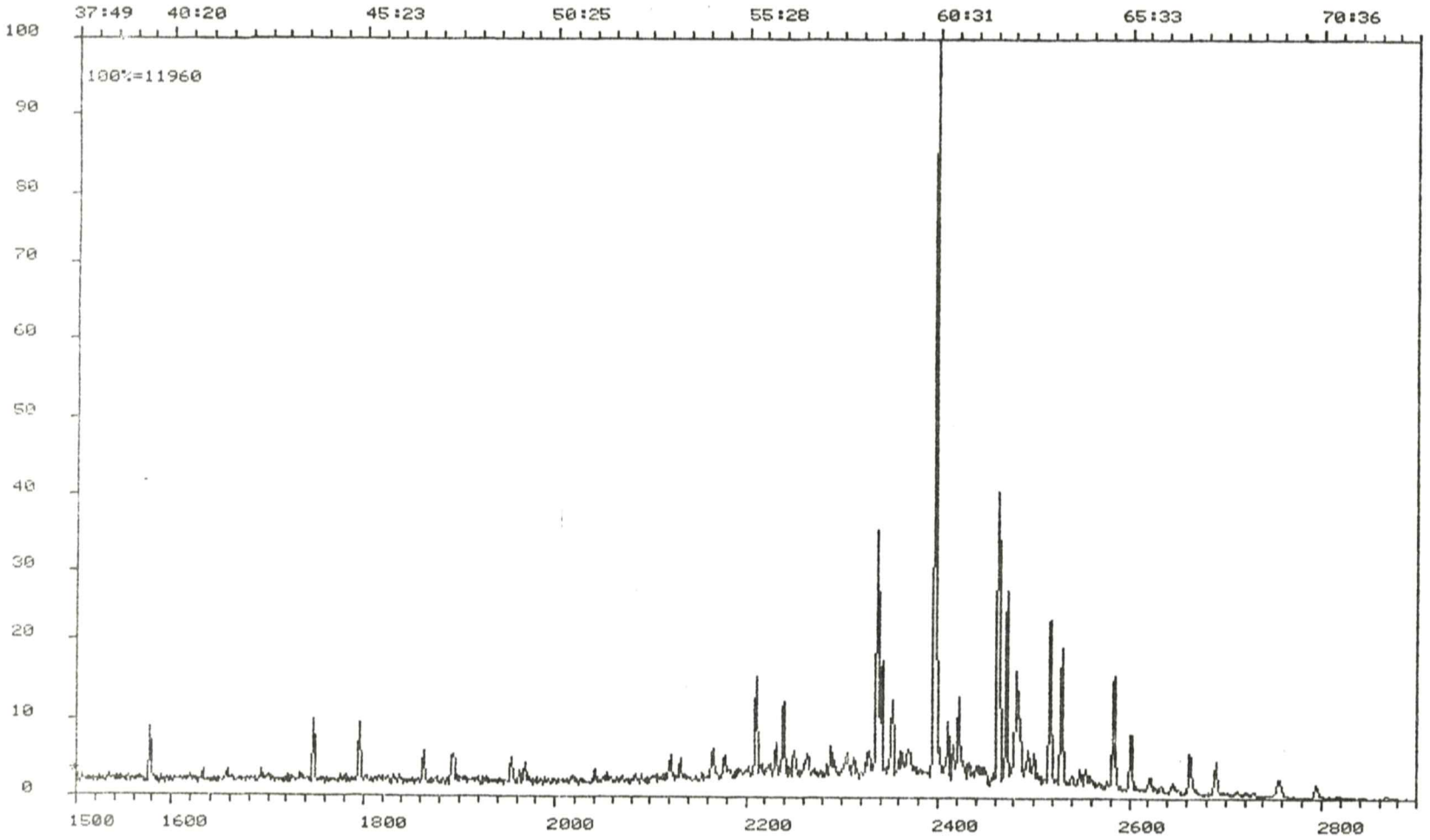

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BEN NEVIS I-45 DST#11
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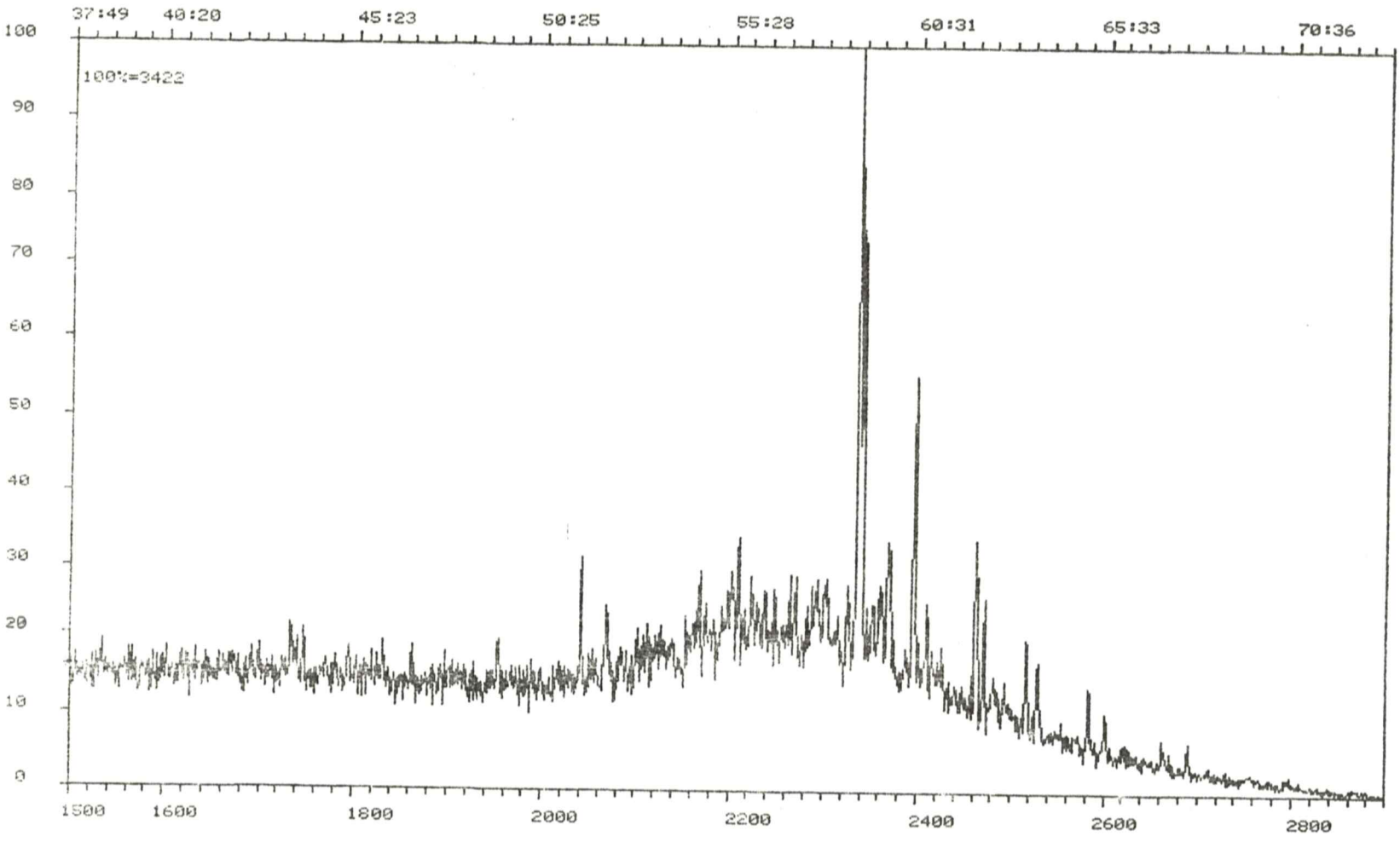

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BEN NEV IS I-45 DST#3

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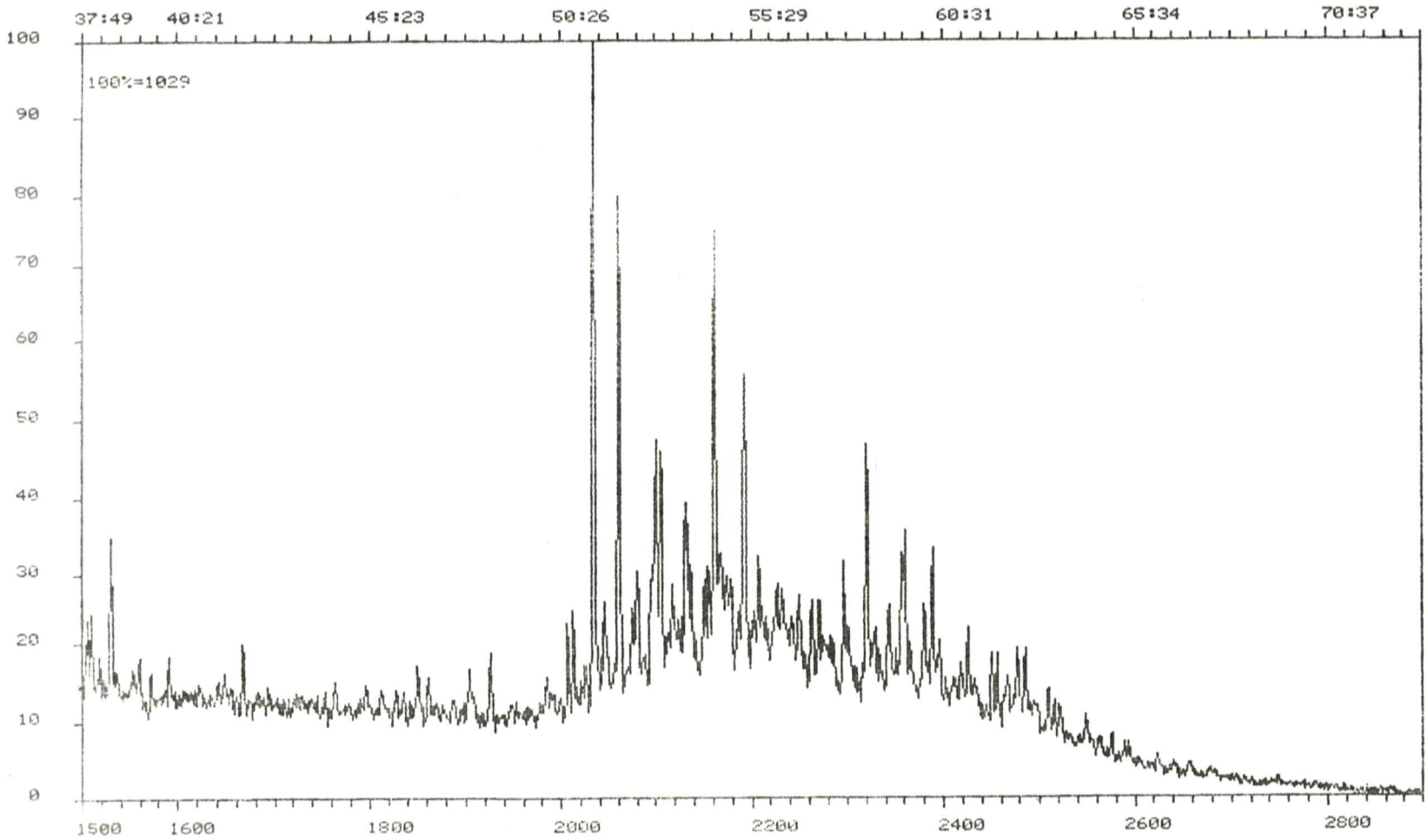

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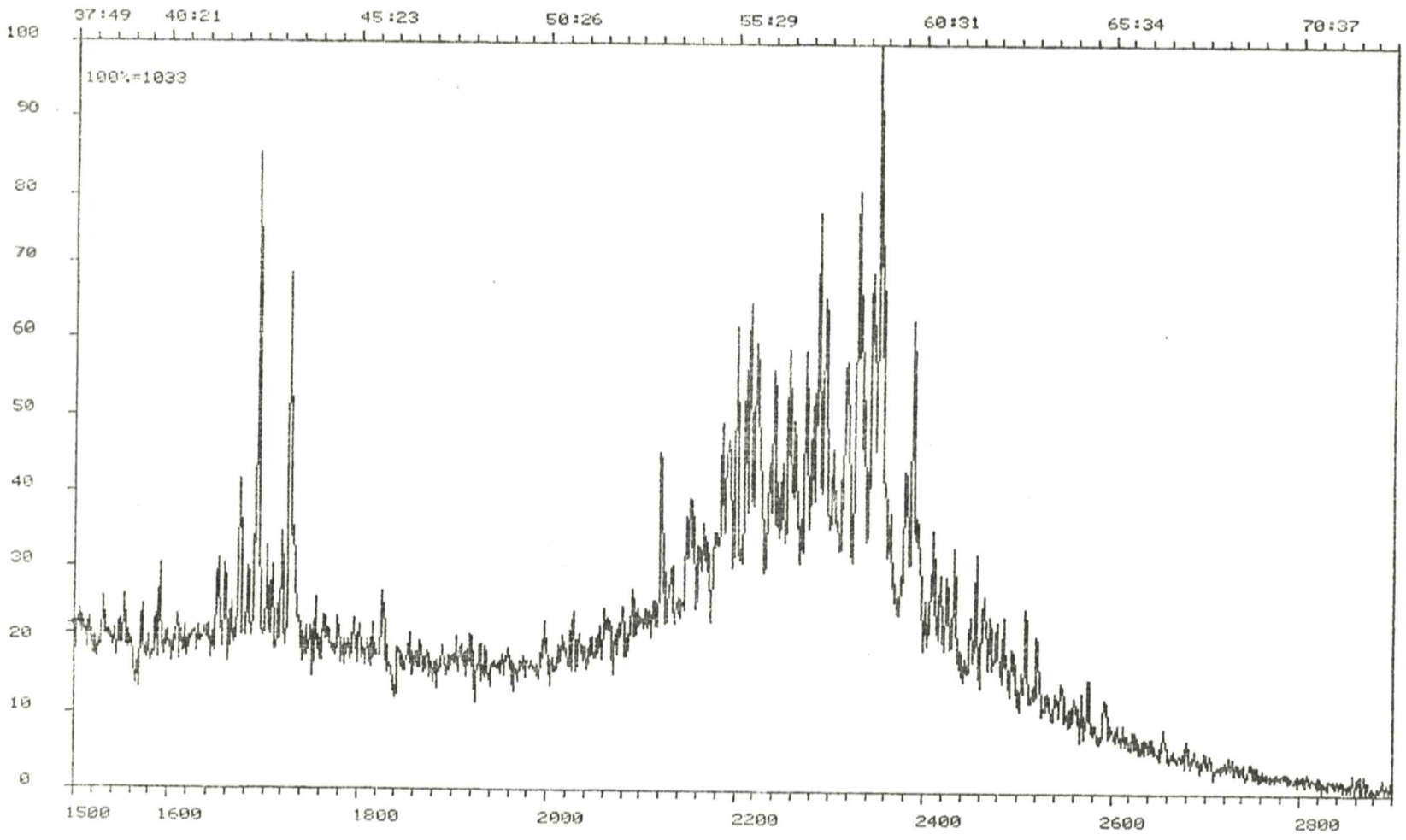
BEN NEV IS I-45 DST=3

* 231



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BEN NEV IS I-45 DST#3

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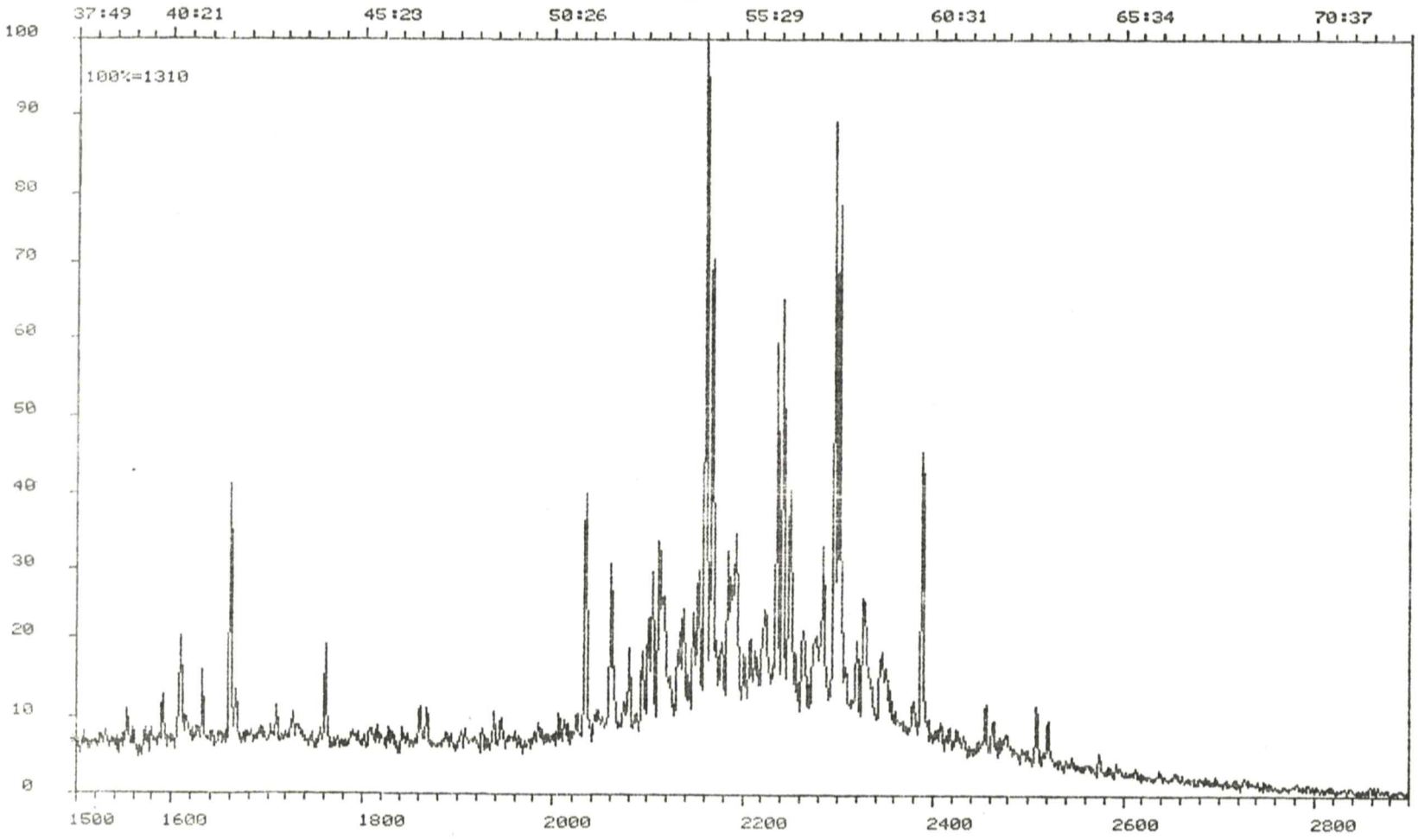

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BEN NEV IS I-45 DST#3

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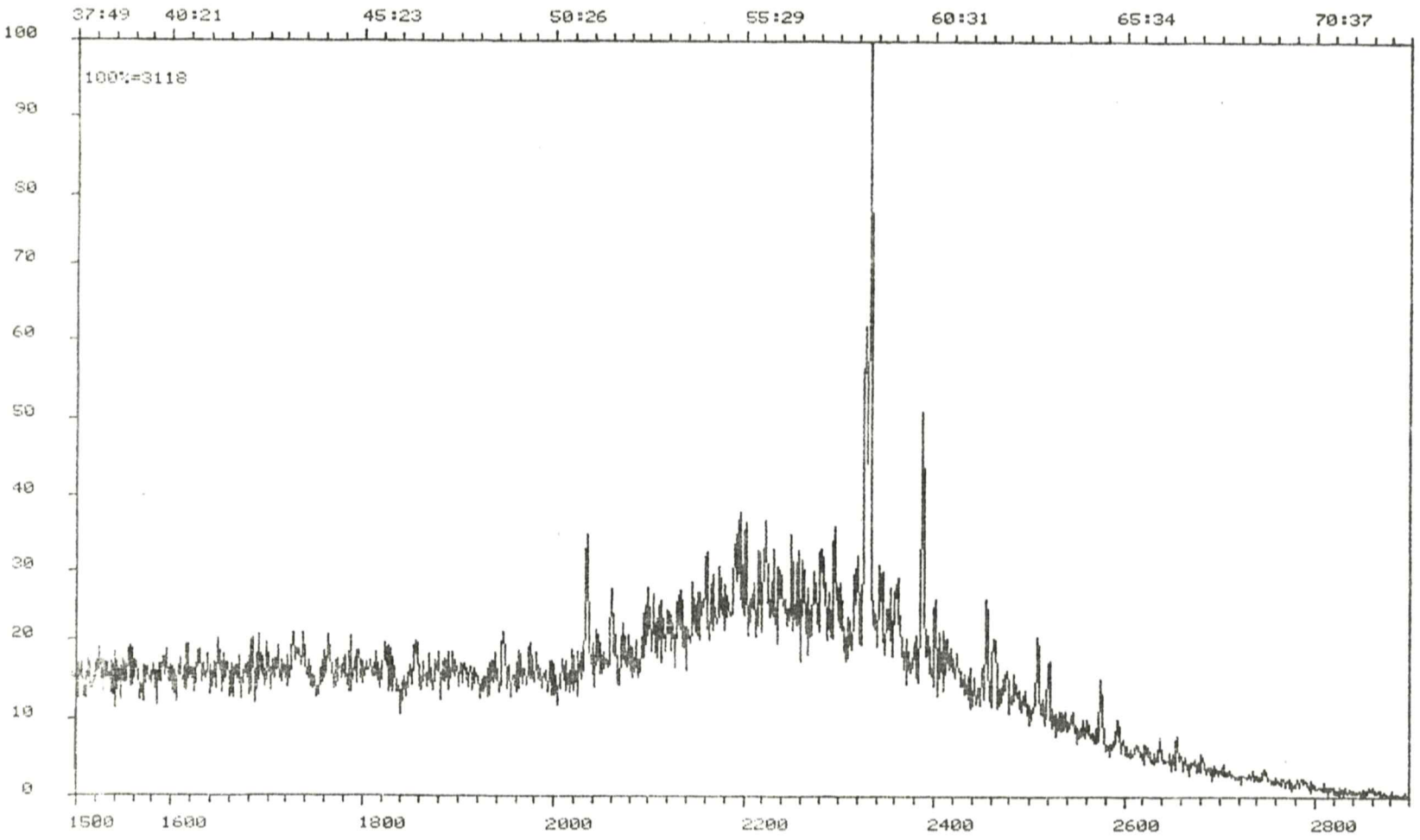
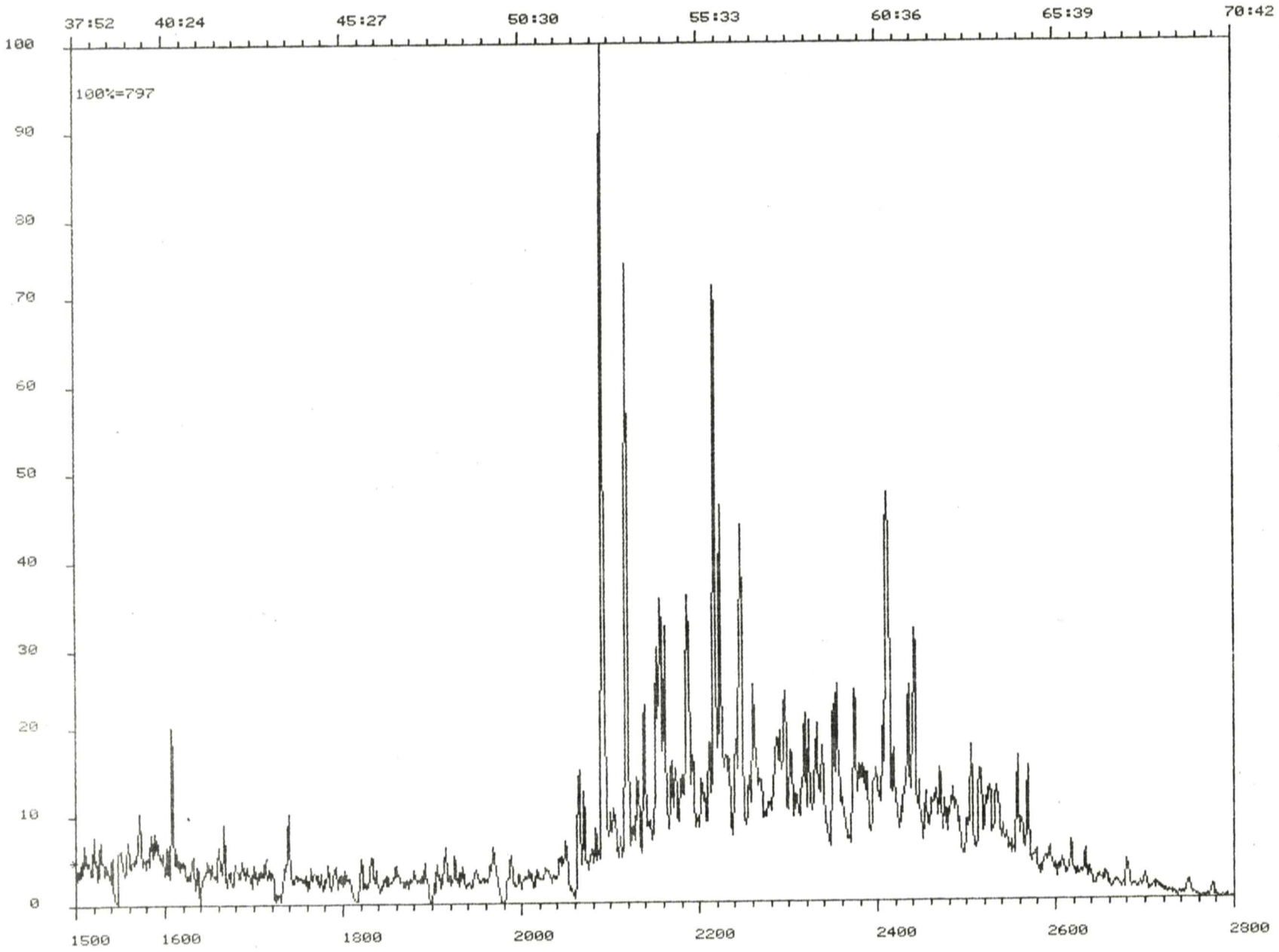


DS-55 CROSS SCAN REPORT, RUN: 204460002

BEOTHUK K-05 DST 3

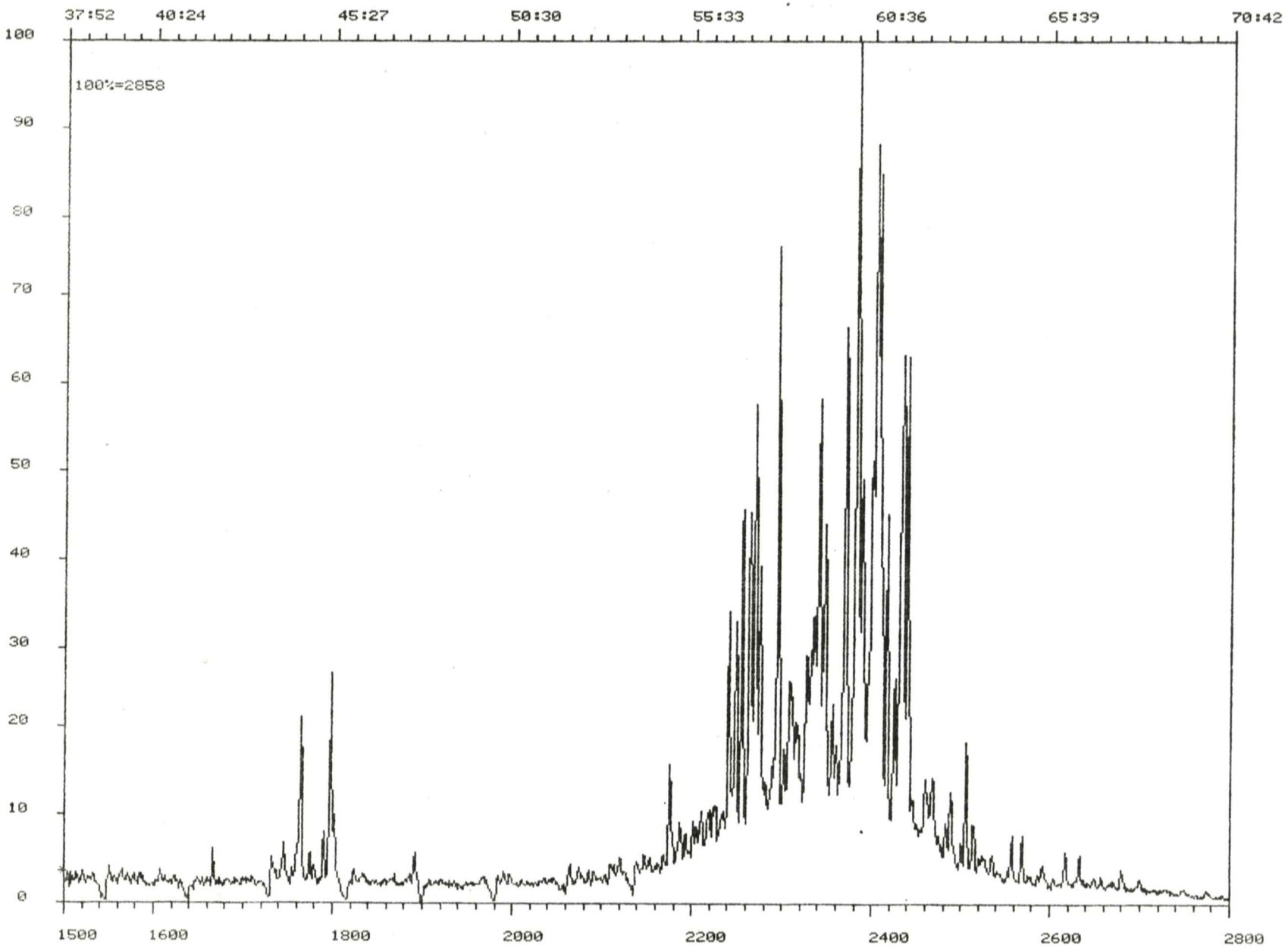
* 259



DS-55 CROSS SCAN REPORT, RUN. 204460002

BEOTHUK K-05 DST 3

* 231



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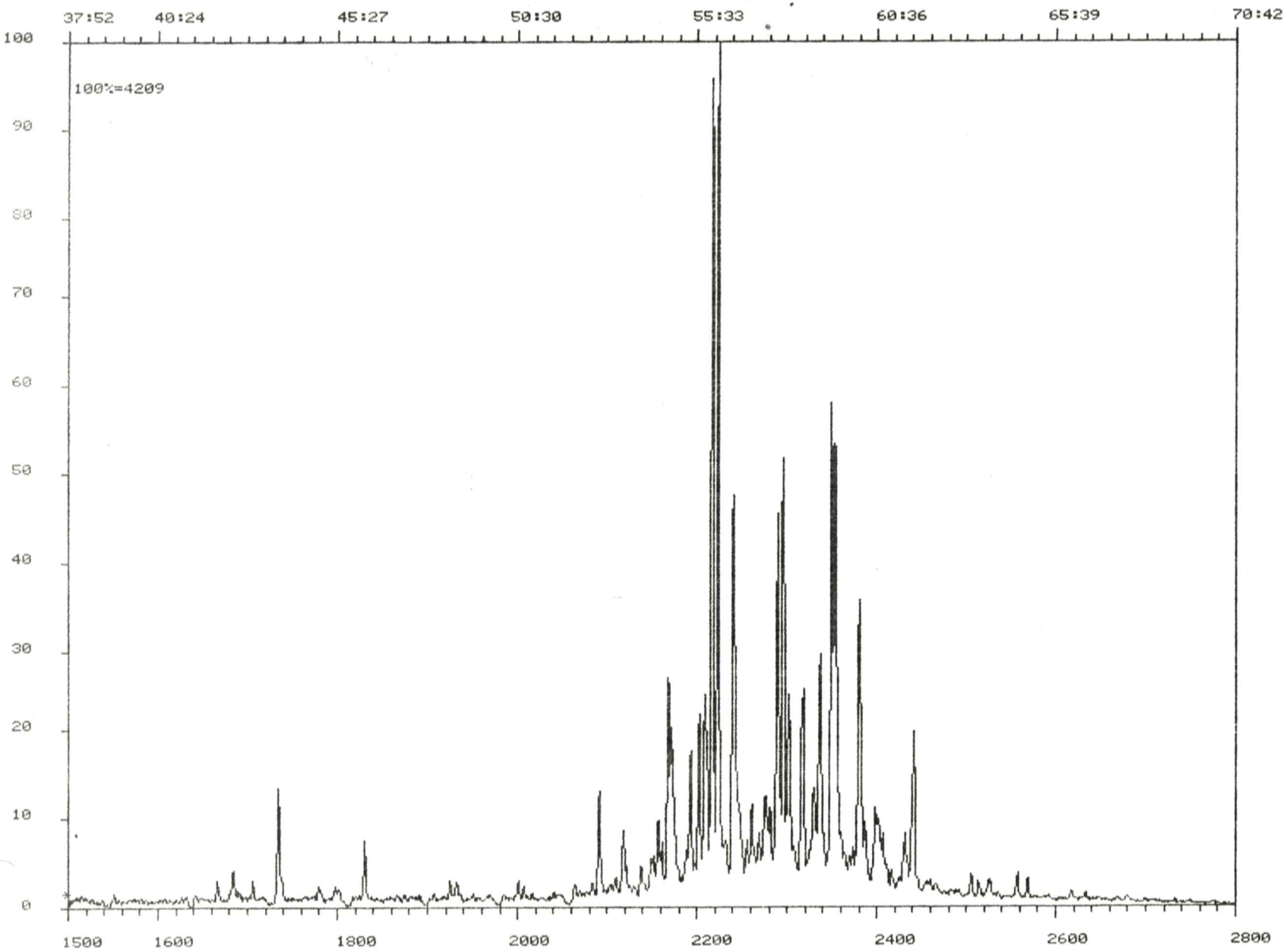
BEOTHUK K-05 DST 3

* 218



DS-55 CROSS SCAN REPORT, RUN: 204460002

BEOTHUK K-05 DST 3

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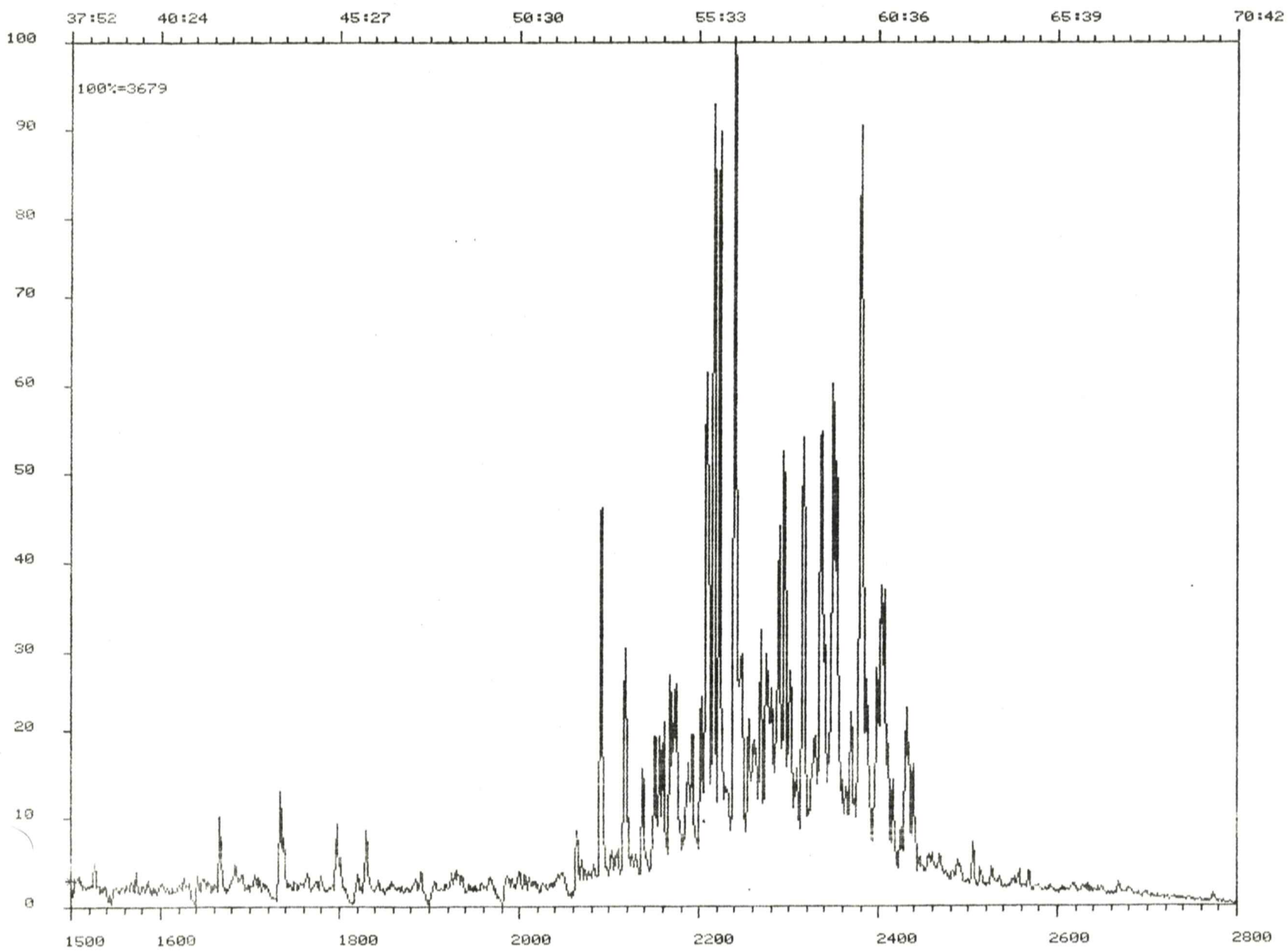

DS-55 CROSS SCAN REPORT, RUN: 204460002

BEOTHUK K-05 DST 3

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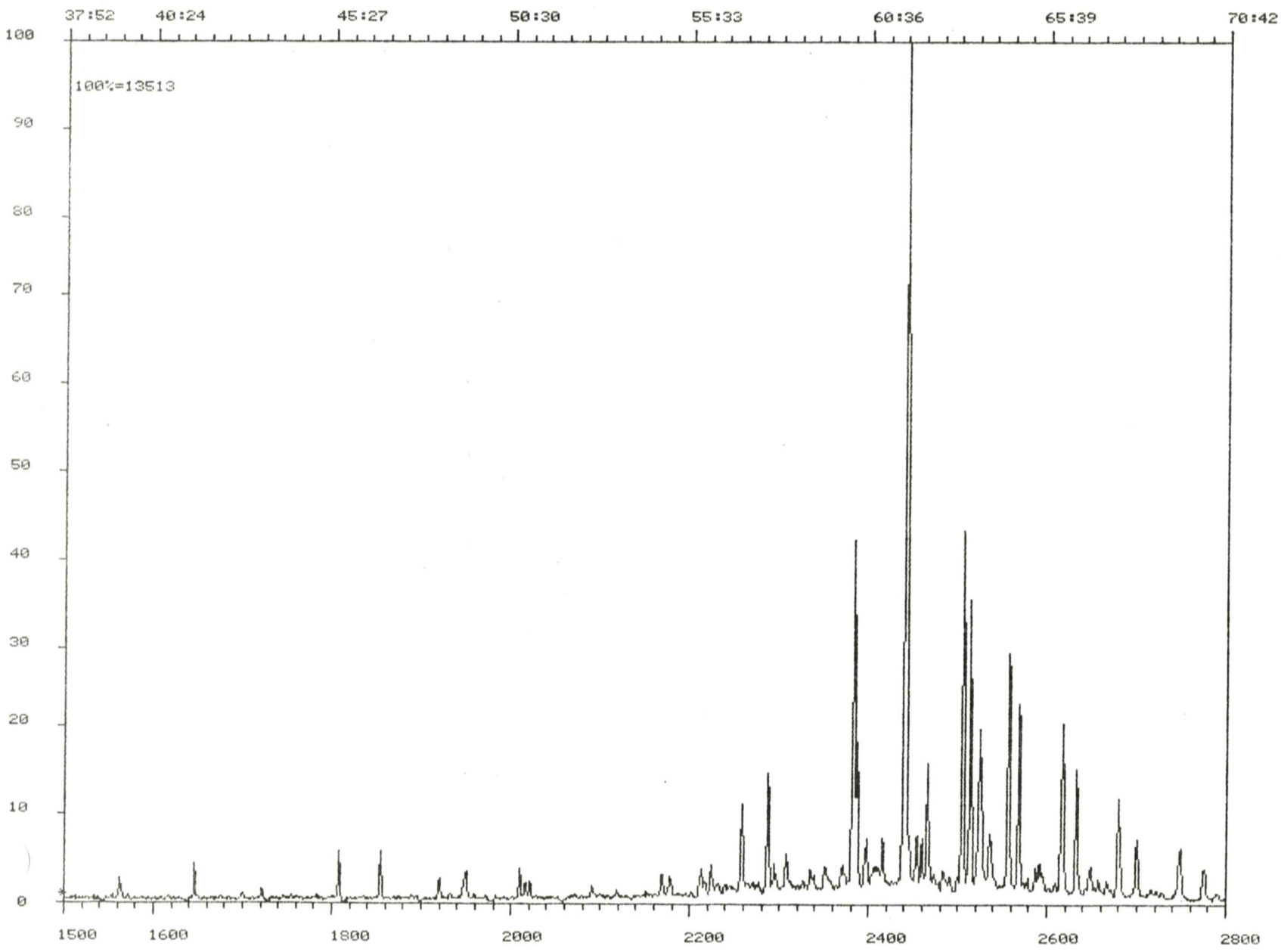

DS-55 CROSS SCAN REPORT, RUN: 204460002

BEOTHUK K-05 DST 3

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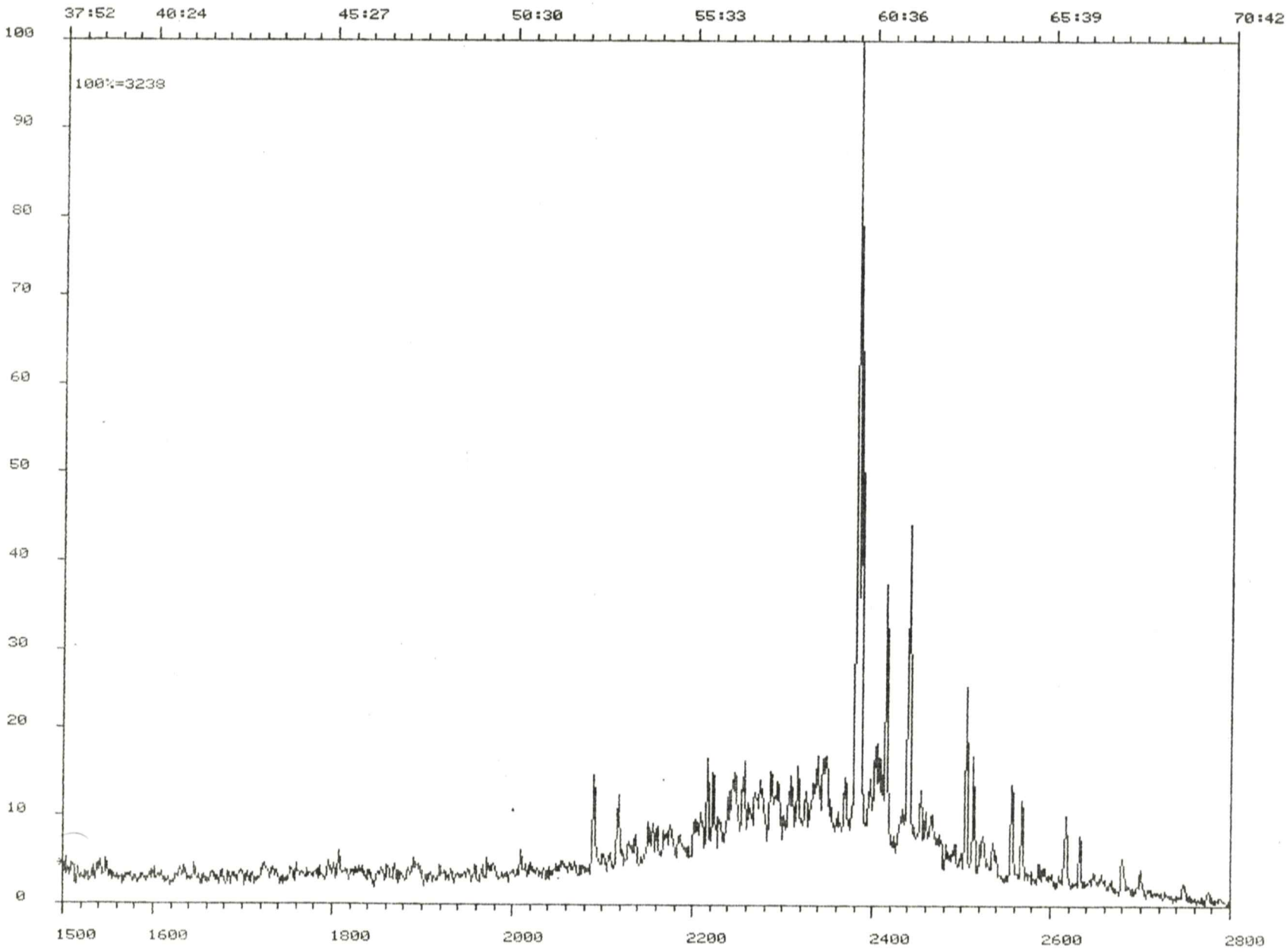

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BEN NEV IS I-45 DST#3

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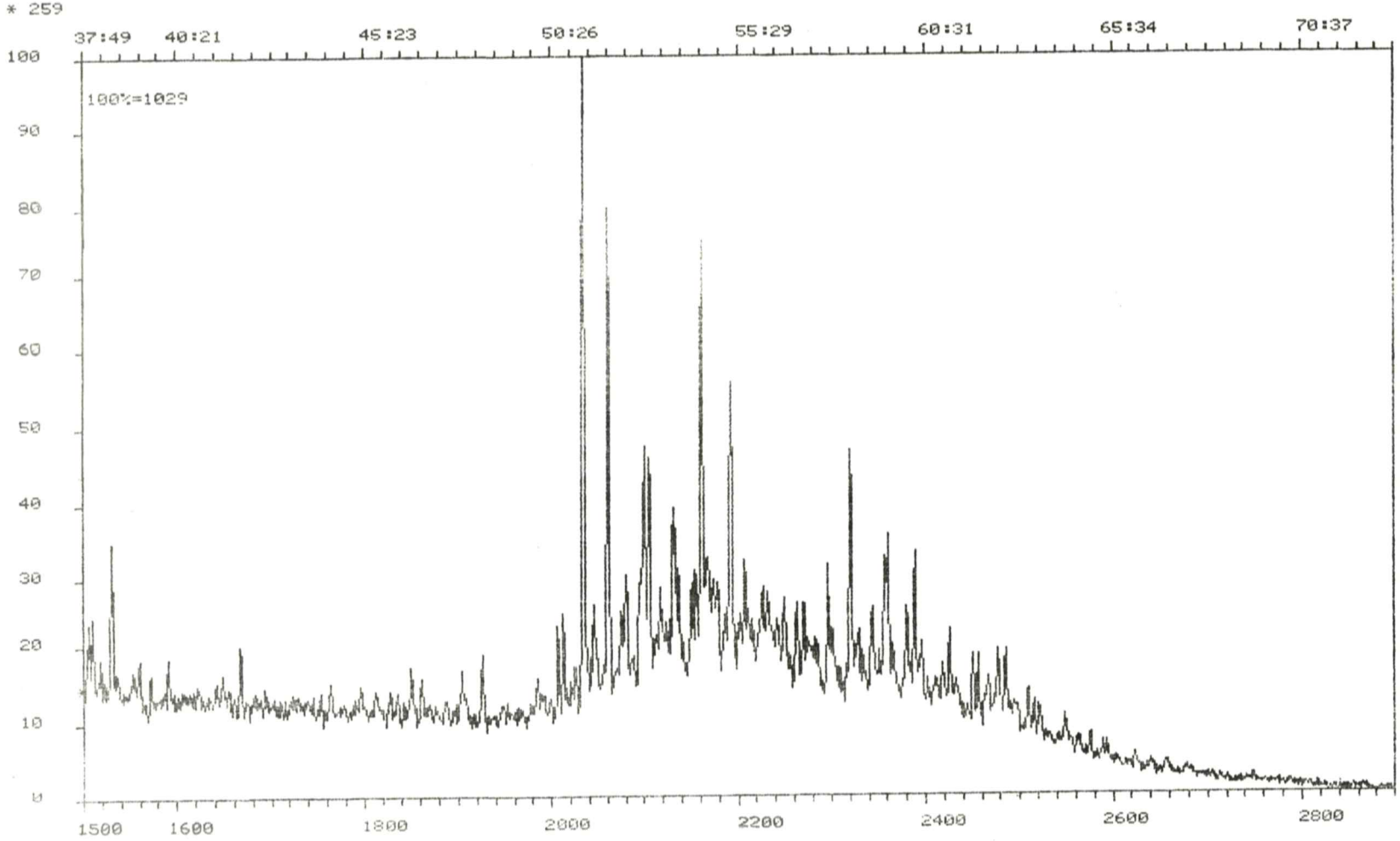

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BEN NEV IS I-45 DST#3

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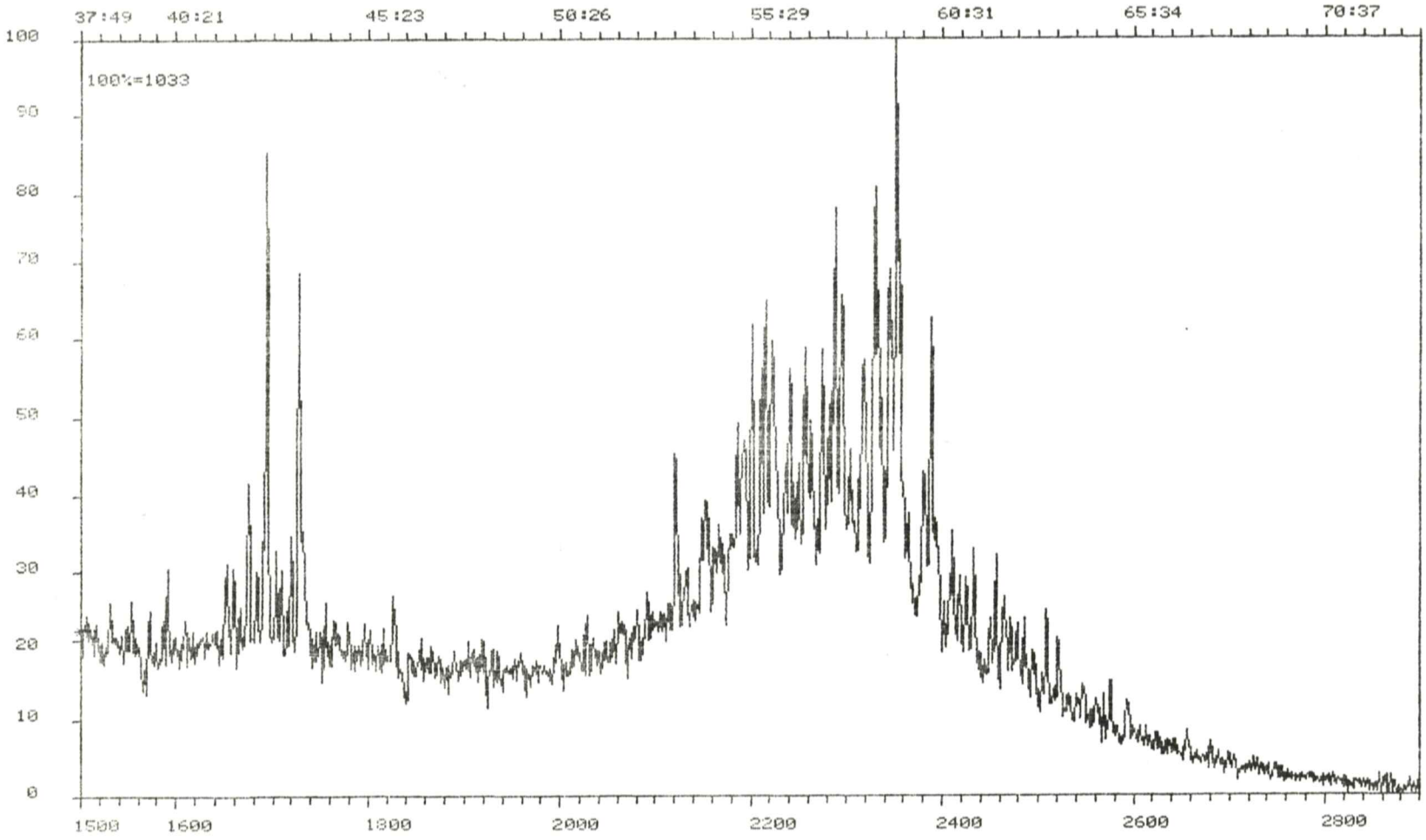

