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Rapport/Report

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Resymé Konklusjon Anbefaling
Summary Conclusion Recommendation

Cretaceous sandstone stringers (2375-90m and 2470-2530m), believed to contain migrated HC, have been extracted and show low content of hydrocarbons. All samples are early mature. The hydrocarbon distribution in samples 2470-2530m indicates a terrestrial origin. Sample 2375-90m is dominated by an algal signature. There is no clear evidence of mature migrated hydrocarbons in these sandstones.

Upper Jurassic source rocks in the interval 2902-2911m have good potensial for gas/condensate. Maturity assesments suggest this source horizon to be in the state of early oil generation.

Oils from well 34/8-1 do not correlate with extracted hydrocarbons in well 34/8-2.

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CONTENT:

1. INTRODUCTION.

The aim of this report is to evaluate Late Jurassic source rocks, characterize 'shows' in Cretaceous sandstones and to correlate oils in well 34/8-1 with source rocks and 'shows' in well 34/8-2.

The location of the wells are indicated on the map,- next page.

The following samples are investigated:

a. Source rock evaluation: SWC's 2898.5 m
2902.0 m
2905.0 m
2908.0 m
2911.0 m
2917.0 m

b. Shows, Creataceous sandstone of DC-samples:

Samples were combined because of low SST-content. Start and end depths indicate analysed intervals of combined samples:

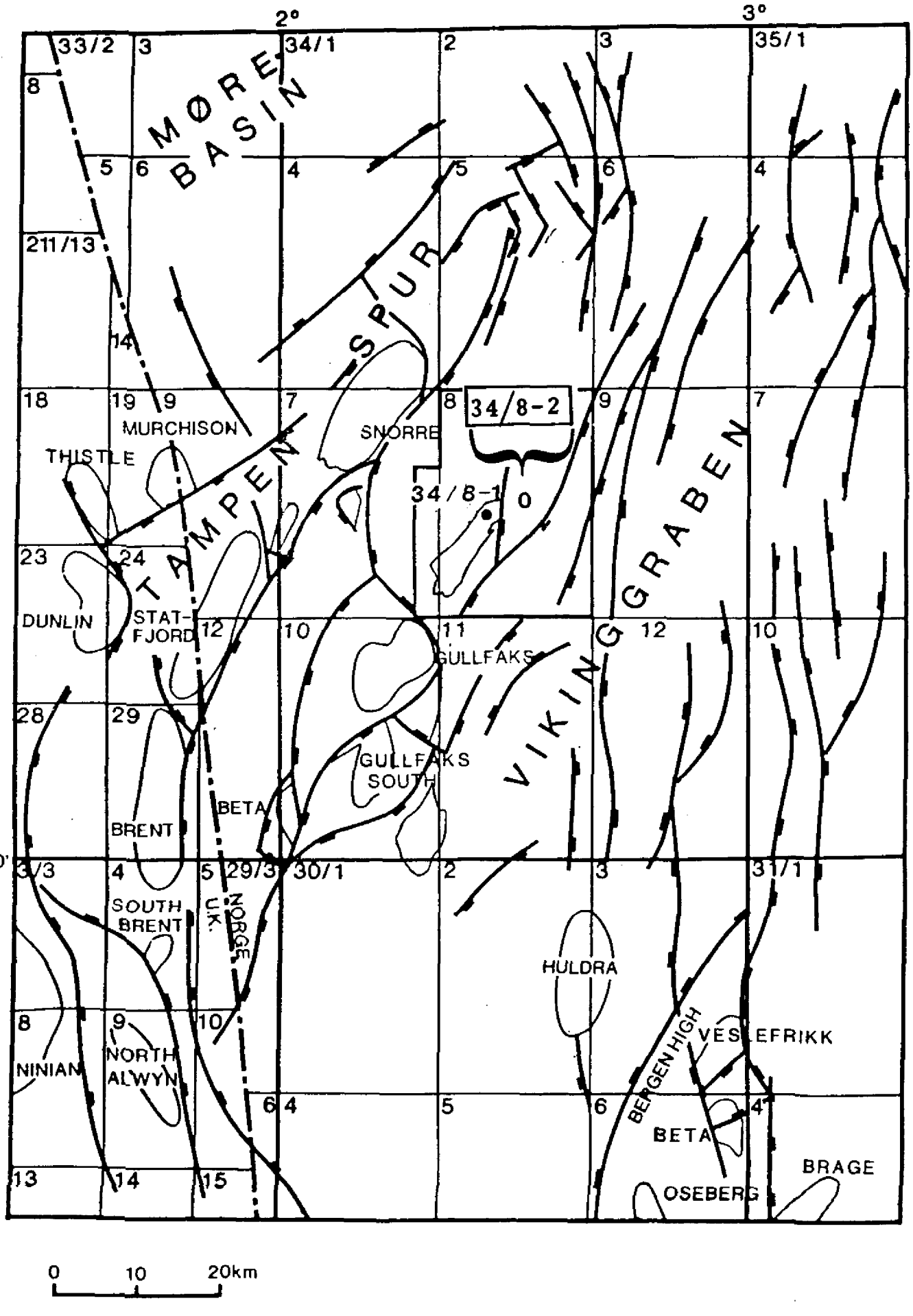
2375-90 m, 10% SST
2470-85 m, 10% SST
2485-95 m, 15% SST
2495-2515 m, 20% SST
2515-30 m, 30% SST

c. Oils, well 34/8-1:

Stock Tank Oil (STO)
DST #2
Test #3

Sample labelled 'biom.std.' is an internal reference sample for analytical control.

MAIN STRUCTURAL ELEMENTS, TAMPEN SPUR AREA



2. RESULTS/DISCUSION.

ROCK-EVAL AND TOC ANALYSIS:

Data are listed in table 1, page 6.

a. Source rock evaluation (2898.5-2917m):

Source rock samples (shale/claystone) have TOC values in the range of 1-7 %. Samples 2917m and 2898.5m are the poorest samples with TOC => 1.2-1.6 %.

The source quality (S2 and TOC) tend to increase downwards in the Viking Group shales, but makes an abrupt decrease in the bottom sample, 2917m.
Samples 2898.5 and 2917m have S2 values of
1.9 and 1.2 kg/t => poor source rocks.
This observation support the source rock quality seen by the TOC data.
The other samples (2902-11m) have values in the range of
13-25 kg/t => excellent source rocks.

HI values classify samples 2902-11m to contain mixed type II and III kerogen. Samples 2898.5 and 2917m, as already suggested by S2 and TOC data, contain type III-kerogen due to low HI. The middle section should thus have potensial both for gas and light oil. The top and bottom part of the formation are gas prone only.

Tmax values of 425-435 °C indicate immature-early mature source rocks.

b. Shows, Creataceous sandstone from DC-samples:

DC-sample 2370-2530m have a SST content in the range of 10-30%. TOC values for these SST-samples are <1%.

Table 1 **SOURCE ROCK SCREENING DATA WELL 34/8-2**

Petroleum Geochemistry Group
Research Center Bergen

HYDRO

Depth (m)	Group/Fm	Lithology	Sample	S1 Kg/t	S2 Kg/t	S3 Kg/t	TOC %	HI	OI	PI	Tmax Deg.c	Company
2390.00	SHETLAND	SST(10%)	DC				0.7					GEOLABNOR
2485.00	SHETLAND	SST(10%)	DC				0.4					GEOLABNOR
2495.00	SHETLAND	SST(15%)	DC				0.3					GEOLABNOR
2515.00	SHETLAND	SST(20%)	DC				0.2					GEOLABNOR
2530.00	SHETLAND	SST(30%)	DC				0.2					GEOLABNOR
2898.50	VIKING	BULK	SWC	0.0	1.9	1.3	1.6	121.0	85.4	0.0	427	GEOLABNOR
2902.00	VIKING	BULK	SWC	0.1	13.6	1.0	4.0	338.9	25.7	0.0	432	GEOLABNOR
2905.00	VIKING	SH/CLYST	SWC	1.9	15.8	0.2	5.1	310.2	4.1	0.1	427	GEOLABNOR
2908.00	VIKING	SH/CLYST	SWC	3.8	24.7	1.1	7.0	351.4	15.7	0.1	425	GEOLABNOR
2911.00	VIKING	BULK	SWC	0.2	24.8	1.1	6.5	381.2	16.3	0.0	427	GEOLABNOR
2917.00	VIKING	BULK	SWC	0.1	1.2	1.0	1.2	99.2	81.0	0.1	437	GEOLABNOR

VIS. KEROGEN AND VITRINITE REFLECTANCE OF UPPER JURASSIC SHALES:

Vitrinite reflectance measurement of sample 2905 and 2911m give maturity Ro-values of 0.44 (30) and 0.50 (14),- respectively. These data indicates oil window threshold maturity.

Visual kerogen analysis indicate 20-50% inertinite (see Table below). Such high content of 'dead' carbon will lower HI-values and consequently indicate an artificial poor source quality. Considering this effect, some of these source rocks may be upgraded conserning their liquid potensials.
Basicly, the visual kerogen data tend to support the chemical data (TOC, S2) indicating poor quality top and bottom parts and a slightly better part in the middle of the section.

Depth Typ Lithology	LIPT %	AmorL	Lip/DetL	Sp/Pol	Cuticl	Resin	Algae	Dinofl	Acrit	BitL	INERT %	Fusin	SemFus	IntDet	Micrin	Sclero	BitI	VITR %	Tellin	Collin	VitDet	AmorV	BitV
2898.50 swc bulk	NDP										NDP							NDP					
2902.00 swc bulk	20?		*								20?			*				60?			*	*	
2905.00 swc Sh/Clst: ol blk	30?	*	*	**			?				50?	?	**	*				20?			*	*	
2908.00 swc Sh/Clst: ol blk to drk gn gy	40?	*	**	*			?				25?		*	**				35?			**	**	
2911.00 swc bulk	50		**	*							20	*	**	*				30			*	*	
2917.00 swc bulk	10		*								50		?	*				40			*		

PYROLYSIS-GC OF EXTRACTED SOURCE ROCKS:

Pyrograms of SWC's 2898.5,2902,2905,2908,2911,2917m are enclosed in appendix I (please notice different scales).

All pyrolysis patterns are dominated by light hydrocarbons indicating all samples to be gas prone source rocks.

All samples have, more or less, a hump in the range of C_{25}+. This effect is likely due to contaminants introduced during drilling, sampling or sample workup.
This possible contaminant is dominantly present in the good quality samples and can account for an apparent better quality of S2 and consequently HI. A scaledown of HI to approximately 200 for the four best samples is probably more in agreement with the visual kerogen and Py-GC data.

EXTRACTION AND GROUP TYPE SEPARATION:

Extraction is performed by standard 4 hr SOXTECH and separation on silica-cyano/amin columns.

Data are presentated in tables 2 and 3, pages 9 and 10

The extracted SST-samples (Cretaceous Shetland Group) gave all very low yields,- EOM < 1%.
Extacted yields from the source rocks were in the order of 0.2-1.6%. The amounts follow vertically the quality trend seen by Rock-Eval and TOC data.

GC ANALYSIS OF SAT-FRACTIONS:

Chromatograms and peak informations are enclosed in Appendix II and calculated molecular ratios are listed in table 4, page 11

The saturated hydrocarbon pattern indicate a dominating content of higher hydrocarbons in SST's samples 2485-2530m. The other samples, source rocks and SST 2375-2390m, are more affected by an algal signature.
All samples have a high pristane/phytane ratio.

GC ANALYSIS OF ARO-FRACTIONS:

Chromatograms are enclosed in Appendix III.

The results are affected by low aromatic concentrations and are in addition obviously contaminated.

Table 2 **SOURCE ROCK EXTRACTION DATA I WELL 34/8-2**

Petroleum Geochemistry Group
Research Center Bergen
HYDRO

Depth(m)	Group/Fm	EOM(mg)	EOM(%)	Hydrocarbons SAT(%)	Hydrocarbons ARO(%)	Hydrocarbons TOTAL(%)	Non Hydrocarbons NSO(%)	Non Hydrocarbons ASPH(%)	Non Hydrocarbons TOTAL(%)
2390.00	SHETLAND	12.60	0.84	11.20	10.40	21.60	69.30	8.80	78.10
2485.00	SHETLAND	11.50	0.48	13.90	10.40	24.30	66.10	9.56	75.66
2495.00	SHETLAND	19.10	0.76	9.40	5.80	15.20	78.00	6.80	84.80
2515.00	SHETLAND	17.40	0.67	13.80	7.50	21.30	74.10	4.60	78.70
2530.00	SHETLAND	12.40	0.54	9.70	6.50	16.20	75.80	8.06	83.86
2898.50	VIKING	16.70	0.30	6.00	7.10	13.10	76.70	10.20	86.90
2902.00	VIKING	23.00	0.70	20.40	10.40	30.80	45.70	23.50	69.20
2905.00	VIKING	6.30	1.58	1.60	3.20	4.80	79.40	15.87	95.27
2908.00	VIKING	22.40	1.61	13.30	9.80	23.10	58.20	18.67	76.87
2911.00	VIKING	22.60	1.40	8.90	7.50	16.40	72.10	11.50	83.60
2917.00	VIKING	8.20	0.20	1.20	1.20	2.40	46.30	51.20	97.50
Oils from well 34/8-1:									
	STO:			68.38	22.73	91.11	8.57	0.32	0.32
	DST 2:			68.66	23.05	91.71	8.08	0.21	8.29
	TEST 3:			73.40	24.90	98.30	1.70	0.00	1.70

Table 3 **SOURCE ROCK EXTRACTION DATA II WELL 34/8-2**

Petroleum Geochemistry Group
Research Center Bergen
HYDRO

Depth(m)	Group/Fm	TOC (%)	EOM(%)/TOC(%)	SAT(%)/TOC(%)	SAT(%)/ARO(%)	HC/non HC
2390.00	SHETLAND	0.68	1.24	16.47	1.08	0.28
2485.00	SHETLAND	0.37	1.30	37.57	1.34	0.32
2495.00	SHETLAND	0.33	2.30	28.48	1.62	0.18
2515.00	SHETLAND	0.20	3.35	69.00	1.84	0.27
2530.00	SHETLAND	0.20	2.70	48.50	1.49	0.19
2898.50	VIKING	1.57	0.19	3.82	0.85	0.15
2902.00	VIKING	4.01	0.17	5.09	1.96	0.45
2905.00	VIKING	5.08	0.31	0.31	0.50	0.05
2908.00	VIKING	7.02	0.23	1.89	1.36	0.30
2911.00	VIKING	6.50	0.22	1.37	1.19	0.20
2917.00	VIKING	1.21	0.17	0.99	1.00	0.02

Table 4 **SATURATED FRAC., MOLECULAR RATIOS WELL 34/8-2**

Petroleum Geochemistry Group
Research Center Bergen
HYDRO

Depth	Group/Fm	Pr/n-C17	Pr/Ph	CPI-I	CPI-II	n-C17/n-C27
2390.00	SHETLAND	1.30	1.30	1.10	1.10	1.16
2485.00	SHETLAND	0.62	1.05	1.19	1.12	0.32
2495.00	SHETLAND	1.03	1.75	1.14	1.13	0.41
2515.00	SHETLAND	0.67	1.26	1.22	1.27	0.32
2530.00	SHETLAND	0.75	1.26	1.09	1.23	0.36
2898.50	VIKING	1.20	1.80	1.10	1.20	1.44
2902.00	VIKING	1.10	1.90	1.13	1.09	1.10
2905.00	VIKING	1.19	1.26	1.07	1.26	1.05
2908.00	VIKING	1.44	1.26	1.13	1.14	1.22
2911.00	VIKING	1.49	1.43	1.03	1.18	1.24
2917.00	VIKING	1.11	2.40	1.61	1.68	0.95

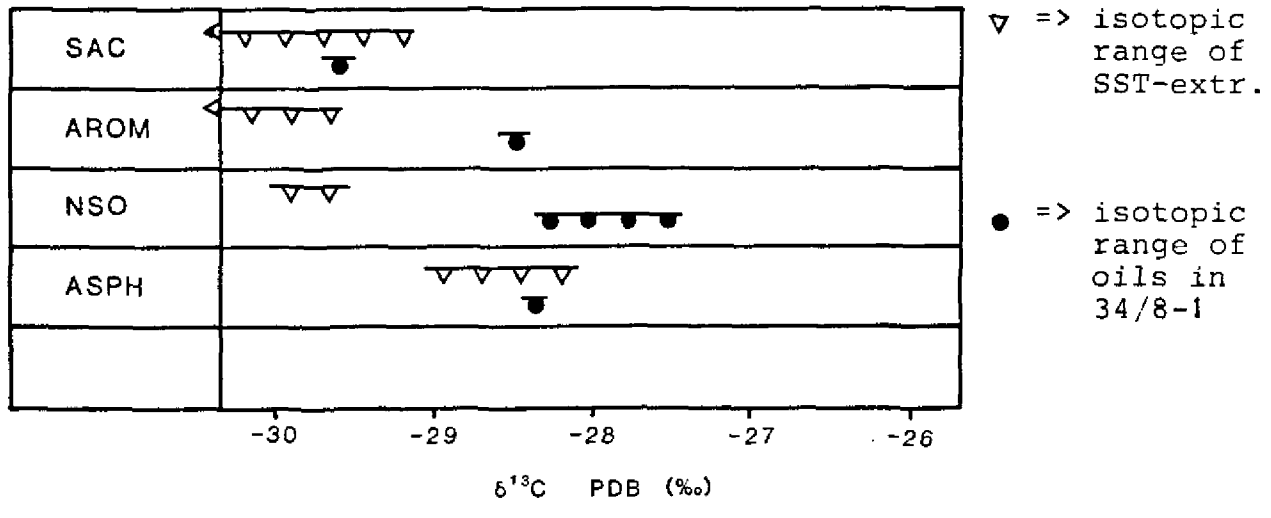
Oils from well 34/8-1:

STO:	0.60	1.56	1.03	1.05	1.77
DST 2:	0.62	1.38	1.06	0.99	1.76
TEST 3:	0.69	1.65	1.03	0.98	4.97

d^{13}-ISOTOPE MEASUREMENT OF FRACTIONS:

Data from extracted SST's and well 34/8-1 oils are presented in table 5 and the enclosed Galimov plot:

0	DEPTH START	1 DEPTH END	2 SAMPLE	3 C-13 Isotope SAT-frac.	4 C-13 Isotope ARO-frac.	5 C-13 Isotope NSO-frac.	6 C-13 Isotope ASPH.-frac.
1	2375.0	2390.0	DC	-30.54	-30.51	-30.01	-28.95
2	2470.0	2485.0	DC	-29.09	-29.60	-29.57	-28.64
3	2485.0	2495.0	DC	-30.48	-29.82	-29.62	-28.12
4	2495.0	2515.0	DC	-31.18	-29.79	-29.73	-28.69
5	2515.0	2530.0	DC	-30.62	-30.29	-30.03	
6	2898.5	2898.5	SWC				
7	2902.0	2902.0	SWC				
8	2905.0	2905.0	SWC				
9	2908.0	2908.0	SWC				
10		BIOM.STD	OIL				
11	2911.0	2911.0	SWC				
12	2917.0	2917.0	SWC				
13		STO	OIL		-28.60	-28.27	-28.49
14		DST2	OIL	-29.53	-28.35	-27.53	
15		TEST3	OIL	-29.69	-28.73	-28.37	-28.28



As illustrated in the Galimov plot there is an apparent mismatch between AROM and NSO fractions from the extracted SST's and Well 34/8-1 oils. Allthough similarities exist in the SAC and ASPH fractions of the oils with some of the sandstone extracts, there is, conclusively, a negative correlation between SST extracts and Well 34/8-1 oils.

GC/MS ANALYSIS OF TRITERPANE/STERANE-BIOMARKERS:

Traditional biomarker ratios for maturity assesments and correlatation purposes are listed in Table 6, page 14.

Maturity ratios applied for all sediment samples:

%-C_{32}-22S: close to equillibrium, equivalent to approx. Ro = 0.5
%-C_{29}-20S: range of 25-35%, at oil window threshold. The 20S is plotted versus depth in fig. 1, page 15

Correlation,- Following traditional biomarker ratios are listed:

%-Ts/Ts+Tm,	plot vs. depth (Fig. 2,p.16)
C_{28}-hopane+moretane/C_{29}-hopane	
Ts+Tm/C_{28}-hopane+moretane	
C_{30}-?/C_{30}-hopane	
C29-βα-20S-/C_{29}-ααα-20R+S-steranes,	plot vs. depth (Fig. 2,p.16)
Total C_{30}-/C_{29}-steranes	
Relative distribution of	
$C_{27,28,29}$-ααα-20R-steranes,	Triangular plot (Fig. 4,p.17)

Comparison of these ratios in Table 6 suggest the samples to be divided into 5 different groups (+ sample #10, biom.std.):

Group 1: sample #1 (SST 2375-90m)
2: #2,3,4,5 (SST's 2470-2530m)
3: #6,8,9,11 (SWC's 2898.5, 2905, 2908, 2911m)
#7 (SWC 2902m) show some familarity to this group
4: #12 (SWC 2917m)
5: #13,14,15 (34/8-2 oils)

According to the relative amounts of C27-28-29 steranes all samples have a marine/estuarine bay type origin (see Fig. 3). This parameter and the relative amounts of Ts/Tm (Fig. 2) separate group 1 and 4. Sample #7 has a relatively high amount of diasteranes compared to the other samples in group 3 but otherwise it classsifies as group 3. Oils from well 34/8-1 form, as expected, a separate group. It can be concluded that the 34/8-1 oils do not correlate with the possible shows in SST samples or with the Upper Jurassic shales encountered in well 34/8-2.

MS3482D

0	DEPTH START	1 DEPTH END	2 SAMPLE	3 %-Ts/Ts+Tm	4 %-C29-20S
1	2375.0	2390.0	DC	49	34
2	2470.0	2485.0	DC	60	27
3	2485.0	2495.0	DC	59	29
4	2495.0	2515.0	DC	58	26
5	2515.0	2530.0	DC	60	24
6	2898.5	2898.5	SWC	37	33
7	2902.0	2902.0	SWC	45	35
8	2905.0	2905.0	SWC	41	30
9	2908.0	2908.0	SWC	38	33
10		BIOM.STD	OIL	60	46
11	2911.0	2911.0	SWC	35	29
12	2917.0	2917.0	SWC	18	36
13		STO	OIL	83	52
14		DST2	OIL	84	50
15		TEST3	OIL	81	57

0	DEPTH START	5 C29-ba-20S/ C29-aaa-20R+S	6 %-C32-22S	7 C28/C29 hopanes	8 C27/C28 Ts+Tm/hop.+mor.
1	2375.0	0.59	58	0.07	10.59
2	2470.0	1.31	60	0.23	3.99
3	2485.0	1.31	60	0.22	4.13
4	2495.0	1.22	59	0.22	1.11
5	2515.0	1.33	59	0.18	4.28
6	2898.5	0.54	61	0.02	42.59
7	2902.0	0.72	61	0.02	34.86
8	2905.0	0.39	60	0.01	106.89
9	2908.0	0.49	60	0.01	121.78
10		2.46	62	0.62	1.49
11	2911.0	0.44	63	0.00	194.13
12	2917.0	0.83	64	0.07	9.88
13		4.23	64	0.33	5.80
14		4.40	63	0.35	4.94
15		6.61	63	0.36	5.15

0	DEPTH START	9 C30?/C30-hop.	10 Tot.C30/C29 steranes	11 %-C29 aaa-20R	12 %-C28 aaa-20R	13 %-C27 aaa-20R
1	2375.0	0.04	0.26	28	29	42
2	2470.0	0.08	0.28	32	32	36
3	2485.0	0.08	0.24	31	33	36
4	2495.0	0.08	0.24	31	34	35
5	2515.0	0.06	0.23	30	37	33
6	2898.5	0.04	0.24	27	27	45
7	2902.0	0.04	0.23	31	23	46
8	2905.0	0.03	0.26	29	27	44
9	2908.0	0.02	0.28	29	28	42
10		0.06	0.17	42	20	37
11	2911.0	0.01	0.21	26	28	45
12	2917.0	0.03	0.23	39	20	42
13		0.14	0.20	37	24	40
14		0.15	0.19	33	24	43
15		0.12	0.22	29	23	48

Table 6.

Biomarker data

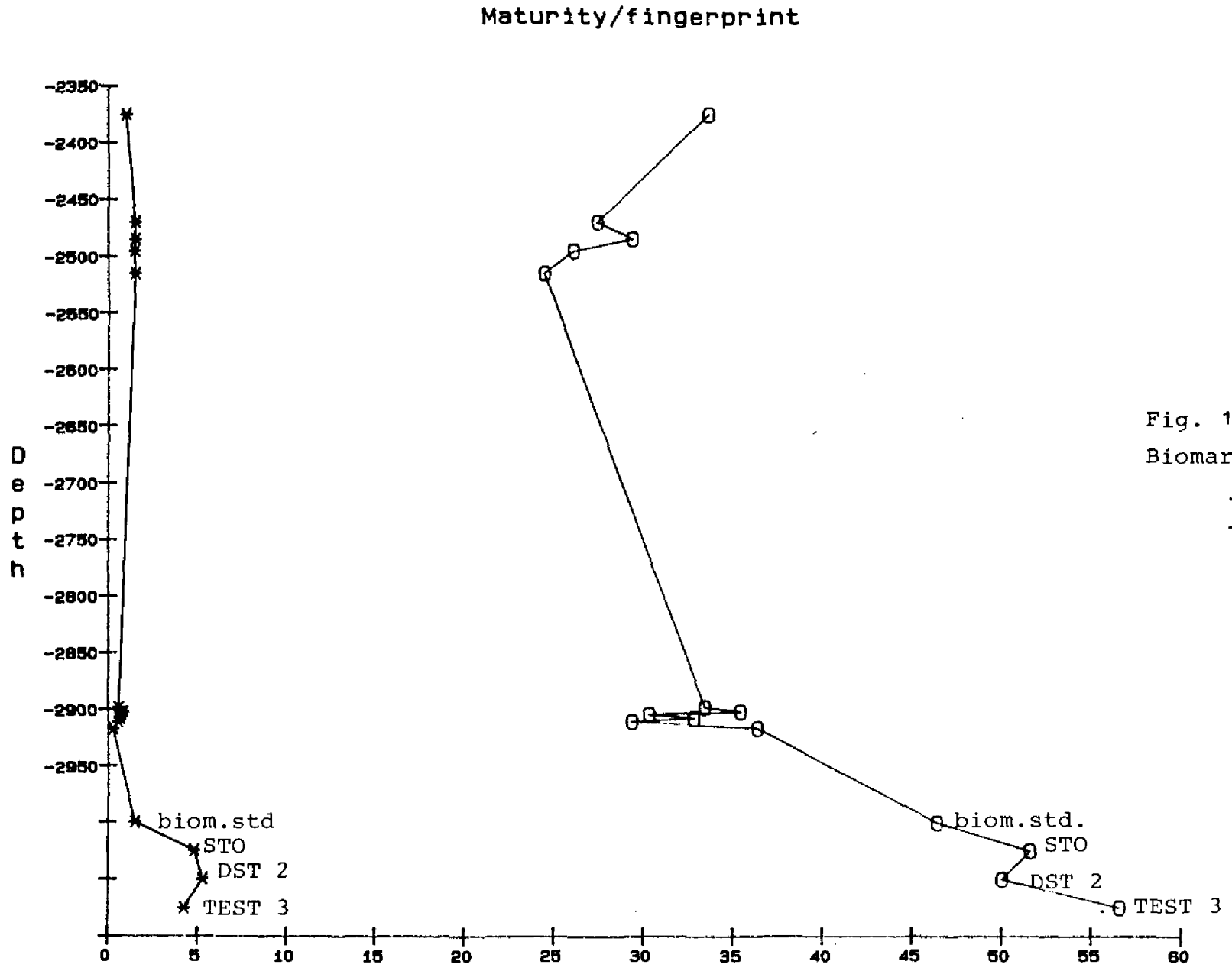


Fig. 1

Biomarker data vs. depth

—*— Ts/Tm

—O— C29-%-20S

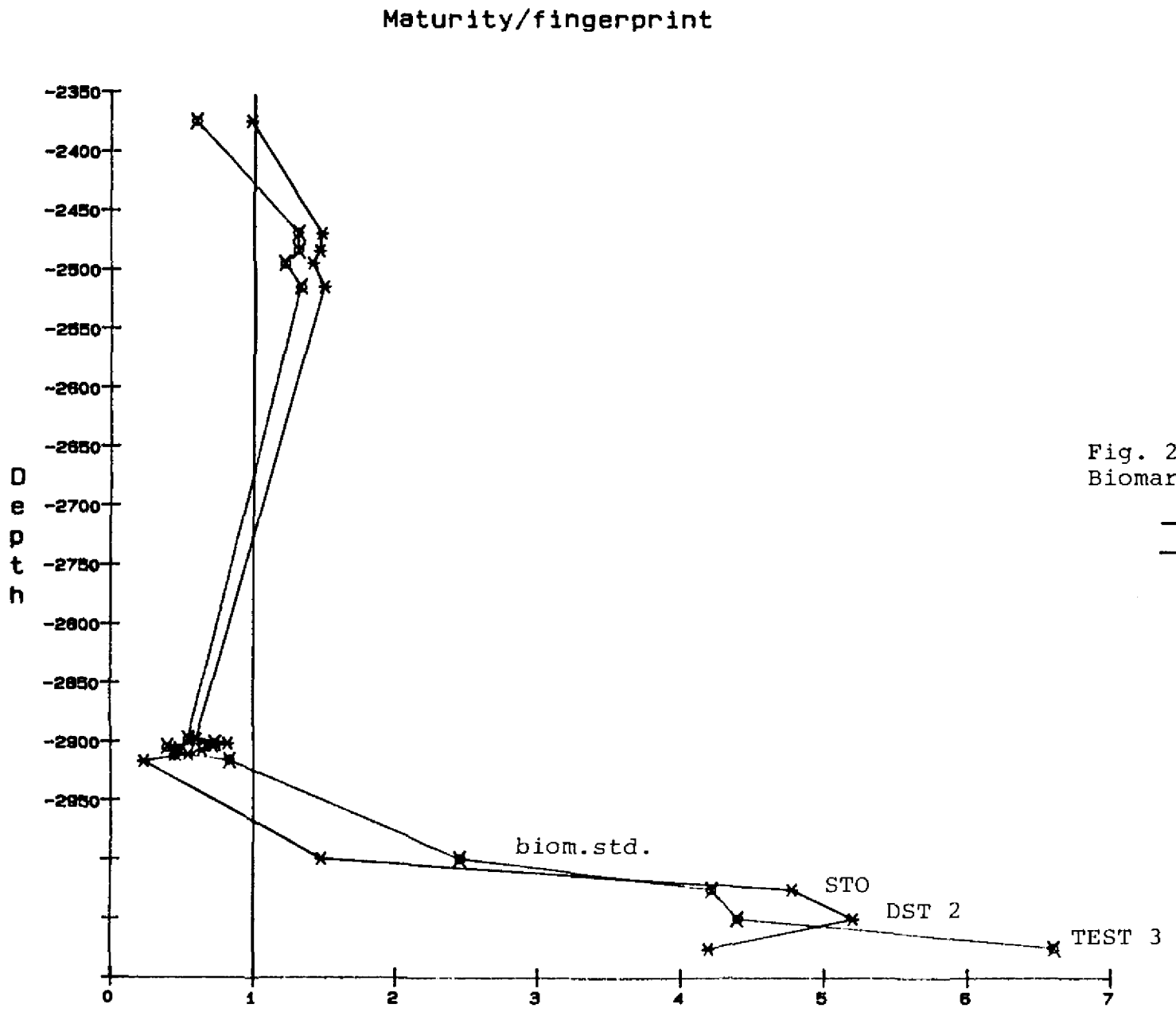


Fig. 2
Biomarker data vs. depth

—*— Ts/Tm
—X— C29 ba/aaa-20R+S

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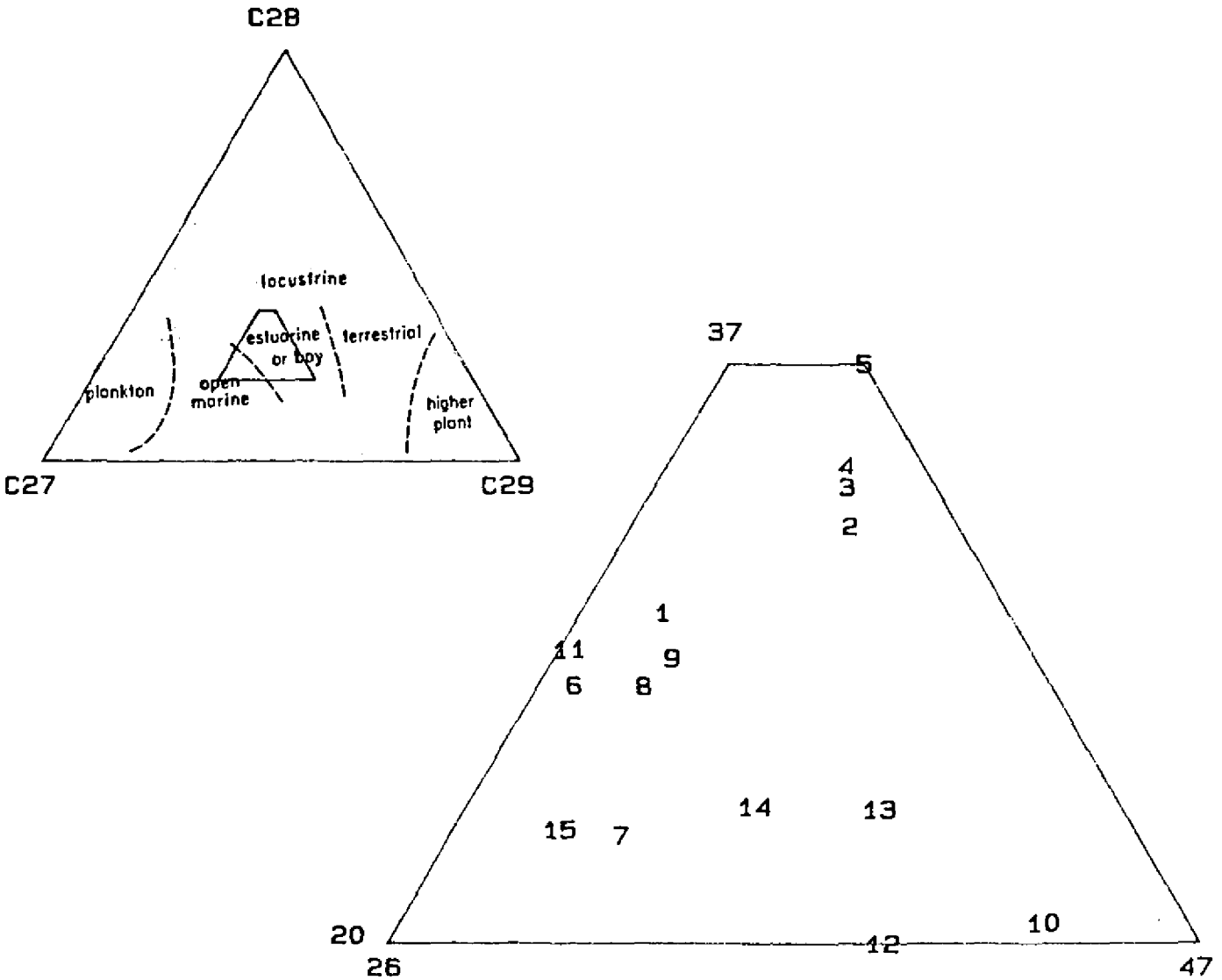


Fig. 3

Biomarker data

%-relativ distribution of C27-28-29 aaa-20R-steranes

MULTIVARIATE STATISTICAL ANALYSIS:

This multivariate comparison is performed by the following procedure:

Data pretreatment/reduction:

1. Shift correction of possible variation in retention time.
2. All fragmentograms(transitions), representing each sample, are linked into one file/fingerprint.
3. Data reduction by rejecting data points of neglectable variance.
4. Subtraction of background.
5. Data reduction by Maximum Entropy method.
6. Normalization to constant area.

This data treatment reject data points of no significance. The number of data points/sample are reduced from 55000 to approximately 1000,- without loss of information.
Resulting fingerprint of each sample are enclosed in Appendix V.
Peak I.D. of group compounds are indicated on sample #10 (biom.std).

Multivariate analysis by Principal Component Analysis(PCA):

The maturity of source rocks and extracted SST's are all in the same maturity range and hence, not concidered in this classification method.

Factor 1 describes most of the variance and is mainly affected by the ralative amounts of triterpanes/steranes,- dominated by C_{32}-, C_{31}-, C_{30}-, C_{29}-, C_{27}-Tm-triterpanes versus C_{27-29}-diasteranes. (Fig. 4, page 20).

Factor 2 indicates negative correlation between regulare steranes versus diasteranes, C_{30}-, C_{29}-shoulder to αβ-, C_{28}-, C_{27}-Ts-triterpanes.(Fig. 5, page 21).

Factor 3 is affected by 'analytical noise' and is therefore not considered. (Fig. 6 and 7, pages 22-23).

Result from this multivariate comparison
of the following samples:

Sample	Description
1	2375_90
2	2470_85
3	2485_95
4	2495_2515
5	2515_30
6	2898.5
7	2902
8	2905
9	2908
10	BIOM.STD
11	2911
12	2917
13	STO
14	DST2
15	TEST3

Please see fig. 8, page 24:

Samples #2,3,4,5 (SST's 2470-2530m) are classified as one separate group.

Sample #1 (SST 2375-2390m) is more correlated to the source rocks (SWC's 2898.5-2911m). However, these source rocks have not reached the maturity sufficient for expulsion of HC and are likely not the origin of these SST extracts.

Expected source rocks (SWC's 2898.5-2911m) can not be classified as uniform. However, there is an indication of similarity between these samples.
Sample #12 (SWC 2917m) is separated from the other SWC's and indicate an different environment of deposition relative to the other samples.

Oils from well 34/8-1 (STO, DST#2, TEST#3) are positively separated from analysed 34/8-2 samples. (This classification can be affected by different maturity between oils and sediment extracts).
Within this group, test#3 is separated from the other two oil samples.

In general, it can be concluded that the 34/8-1 oils do not correlate with either the Cretaceous sandstone extracts or the Upper Jurassic source rocks in 34/8-2.