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BEN NEV IS I-45 DST#3

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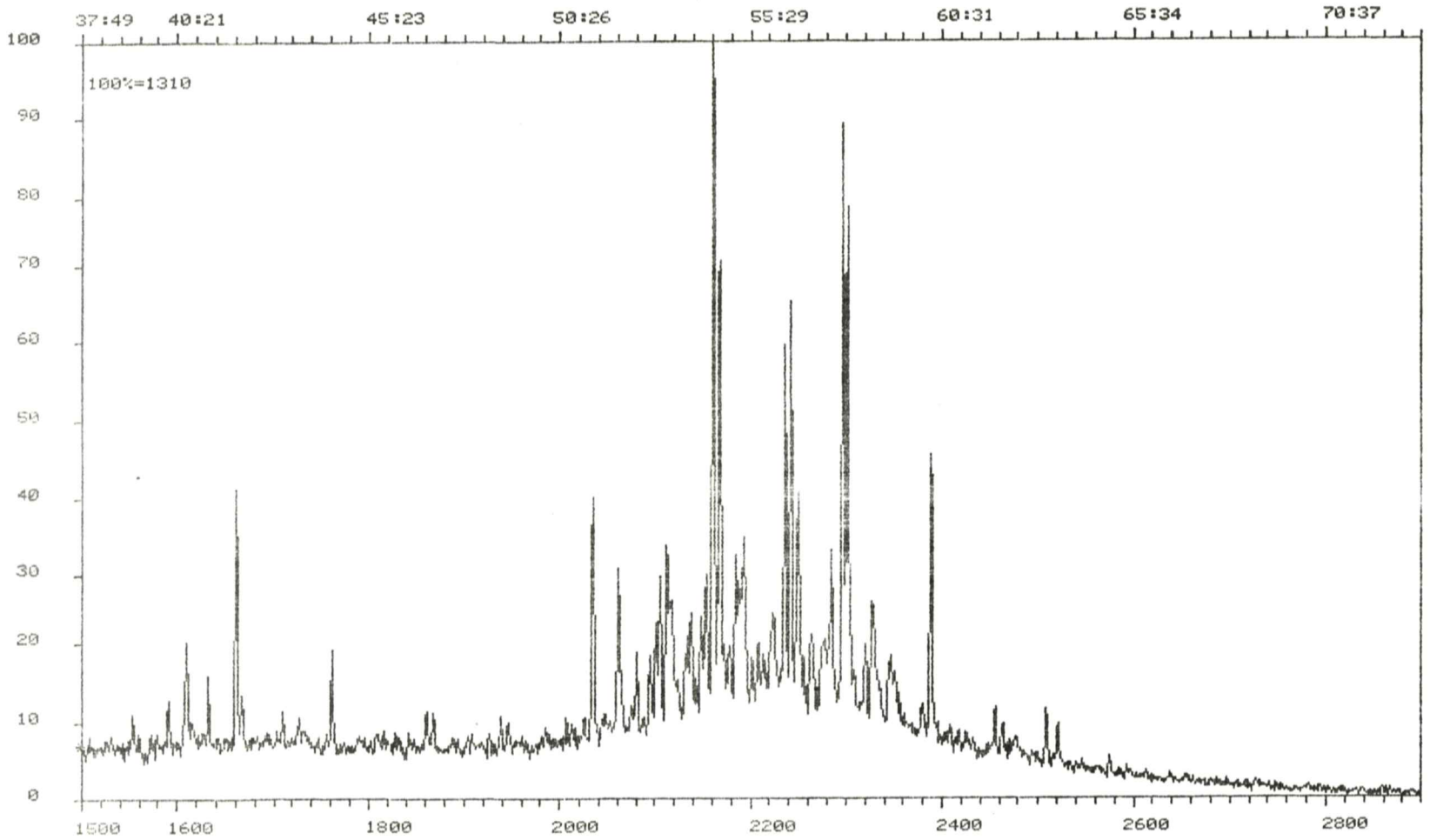

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BEN NEV IS I-45 DST#3

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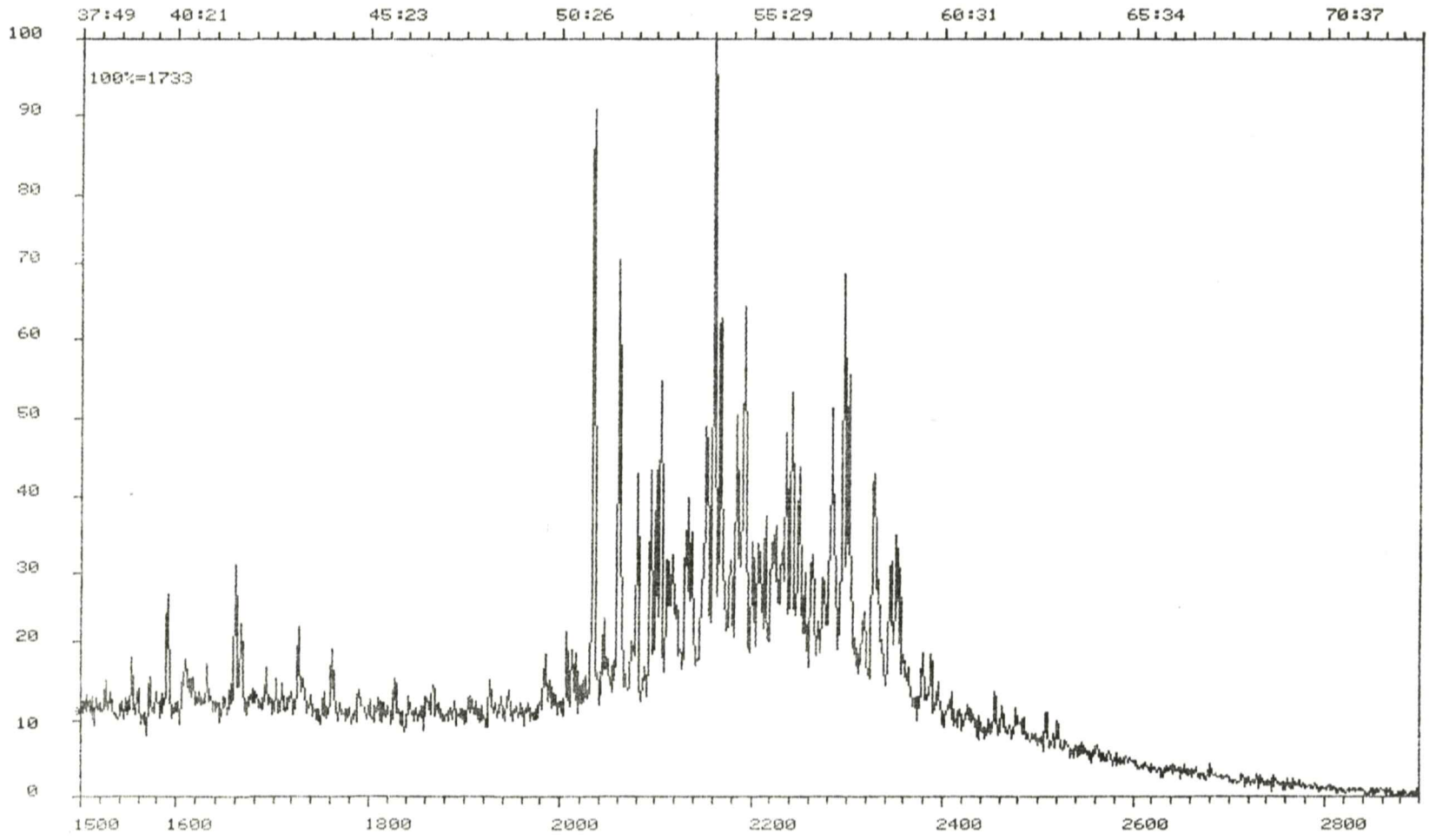

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BEN NEV IS I-45 DST#3

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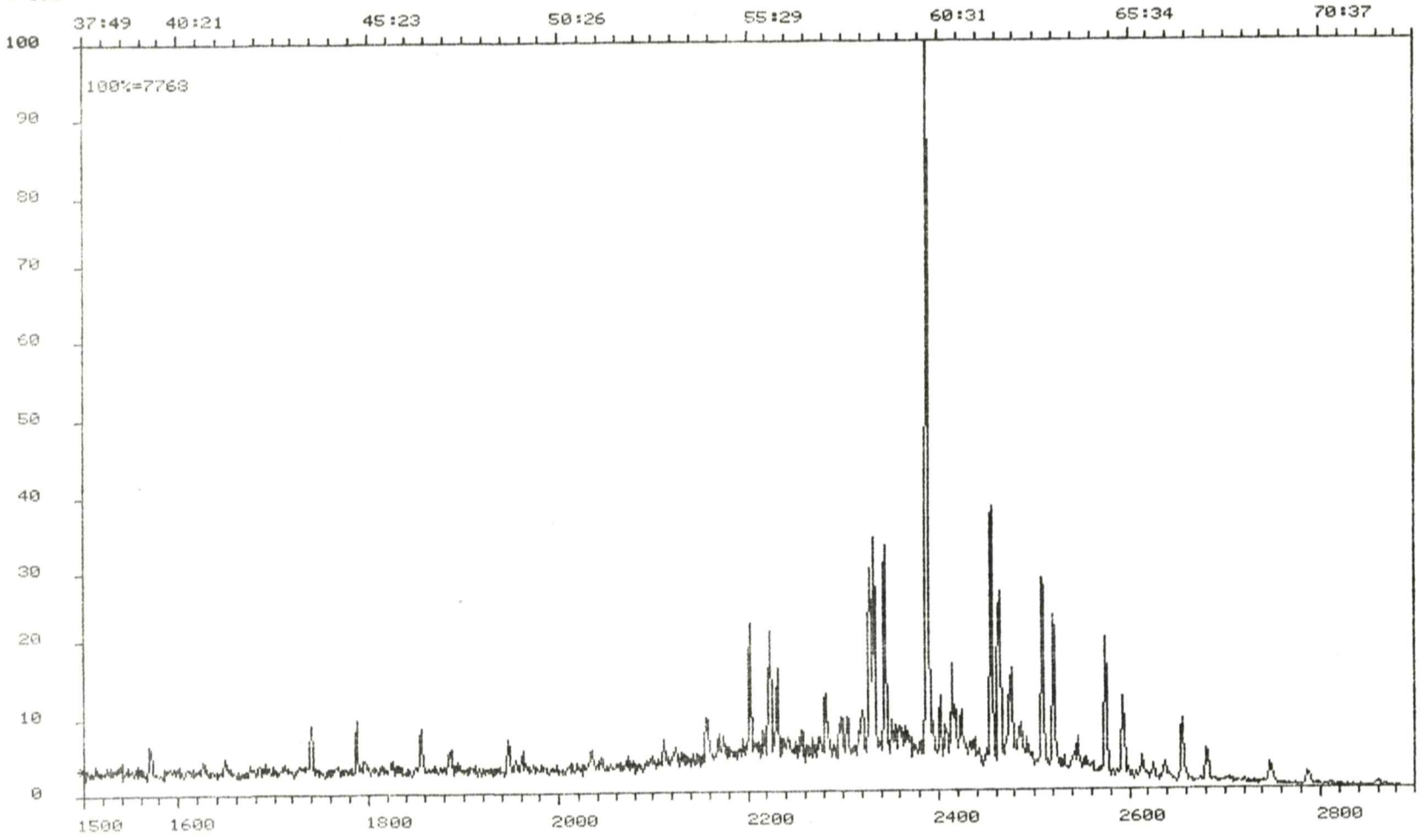

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BEN NEV IS I-45 DST#3

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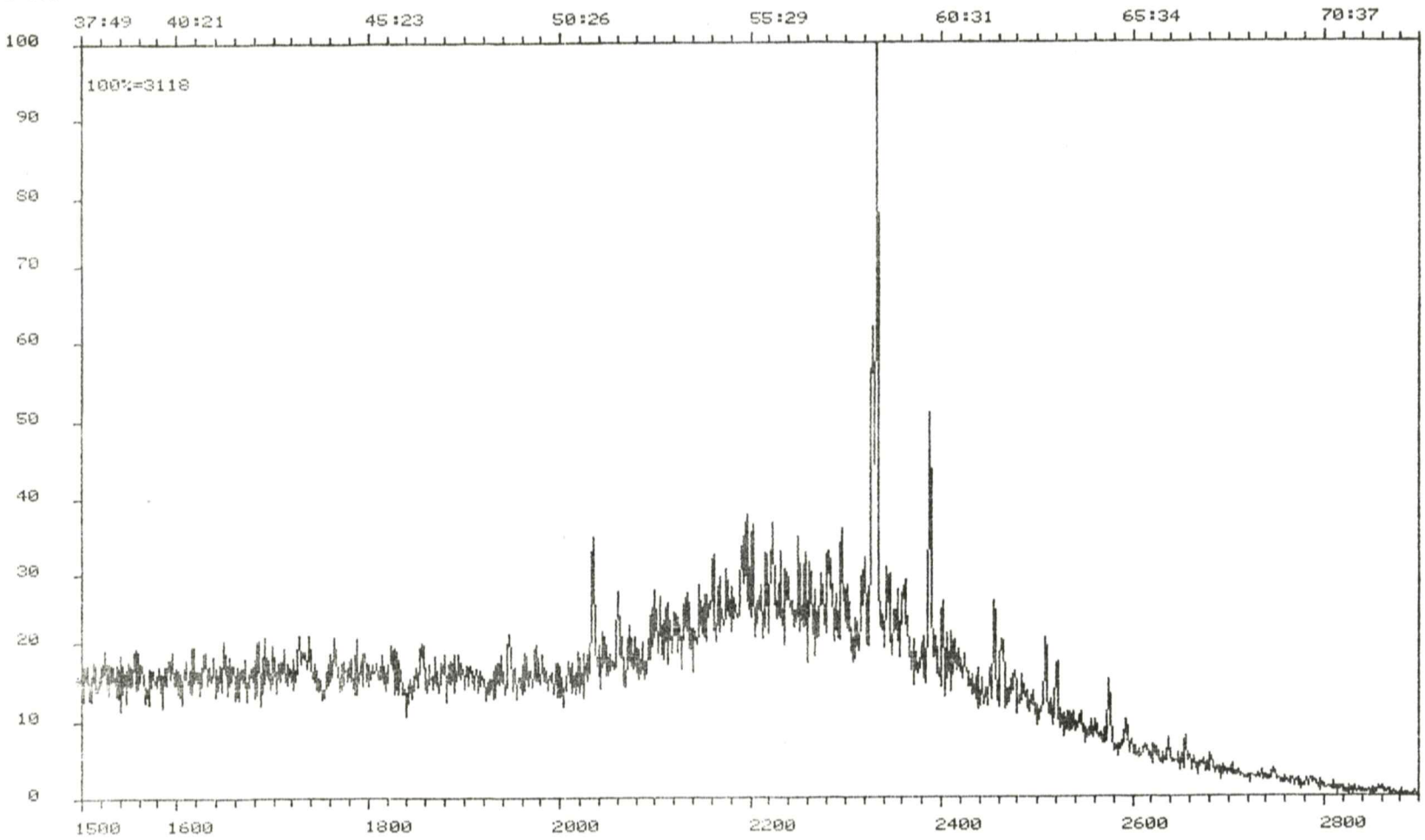
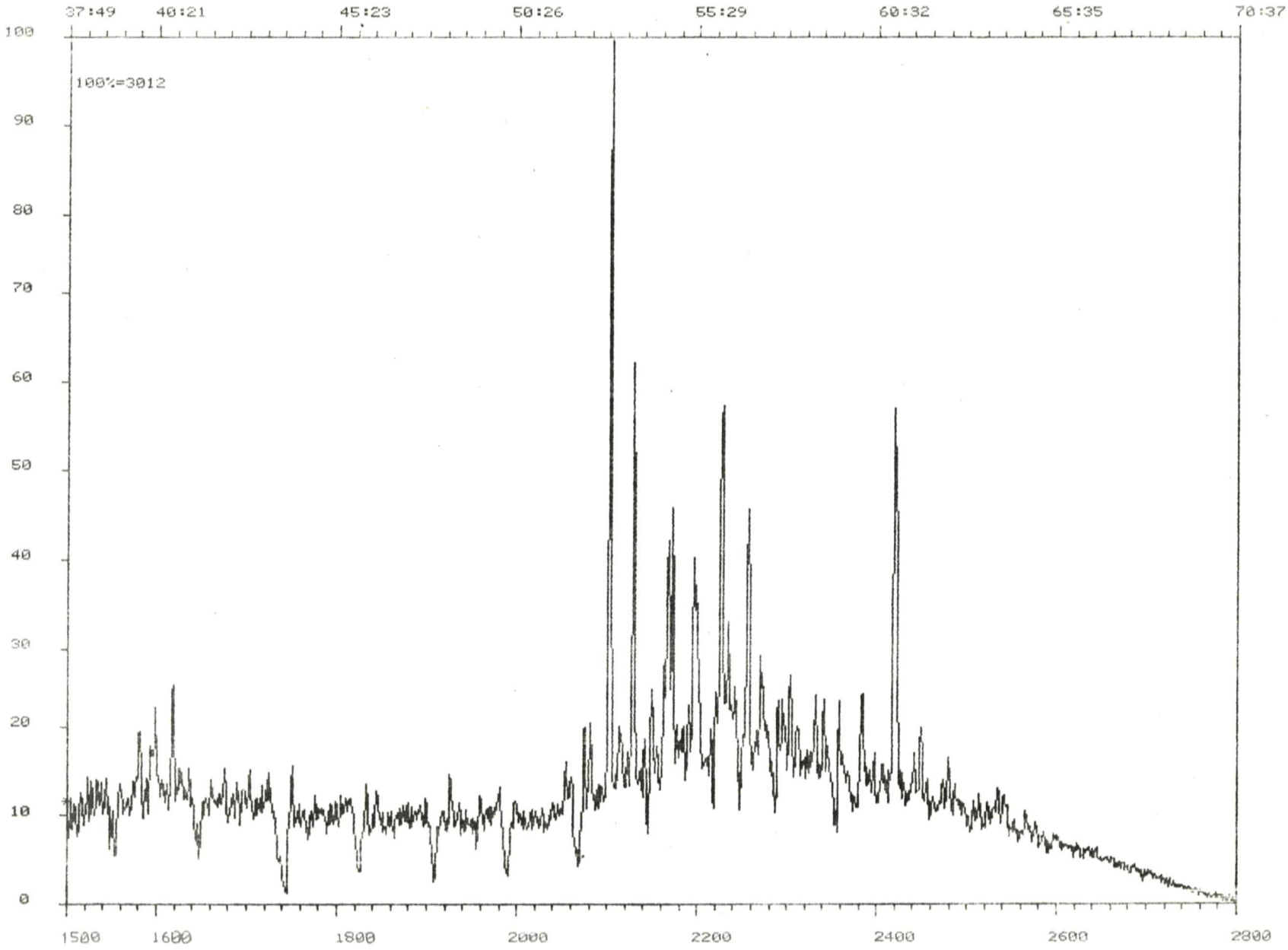


DS-55 CROSS SCAN REPORT, RUN: 201250009

ADOLPHUS 2K-41 8560M

* 259



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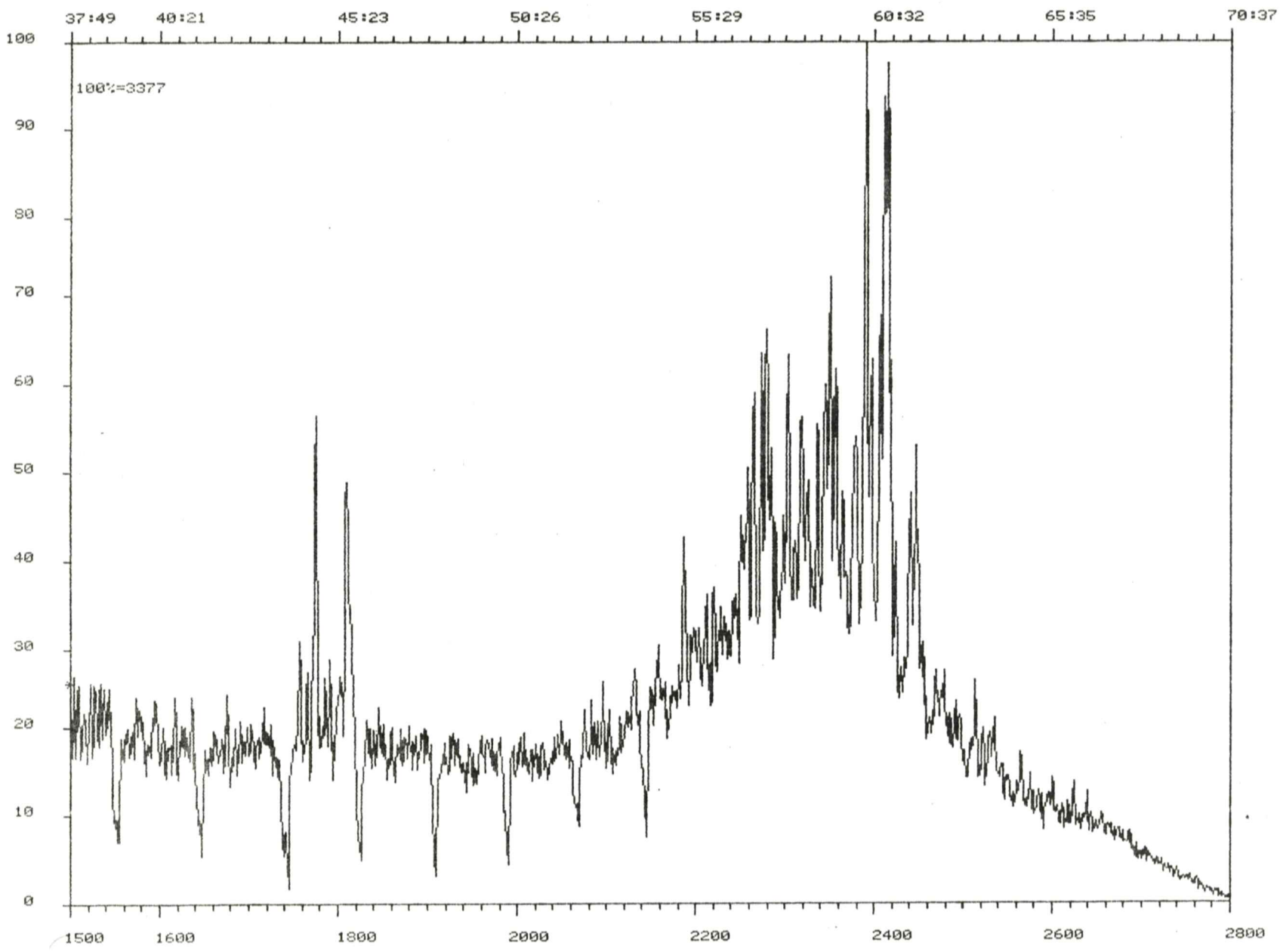
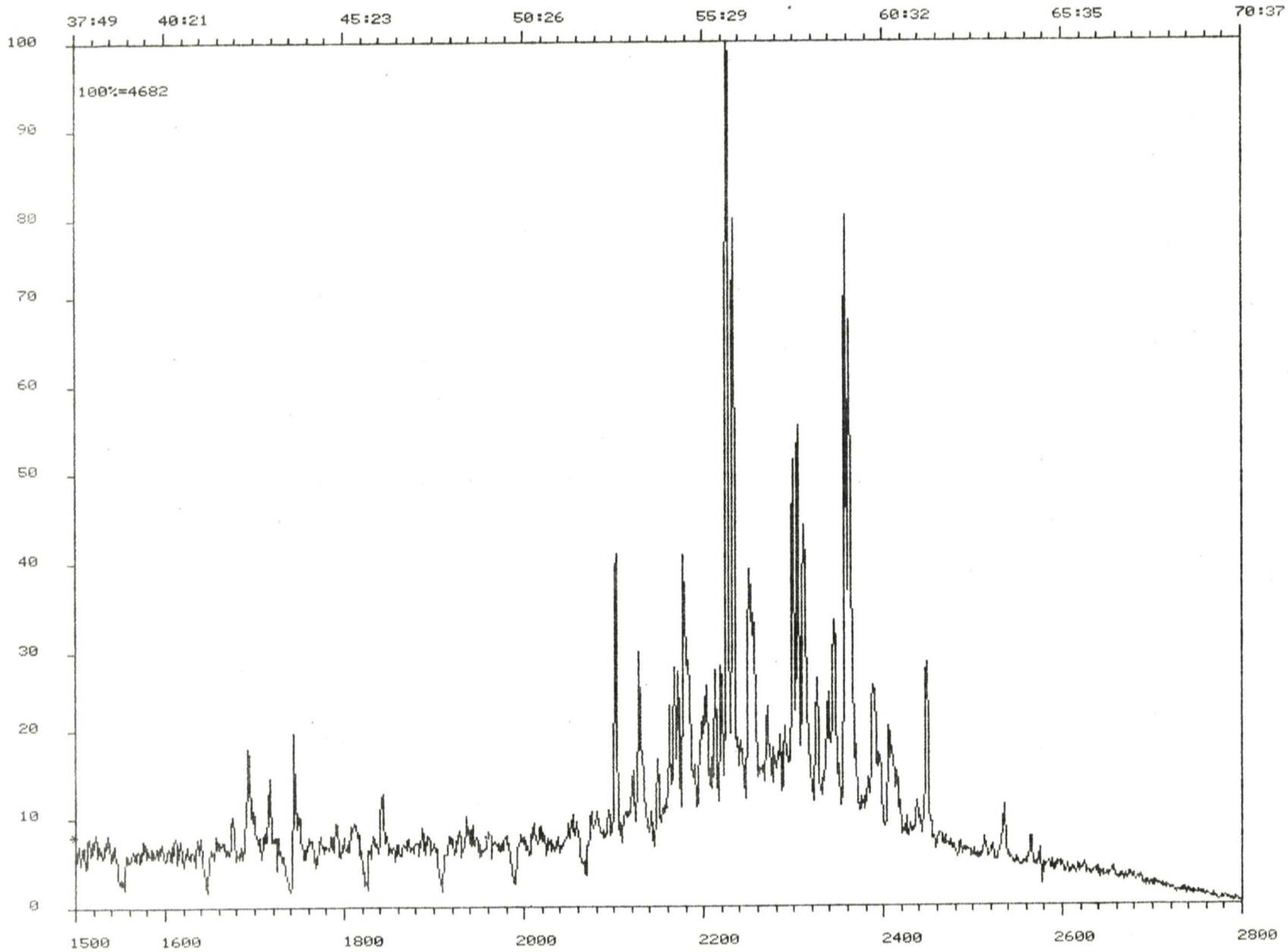
ADOLPHUS 2K-41 8560M

* 231



ADOLPHUS 2K-41 8560M

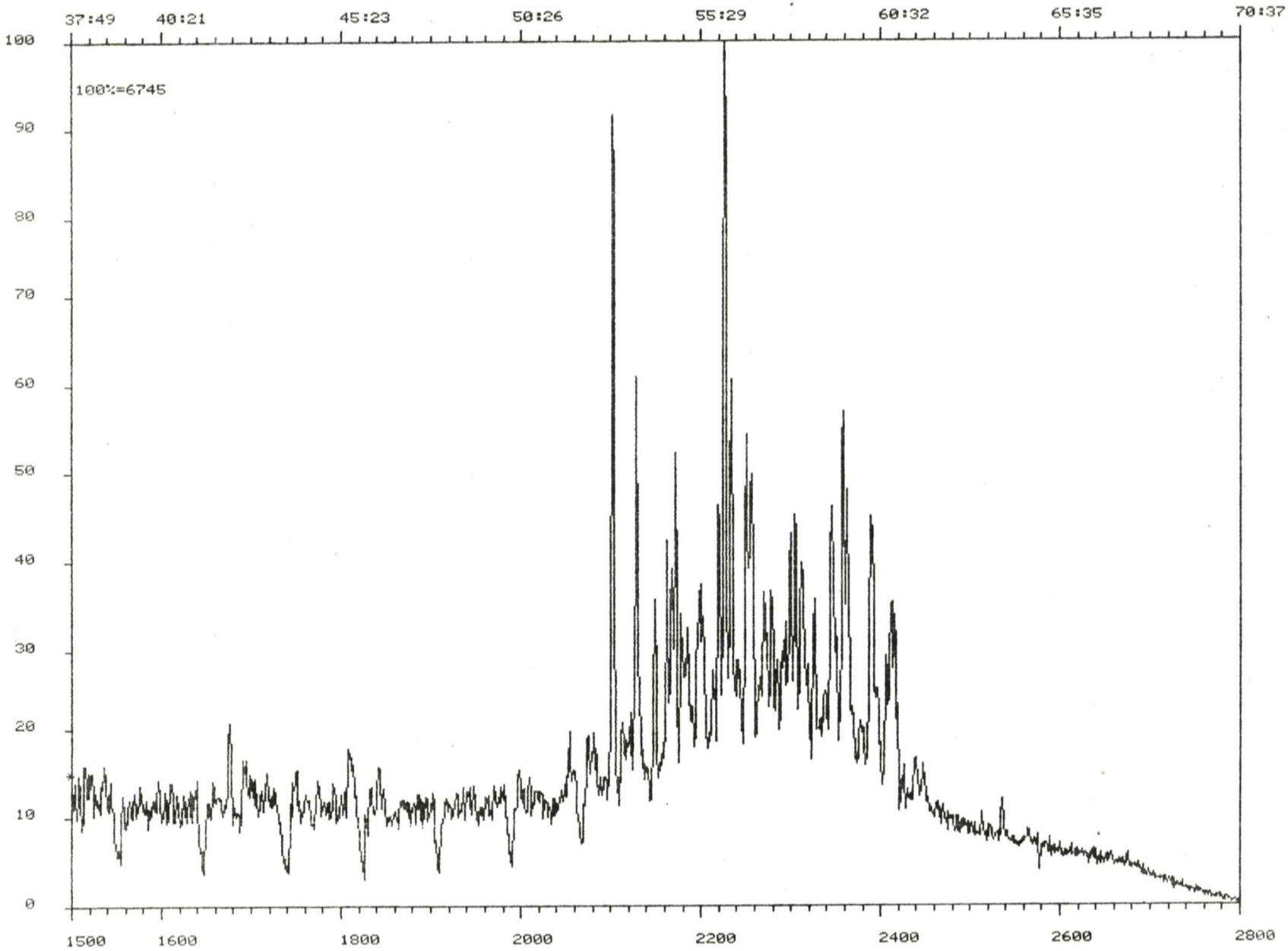
* 218



DS-55 CROSS SCAN REPORT, RUN: 201250009

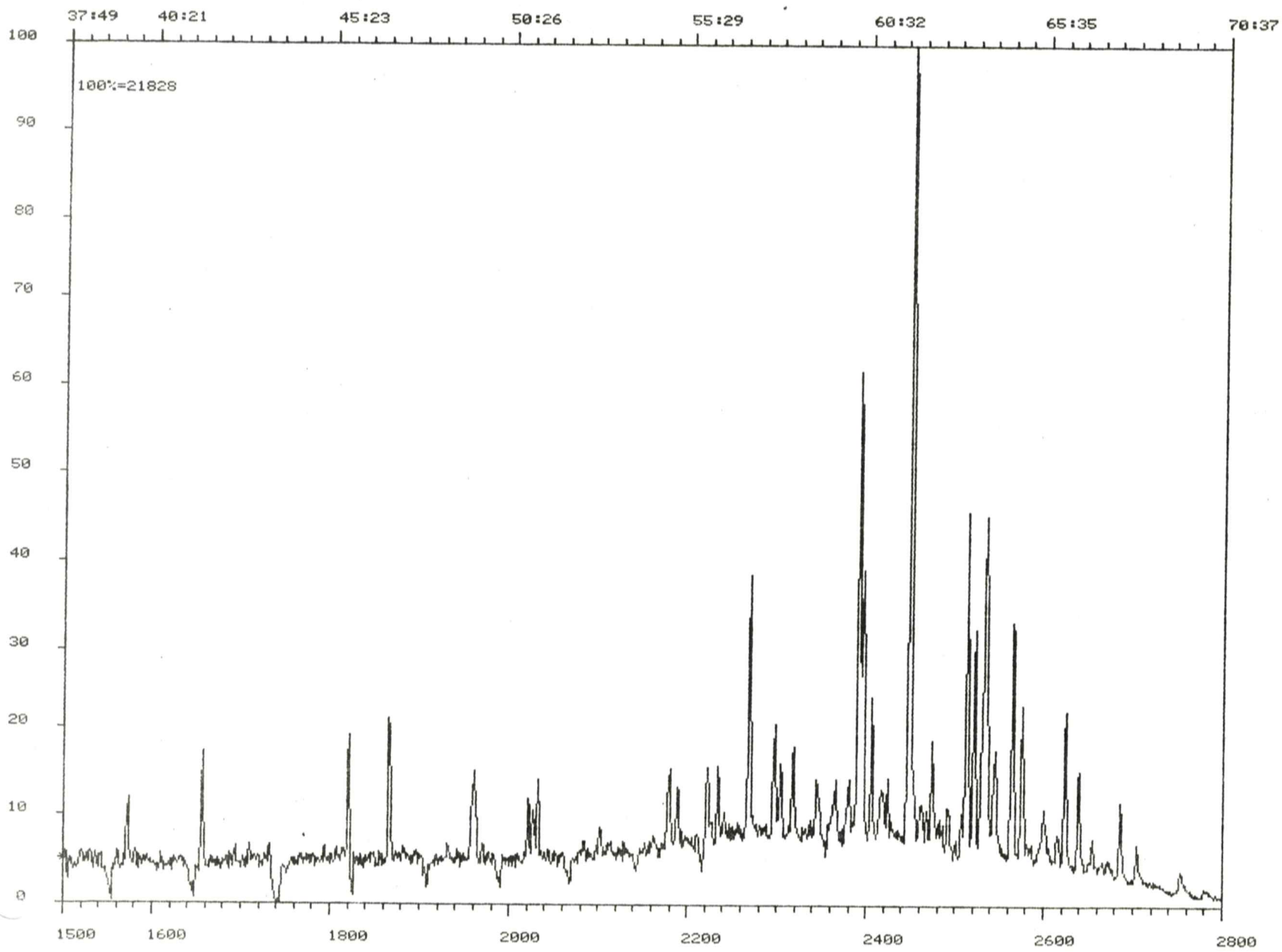
ADOLPHUS 2K-41 8560M

* 217



ADOLPHUS 2K-41 8560M

* 191



DS-55 CROSS SCAN REPORT) RUN: 201250009

ADOLPHUS 2K-41 8560M

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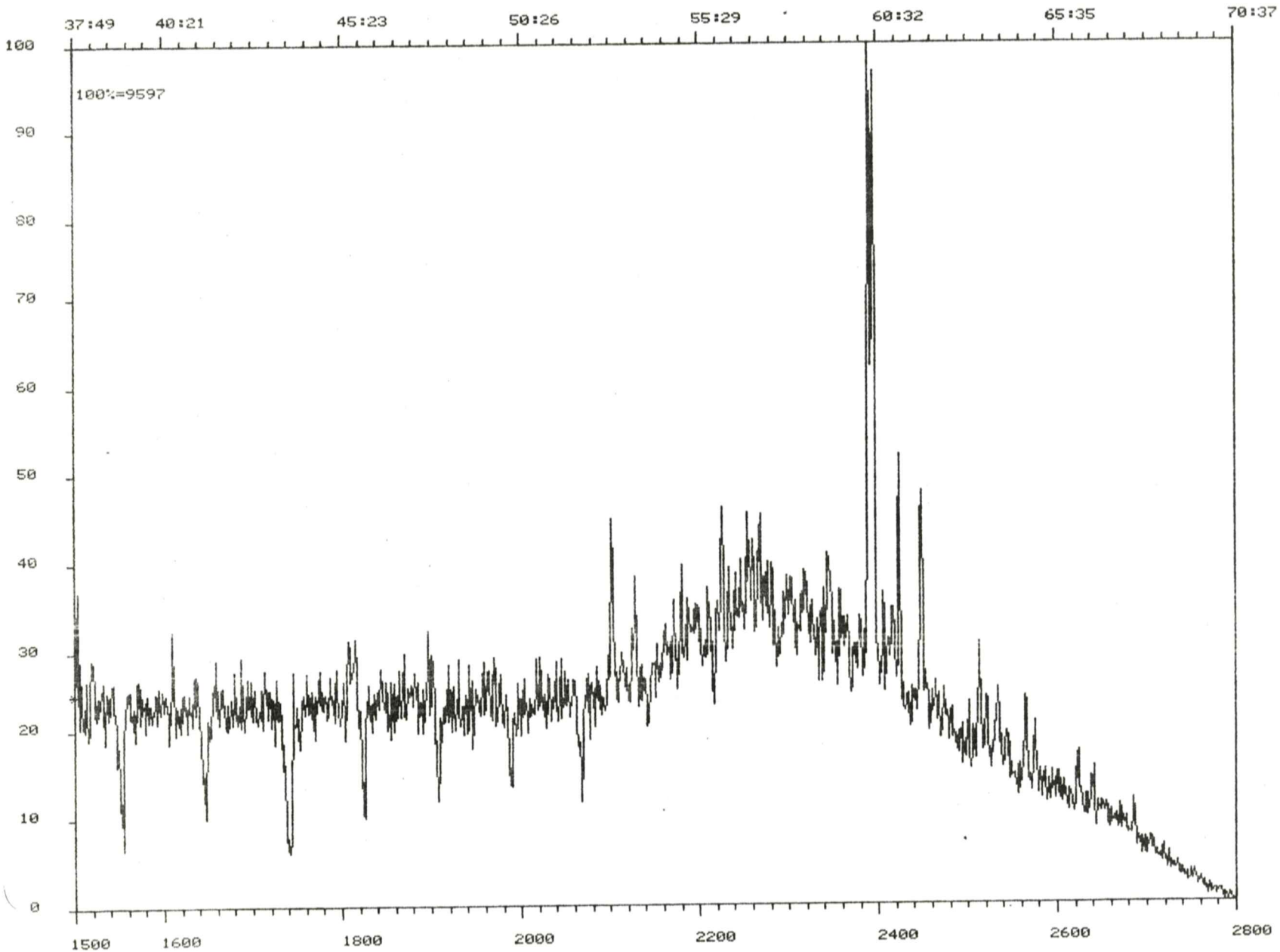
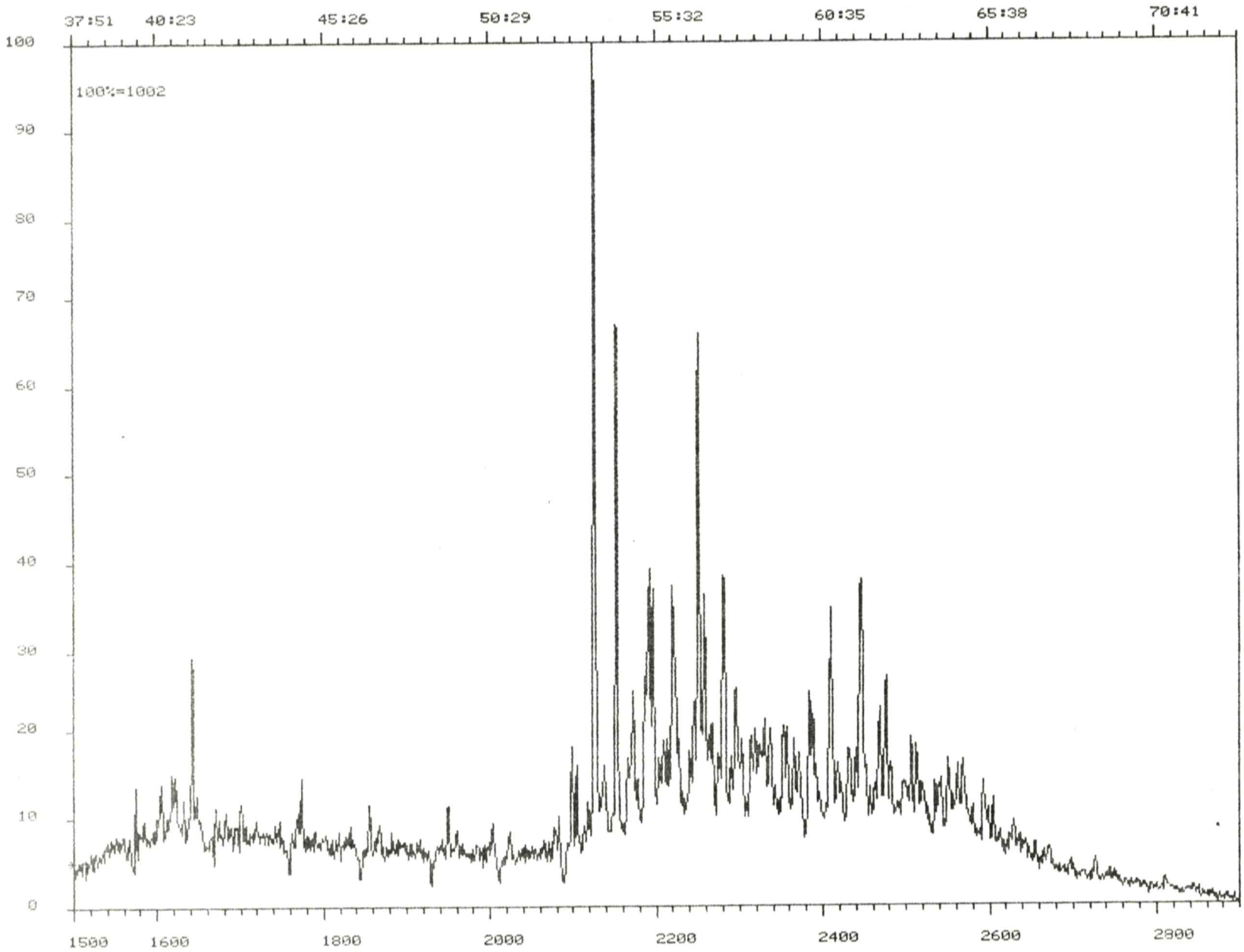


DS-55 CROSS SCAN REPORT; RUN: 202530001

HIBERNIA/DST3

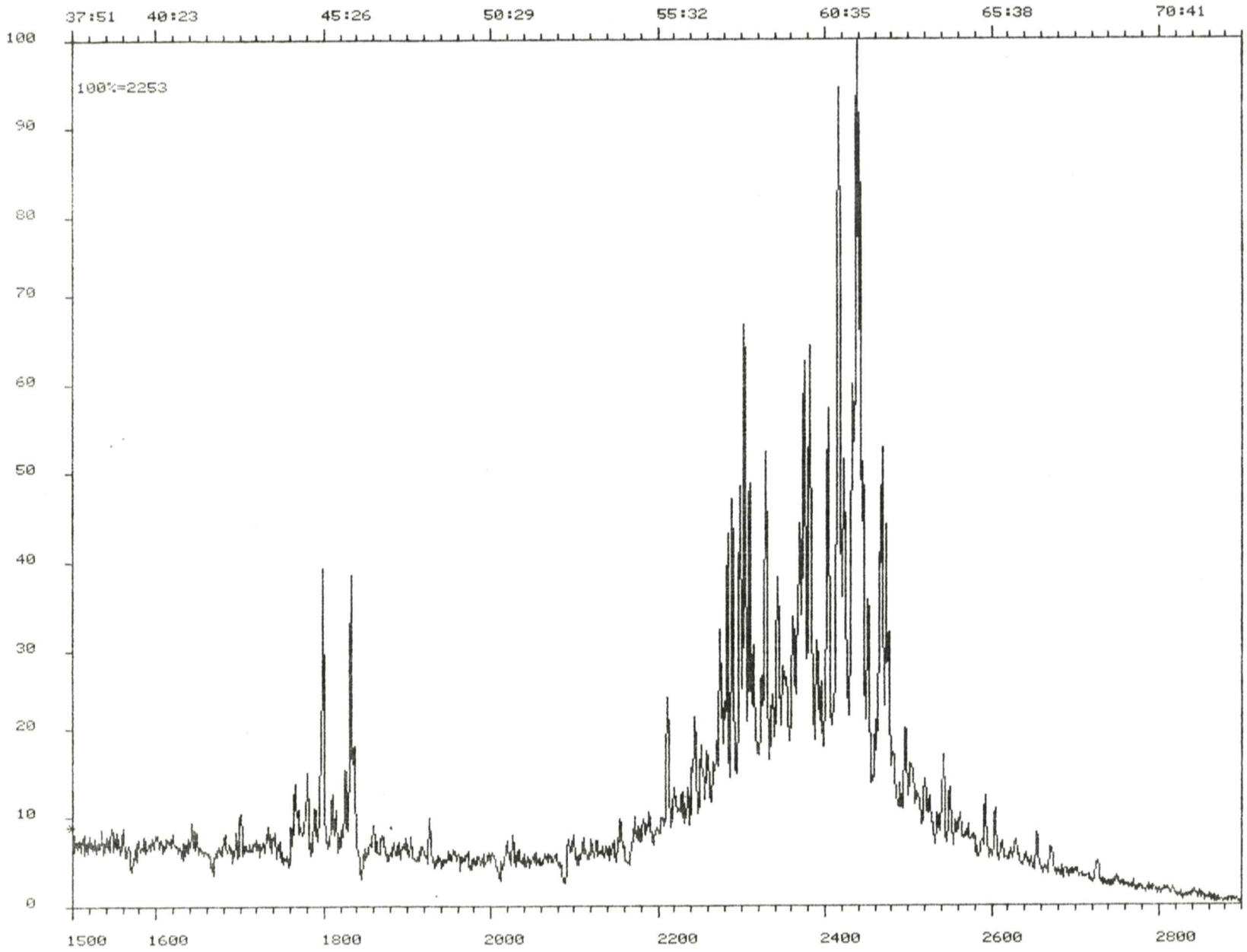
* 259



DS-55 CROSS SCAN REPORT, RUN: 202530001

HIBERNIA K-18 / DST3

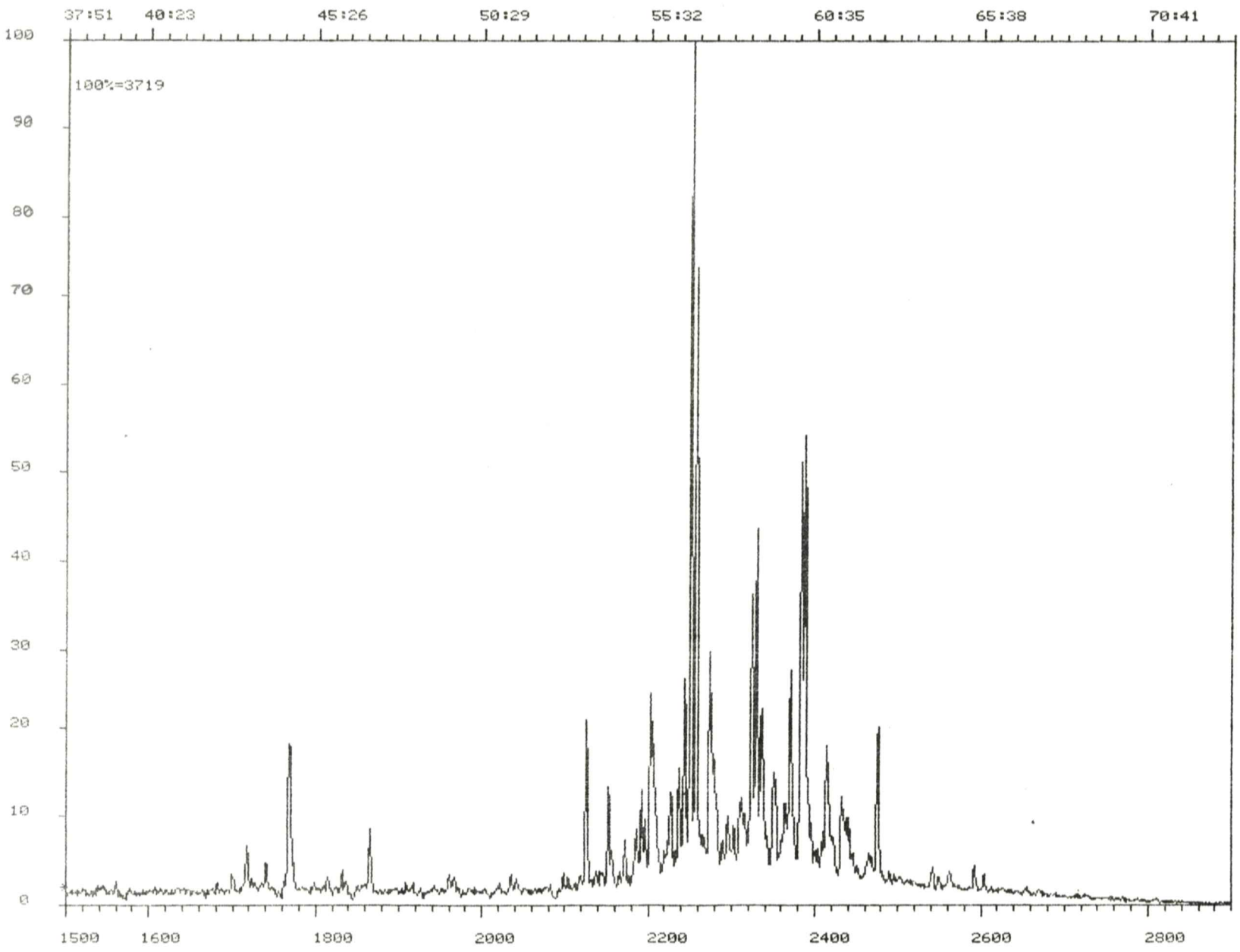
* 231



DI-SS CROSS SCAN REPORT: RUN: 202530001

K-18
HIBERNIA/DST3

* 218

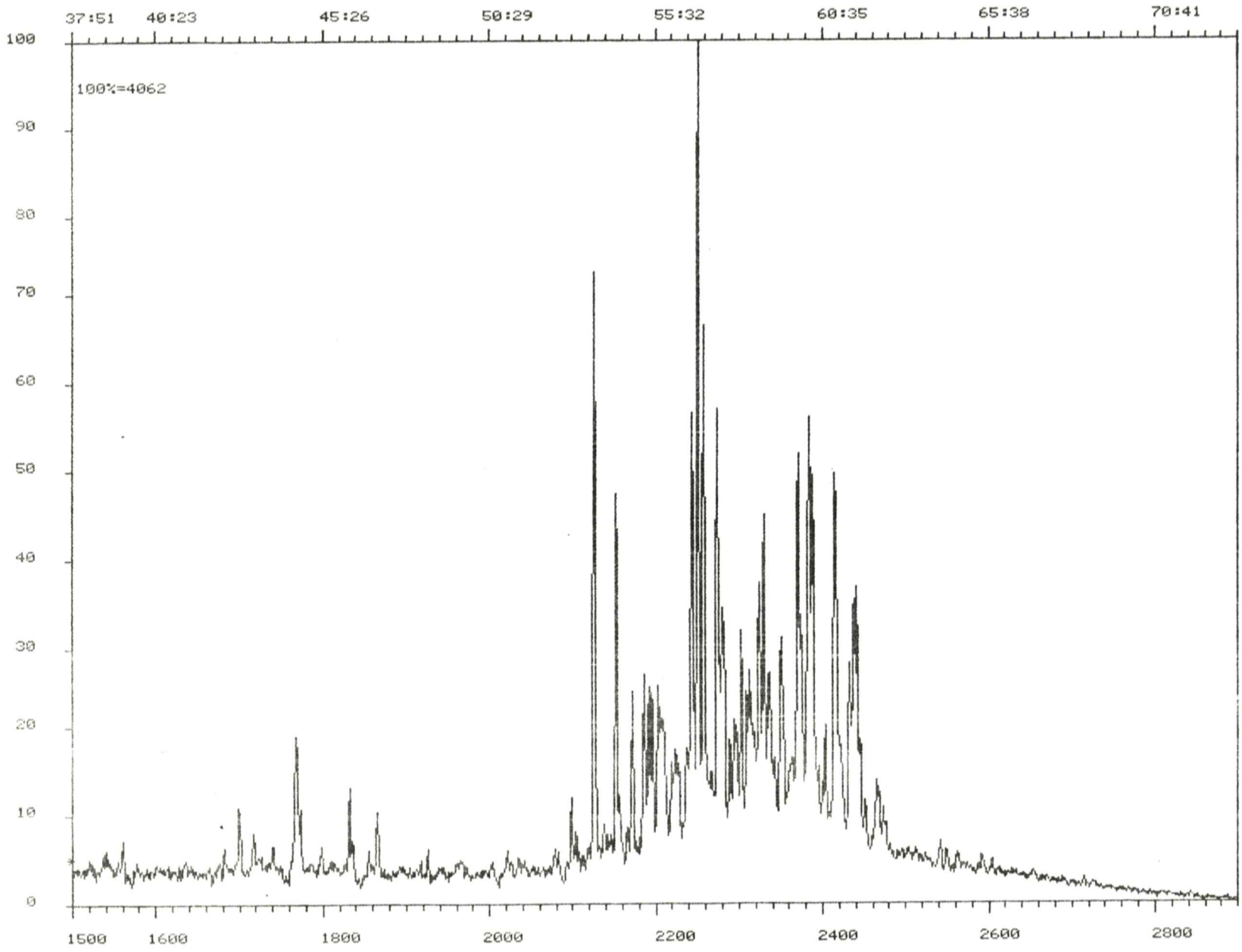


DS-55 CROSS SCAN REPORT, RUN: 202530001

K-18

HIBERNIA/DST3

* 217



DS-55 CROSS SCAN REPORT, RUN: 202530001

HIBERNIA/K-18 DST3

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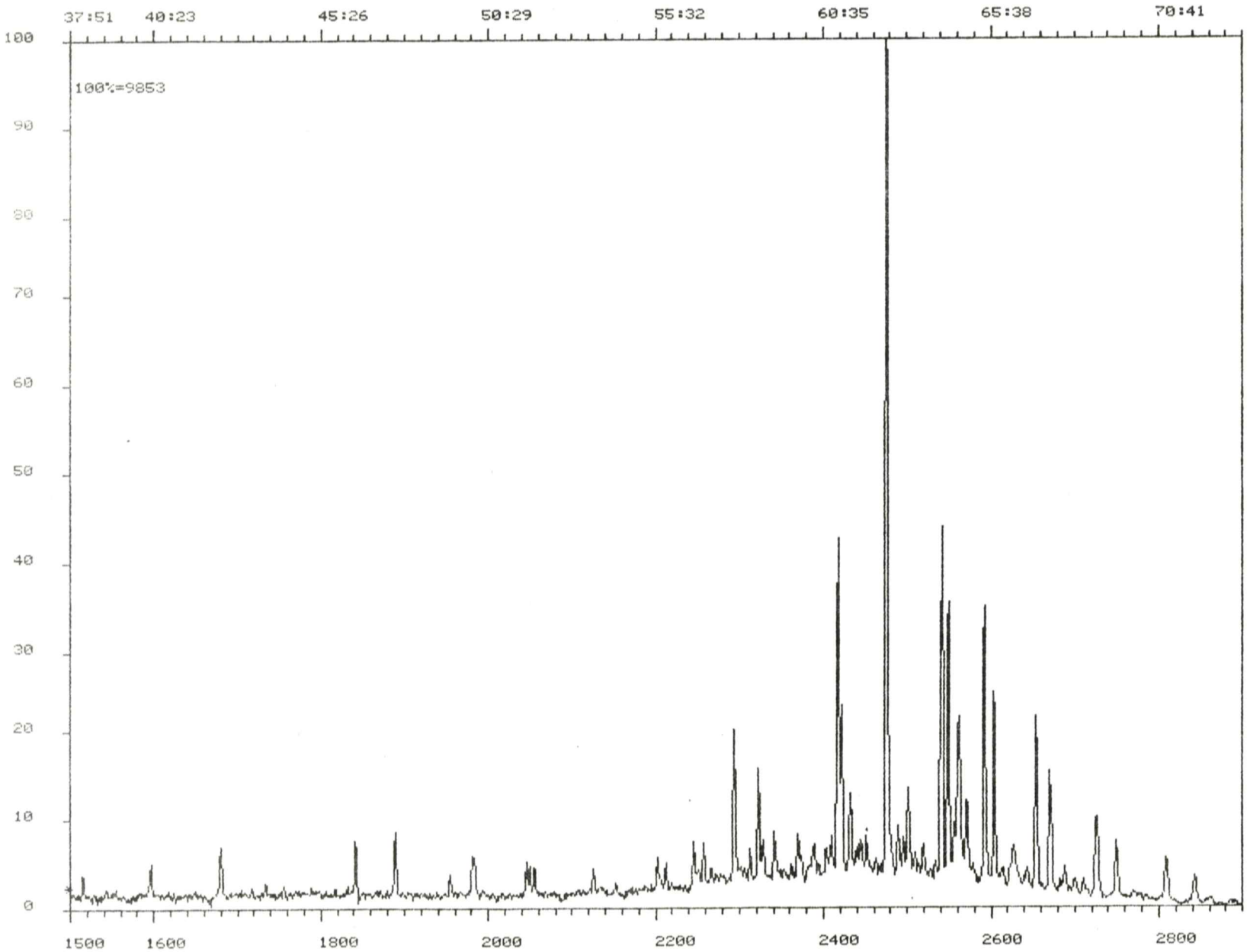