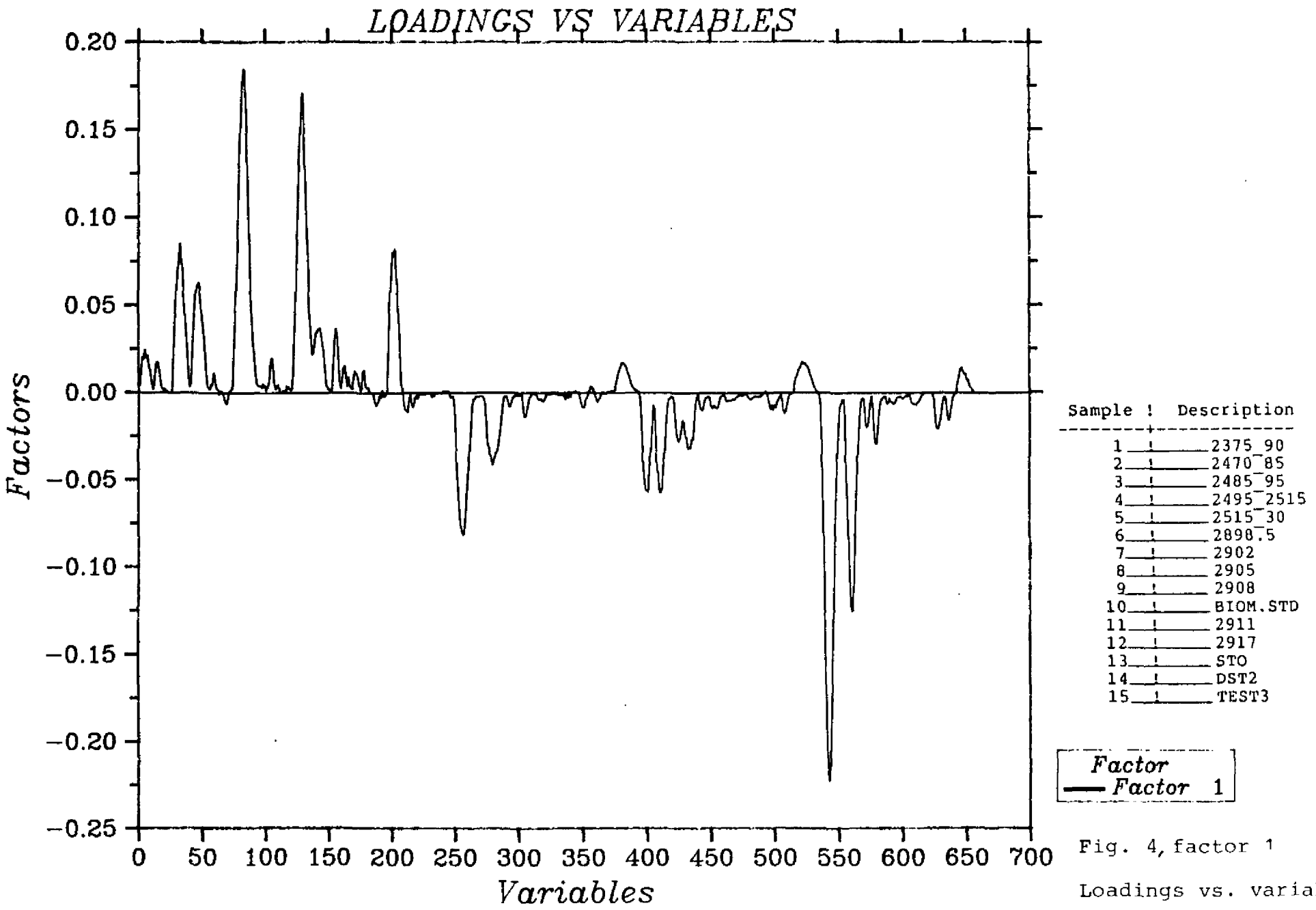


Fig. 4, factor 1

Loadings vs. variables

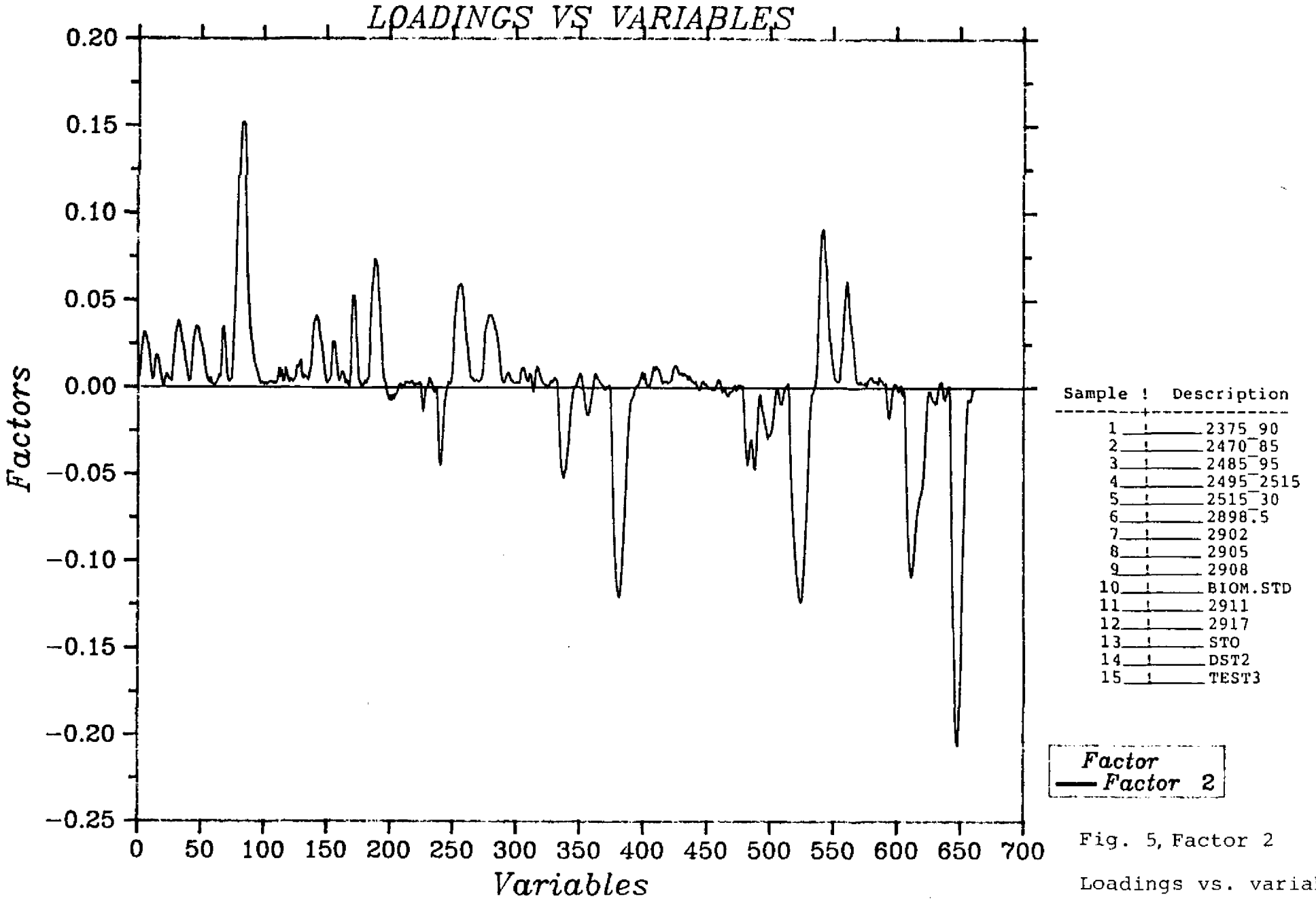
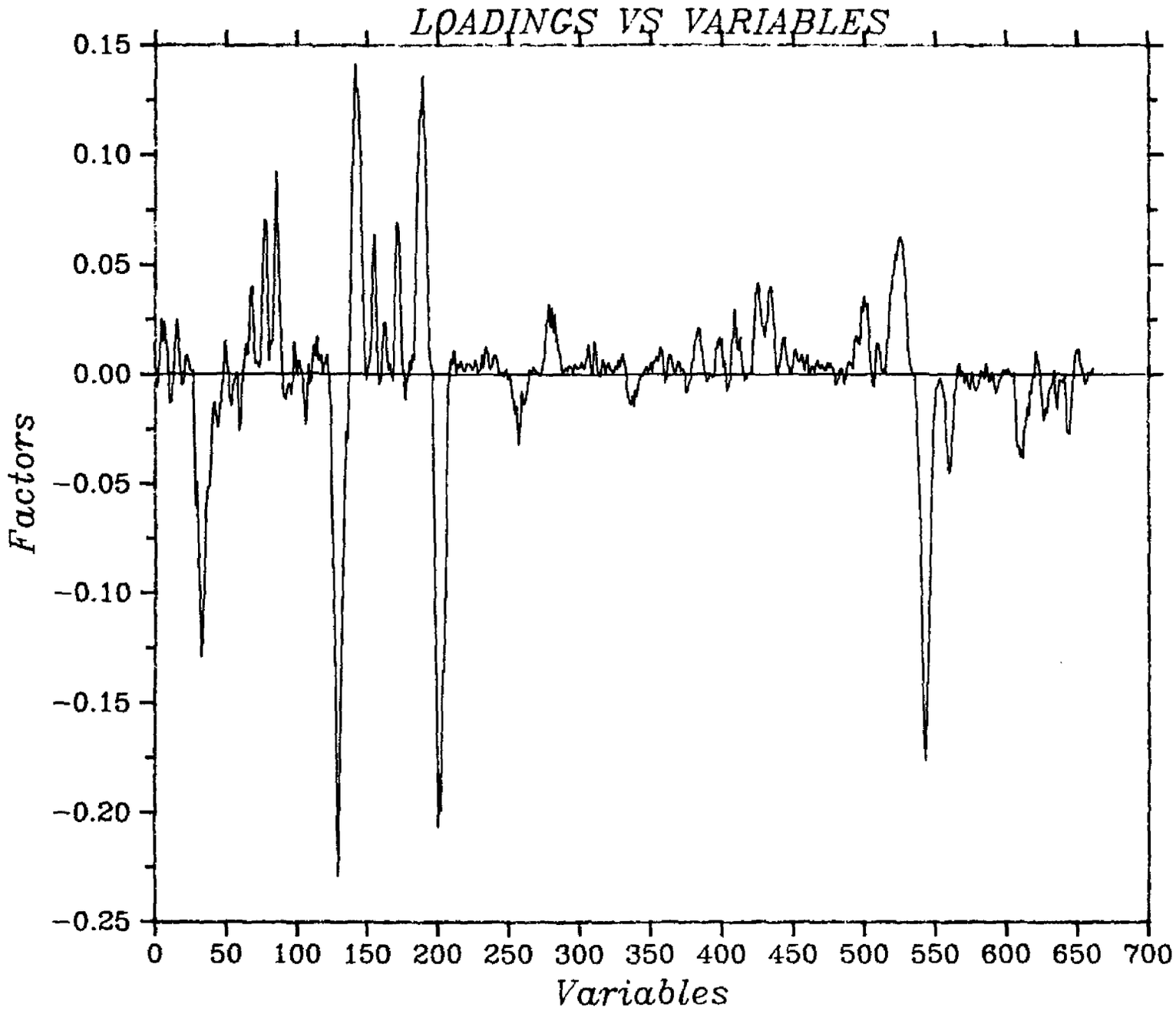


Fig. 5, Factor 2

Loadings vs. variables



Sample	Description
1	2375_90
2	2470_85
3	2485_95
4	2495_2515
5	2515_30
6	2898.5
7	2902
8	2905
9	2908
10	BIOM.STD
11	2911
12	2917
13	STO
14	DST2
15	TEST3

Factor
Factor 3

Fig. 6, Factor 3

Loadings vs. variables

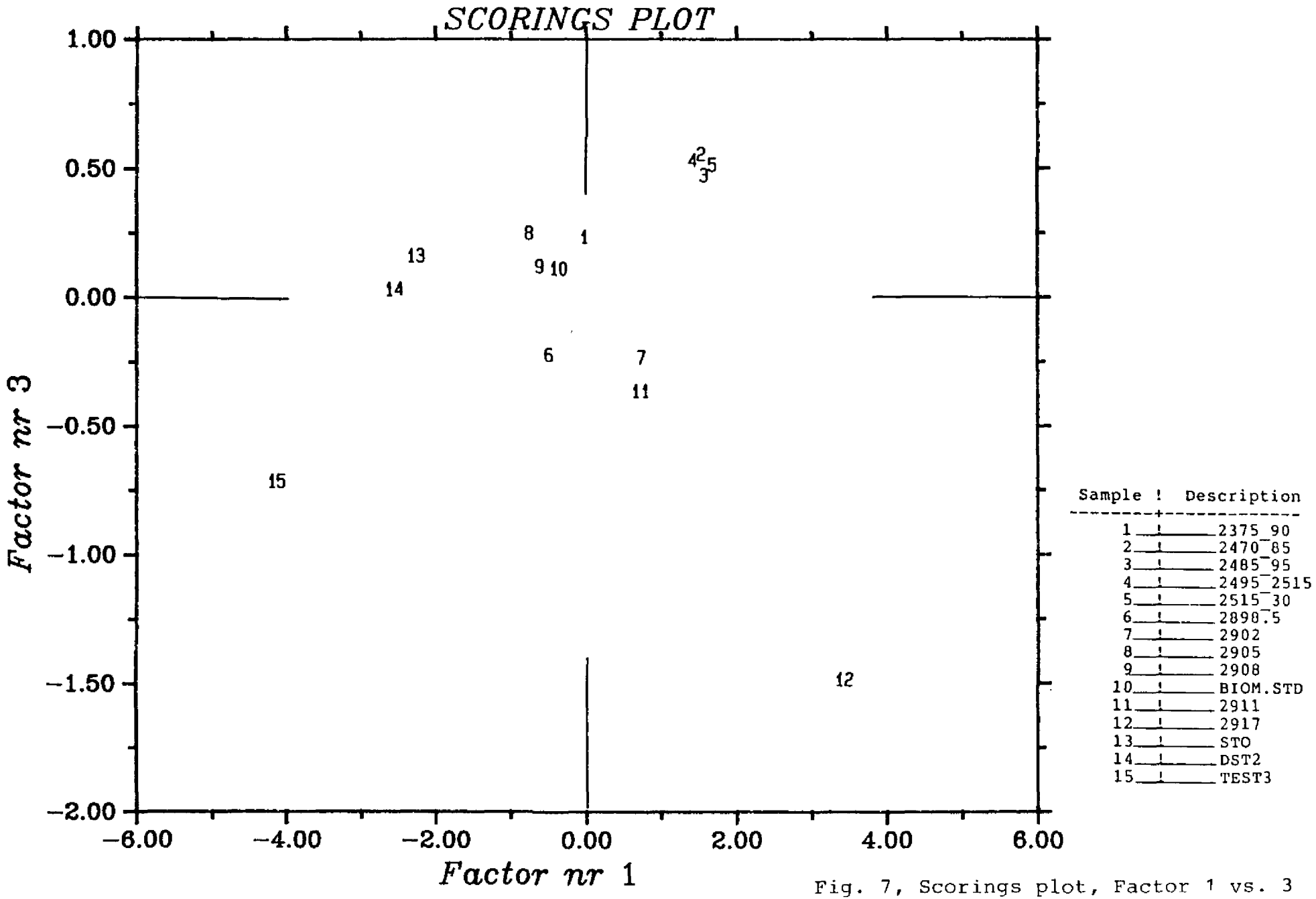


Fig. 7, Scorings plot, Factor 1 vs. 3

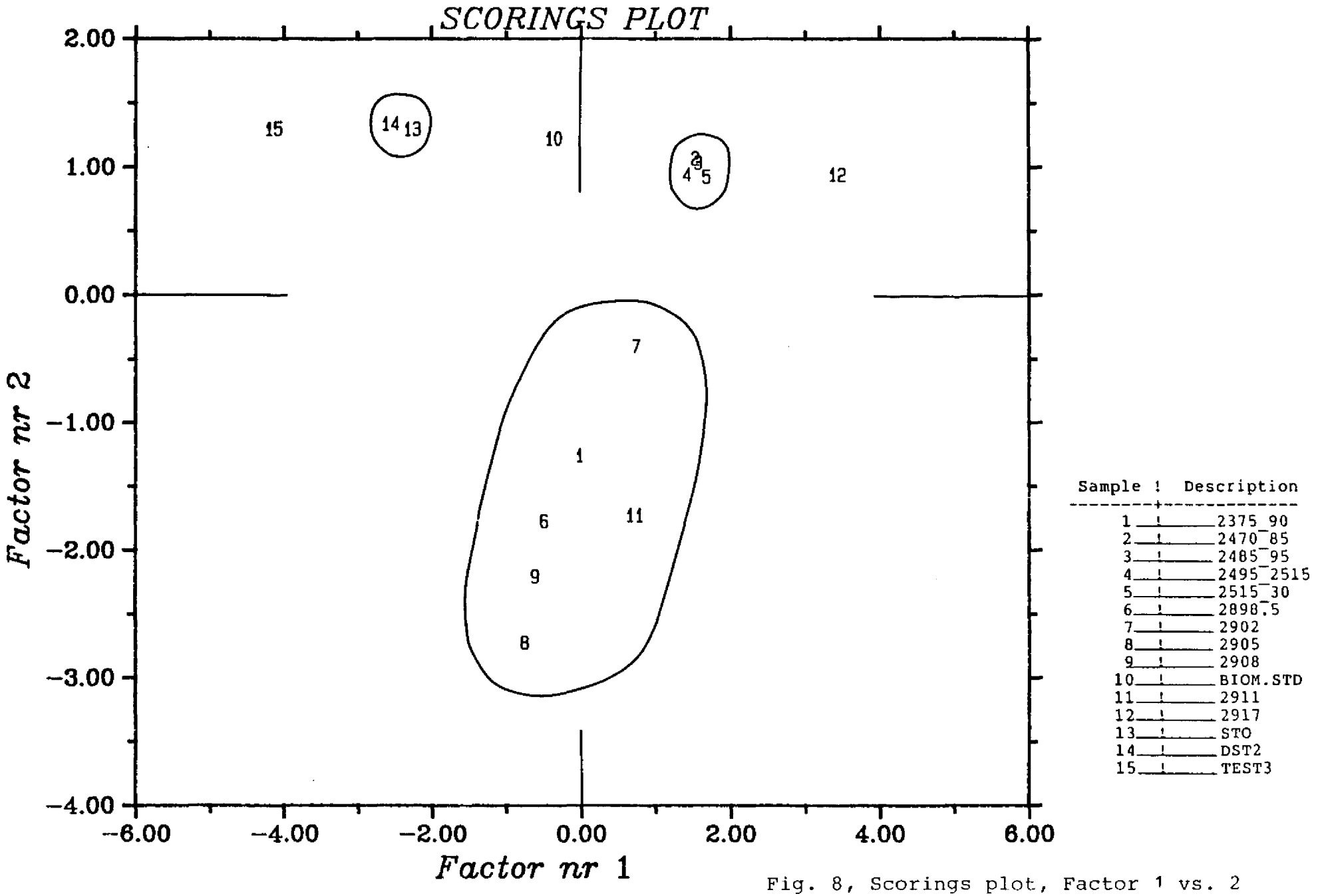


Fig. 8, Scorings plot, Factor 1 vs. 2

3. CONCLUSION.

a. Source rock evaluation:

Viking Group shales are based on their source rock quality classified into two groups:
2898.5 and 2917 m: TOC=1.4, S2=1.6, HI=110 =>
poor quality, gas prone
2902-2911 m: TOC=5.7, S2=19.7, HI=345 =>
excellent quality, gas/condesate prone.
However, contaminants, indicated by pyrolysis-GC may have contributed to the pyrolysis S2 yield and consequently enhanced the source rock quality.
Pyrolysis-GC classify all samples as gas prone source rocks.
Extracted hydrocarbons are less than 30% relative to non-hydrocarbons. N-alkane distribution indicate significant contribution of algal input to the organic matter.
Maturity based on vitrinite reflectance and biomarker isomerization indicate early mature/oil window threshold samples.
Fingerprint analysis suggests a shift in environment of deposition for sample 2917m relative to the other source rocks.

b. Shows, Creataceous sandstone from DC-samples:

Picked SST fractions of DC-samples over 2 Cretaceous intervals (2375-90, 2470-2530m) believed to contain migrated HC have TOC values <1% and extractable organic matter <1%.
Maturity based on biomarker ratios of C_{29}-20S and C_{32}-22S indicates early mature samples.
Relative distribution of saturated hydrocarbons classify these samples into two groups of 2375-90 and 2470-2530m.
Low maturity and the hydrocarbon content in general, excludes these small SST intervals to contain secondary migrated hydrocarbons of significant amounts.

c. Oils, well 34/8-1:

Data from well 34/8-1 oils do not correlate to well 34/8-2 samples, neither source rocks nor possible oil stained sandstones. This result is seen both by traditional correlation using stable isotope measurements/biological marker ratios and comparison of raw data by multivariate statistical analysis of the biological marker content of the analysed samples.

4. REFERENCES

1. Data report for Norsk Hydro Well NOCS 34/8-2, Geolab Nor, Trondheim, 02.03.87.

2. Laboratorie Manual for Petroleums Geokjemi, F-Bergen, Nov.-86

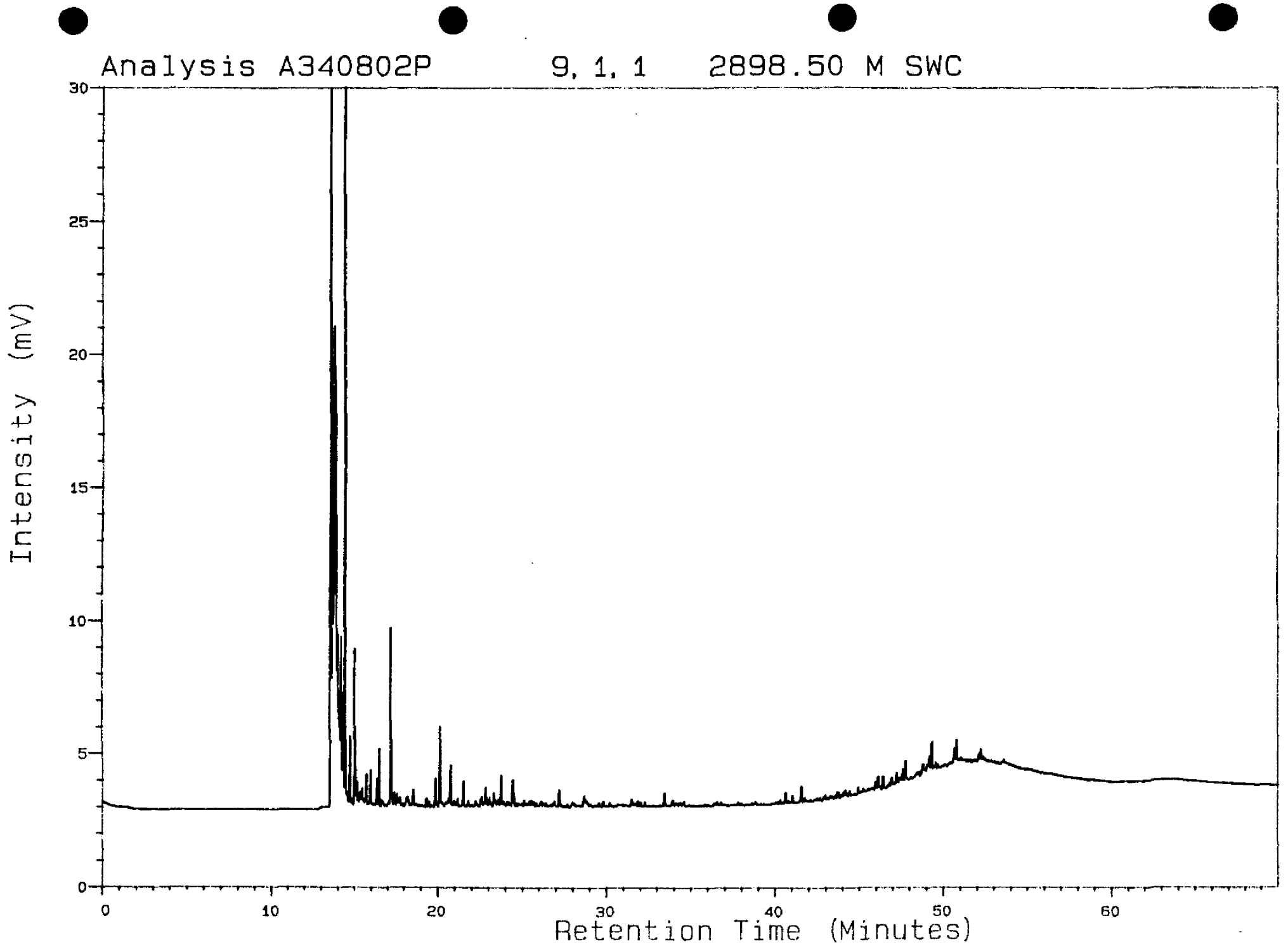
3. Reference sample for GC/NS analysis of Sterane/Triterpane-biomarkers, F-Bergen, Jun.-86

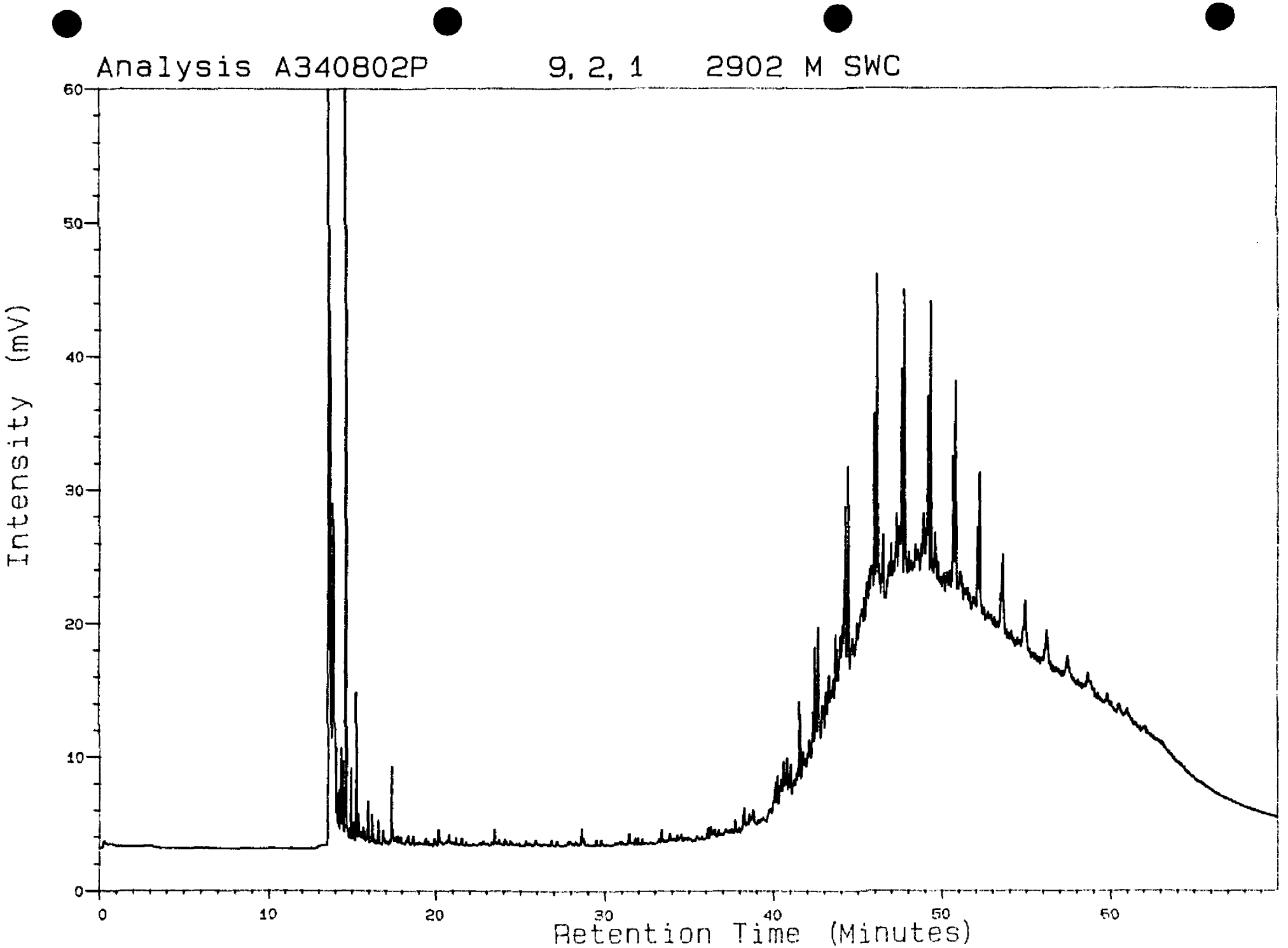
4. Multivariable Analysis of Mass Spectrometric Raw Data, F-Bergen, Oct.-86

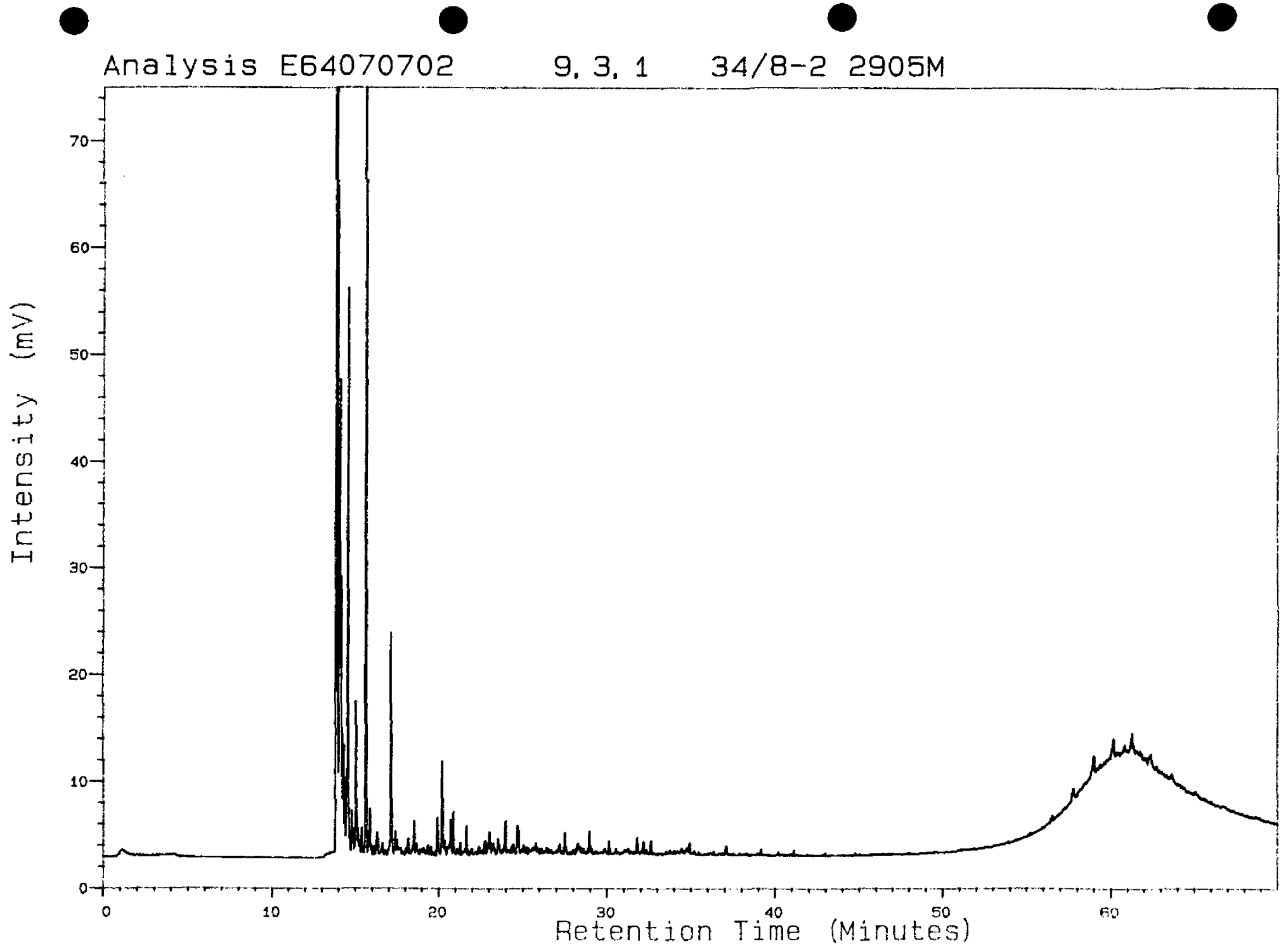
APPENDIX I

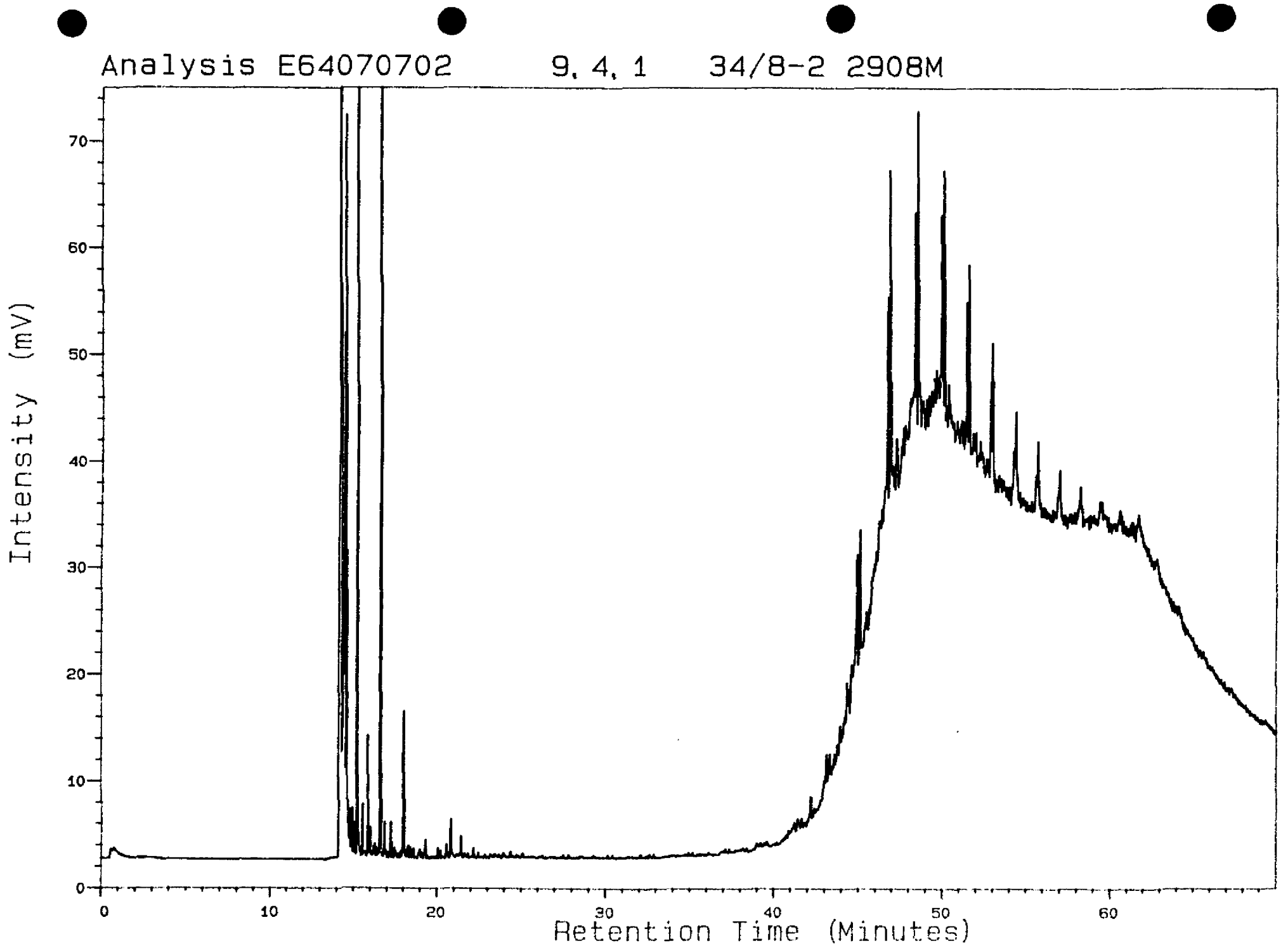
Pyrolysis-GC of extracted samples:

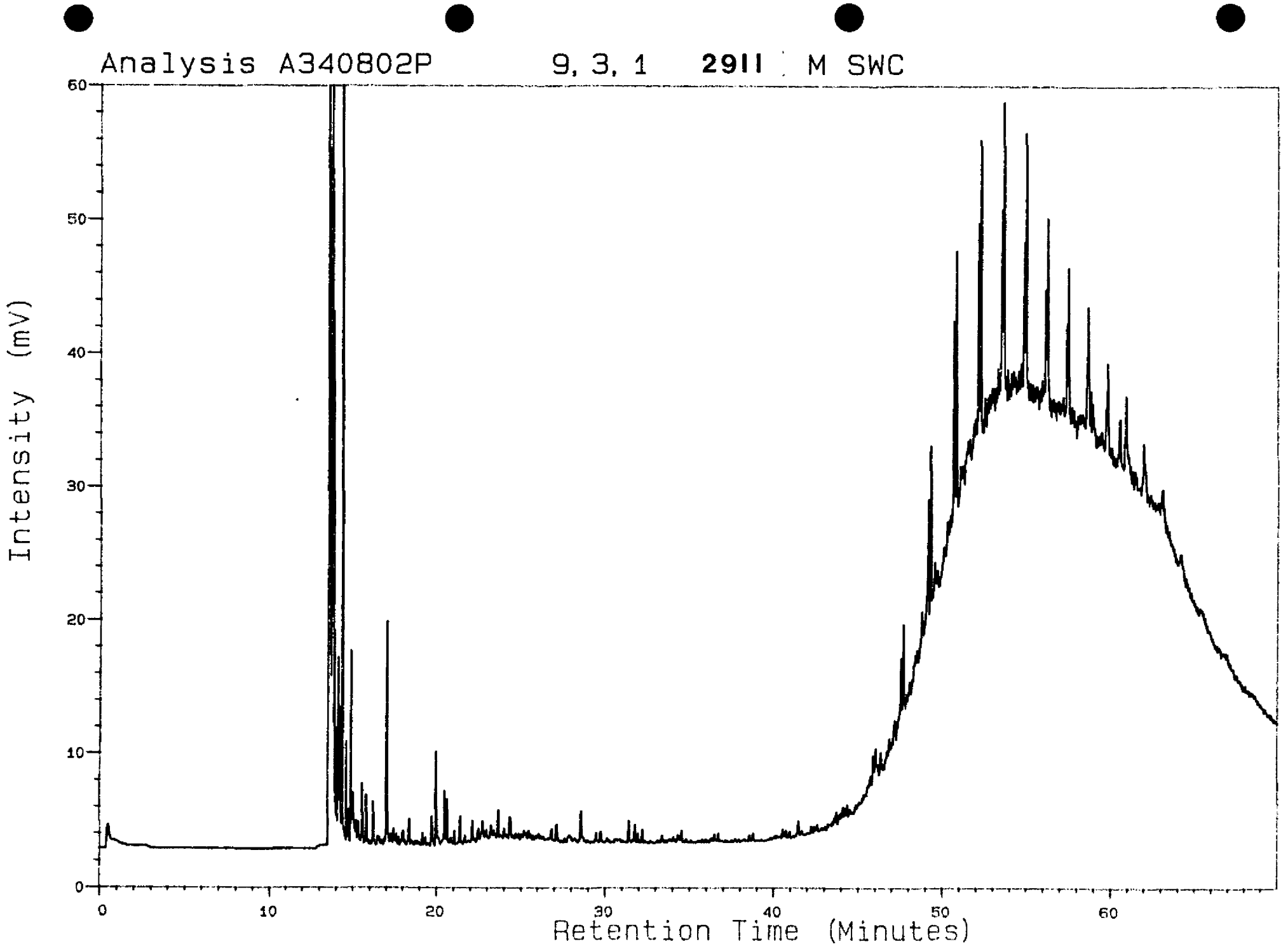
Chromatograms.

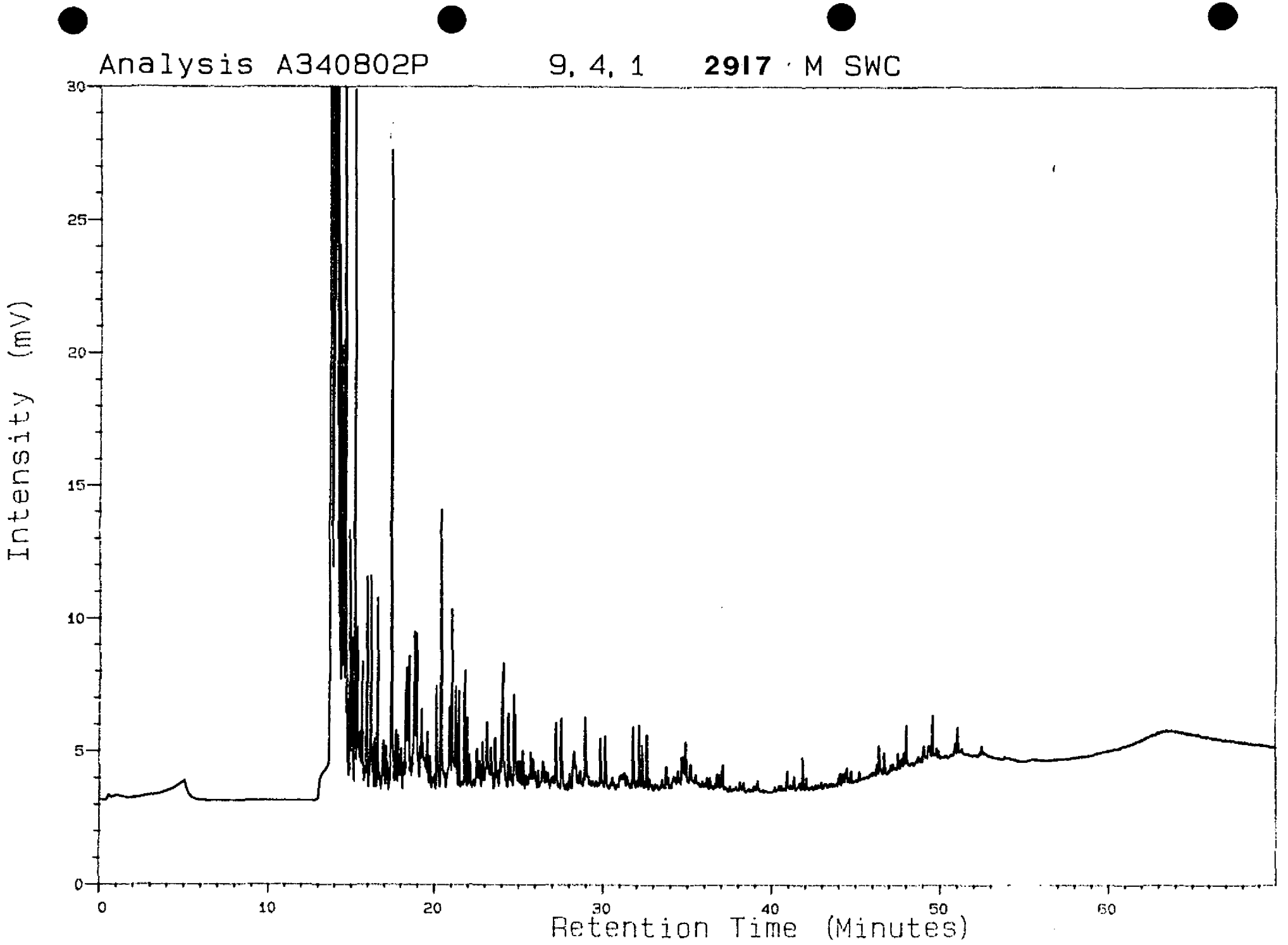

Analysis A340802P 9, 1, 1 2898.50 M SWC
Intensity (mV)
30
25
20
15
10
5
0
0
10
20
30
40
50
60
Retention Time (Minutes)


Analysis A340802P 9, 2, 1 2902 M SWC
Intensity (mV)
0
10
20
30
40
50
60
Retention Time (Minutes)


Analysis E64070702 9, 3, 1 34/8-2 2905M
Intensity (mV)
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
Retention Time (Minutes)


Analysis E64070702 9, 4, 1 34/8-2 2908M
Intensity (mV)
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
Retention Time (Minutes)

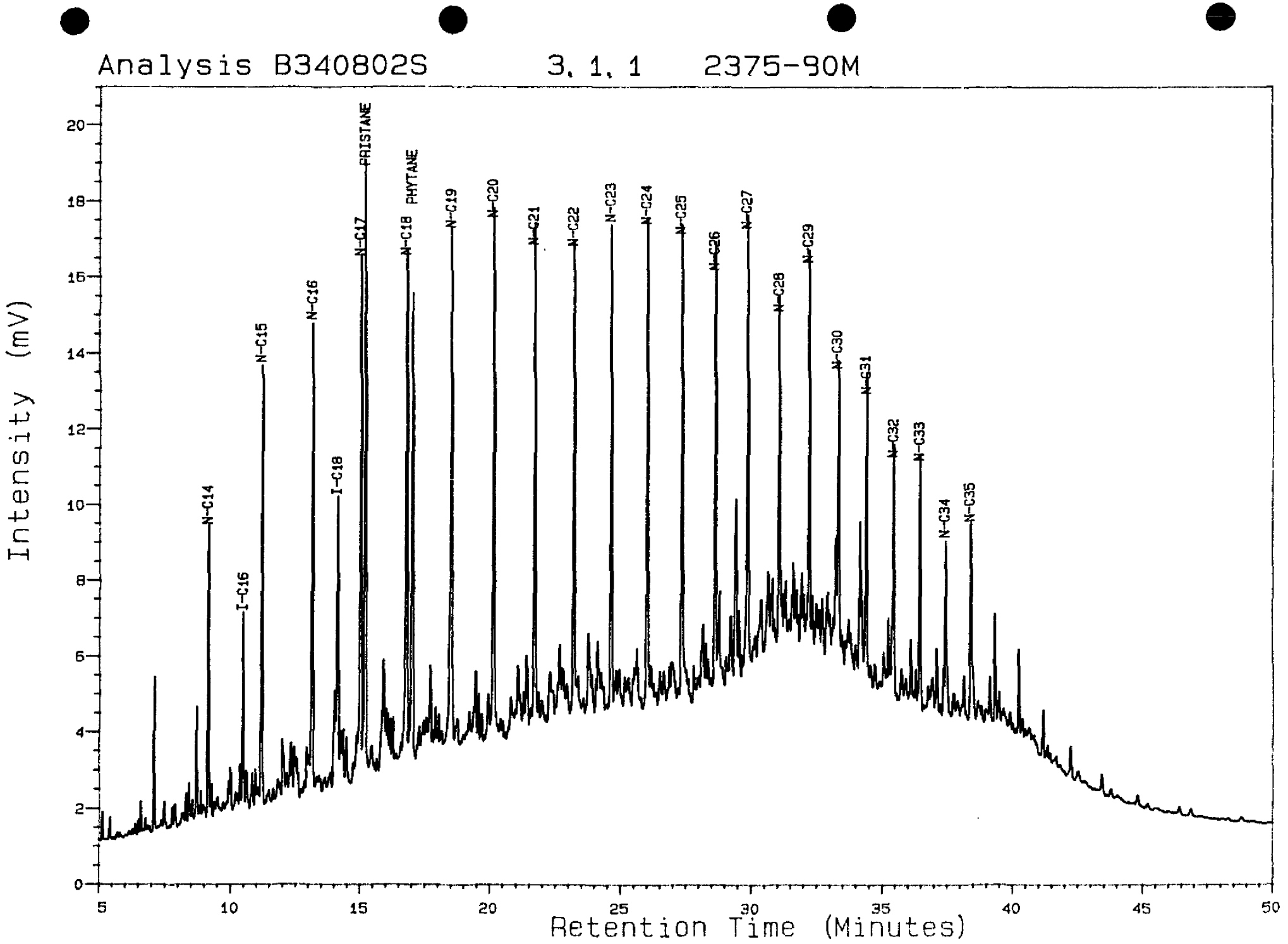

Analysis A340802P 9, 3, 1 2911 M SWC
Intensity (mV)
0
10
20
30
40
50
60
Retention Time (Minutes)


Analysis A340802P 9, 4, 1 2917 M SWC
Intensity (mV)
30
25
20
15
10
5
0
0
10
20
30
40
50
60
Retention Time (Minutes)

APPENDIX II

GC analysis of SAT-fractions:

Chromatograms and peak information.


Analysis B340802S 3, 1, 1 2375-90M
Intensity (mV)
Retention Time (Minutes)
N-C14
I-C16
N-C15
N-C16
I-C18
PRISTANE
N-C17
PHYTANE
N-C18
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35

Analysis: 3 B3406025, 1, 1
Reported on 17-Mar-87 at 13:39

M U L T I C H R O M V3.2

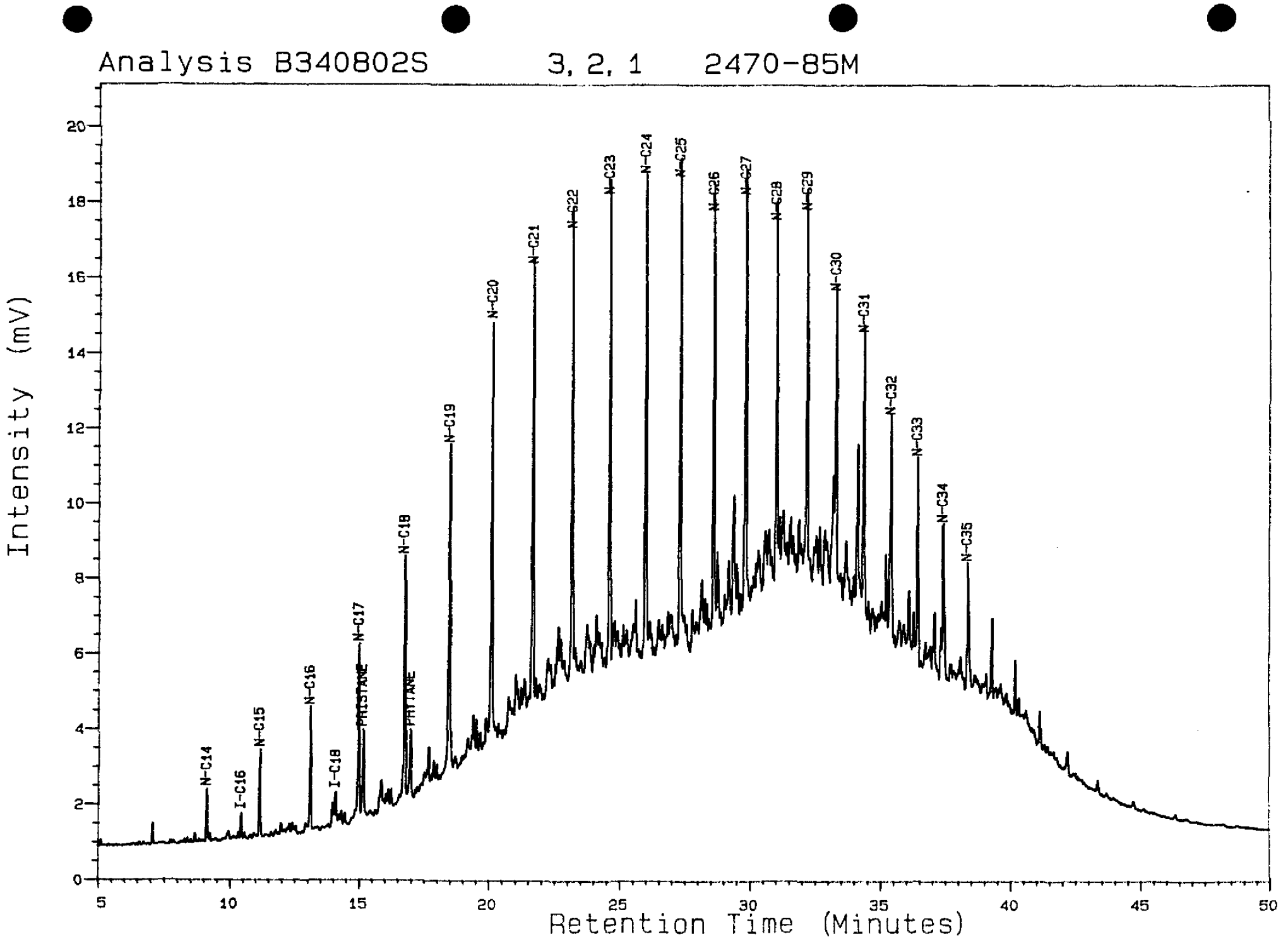
Analyst Name :AFNE Analysis ID: SAT AUTO
Information :34/8-2 SAT

SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3 Date 16-Mar-87 Time 17:45
Analysis:B3406025 Sample Name:2375-80M Sample ID: 0 Bottle:
Sample 1 Injection 1

Peak	R/T m.	RT Corr	RT Val	Hght uV	Area uVs	%	Identity
16	9.157	9.193	1400.0	7710	21771	1.170	N-C14
24	10.472	10.512	1464.4	5163	16743	0.900	I-C16
28	11.200	11.243	1500.0	11493	36415	1.957	N-C15
39	13.160	13.211	1600.0	12266	42077	2.262	N-C16
41	14.133	14.183	1651.8	7636	33656	1.809	I-C18
46	15.037	15.085	1700.0	13503	52745	2.835	N-C17
47	15.211	15.258	1709.7	16038	69099	3.714	PRISTANE
53	16.824	16.869	1800.0	13210	50324	2.705	N-C18
[illegible]	17.037	17.082	1812.5	12242	55361	2.977	PHYTANE
63	18.531	18.573	1900.0	13539	59411	3.193	N-C19
70	20.160	20.200	2000.0	13576	55322	2.974	N-C20
78	21.717	21.751	2100.0	13235	47627	2.560	N-C21
86	23.216	23.244	2200.0	12401	44849	2.410	N-C22
93	24.651	24.672	2300.0	12782	43431	2.334	N-C23
99	26.032	26.046	2400.0	12796	44441	2.389	N-C24
105	27.360	27.371	2500.0	12300	47198	2.537	N-C25
110	28.640	28.645	2600.0	11678	39631	2.130	N-C26
117	29.863	29.698	2700.0	11905	47666	2.563	N-C27
123	31.069	31.094	2800.0	9621	44791	2.407	N-C28
130	32.227	32.260	2900.0	11063	44741	2.405	N-C29
138	33.336	33.372	3000.0	8374	37853	2.034	N-C30
144	34.408	34.458	3100.0	8277	31304	1.682	N-C31
149	35.453	35.512	3200.0	6679	27642	1.486	N-C32
154	36.472	36.538	3300.0	6700	22741	1.223	N-C33
159	37.451	37.525	3400.0	4562	15031	1.023	N-C34
162	38.419	38.500	3500.0	5199	23732	1.276	N-C35
[illegible]dual				172695	800906	43.047	
Total				446996	1860555	100.000	

Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area


Analysis B340802S 3, 2, 1 2470-85M
Intensity (mV)
Retention Time (Minutes)
N-C14
I-C16
N-C15
N-C16
I-C18
PRISTANE
N-C17
N-C18
PHYTANE
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35

Analysis: 3 B3408025, 2, 1
Reported on 17-Mar-87 at 13:40

M U L T I C H R O M Vs.2

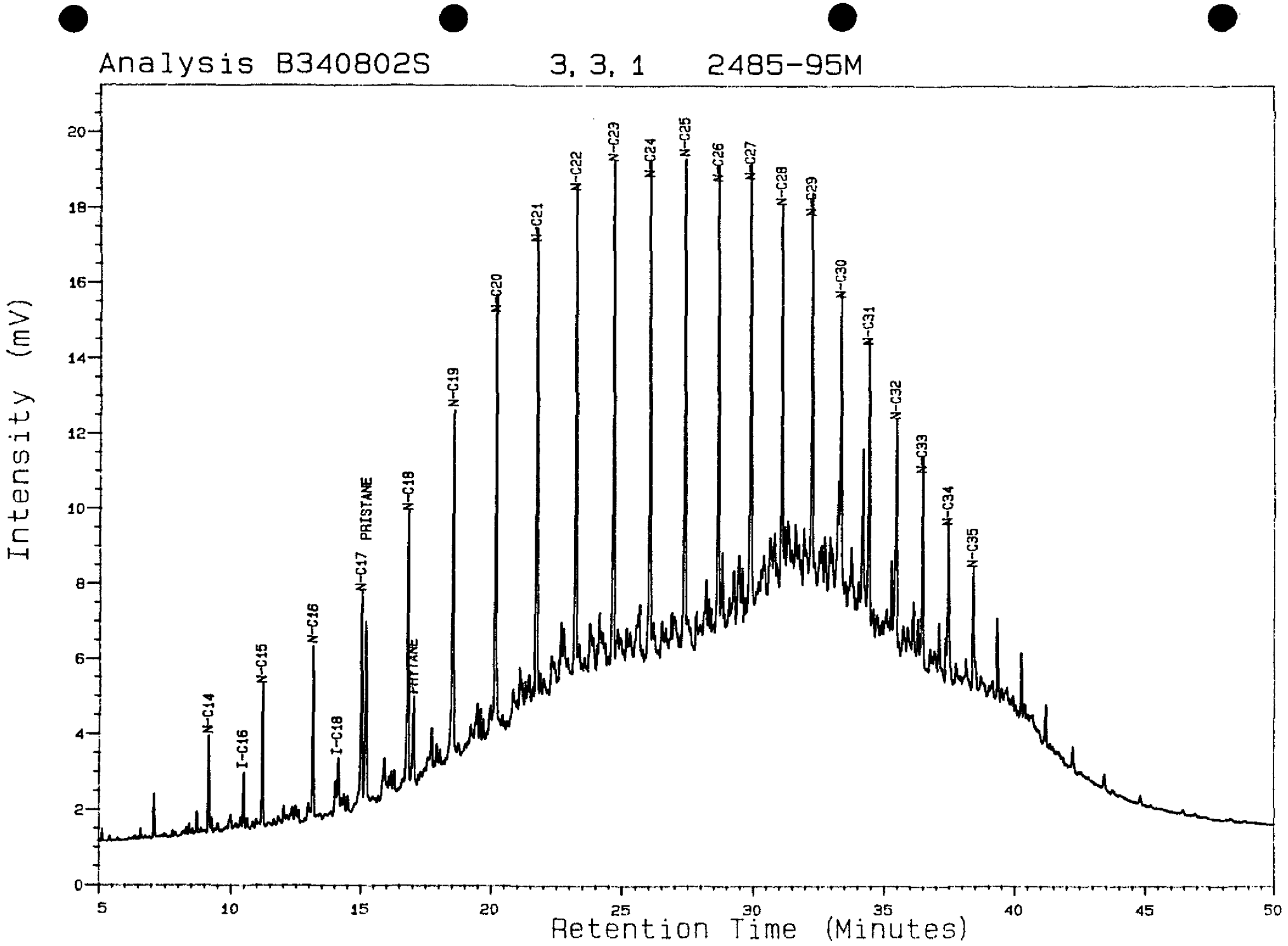
Analyst Name :ARNE Analysis ID: SAT AUTO
Information :34/8-2 SAT

SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3 Date 16-Mar-87 Time 18:40
Analysis:B3408025 Sample Name:2470-85M Sample ID: 0 Bottle:1
Sample 2 Injection 1

Peak	R/T m.	RT Corr	RT Val	Hght uV	Area uVs	%	Identity
3	9.133	9.191	1400.0	1357	3602	0.252	N-C14
4	10.451	10.516	1464.7	646	1907	0.133	I-C16
5	11.171	11.241	1500.0	2313	7160	0.501	N-C15
7	13.128	13.211	1600.0	3337	10113	0.708	N-C16
9	14.112	14.192	1652.5	801	3459	0.242	I-C18
11	15.093	15.080	1700.0	4475	14773	1.034	N-C17
12	15.171	15.248	1709.4	2252	9042	0.633	PRISTANE
17	16.792	16.863	1800.0	6430	22671	1.587	N-C18
18	17.003	17.075	1812.3	1817	8571	0.600	PHYTANE
22	18.501	18.570	1900.0	8644	35938	2.516	N-C19
26	20.136	20.200	2000.0	10960	41307	2.891	N-C20
34	21.701	21.758	2100.0	11982	45555	3.189	N-C21
43	23.195	23.245	2200.0	12445	45024	3.152	N-C22
51	24.629	24.674	2300.0	12875	45648	3.195	N-C23
58	26.011	26.049	2400.0	12830	46956	3.287	N-C24
65	27.341	27.374	2500.0	13015	54983	3.849	N-C25
72	28.619	28.645	2600.0	11900	42120	2.948	N-C26
79	29.859	29.894	2700.0	11554	46294	3.241	N-C27
86	31.048	31.097	2800.0	10709	40783	2.855	N-C28
93	32.200	32.260	2900.0	11340	61135	4.279	N-C29
99	33.309	33.380	3000.0	9090	44348	3.104	N-C30
104	34.381	34.462	3100.0	8403	36492	2.554	N-C31
111	35.427	35.517	3200.0	6381	32968	2.308	N-C32
116	36.440	36.539	3300.0	5535	20916	1.464	N-C33
121	37.421	37.530	3400.0	4115	17829	1.248	N-C34
123	38.376	38.493	3500.0	3364	15389	1.077	N-C35
Residual				117449	673602	47.152	
Total				305909	1428579	100.000	

Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area


Analysis B340802S 3, 3, 1 2485-95M
Intensity (mV)
Retention Time (Minutes)
N-C14
I-C16
N-C15
N-C16
I-C18
PRISTANE
N-C17
PHYTANE
N-C18
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35

Analysis: 3 B3408025.3.1
Reported on 17-Mar-87 at 13:40

M U L T I C H R O M V3.2

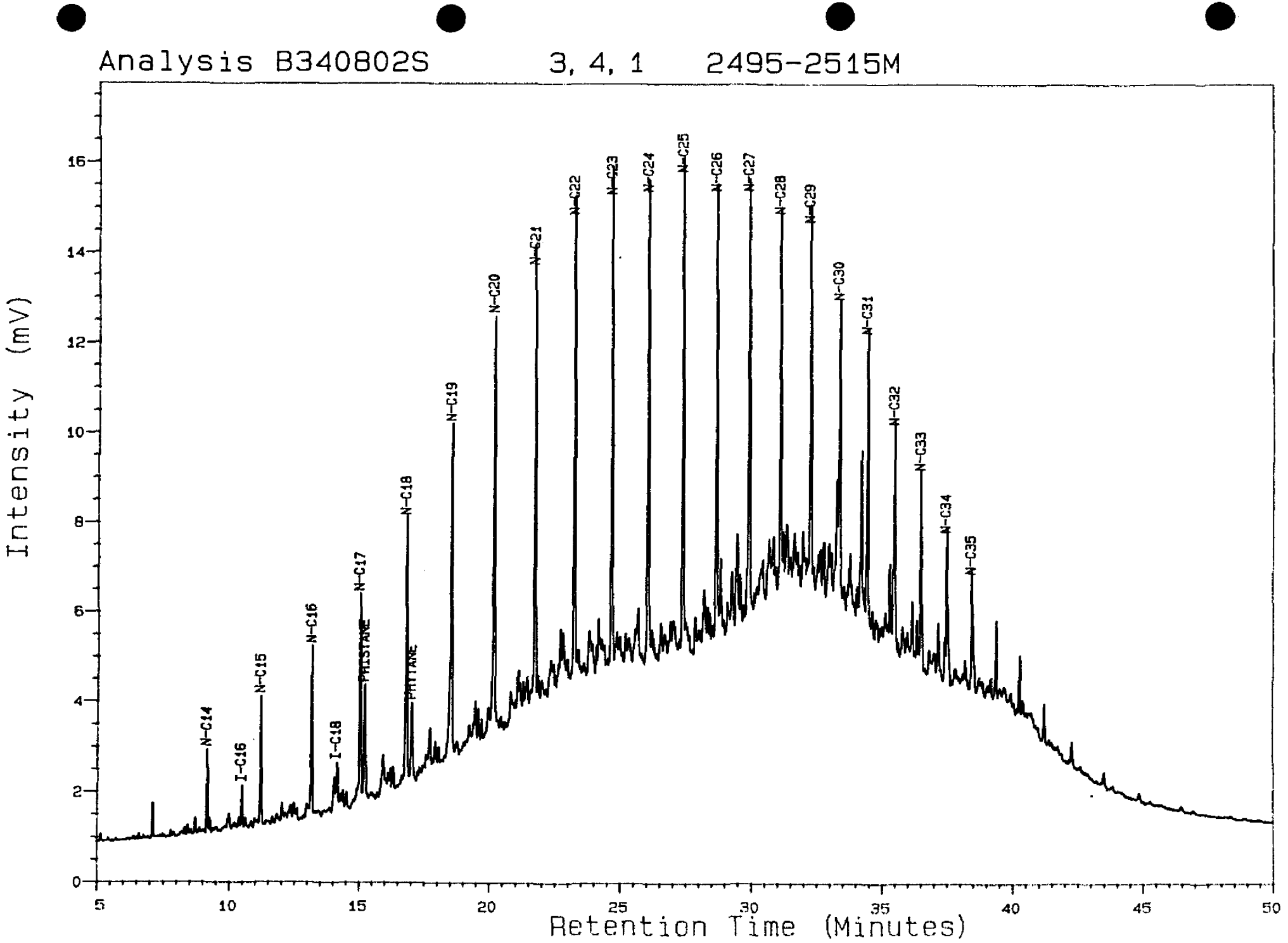
Analyst Name :ARNE Analysis ID: SAT AUTO
Information :34/8-2 SAT

SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3 Date 16-Mar-87 Time 19:51
Analysis:B3408025 Sample Name:2485-95M Sample ID: 0 Bottle
Sample 3 Injection 1

Peak	R/T m.	RT Corr	RT Val	Hght uV	Area uVs		% Identity
5	9.160	9.193	1400.0	2560	7239	0.469	N-C14
7	10.480	10.518	1464.7	1446	4294	0.278	I-C16
9	11.200	11.241	1500.0	3741	11596	0.752	N-C15
14	13.163	13.211	1600.0	4555	15830	1.026	N-C16
16	14.136	14.181	1651.9	1336	5615	0.364	I-C18
19	15.037	15.079	1700.0	5469	18857	1.223	N-C17
20	15.211	15.252	1709.7	4701	19351	1.255	PRISTANE
25	16.832	16.867	1800.0	7210	26623	1.726	N-C18
[illegible]	17.035	17.069	1811.8	2339	11070	0.718	PHYTANE
31	18.544	18.574	1900.0	9185	38835	2.518	N-C19
37	20.176	20.200	2000.0	11564	44692	2.898	N-C20
46	21.744	21.760	2100.0	12897	49079	3.182	N-C21
53	23.243	23.250	2200.0	13513	54287	3.520	N-C22
60	24.677	24.677	2300.0	13682	49463	3.207	N-C23
66	26.053	26.046	2400.0	13244	46877	3.039	N-C24
73	27.387	27.372	2500.0	12775	45848	2.973	N-C25
79	28.667	28.645	2600.0	12399	41674	2.702	N-C26
86	29.904	29.894	2700.0	11863	45536	2.952	N-C27
91	31.101	31.103	2800.0	10519	39096	2.535	N-C28
99	32.248	32.260	2900.0	11226	56707	3.677	N-C29
106	33.357	33.380	3000.0	8981	41599	2.697	N-C30
112	34.435	34.467	3100.0	8016	34119	2.212	N-C31
119	35.475	35.517	3200.0	6324	29941	1.941	N-C32
124	36.483	36.534	3300.0	5645	20755	1.346	N-C33
129	37.465	37.530	3400.0	4287	17329	1.124	N-C34
132	38.429	38.499	3500.0	3260	14771	0.958	N-C35
[illegible]dual				127683	751216	48.708	
Total				330382	1542299	100.000	

Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area


Analysis B340802S 3, 4, 1 2495-2515M
Intensity (mV)
Retention Time (Minutes)
N-C14
I-C16
N-C15
N-C16
I-C18
PRISTANE
N-C17
PHYTANE
N-C18
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35

Analysis: 3 B3408025, 4, 1
Reported on 17-Mar-87 at 13:40

M U L T I C H R O M V3.2

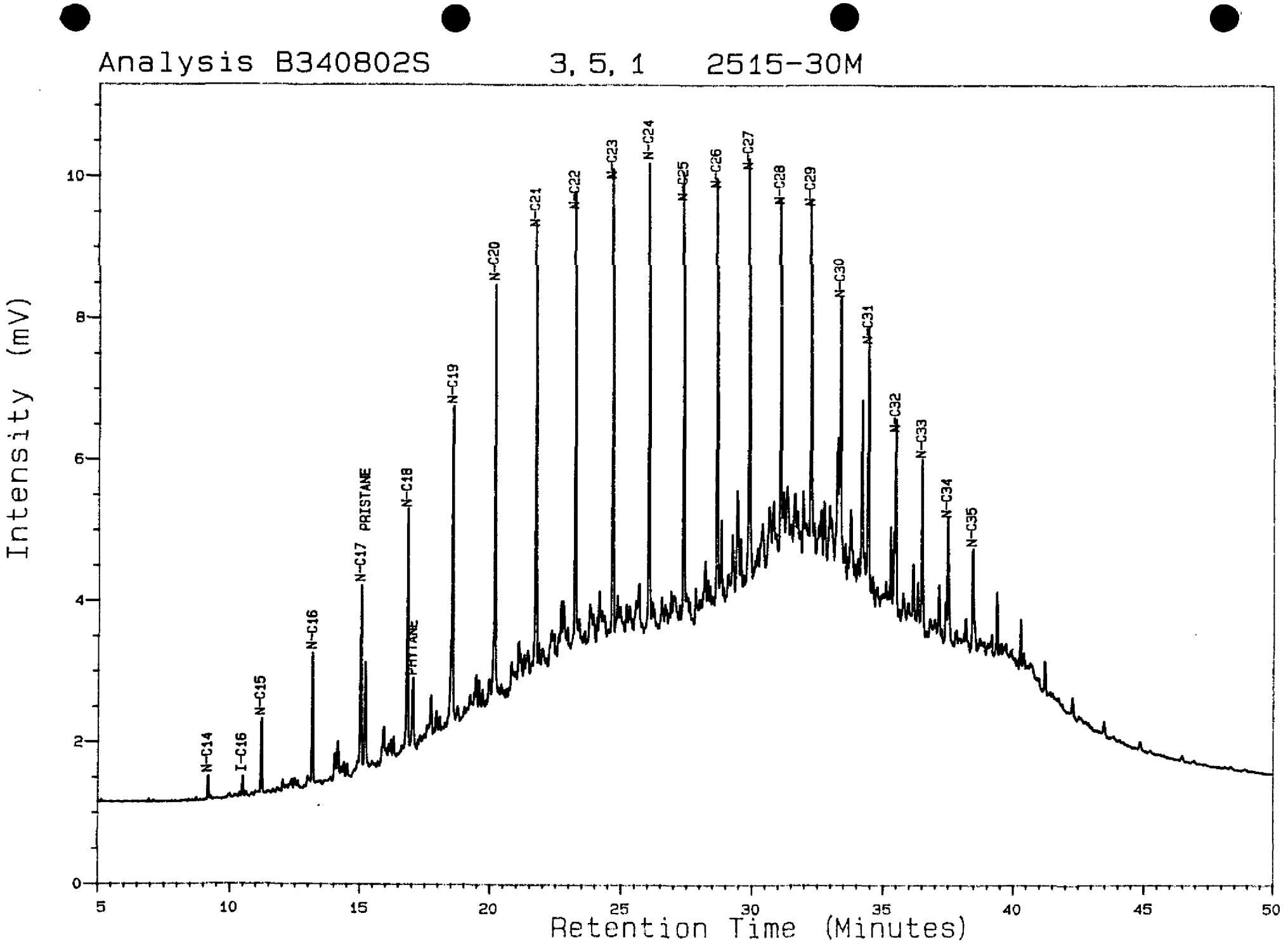
Analyst Name :ARNE Analysis ID: SAT AUTO
Information :34/8-2 SAT

SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3 Date 16-Mar-87 Time 20:54
Analysis:B3408025 Sample Name:2495-2515M Sample ID: 0 Bottle:1
Sample 4 Injection 1

Peak	R/T m.	RT Corr	RT Val	Hght uV	Area uVs	%	Identity
3	9.165	9.195	1400.0	1820	4856	0.364	N-C14
4	10.485	10.519	1464.6	902	2711	0.203	I-C16
5	11.208	11.244	1500.0	2845	8914	0.668	N-C15
8	13.168	13.211	1600.0	3691	11610	0.870	N-C16
10	14.144	14.184	1652.1	939	4087	0.306	I-C18
13	15.043	15.080	1700.0	4435	15308	1.147	N-C17
14	15.216	15.252	1709.7	2479	10295	0.772	PRISTANE
[illegible]	16.832	16.864	1800.0	5663	21440	1.607	N-C18
20	17.040	17.071	1812.1	1724	8175	0.613	PHYTANE
24	18.544	18.570	1900.0	7248	29178	2.187	N-C19
28	20.179	20.200	2000.0	9039	33673	2.524	N-C20
34	21.739	21.752	2100.0	9970	34385	2.577	N-C21
42	23.237	23.243	2200.0	10647	36757	2.755	N-C22
47	24.672	24.671	2300.0	11018	36165	2.710	N-C23
53	26.053	26.045	2400.0	10730	38783	2.906	N-C24
60	27.387	27.372	2500.0	10813	37871	2.838	N-C25
67	28.667	28.645	2600.0	10097	34577	2.591	N-C26
74	29.907	29.897	2700.0	10181	48243	3.615	N-C27
80	31.101	31.103	2800.0	9684	41608	3.118	N-C28
87	32.248	32.260	2900.0	9876	61500	4.609	N-C29
94	33.363	33.385	3000.0	7891	40365	3.025	N-C30
99	34.440	34.472	3100.0	7358	32435	2.431	N-C31
105	35.480	35.522	3200.0	5392	25018	1.875	N-C32
111	36.493	36.545	3300.0	4470	15863	1.189	N-C33
116	37.480	37.541	3400.0	3437	14138	1.060	N-C34
120	38.440	38.510	3500.0	2661	11903	0.892	N-C35
Residual				108333	674499	50.548	
Total				273548	1334360	100.000	

Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area


Analysis B340802S 3, 5, 1 2515-30M
Intensity (mV)
Retention Time (Minutes)
N-C14
I-C16
N-C15
N-C16
N-C17
PRISTANE
N-C18
PHYTANE
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35

Analysis: 3 B3408025.5.3
Reported on 17-Mar-87 at 13:40

MULTICHROM V3.2

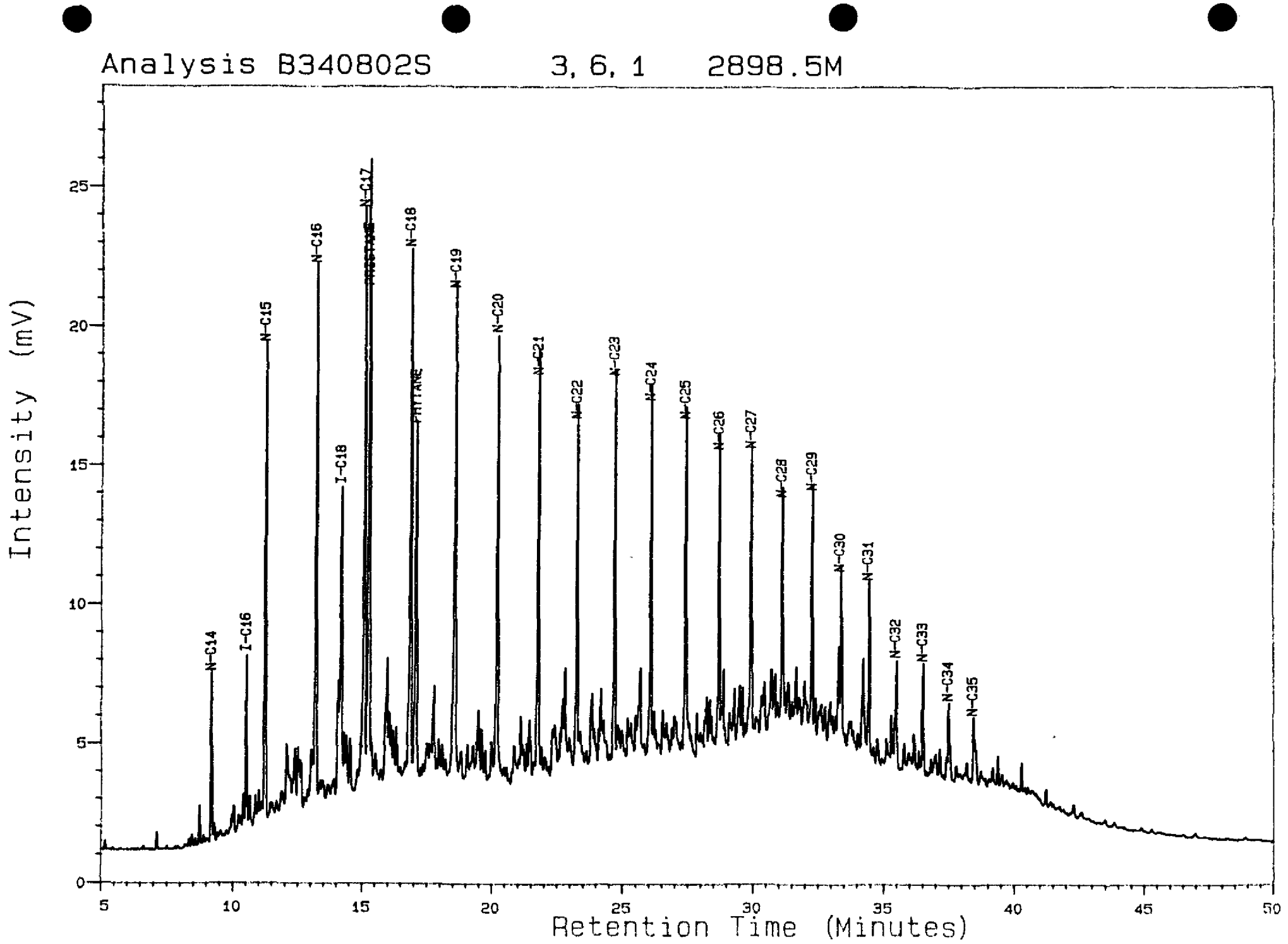
Analyst Name :ARNE Analysis ID: SAT AUTO
Information :34/8-2 SAT

SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3 Date 16-Mar-87 Time 21:57
Analysis:B3408025 Sample Name:2515-30M Sample ID: 0 Bottle:
Sample 5 Injection 1

Peak	R/T m.	RT Corr	RI Val	hght uV	Area uVs	% Identity	
1	9.168	9.200	1400.0	328	850	0.163	N-C14
2	10.483	10.519	1464.6	274	787	0.151	I-C16
3	11.203	11.241	1500.0	1059	3071	0.590	N-C15
4	13.165	13.211	1600.0	1835	5309	1.020	N-C16
5	15.037	15.079	1700.0	2522	7634	1.466	N-C17
6	15.213	15.255	1709.8	1471	5688	1.092	PRISTANE
8	16.827	16.865	1800.0	3394	11154	2.142	N-C18
9	17.043	17.081	1812.6	1005	4522	0.868	PHYTANE
11	18.536	18.571	1900.0	4431	15723	3.020	N-C19
14	20.168	20.200	2000.0	5792	18661	3.584	N-C20
19	21.733	21.758	2100.0	6257	19282	3.703	N-C21
26	23.227	23.245	2200.0	6401	19839	3.810	N-C22
32	24.661	24.674	2300.0	6539	19250	3.697	N-C23
37	26.043	26.049	2400.0	6570	20129	3.866	N-C24
43	27.365	27.366	2500.0	6335	23015	4.420	N-C25
48	28.651	28.645	2600.0	6006	17921	3.442	N-C26
55	29.888	29.894	2700.0	5939	21245	4.080	N-C27
60	31.077	31.095	2800.0	5143	16600	3.188	N-C28
67	32.252	32.260	2900.0	4601	15219	2.923	N-C29
74	33.347	33.385	3000.0	3935	16837	3.234	N-C30
79	34.419	34.467	3100.0	3847	14110	2.710	N-C31
85	35.484	35.523	3200.0	2759	12321	2.366	N-C32
87	36.488	36.556	3300.0	2452	8517	1.636	N-C33
90	37.475	37.551	3400.0	1788	7085	1.361	N-C34
92	38.432	38.518	3500.0	1440	6538	1.256	N-C35
Residual				42512	209391	40.213	
Total				134834	520683	100.000	

Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area


Analysis B340802S 3, 6, 1 2898.5M
Intensity (mV)
Retention Time (Minutes)
N-C14
I-C16
N-C15
N-C16
I-C18
N-C17
PRISTANE
N-C18
PHYTANE
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35

Analysis: 3 B340802S,6,1
Reported on 17-Mar-87 at 13:40

M U L T I C H R O M V3.2

Analyst Name :ARNE
Information :34/8-2 SAT

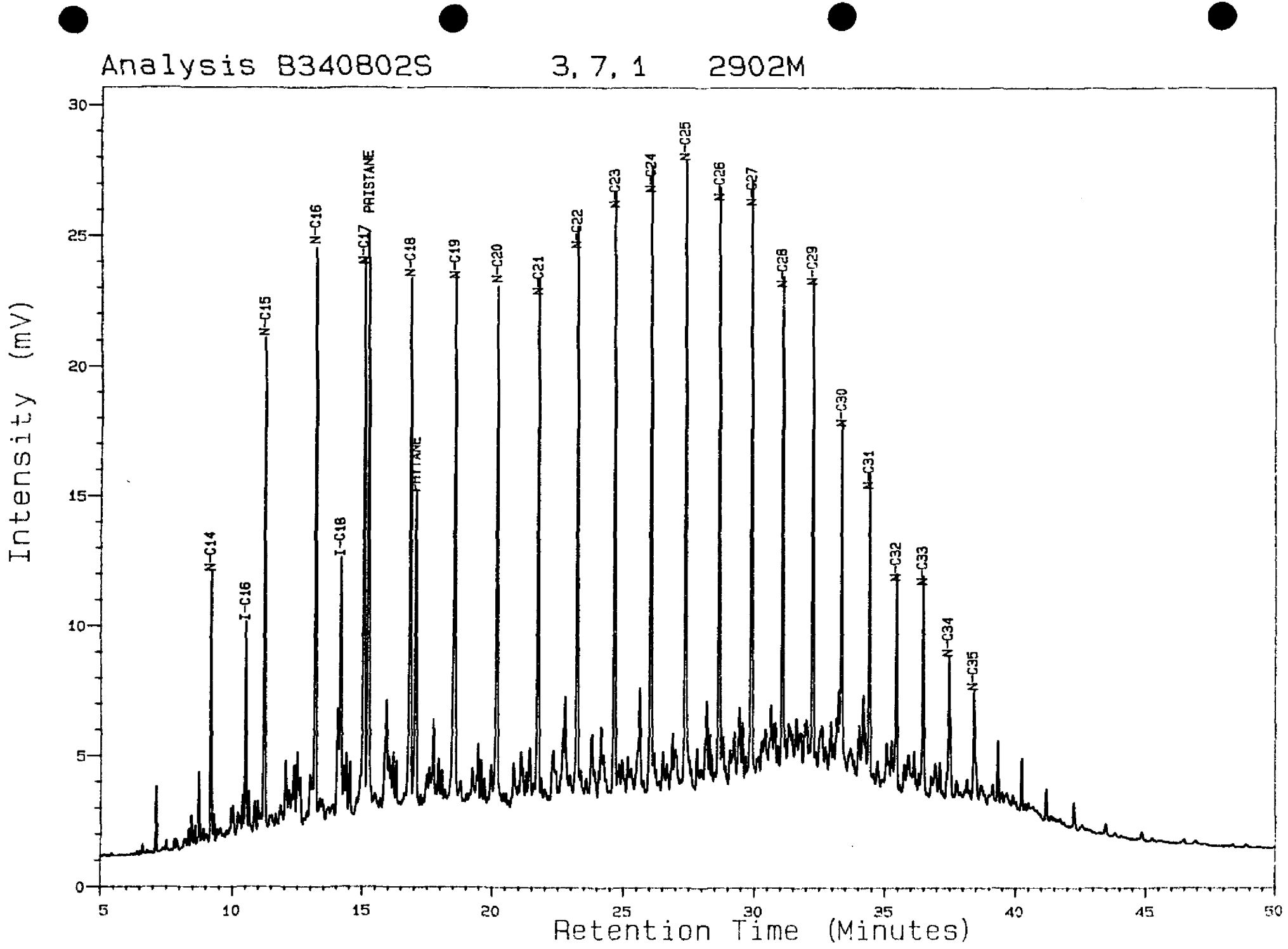
Analysis ID: SAT AUTO

SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3 Date 16-Mar-87 Time 23:00
Analysis:B340802S Sample Name:2898.5M Sample ID: 0 Bottle:
Sample 6 Injection 1

Peak	R/T m.	RT Corr	RT Val	Hght uV	Area uVs	% Identity	
8	9.184	9.182	1400.0	6112	17852	0.733	N-C14
15	10.509	10.507	1464.4	6223	20731	0.851	I-C16
20	11.243	11.240	1500.0	17213	59811	2.455	N-C15
33	13.213	13.211	1600.0	19307	71505	2.927	N-C16
38	14.189	14.186	1651.8	10978	50412	2.069	I-C18
44	15.099	15.094	1700.0	20691	89372	3.668	N-C17
48	15.275	15.270	1709.9	22504	106509	4.372	PRISTANE
55	16.883	16.876	1800.0	18884	74650	3.064	N-C18
56	17.088	17.081	1812.1	12783	59705	2.451	PHYTANE
66	18.584	18.575	1900.0	17640	80140	3.289	N-C19
75	20.211	20.200	2000.0	15908	63613	2.611	N-C20
82	21.771	21.754	2100.0	15276	56890	2.335	N-C21
92	23.264	23.241	2200.0	12909	48293	1.982	N-C22
101	24.704	24.675	2300.0	12903	45171	1.854	N-C23
110	26.080	26.045	2400.0	13188	45152	1.853	N-C24
117	27.411	27.371	2500.0	12406	56912	2.336	N-C25
123	28.691	28.645	2600.0	11680	43934	1.803	N-C26
130	29.928	29.895	2700.0	11382	62013	2.545	N-C27
137	31.117	31.096	2800.0	9876	56595	2.323	N-C28
143	32.269	32.260	2900.0	9946	45068	1.850	N-C29
151	33.373	33.375	3000.0	7110	41641	1.709	N-C30
156	34.451	34.463	3100.0	6775	26845	1.102	N-C31
162	35.491	35.514	3200.0	3886	18122	0.744	N-C32
167	36.509	36.543	3300.0	3982	14417	0.592	N-C33
172	37.496	37.539	3400.0	2755	12729	0.522	N-C34
178	38.456	38.509	3500.0	2355	14703	0.604	N-C35
Residual				218244	1153725	47.355	
Total				524120	2436309	100.000	

Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area


Analysis B340802S 3,7,1 2902M
Intensity (mV)
Retention Time (Minutes)
N-C14
I-C16
N-C15
N-C16
I-C18
N-C17
PRISTANE
N-C18
PHYTANE
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35

Analysis: 3 B3408025.7.1
Reported on 17-Mar-87 at 13:40

M U L T I C H R O M V3.2

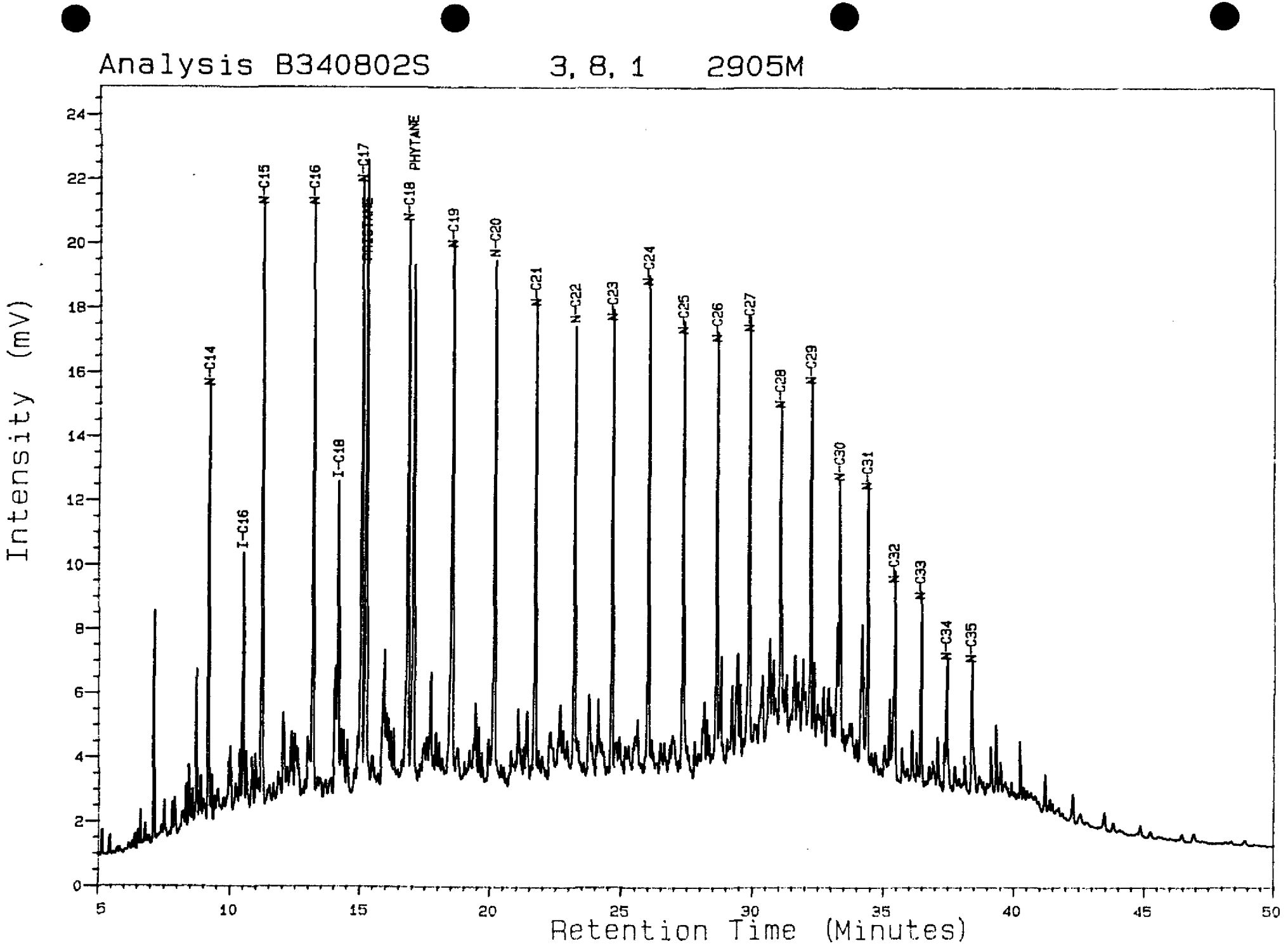
Analyst Name :ARNE Analysis ID: SAT AUTO
Information :34/8-2 SAT

SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3 Date 17-Mar-87 Time 0:03
Analysis:B3408025 Sample Name:2902M Sample ID: 0 Bottle:
Sample 7 Injection 1

Peak	R/T m.	RT Corr	RT Val	Hght uV	Area uVs	%	Identity
11	9.176	9.187	1400.0	10444	29992	1.096	N-C14
19	10.493	10.506	1464.2	8142	26400	0.965	I-C16
23	11.229	11.243	1500.0	18712	61500	2.248	N-C15
34	13.195	13.211	1600.0	21398	71085	2.599	N-C16
38	14.160	14.175	1651.3	9929	44966	1.644	I-C18
[illegible]	15.075	15.089	1700.0	21074	92911	3.396	N-C17
44	15.248	15.263	1709.7	22073	100882	3.688	PRISTANE
51	16.858	16.872	1800.0	20063	77783	2.845	N-C18
52	17.067	17.080	1812.2	11937	53740	1.964	PHYTANE
61	18.563	18.575	1900.0	20017	87016	3.181	N-C19
69	20.189	20.200	2000.0	19765	76438	2.794	N-C20
78	21.745	21.759	2100.0	20193	76285	2.789	N-C21
86	23.248	23.245	2200.0	21978	83167	3.040	N-C22
92	24.693	24.674	2300.0	23061	83532	3.054	N-C23
99	26.064	26.049	2400.0	24000	90307	3.301	N-C24
105	27.397	27.376	2500.0	24114	103590	3.798	N-C25
112	28.672	28.645	2600.0	22958	82236	3.006	N-C26
119	29.909	29.896	2700.0	22752	84545	3.091	N-C27
126	31.096	31.096	2800.0	19033	73472	2.686	N-C28
134	32.248	32.260	2900.0	19098	73148	2.674	N-C29
141	33.352	33.376	3000.0	13696	57957	2.119	N-C30
145	34.424	34.460	3100.0	11930	43350	1.585	N-C31
150	35.464	35.511	3200.0	8111	29389	1.074	N-C32
156	36.477	36.535	3300.0	8439	33586	1.228	N-C33
[illegible]	37.464	37.532	3400.0	5478	30860	1.128	N-C34
163	38.419	38.497	3500.0	4275	22676	0.829	N-C35
Residual				207232	1044449	38.180	
Total				639900	2735563	100.000	

Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area


Analysis B340802S 3, 8, 1 2905M
Intensity (mV)
Retention Time (Minutes)
N-C14
I-C16
N-C15
N-C16
I-C18
N-C17
PRISTANE
N-C18
PHYTANE
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35

Analysis:3 B340802S.8.1
Reported on 17-Mar-87 at 13:40

M U L T I C H R O M V3.2

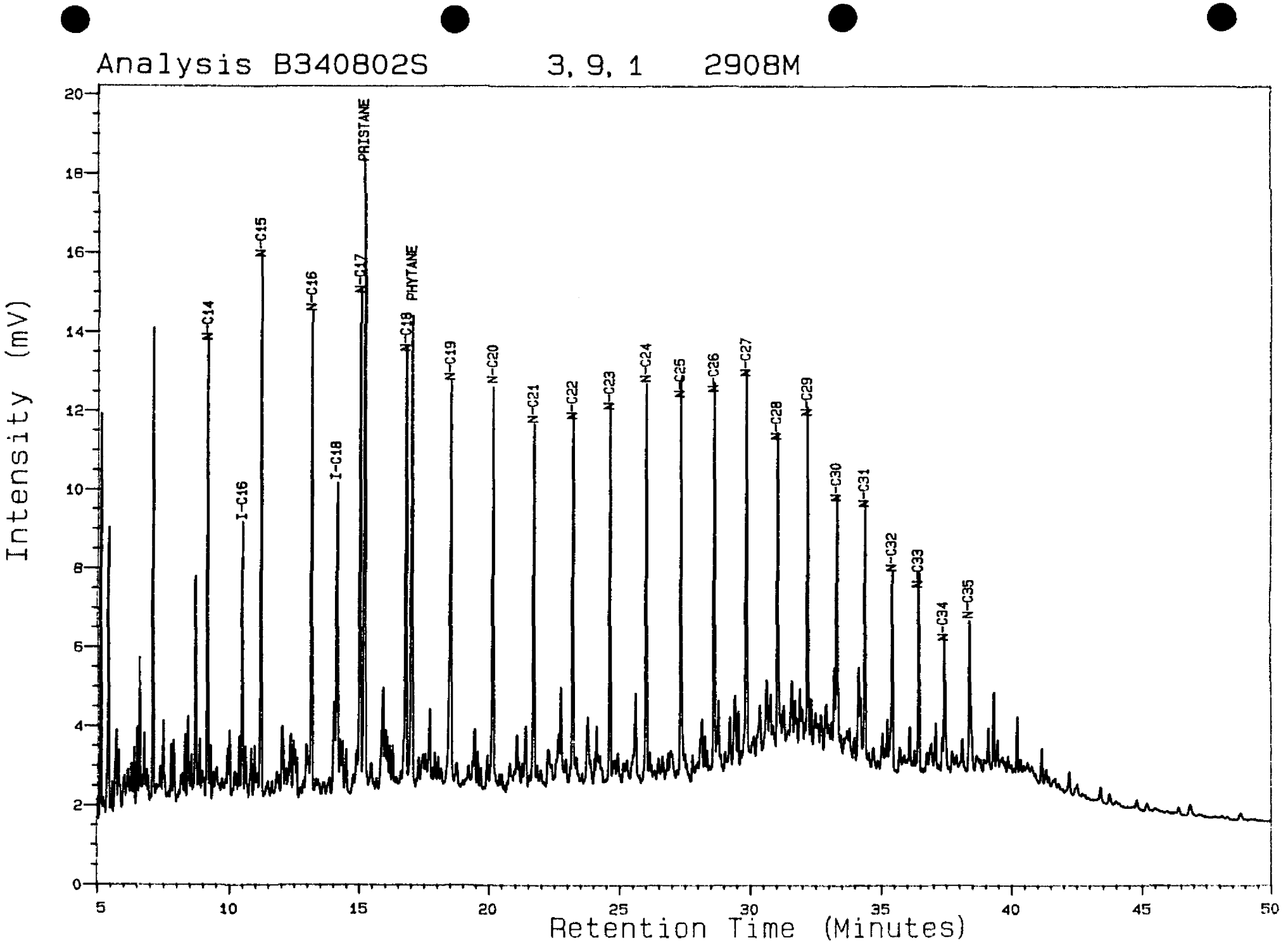
Analyst Name :ARNE Analysis ID: SAT AUTO
Information :34/8-2 SAT

SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3 Date 17-Mar-87 Time 1:06
Analysis:B340802S Sample Name:2905M Sample ID: 0 Bottle:1
Sample 8 Injection 1

Peak	R/T m.	RI Corr	RT Val	Hght uV	Area uVs	%	Identity
21	9.179	9.195	1400.0	13643	39881	1.510	N-C14
30	10.496	10.515	1464.3	7882	25822	0.978	I-C16
35	11.227	11.247	1500.0	16830	63043	2.388	N-C15
49	13.187	13.211	1600.0	18373	63365	2.400	N-C16
53	14.160	14.183	1651.8	9745	43905	1.663	I-C18
57	15.067	15.089	1700.0	18968	77940	2.952	N-C17
59	15.243	15.264	1709.9	19498	92637	3.508	PRISTANE
66	16.853	16.873	1800.0	17167	66131	2.505	N-C18
67	17.067	17.086	1812.5	15950	73701	2.791	PHYTANE
76	18.555	18.573	1900.0	16515	71703	2.716	N-C19
84	20.184	20.200	2000.0	16244	63847	2.418	N-C20
93	21.739	21.749	2100.0	14993	55054	2.087	N-C21
101	23.235	23.240	2200.0	13795	49485	1.874	N-C22
109	24.667	24.667	2300.0	14445	47930	1.815	N-C23
115	26.046	26.044	2400.0	15361	53205	2.015	N-C24
122	27.376	27.367	2500.0	13791	52926	2.004	N-C25
130	28.659	28.645	2600.0	13878	51587	1.954	N-C26
137	29.896	29.895	2700.0	14378	74277	2.813	N-C27
143	31.085	31.096	2800.0	11757	65949	2.498	N-C28
150	32.237	32.260	2900.0	12558	56249	2.130	N-C29
158	33.341	33.375	3000.0	9483	48230	1.827	N-C30
165	34.419	34.463	3100.0	9481	38881	1.472	N-C31
172	35.459	35.514	3200.0	6746	32604	1.235	N-C32
177	36.477	36.543	3300.0	6139	19712	0.747	N-C33
182	37.461	37.537	3400.0	4060	16017	0.607	N-C34
186	38.424	38.509	3500.0	4140	21083	0.798	N-C35
Residual				255356	1275266	48.297	
Total				593175	2640470	100.000	

Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area


Analysis B340802S 3, 9, 1 2908M
Intensity (mV)
Retention Time (Minutes)
N-C14
I-C16
N-C15
N-C16
I-C18
PRISTANE
N-C17
PHYTANE
N-C18
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35

Analysis:3 B3408025,9,1
Reported on 17-Mar-87 at 13:41

M U L T I C H R O M V3.2

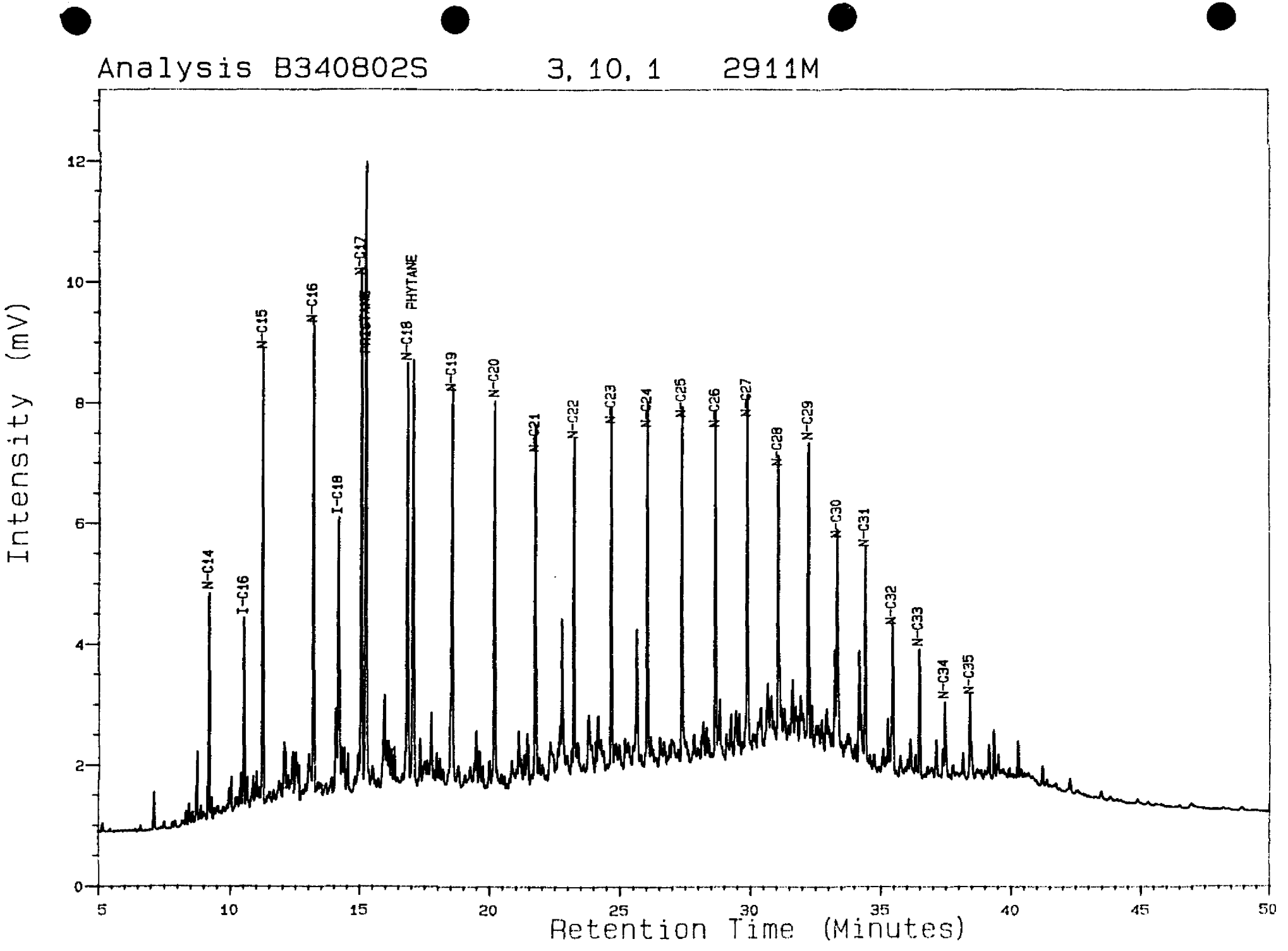
Analyst Name :ARNE Analysis ID: SAT AUTO
Information :3408-2 SAT

SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3 Date 17-Mar-87 Time 2:10
Analysis:B3408025 Sample Name:2908M Sample ID: 0 Bottle:
Sample 9 Injection 1

Peak	R/T m.	RT Corr	RI Val	Hght uV	Area uVs	%	Identity
35	9.160	9.195	1400.0	11690	32263	2.018	N-C14
44	10.475	10.515	1464.4	6770	20176	1.262	I-C16
48	11.203	11.246	1500.0	13621	40543	2.536	N-C15
61	13.160	13.211	1600.0	12164	38493	2.408	N-C16
63	14.136	14.186	1652.0	7877	32819	2.053	I-C18
[illegible]	15.037	15.087	1700.0	12697	45675	2.857	N-C17
70	15.213	15.263	1709.9	15916	65769	4.114	PRISTANE
77	16.821	16.871	1800.0	11069	39726	2.485	N-C18
78	17.037	17.087	1812.7	11932	52127	3.260	PHYTANE
86	18.523	18.571	1900.0	10148	42681	2.670	N-C19
92	20.152	20.200	2000.0	10204	37657	2.355	N-C20
100	21.712	21.756	2100.0	9129	30713	1.921	N-C21
107	23.205	23.245	2200.0	9247	30223	1.890	N-C22
113	24.637	24.673	2300.0	9587	29549	1.848	N-C23
120	26.016	26.047	2400.0	10015	32256	2.019	N-C24
126	27.341	27.369	2500.0	10205	42830	2.679	N-C25
133	28.621	28.645	2600.0	9799	31474	1.969	N-C26
140	29.856	29.893	2700.0	9811	37276	2.332	N-C27
146	31.045	31.096	2800.0	8147	33732	2.110	N-C28
153	32.197	32.260	2900.0	8765	31478	1.969	N-C29
160	33.307	33.381	3000.0	6530	26834	1.678	N-C30
166	34.387	34.473	3100.0	6663	21974	1.374	N-C31
173	35.432	35.530	3200.0	5079	21149	1.323	N-C32
177	36.445	36.554	3300.0	4988	15146	0.947	N-C33
[illegible]	37.429	37.549	3400.0	3355	13546	0.847	N-C34
[illegible]	38.395	38.524	3500.0	3783	17682	1.118	N-C35
Residual				191283	734755	45.957	
Total				430490	1598780	100.000	

Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area


Analysis B340802S 3, 10, 1 2911M
Intensity (mV)
Retention Time (Minutes)
N-C14
I-C16
N-C15
N-C16
I-C18
N-C17
PRISTANE
PHYTANE
N-C18
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35

Analysis:3 B3408025,10,1
Reported on 17-Mar-87 at 13:41

M U L T I C H R O M V6.2

Analyst Name :ARNE
Information :34/8-2 SAT

Analysis ID: SA1 AUTO

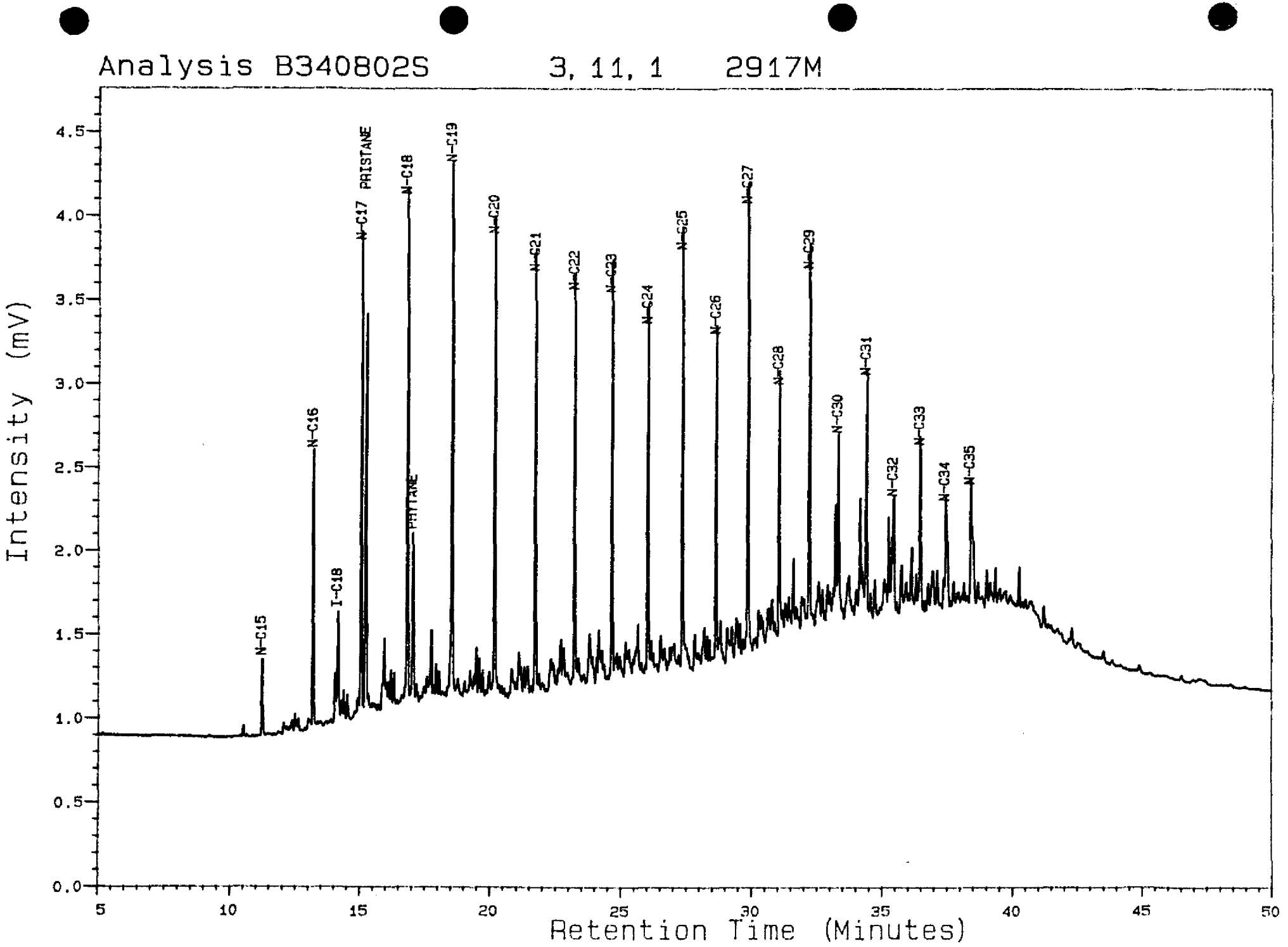
SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3
Analysis:B3408025 Sample Name:2911M
Sample 10 Injection 1

Date 17-Mar-87 Time 3:13
Sample ID: 0 Bottle:1

Peak	R/T m.	RT Corr	RT Val	Hght uV	Area uVs	%	Identity
5	9.189	9.202	1400.0	3751	9687	1.396	N-C14
11	10.507	10.522	1464.5	3117	8657	1.248	I-C16
15	11.232	11.248	1500.0	7531	20769	2.994	N-C15
22	13.192	13.211	1600.0	7889	21802	3.143	N-C16
24	14.173	14.191	1652.3	4546	18790	2.709	I-C18
[illegible]	15.069	15.086	1700.0	8475	26149	3.770	N-C17
30	15.248	15.264	1710.0	10295	38992	5.621	PRISTANE
36	16.856	16.870	1800.0	6672	18568	2.677	N-C18
37	17.069	17.084	1812.5	6997	27291	3.934	PHYTANE
42	18.557	18.570	1900.0	6447	22438	3.235	N-C19
46	20.189	20.200	2000.0	6342	20486	2.953	N-C20
53	21.744	21.751	2100.0	5832	17729	2.556	N-C21
60	23.243	23.246	2200.0	5532	16986	2.449	N-C22
65	24.675	24.674	2300.0	5927	16466	2.374	N-C23
73	26.048	26.044	2400.0	6007	17974	2.591	N-C24
79	27.376	27.369	2500.0	5833	19499	2.811	N-C25
85	28.656	28.645	2600.0	5722	17195	2.479	N-C26
92	29.888	29.889	2700.0	5892	21070	3.038	N-C27
96	31.077	31.085	2800.0	4731	18576	2.678	N-C28
101	32.237	32.260	2900.0	4849	14104	2.033	N-C29
109	33.341	33.374	3000.0	3719	15242	2.197	N-C30
113	34.424	34.467	3100.0	3625	11752	1.694	N-C31
118	35.464	35.517	3200.0	2463	9043	1.304	N-C32
123	36.483	36.545	3300.0	2113	6431	0.927	N-C33
[illegible]	37.467	37.538	3400.0	1241	4685	0.675	N-C34
129	38.429	38.510	3500.0	1395	6281	0.906	N-C35
Residual				62341	247003	35.608	
Total				199284	693664	100.000	

Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area


Analysis B340802S 3, 11, 1 2917M
Intensity (mV)
Retention Time (Minutes)
N-C15
N-C16
I-C18
N-C17
PRISTANE
N-C18
PHYTANE
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35

Analysis: B340802S , 11 , 1
Reported on 17-Mar-87 at 13:41

M U L T I C H R O M V3.2

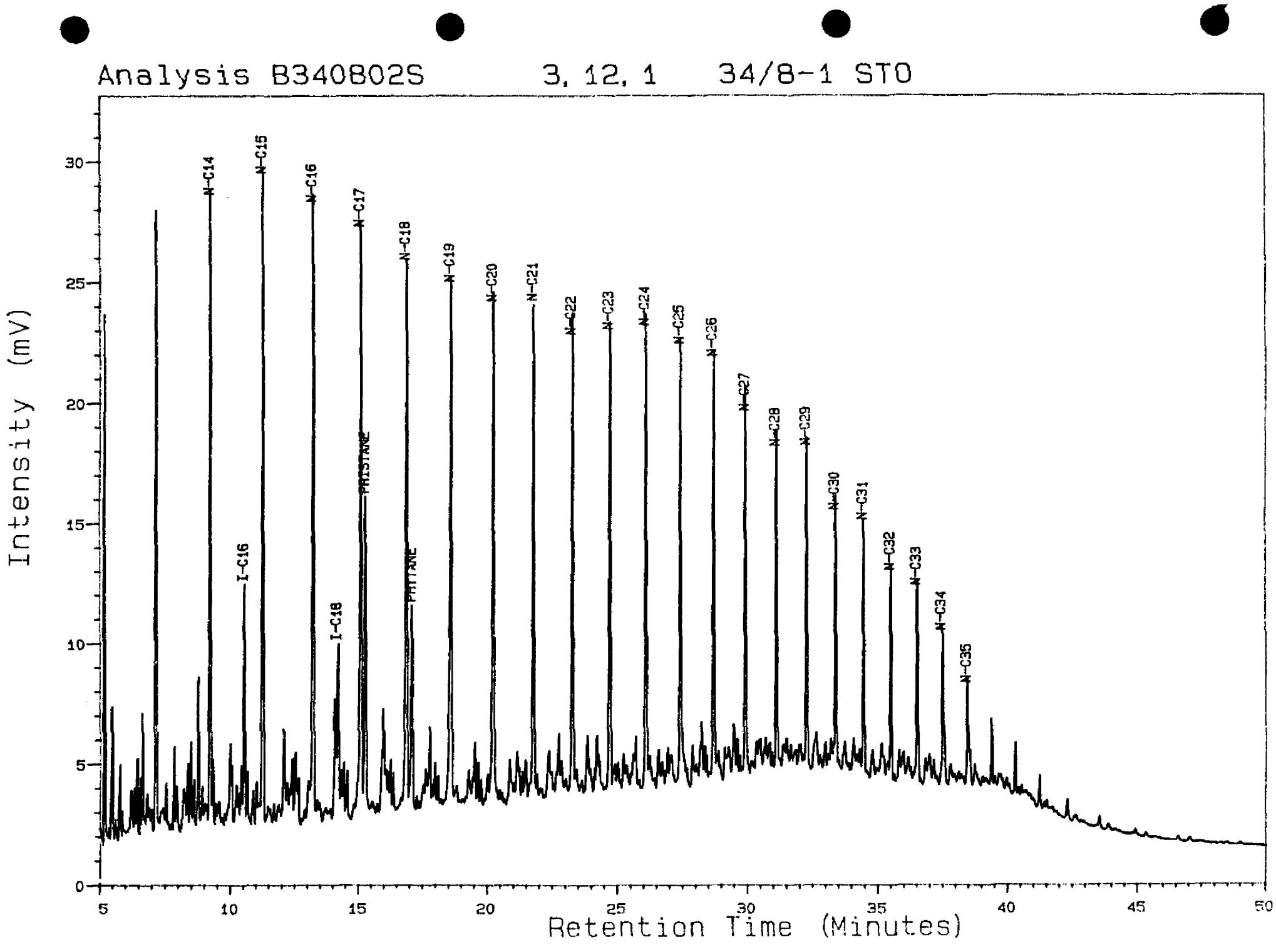
Analyst Name :ARNE Analysis ID: SAT AUTO
Information :34/8-2 SAT

SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3 Date 17-Mar-87 Time 4:16
Analysis:B340802S Sample Name:2917M Sample ID: 0 Bottle:
Sample 11 Injection 1

Peak	R/T m.	RI Corr	RI Val	Hght uV	Area uVs	%	Identity
1	11.235	11.253	1500.0	450	1209	0.771	N-C15
2	13.189	13.211	1600.0	1641	4311	2.750	N-C16
3	14.171	14.192	1653.4	570	1858	1.185	I-C18
4	15.061	15.082	1700.0	2831	7590	4.842	N-C17
5	15.237	15.258	1709.9	2347	8416	5.368	PRISTANE
6	16.848	16.868	1800.0	3009	7995	5.100	N-C18
8	17.064	17.084	1812.7	969	3520	2.245	PHYTANE
10	18.555	18.574	1900.0	3149	9332	5.952	N-C19
11	20.181	20.200	2000.0	2816	7881	5.027	N-C20
13	21.739	21.754	2100.0	2635	8021	5.116	N-C21
16	23.232	23.244	2200.0	2413	6917	4.412	N-C22
19	24.661	24.670	2300.0	2403	6660	4.248	N-C23
21	26.037	26.043	2400.0	2150	5716	3.646	N-C24
23	27.365	27.368	2500.0	2583	7362	4.696	N-C25
27	28.645	28.645	2600.0	1955	5143	3.281	N-C26
30	29.880	29.894	2700.0	2754	7993	5.098	N-C27
32	31.067	31.095	2800.0	1539	4384	2.796	N-C28
34	32.219	32.260	2900.0	2224	6204	3.957	N-C29
37	33.336	33.390	3000.0	1019	3389	2.162	N-C30
39	34.419	34.485	3100.0	1419	4335	2.758	N-C31
42	35.464	35.543	3200.0	476	1084	0.691	N-C32
46	36.477	36.568	3300.0	1026	3664	2.337	N-C33
48	37.464	37.566	3400.0	562	2835	1.808	N-C34
50	38.424	38.537	3500.0	741	4425	2.822	N-C35
Residual				7262	26546	16.932	
Total				51007	156778	100.000	

Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area


Analysis B340802S 3, 12, 1 34/8-1 STO
Intensity (mV)
Retention Time (Minutes)
N-C14
N-C15
N-C16
N-C17
N-C18
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35
I-C16
I-C18
PRISTANE
PHYTANE
0
5
10
15
20
25
30
35
40
45
50

Analysis: 3 B340802S,12,1
Reported on 17-Mar-87 at 13:41

M U L T I C H R O M V3.2

Analyst Name :ARNE
Information :34/8-2 SAT

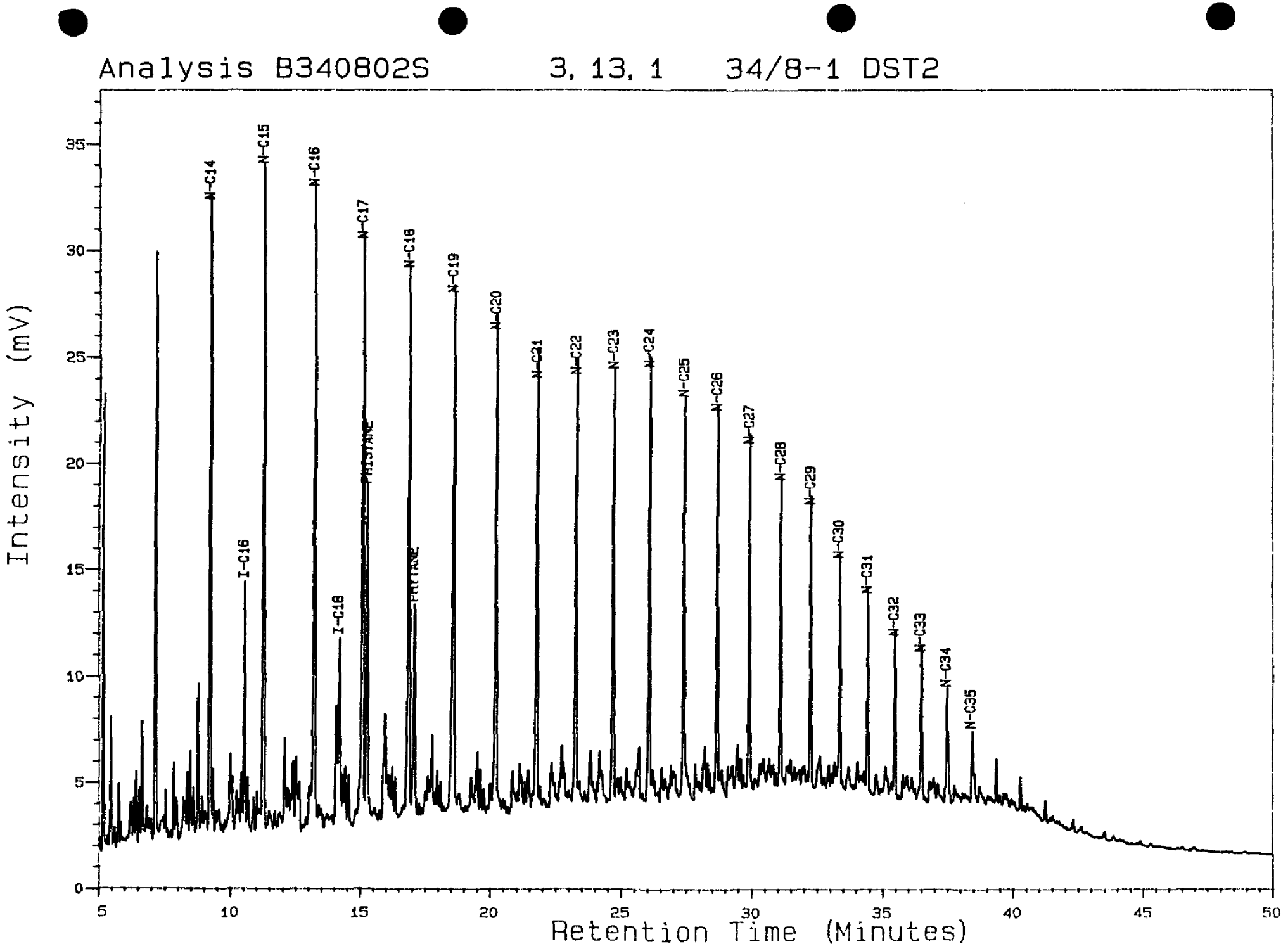
Analysis ID: SAT AUTO

SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3 Date 17-Mar-87 Time 5:19
Analysis:B340802S Sample Name:34/8-1 SIO Sample ID: 0 Bottle:
Sample 12 Injection 1

Peak	R/T m.	RT Corr	RI Val	Hght uV	Area uVs	% Identity	
29	9.237	9.213	1400.0	26369	85568	3.133	N-C14
39	10.541	10.514	1463.8	9975	33444	1.225	I-C16
43	11.283	11.253	1500.0	27166	96622	3.538	N-C15
56	13.245	13.211	1600.0	26010	101646	3.723	N-C16
[illegible]	14.208	14.171	1651.3	7240	34136	1.250	I-C18
[illegible]	15.123	15.084	1700.0	24301	101171	3.705	N-C17
65	15.285	15.246	1709.1	13003	57427	2.103	PRISTANE
72	16.912	16.869	1800.0	22775	92344	3.382	N-C18
73	17.112	17.069	1811.7	8433	39682	1.453	PHYTANE
82	18.619	18.572	1900.0	21516	94270	3.452	N-C19
90	20.251	20.200	2000.0	21081	85742	3.140	N-C20
99	21.811	21.755	2100.0	20112	69602	2.549	N-C21
105	23.301	23.241	2200.0	19967	74495	2.728	N-C22
111	24.736	24.671	2300.0	19387	68351	2.503	N-C23
119	26.112	26.043	2400.0	19696	70754	2.591	N-C24
126	27.443	27.369	2500.0	18373	76801	2.812	N-C25
132	28.723	28.645	2600.0	17675	62078	2.273	N-C26
139	29.947	29.865	2700.0	16103	57044	2.089	N-C27
146	31.136	31.050	2800.0	13988	46415	1.700	N-C28
153	32.291	32.200	2900.0	13708	44787	1.640	N-C29
159	33.400	33.304	3000.0	11319	41245	1.510	N-C30
164	34.483	34.481	3100.0	10403	33780	1.237	N-C31
168	35.533	35.534	3200.0	8773	28851	1.056	N-C32
[illegible]	36.536	36.561	3300.0	8235	29163	1.068	N-C33
[illegible]	37.523	37.560	3400.0	6492	30838	1.129	N-C34
181	38.477	38.528	3500.0	4400	21956	0.804	N-C35
Residual				280980	1152429	42.201	
Total				697482	2730840	100.000	

Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area


Analysis B340802S 3, 13, 1 34/8-1 DST2
Intensity (mV)
Retention Time (Minutes)
N-C14
N-C15
N-C16
N-C17
N-C18
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35
I-C16
I-C18
PRISTANE
PHYTANE

Analysis: B3408025,13,1
Reported on 17-Mar-87 at 13:41

M U L T I C H R O M V3.2

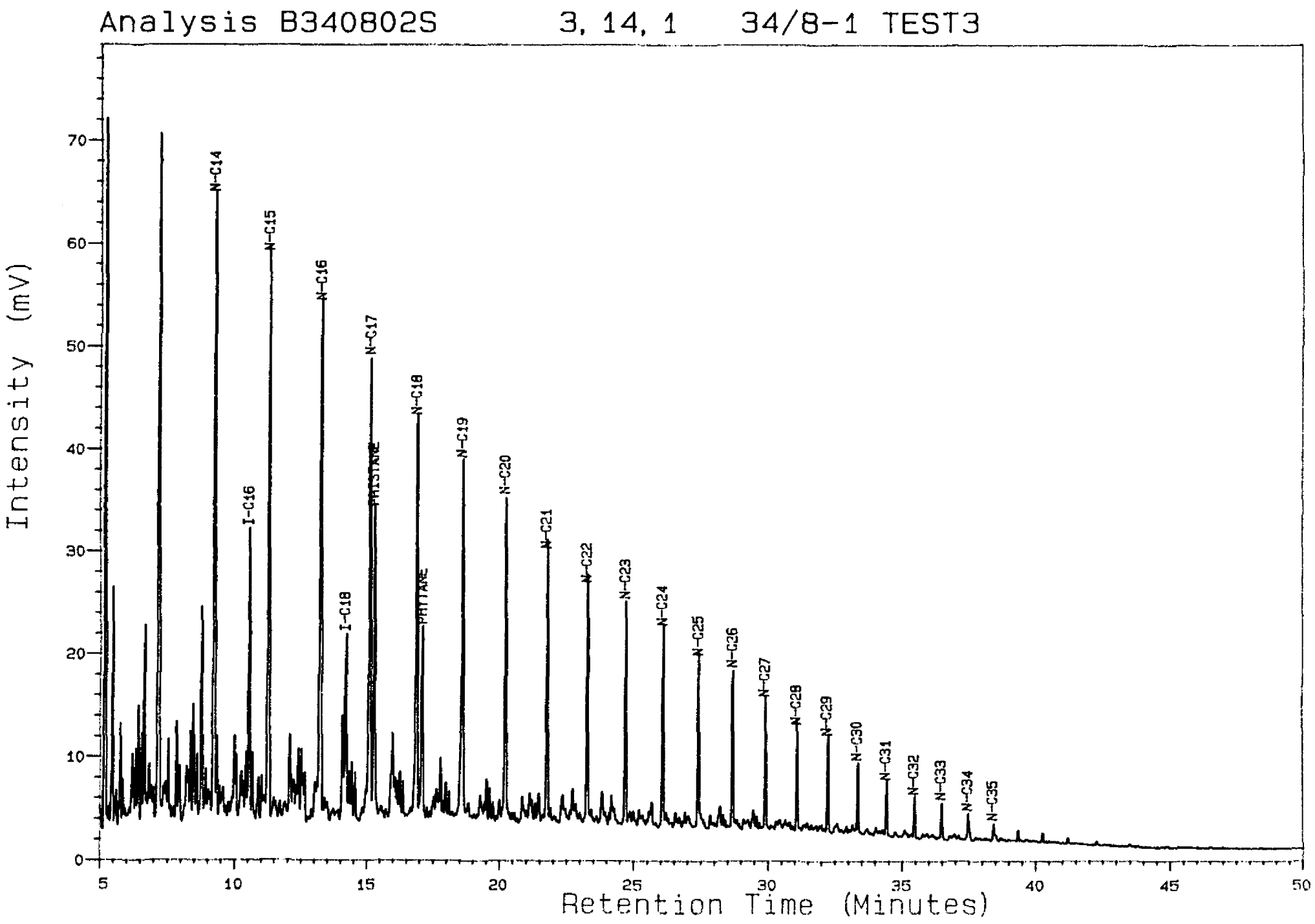
Analyst Name :ARNE Analysis ID: SAT AUTO
Information :34/8-2 SAT

SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3 Date 17-Mar-87 Time 6:22
Analysis:B3408025 Sample Name:34/8-1 DST2 Sample ID: 0 Bottle:
Sample 13 Injection 1

Peak	R/T m.	RT Corr	RT Val	Hght uV	Area uVs	%	Identity
31	9.227	9.212	1400.0	29932	96558	3.317	N-C14
42	10.528	10.511	1463.6	11771	39198	1.347	I-C16
46	11.272	11.254	1500.0	31107	107319	3.687	N-C15
58	13.233	13.211	1600.0	29501	103382	3.552	N-C16
62	14.192	14.170	1651.2	8809	40265	1.383	I-C18
66	15.107	15.085	1700.0	26422	101851	3.499	N-C17
[illegible]	15.267	15.245	1709.0	15263	63148	2.169	PRISTANE
75	16.891	16.866	1800.0	25816	104990	3.607	N-C18
76	17.088	17.065	1811.6	9941	45839	1.575	PHYTANE
86	18.597	18.574	1900.0	24489	106011	3.642	N-C19
95	20.224	20.200	2000.0	23492	98848	3.396	N-C20
104	21.781	21.754	2100.0	21764	66520	2.972	N-C21
111	23.375	23.344	2200.0	21016	81370	2.795	N-C22
117	24.709	24.675	2300.0	20147	71454	2.455	N-C23
124	26.085	26.048	2400.0	20765	73698	2.533	N-C24
130	27.416	27.376	2500.0	18766	80000	2.748	N-C25
138	28.685	28.645	2600.0	18315	67989	2.336	N-C26
145	29.923	29.885	2700.0	16693	57732	1.983	N-C27
151	31.109	31.097	2800.0	14489	48406	1.663	N-C28
158	32.259	32.260	2900.0	13656	45165	1.552	N-C29
164	33.368	33.383	3000.0	11169	42432	1.458	N-C30
170	34.445	34.474	3100.0	9592	34340	1.180	N-C31
174	35.485	35.526	3200.0	7759	25858	0.888	N-C32
179	36.499	36.552	3300.0	7243	29690	1.020	N-C33
[illegible]	37.485	37.551	3400.0	5352	25973	0.892	N-C34
[illegible]	38.445	38.523	3500.0	3309	16846	0.579	N-C35
Residual				301066	1215947	41.773	
Total				747612	2910818	100.000	

Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area


Analysis B340802S 3, 14, 1 34/8-1 TEST3
Intensity (mV)
Retention Time (Minutes)
N-C14
N-C15
N-C16
N-C17
N-C18
N-C19
N-C20
N-C21
N-C22
N-C23
N-C24
N-C25
N-C26
N-C27
N-C28
N-C29
N-C30
N-C31
N-C32
N-C33
N-C34
N-C35
I-C16
I-C18
PRISTANE
PHYTANE

Analysis: 3 B3408025,14,1
Reported on 17-Mar-87 at 13:41

M U L T I C H R O M V3.2

Analyst Name :ARNE Analysis ID: SAT AUTO
Information :34/8-2 SAT

SATURATES SPLITLESS AUTOSAMPLER

Channel:3 Title: CHANNEL 3 Date 17-Mar-87 Time 7:25
Analysis:B3408025 Sample Name:34/8-1 TEST3 Sample ID: 0 Bottle:
Sample 14 Injection 1

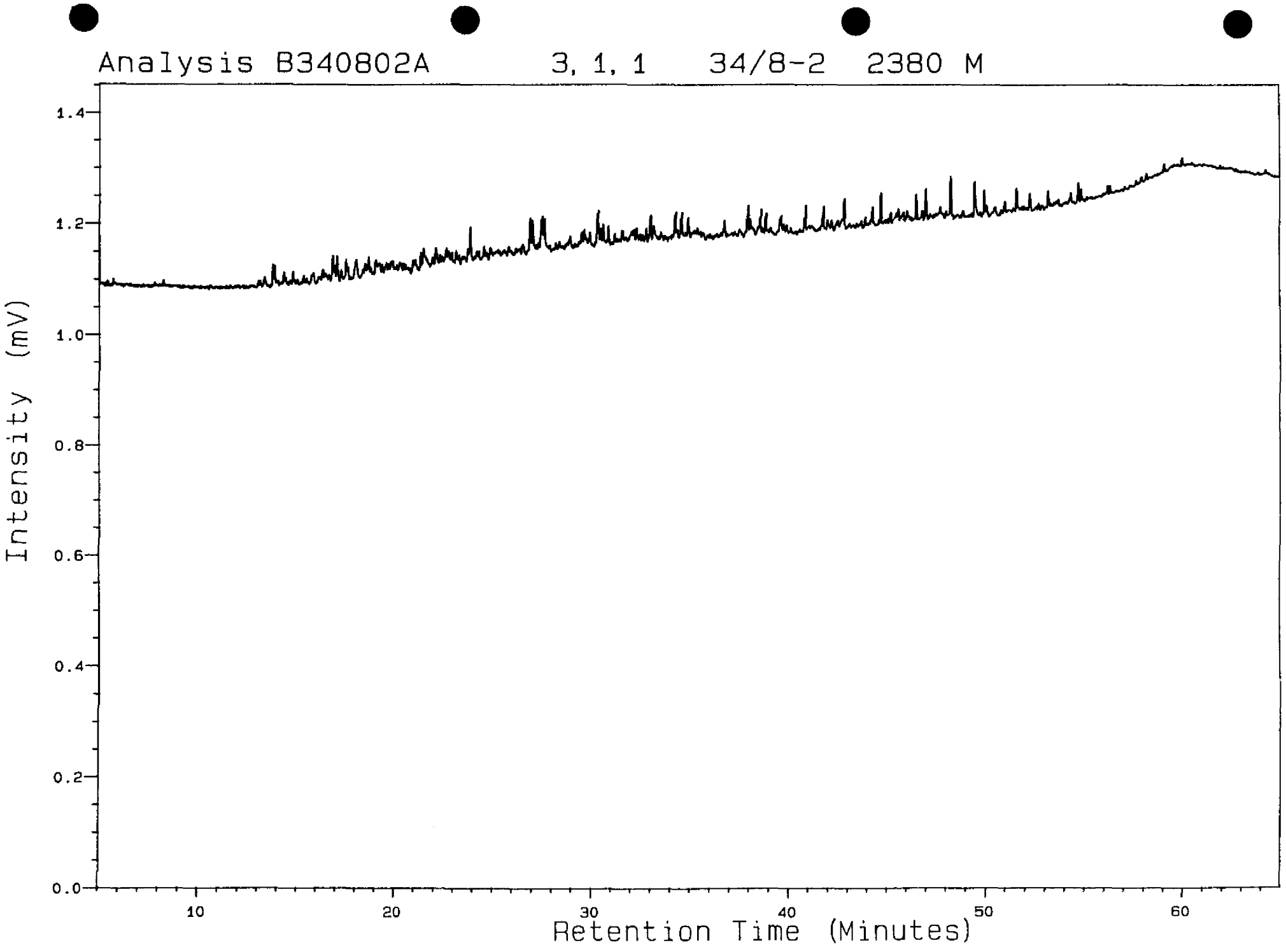
Peak	R/T m.	RT Corr	RT Val	Hght uV	Area uVs	%	Identity
40	9.269	9.234	1400.0	61340	241738	5.106	N-C14
52	10.552	10.512	1463.0	26578	96004	2.028	I-C16
57	11.304	11.261	1500.0	56182	236781	5.002	N-C15
73	13.261	13.211	1600.0	50867	225529	4.764	N-C16
[illegible]	14.211	14.161	1650.6	18144	79590	1.681	I-C18
[illegible]	15.139	15.090	1700.0	44707	194331	4.118	N-C17
87	15.296	15.248	1705.9	30218	134575	2.843	PRISTANE
95	16.915	16.868	1800.0	39210	158911	3.357	N-C18
96	17.112	17.066	1811.6	18579	81398	1.719	PHYTANE
106	18.616	18.571	1900.0	34788	152749	3.227	N-C19
117	20.243	20.200	2000.0	31450	123901	2.617	N-C20
127	21.792	21.751	2100.0	27483	93697	1.979	N-C21
137	23.280	23.240	2200.0	24061	82869	1.750	N-C22
143	24.712	24.674	2300.0	21692	71166	1.503	N-C23
151	26.086	26.045	2400.0	19651	66790	1.411	N-C24
157	27.403	27.367	2500.0	16732	58747	1.241	N-C25
163	28.680	28.645	2600.0	15214	48462	1.024	N-C26
170	29.907	29.862	2700.0	12749	39244	0.829	N-C27
175	31.056	31.092	2800.0	10459	31253	0.660	N-C28
182	32.237	32.260	2900.0	9361	26702	0.564	N-C29
186	33.347	33.387	3000.0	6791	22247	0.470	N-C30
192	34.419	34.476	3100.0	5363	16085	0.340	N-C31
196	35.464	35.539	3200.0	3988	12134	0.256	N-C32
200	36.483	36.574	3300.0	3409	11398	0.241	N-C33
[illegible]	37.469	37.576	3400.0	2497	11545	0.244	N-C34
205	38.424	38.546	3500.0	1586	7858	0.166	N-C35
Residual				650318	2407850	50.861	
Total				1245517	4734151	100.000	