DS-55 CROSS SCAN REPORT: RUN: 202530001

HIBERNIA K-18 DST3

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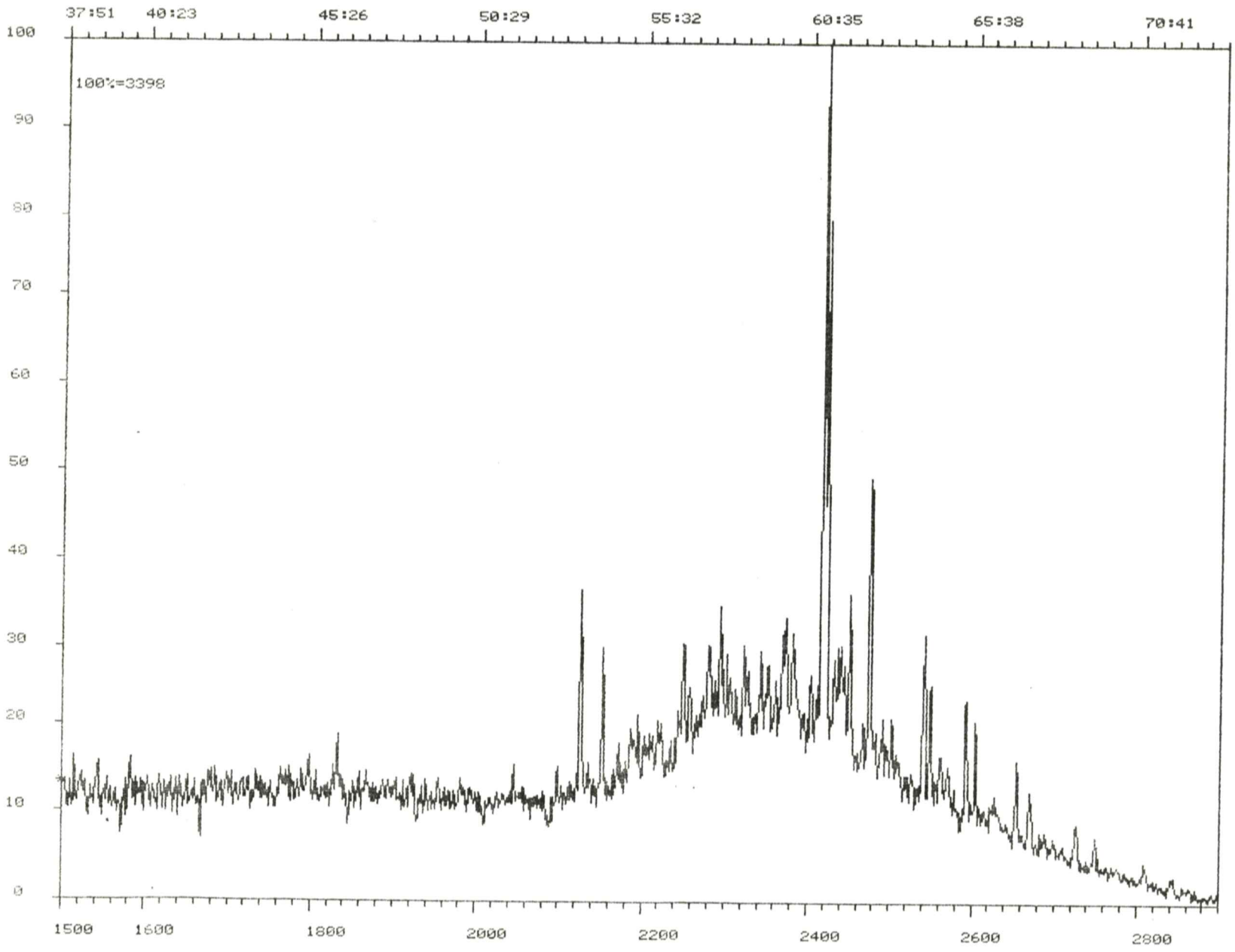
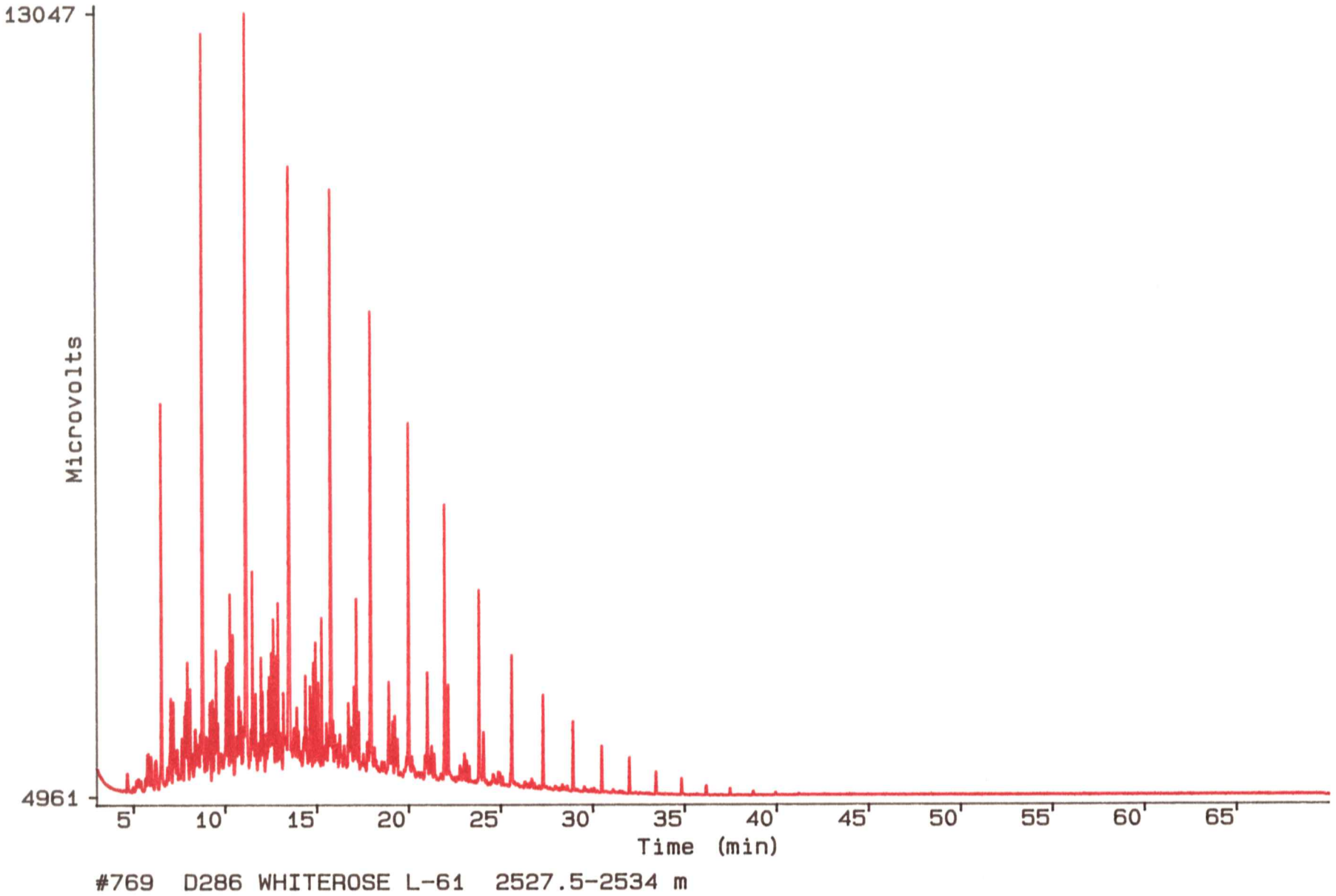
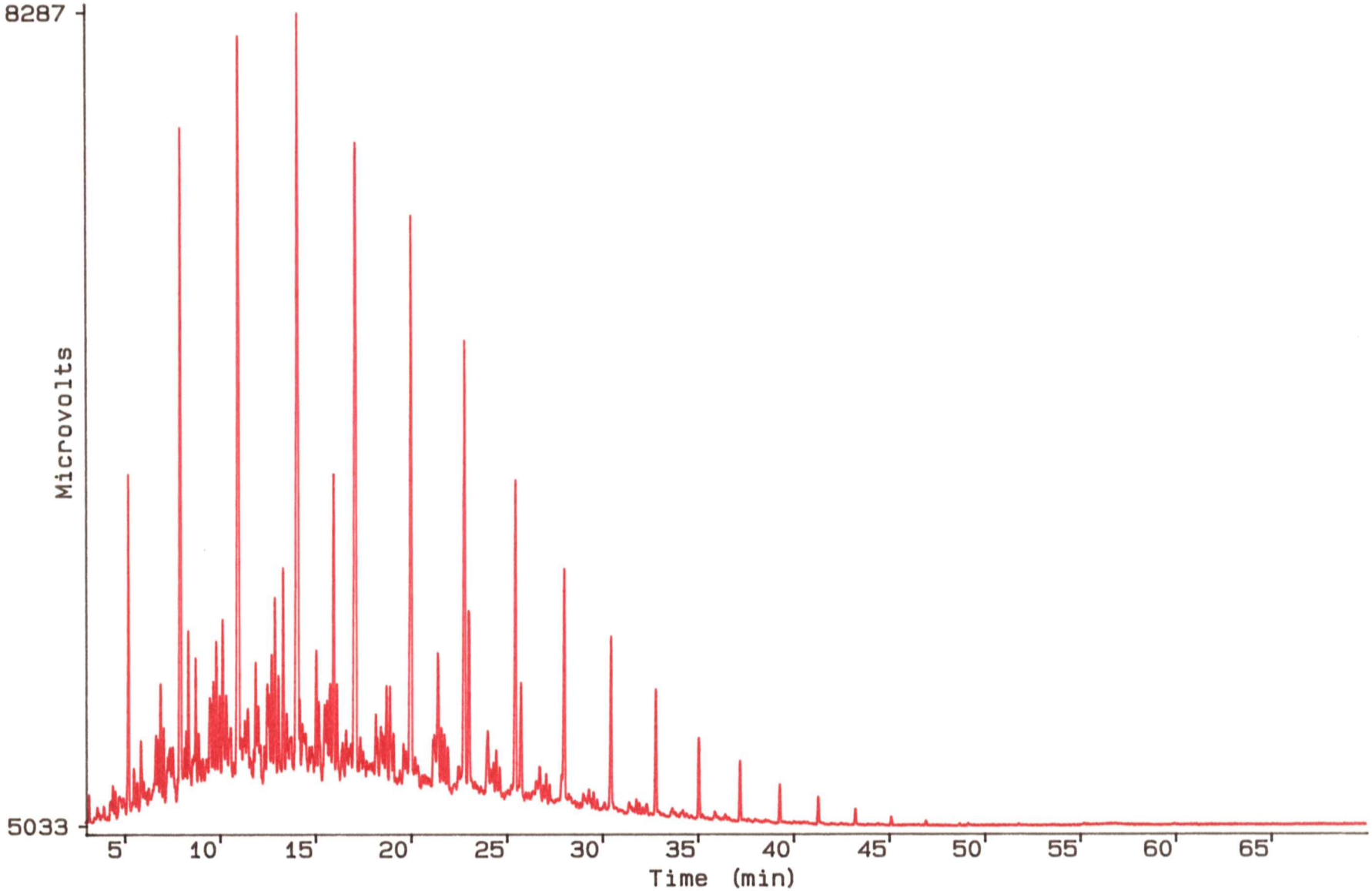
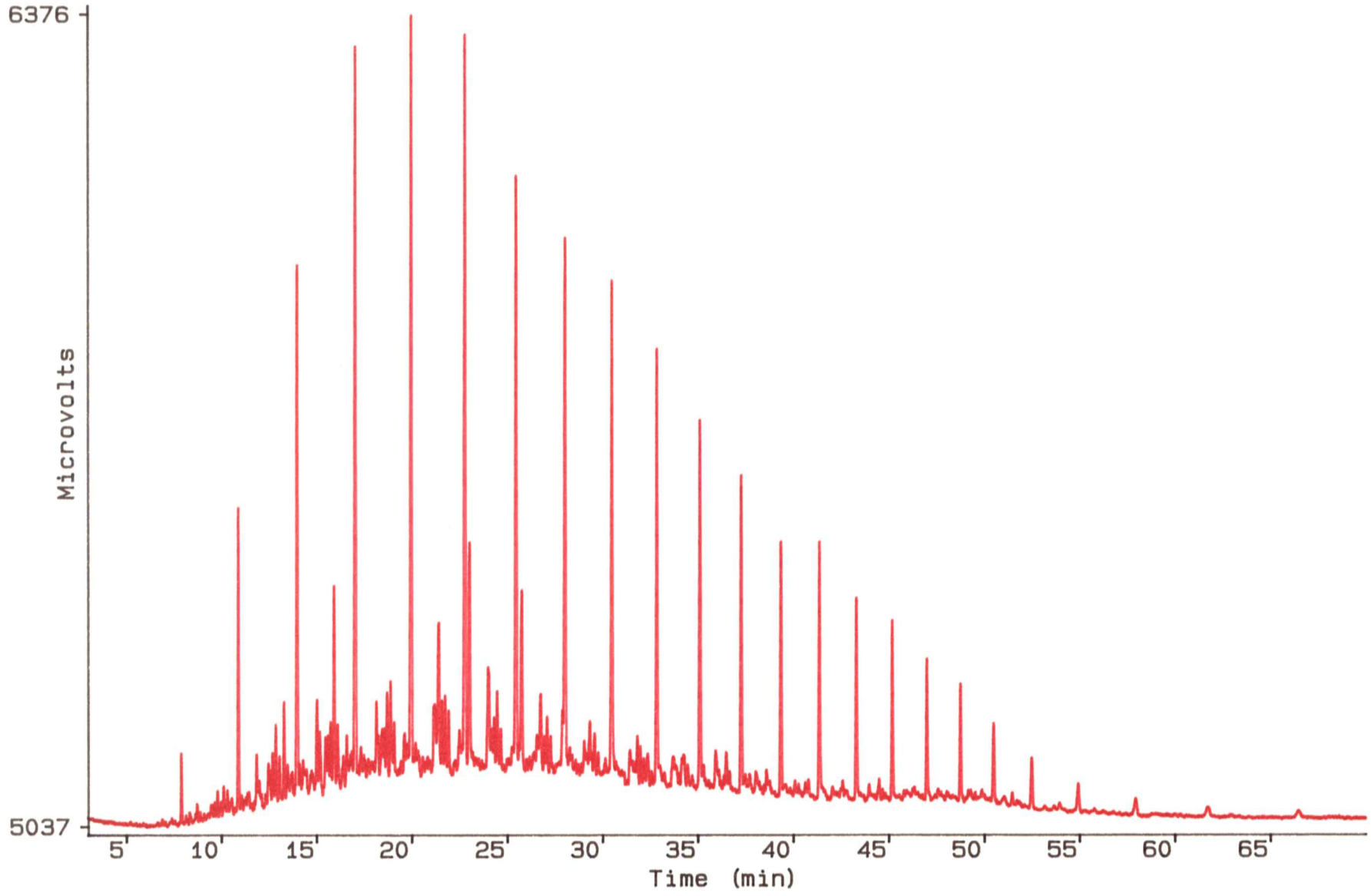




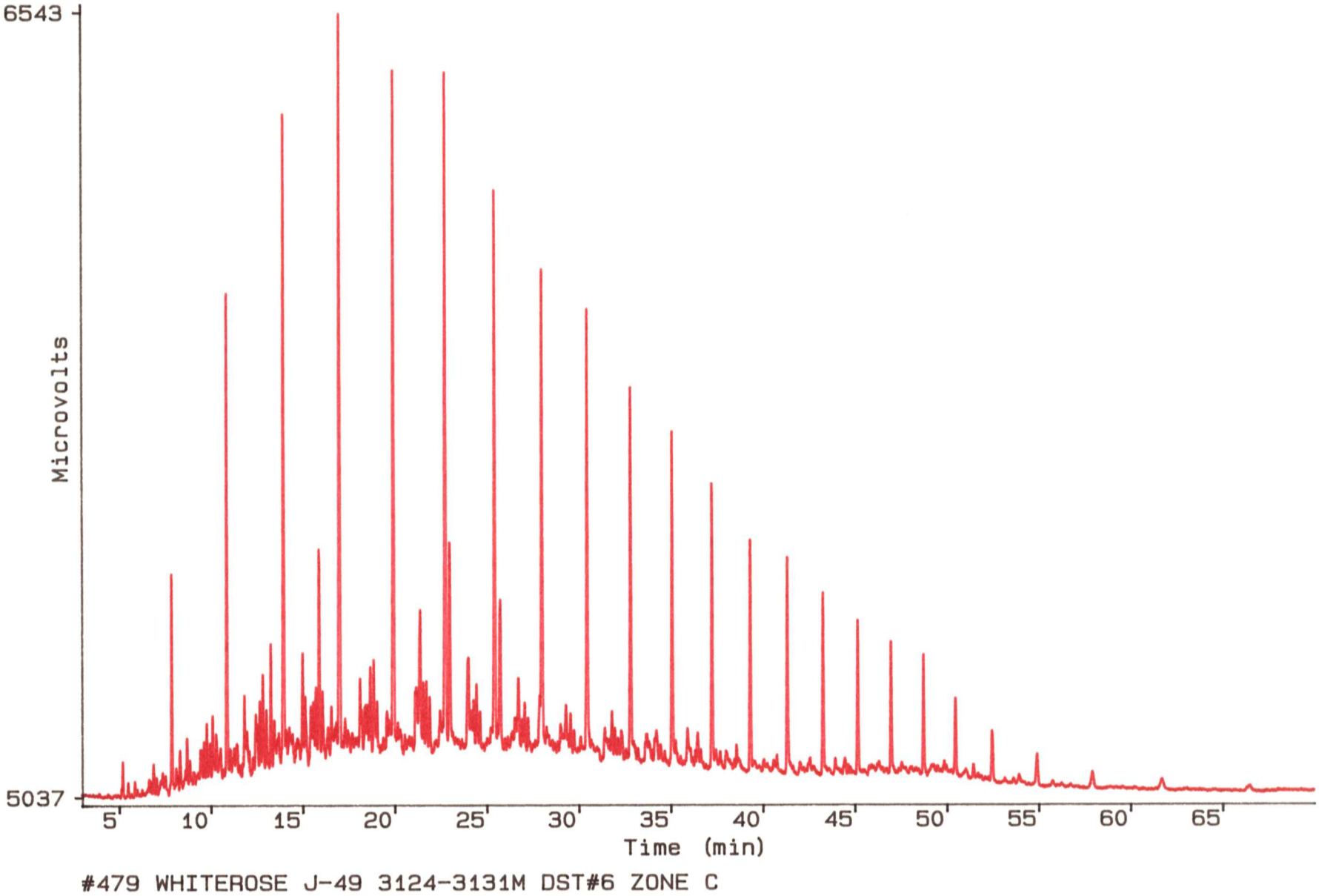
#769 D286 WHITEROSE L-61 2527.5-2534 m



#478 WHITEROSE J-49 3063-3067M DST#8, ZONE F



#480 WHITEROSE J-49 3093.5-3106M DST#7

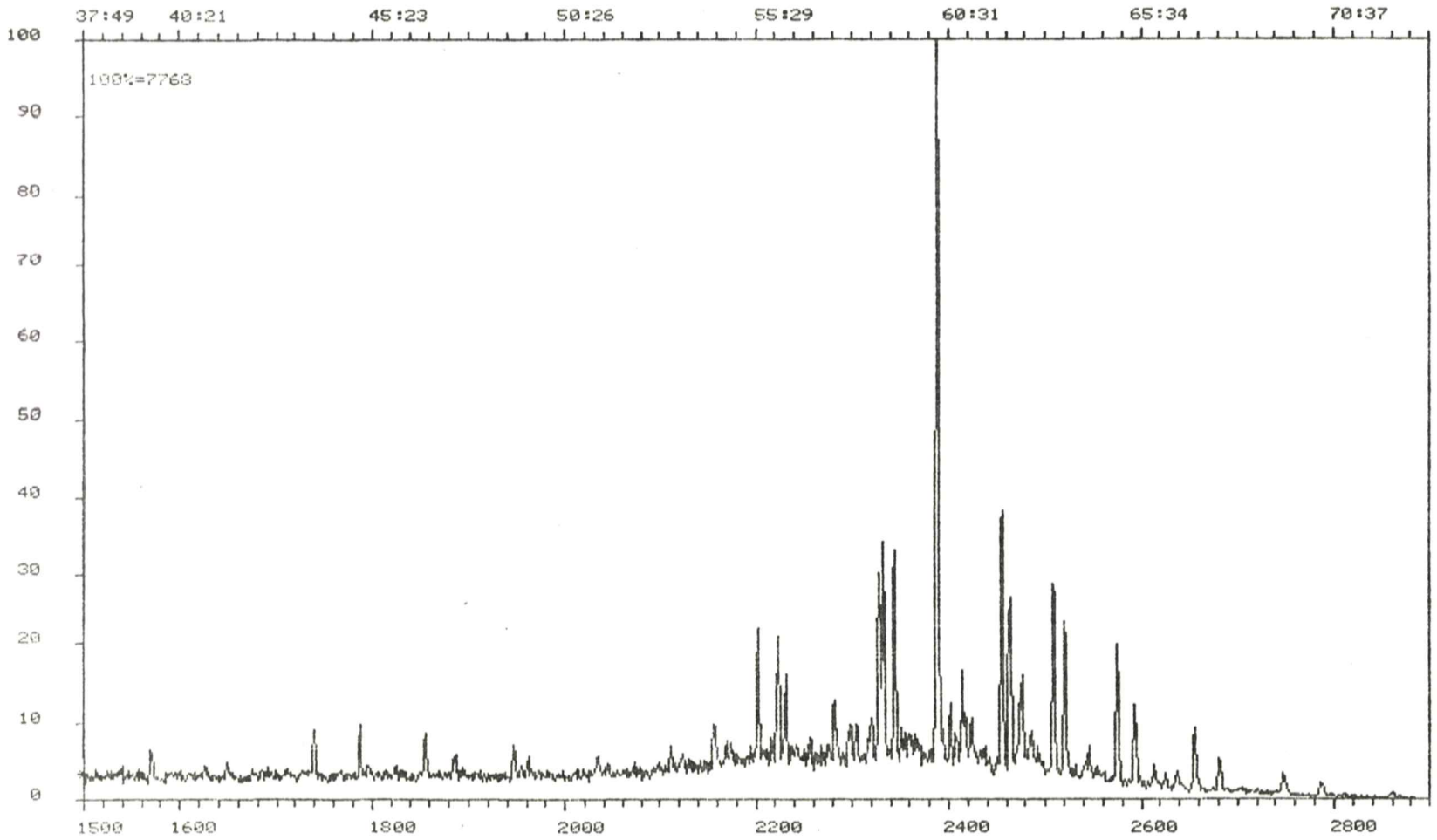


#479 WHITEROSE J-49 3124-3131M DST#6 ZONE C

DS-55 CROSS SCAN REPORT, RUN: 201850001

BEN NEV IS I-45 DST#3

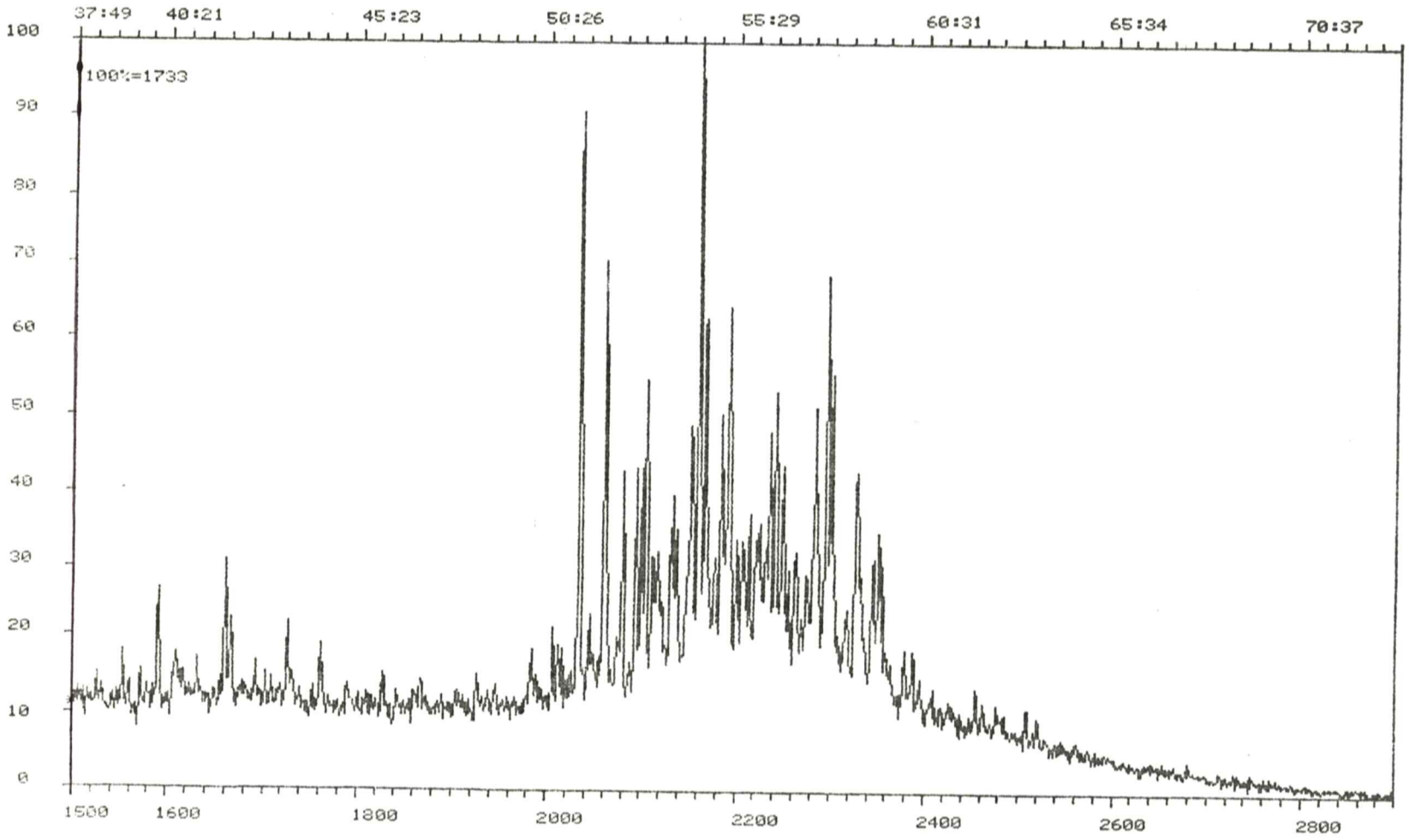
* 191

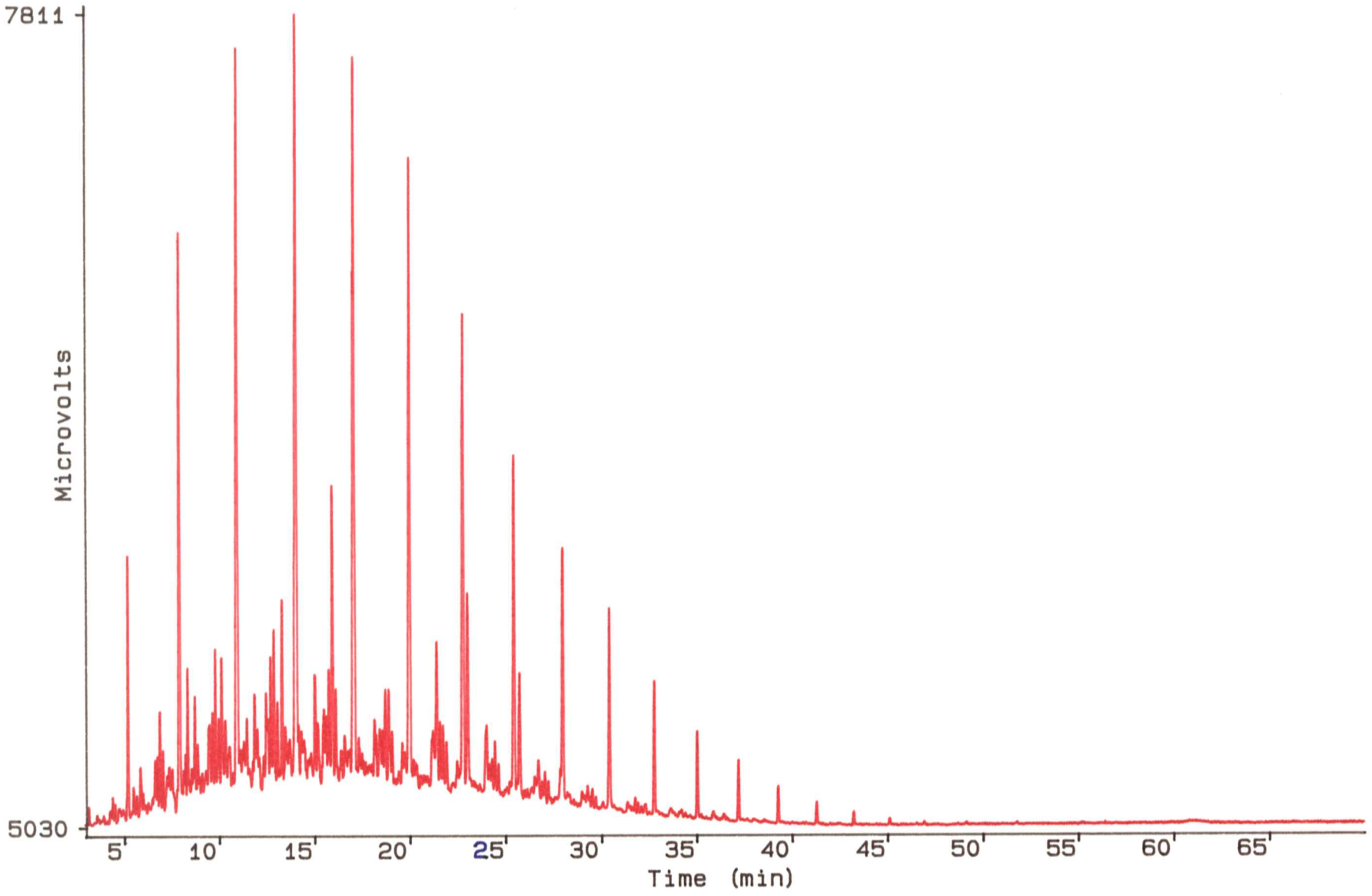


DS-55 CROSS SCAN REPORT, RUN: 201850001

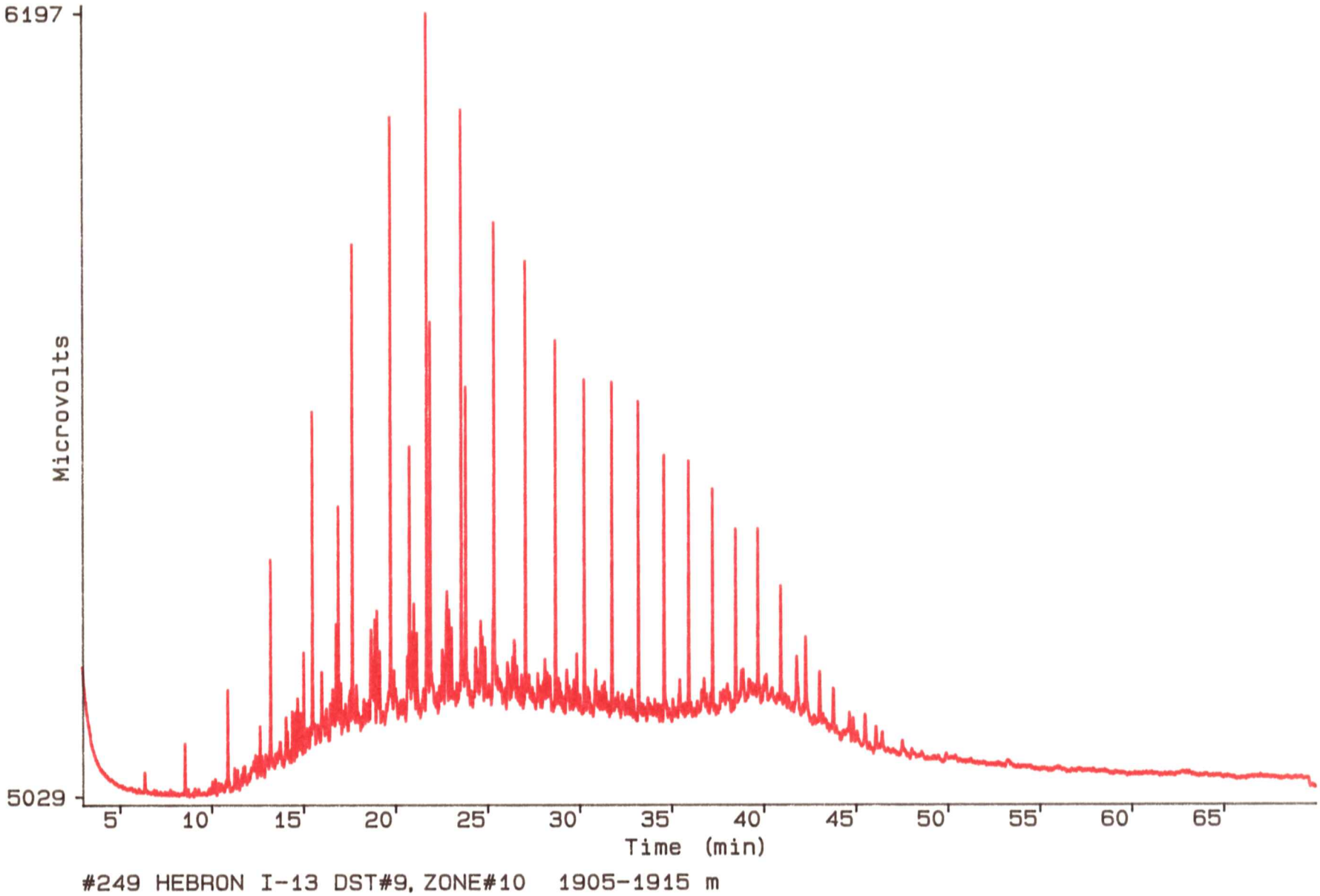
BEN NEV IS I-45 DST#3

* 217



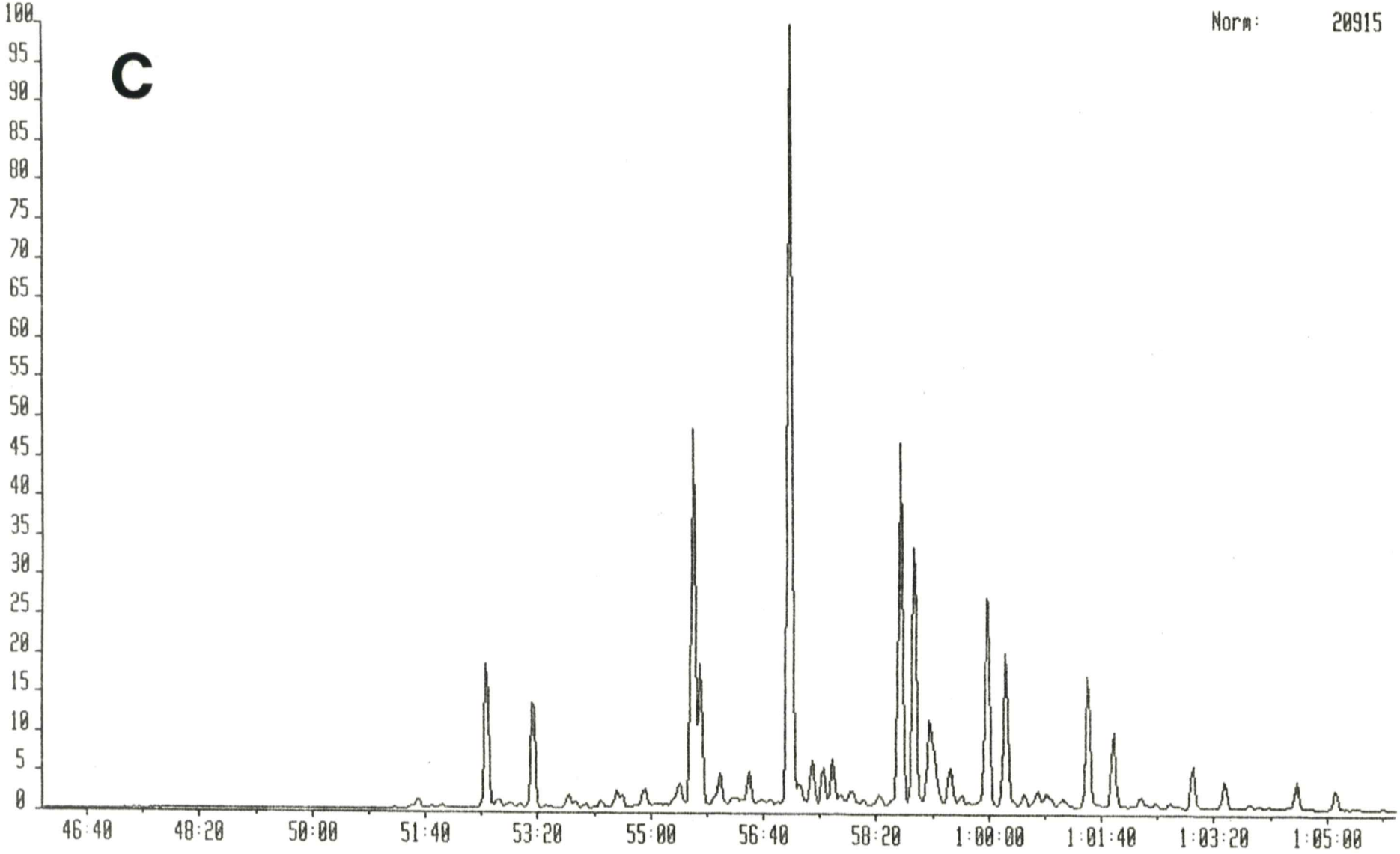


#477 WHITEROSE 3212-3218.5M DST#2, ZONE A

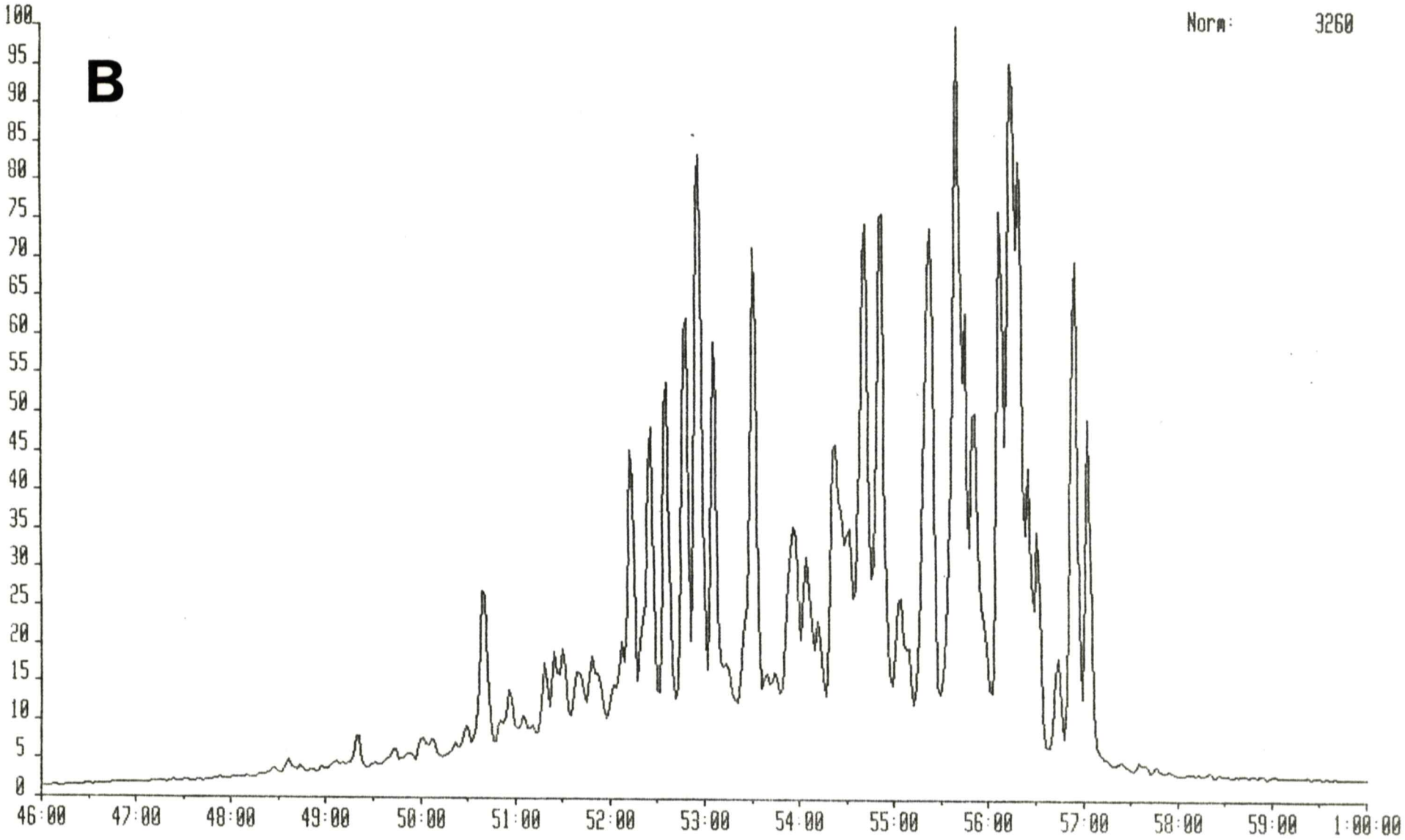


#249 HEBRON I-13 DST#9, ZONE#10 1905-1915 m

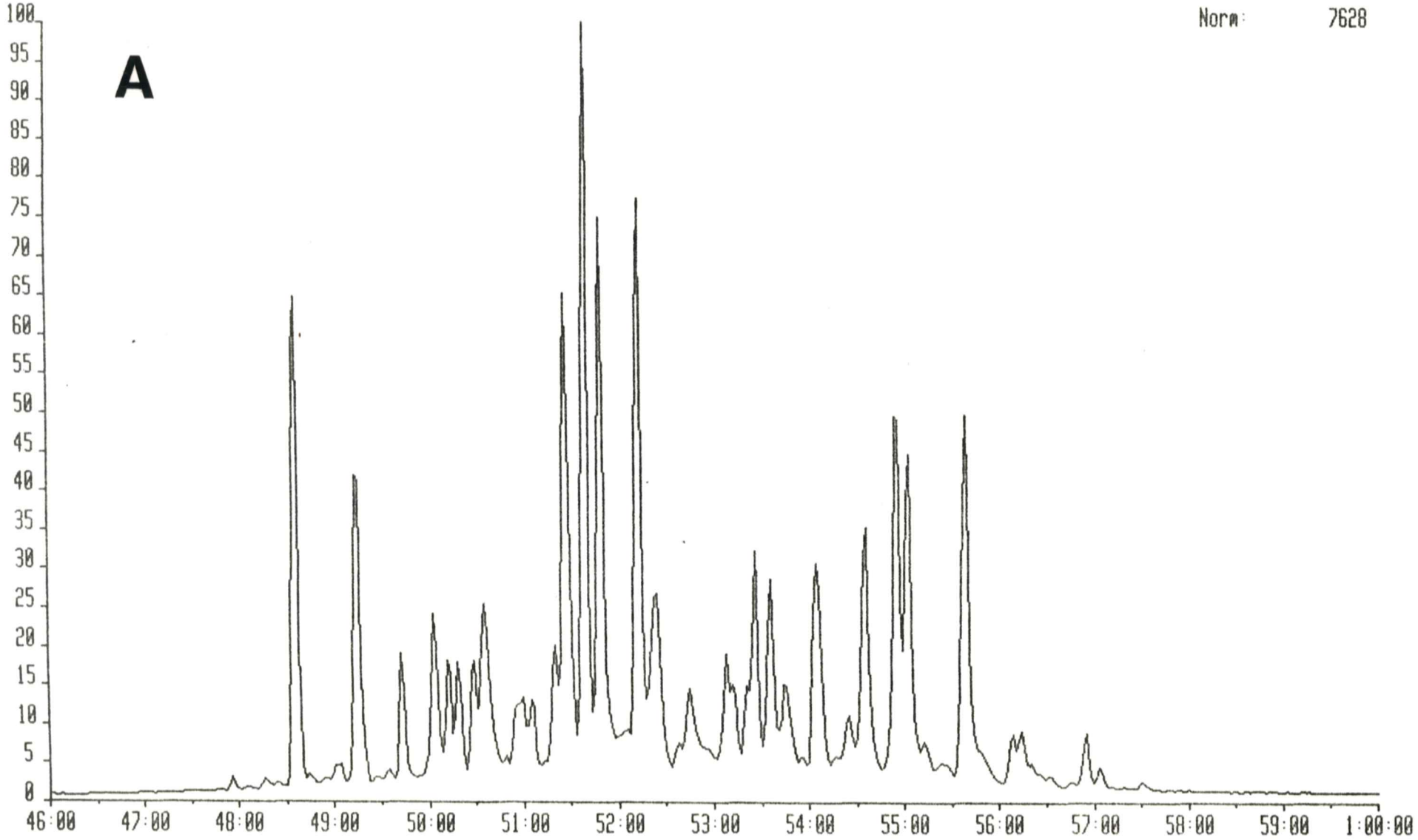
263C 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1
Text:SUMMATION OF M-191



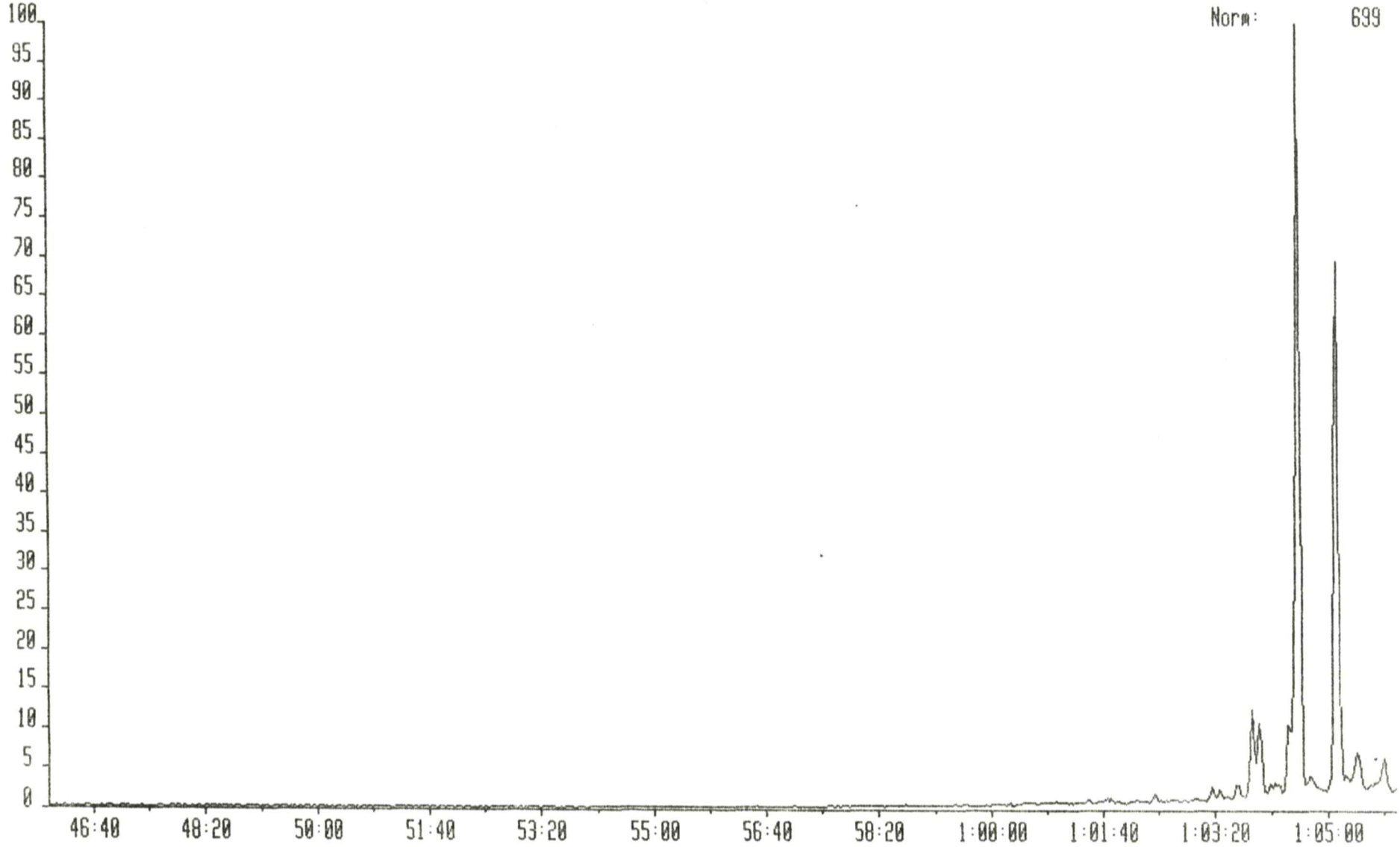
263B 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1
Text:SUMMATION OF M-231



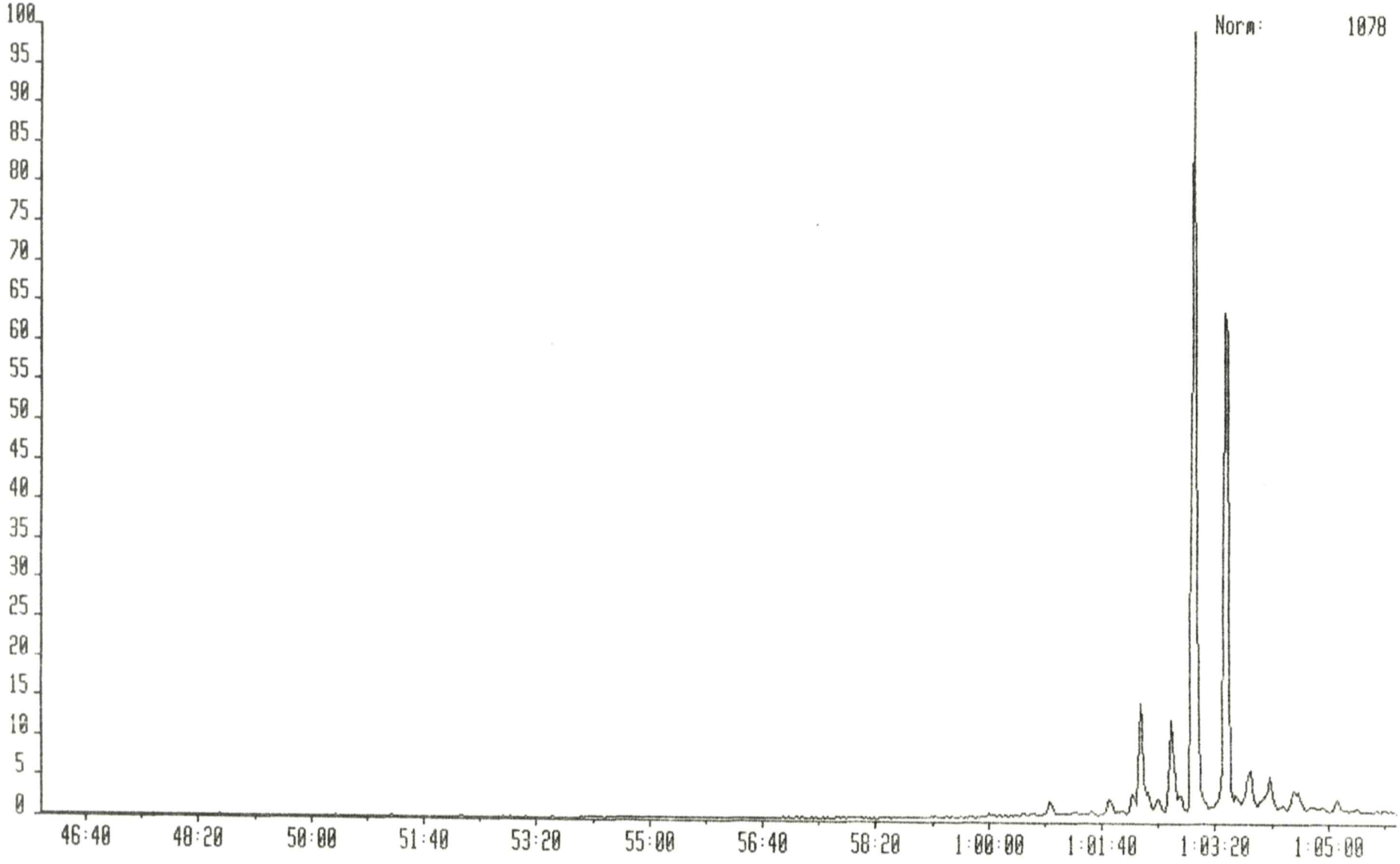
263A 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1
Text:SUMMATION OF M-217



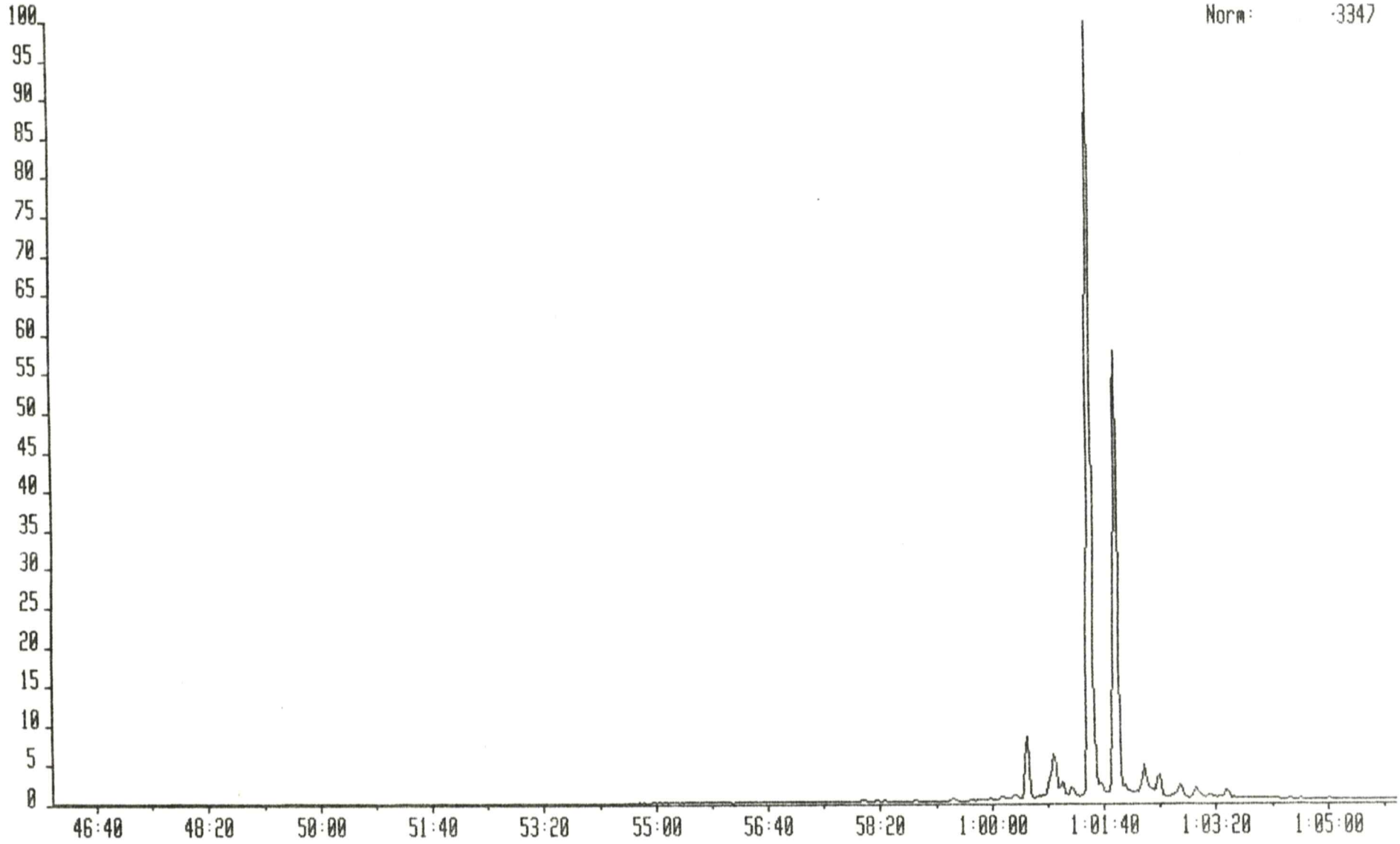
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 482.4000 482.4000->191.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



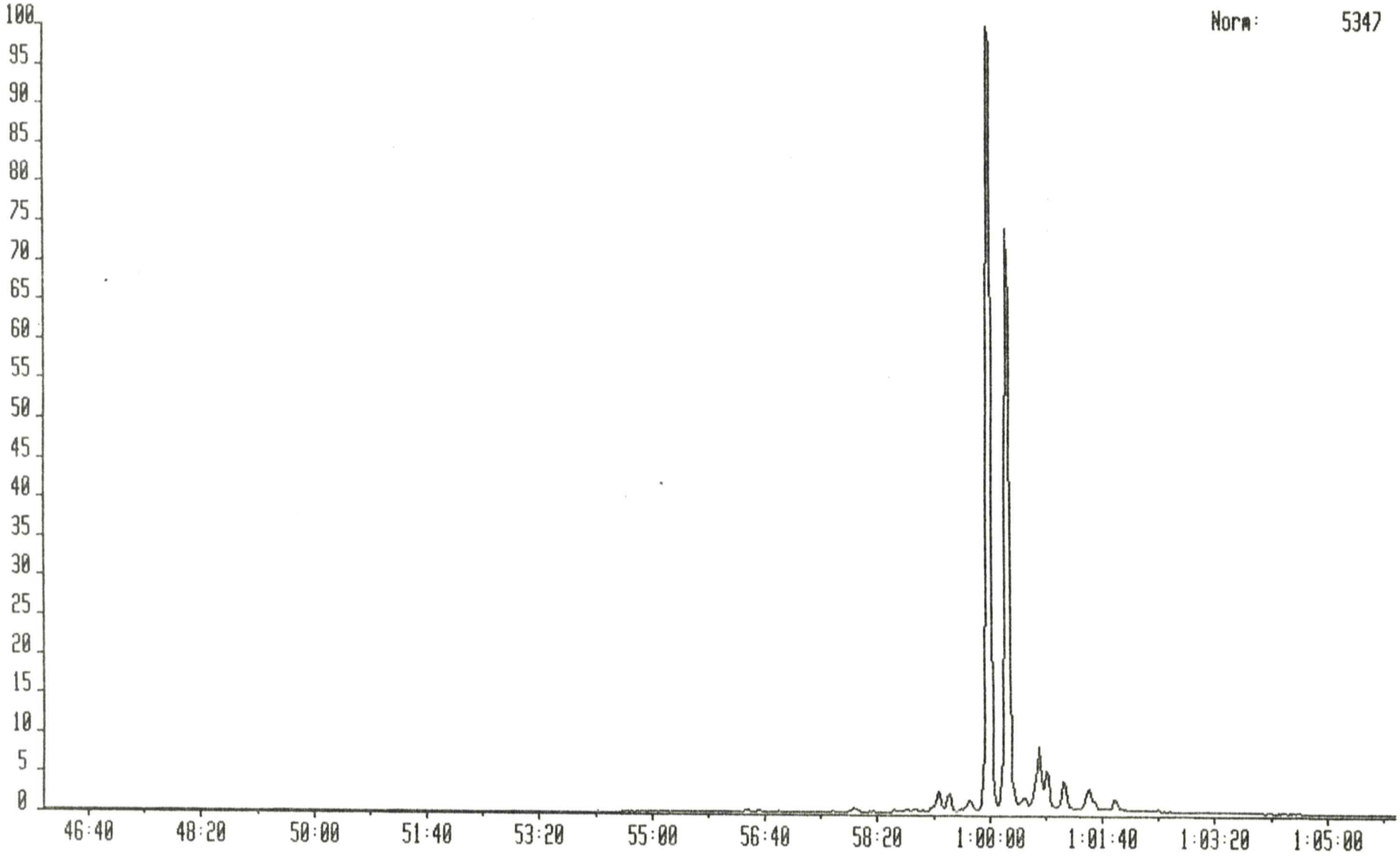
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 468.4000 468.4000->191.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



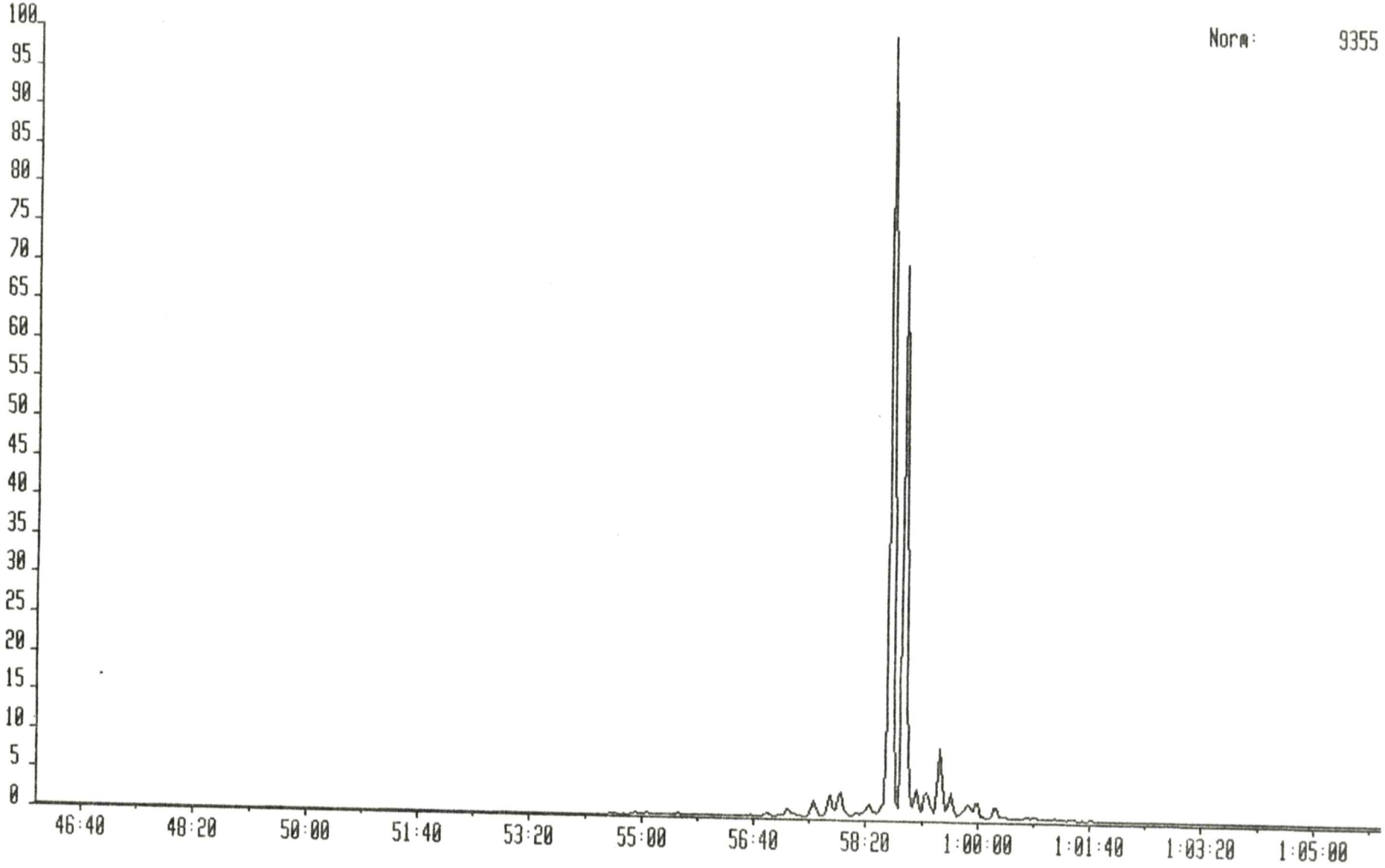
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 454.4000 454.4000->191.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



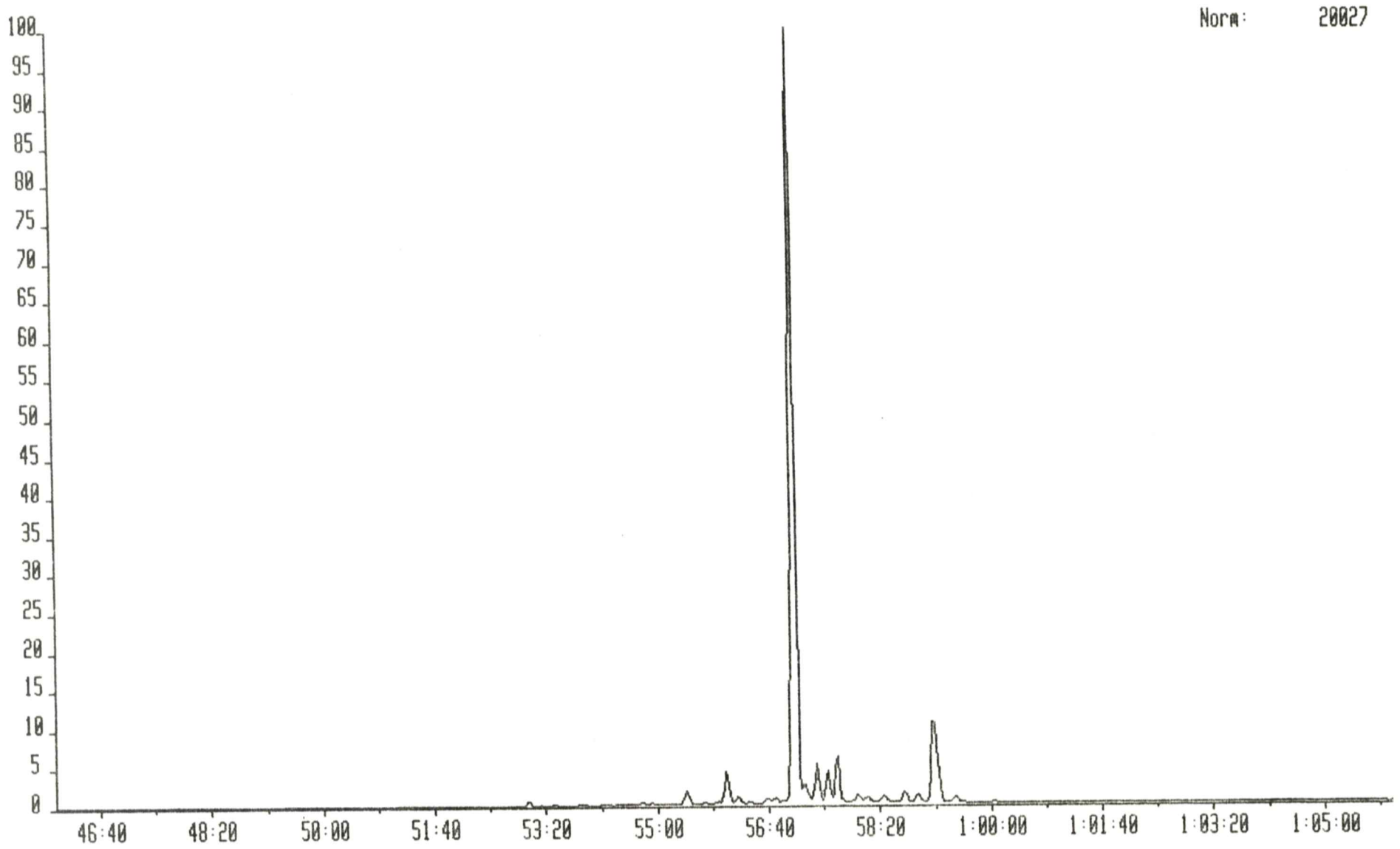
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 440.4000 440.4000->191.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



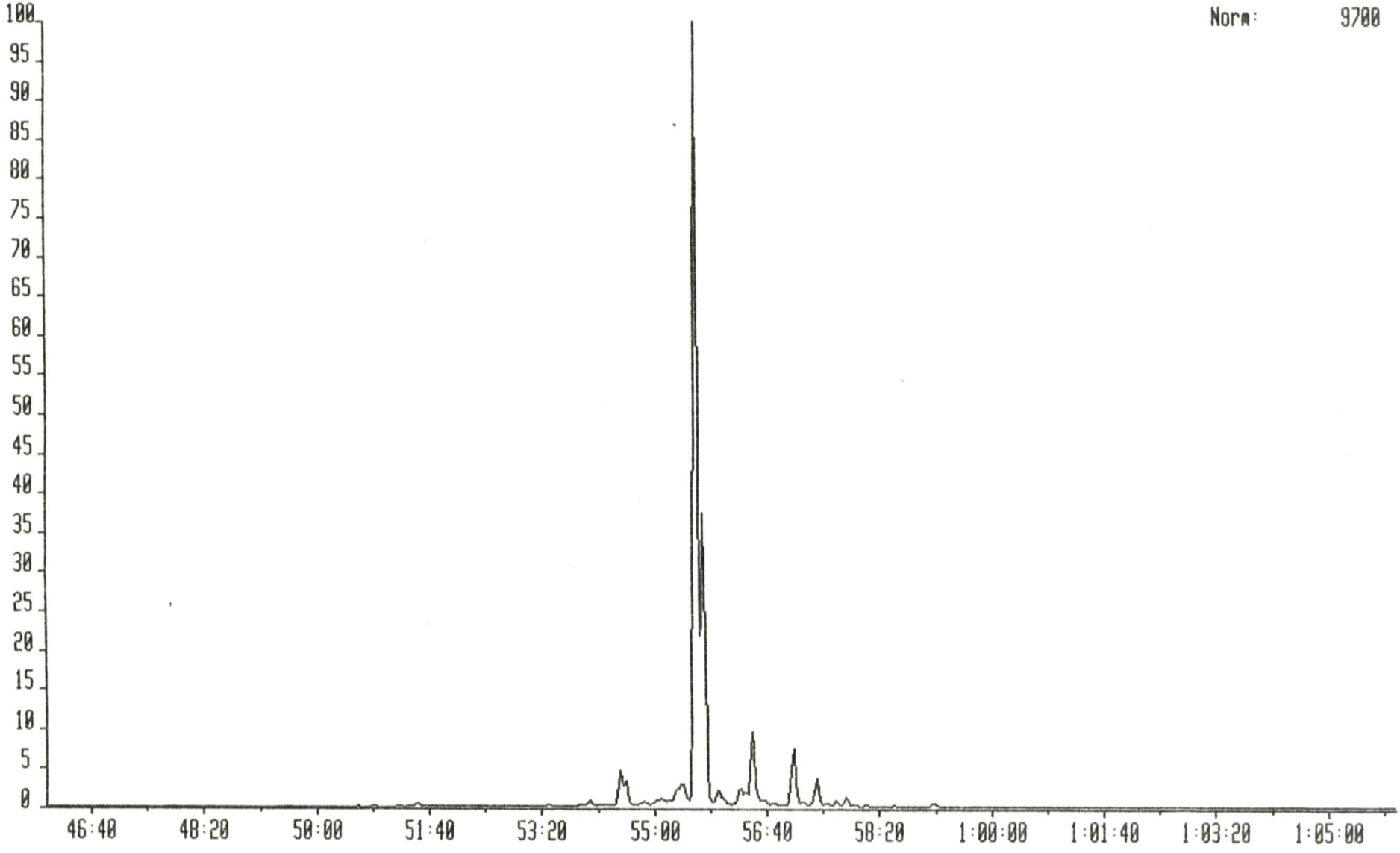
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 426.4000 426.4000->191.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



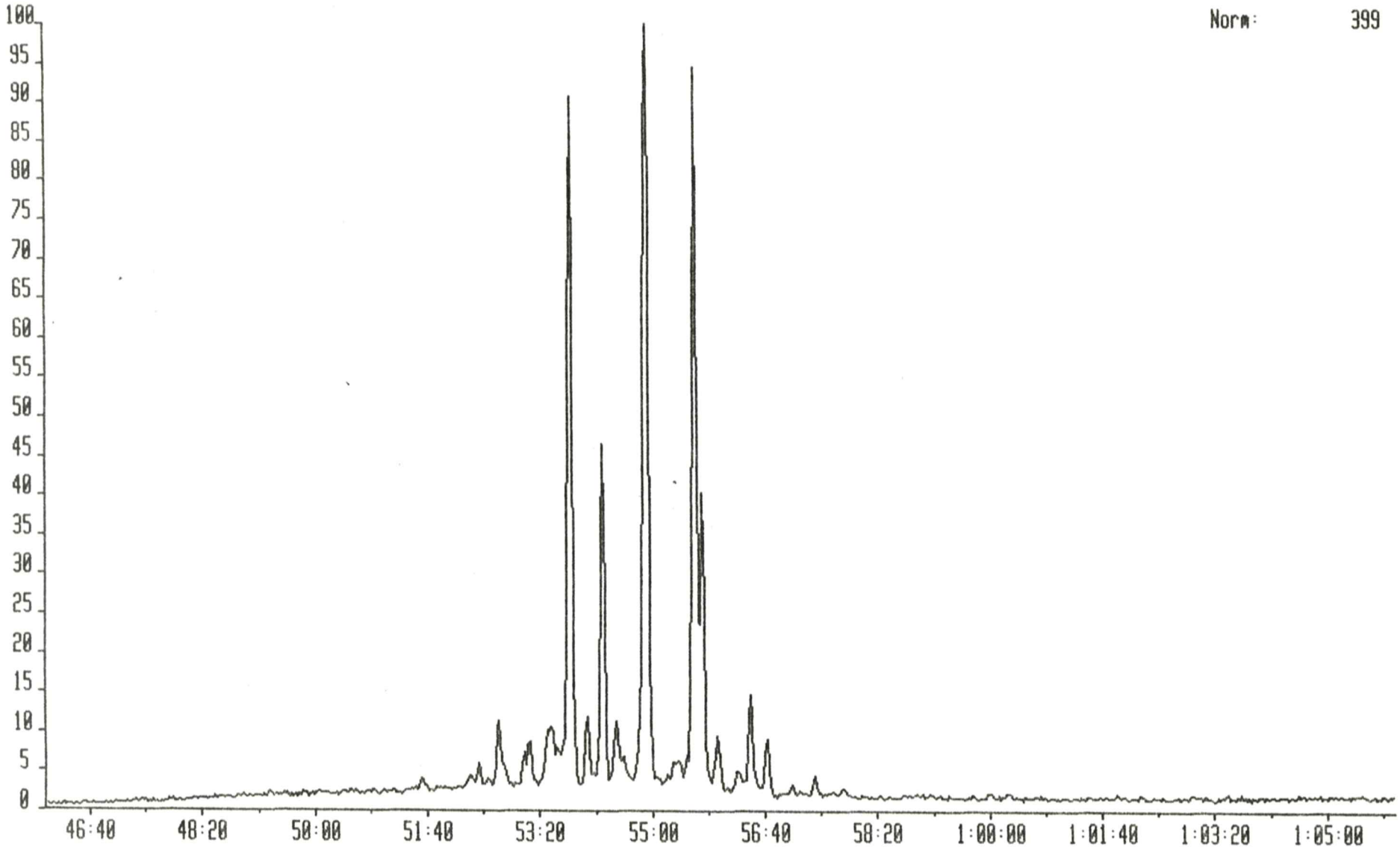
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 412.4000 412.4000->191.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



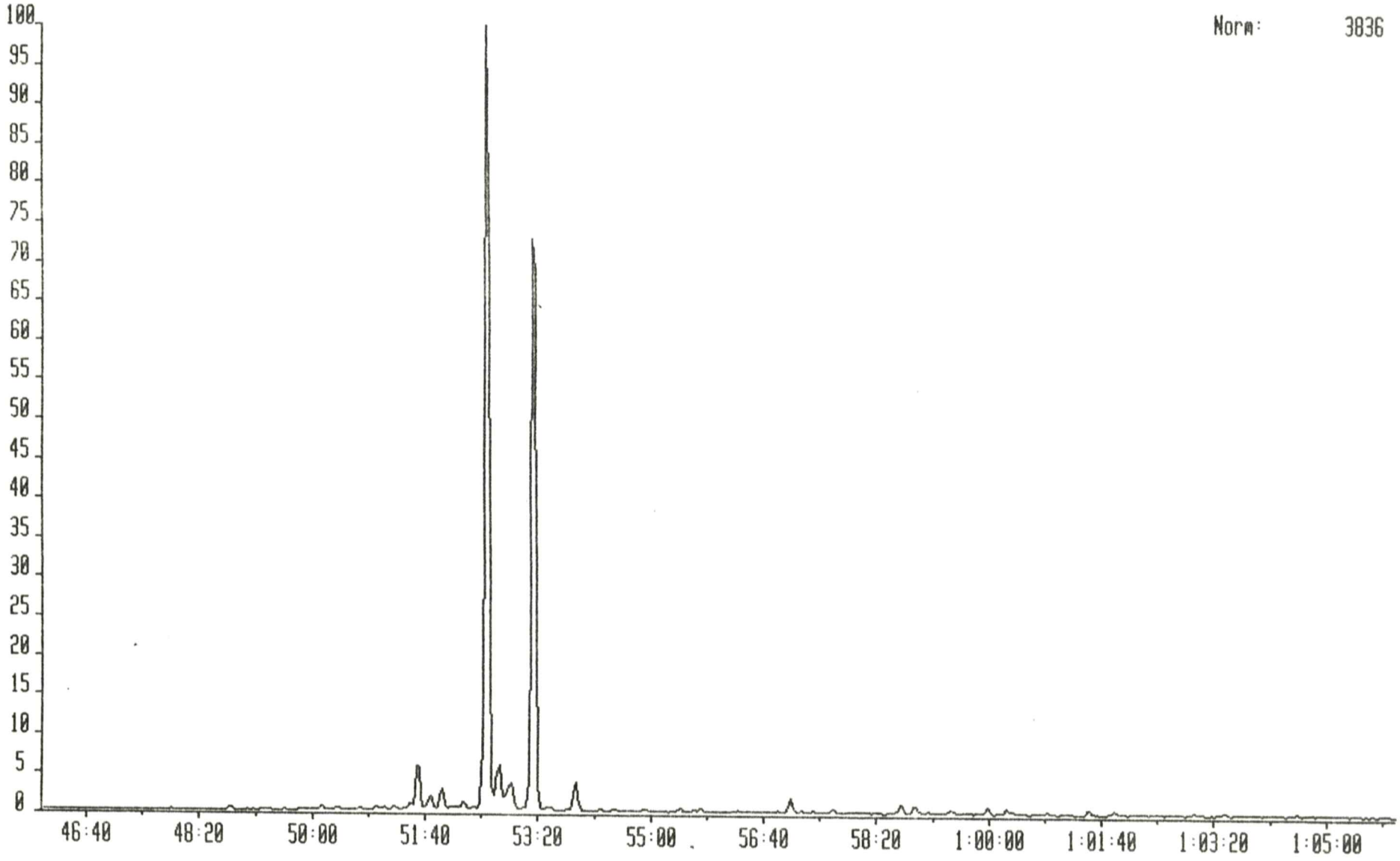
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 398.4000 398.4000->191.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



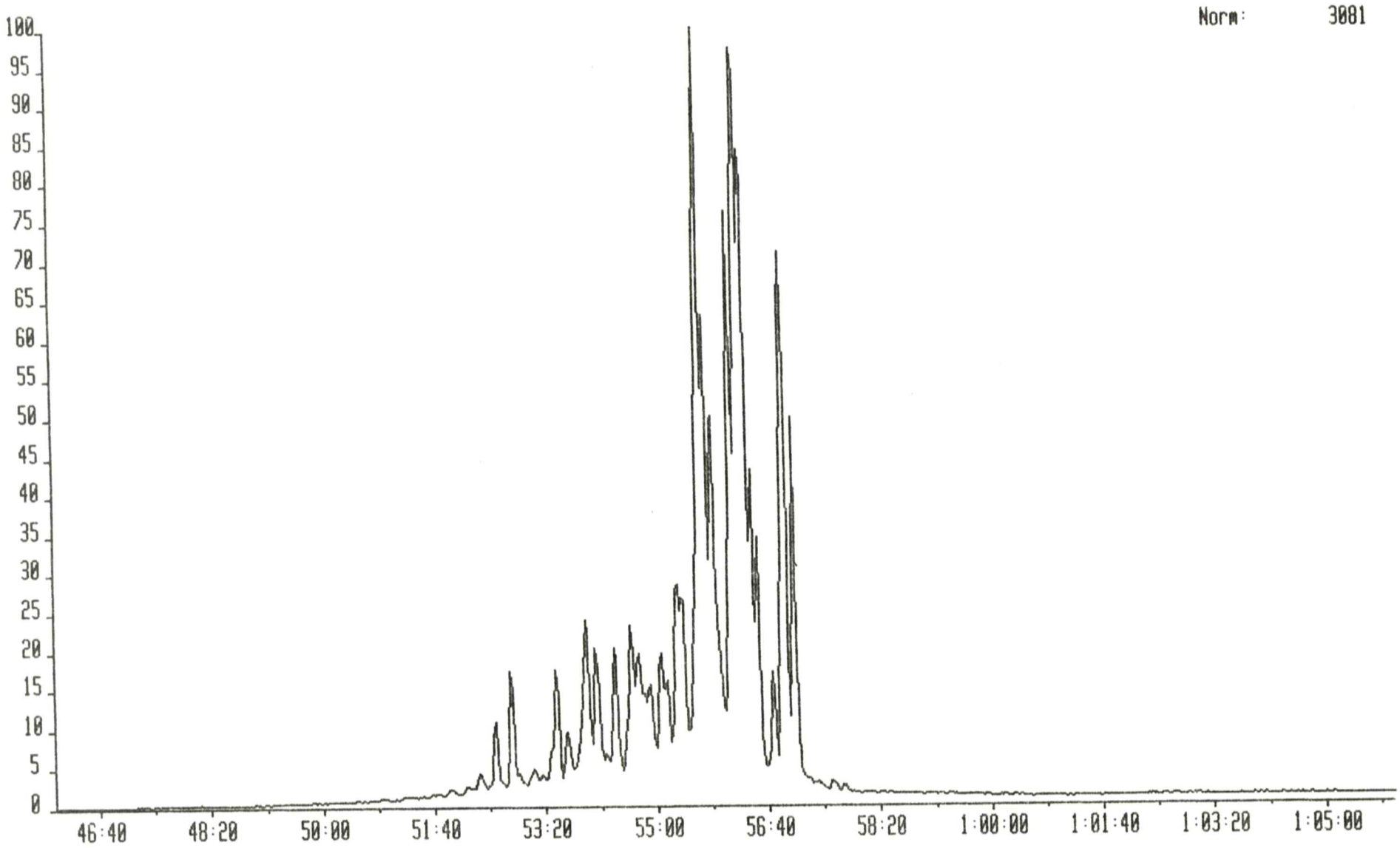
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 384.4000 384.4000->191.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



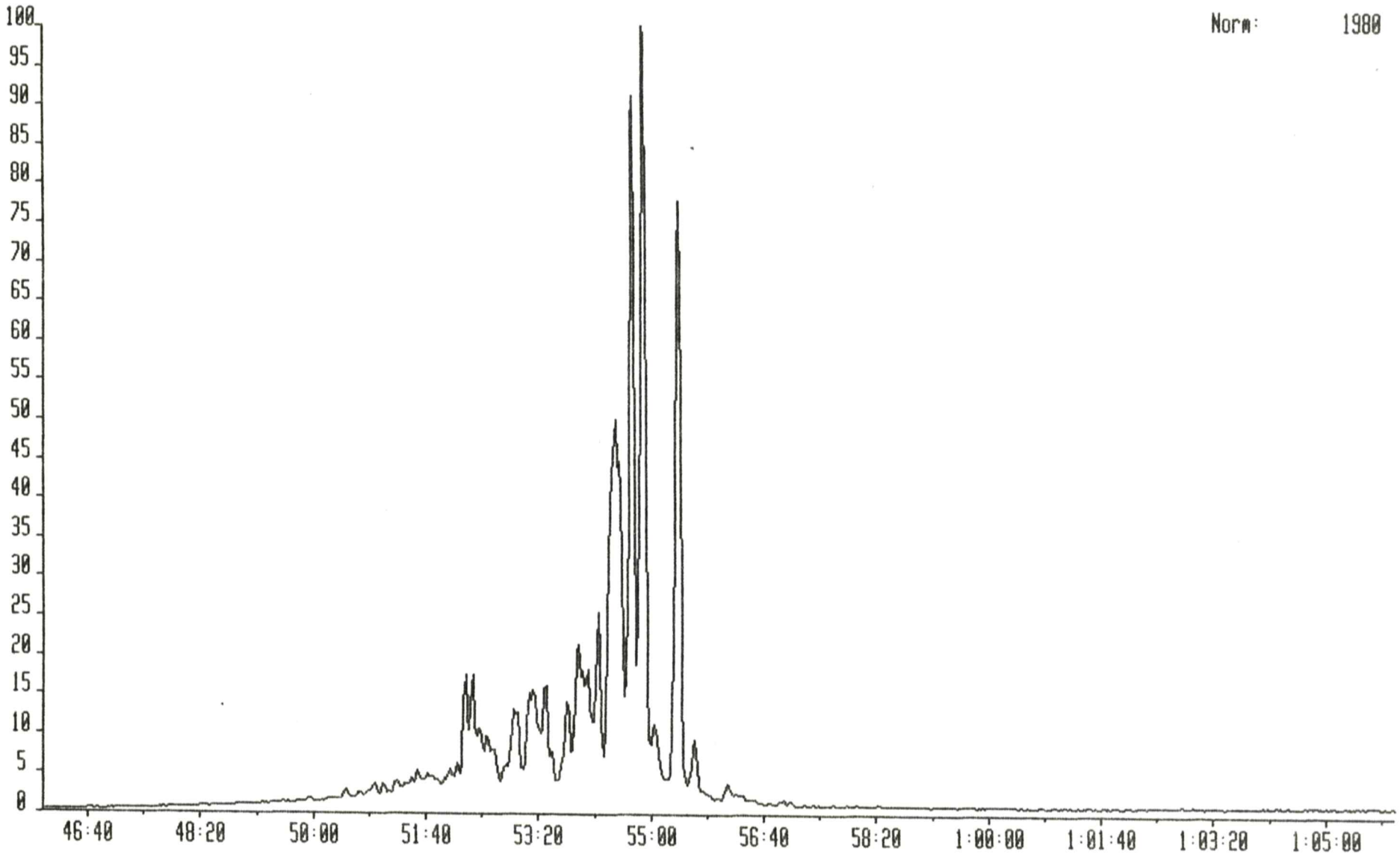
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 370.4000 370.4000->191.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



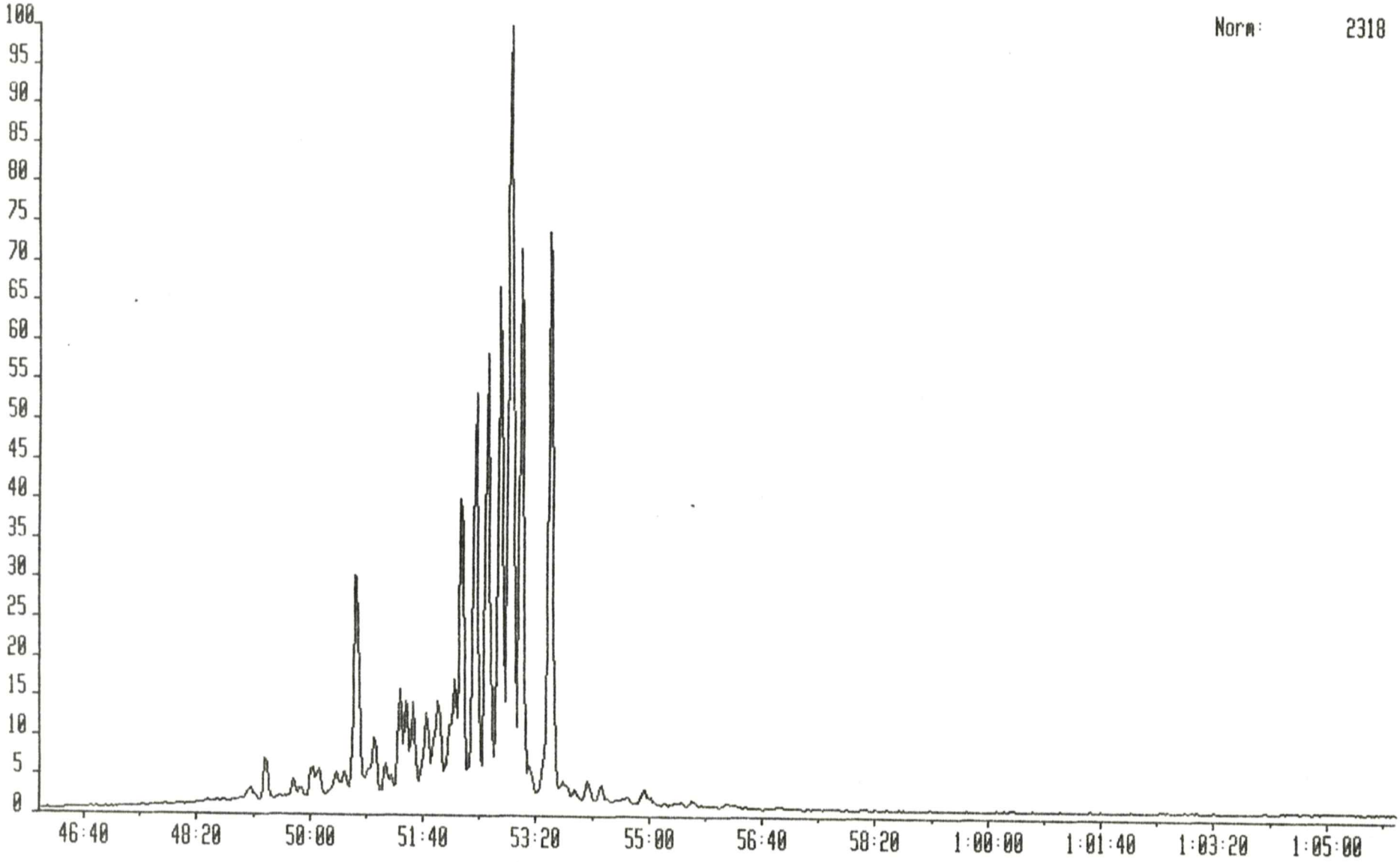
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 414.4000 414.4000->231.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



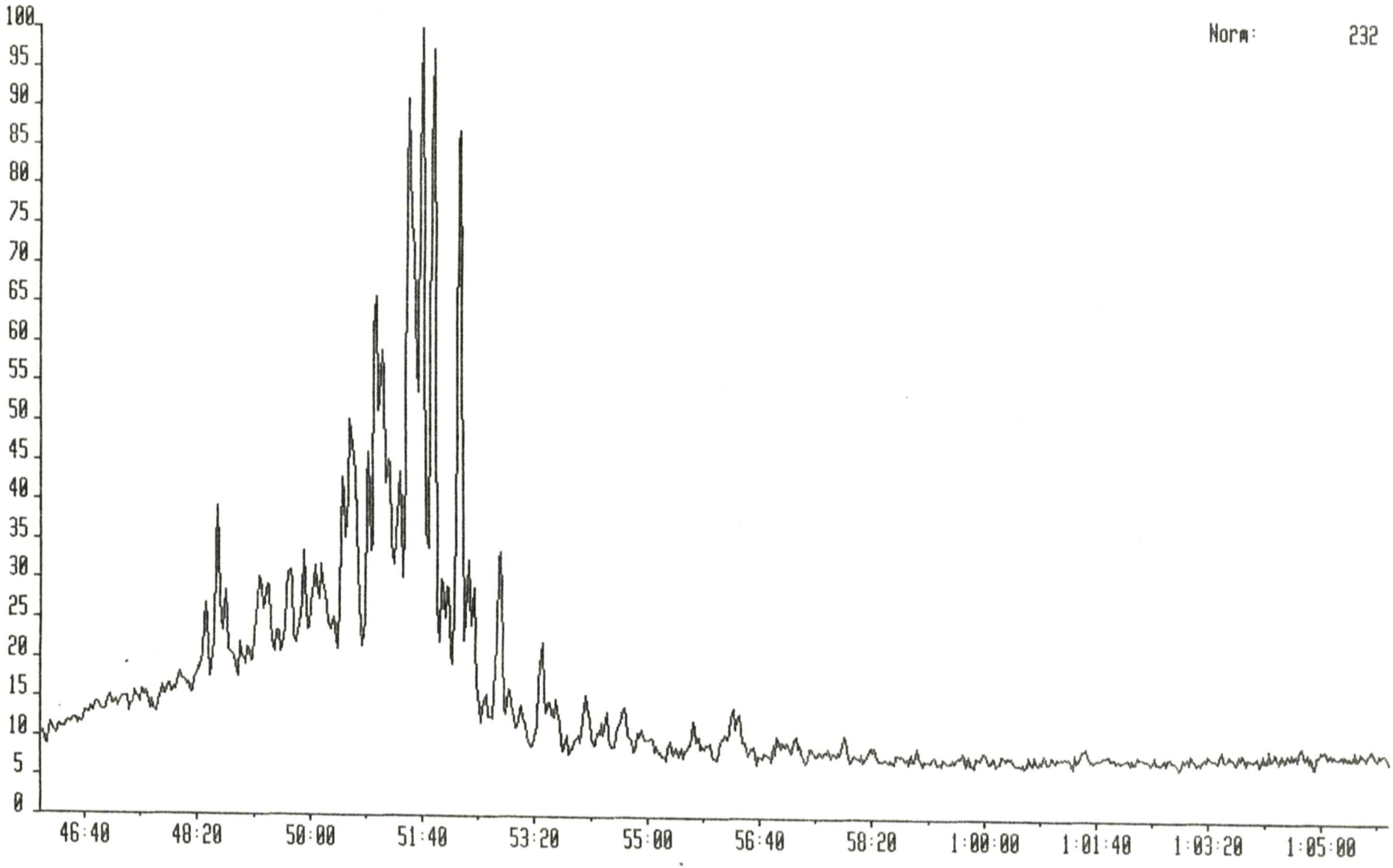
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 400.4000 400.4000->231.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



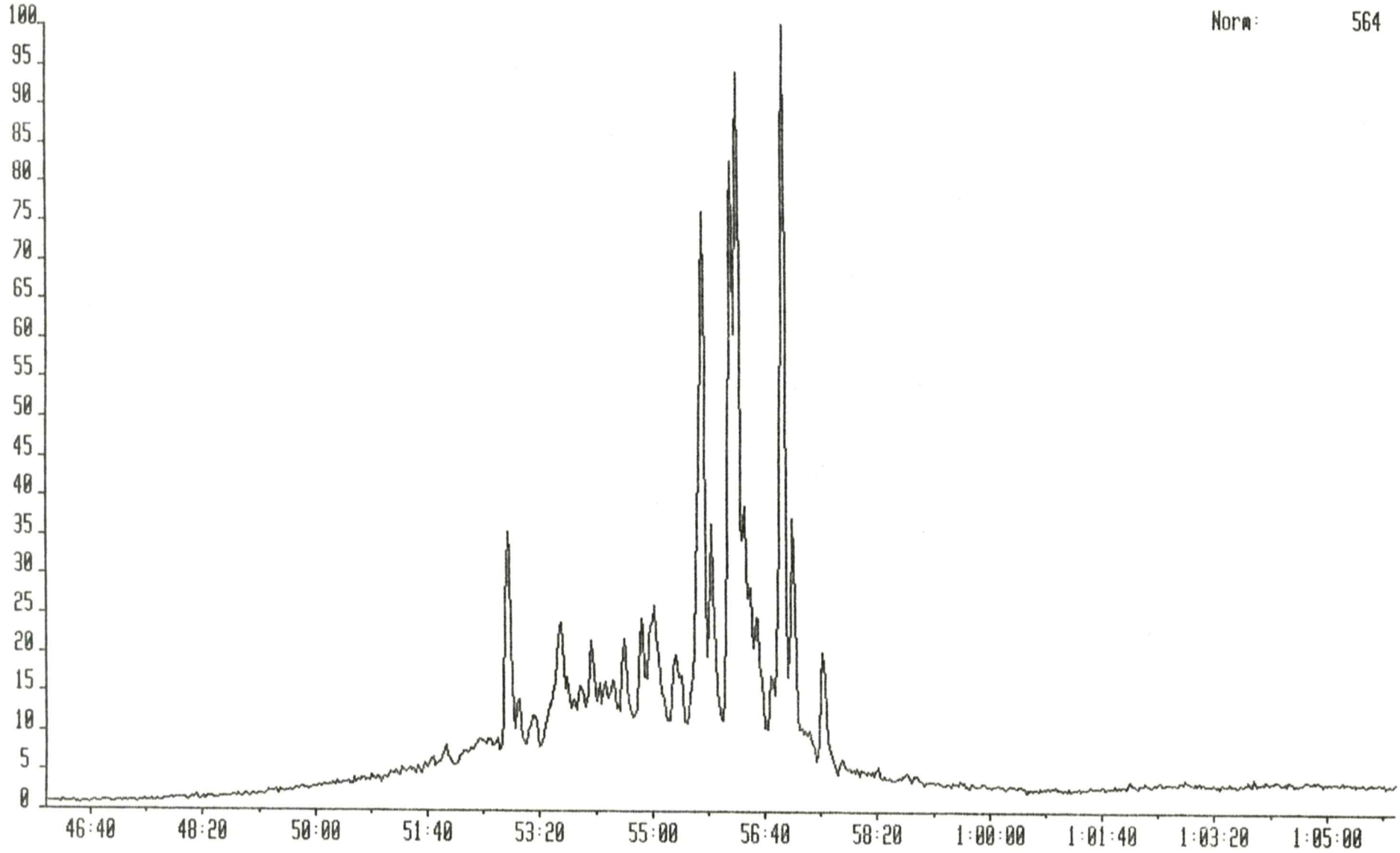
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 386.4000 386.4000->231.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



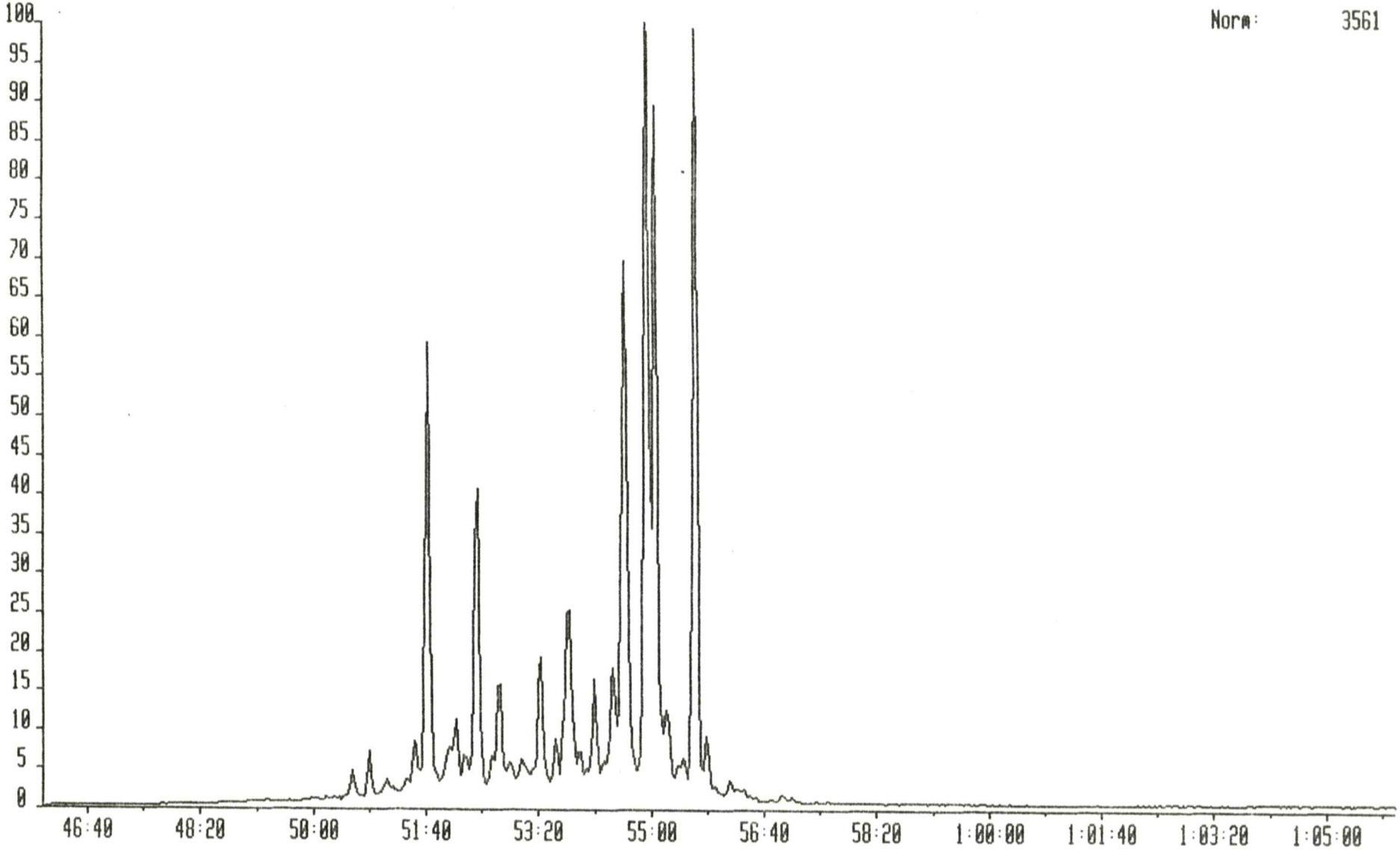
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 372.4000 372.4000->231.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