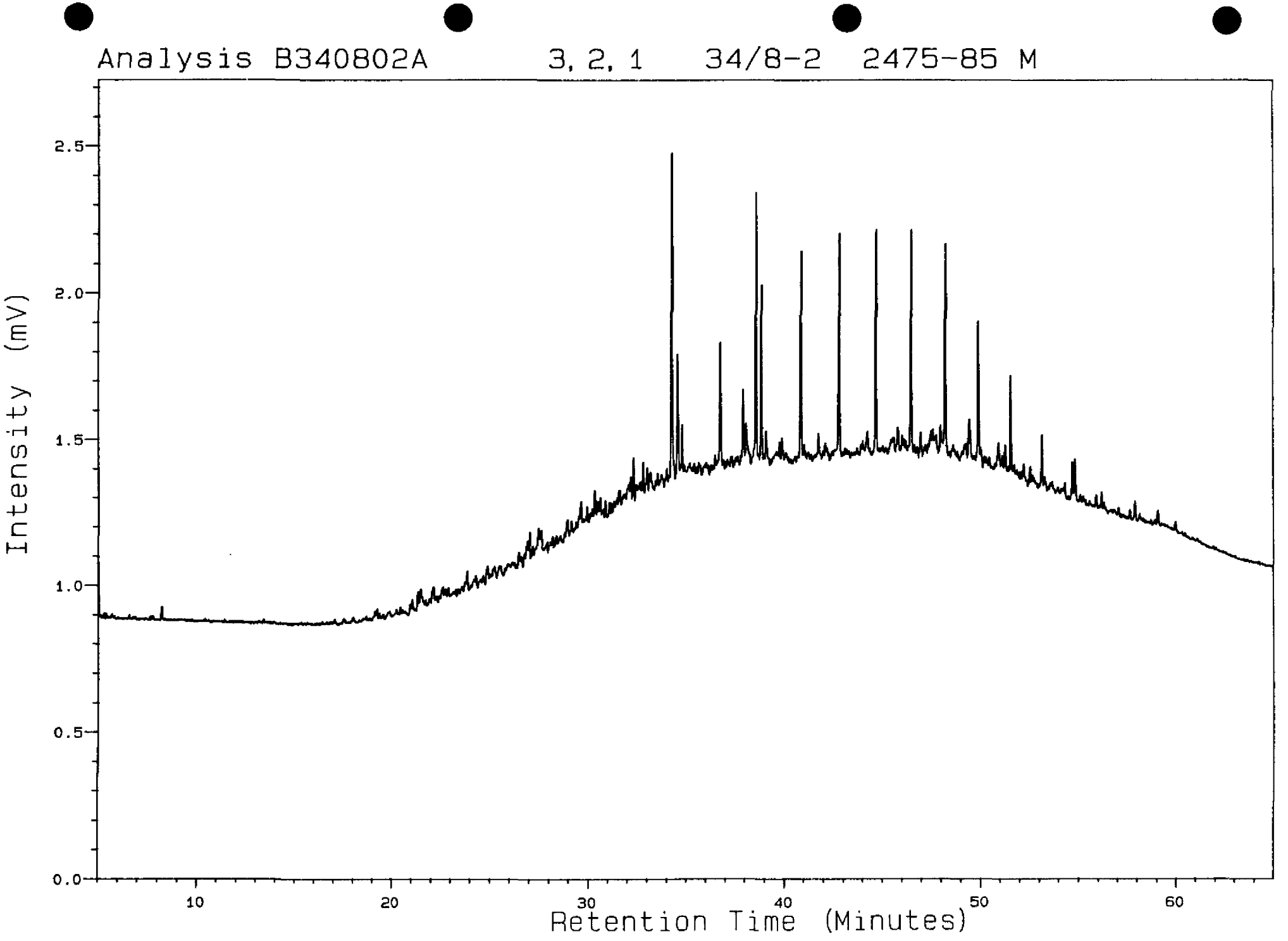
Sample Type: SA Scale Factor: 1.000 Amount: 1.000
Method: SAT Calibration: SAT Type: UC Using:Area

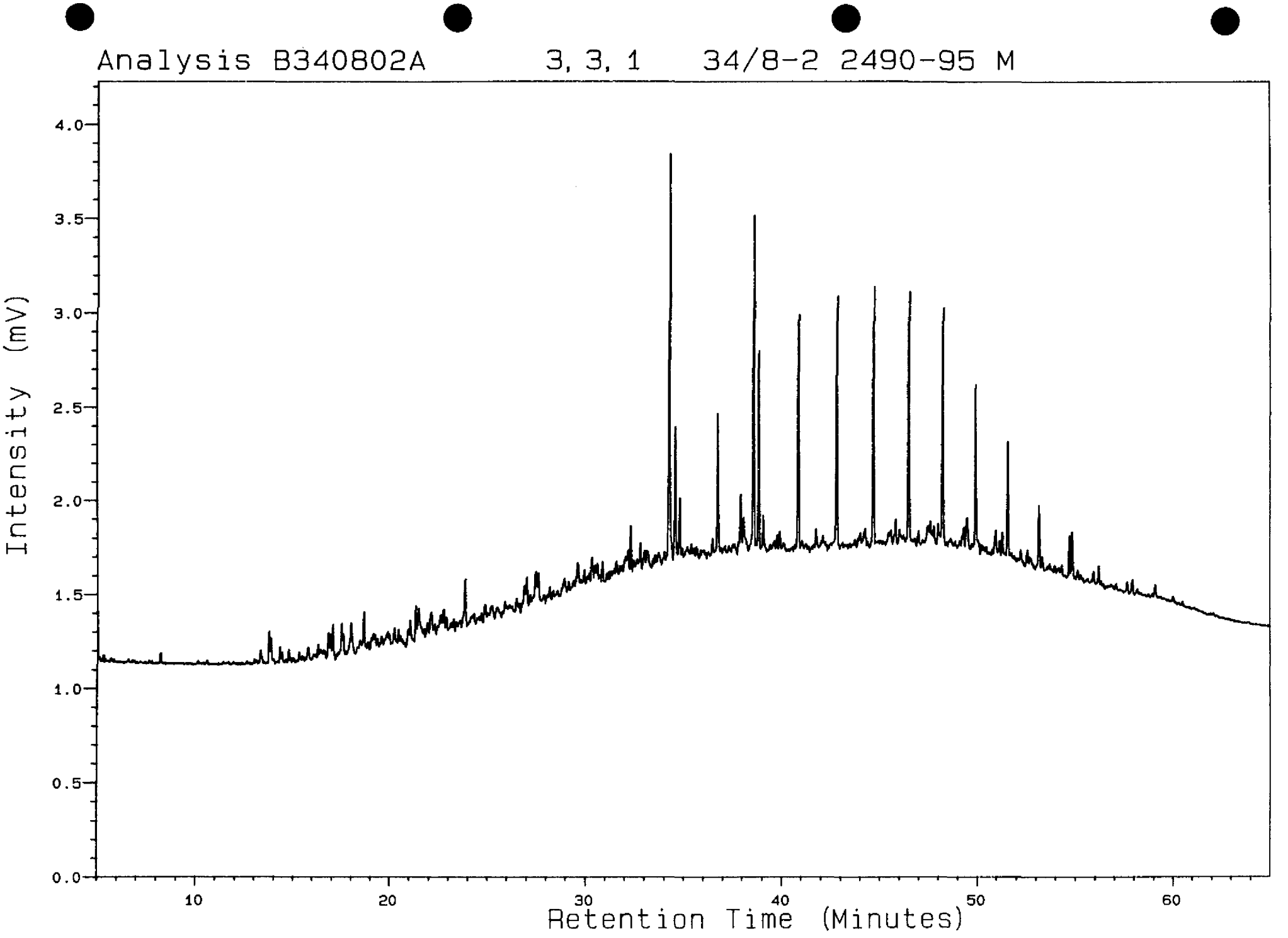
APPENDIX III

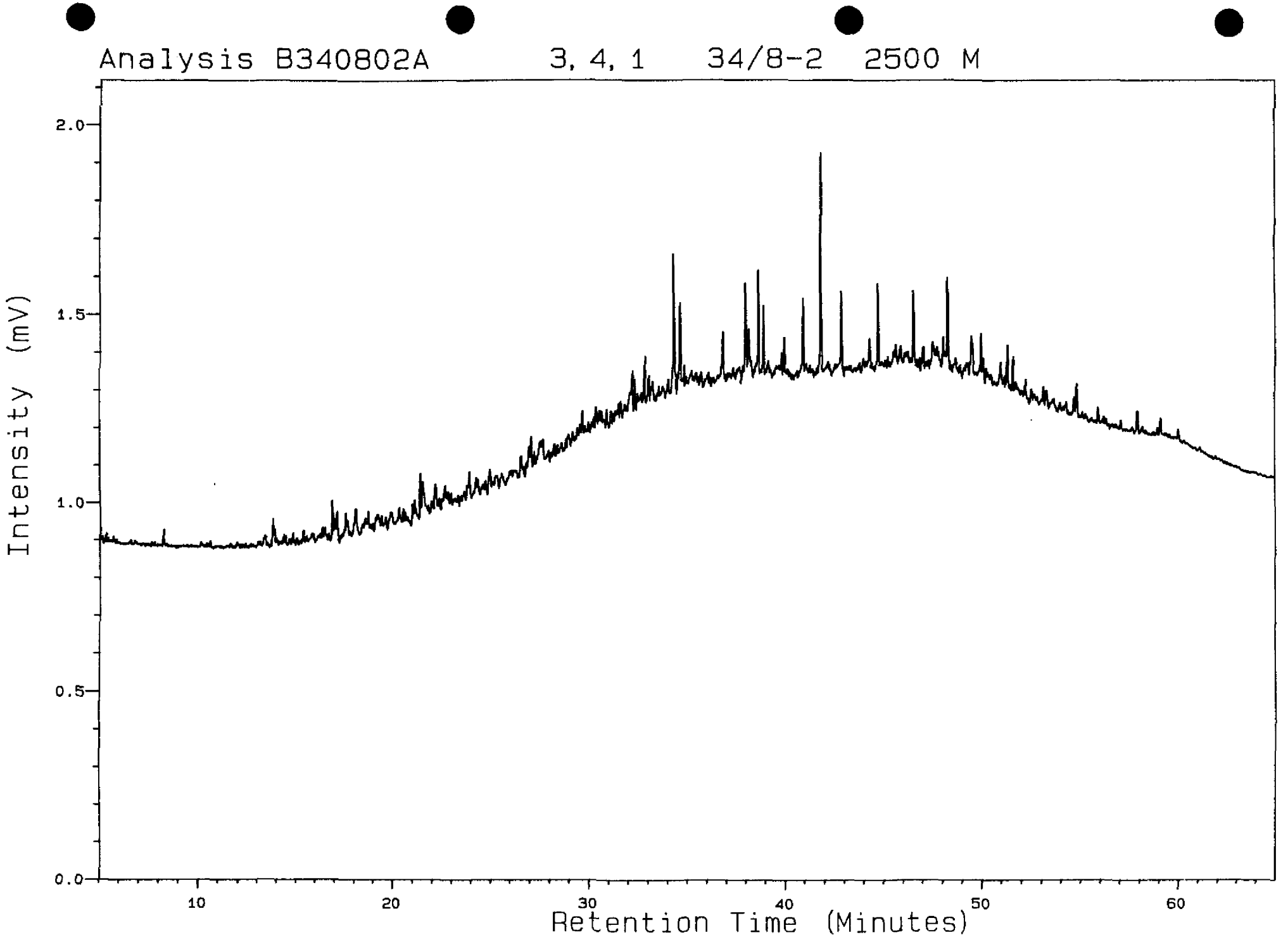
GC analysis of ARO-fractions:

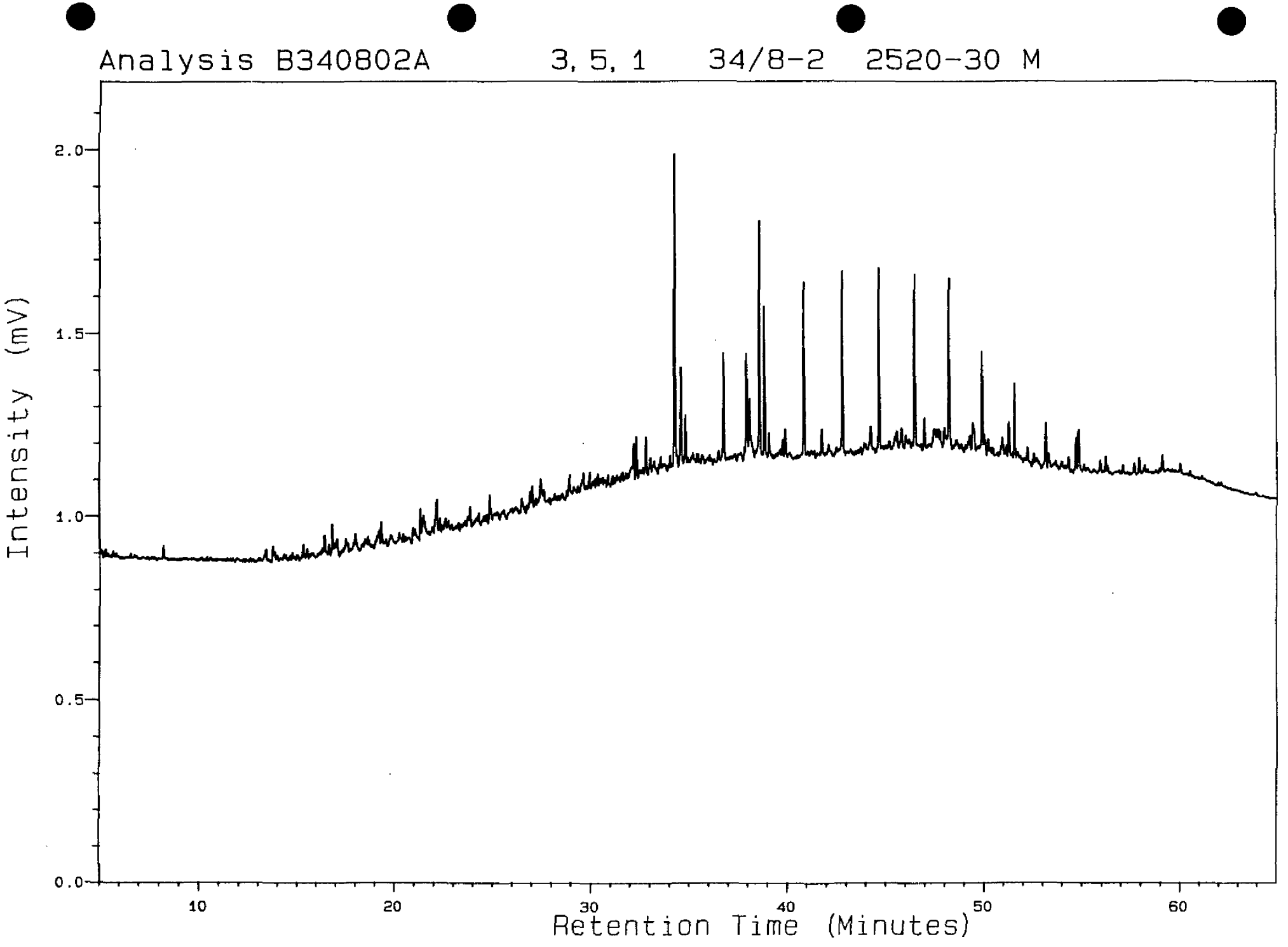
Chromatograms.

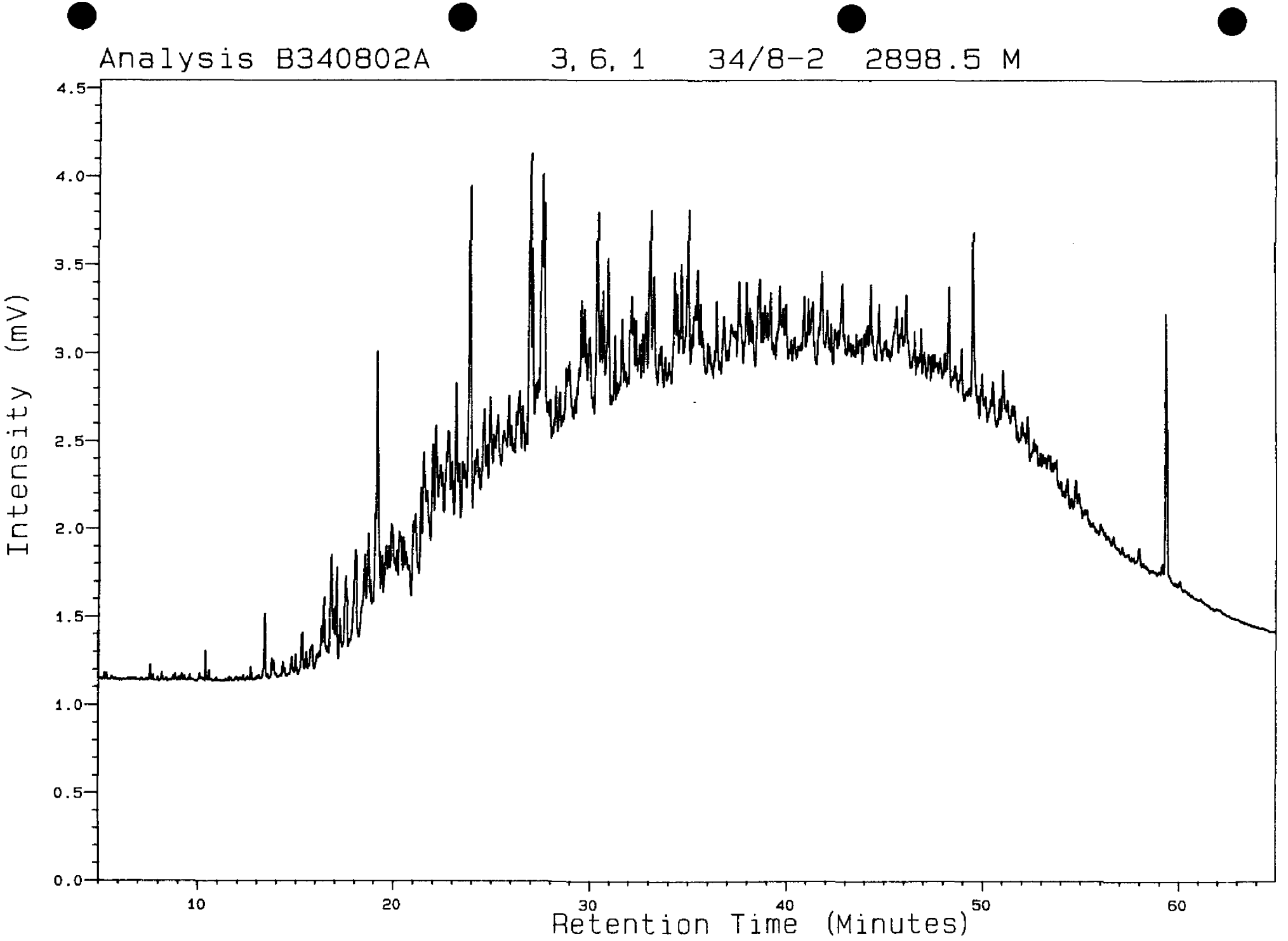

Analysis B340802A 3, 1, 1 34/8-2 2380 M
Intensity (mV)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
10
20
30
40
50
60
Retention Time (Minutes)

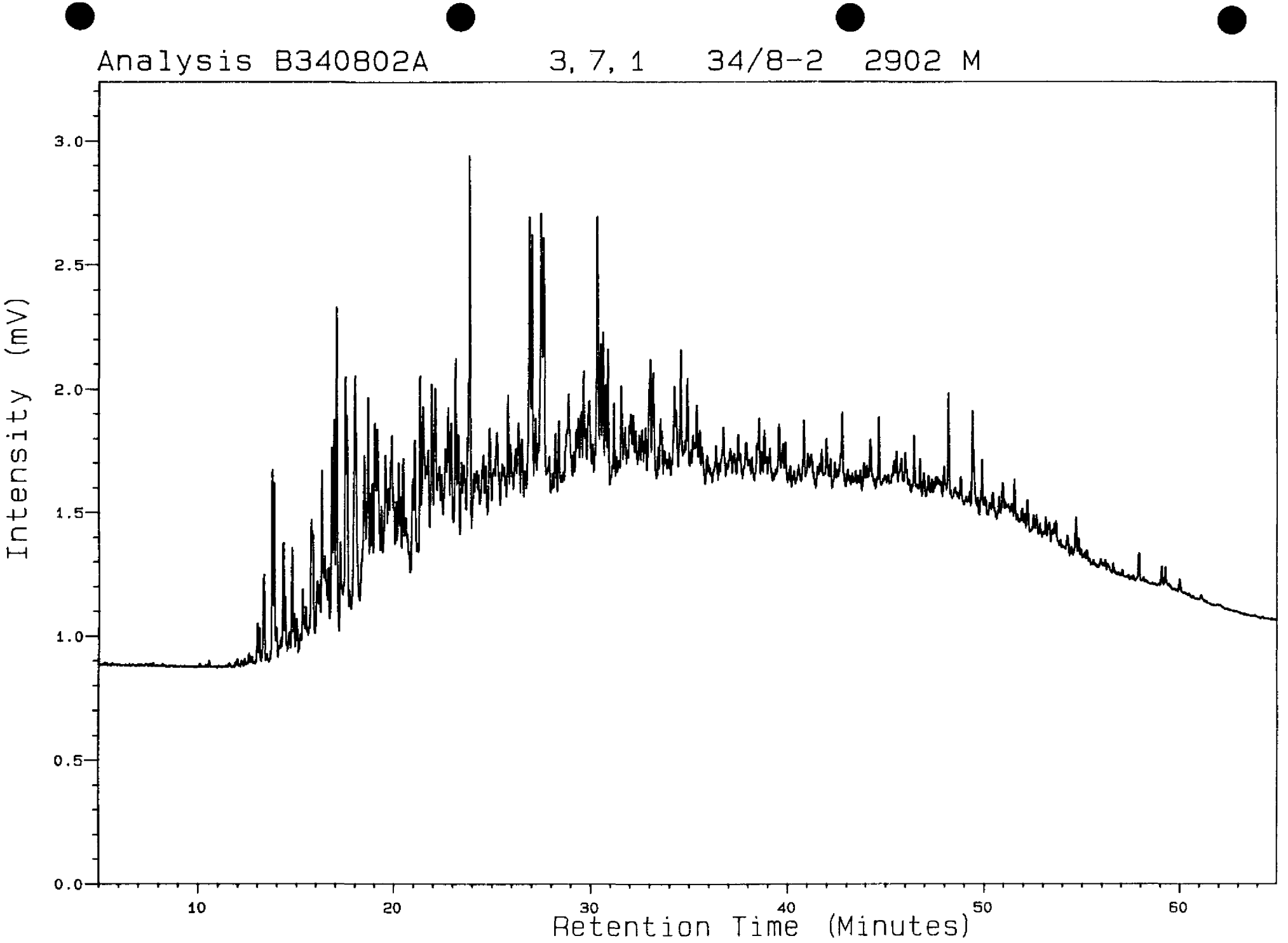

Analysis B340802A 3, 2, 1 34/8-2 2475-85 M
Intensity (mV)
2.5
2.0
1.5
1.0
0.5
0.0
10
20
30
40
50
60
Retention Time (Minutes)

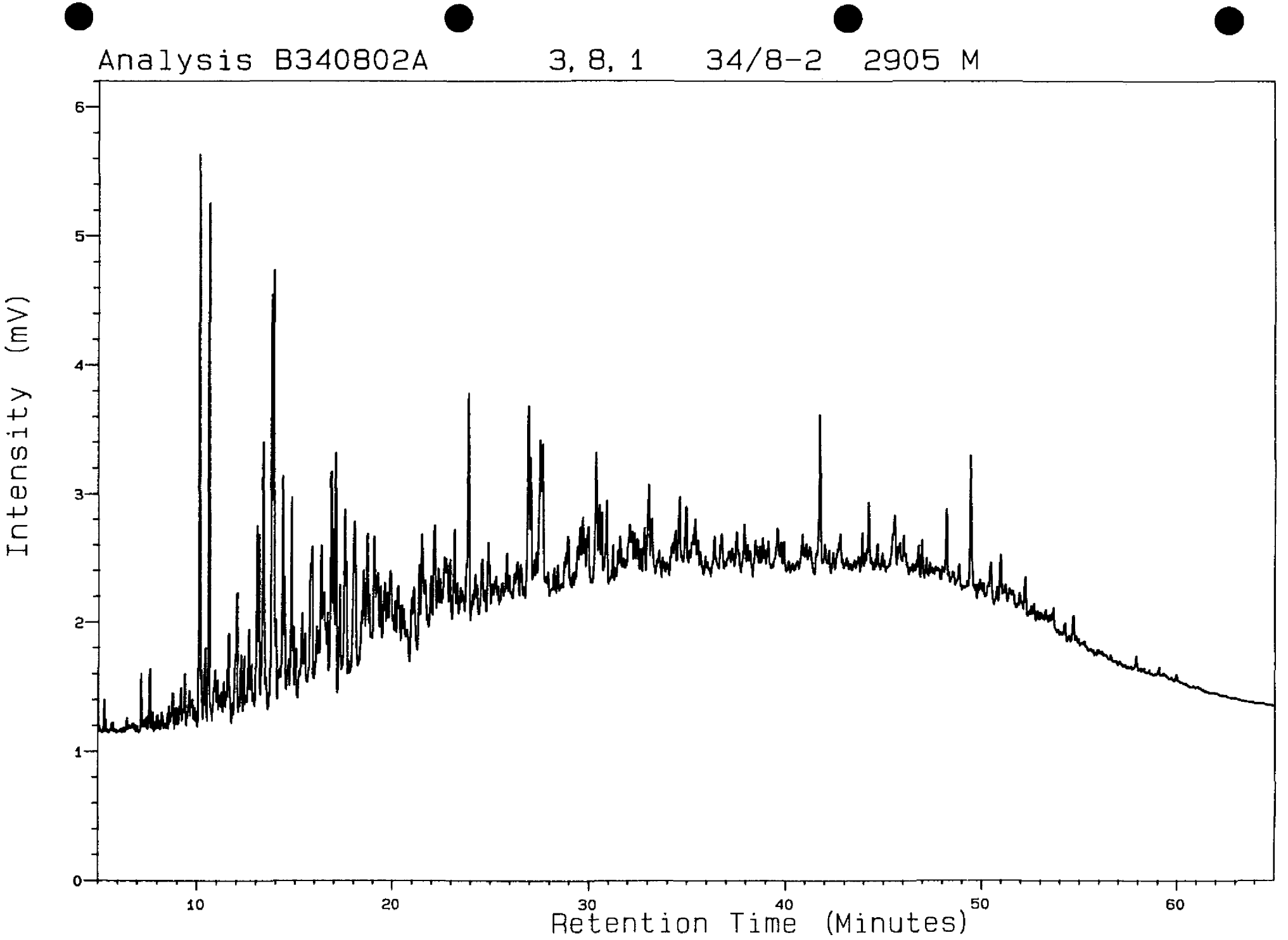

Analysis B340802A 3, 3, 1 34/8-2 2490-95 M
Intensity (mV)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
10
20
30
40
50
60
Retention Time (Minutes)

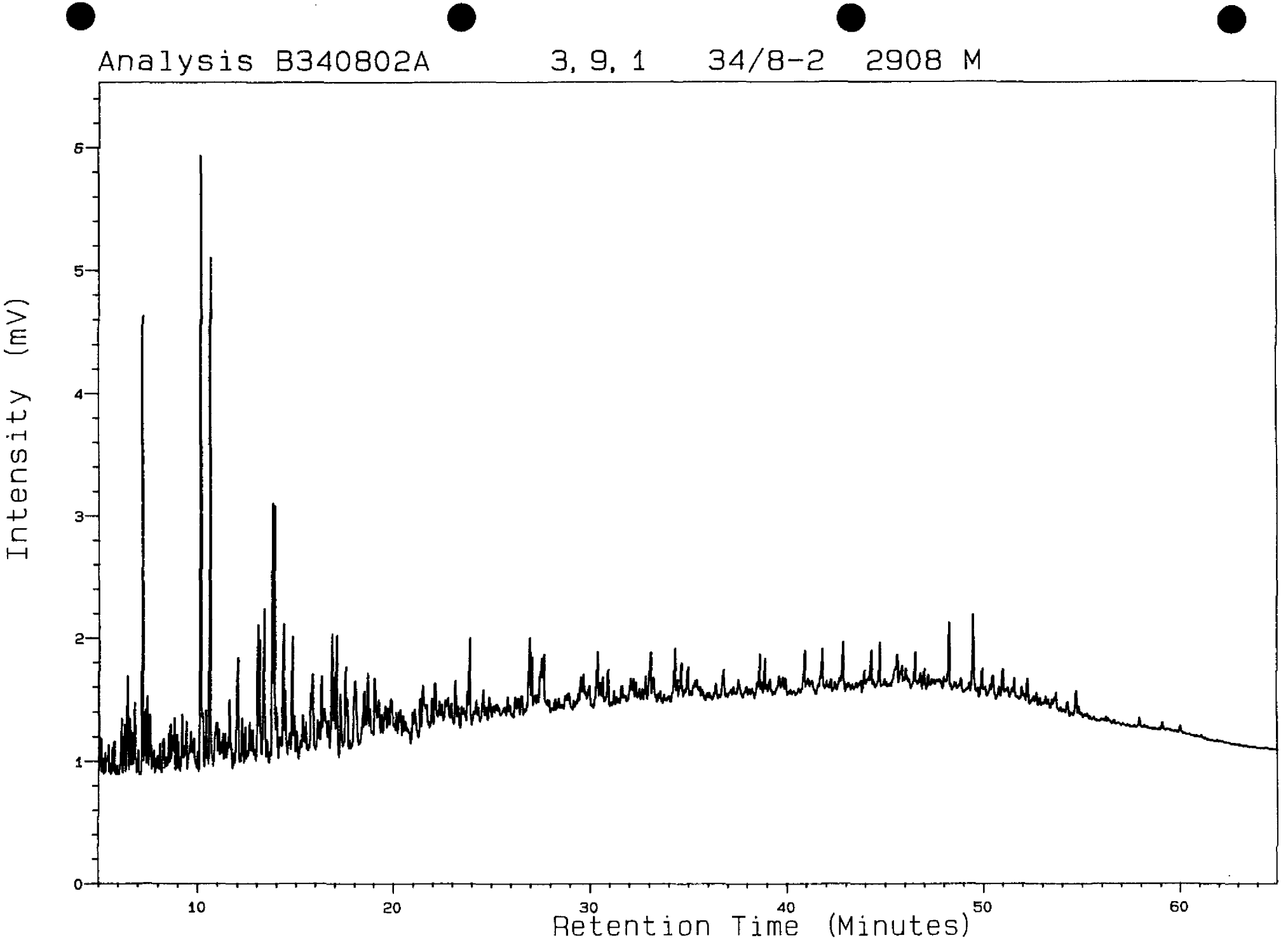

Analysis B340802A 3, 4, 1 34/8-2 2500 M
Intensity (mV)
2.0
1.5
1.0
0.5
0.0
10
20
30
40
50
60
Retention Time (Minutes)

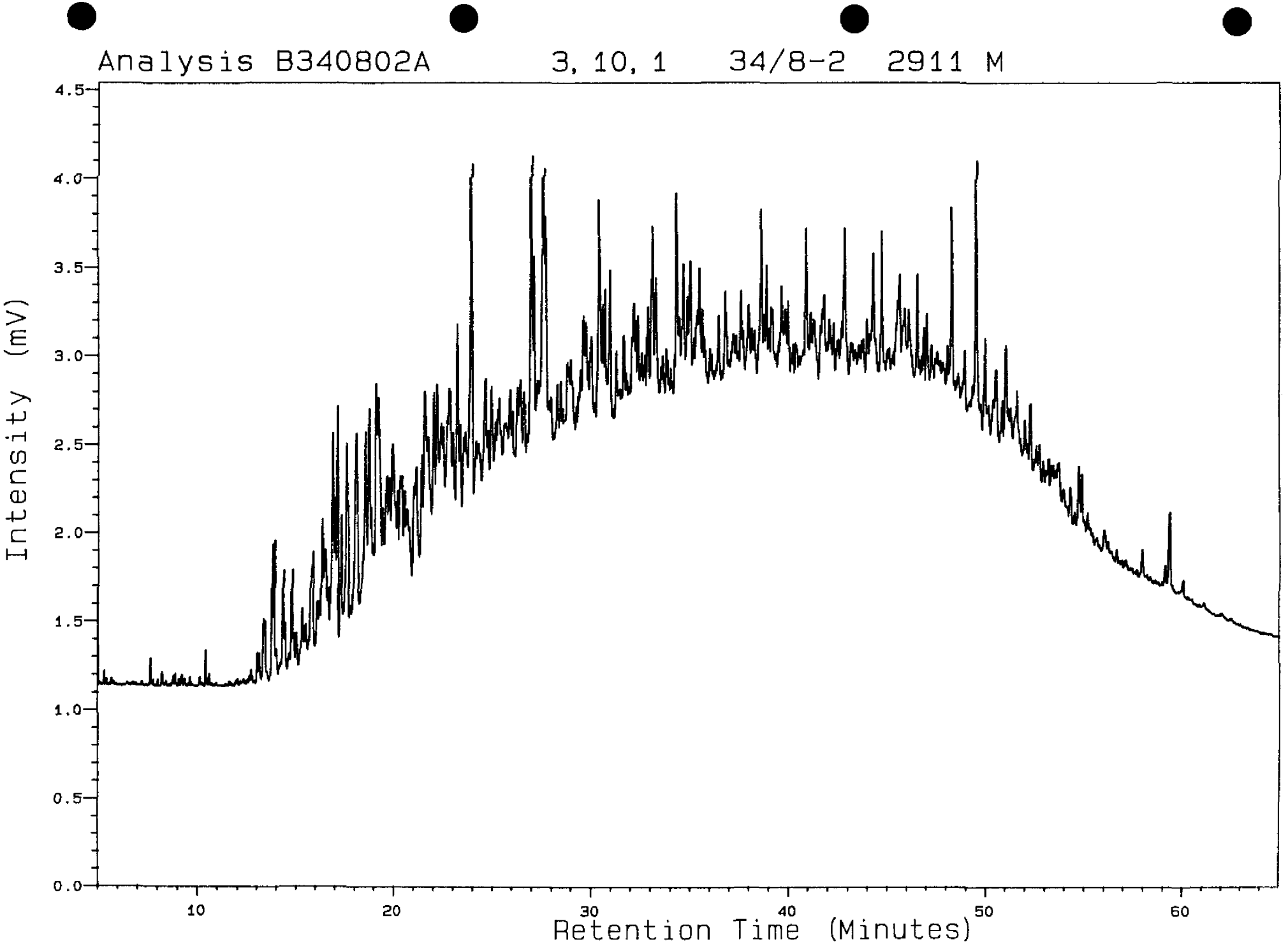

Analysis B340802A 3, 5, 1 34/8-2 2520-30 M
Intensity (mV)
2.0
1.5
1.0
0.5
0.0
10
20
30
40
50
60
Retention Time (Minutes)

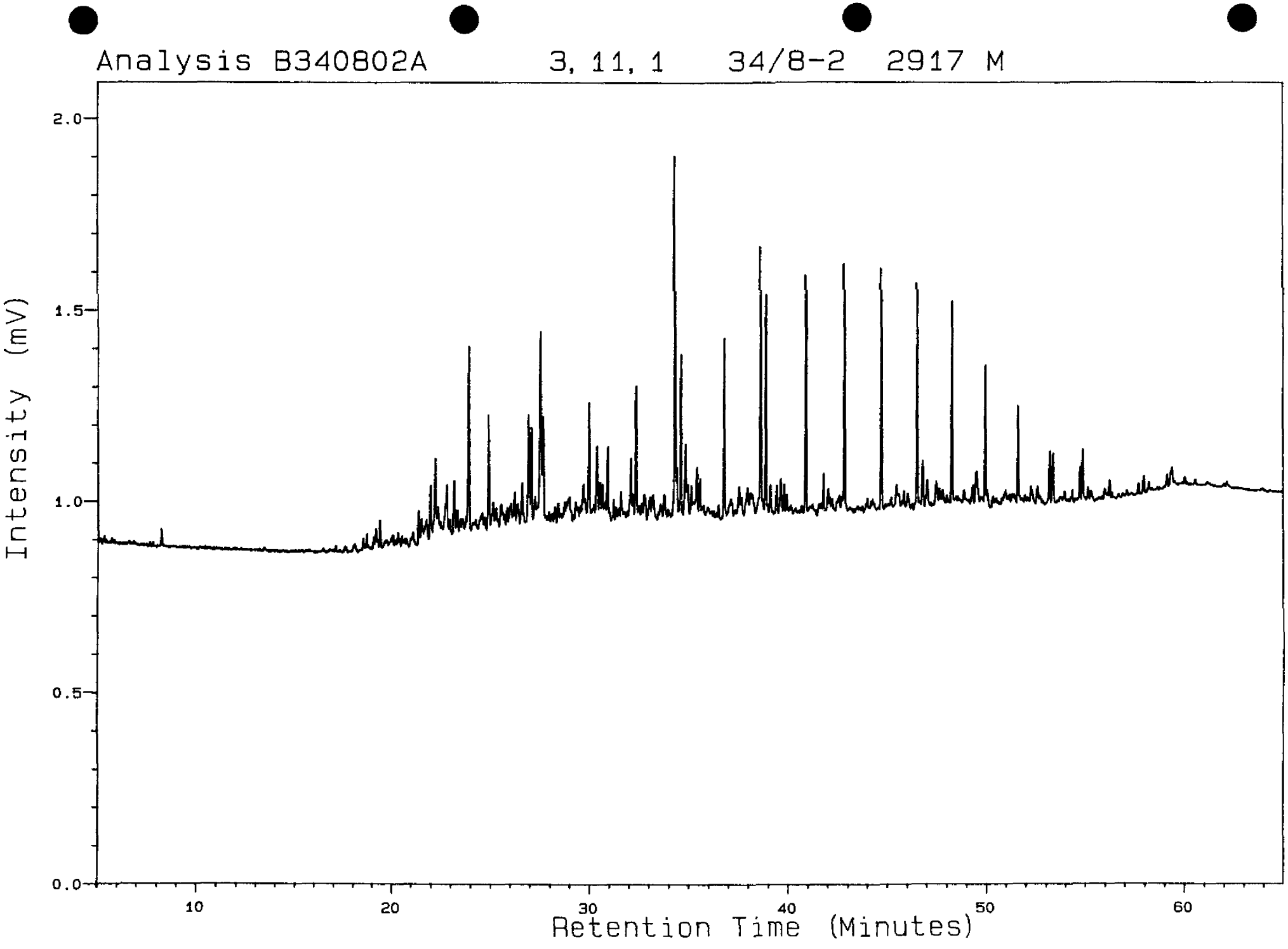

Analysis B340802A 3, 6, 1 34/8-2 2898.5 M
Intensity (mV)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
10
20
30
40
50
60
Retention Time (Minutes)


Analysis B340802A 3, 7, 1 34/8-2 2902 M
Intensity (mV)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
10
20
30
40
50
60
Retention Time (Minutes)


Analysis B340802A 3, 8, 1 34/8-2 2905 M
Intensity (mV)
0
1
2
3
4
5
6
10
20
30
40
50
60
Retention Time (Minutes)


Analysis B340802A 3, 9, 1 34/8-2 2908 M
Intensity (mV)
0
1
2
3
4
5
6
10
20
30
40
50
60
Retention Time (Minutes)


Analysis B340802A 3, 10, 1 34/8-2 2911 M
Intensity (mV)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
10
20
30
40
50
60
Retention Time (Minutes)


Analysis B340802A 3, 11, 1 34/8-2 2917 M
Intensity (mV)
2.0
1.5
1.0
0.5
0.0
10
20
30
40
50
60
Retention Time (Minutes)

APPENDIX IV

GC/MS analysis of triterpane/sterane-biomarkers:

Samples are detected by Selected Metastable Ion Monitoring (SMIM).
See enclosed list of detected transitions (next page).
Identity of the major peaks are indicated on sample #10 (biom.std.).

Standard analytical conditions are given in NH-report R-20141, Reference sample for GC/MS analysis of Sterane/Triterpane-biomarkers, Arne Steen.