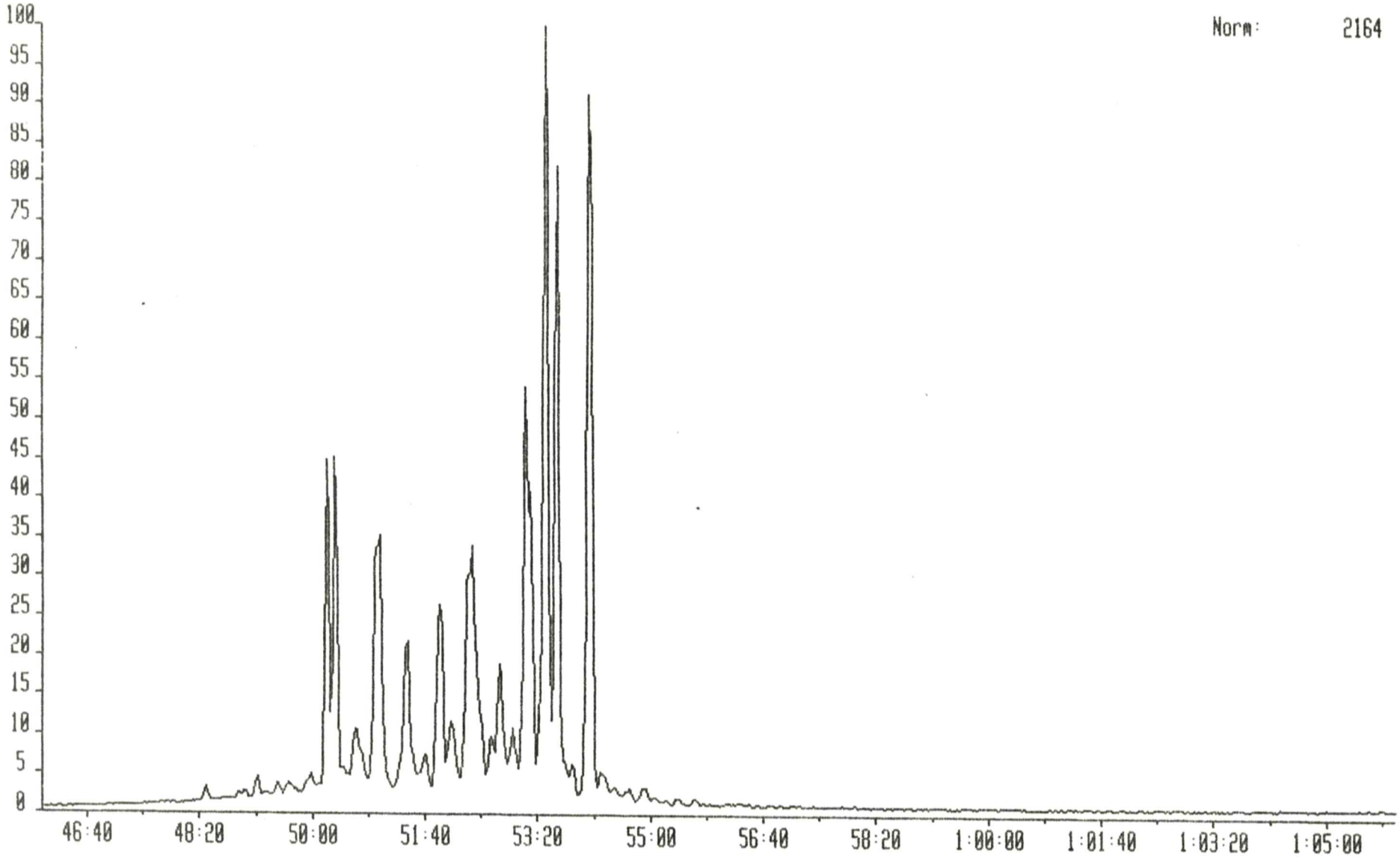
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 414.4000 414.4000->217.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



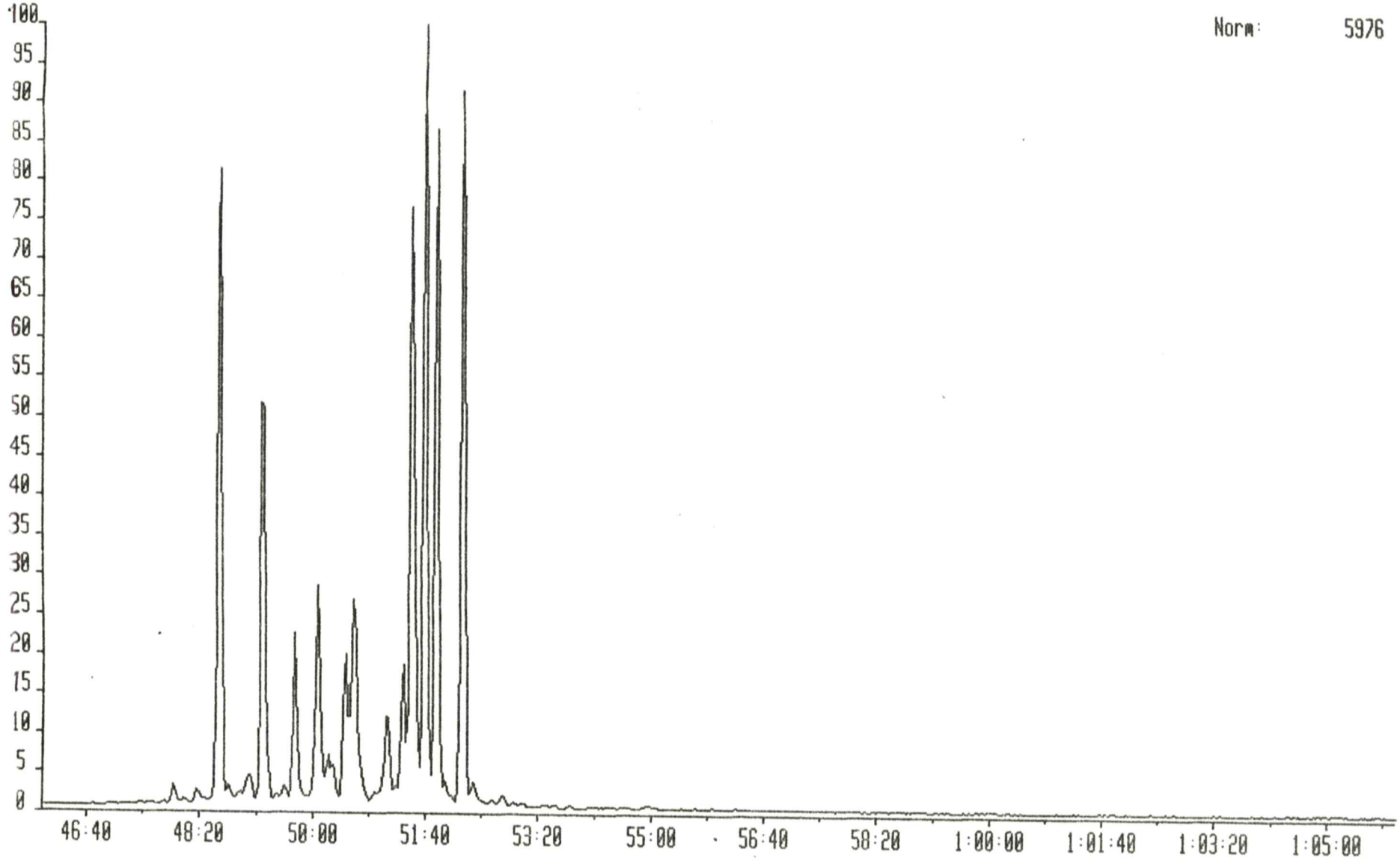
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 400.4000 400.4000->217.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 386.4000 386.4000->217.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



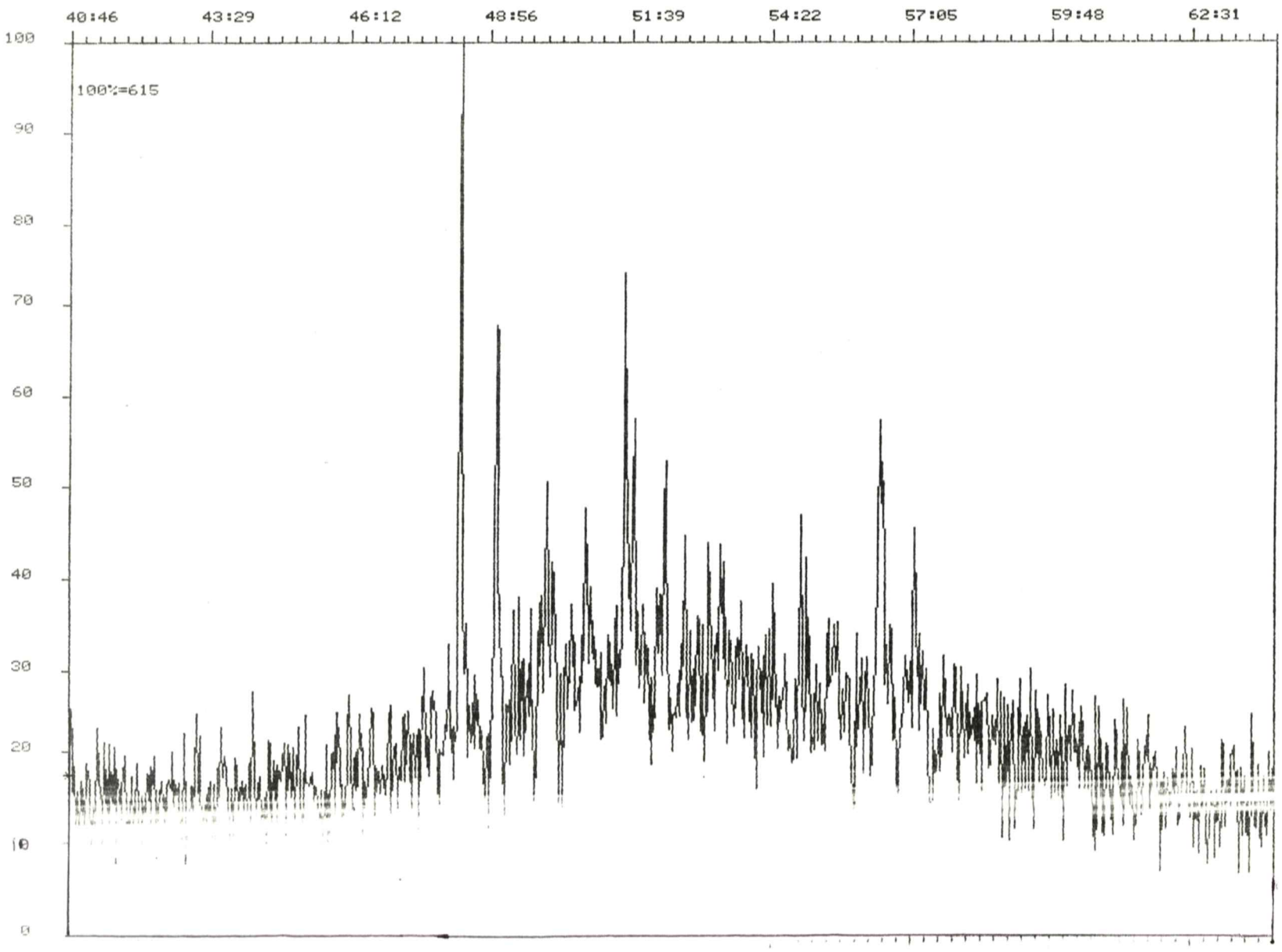
263 22-SEP-87 Sir:Reaction 70SQ Sys: DARC
Sample 1 Injection 1 Group 1 Mass 372.4000 372.4000->217.1000
Text:HIBERNIA K-18 DST#8 ZONE 7 3120-3135M



DS-55 CROSS SCAN REPORT, RUN: MARAR30001

MARA DST#3 REPEAT SLOWER

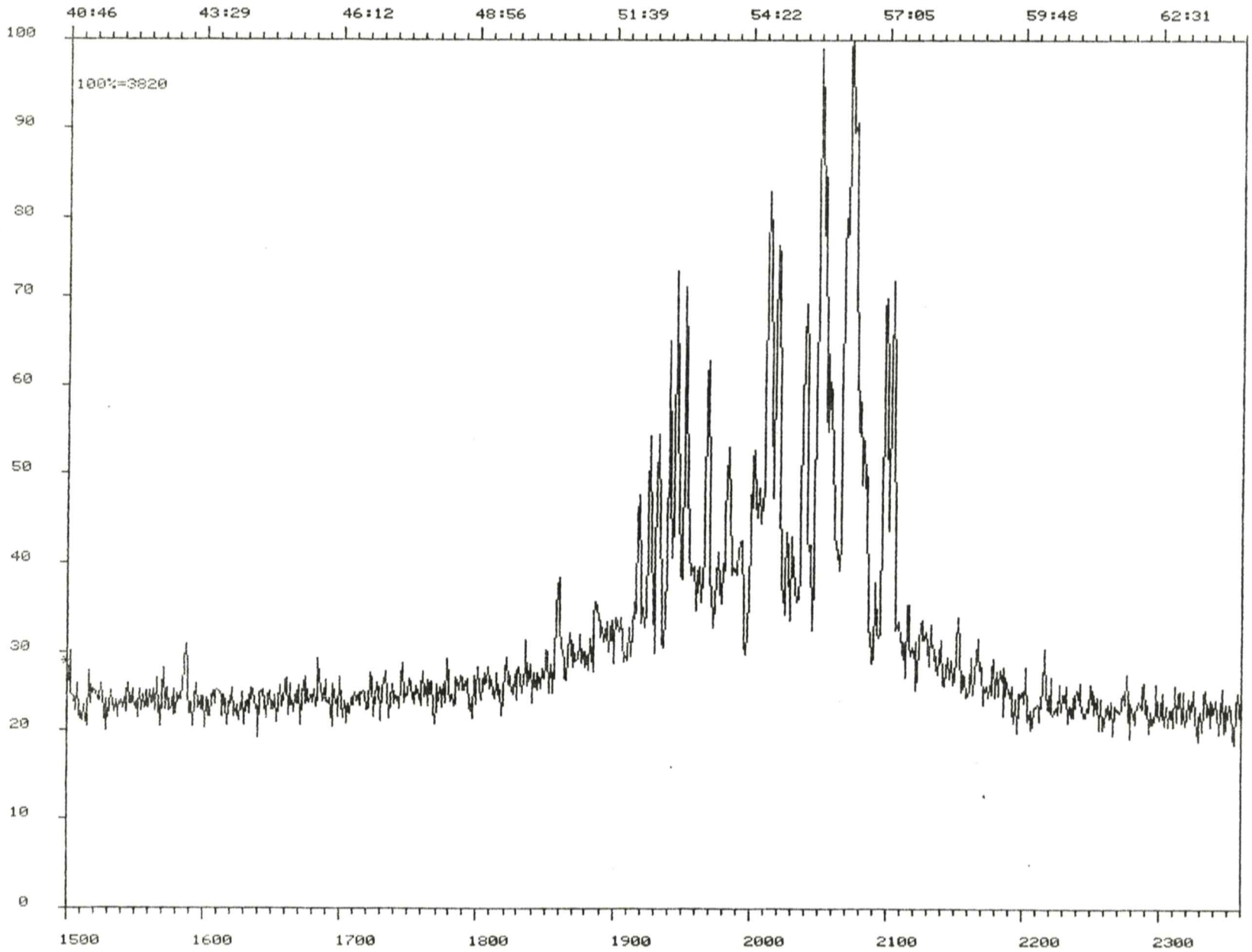
* 259



DS-55 CROSS SCAN REPORT, RUN: MARAR30001

MARA DST#3 REPEAT SLOWER

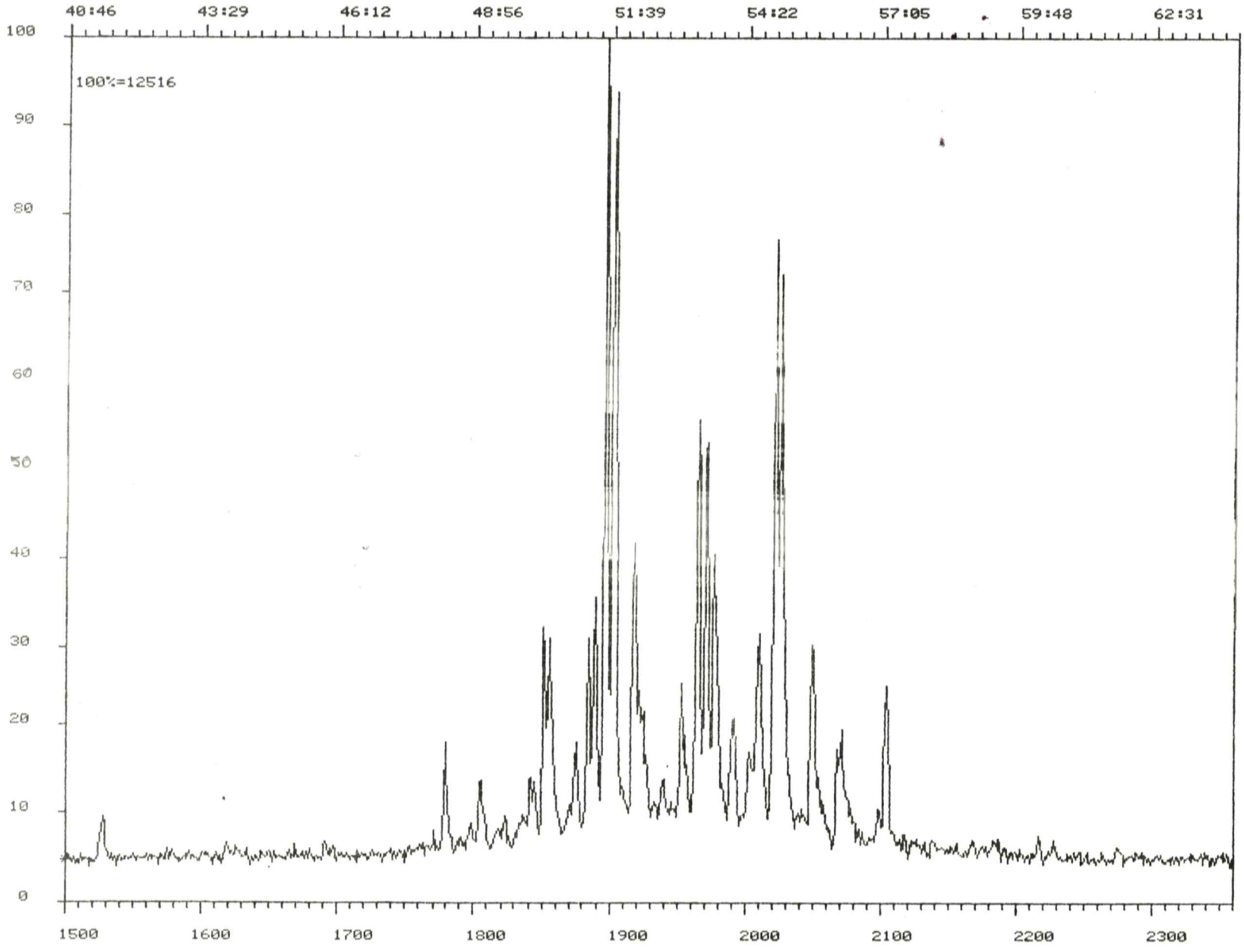
* 231



DS-55 CROSS SCAN REPORT, RUN: MARAR30001

MARA DST#3 REPEAT SLOWER

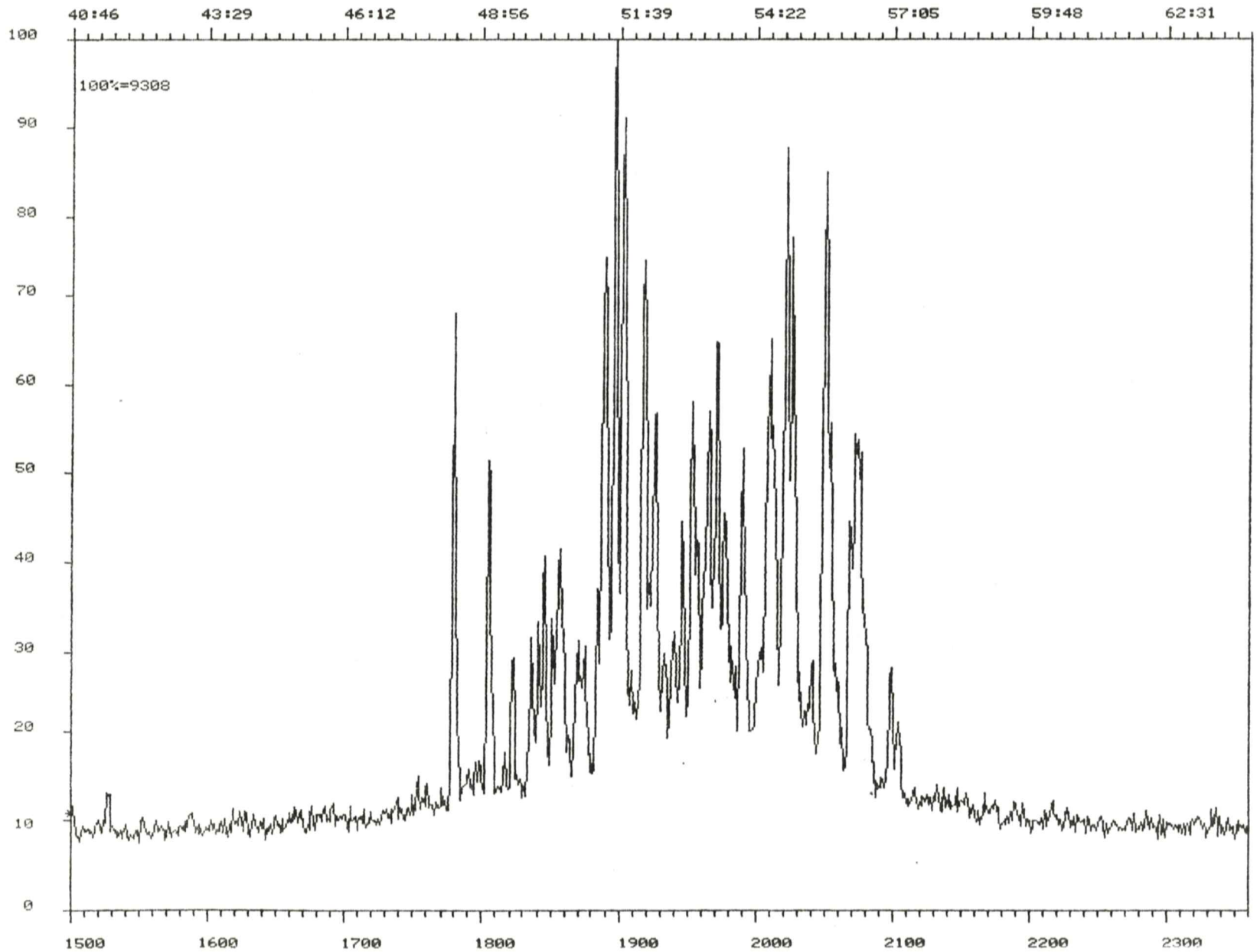
* 218



DS-55 CROSS SCAN REPORT, RUN: MARAR30001

MARA DST#3 REPEAT SLOWER

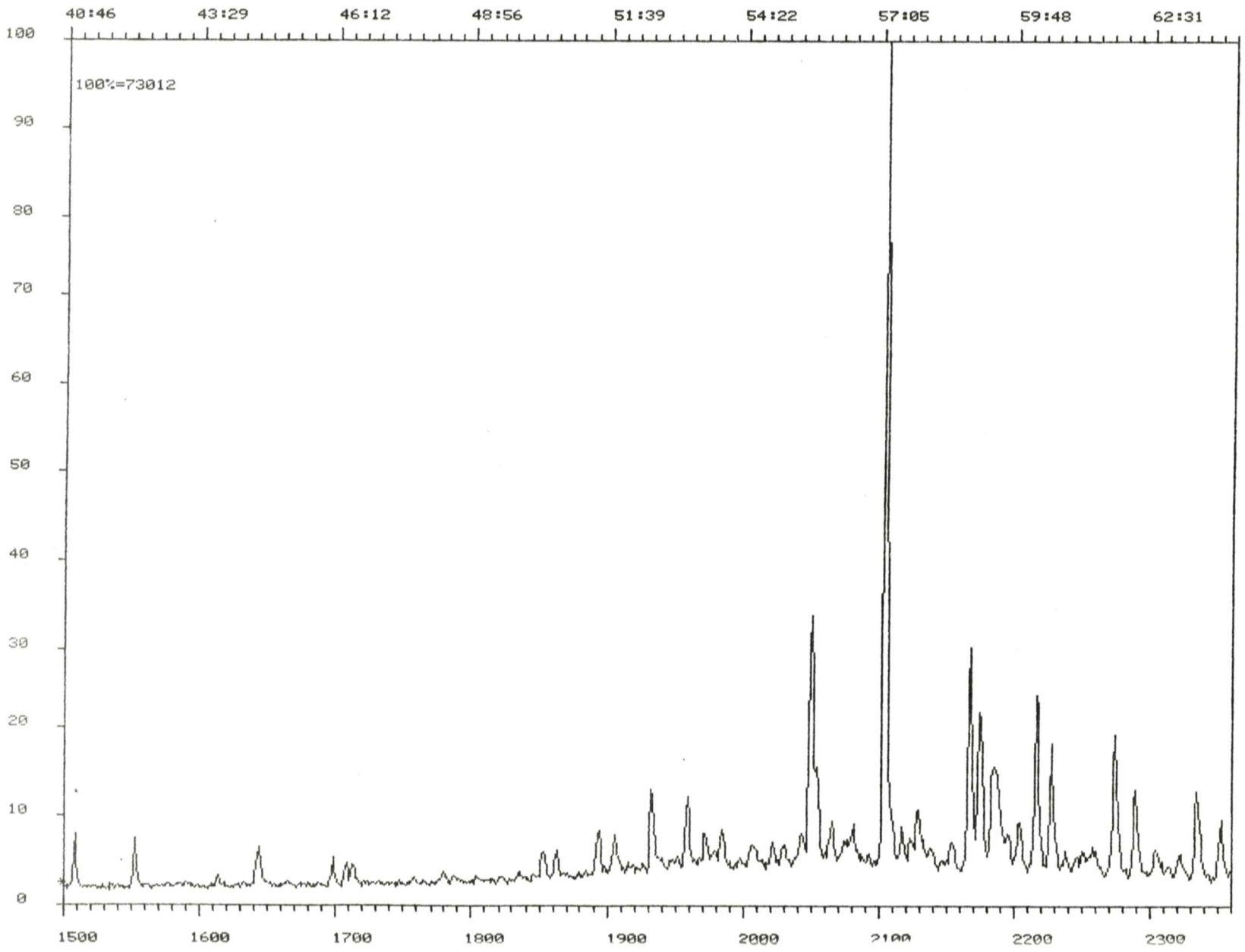
* 217



DS-55 CROSS SCAN REPORT, RUN: MARAR30001

MARA DST#3 REPEAT SLOWER

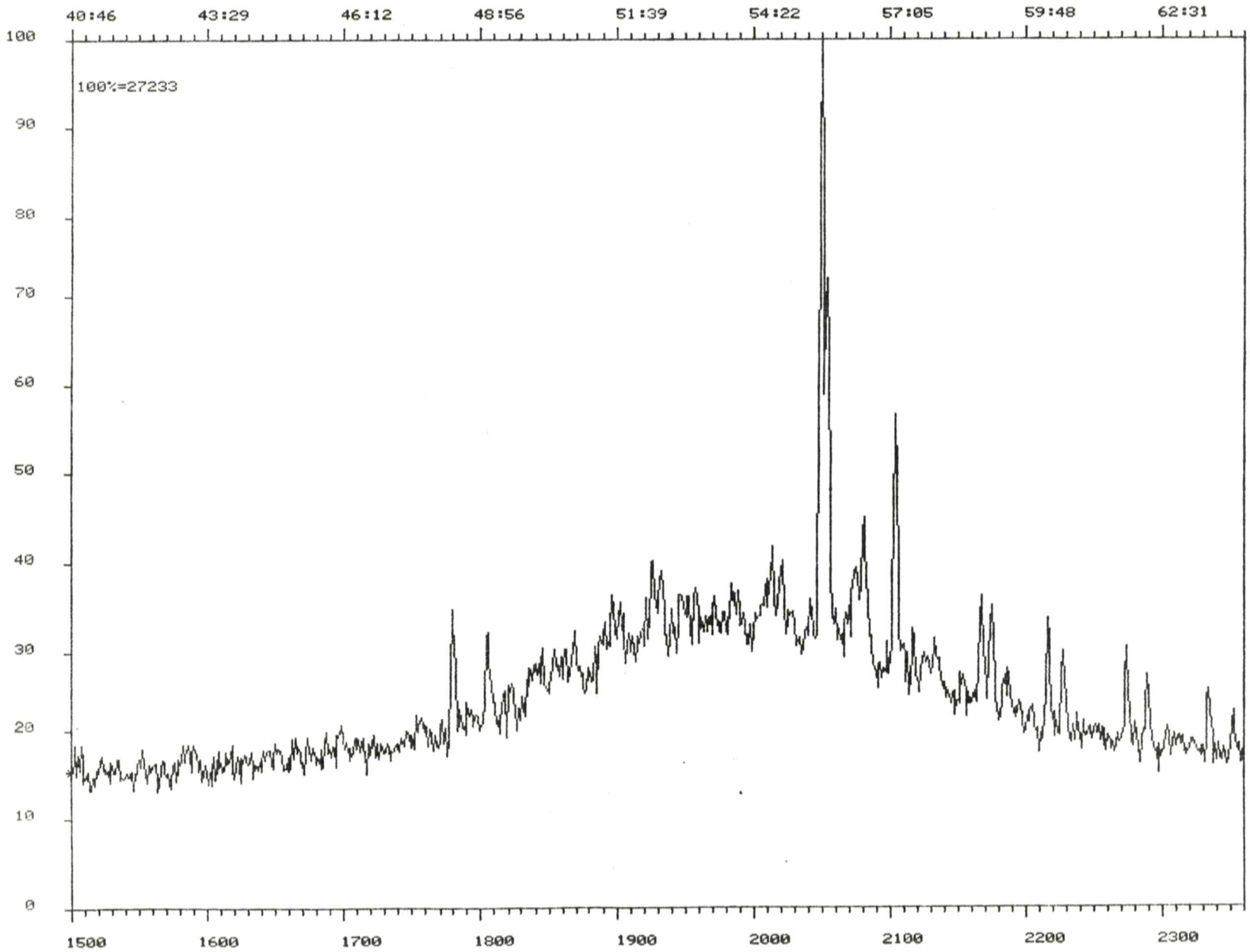
* 191



DS-55 CROSS SCAN REPORT, RUN: MARAR30001

MARA DST#3 REPEAT SLOWER

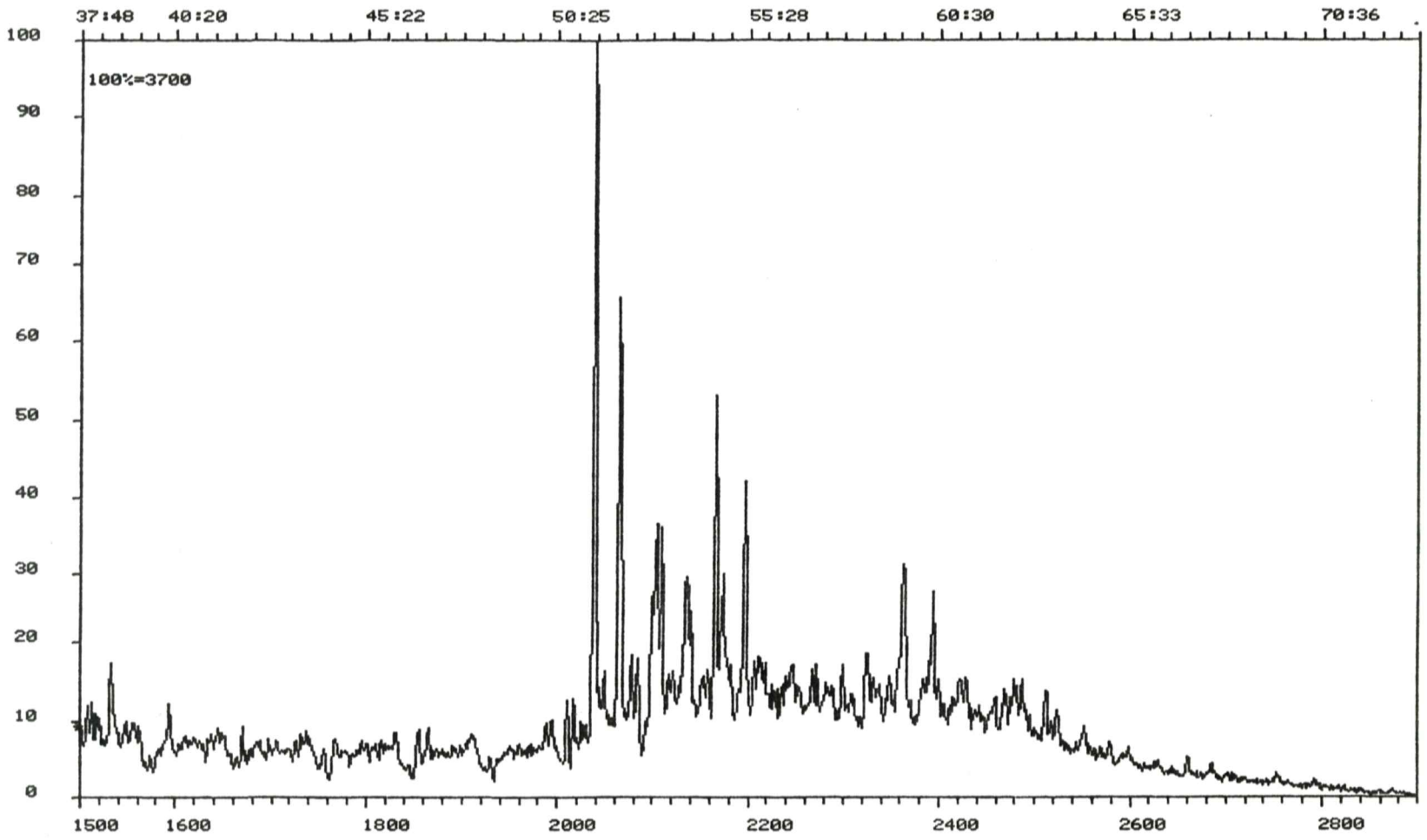
* 177



DS-55 CROSS SCAN REPORT, RUN: 7830002

TERRA NOVA K-08 DST#1

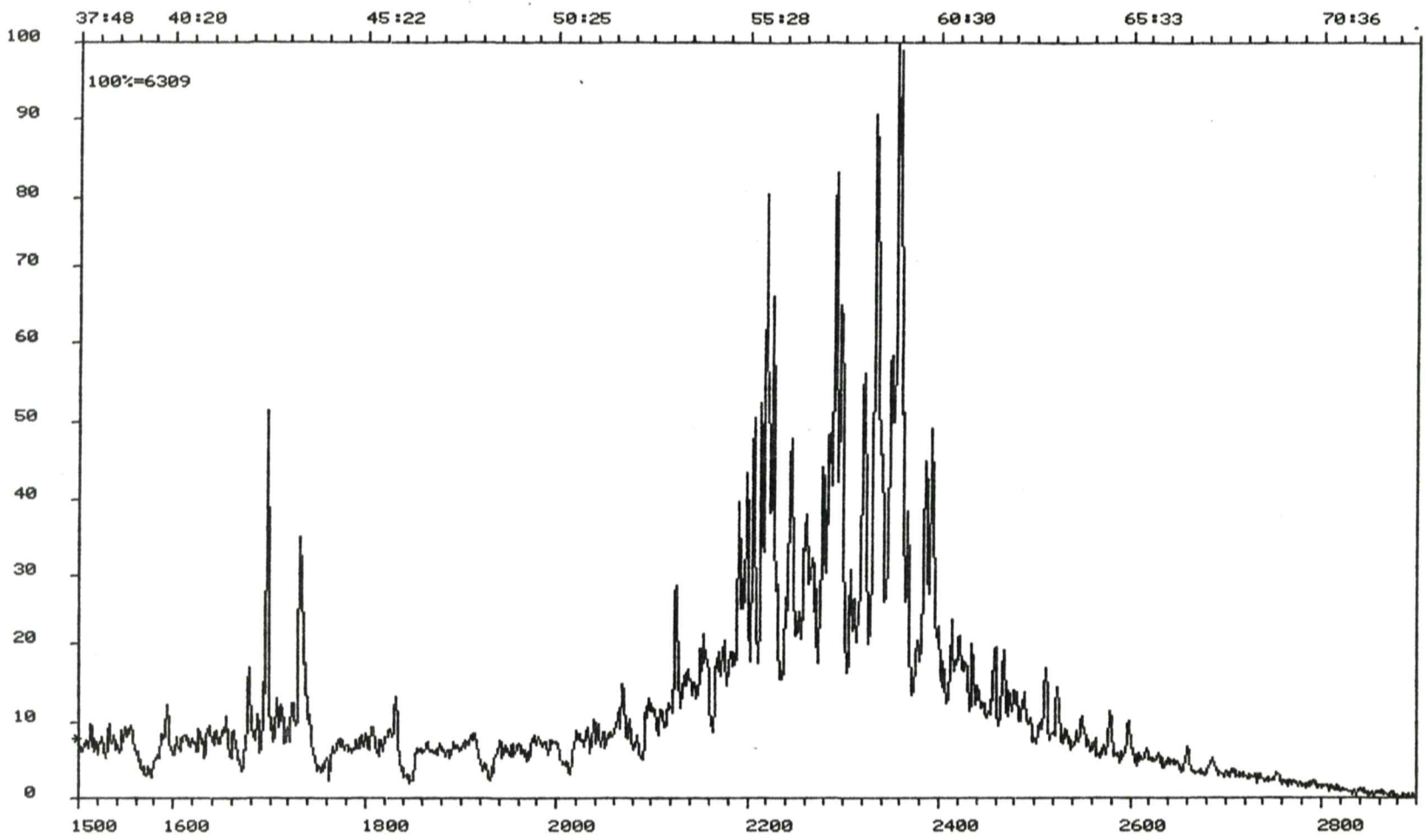
* 259



DS-55 CROSS SCAN REPORT, RUN: 7830002

TERRA NOVA K-08 DST#1

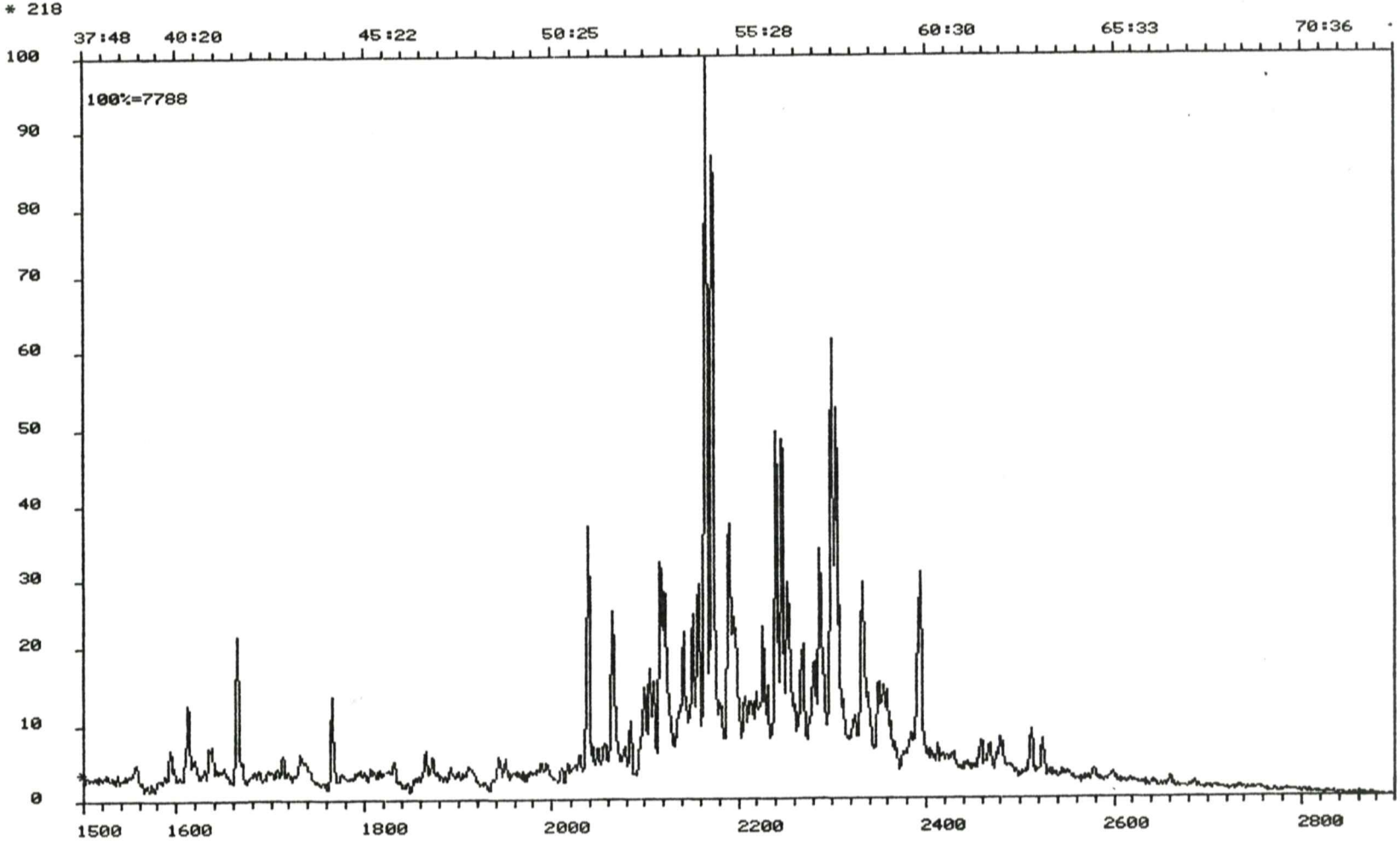
* 231



DS-55 CROSS SCAN REPORT, RUN: 7830002

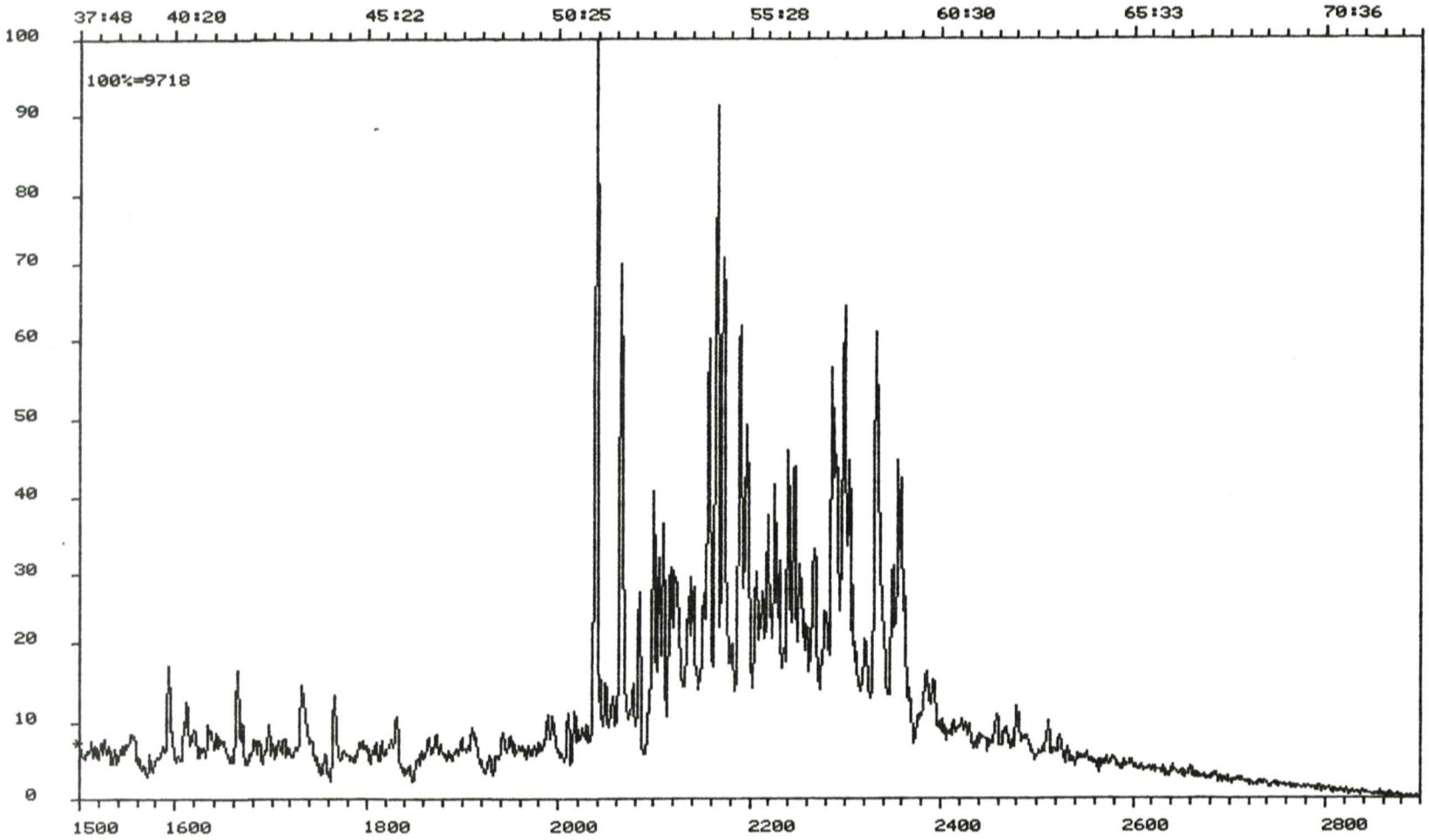
TERRA NOVA K-08 DST#1

* 218



TERRA NOVA K-08 DST#1

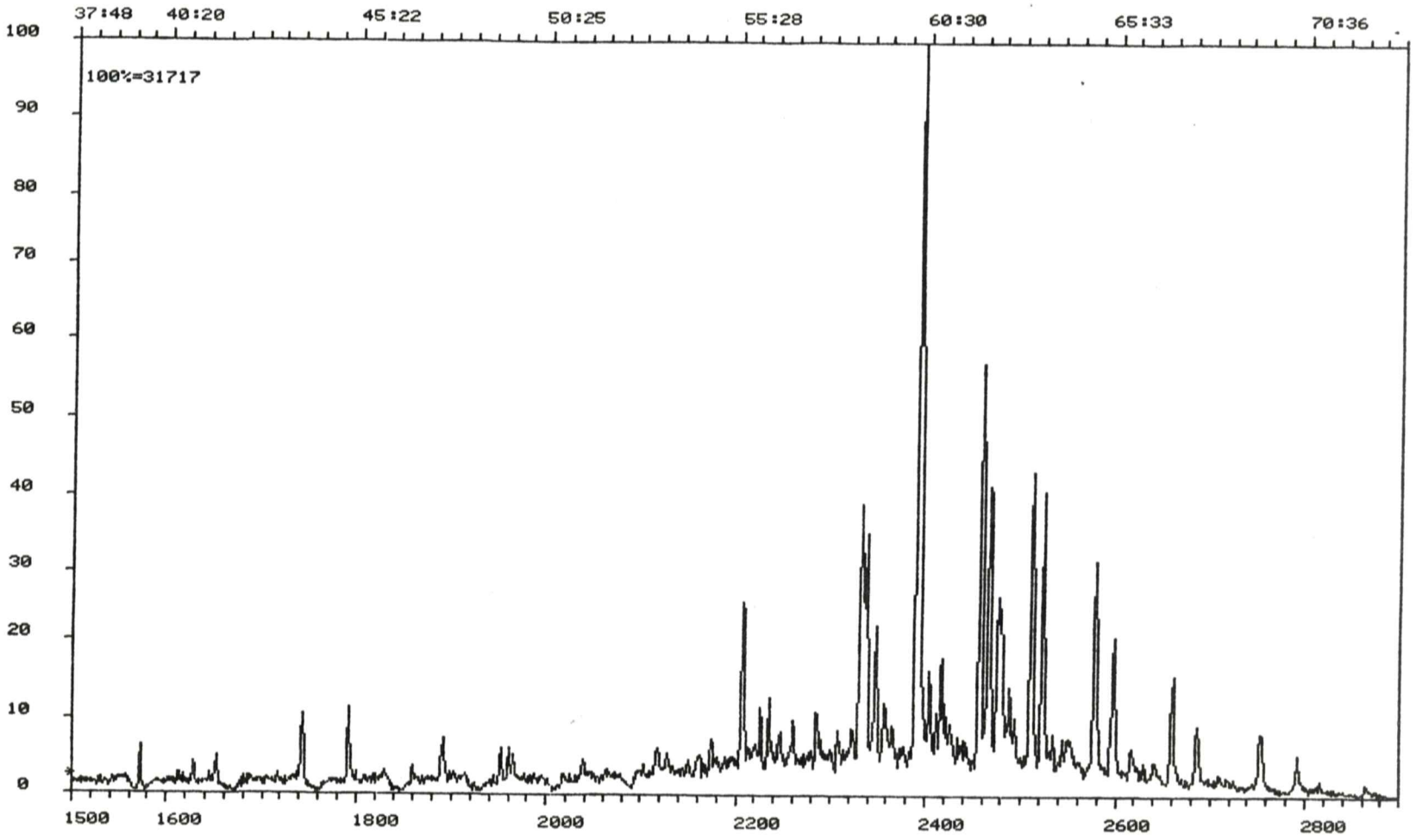
* 217



DS-55 CROSS SCAN REPORT, RUN: 7830002

TERRA NOVA K-08 DST#1

* 191



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TERRA NOVA K-08 DST#1

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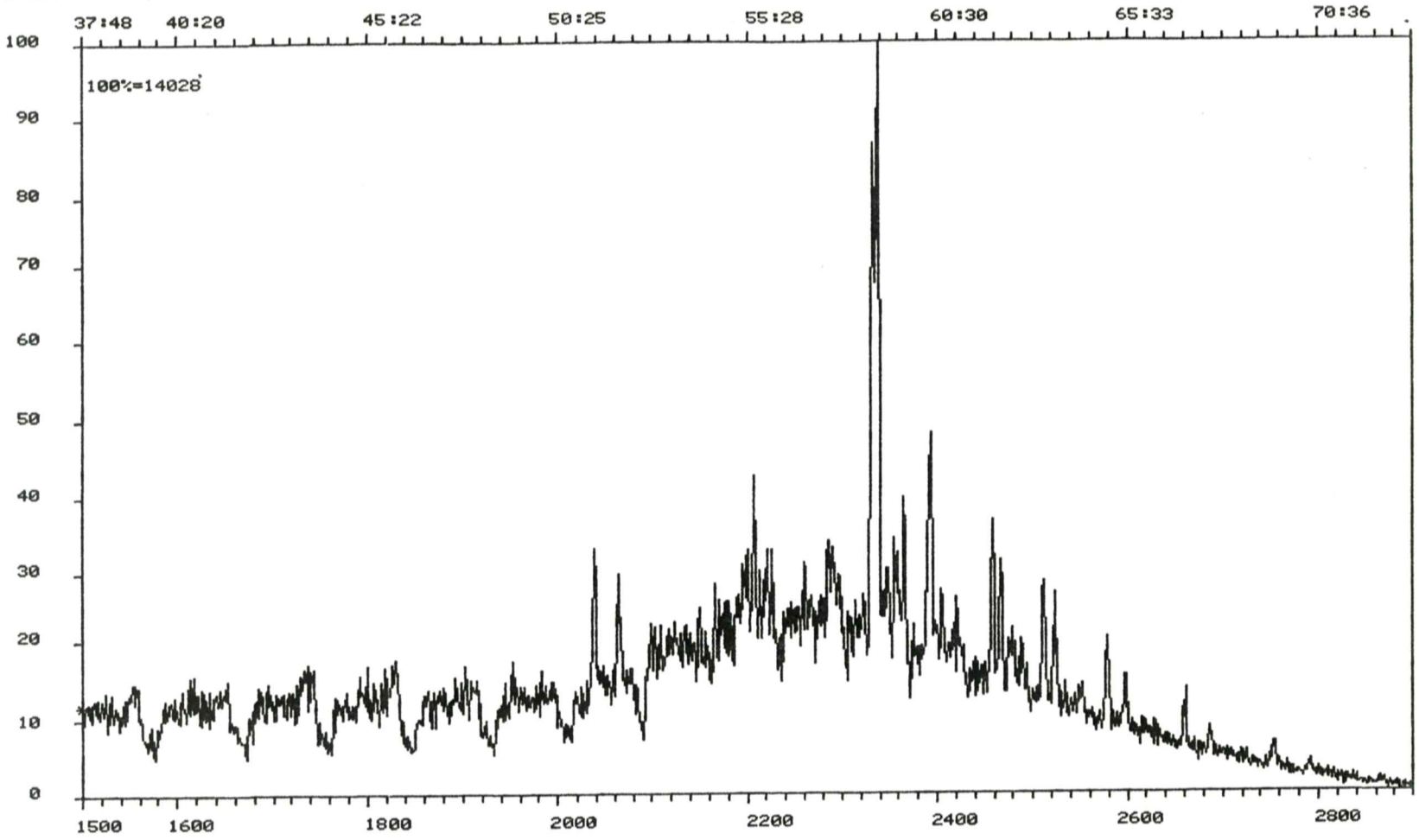