Sample	Description
1	2375_90
2	2470_85
3	2485_95
4	2495_2515
5	2515_30
6	2898.5
7	2902
8	2905
9	2908
10	BIOM.STD
11	2911
12	2917
13	STO
14	DST2
15	TEST3

TRITERPANES:

Abbreviations: 17α(H),21β(H)-homohopane-22S = $C_{31}\alpha\beta22S$

	Fragment ion	Diagnostic ions
$C_{13}H_{21}$	177.1643	De-methylated and C_{29}-ββ-isomer
$C_{14}H_{23}$	191.1800	αβ-and βα-isomers
$C_{15}H_{25}$	205.1956	Methylated and C_{31}-ββ-isomer

	Parent ion	$M-15^+$	$M^*=M^+\rightarrow191$	$M^*=M^+\rightarrow177$
$C_{27}H_{46}$	370.3600	355.3365	98.6872	84.7478
$C_{28}H_{48}$	384.3756	369.3521	95.0887	
$C_{29}H_{50}$	398.3913	383.3678	91.7434	
$C_{30}H_{52}$	412.4069	397.3834	88.6256	
$C_{31}H_{54}$	426.4226	411.3991	85.7126	
$C_{32}H_{56}$	440.4382	425.4147	82.9851	
$C_{33}H_{58}$	454.4539	439.4304	80.4344	
$C_{34}H_{60}$	468.4695	453.4460	78.0308	
$C_{35}H_{62}$	482.4852	467.4617	75.7667	

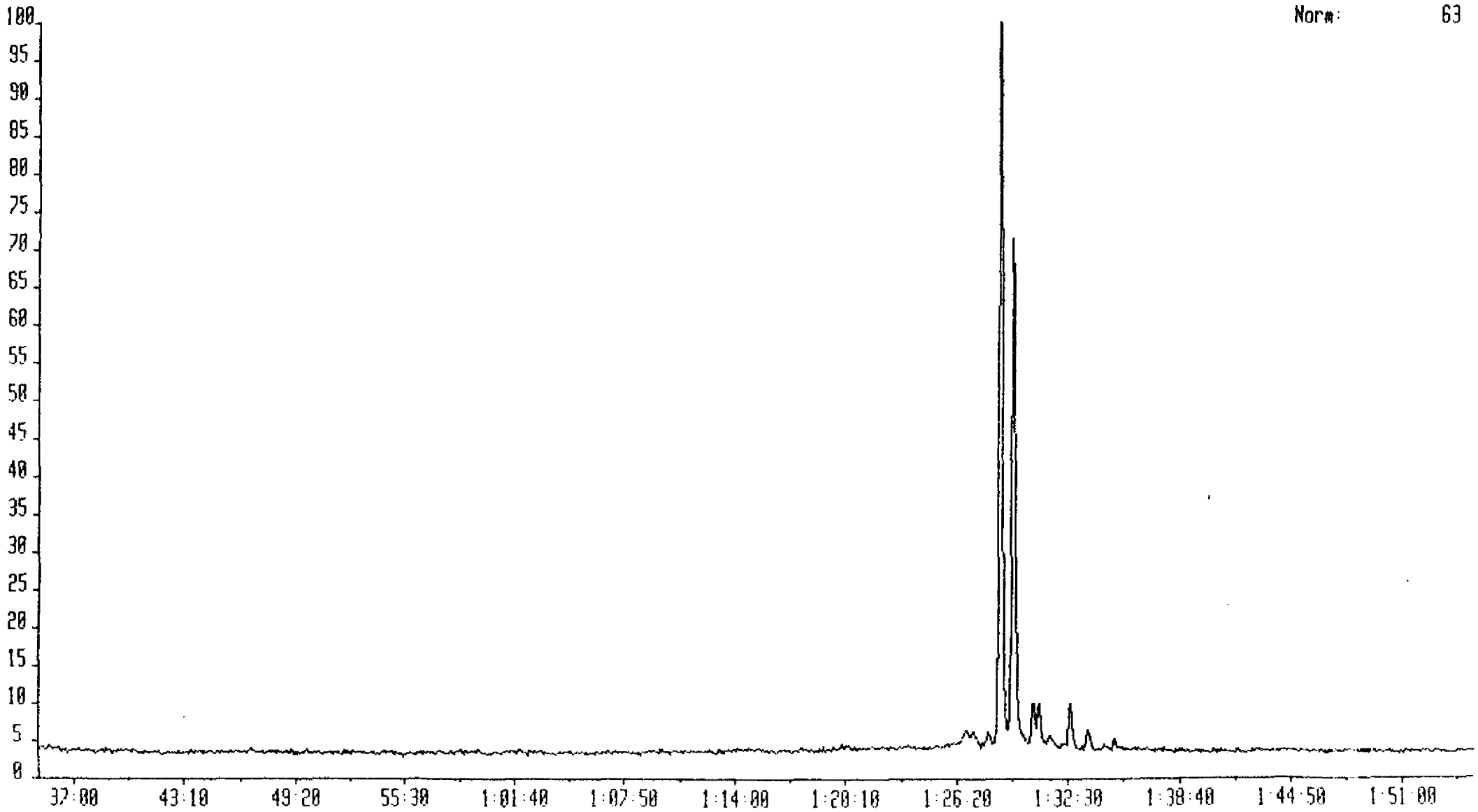
STERANES:

Abbreviations: 24-ethyl-5α(H),14β(H),21β(H)-cholestane-20S = $C_{29}\alpha\beta\beta20S$

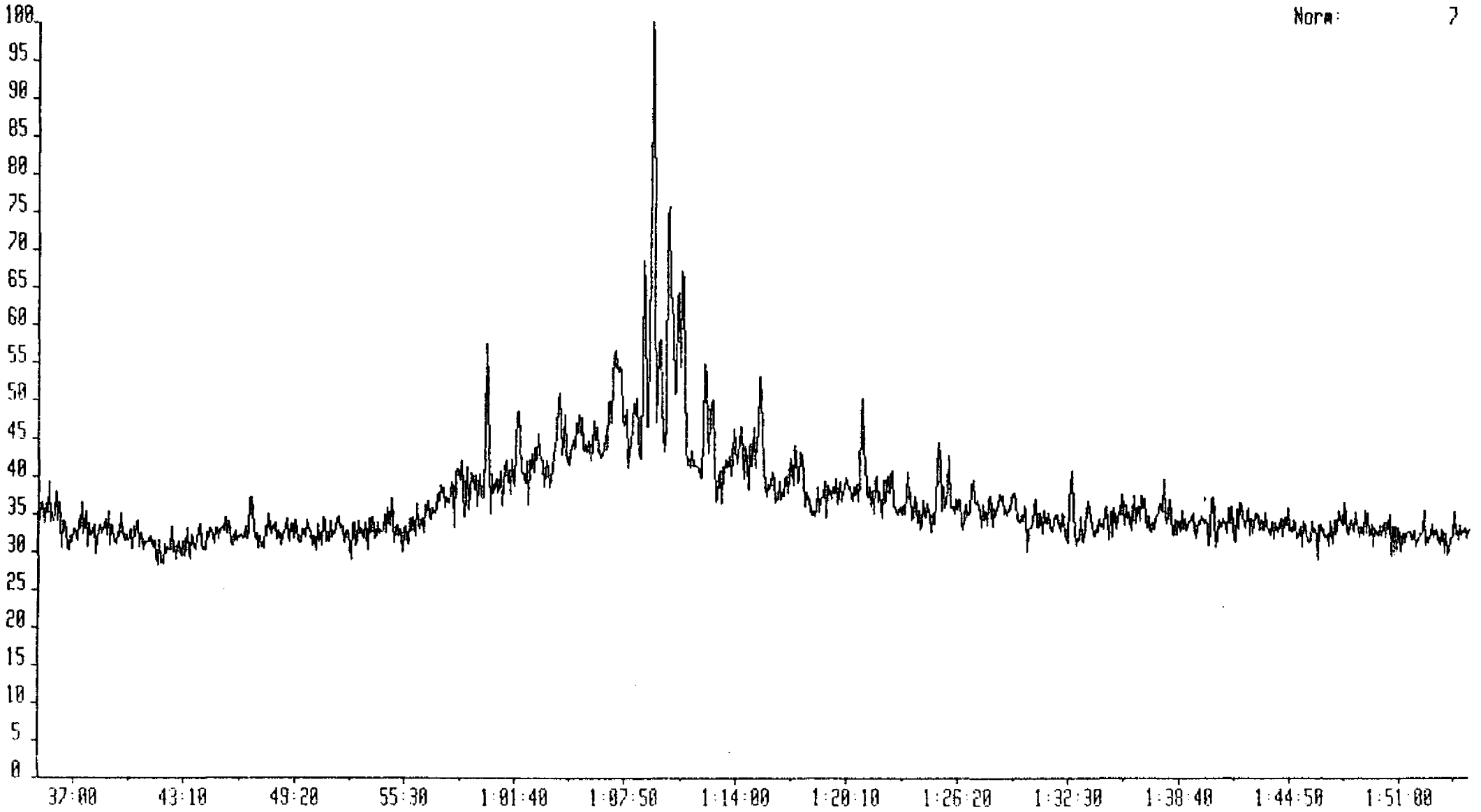
	Fragment ion	Diagnostic ions
$C_{16}H_{25}$	217.1956	Regular steranes, ααα-isomers
$C_{16}H_{26}$	218.2035	--------"-------, αββ- --"---
$C_{19}H_{31}$	259.2426	Diasteranes

	Parent ion	$M-15^+$	$M^*=M^+\rightarrow217$
$C_{27}H_{48}$	372.3756	357.3521	126.6837
$C_{28}H_{50}$	386.3913	371.3678	122.0885
$C_{29}H_{52}$	400.4069	385.3834	117.8150
$C_{30}H_{54}$	414.4226	399.3991	113.8305

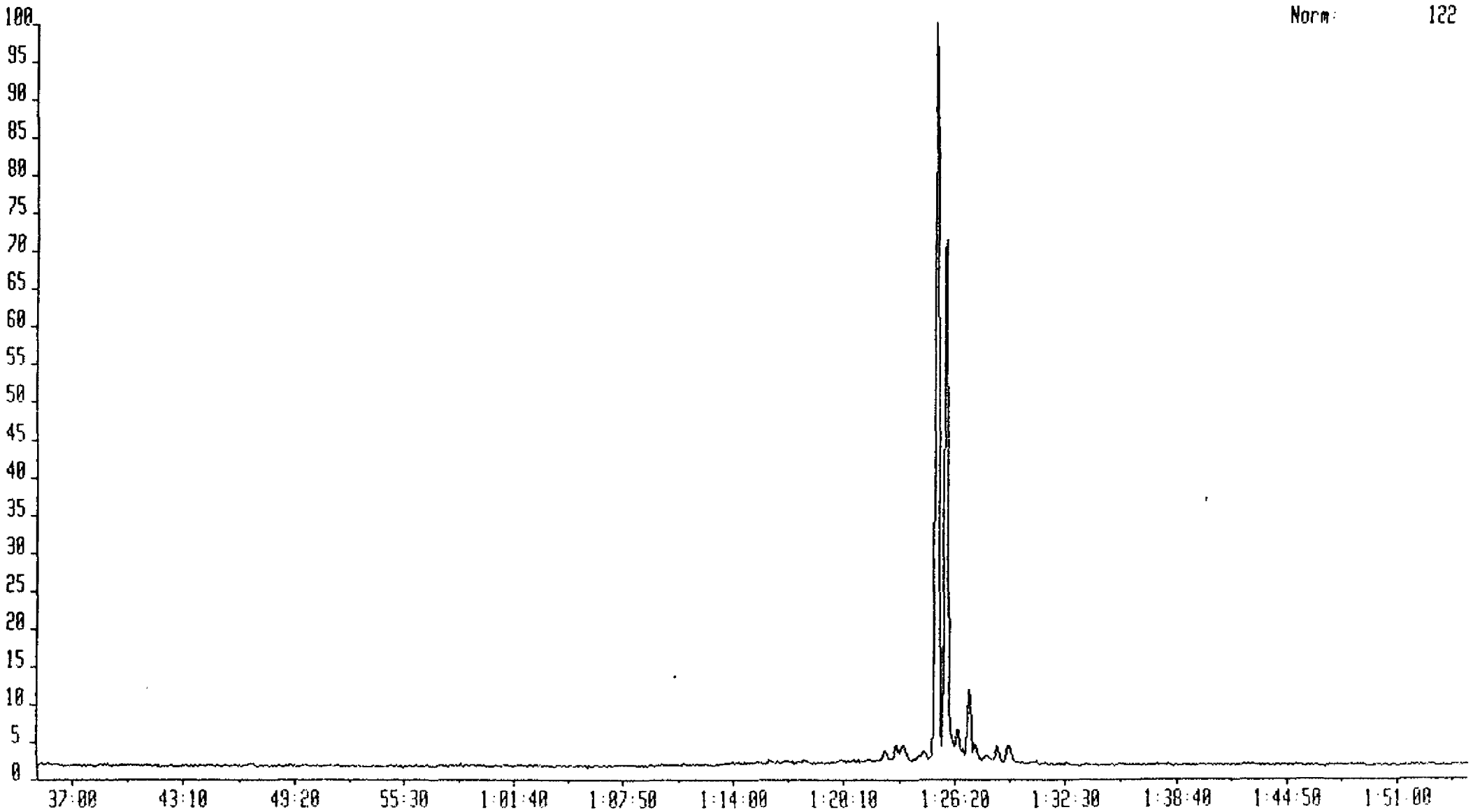
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 1 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:2375-90



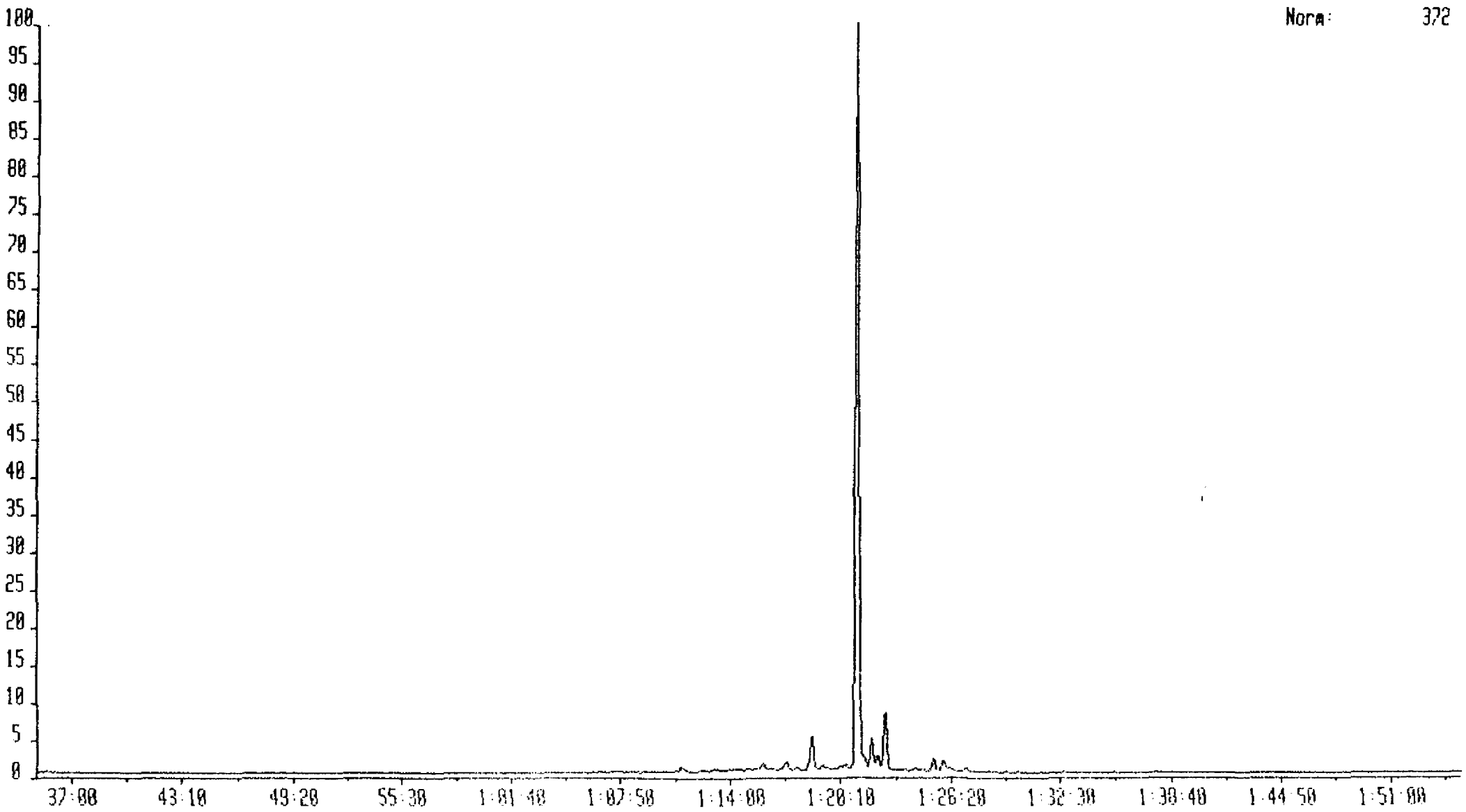
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 1 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:2375-90



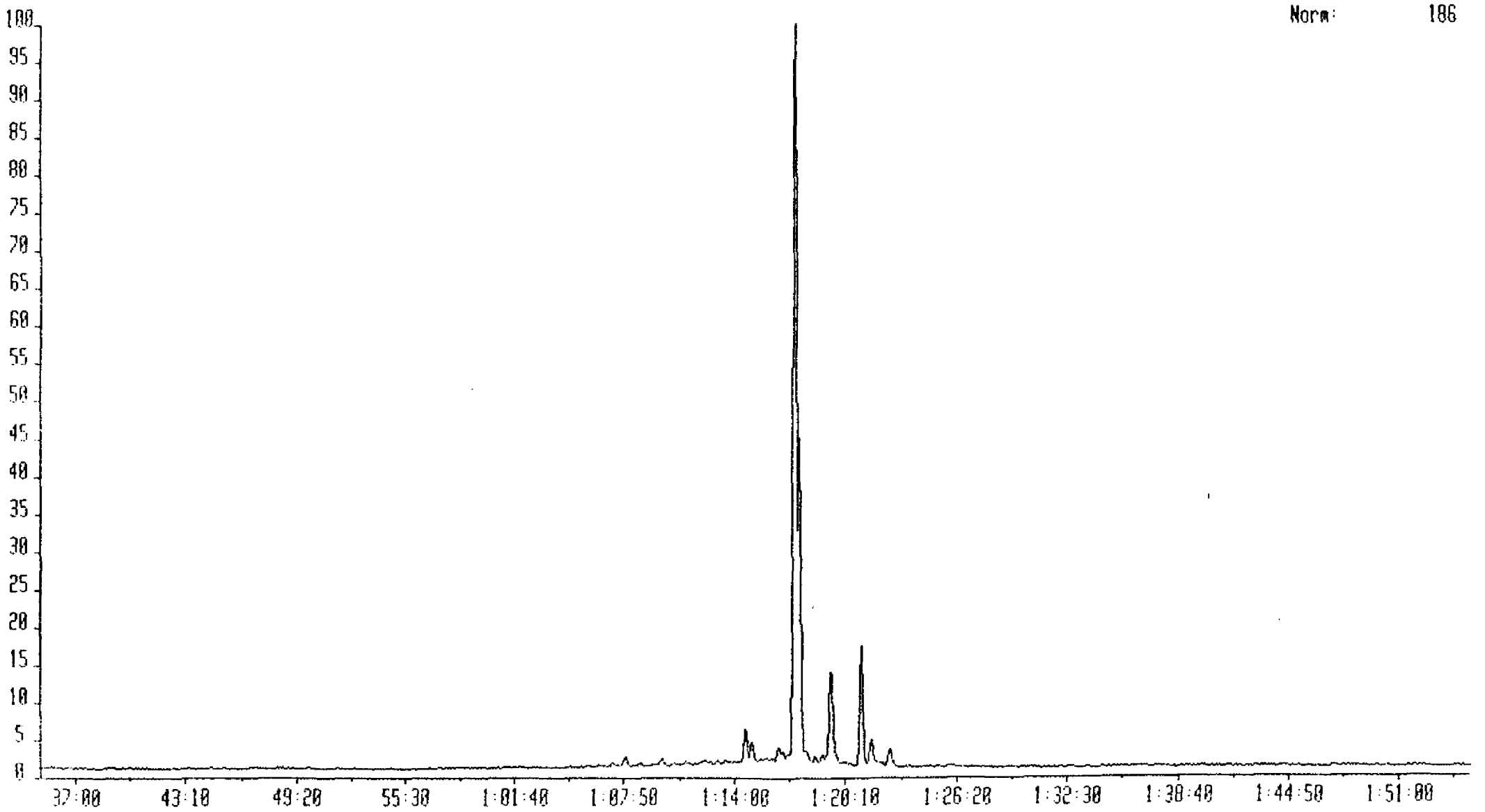
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 1 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:2375-90



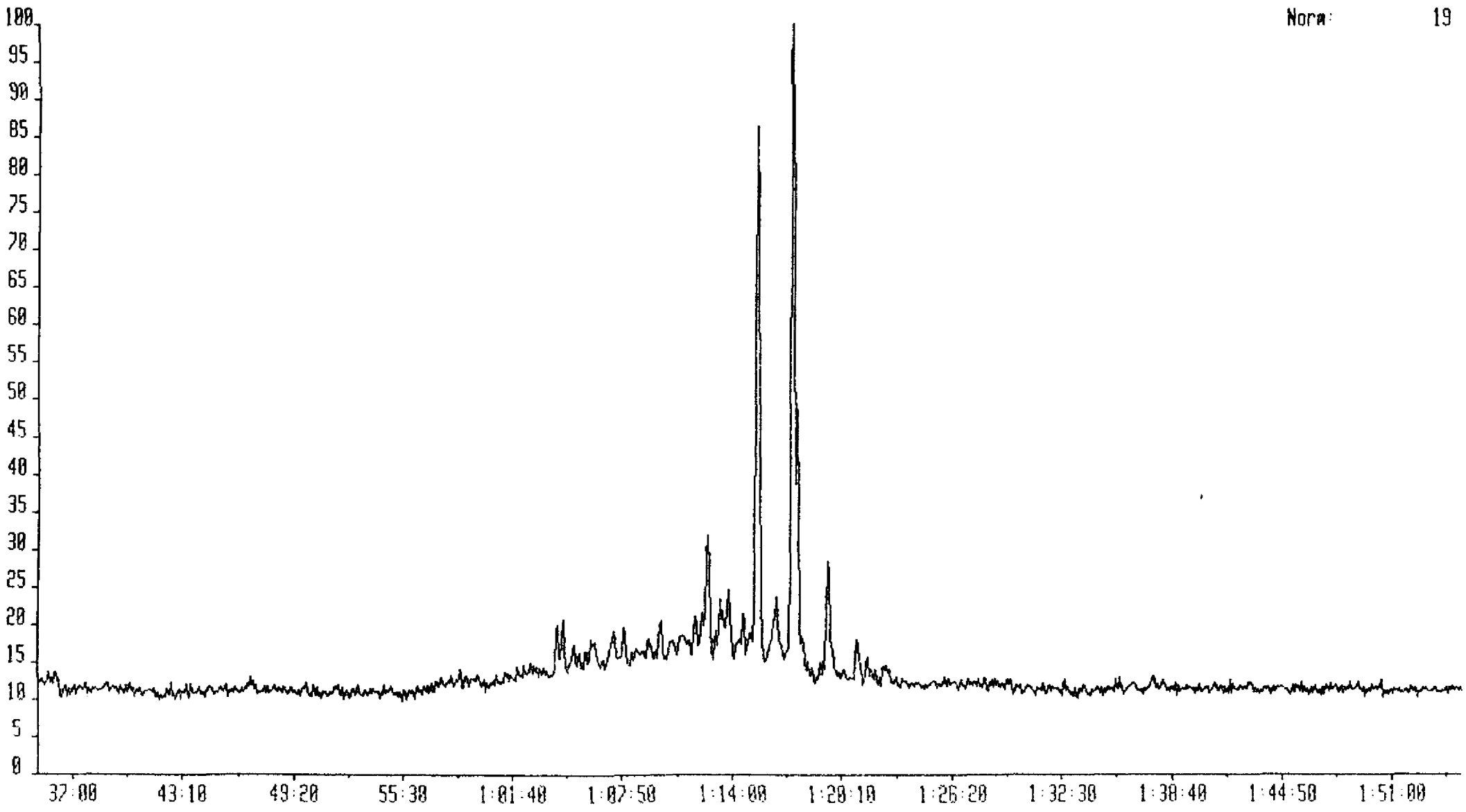
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 1 Injection 1 Group 1 Mass 00.5461 412.0000->191.0000
Text:2375-90



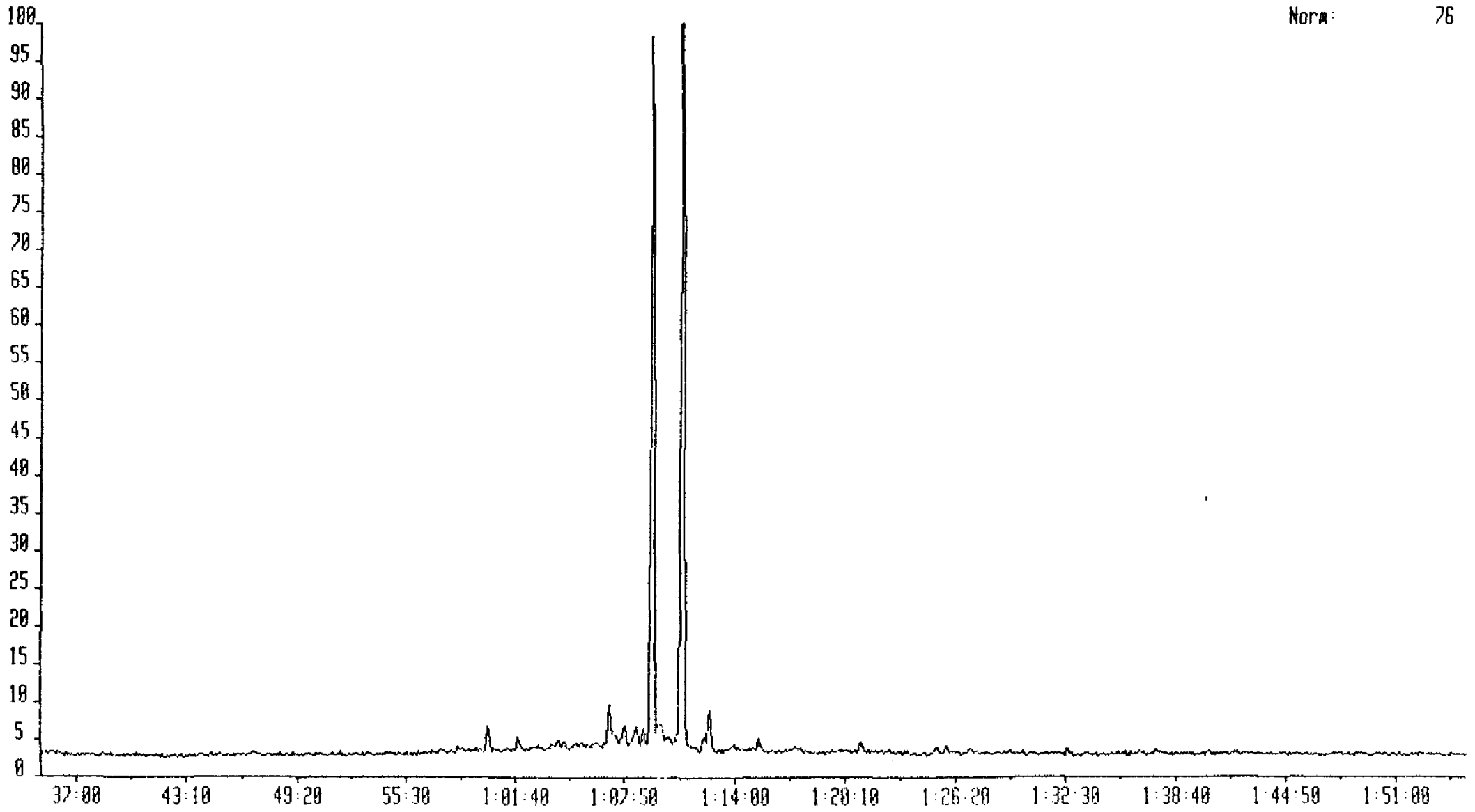
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 1 Injection 1 Group 1 Mass 91.6600 398.0000->191.0000
Text 2375-90



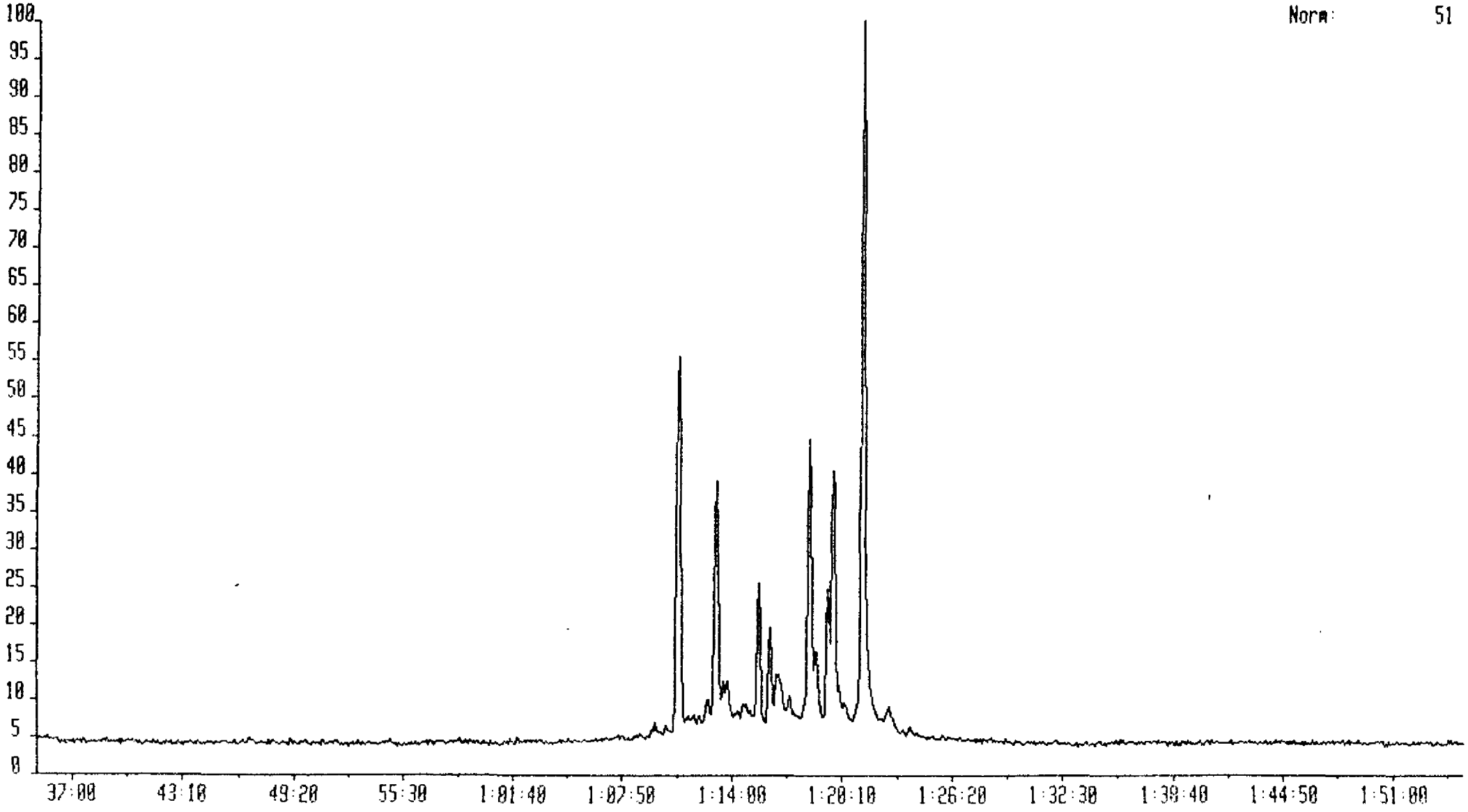
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 1 Injection 1 Group 1 Mass 95.0026 304.0000->191.0000
Text:2375-90



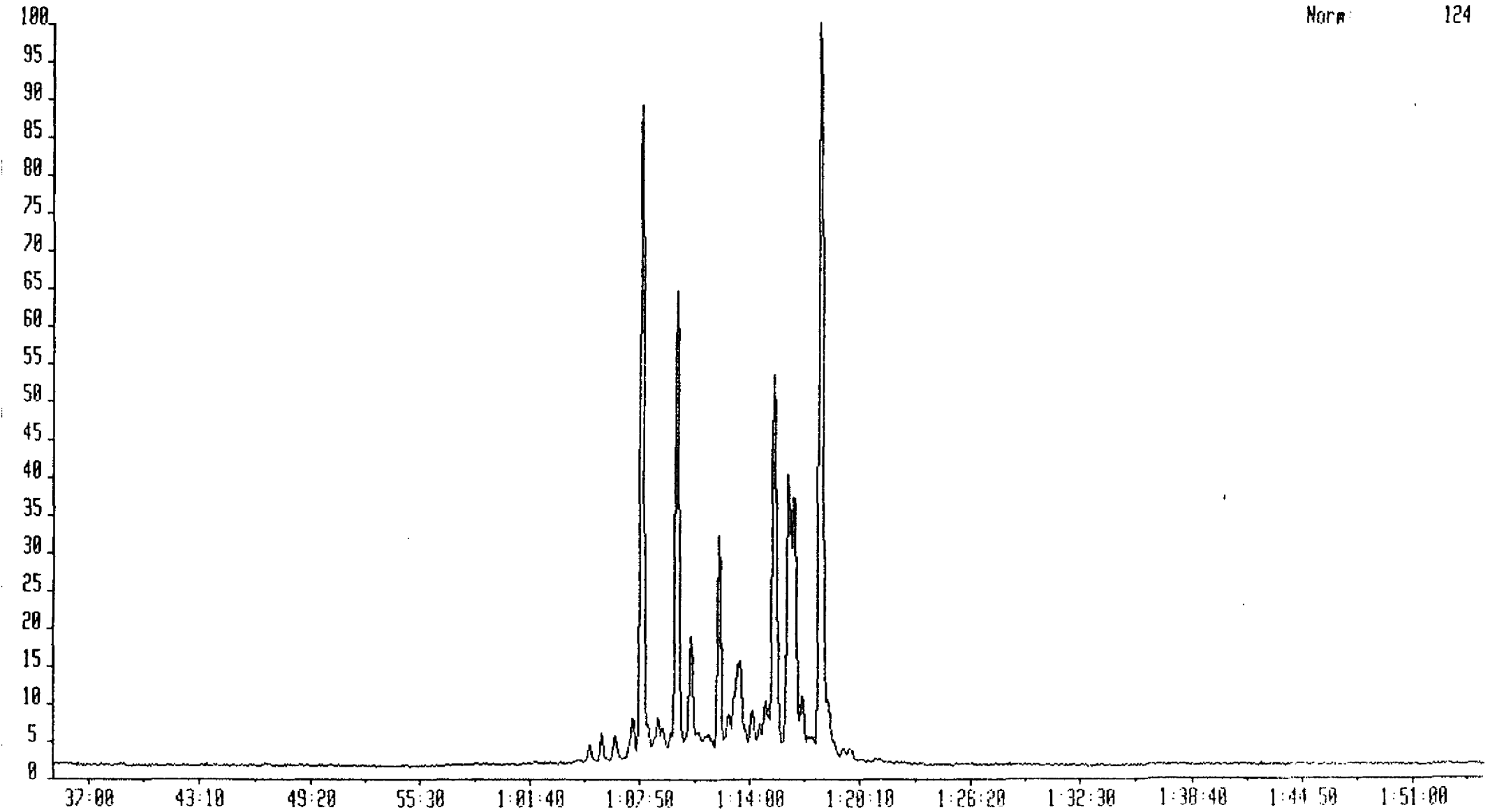
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 1 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:2375-90



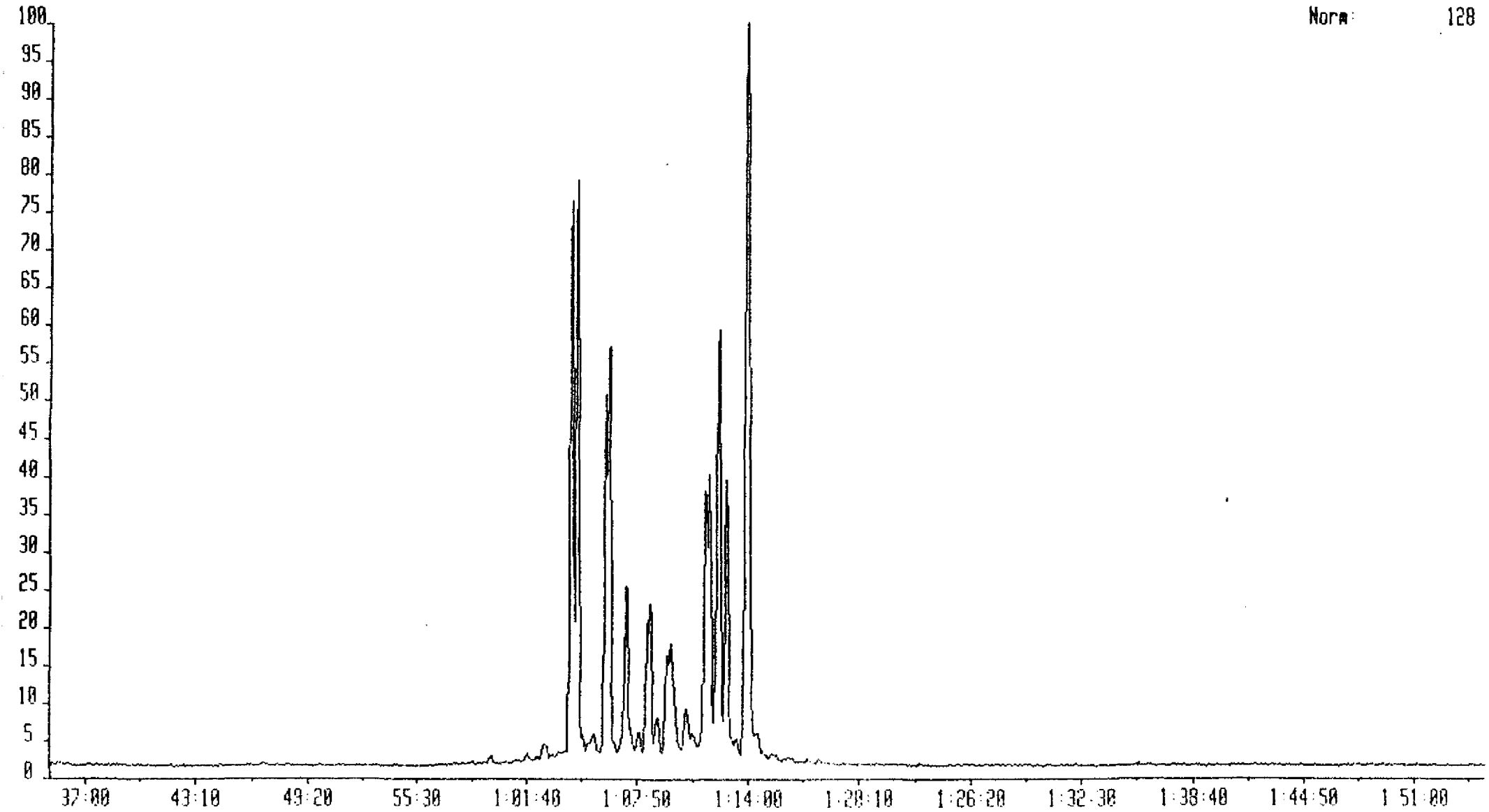
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 1 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:2375-90



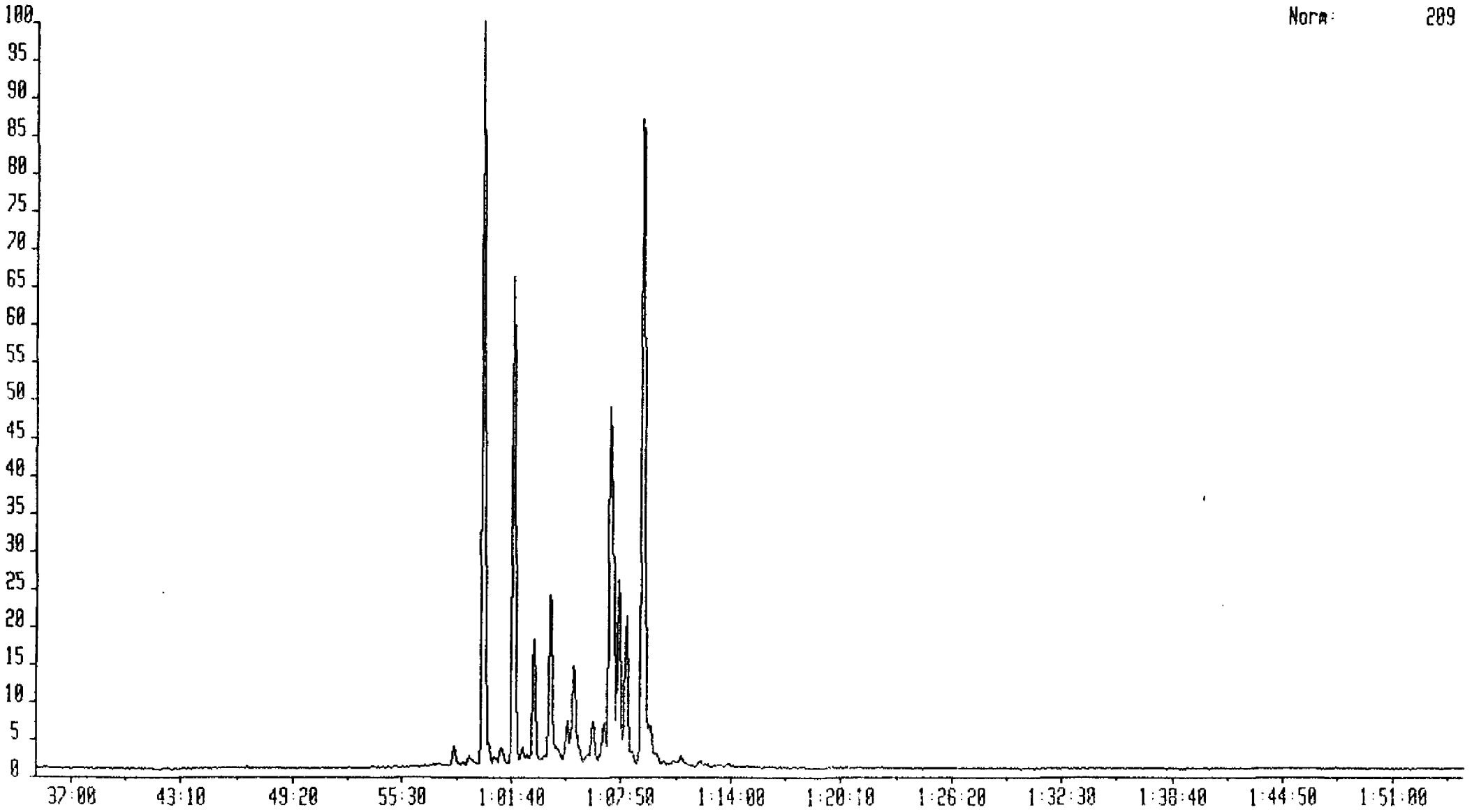
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 1 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:2375-90



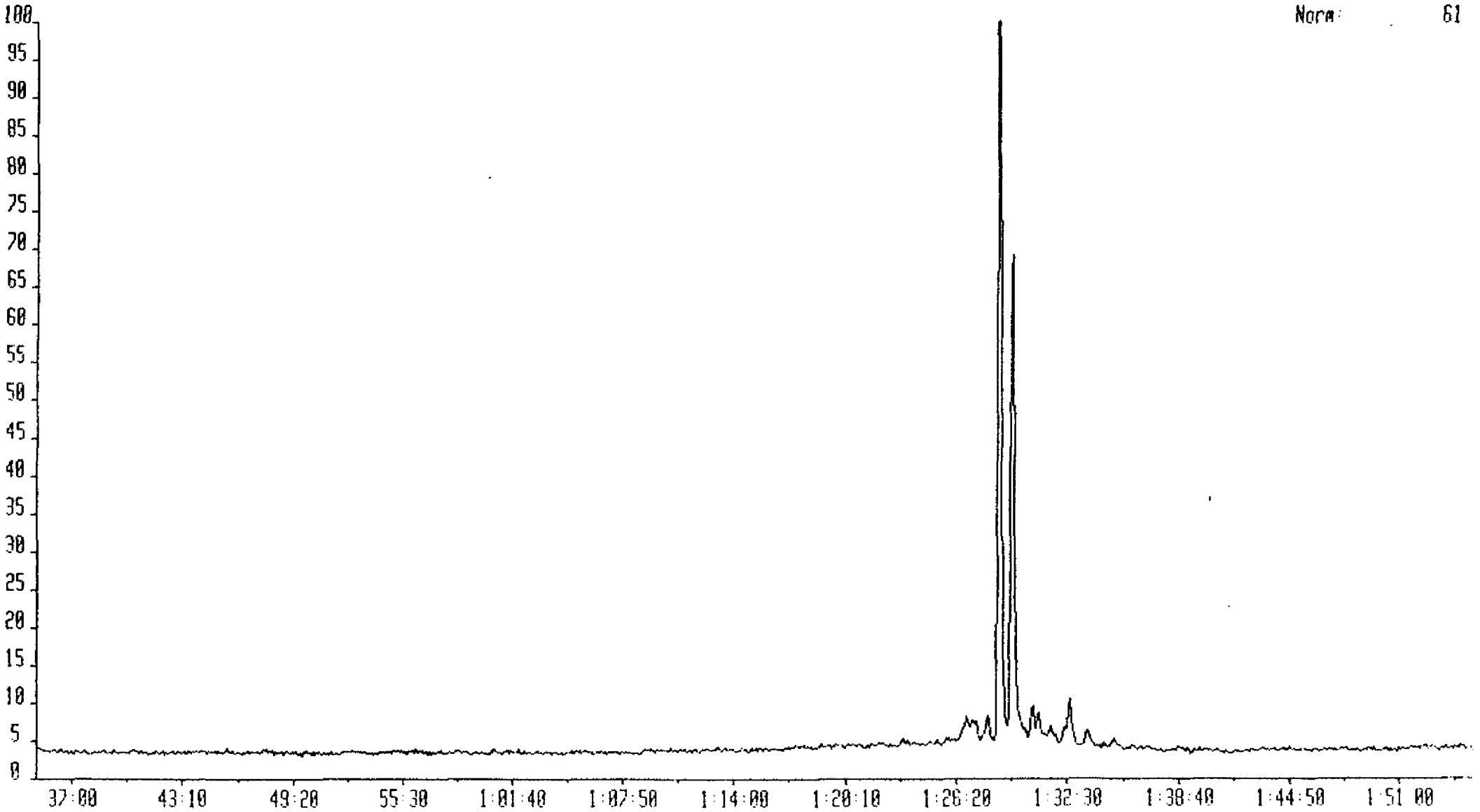
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 1 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:2375-90



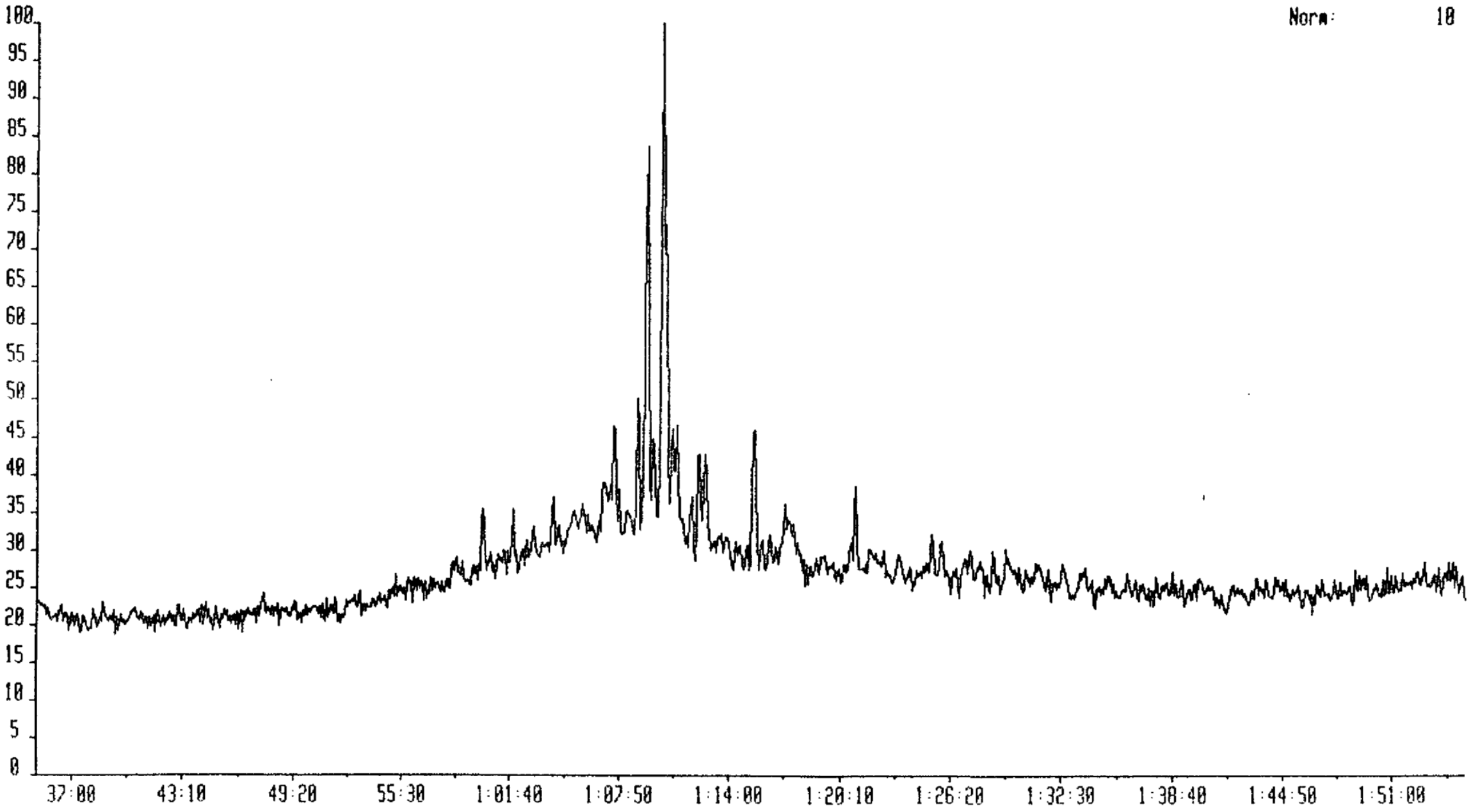
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 1 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:2375-90



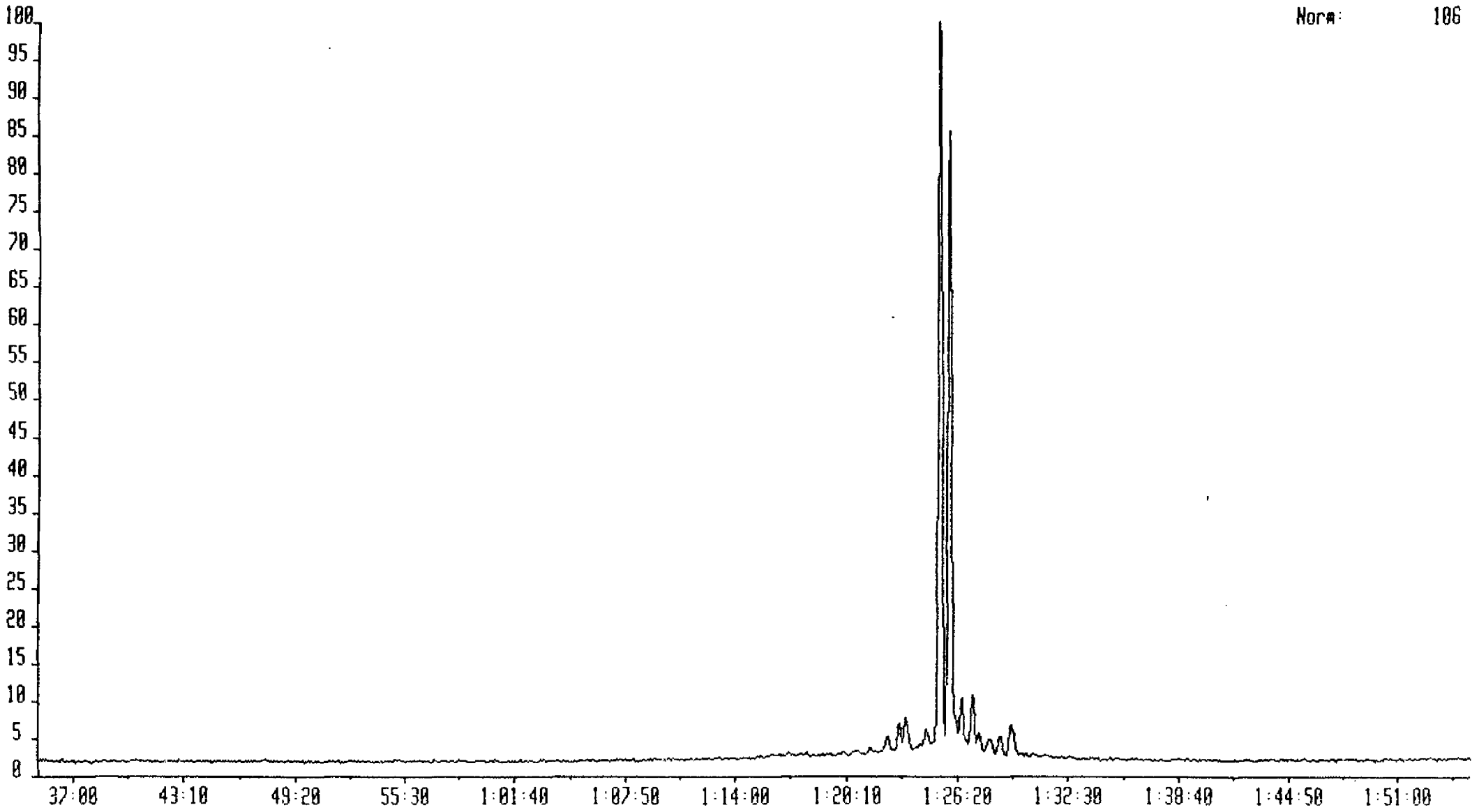
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 2 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:2470-85



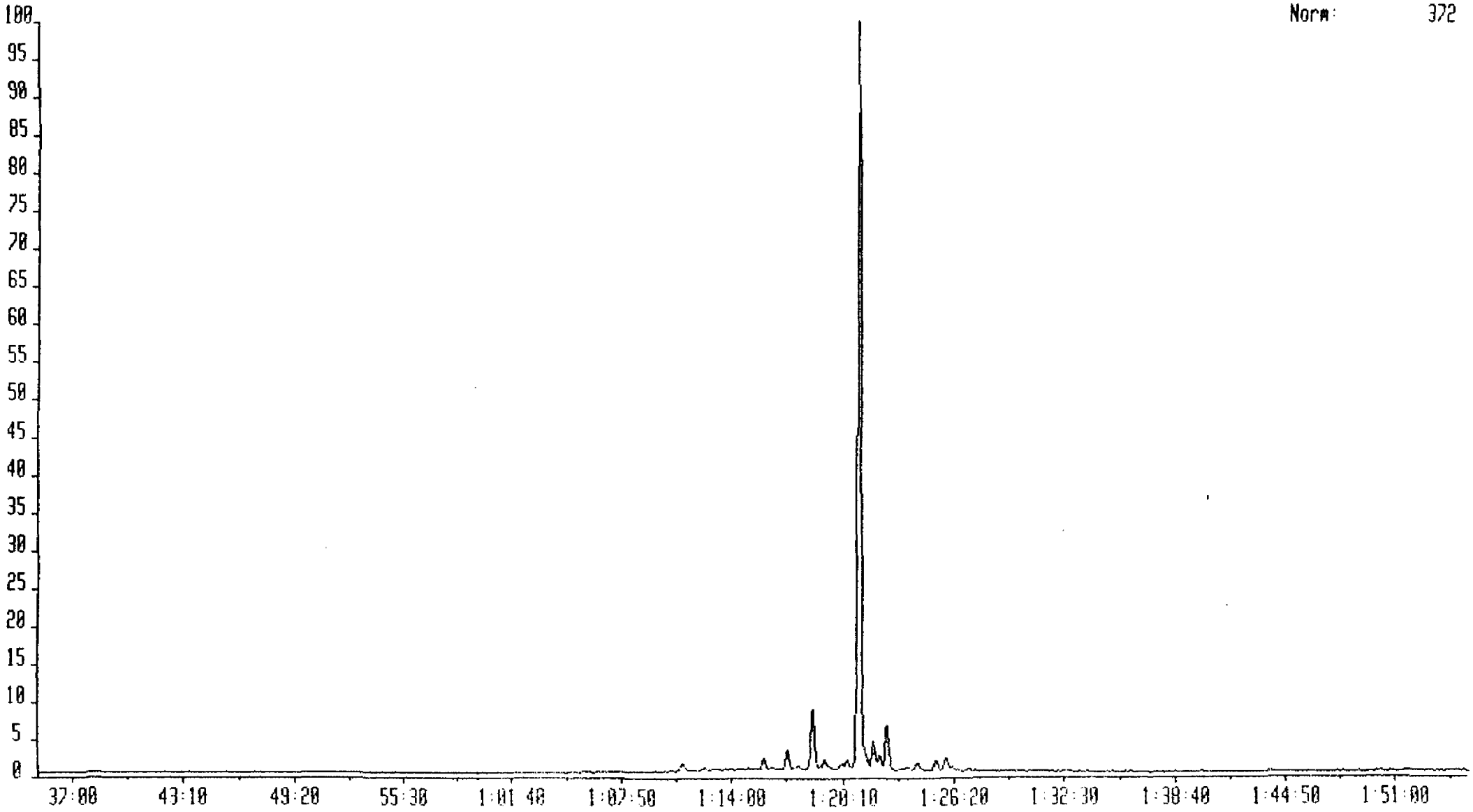
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 2 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:2470-85



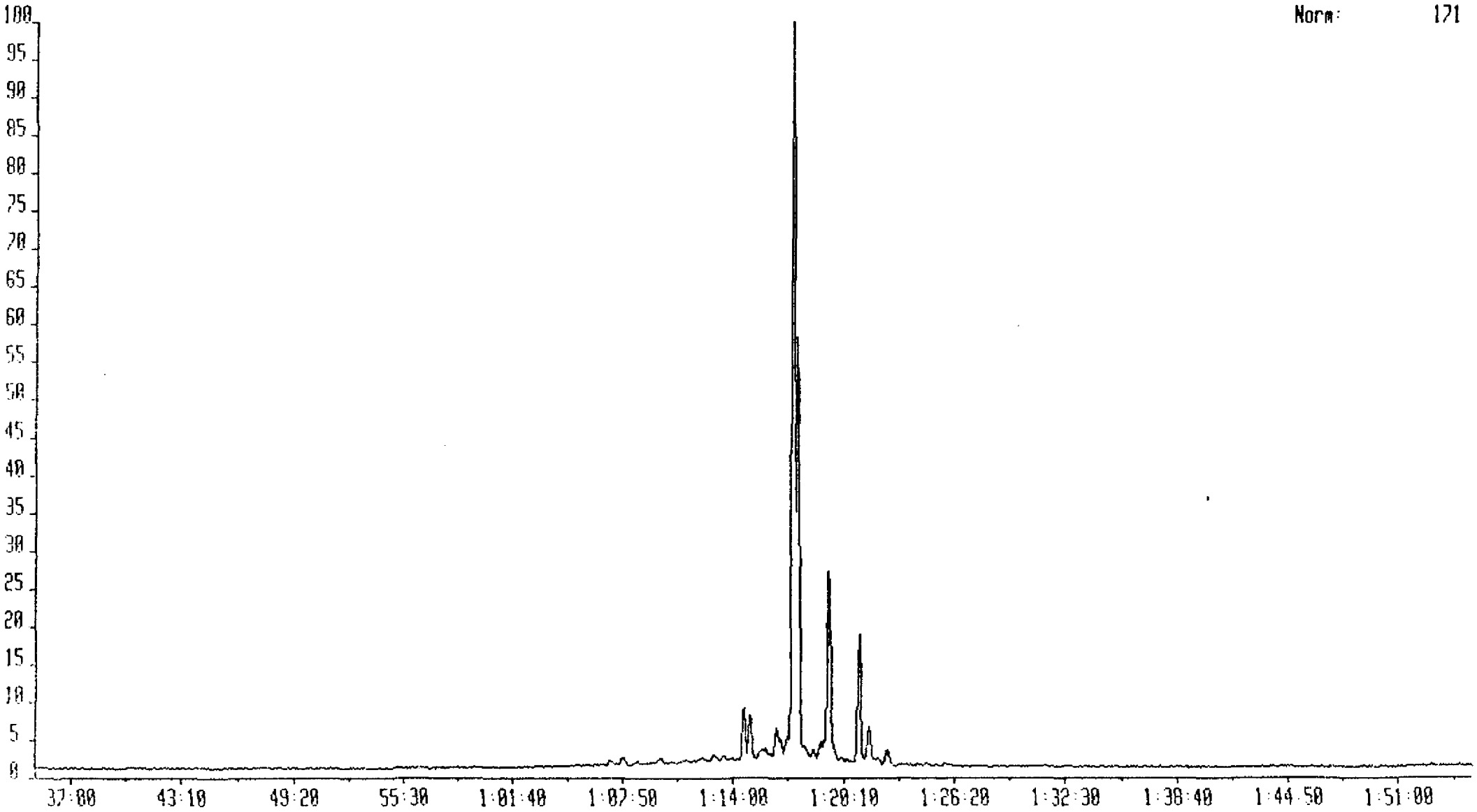
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH Syste#:SMGC
Sample 2 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:2470-85



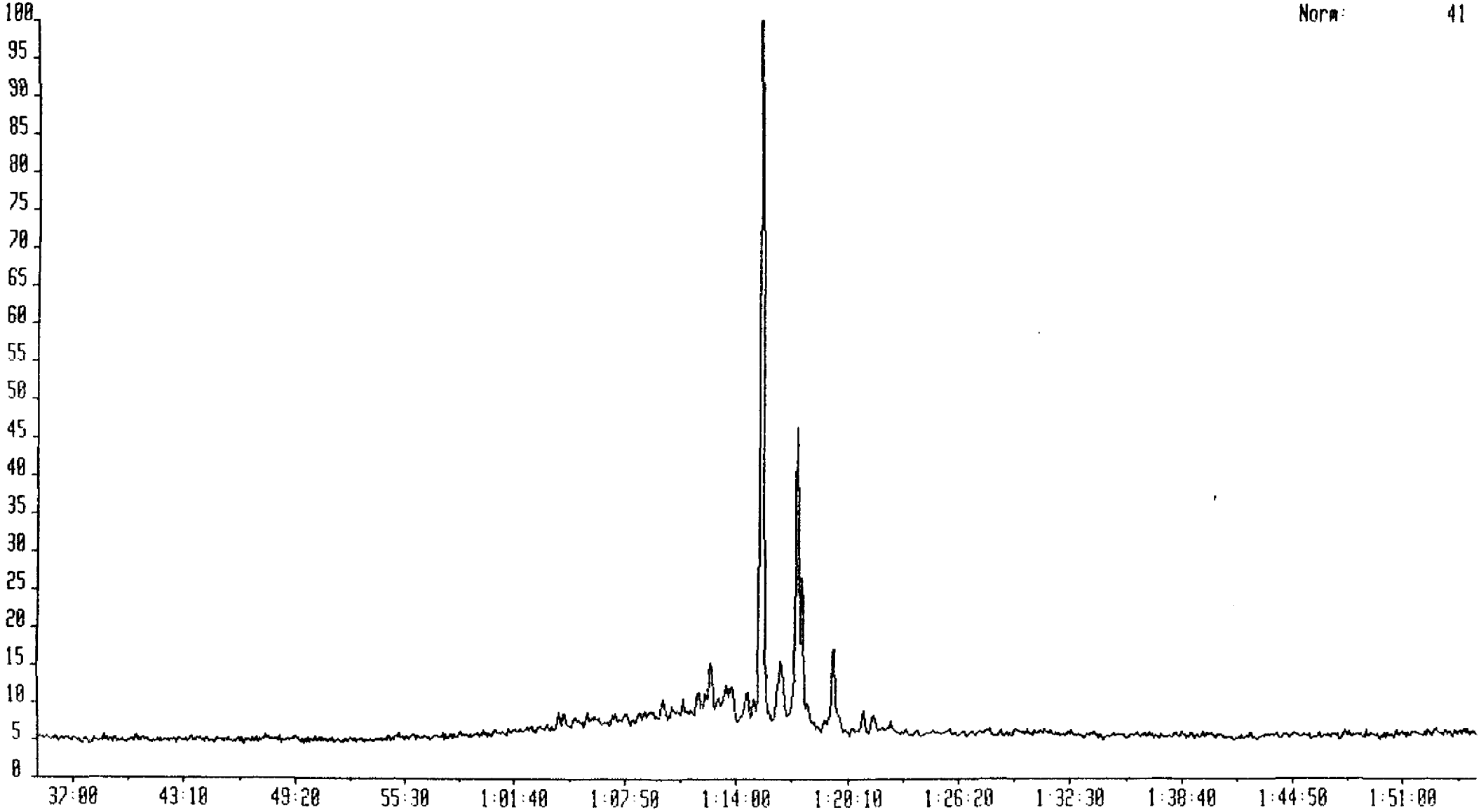
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 2 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:2470-85



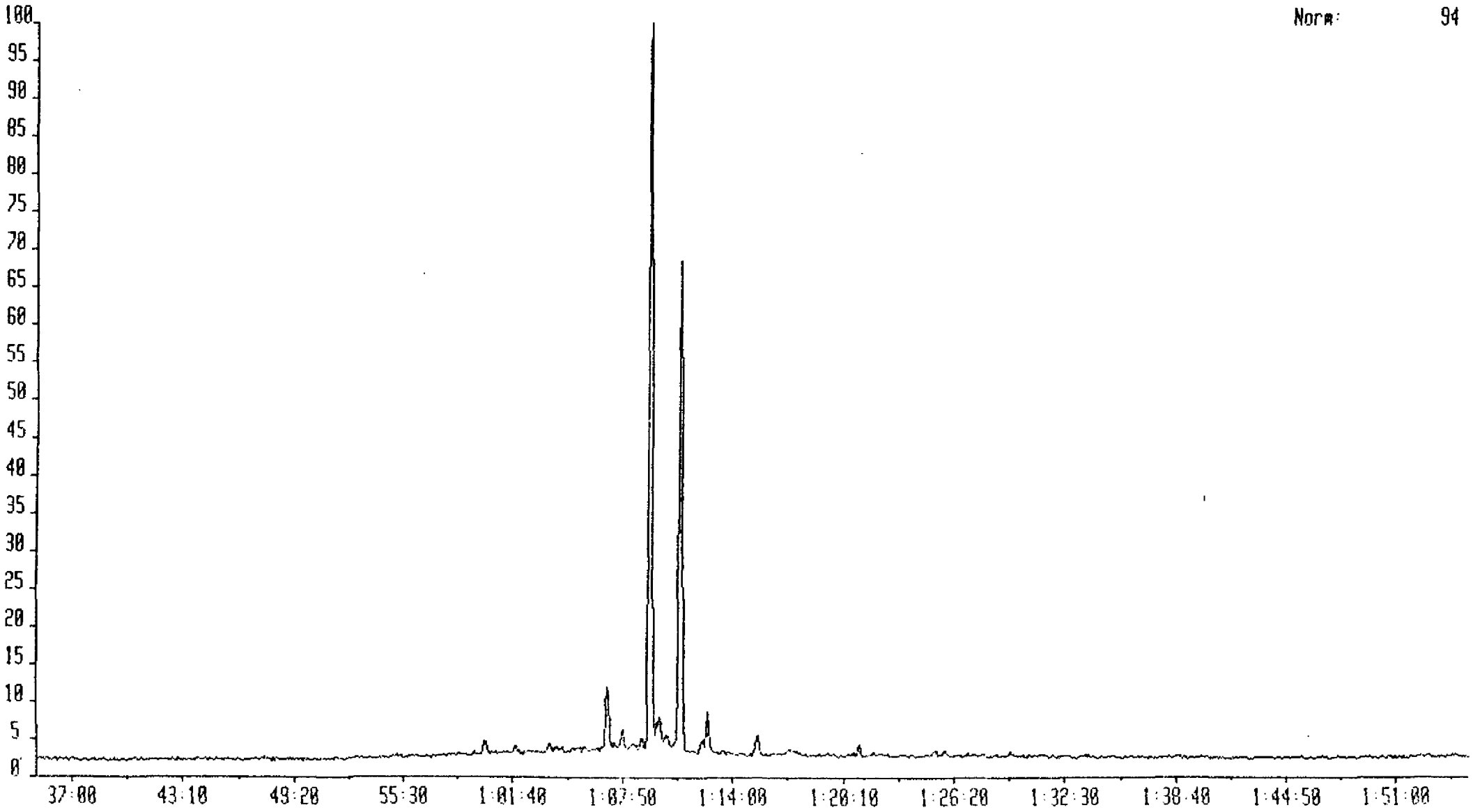
AS810037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 2 Injection 1 Group 1 Mass 91.6608 398.0000->191.0000
Text:2470-85



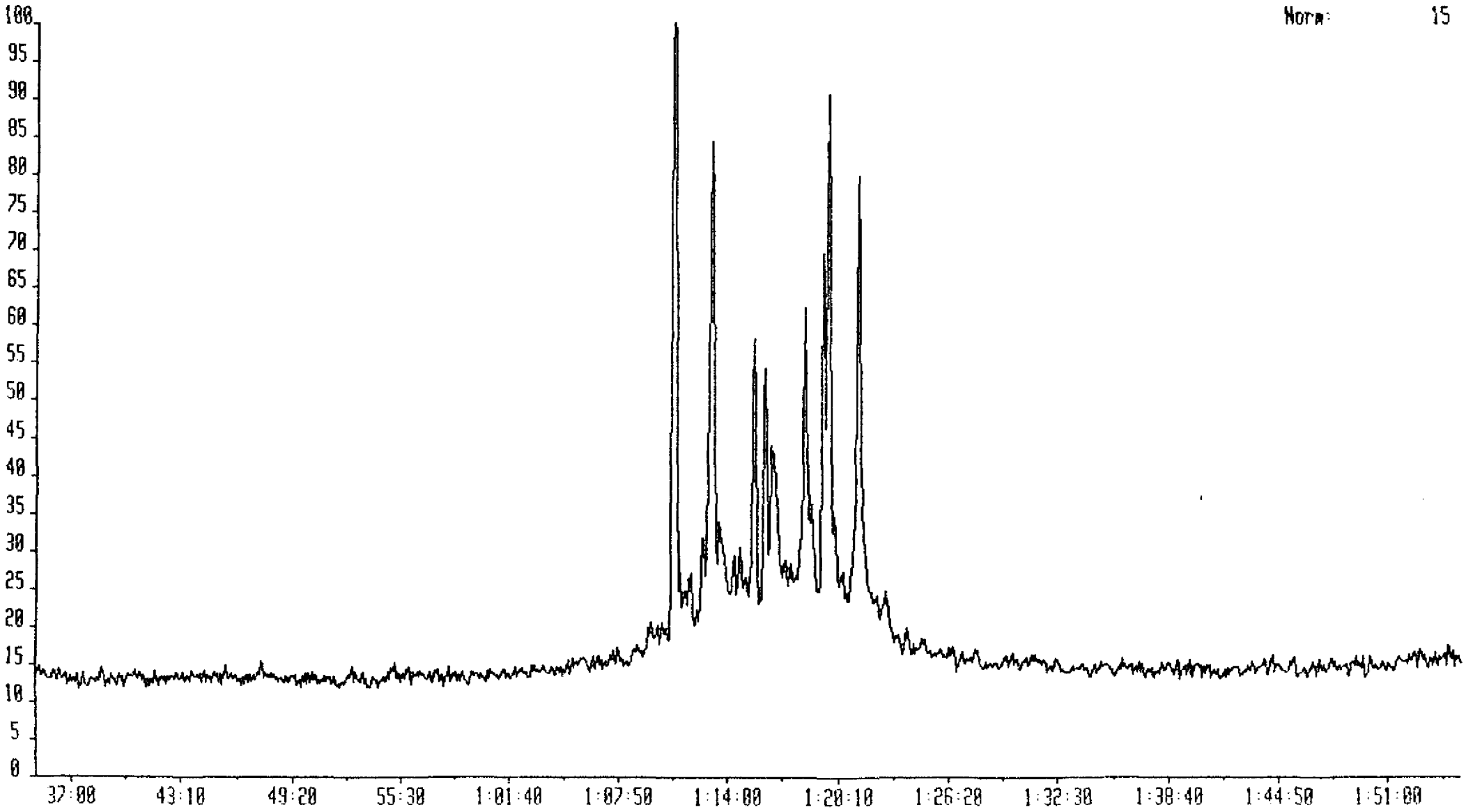
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 2 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:2470-85



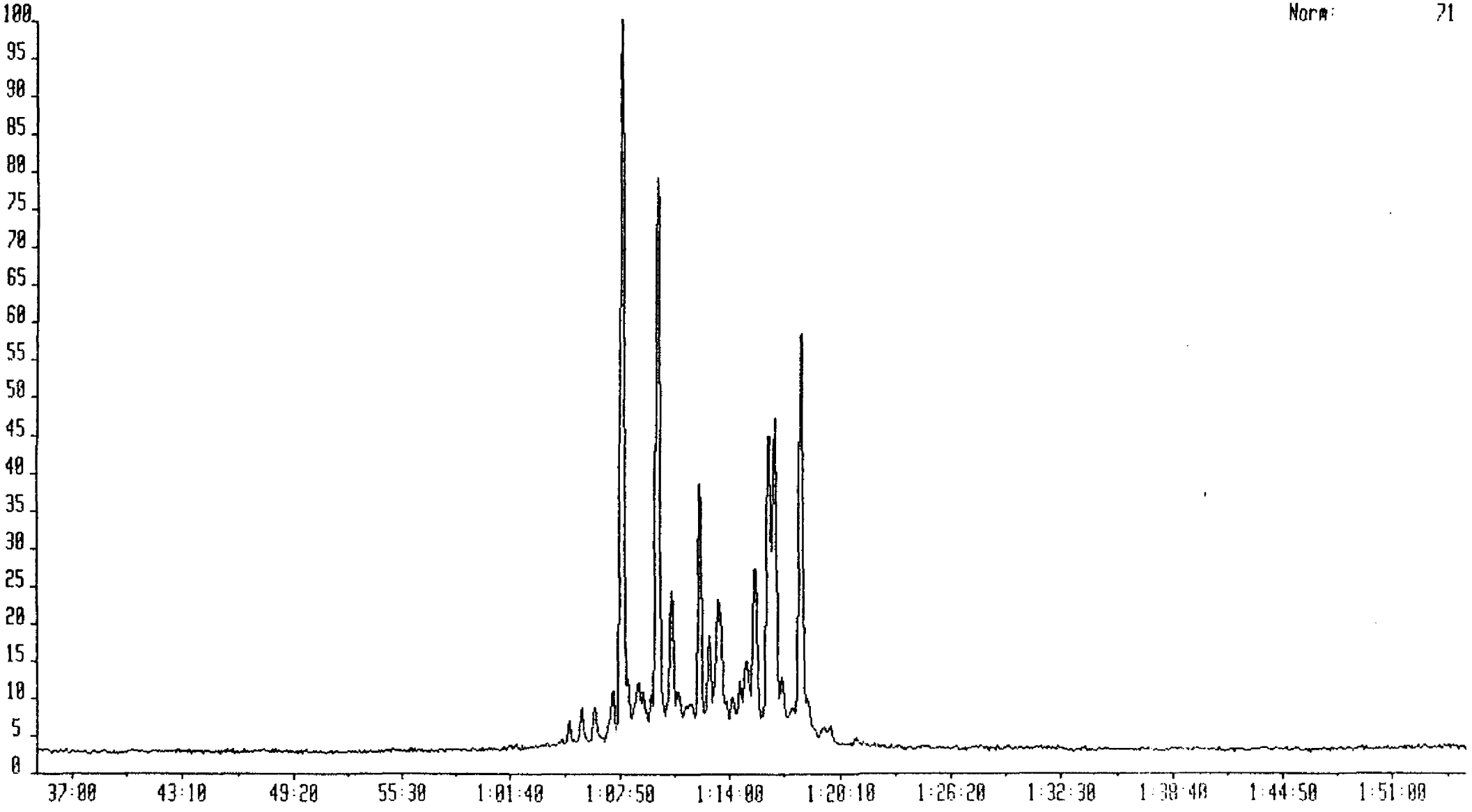
AS810037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 2 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:2470-85



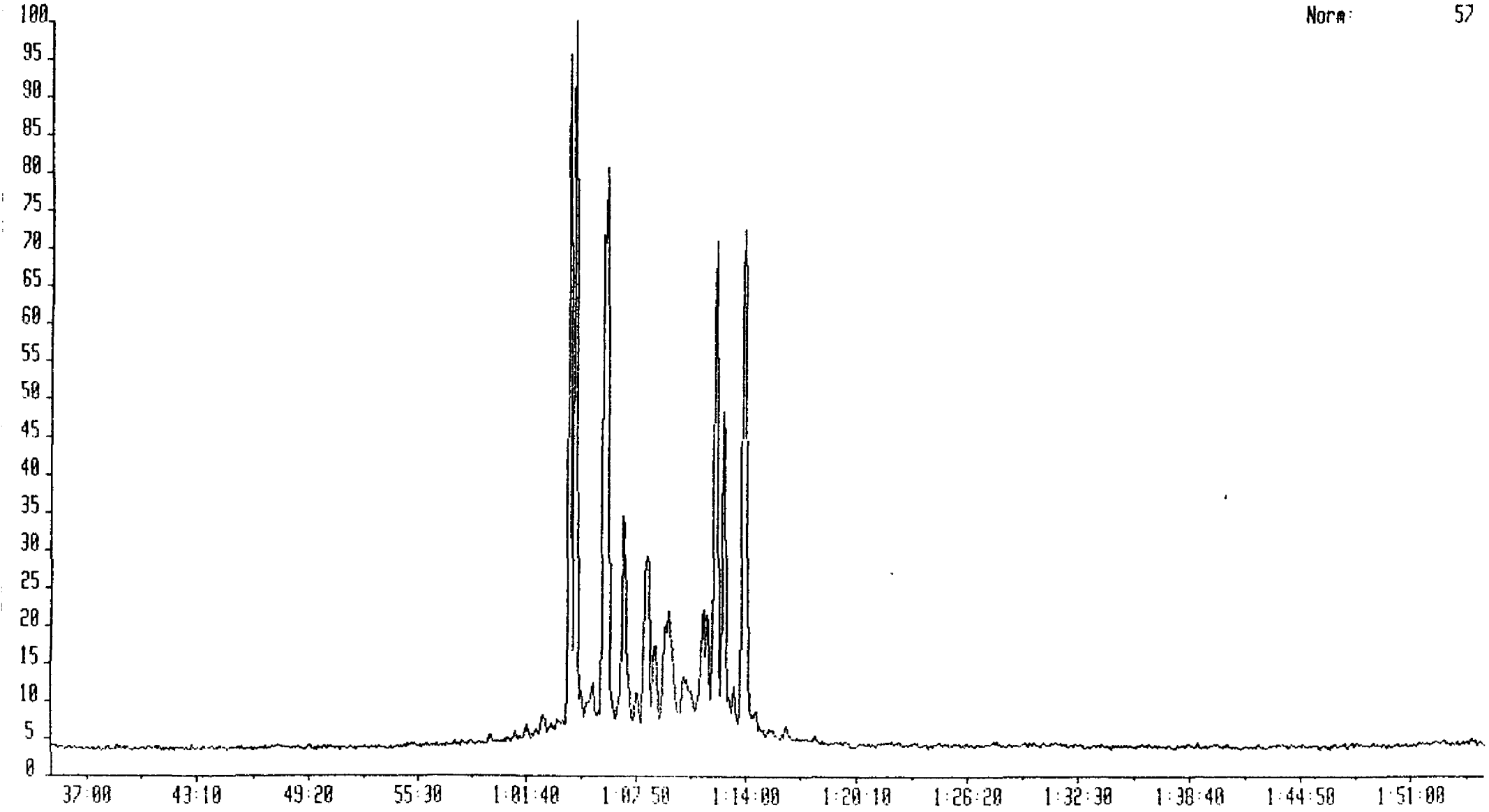
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 2 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:2470-85



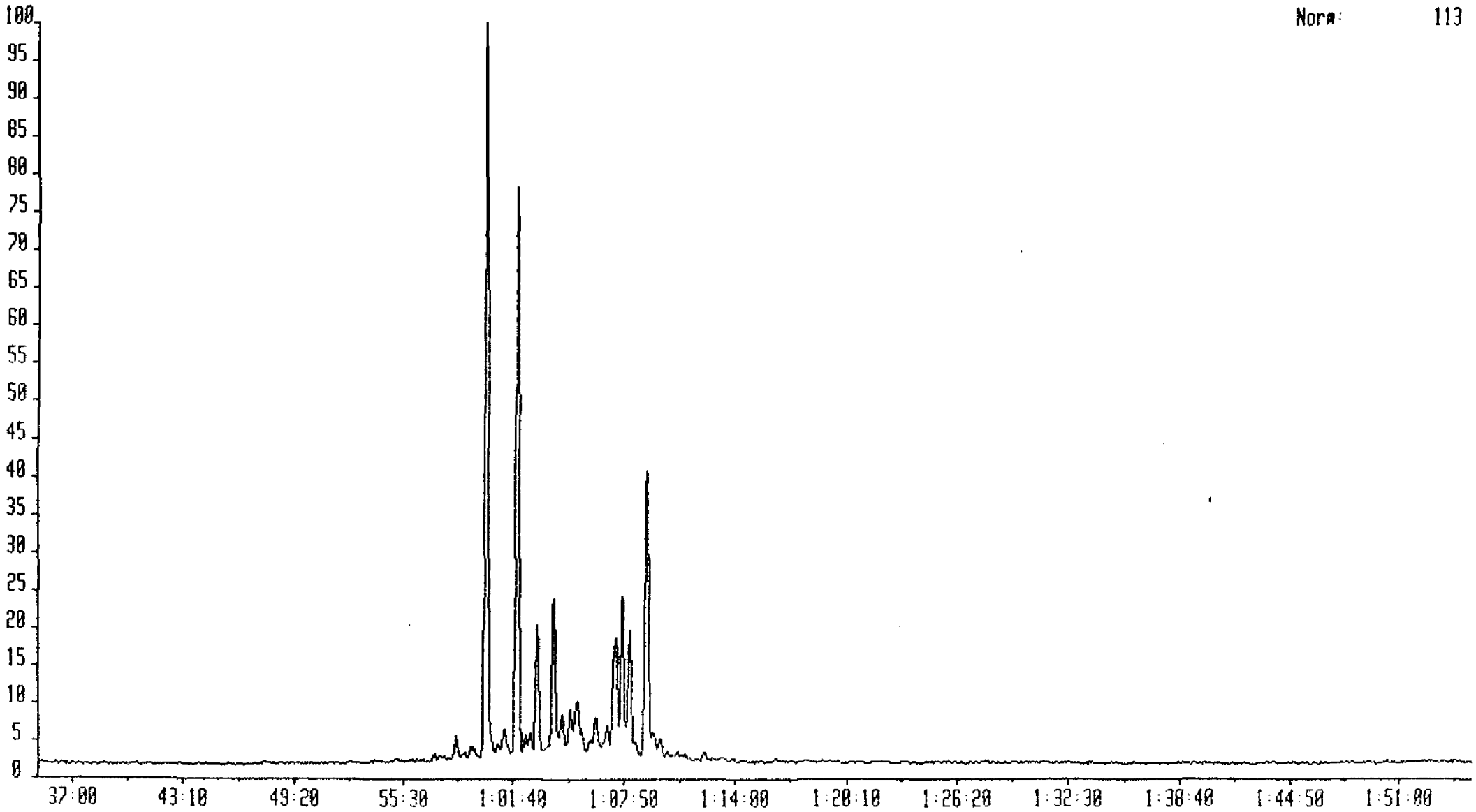
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 2 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:2470-85



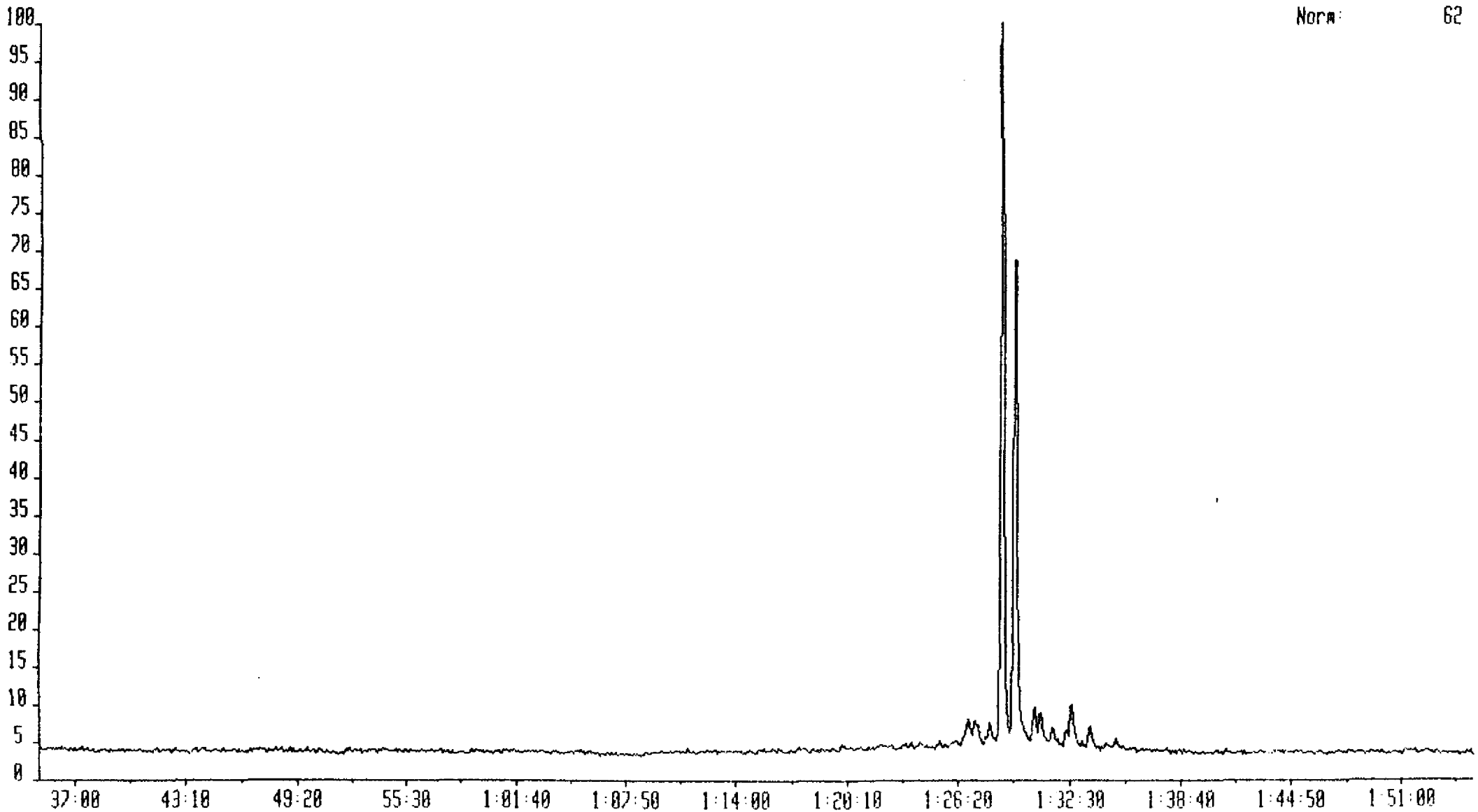
ASB10037 10-MAR-07 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 2 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:2470-85