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W. BEN NEVIS B-75 DST#6

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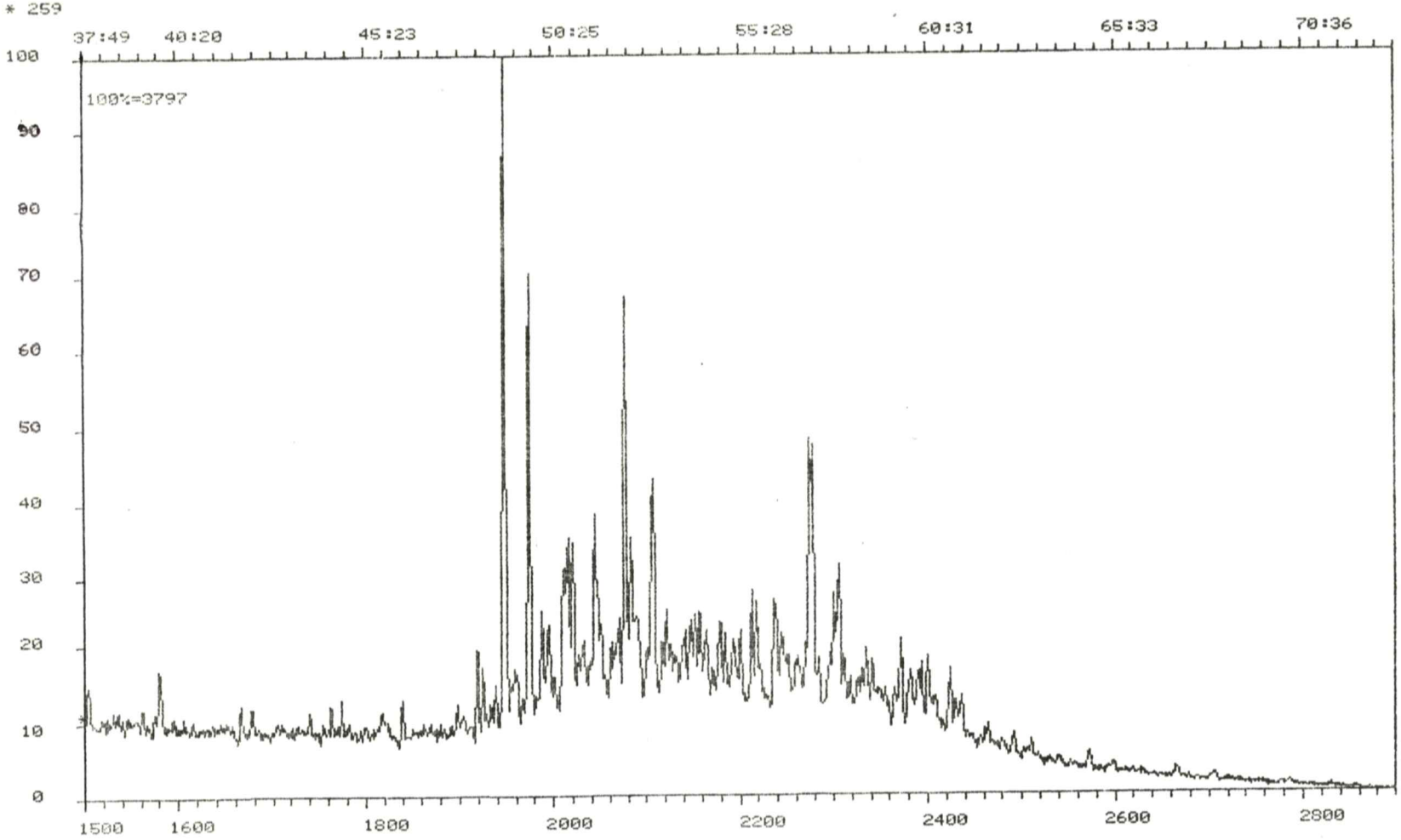

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W. BEN NEVIS B-75 DST#6

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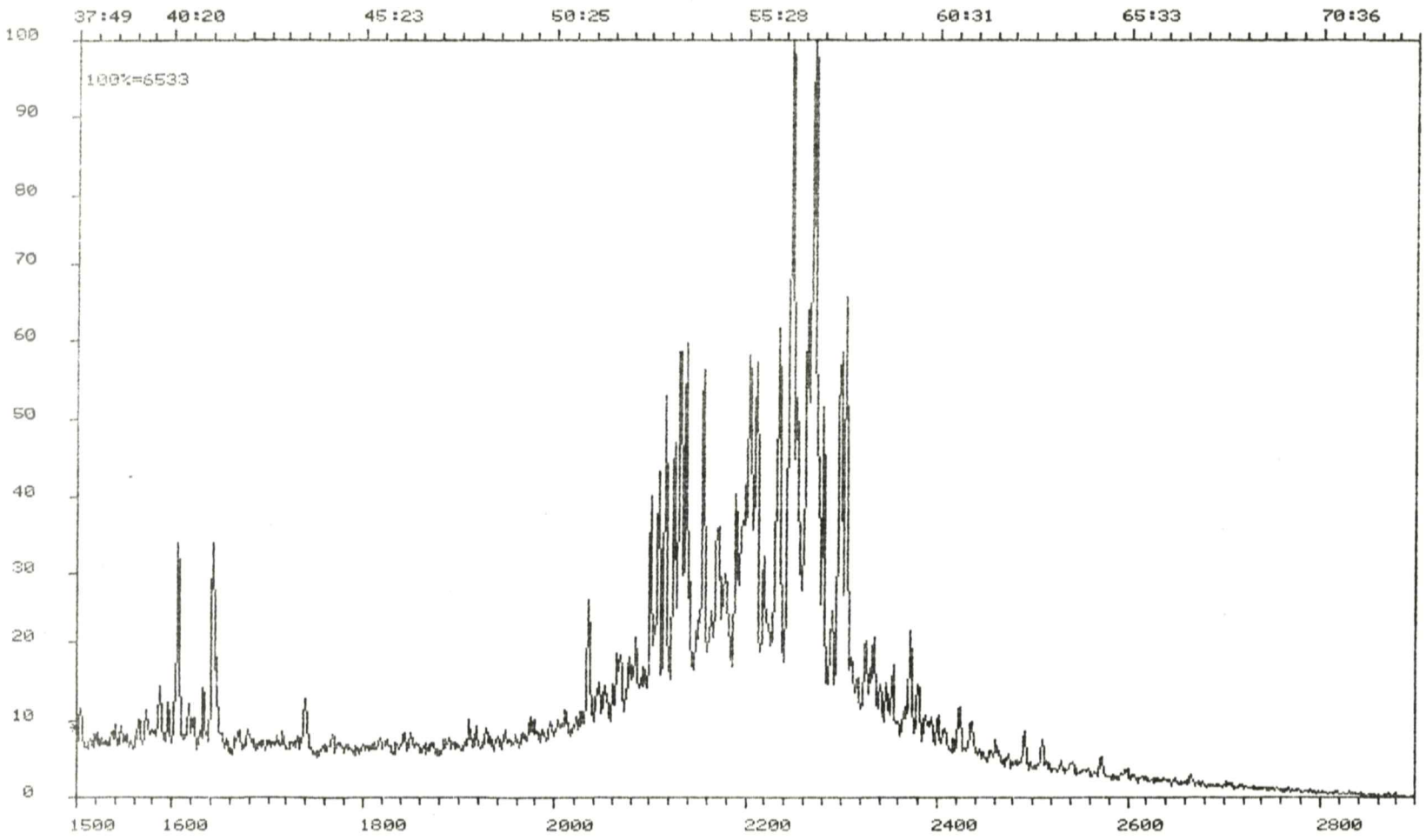

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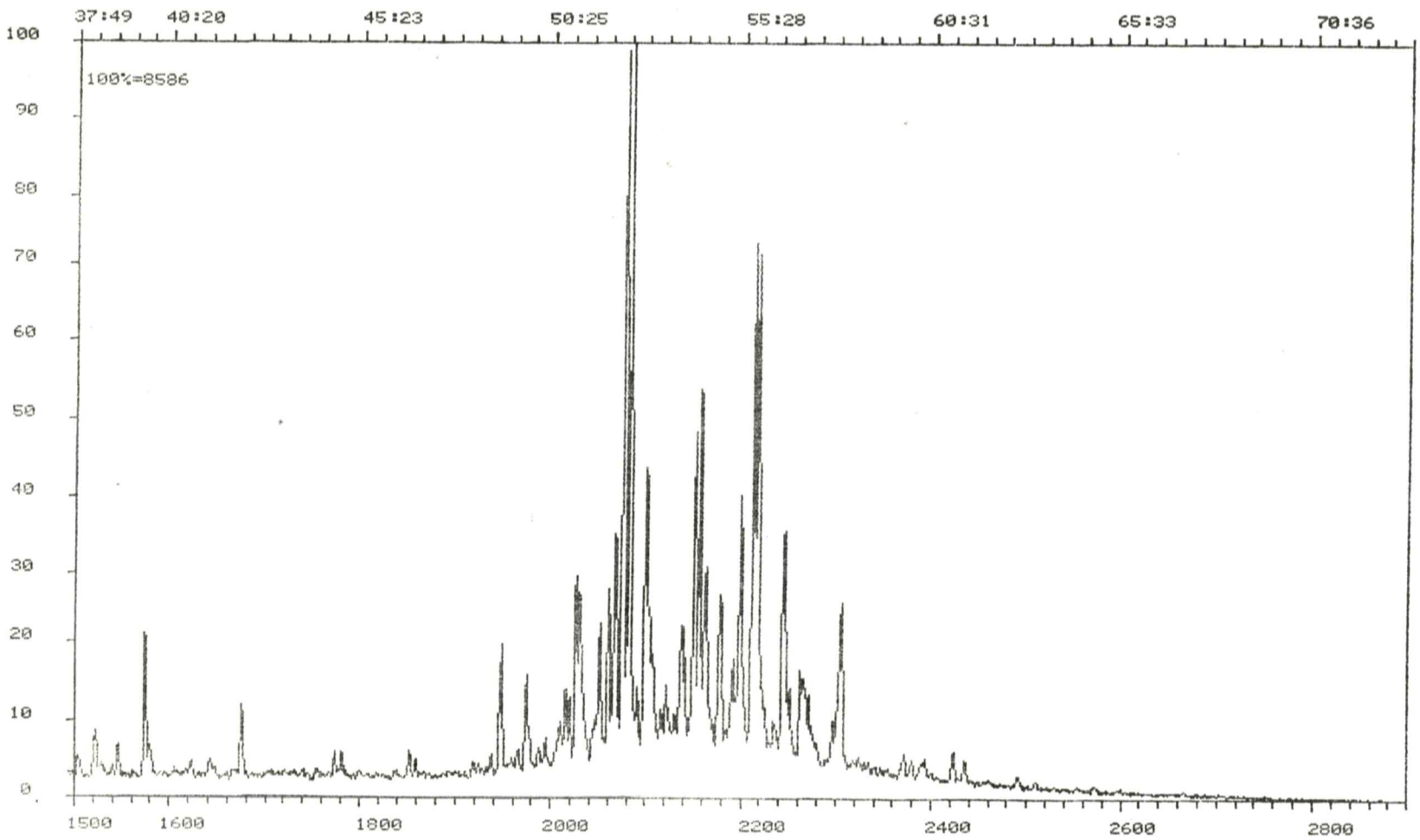

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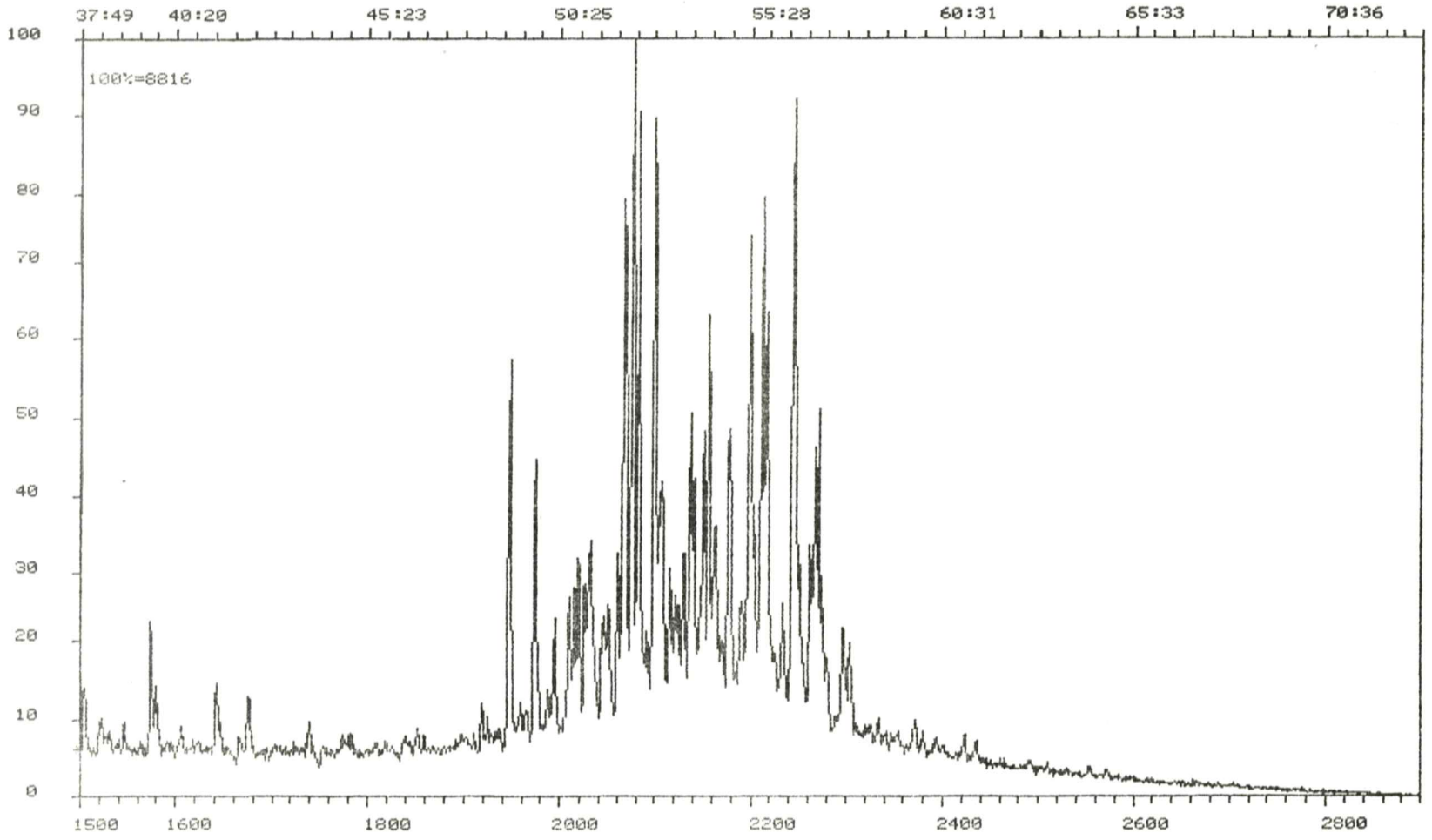
W. BEN NEVIS B-75 DST#6

* 217



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W. BEN NEVIS B-75 DST#6

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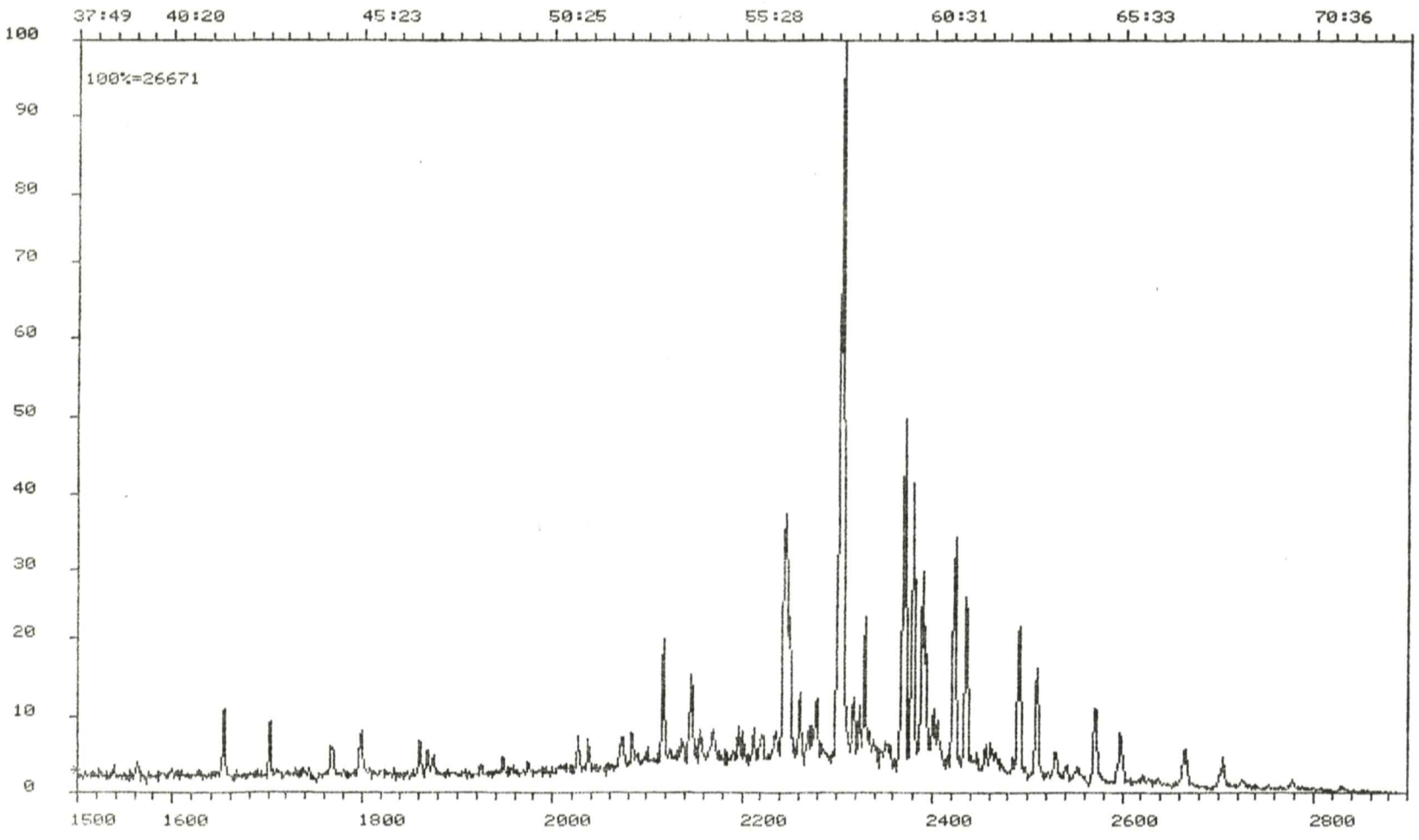

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W. BEN NEVIS B-75 DST#6
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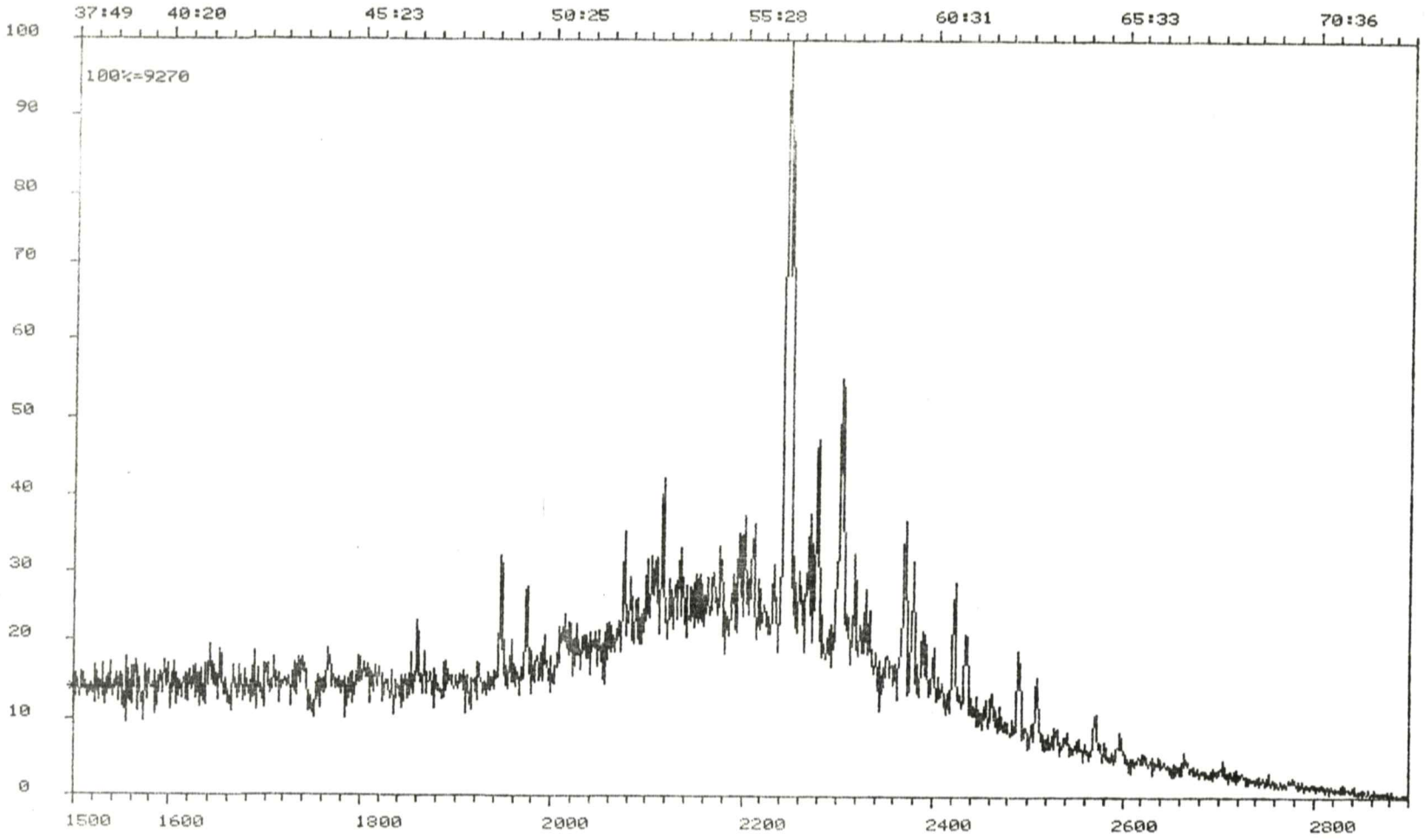

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WHITEROSE J-49 DST#7

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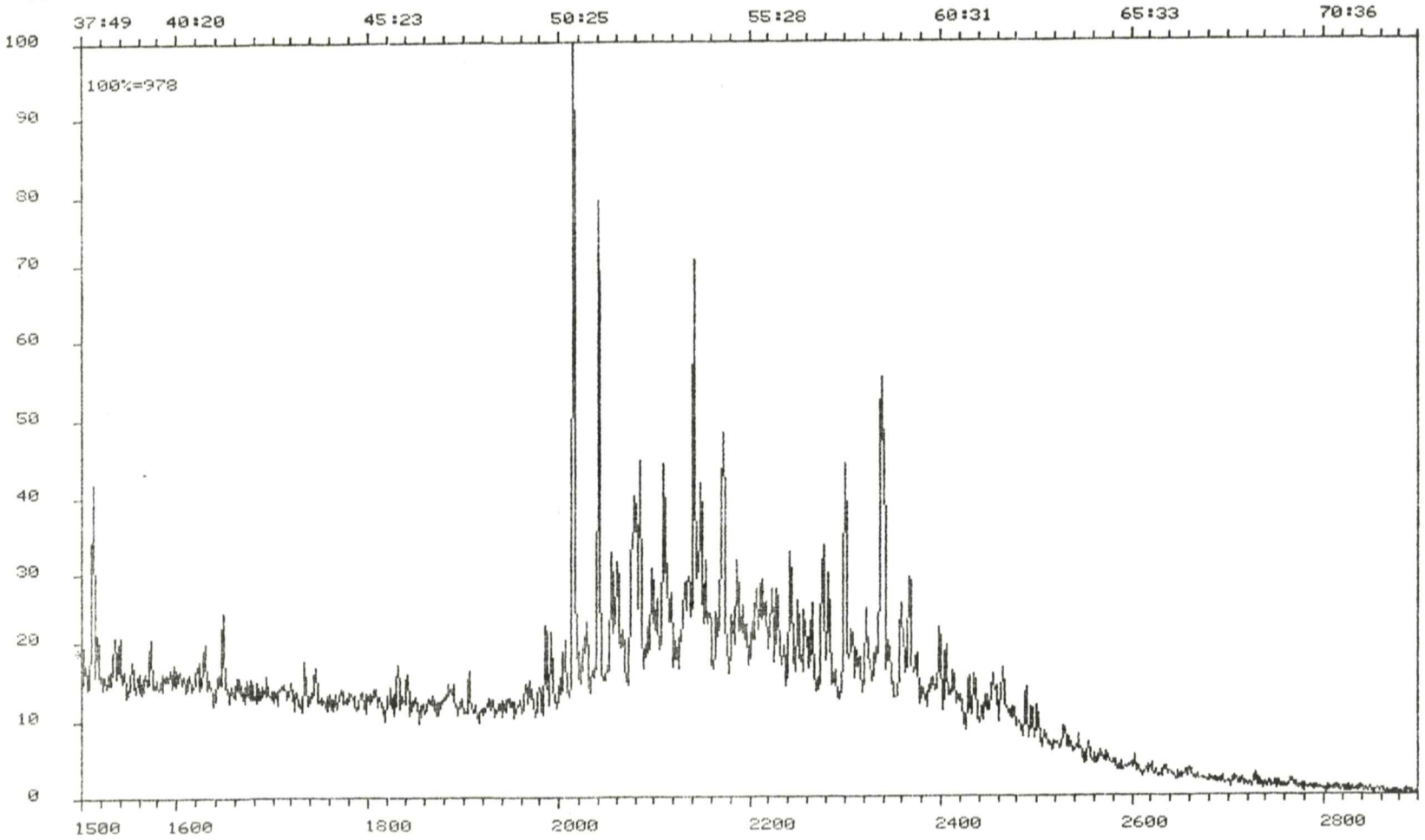

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WHITEROSE J-49 DST#7

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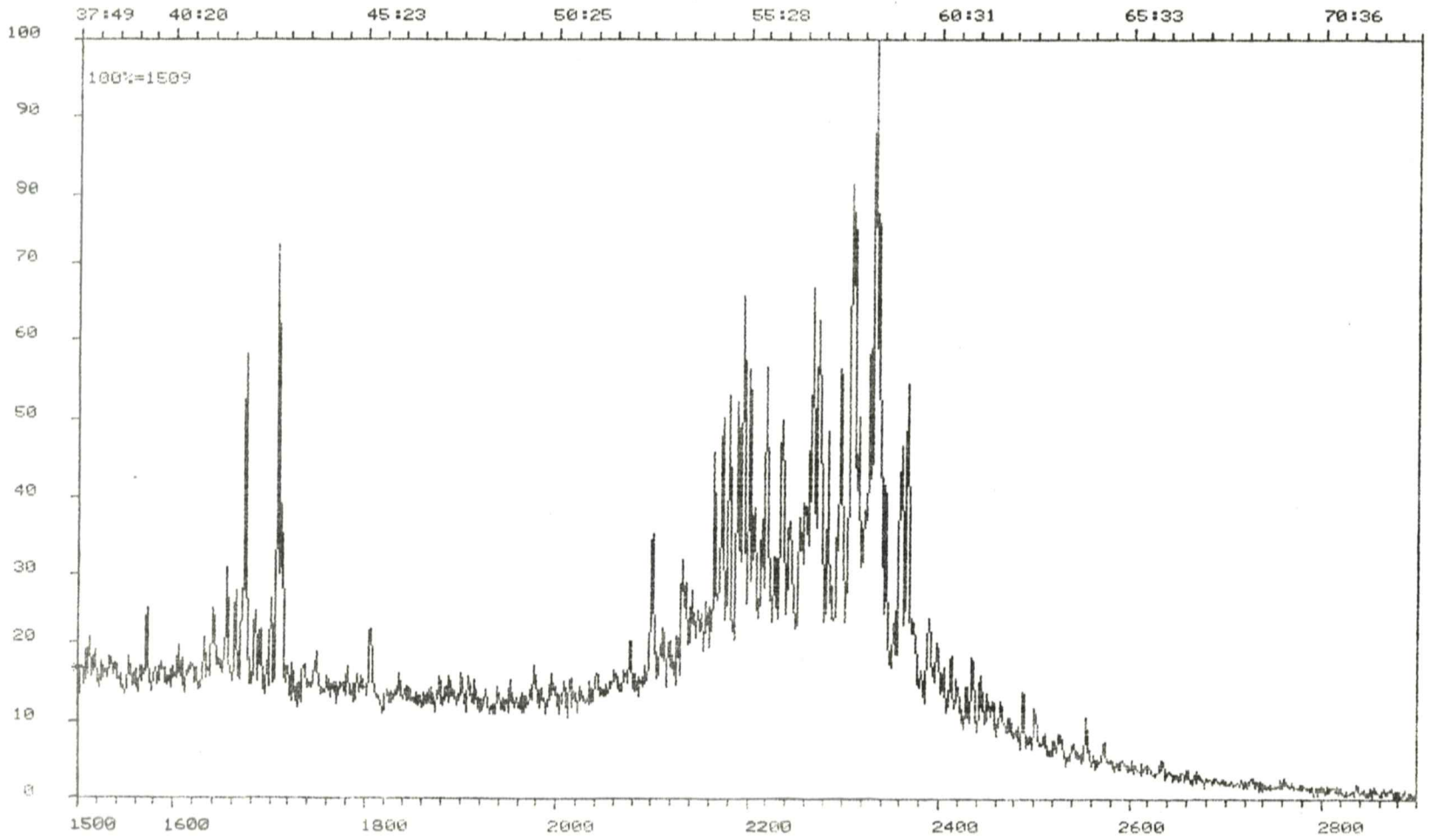

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WHITEROSE J-49 DST#7

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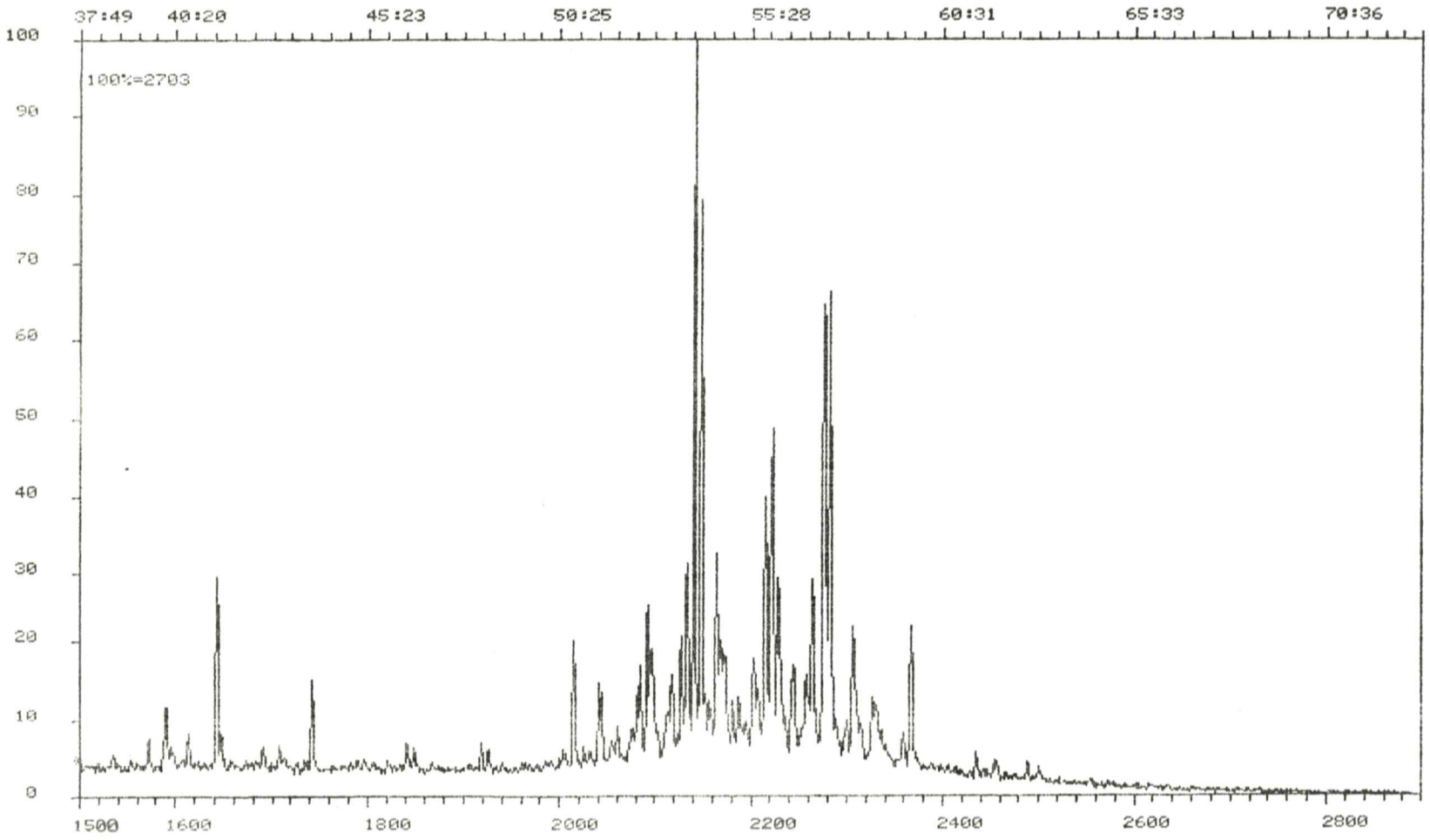

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WHITEROSE J-49 DST#7

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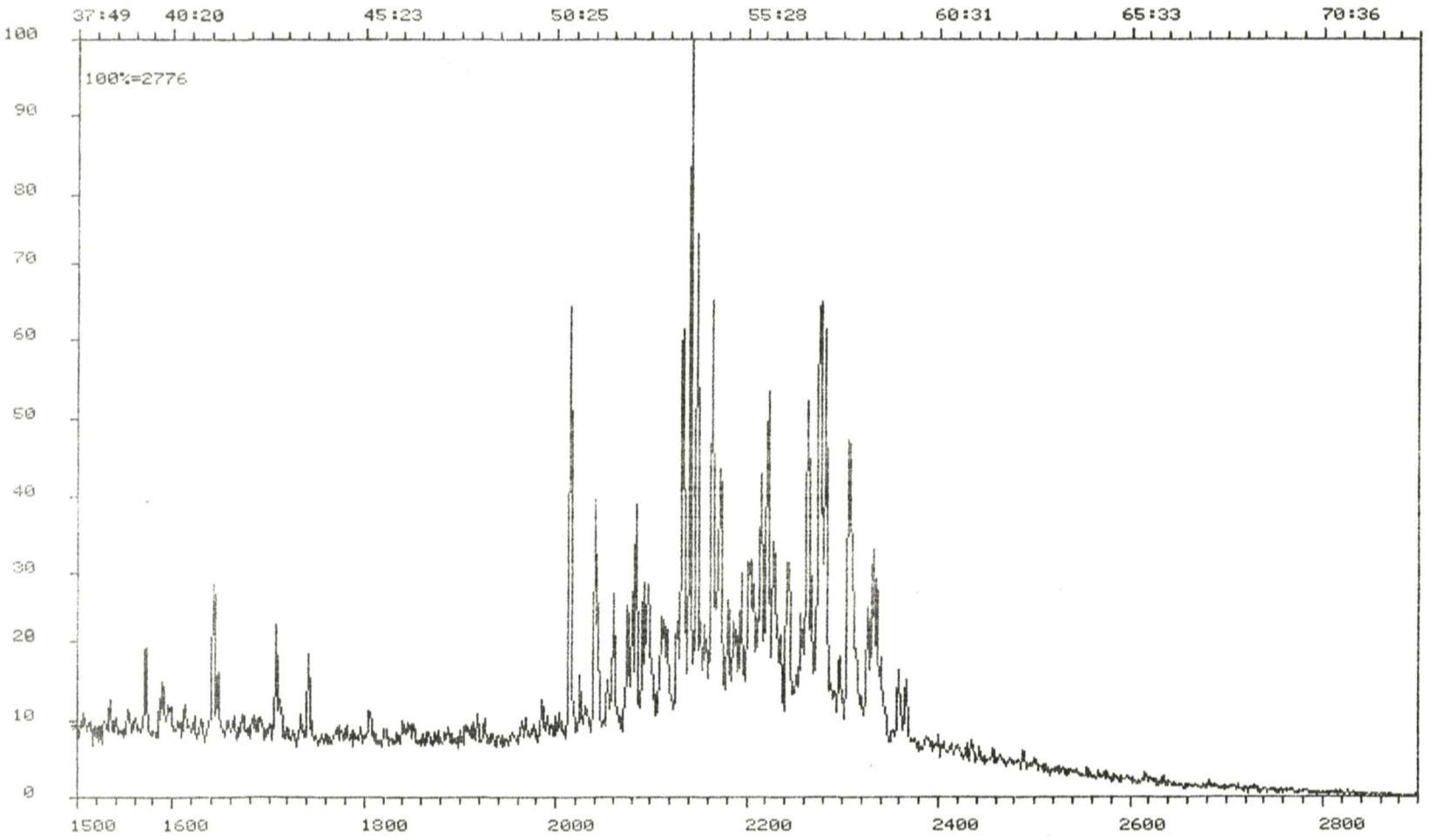

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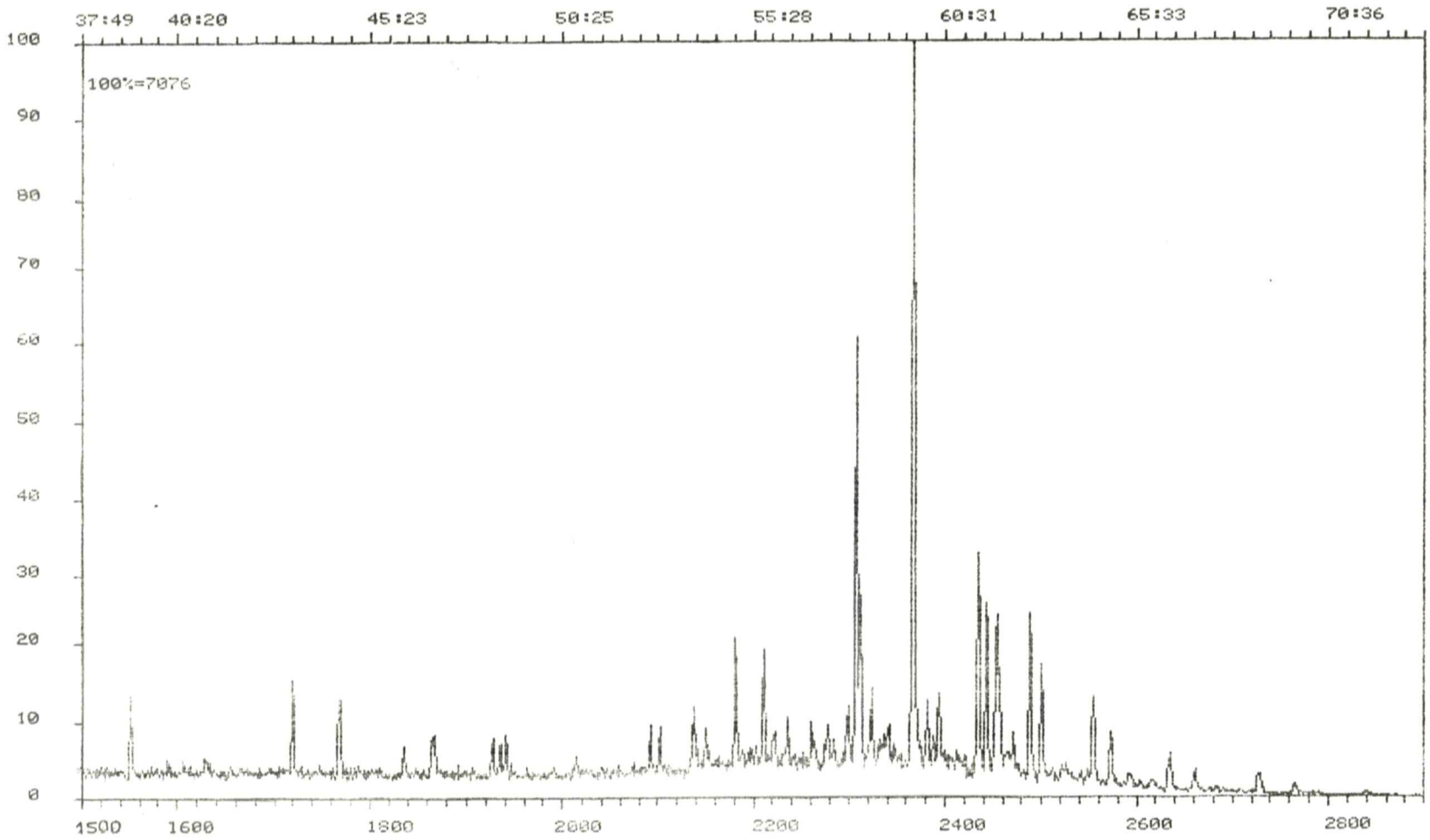

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WHITEROSE J-49 DST#7

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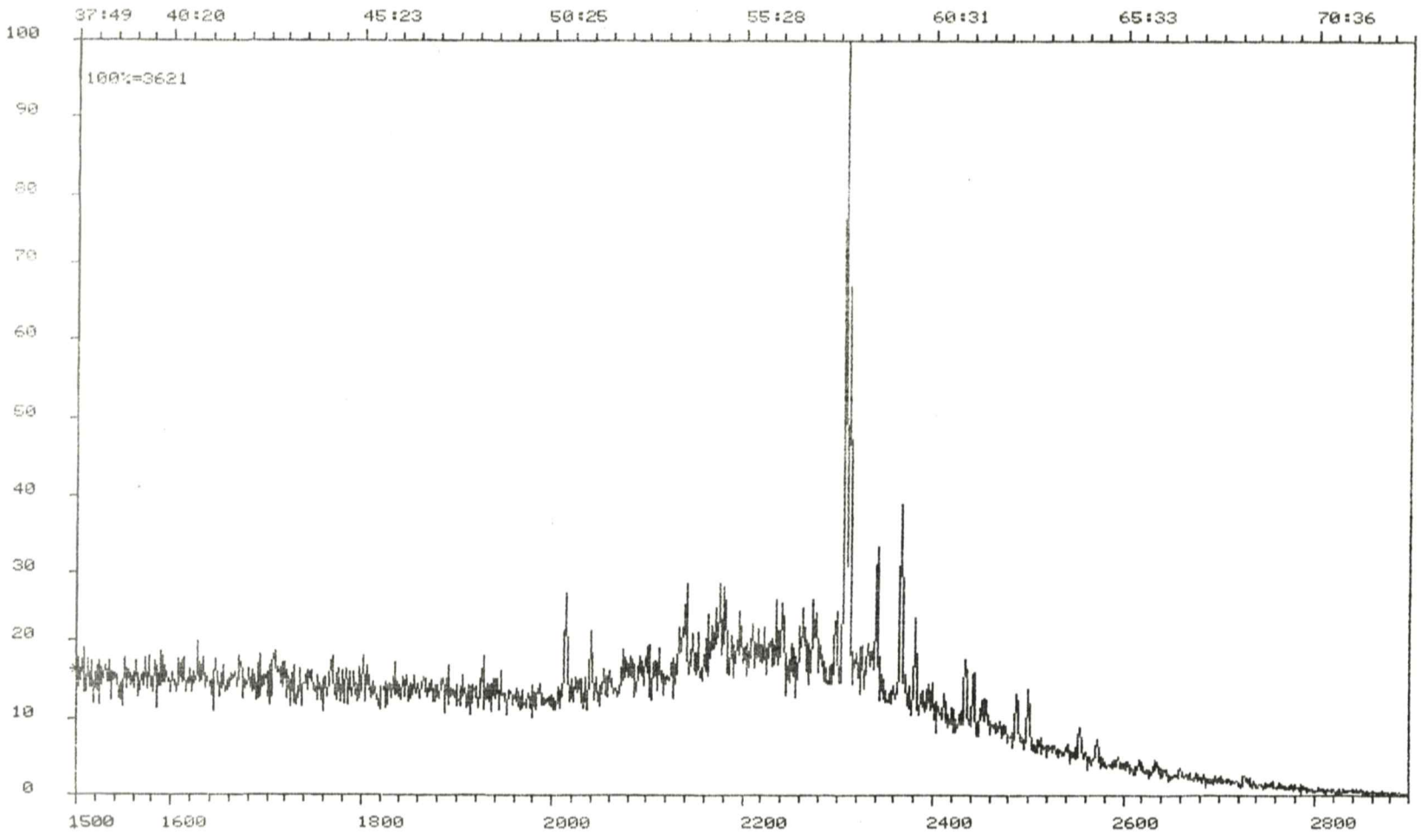
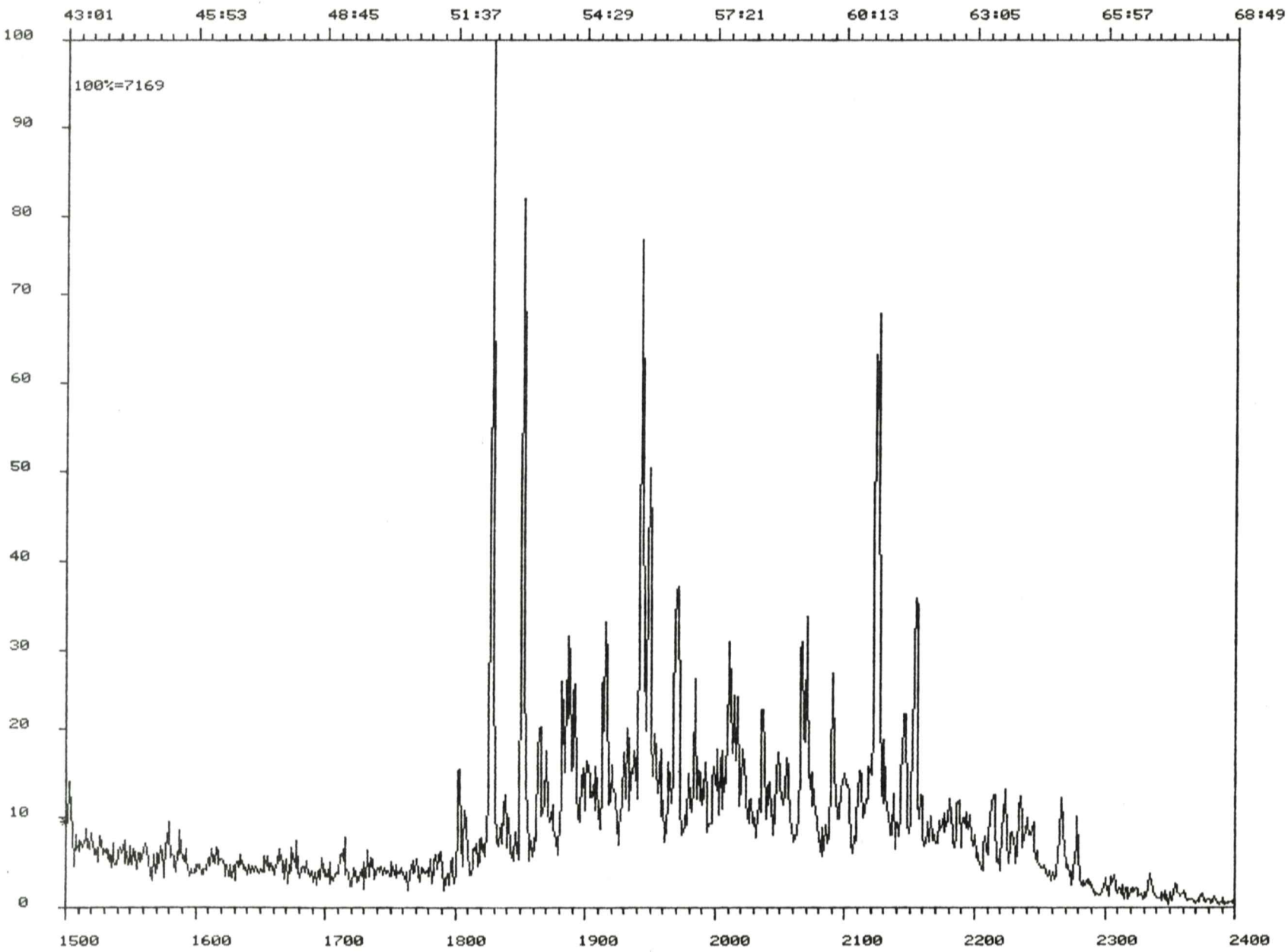


DS-55 CROSS SCAN REPORT, RUN: 4540001

MARA M-54 DST#2

* 259



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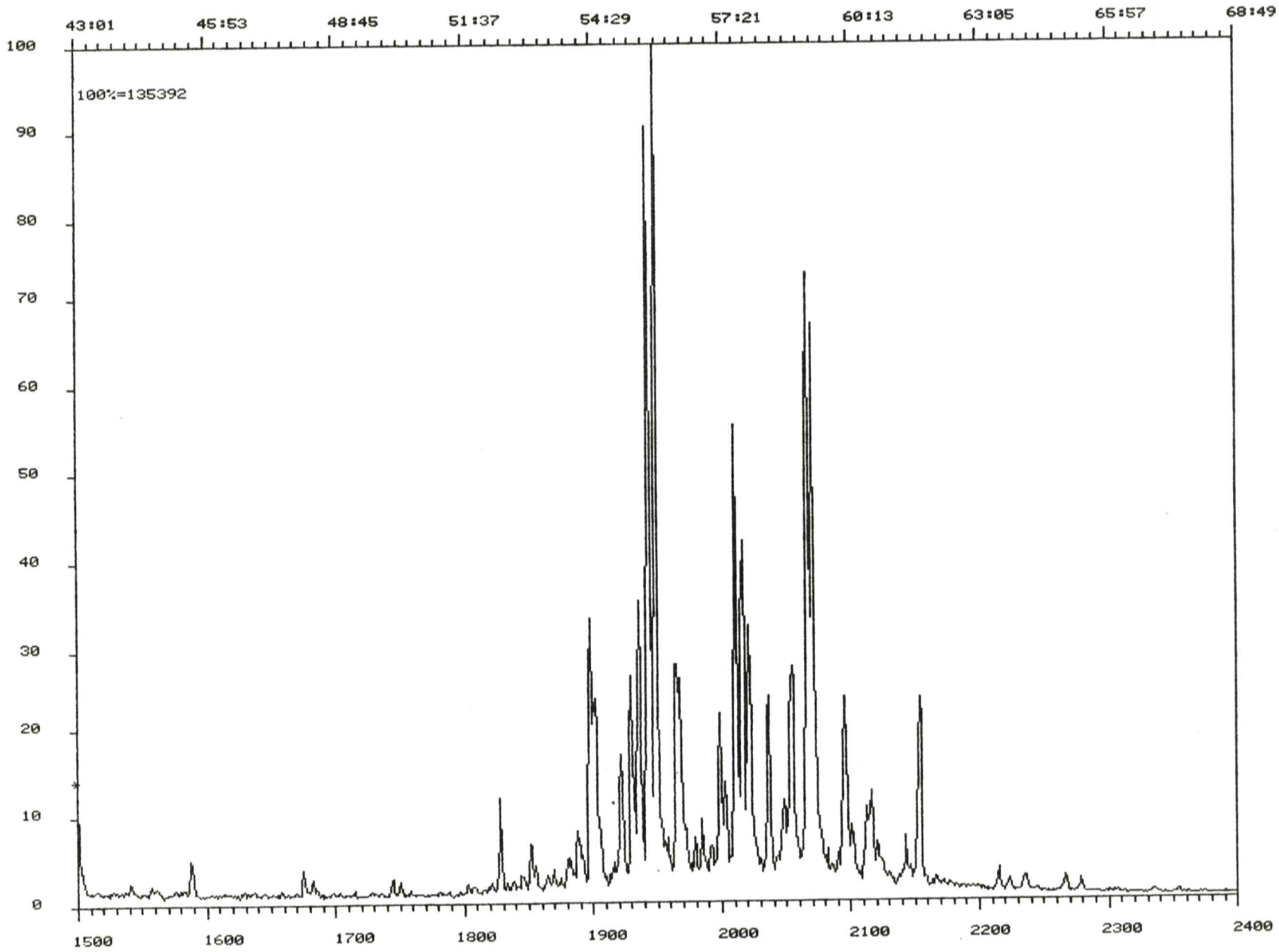
MARA M-54 DST#2

* 218



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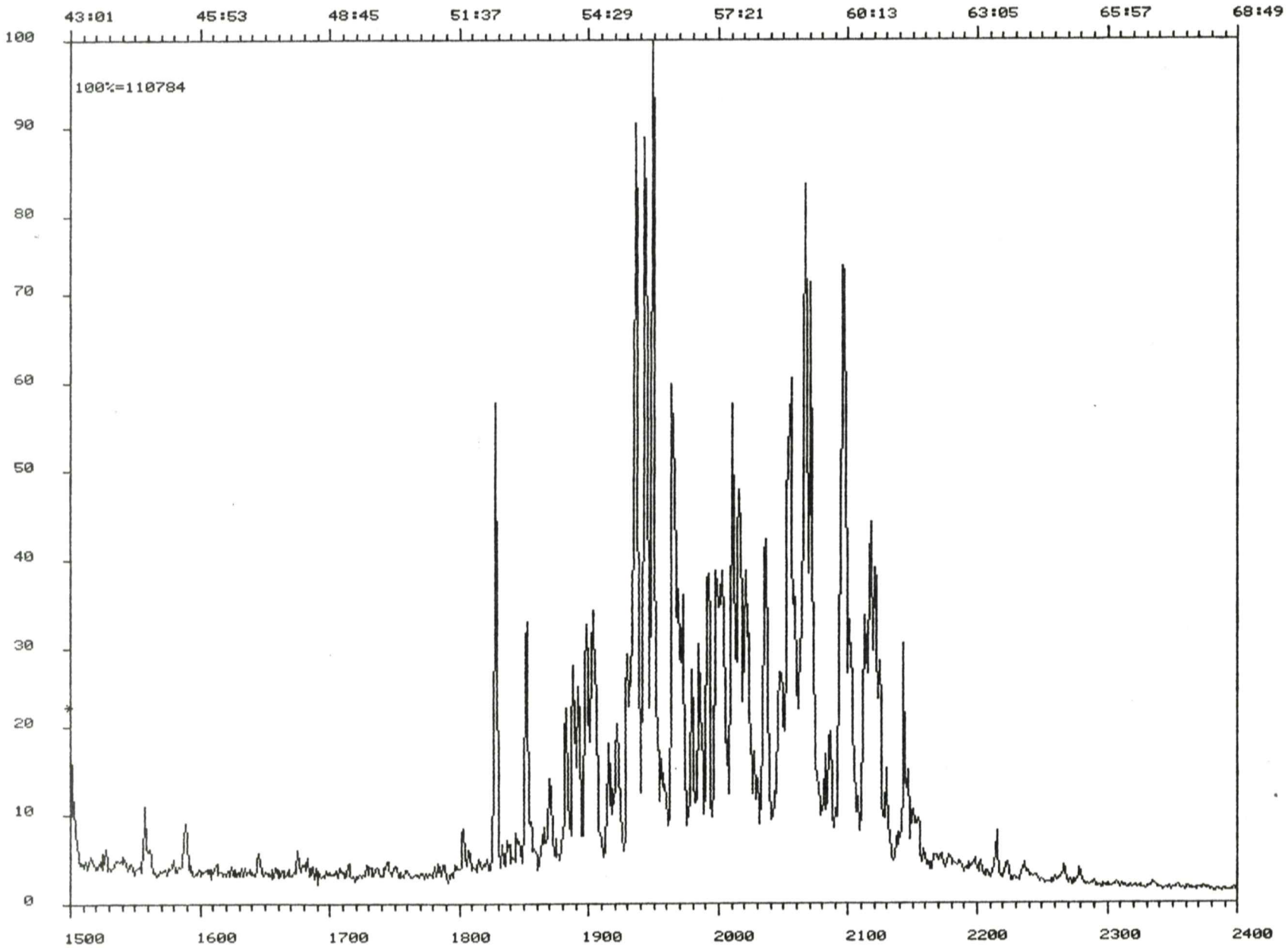

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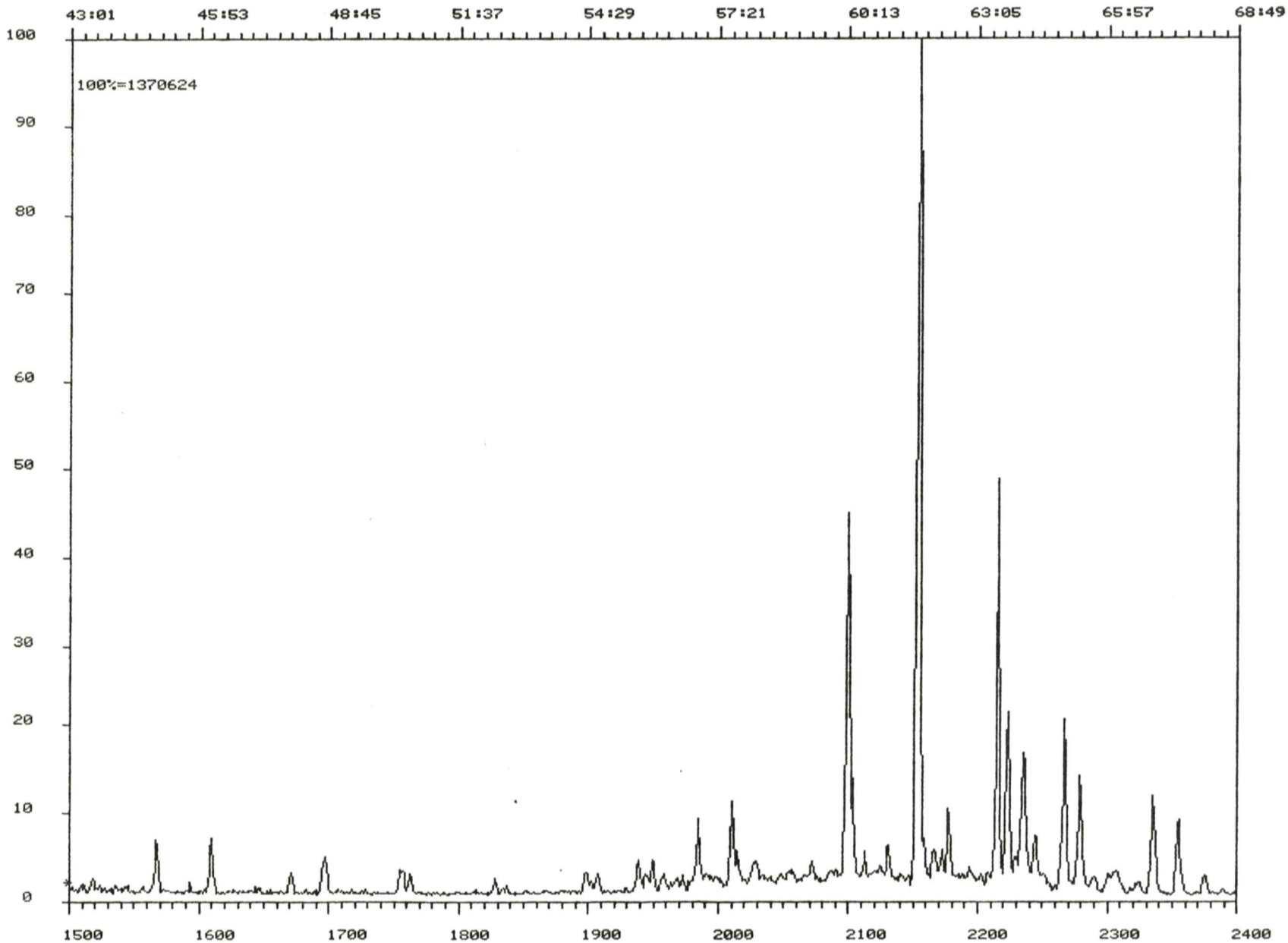

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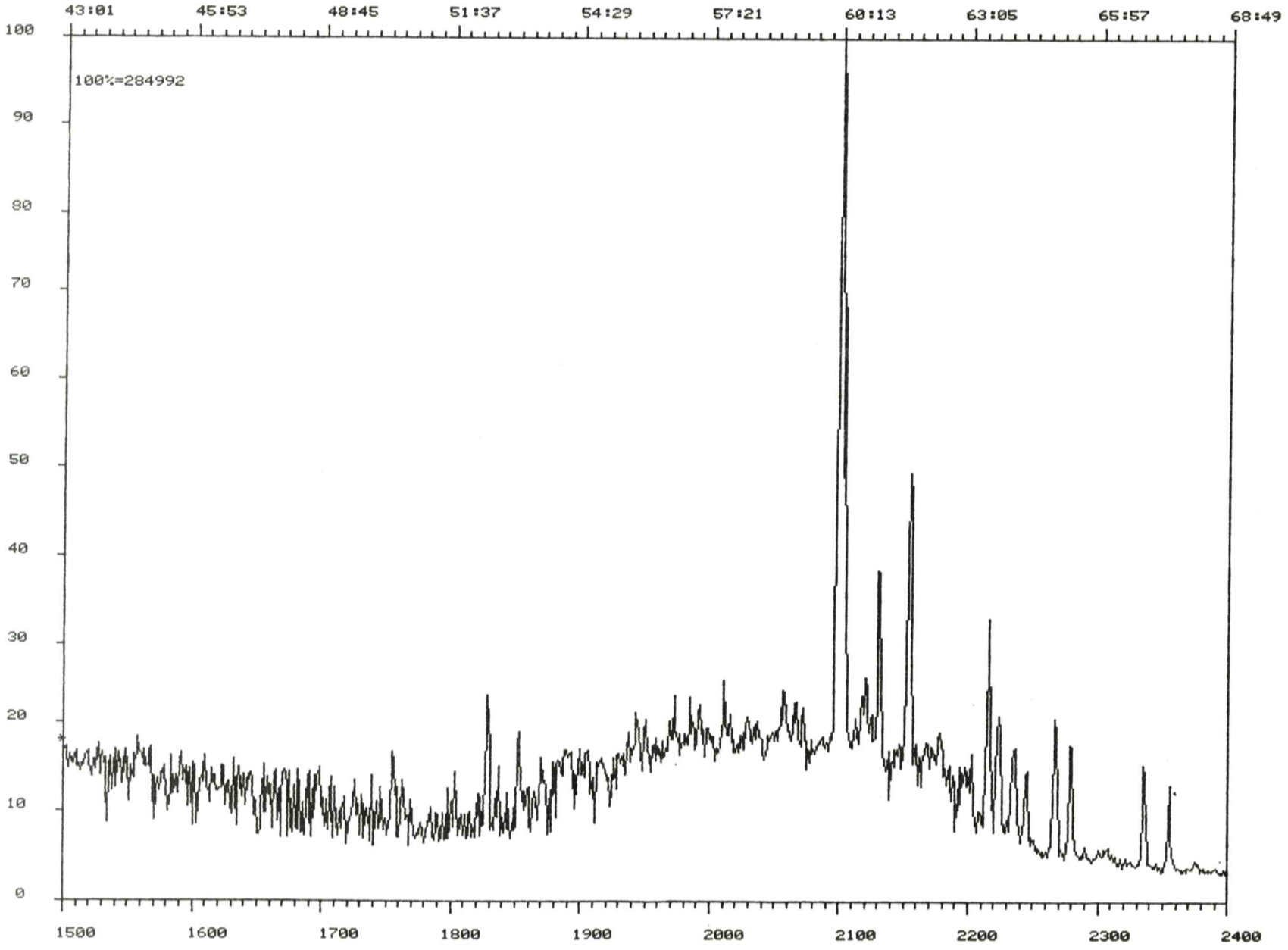

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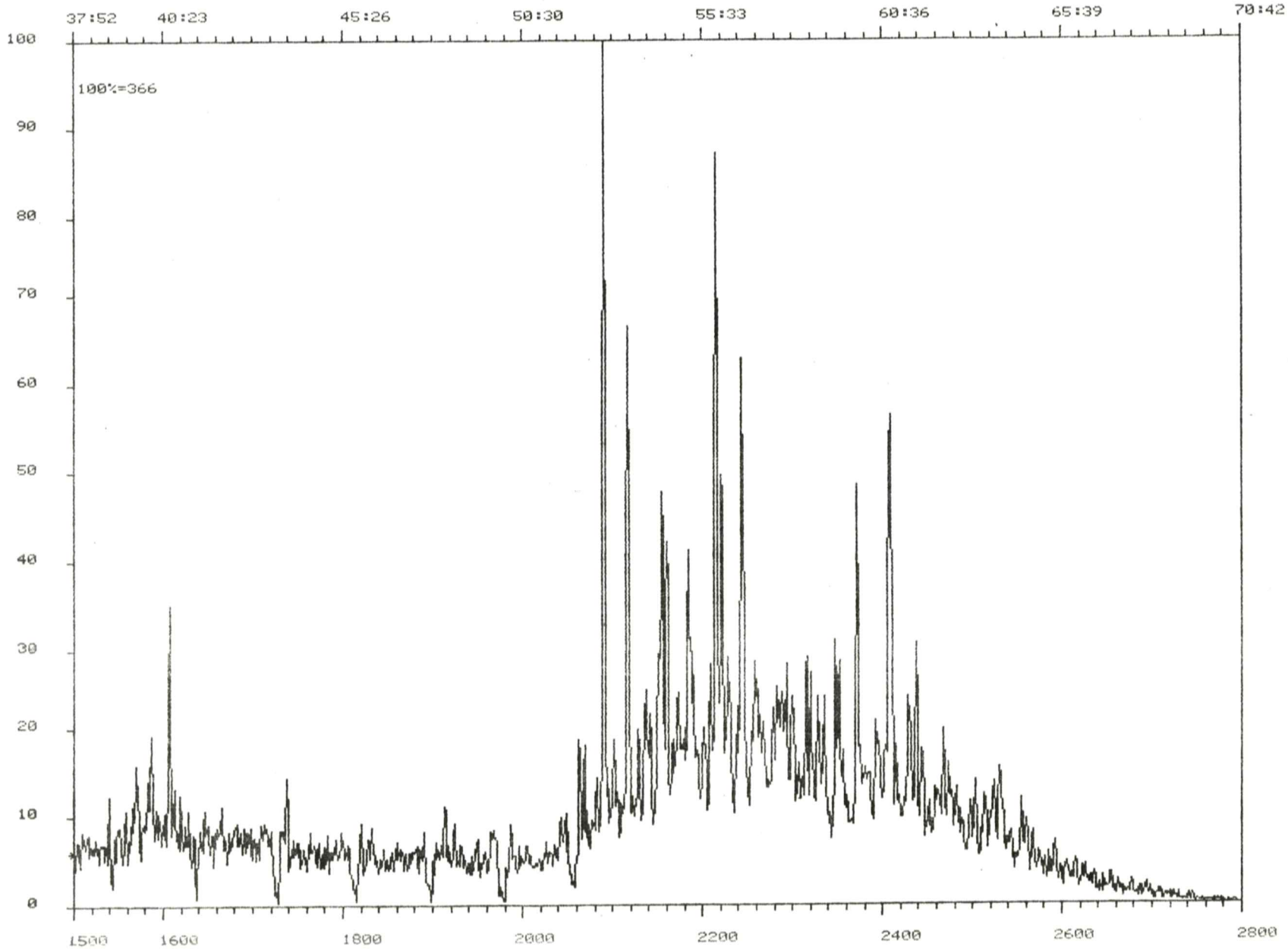
N.BEN NEVIS P-93 3081M

* 259



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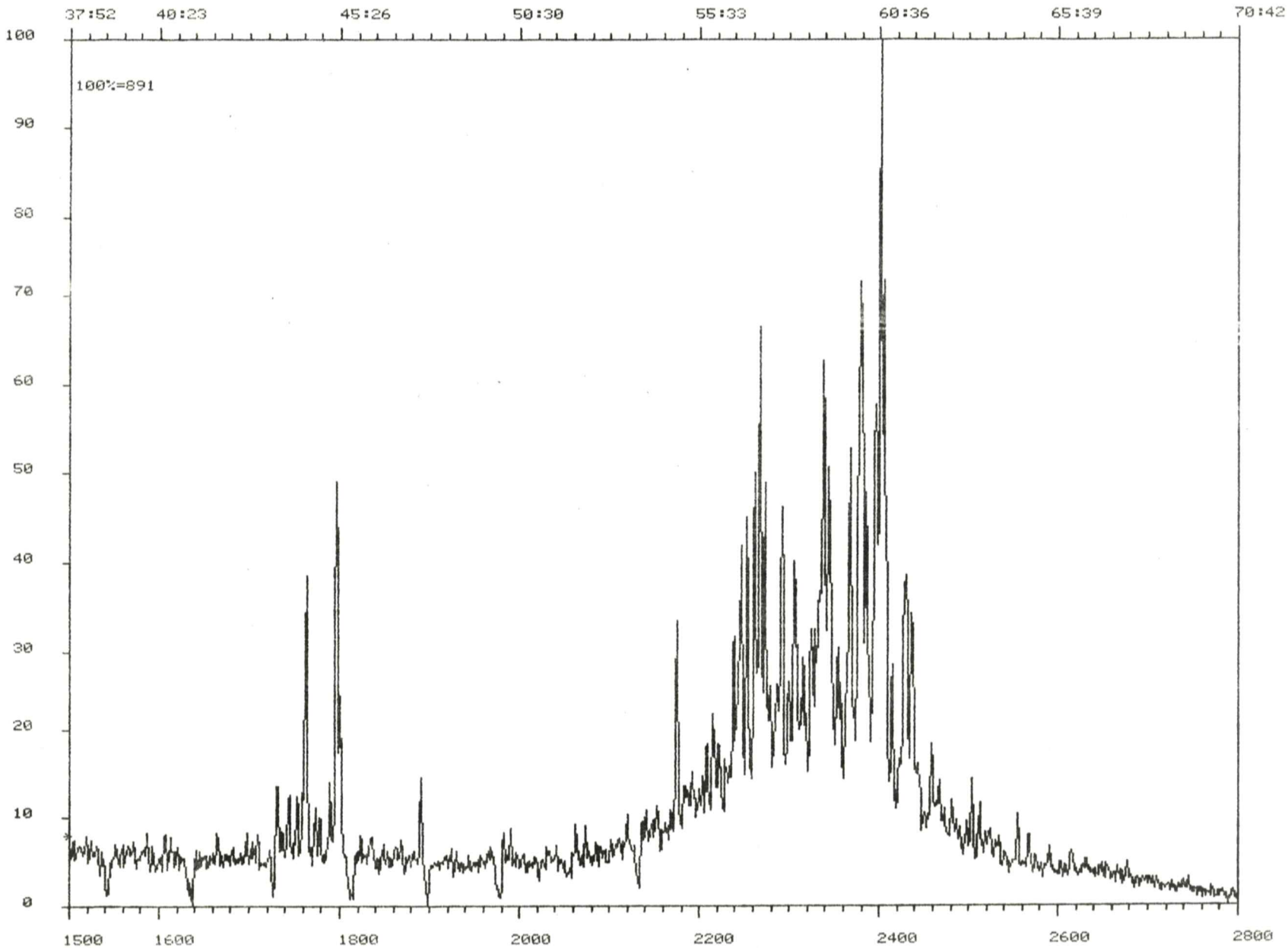

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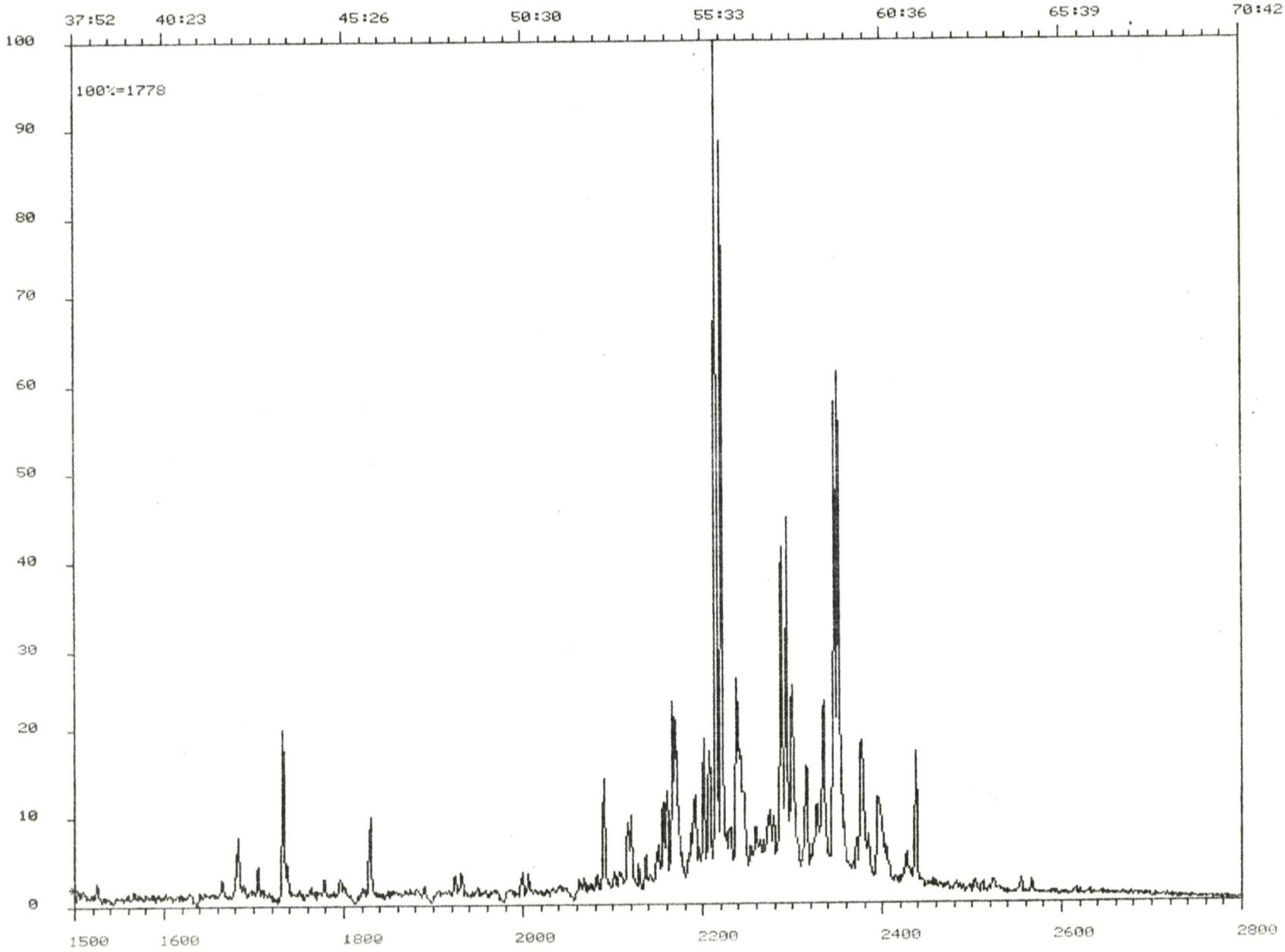
* 218



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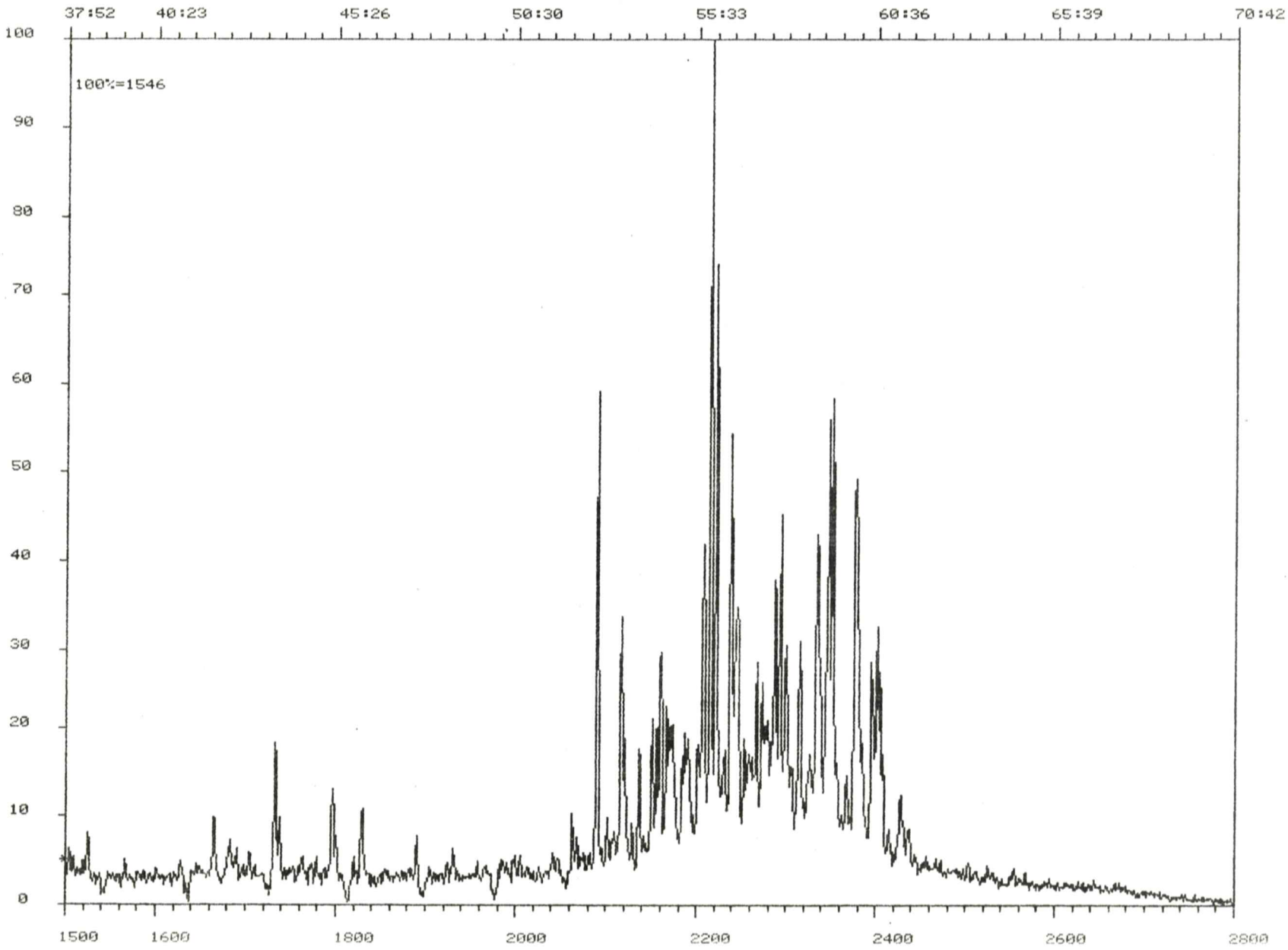

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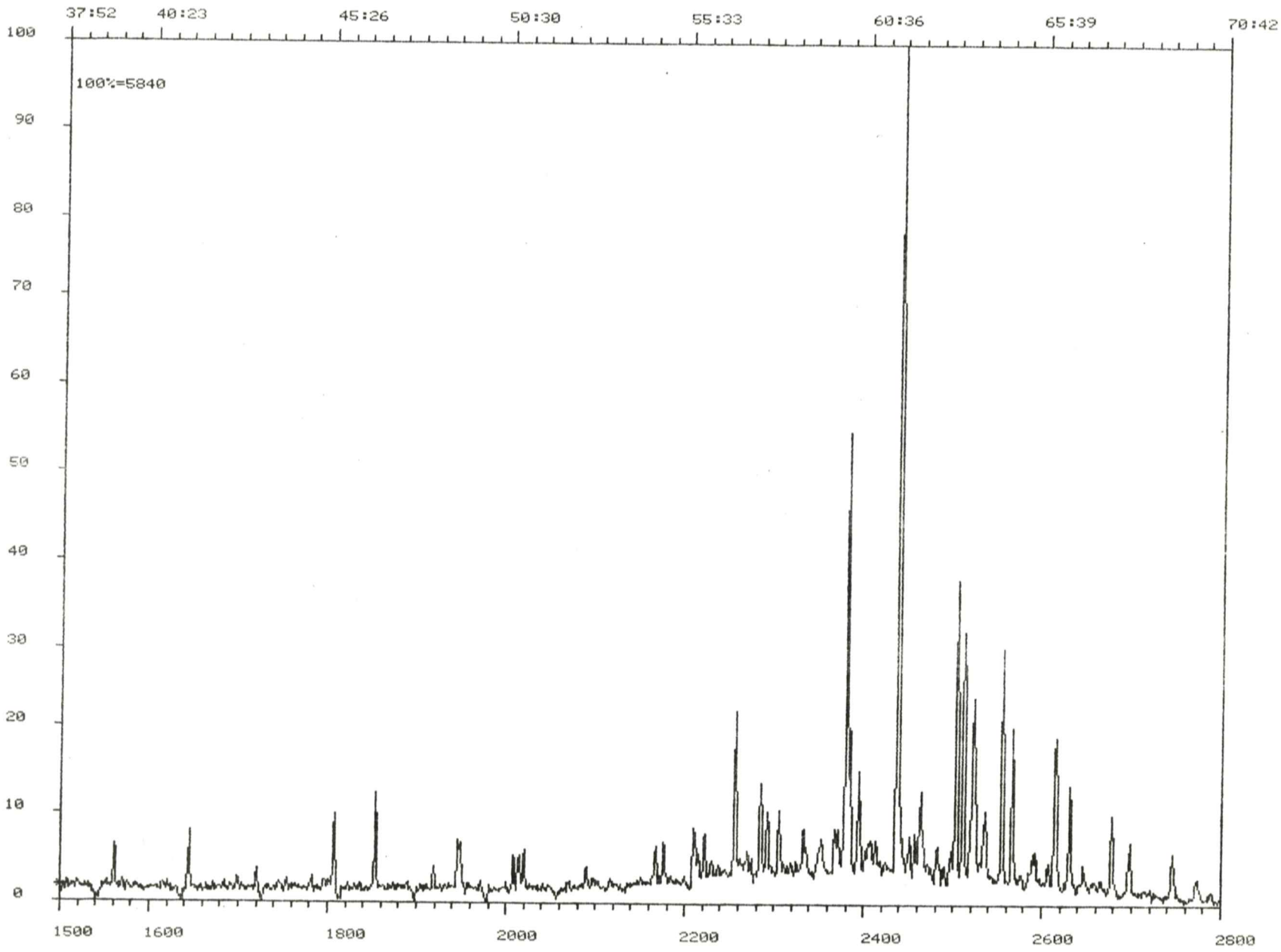

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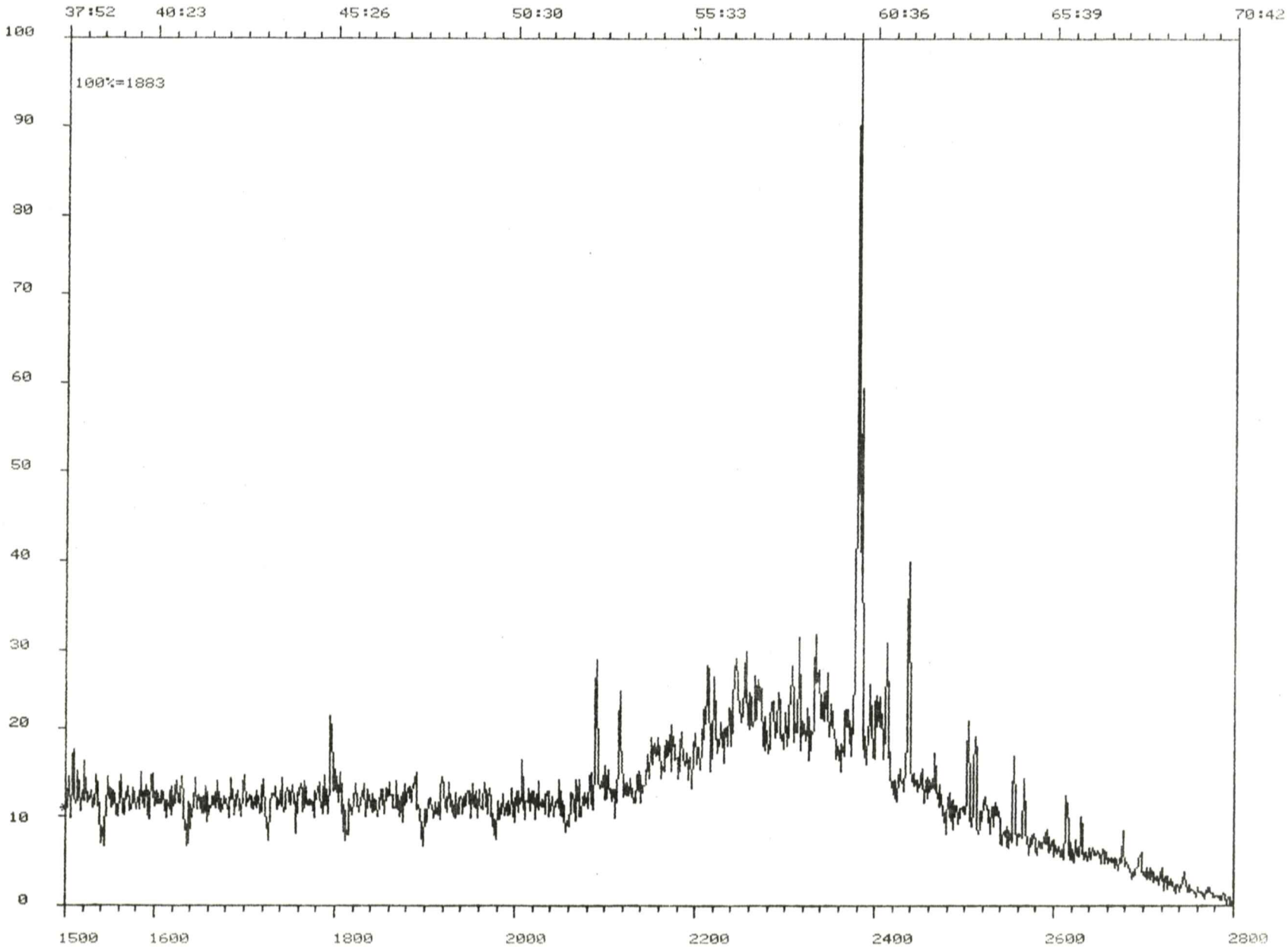
* 177



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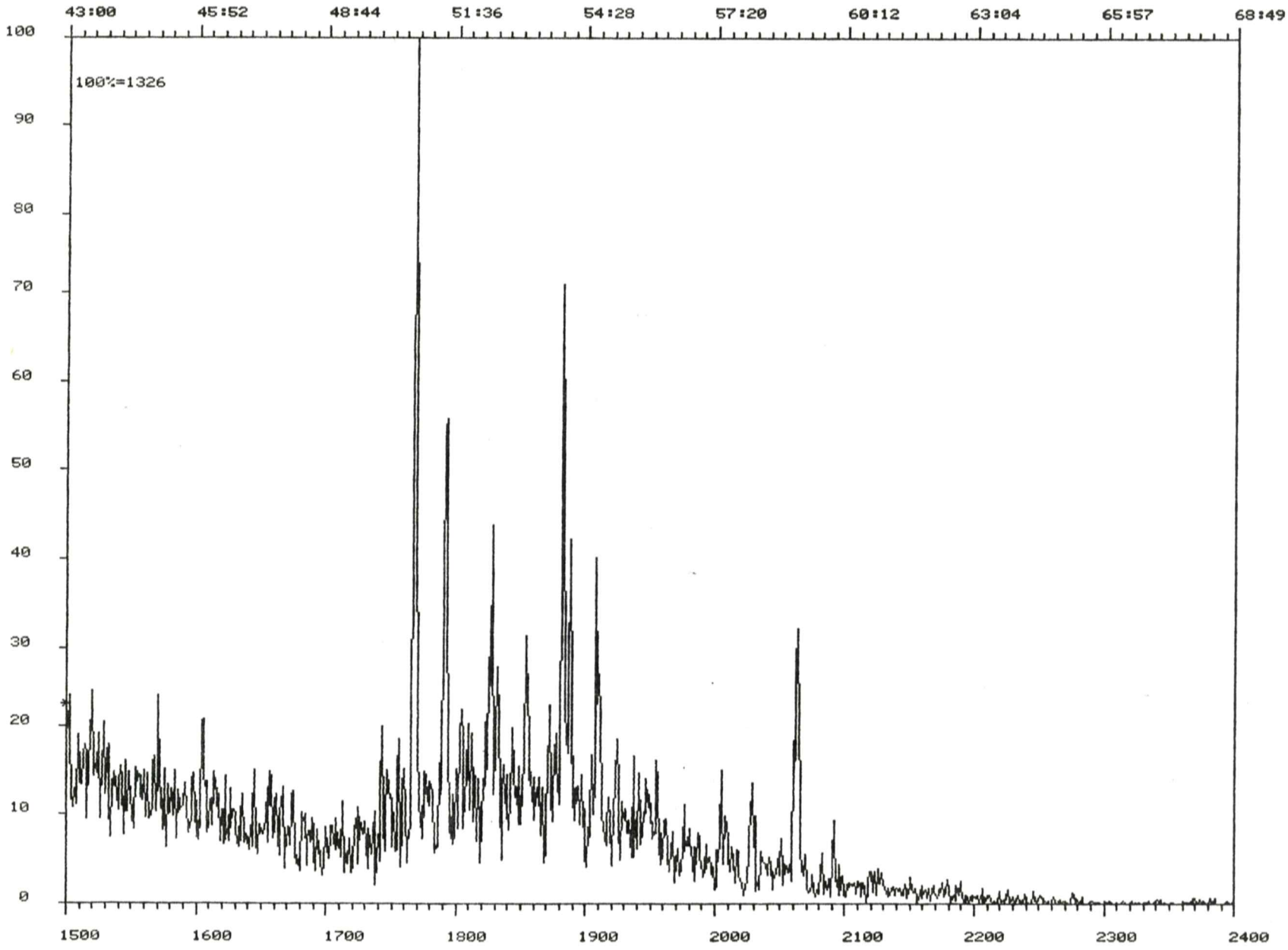
S MARA C-13 DST#2

* 259



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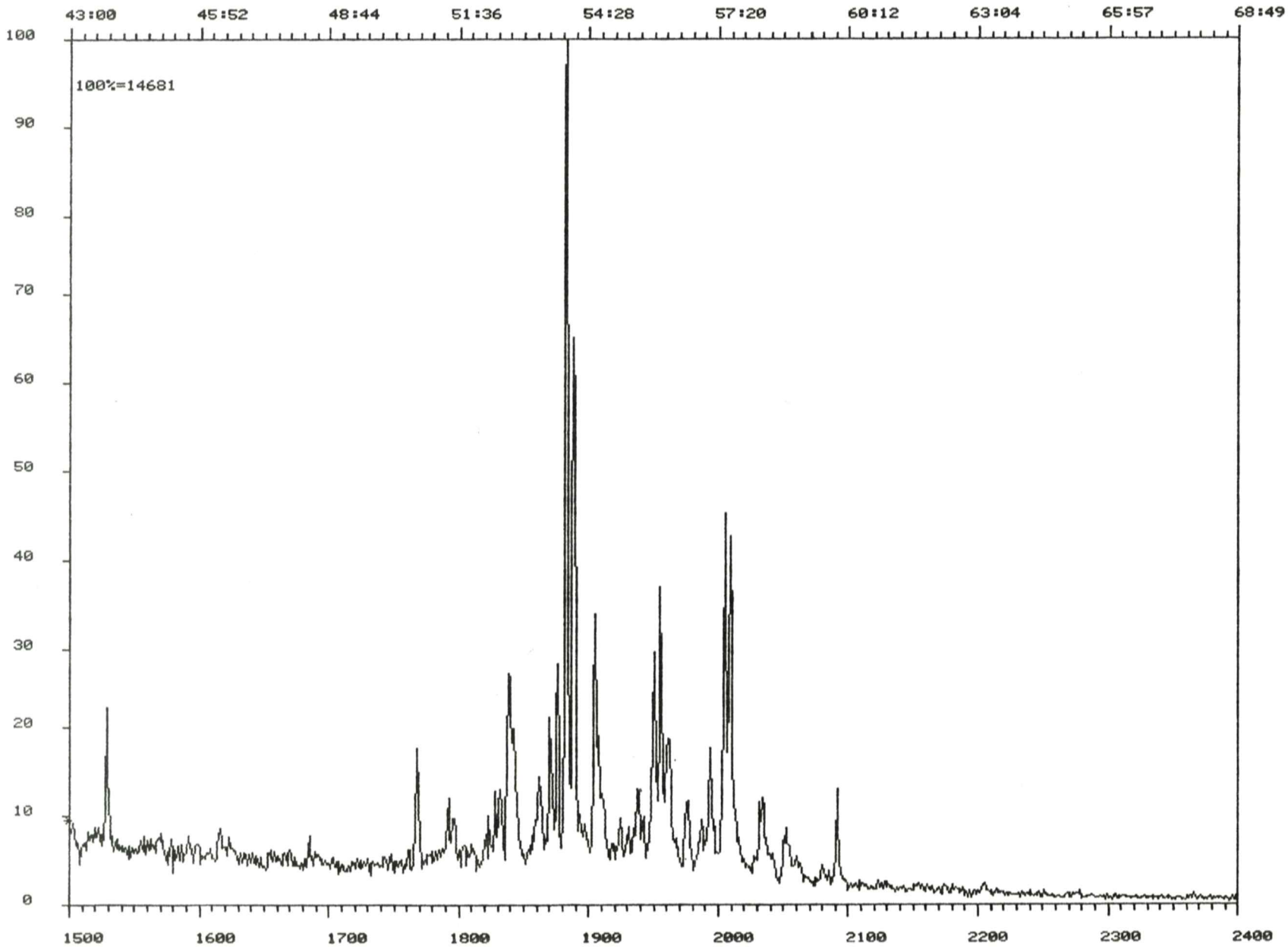

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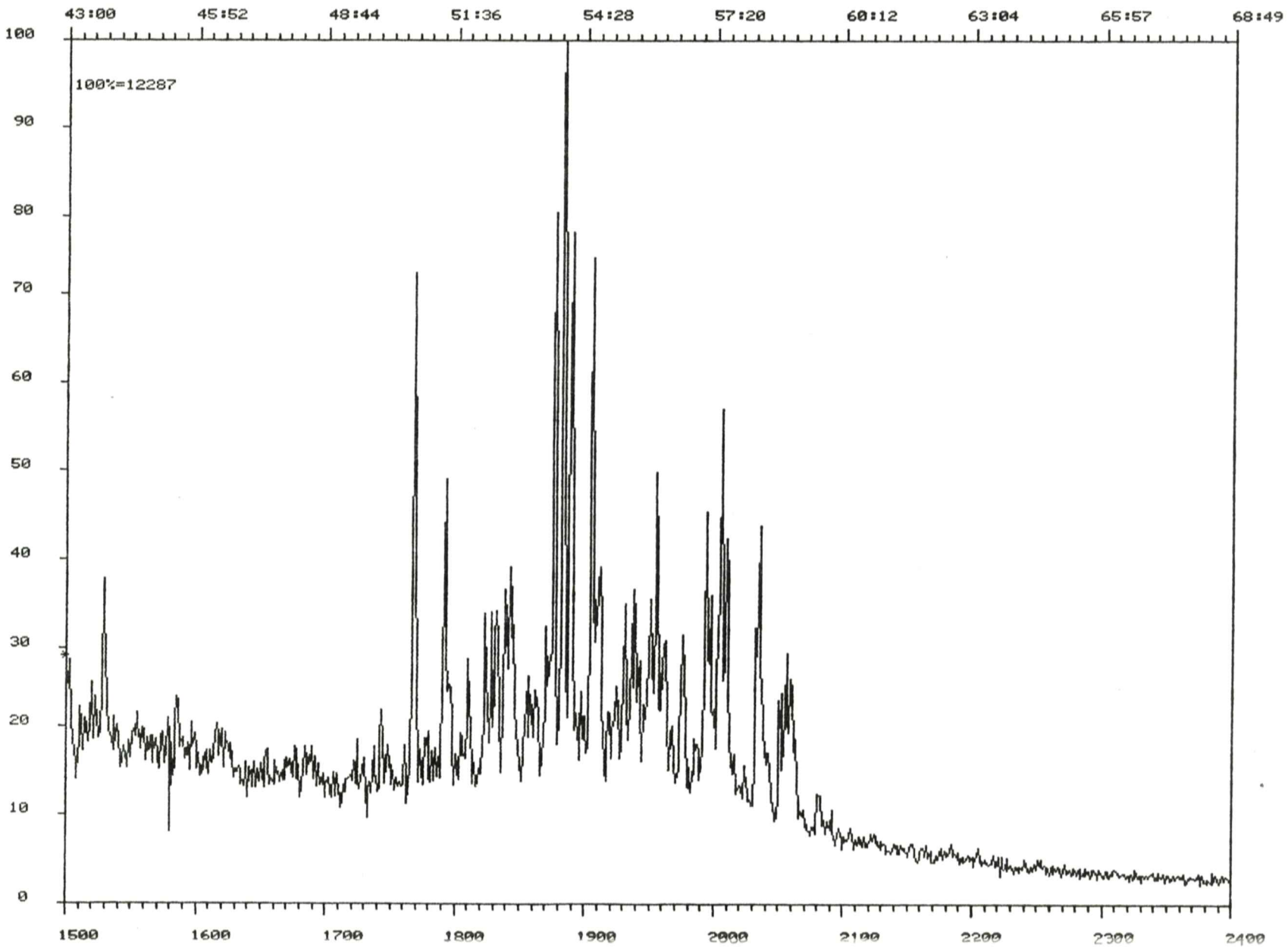

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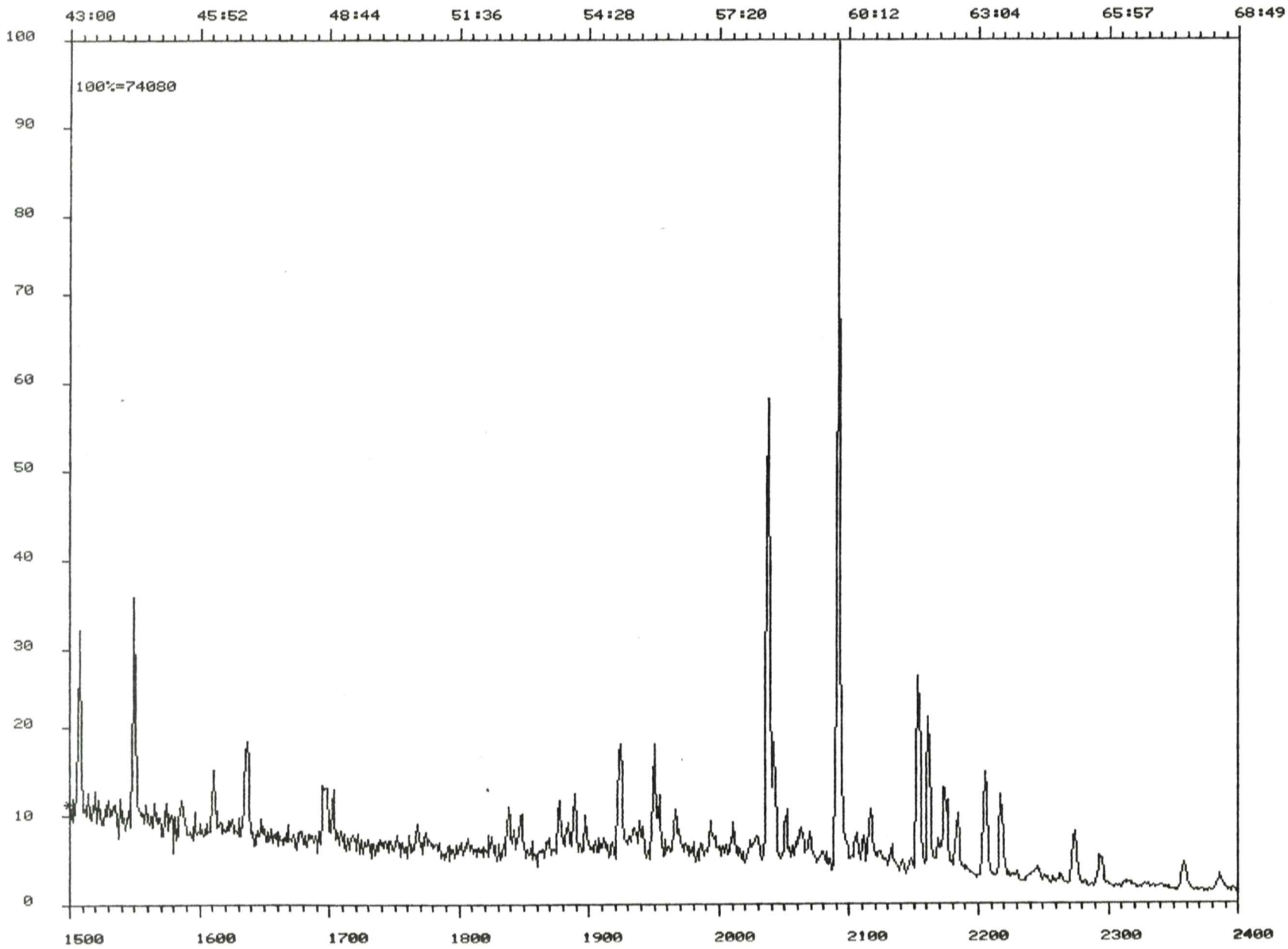

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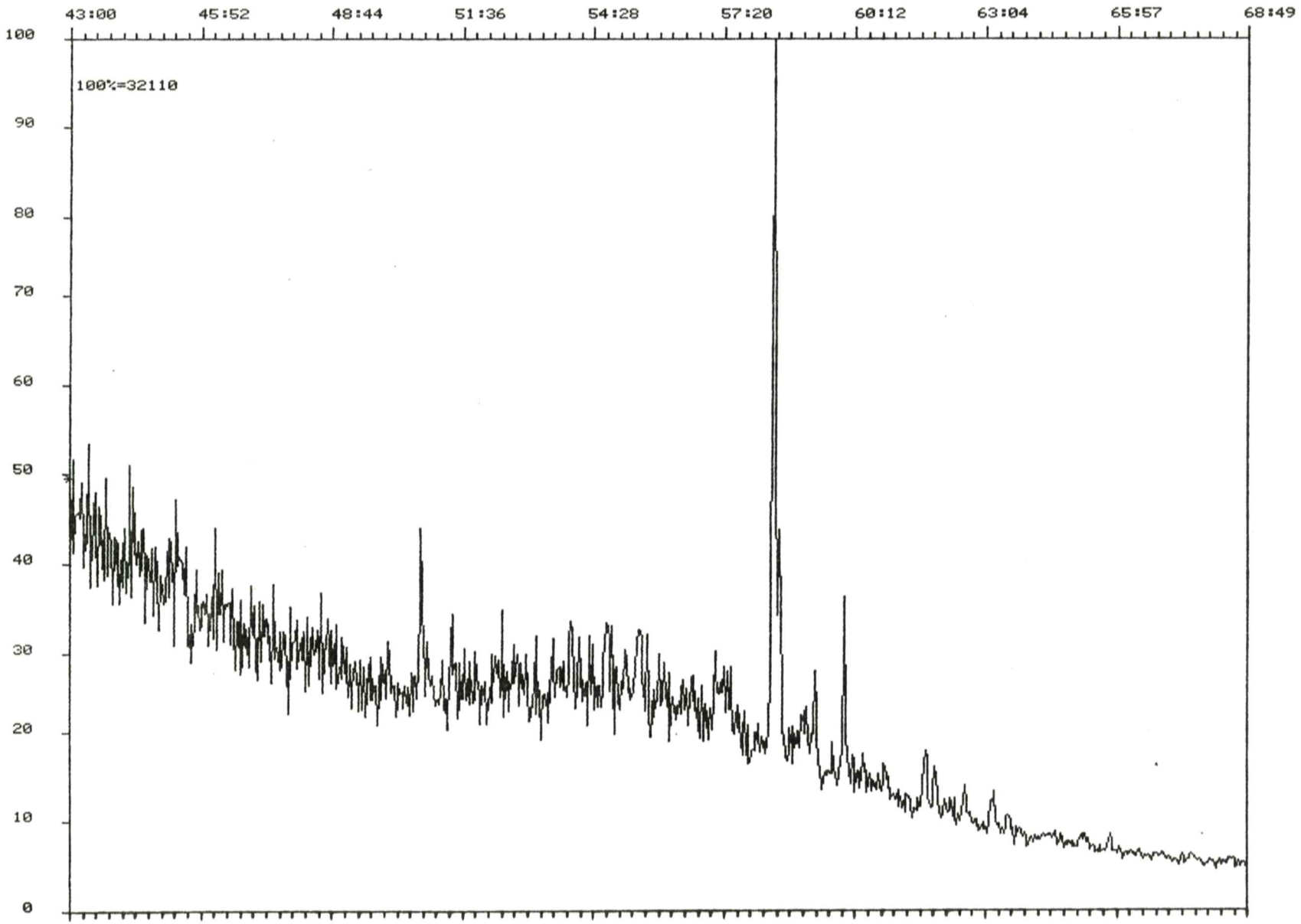

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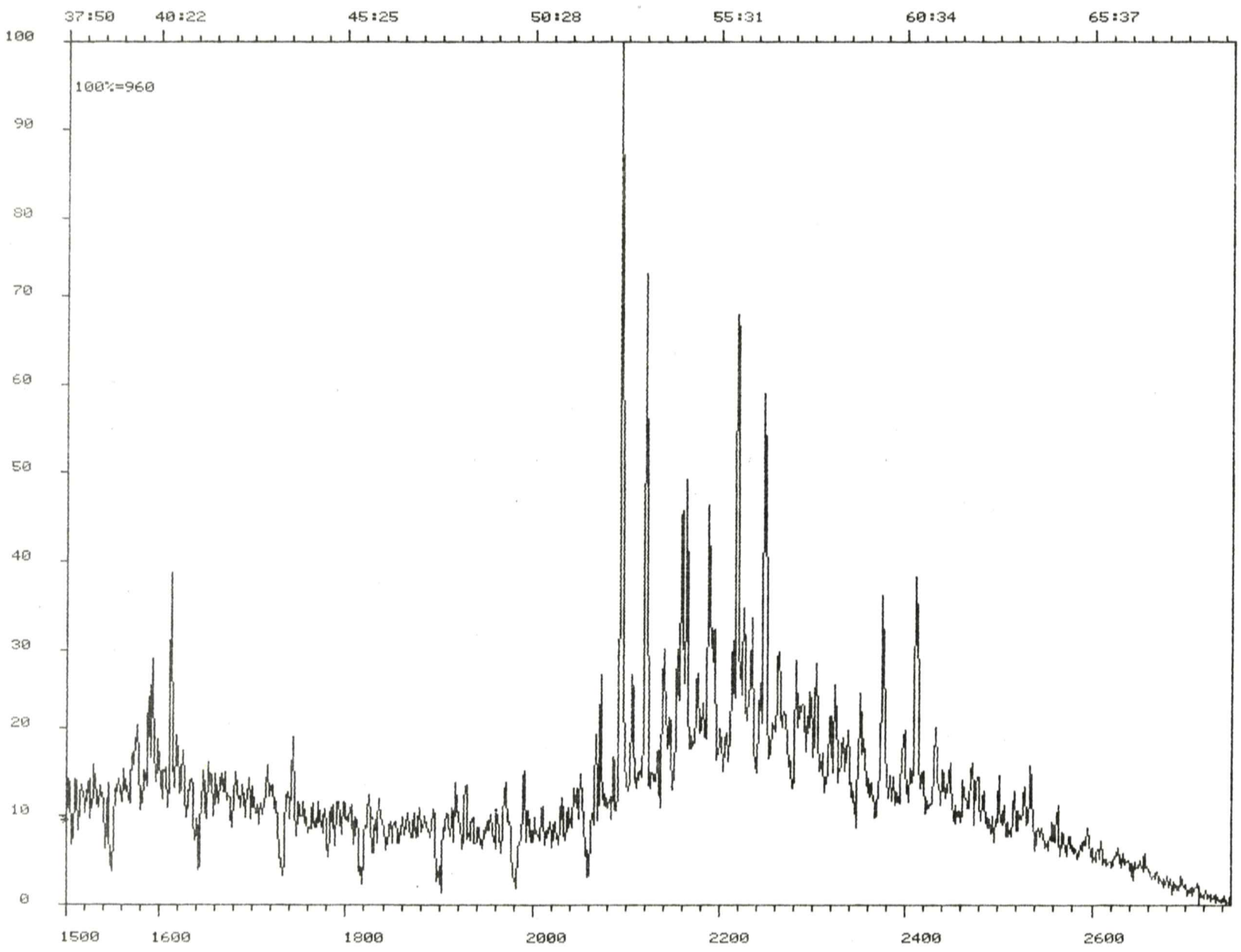
S.TEMPEST G-33 RFT 4043M

* 259



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S.TEMPEST G-33 RFT 4043M

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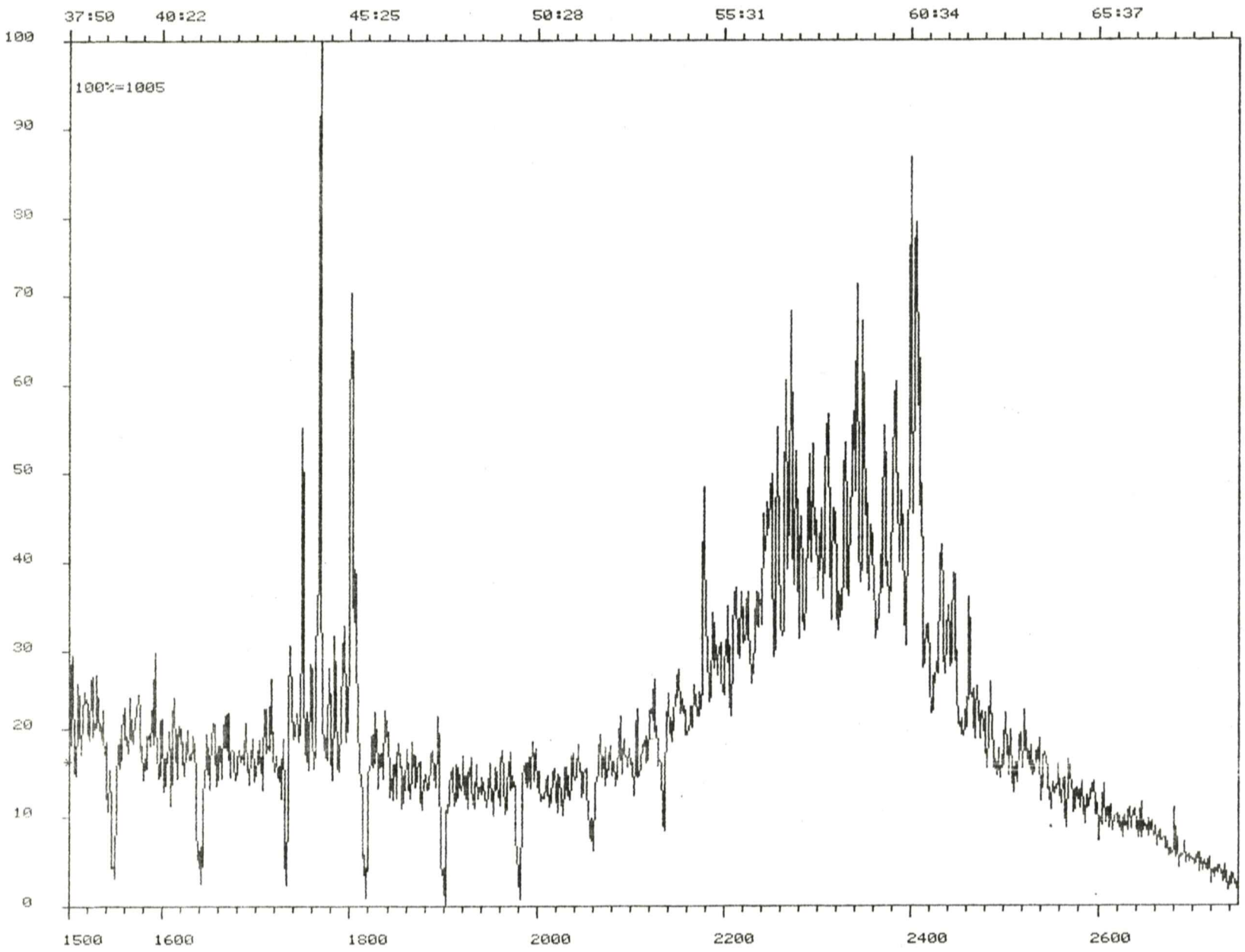

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S.TEMPEST G-33 RFT 4043M

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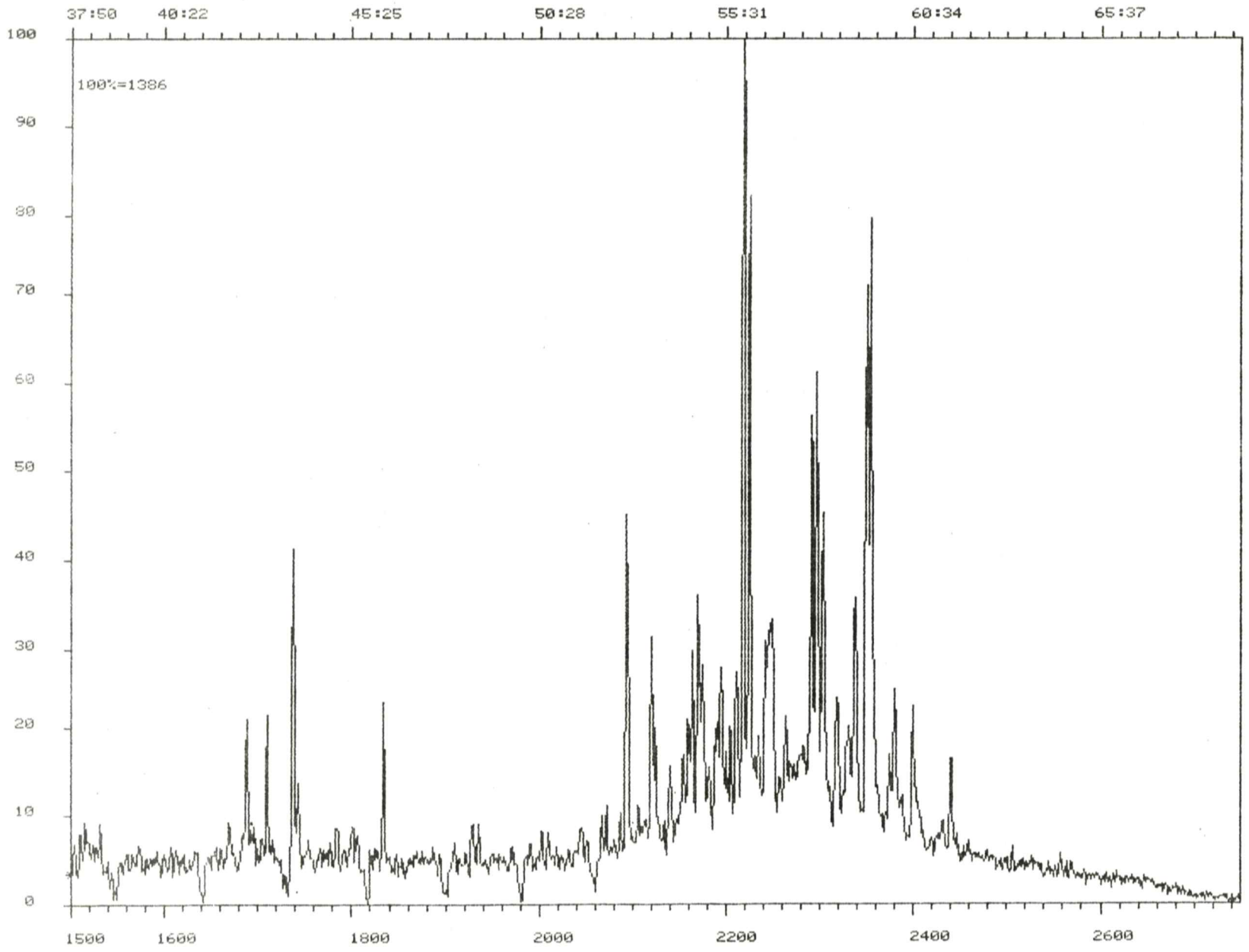

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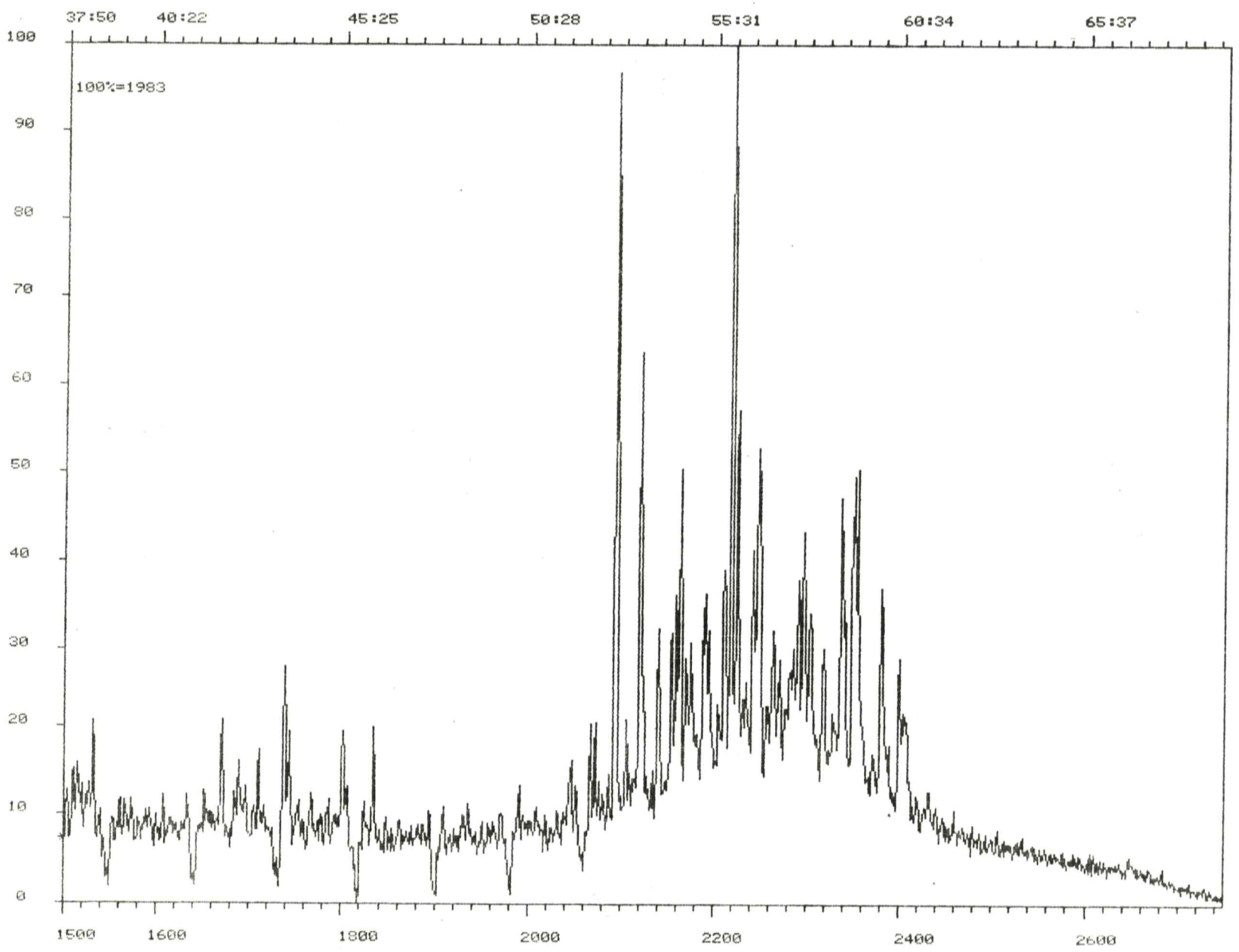

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S.TEMPEST G-33 RFT 4043M

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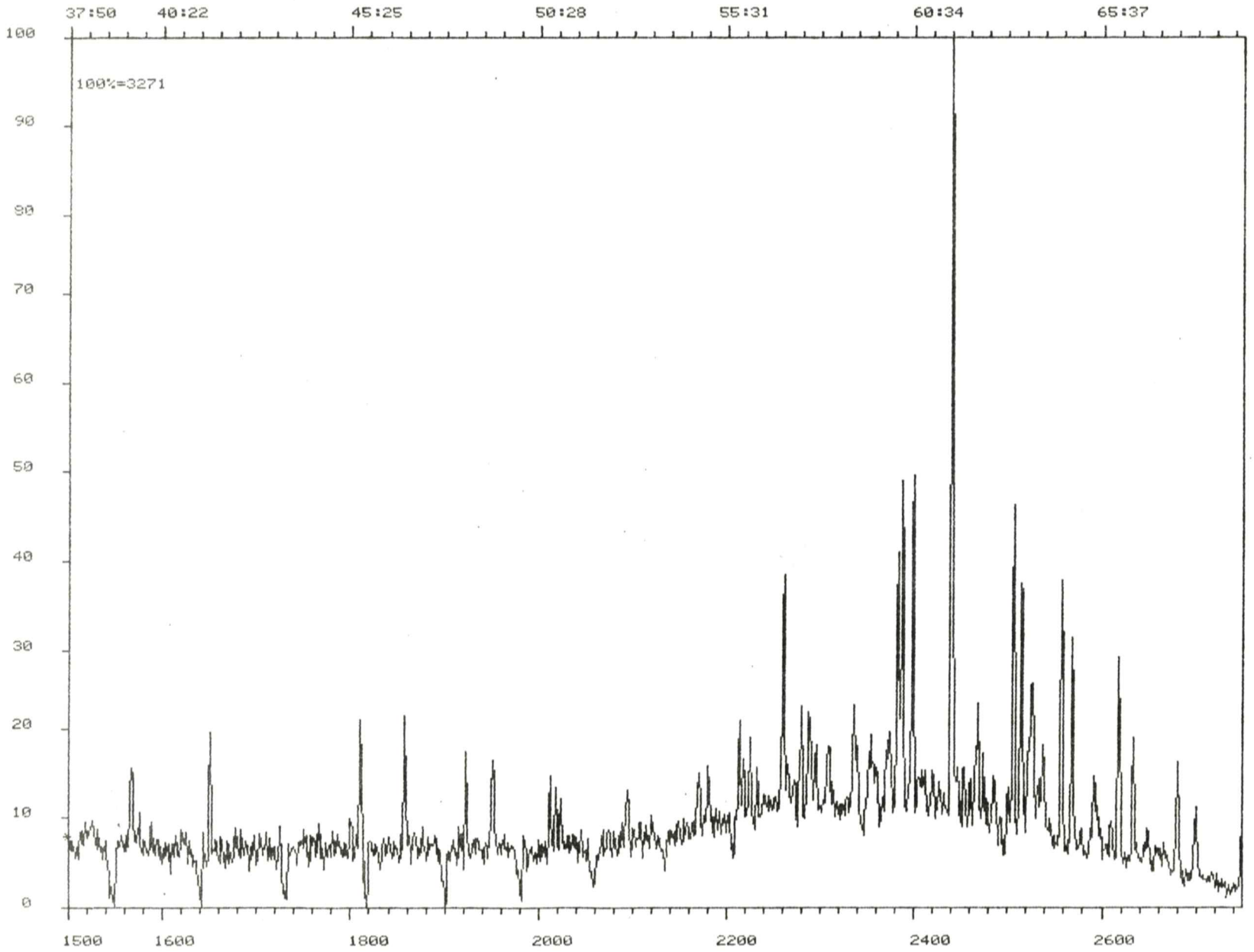

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S.TEMPEST G-33 RFT 4043M

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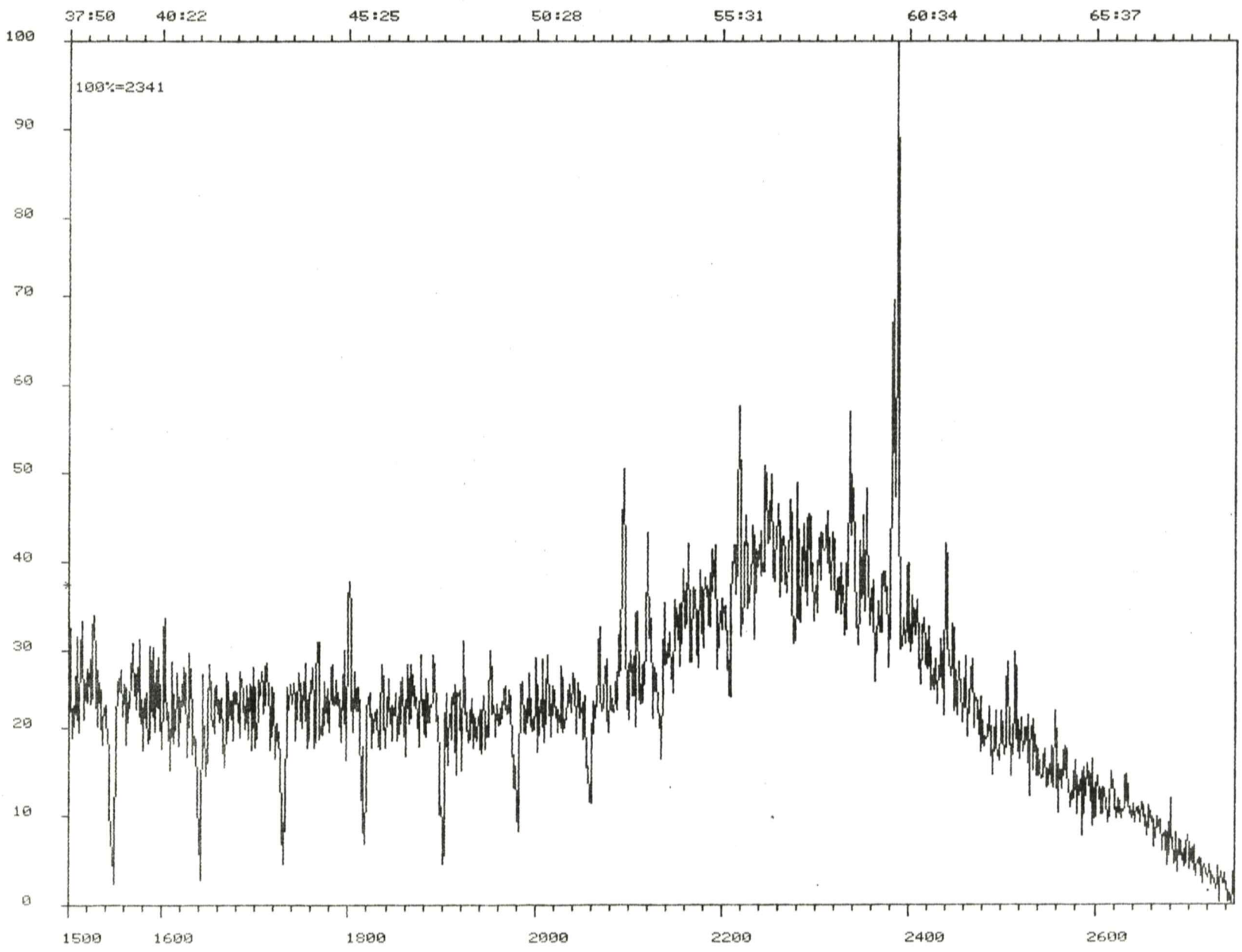

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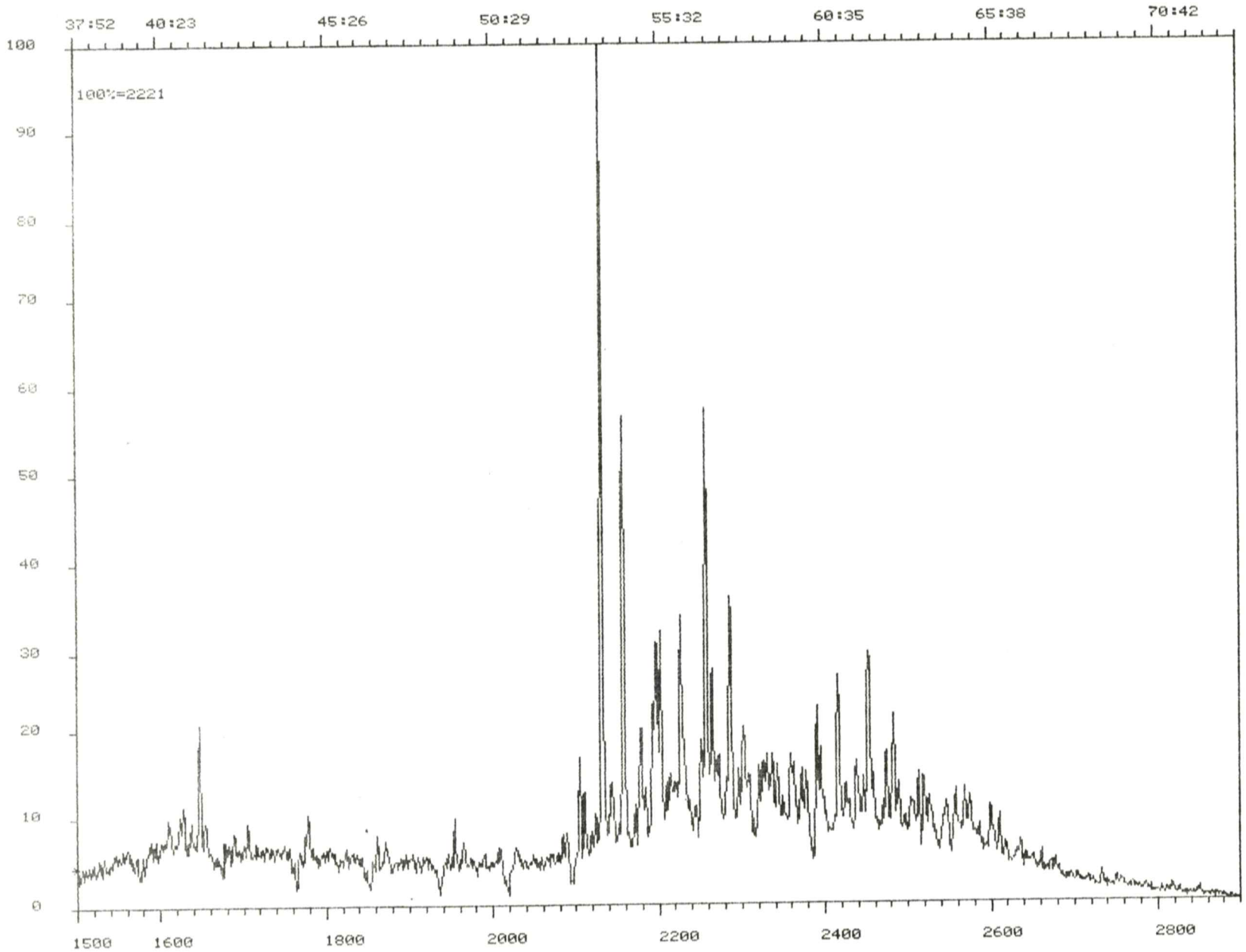
HIBERNIA K-18DST4

* 259



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HIBERNIA K-18DST4

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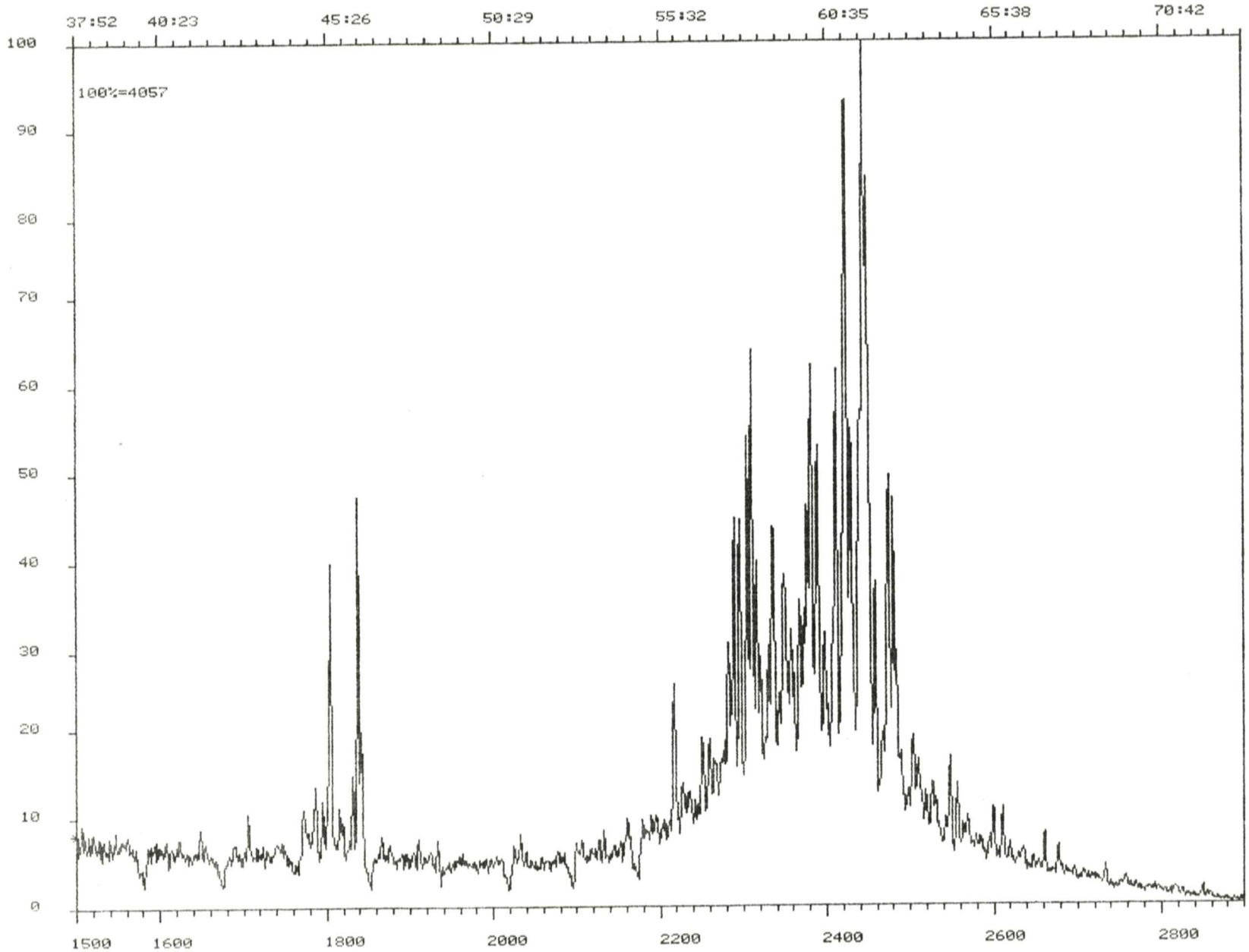

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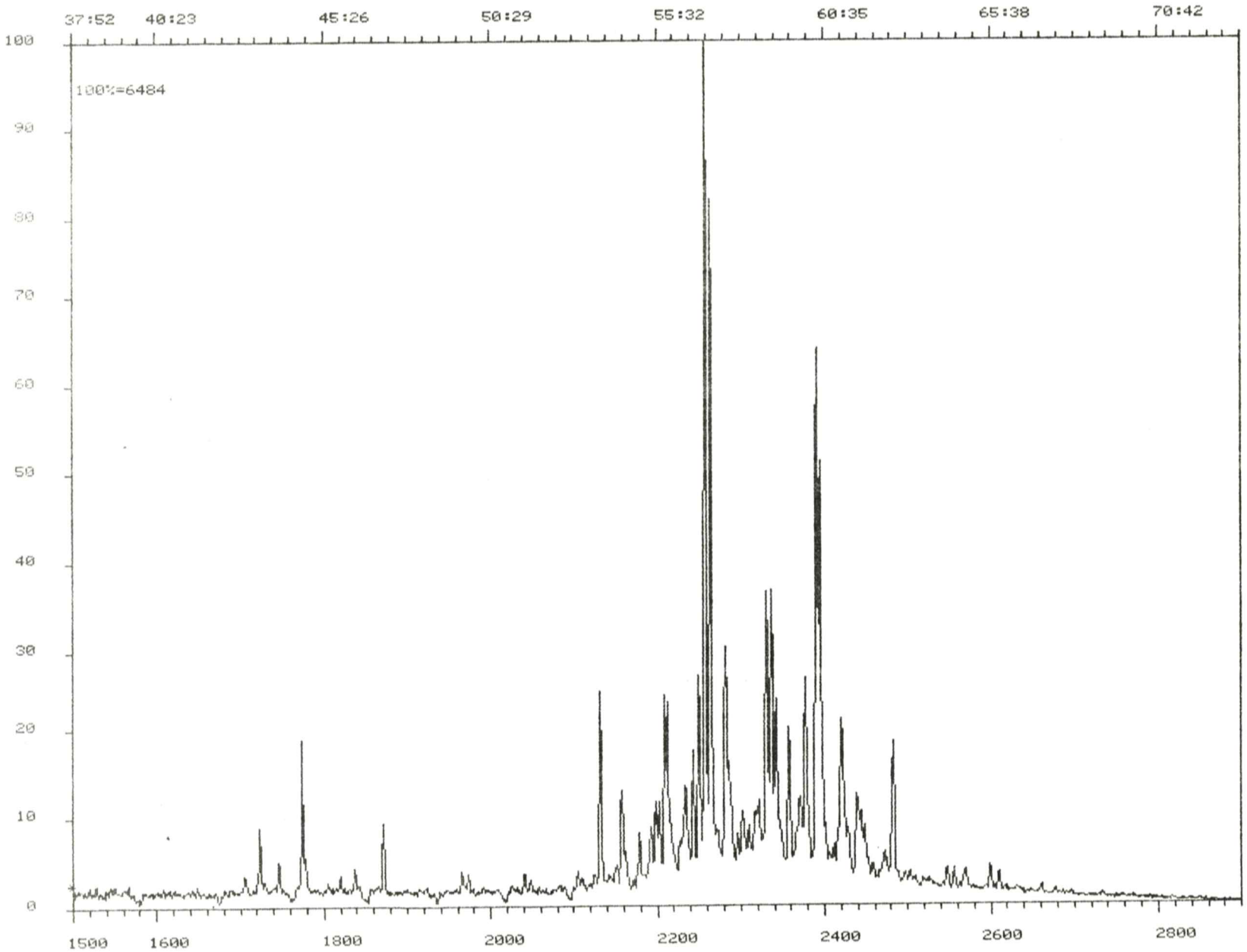
HIBERNIA K-18DST4

* 218



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HIBERNIA K-18DST4

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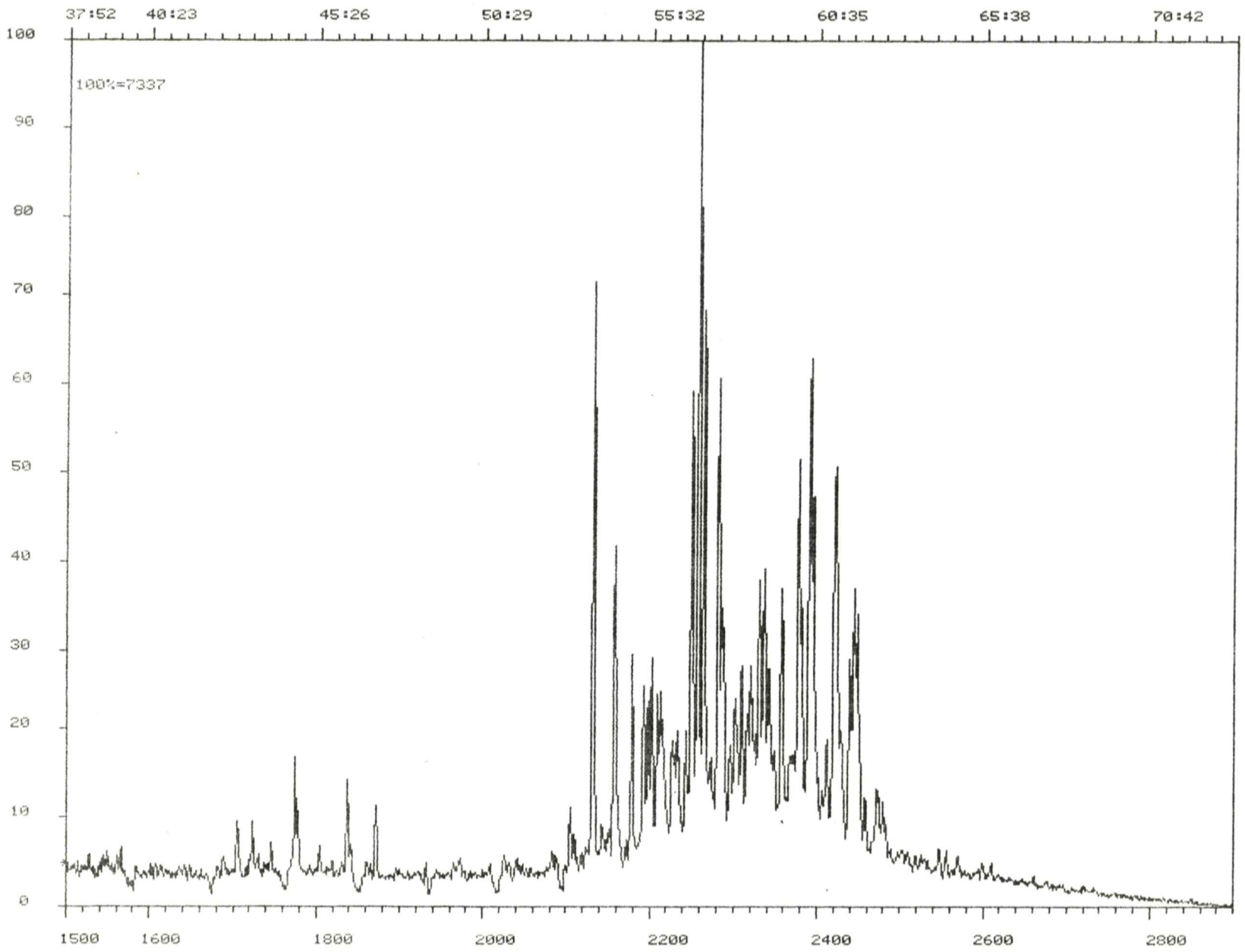

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HIBERNIA K-18DST4

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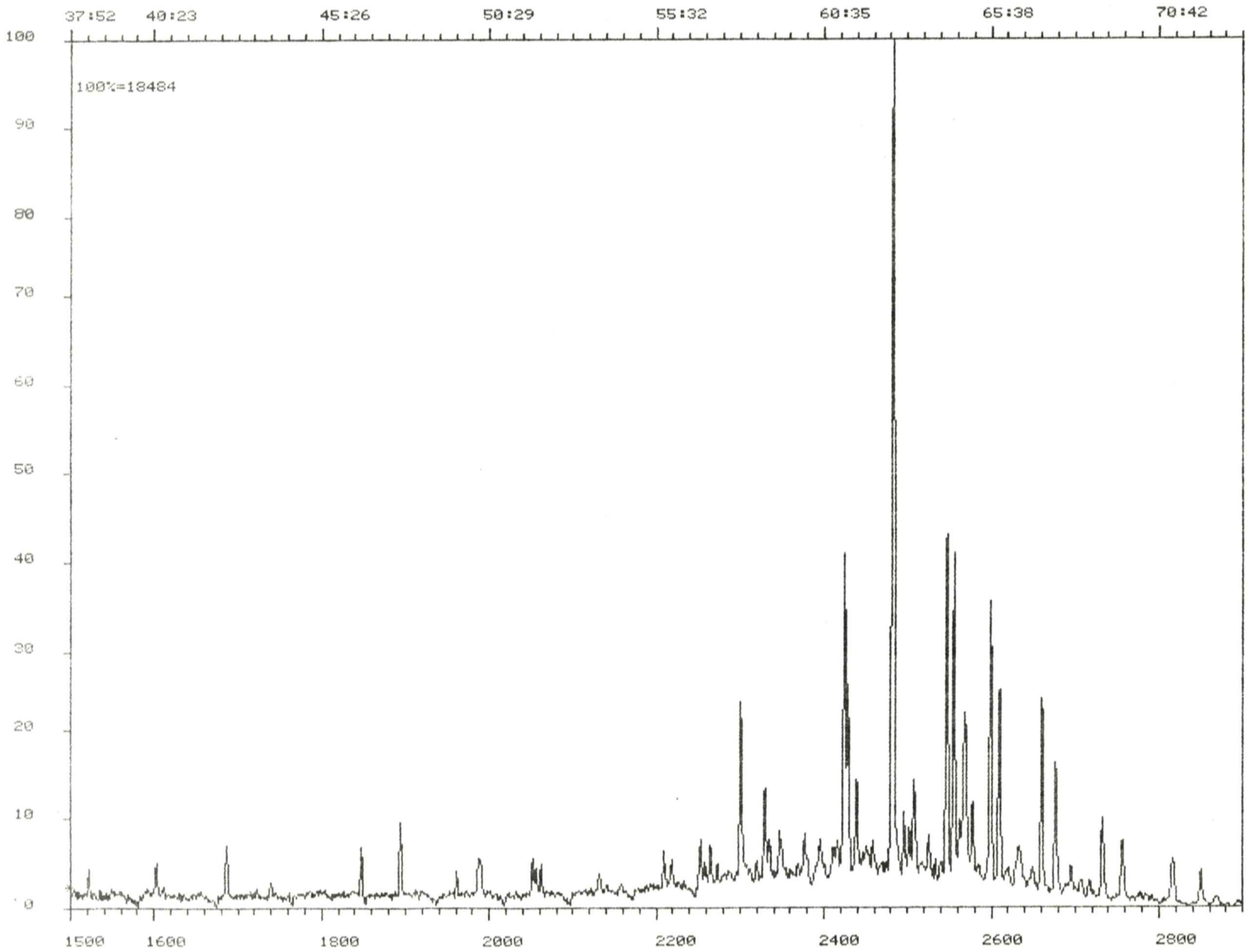

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HIBERNIA K-18DST4

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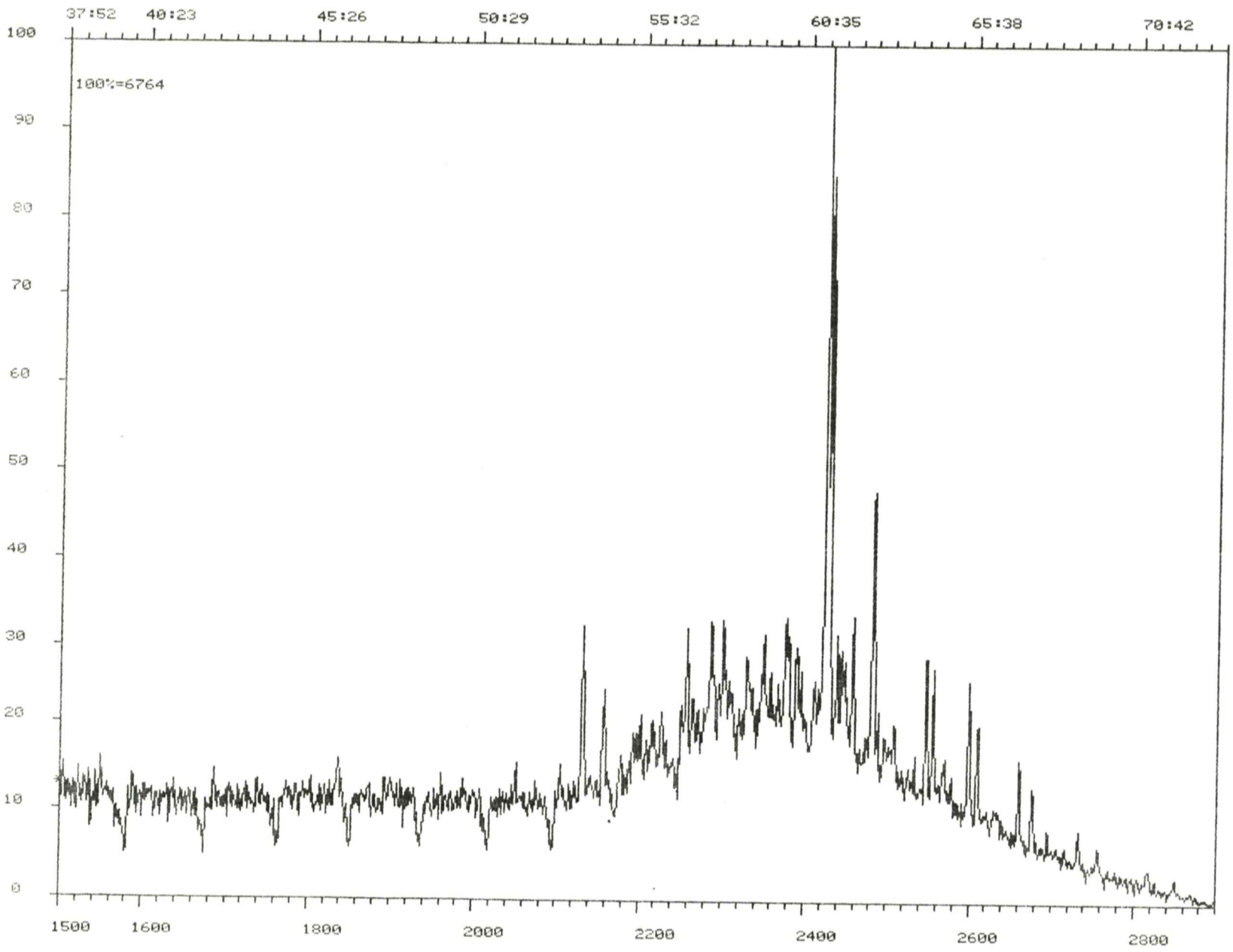

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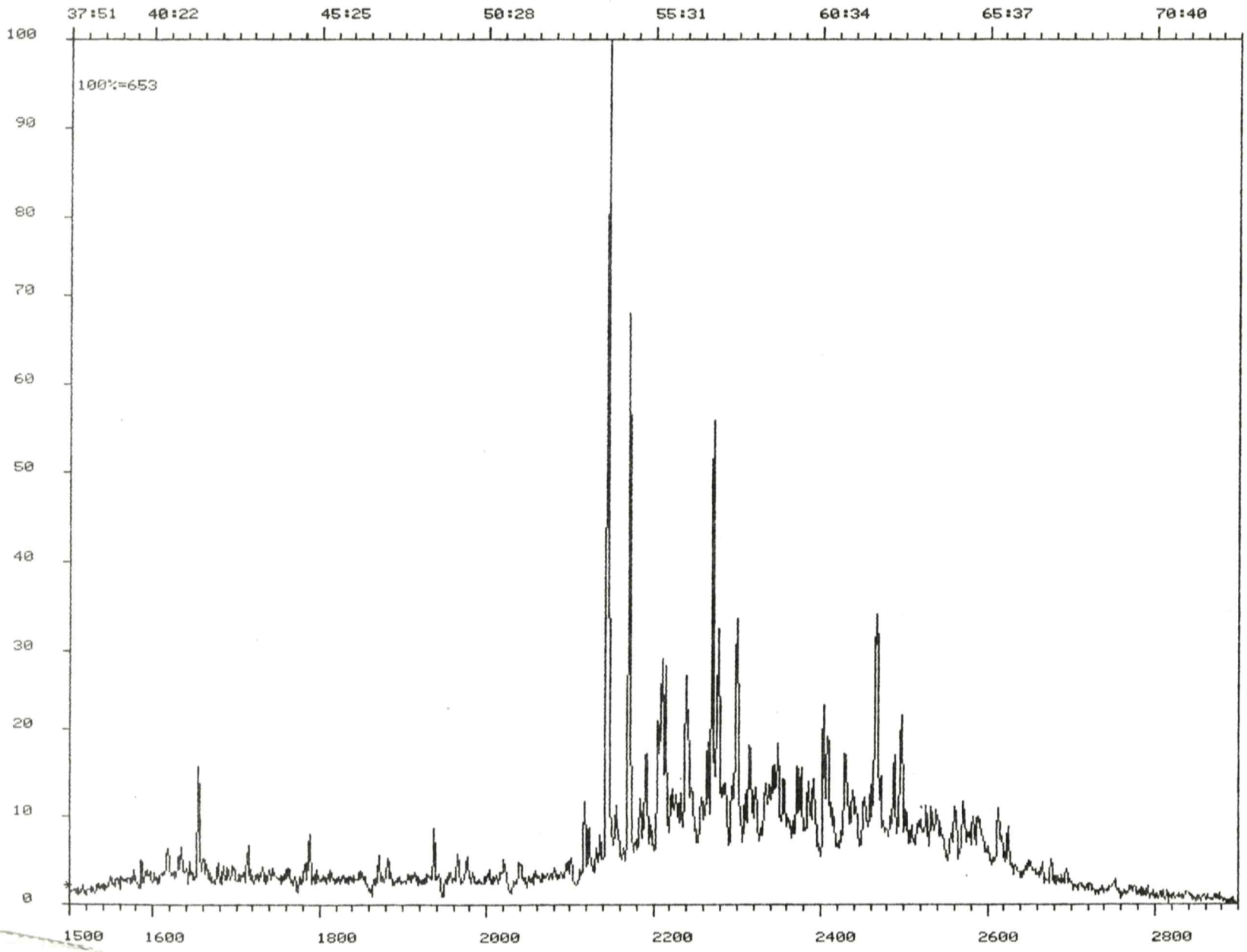
HIBERNIA K-18 DST 13 2285-2294

* 259



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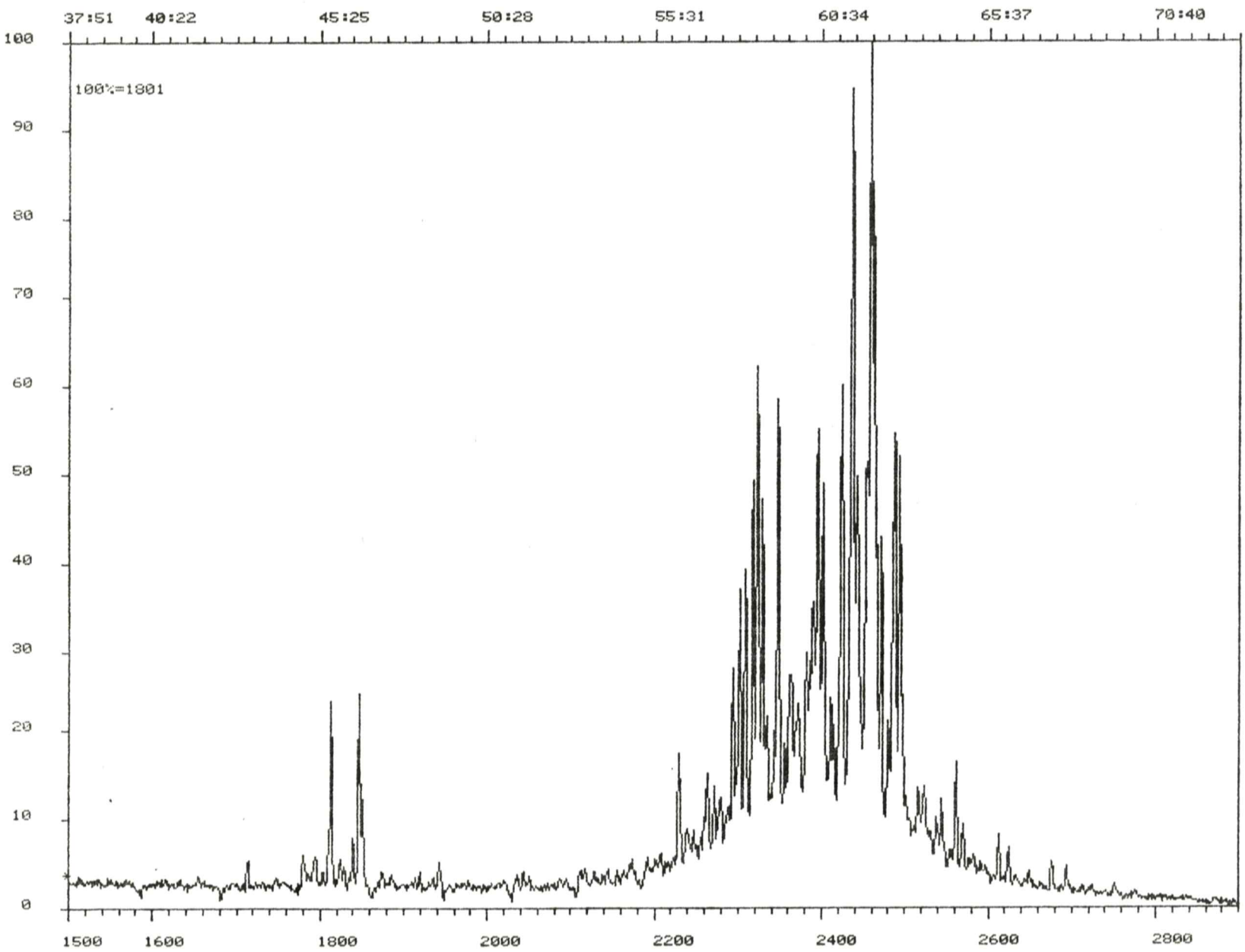
HIBERNIA K-18 DST 13 2285-2294

* 231



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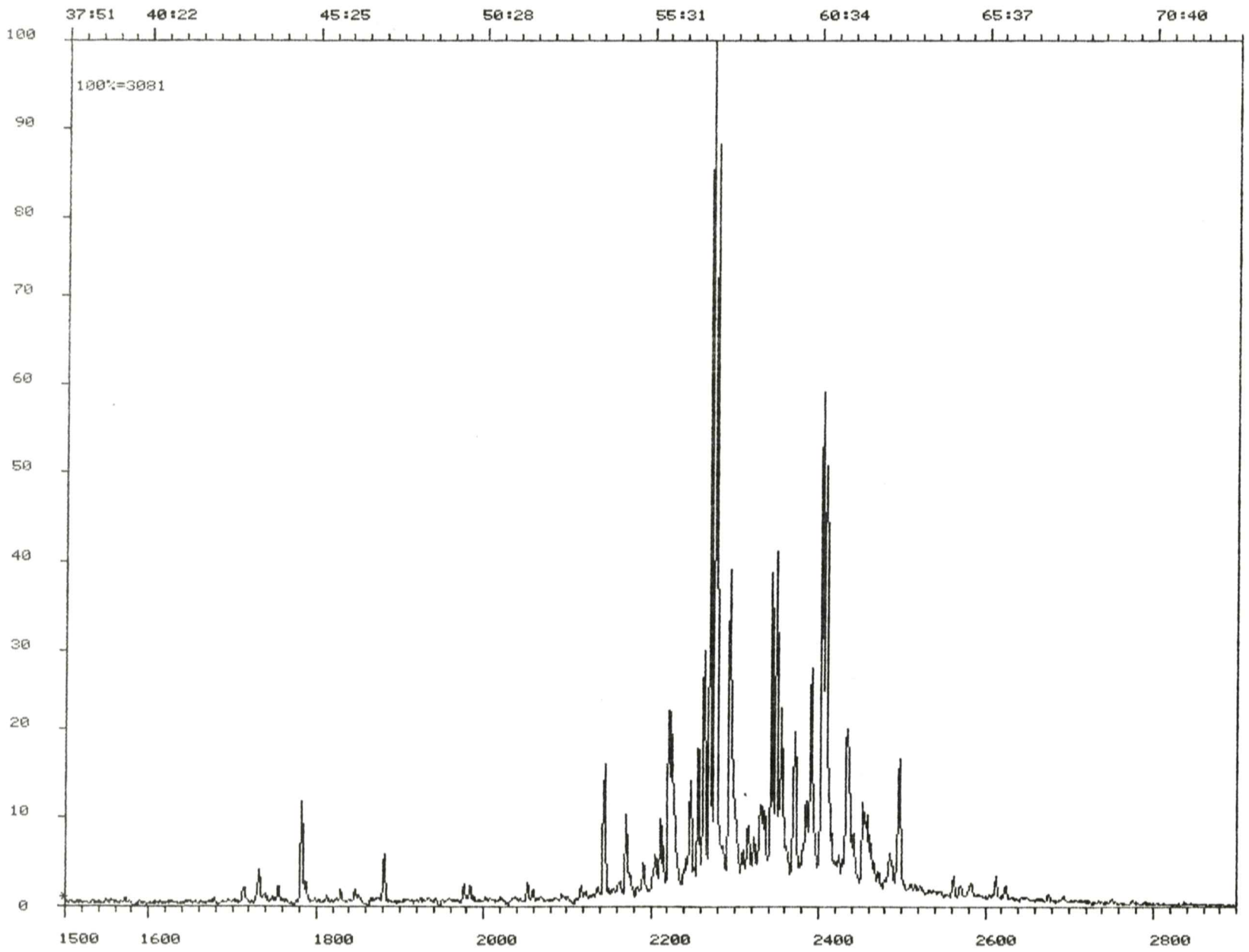
HIBERNIA K-18 DST 13 2285-2294

* 218



DS-55 CROSS SCAN REPORT, RUN: 202650001

HIBERNIA K-18 DST 13 2285-2294

* 217