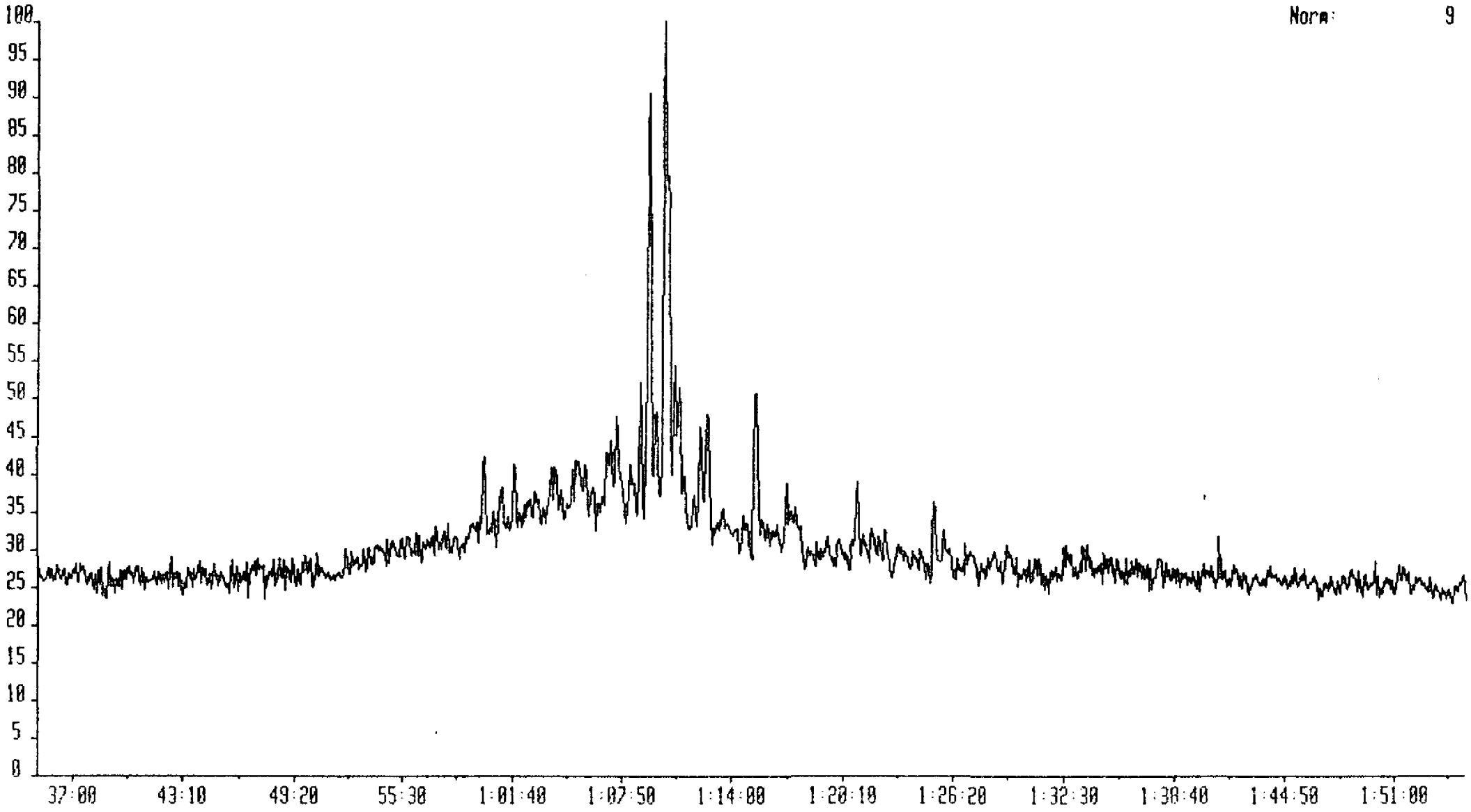
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 2 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:2470-85



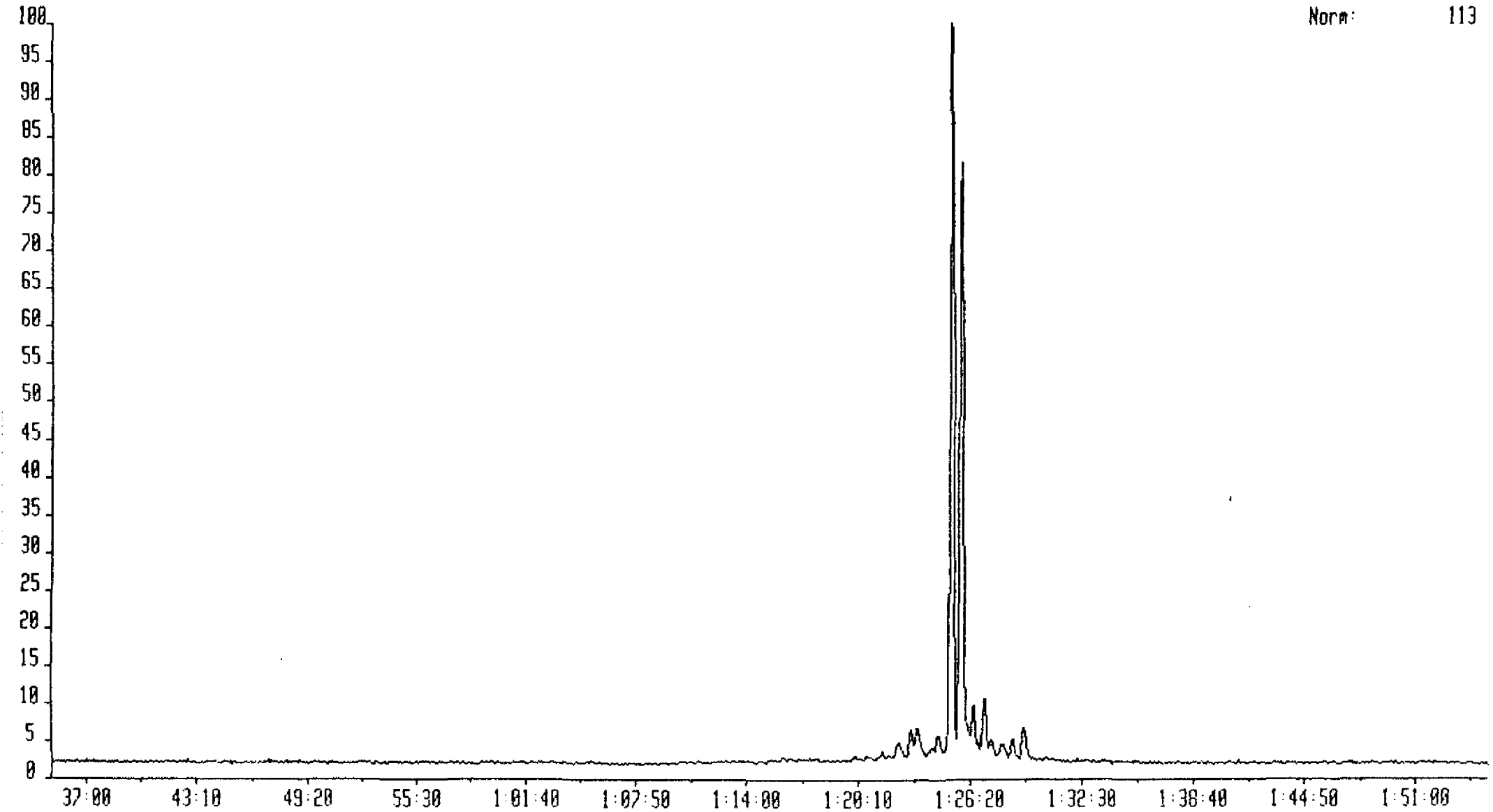
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 3 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:2485-95



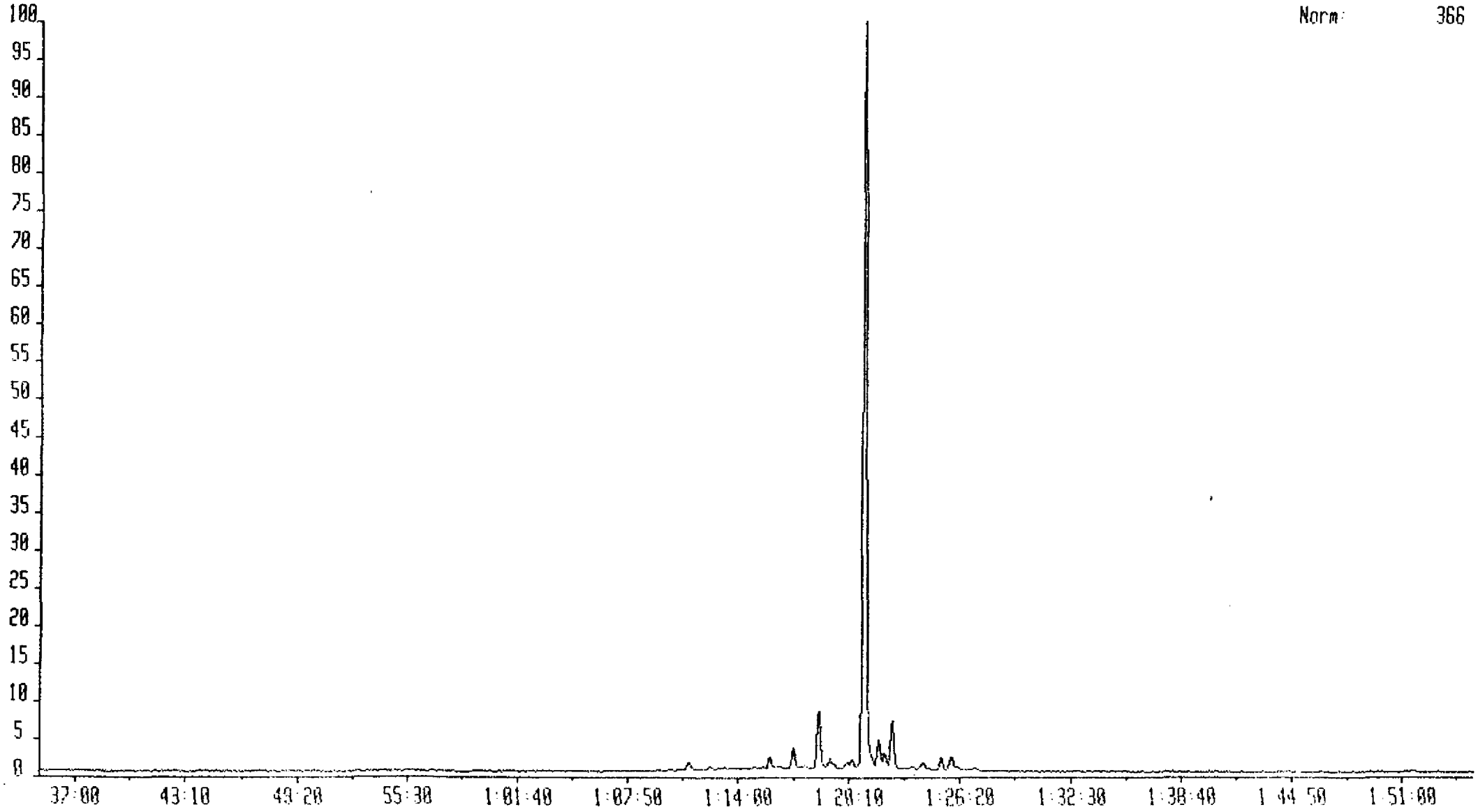
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 3 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:2485-95



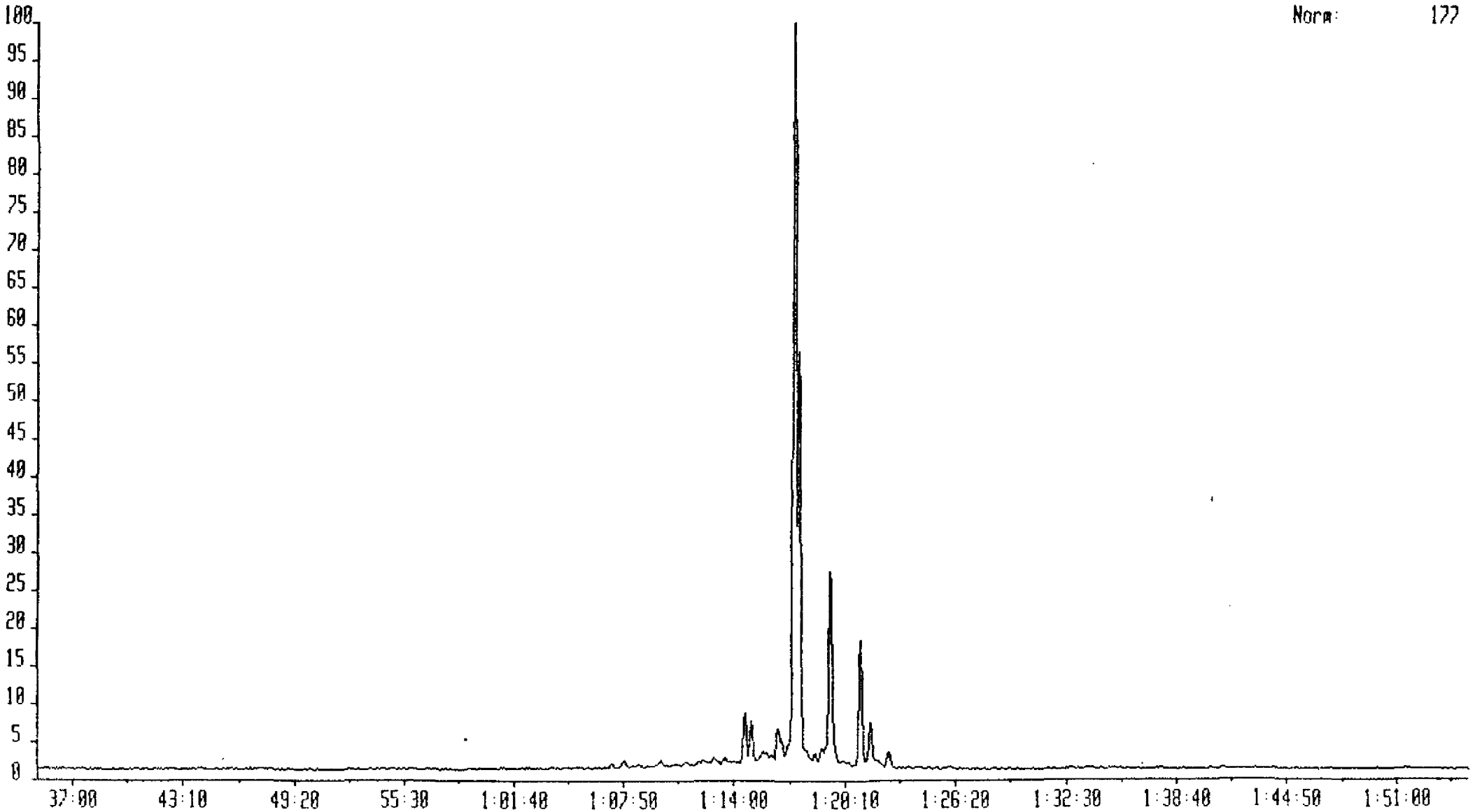
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 3 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:2485-95



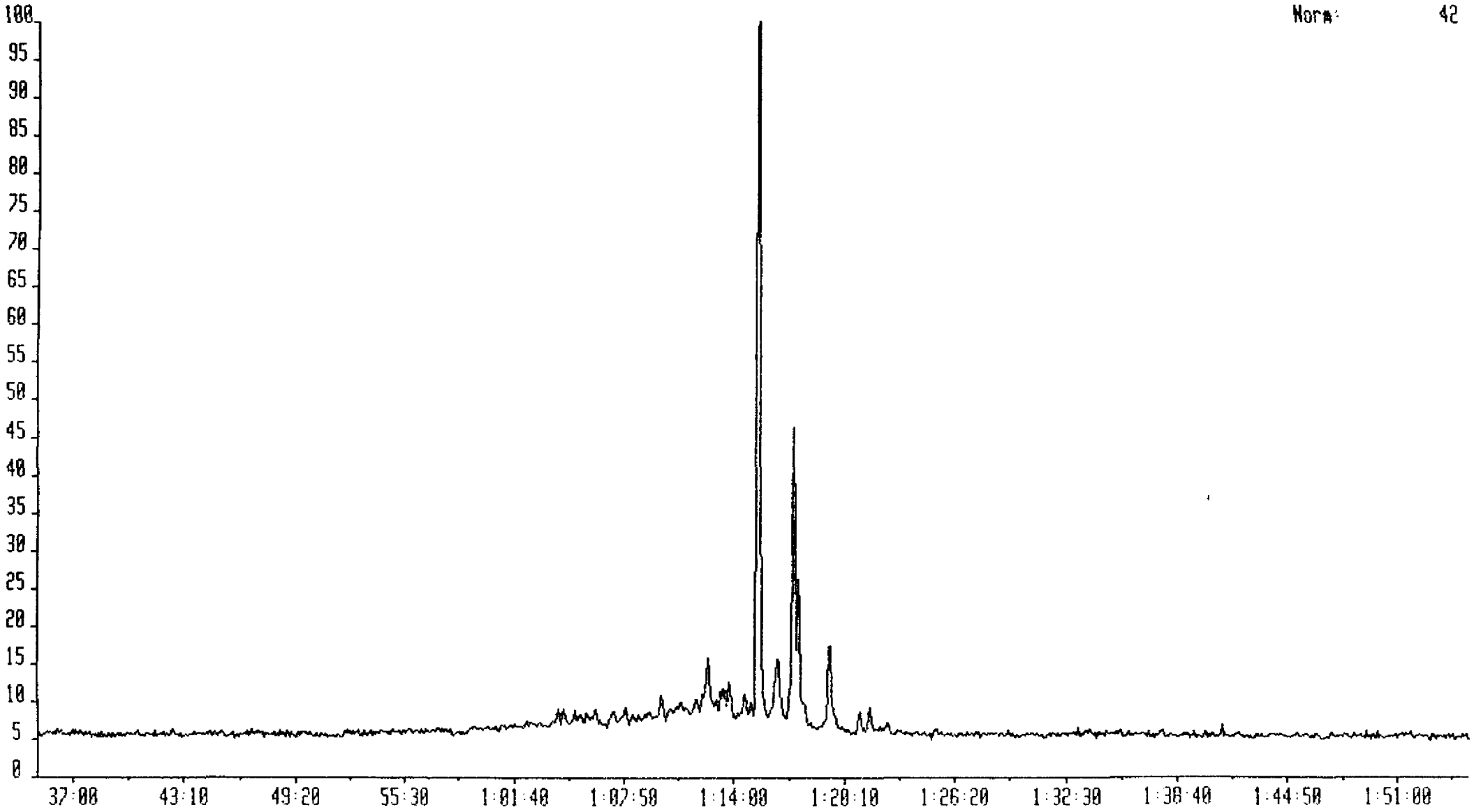
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 3 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:2485-95



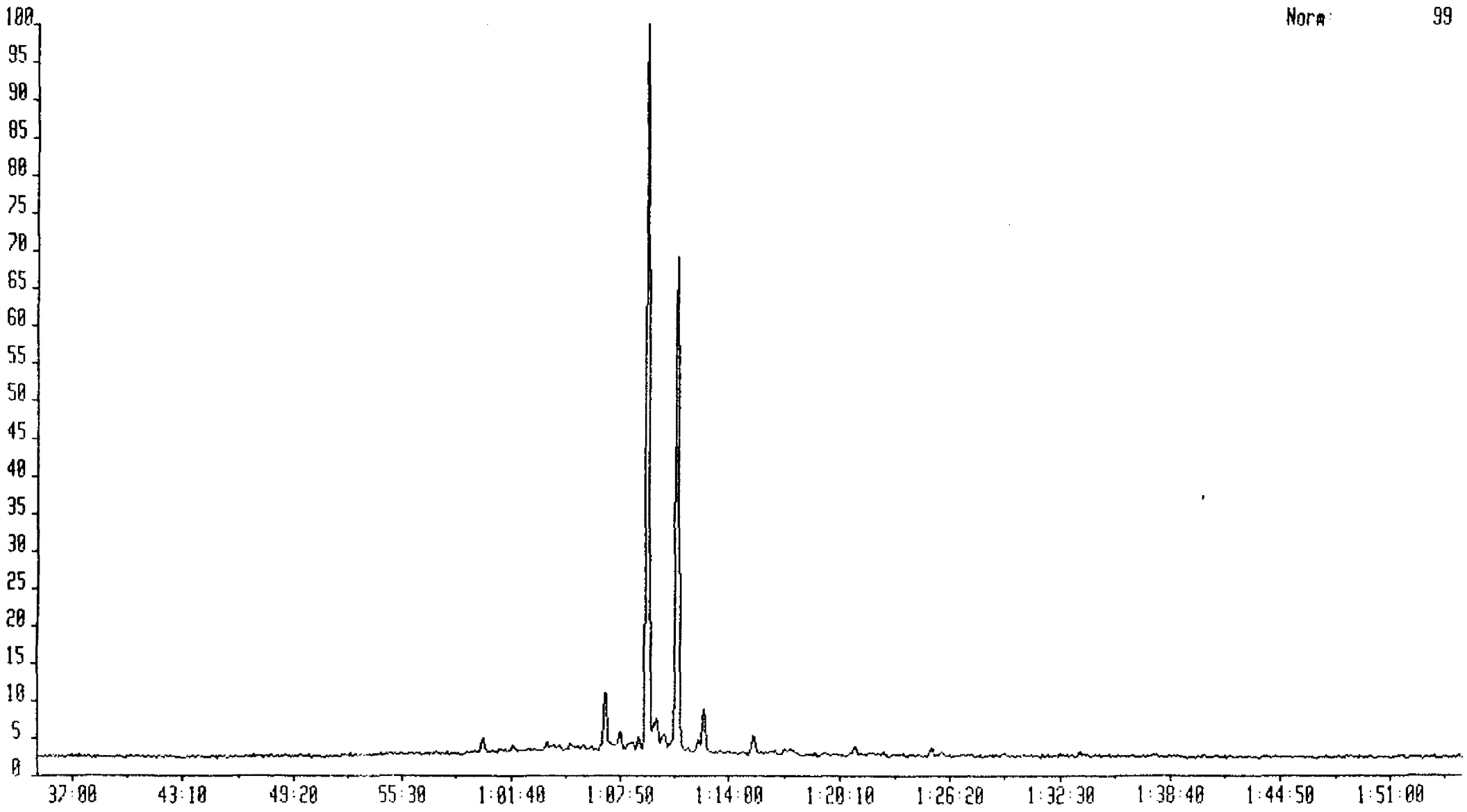
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 3 Injection 1 Group 1 Mass 91.6600 398.0000->191.0000
Text:2485-95



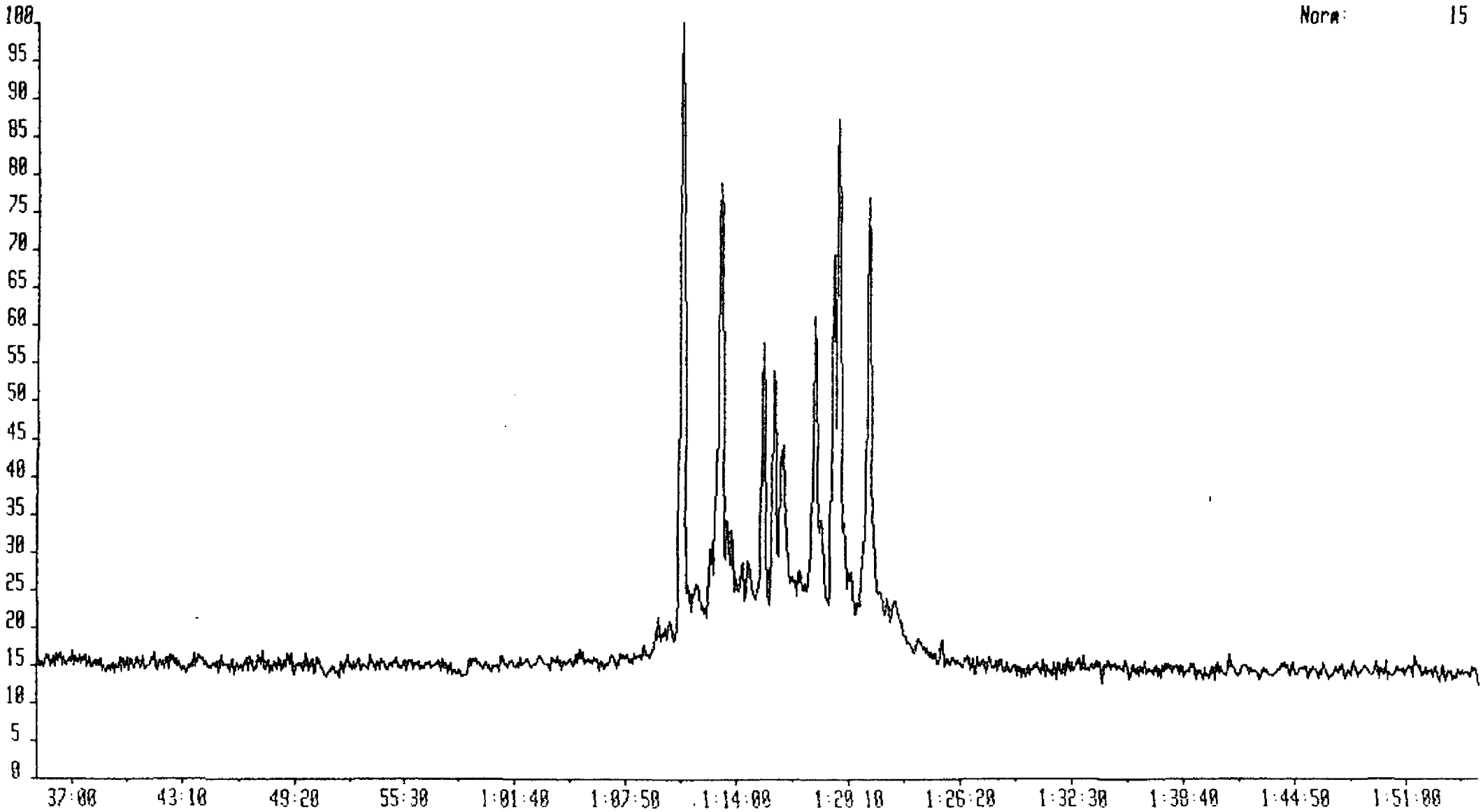
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 3 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:2485-95



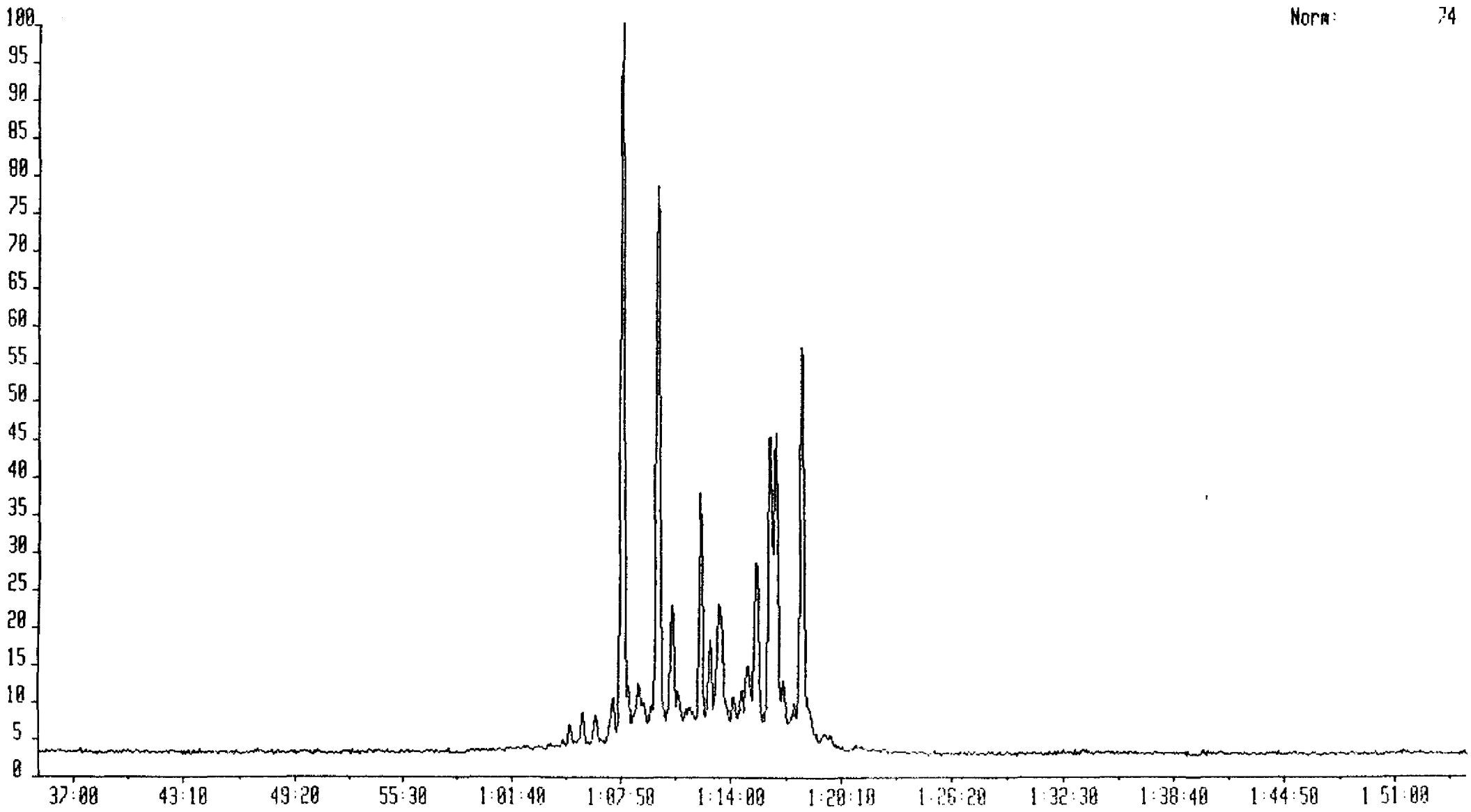
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 3 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:2485-95



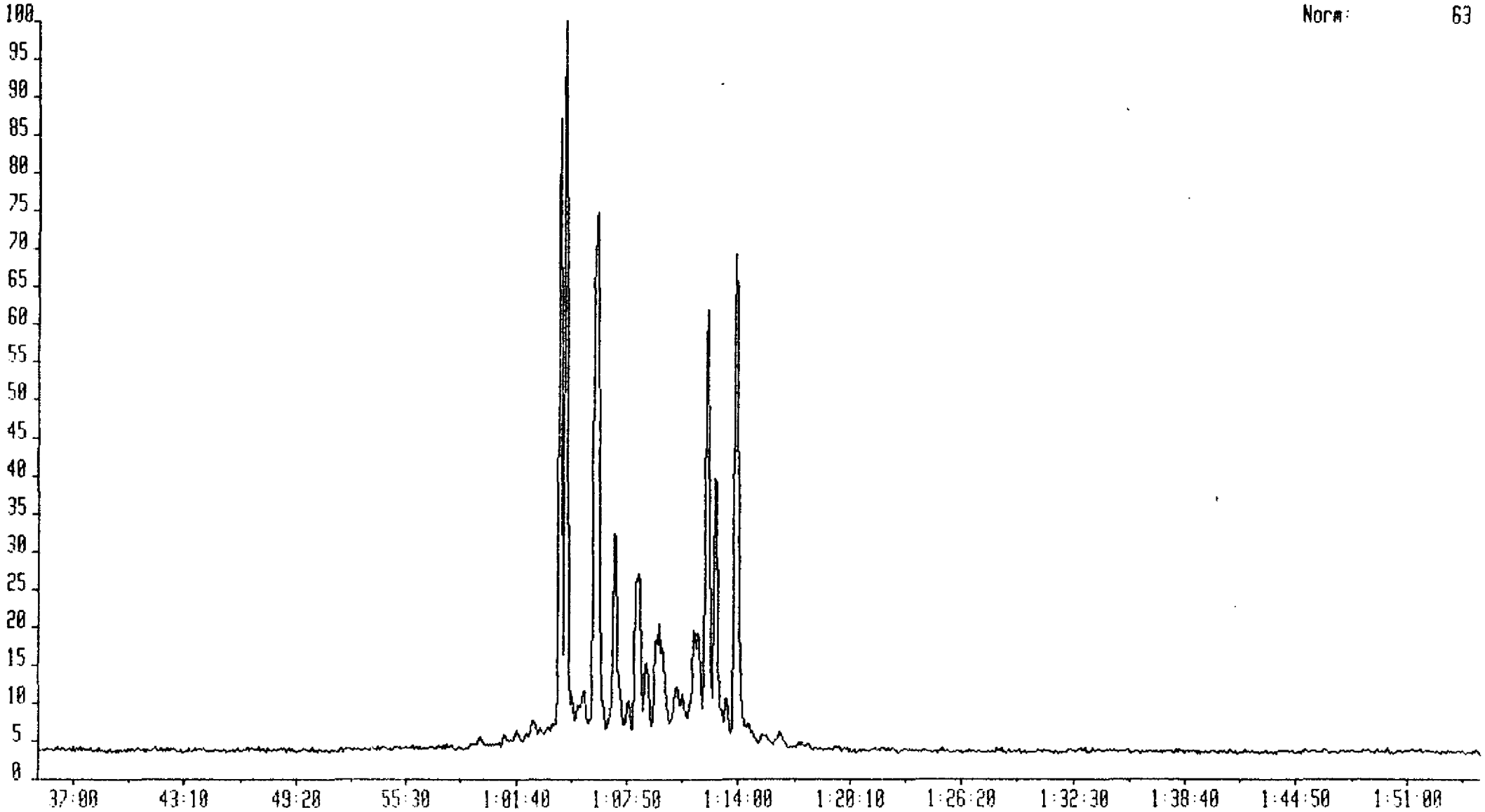
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 3 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:2485-95



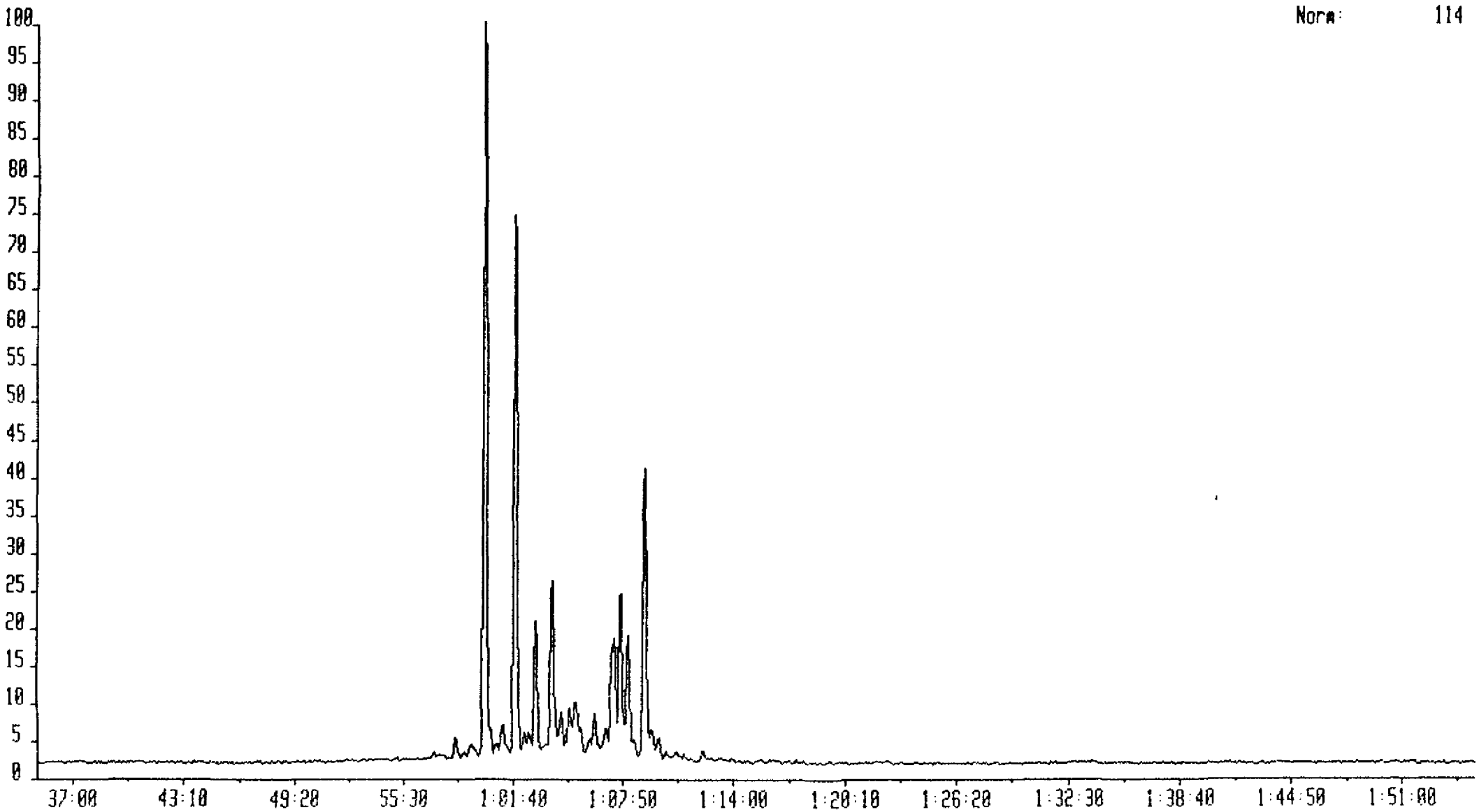
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 3 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:2485-95



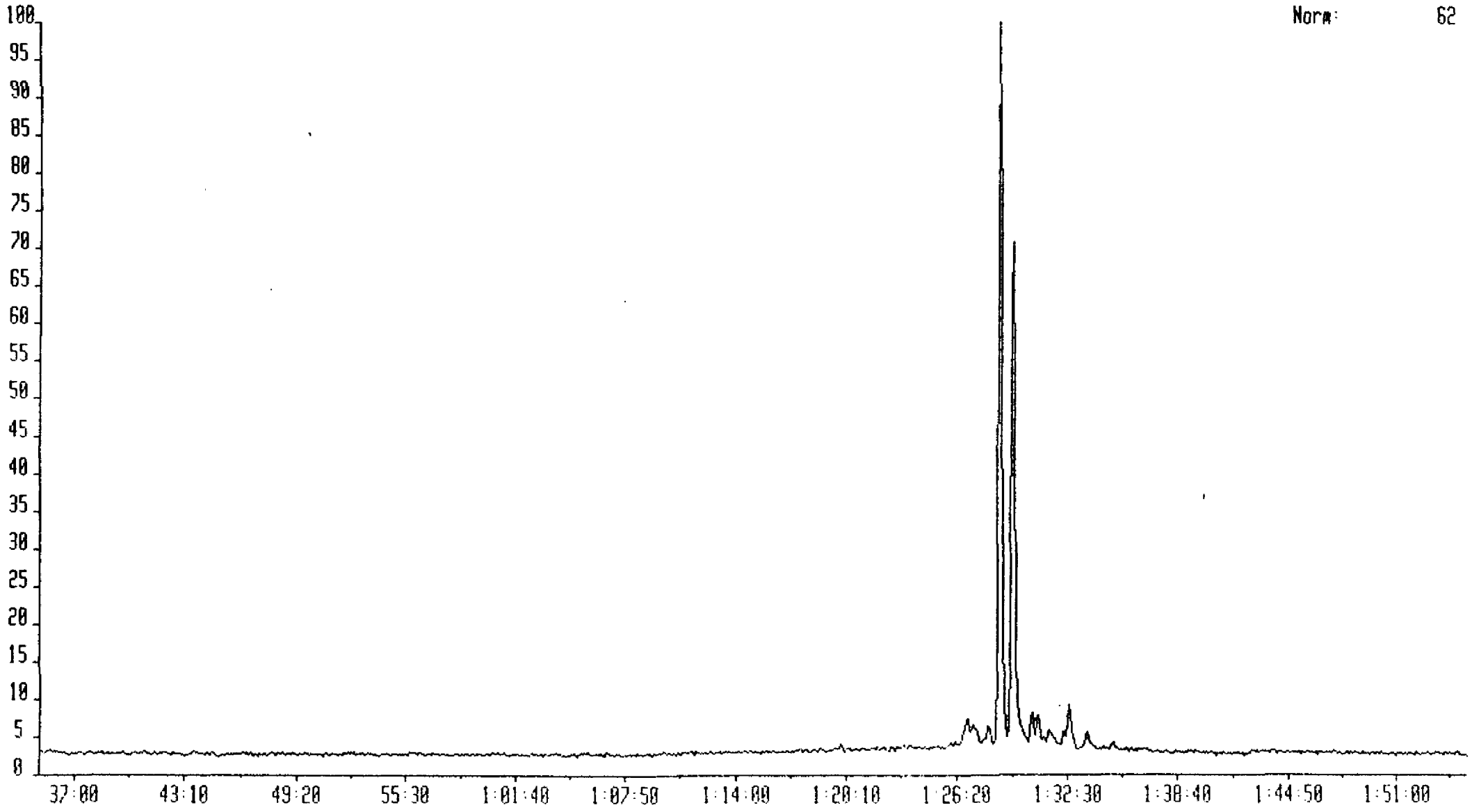
ASB10037 18-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 3 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:2485-95



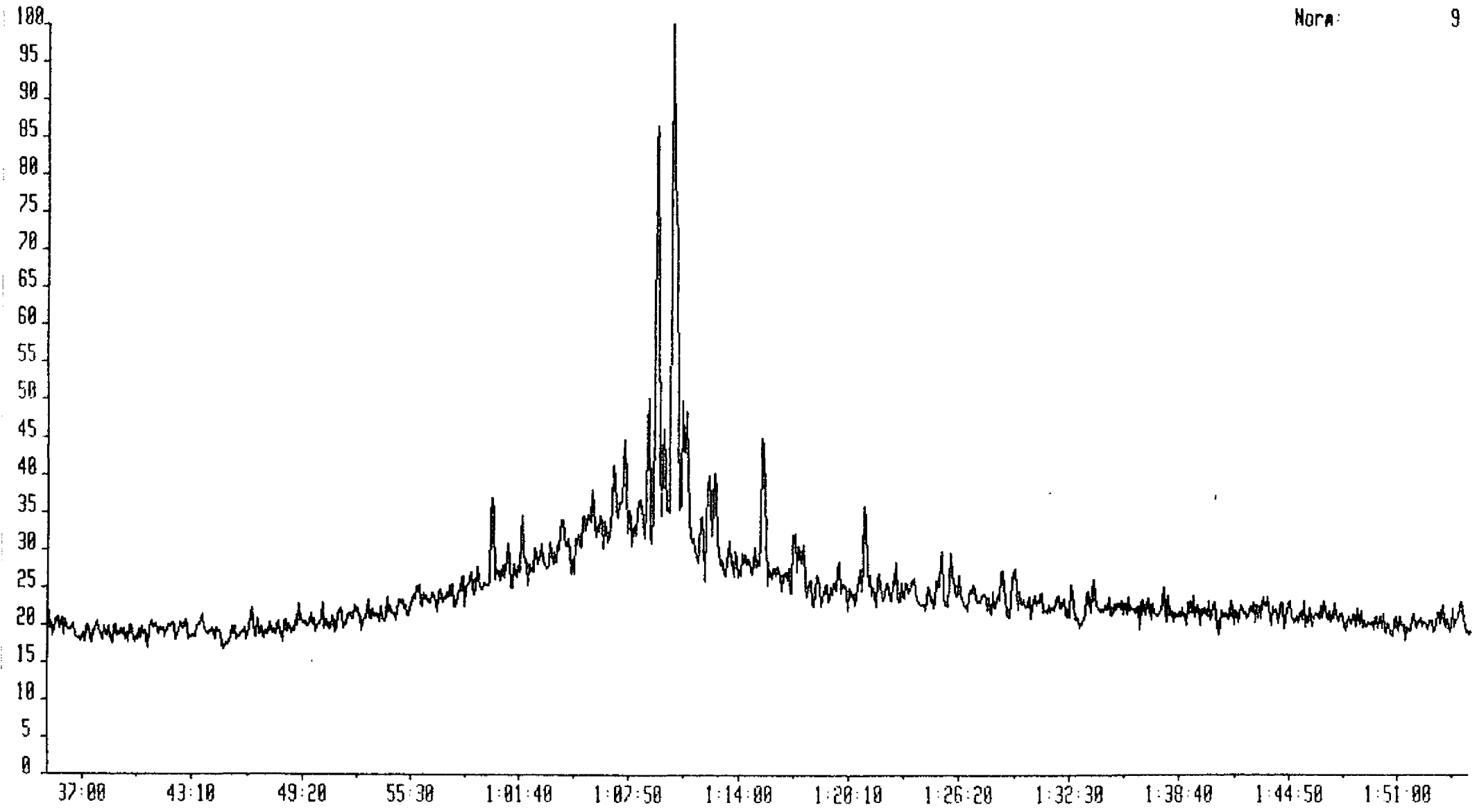
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 3 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:2485-95



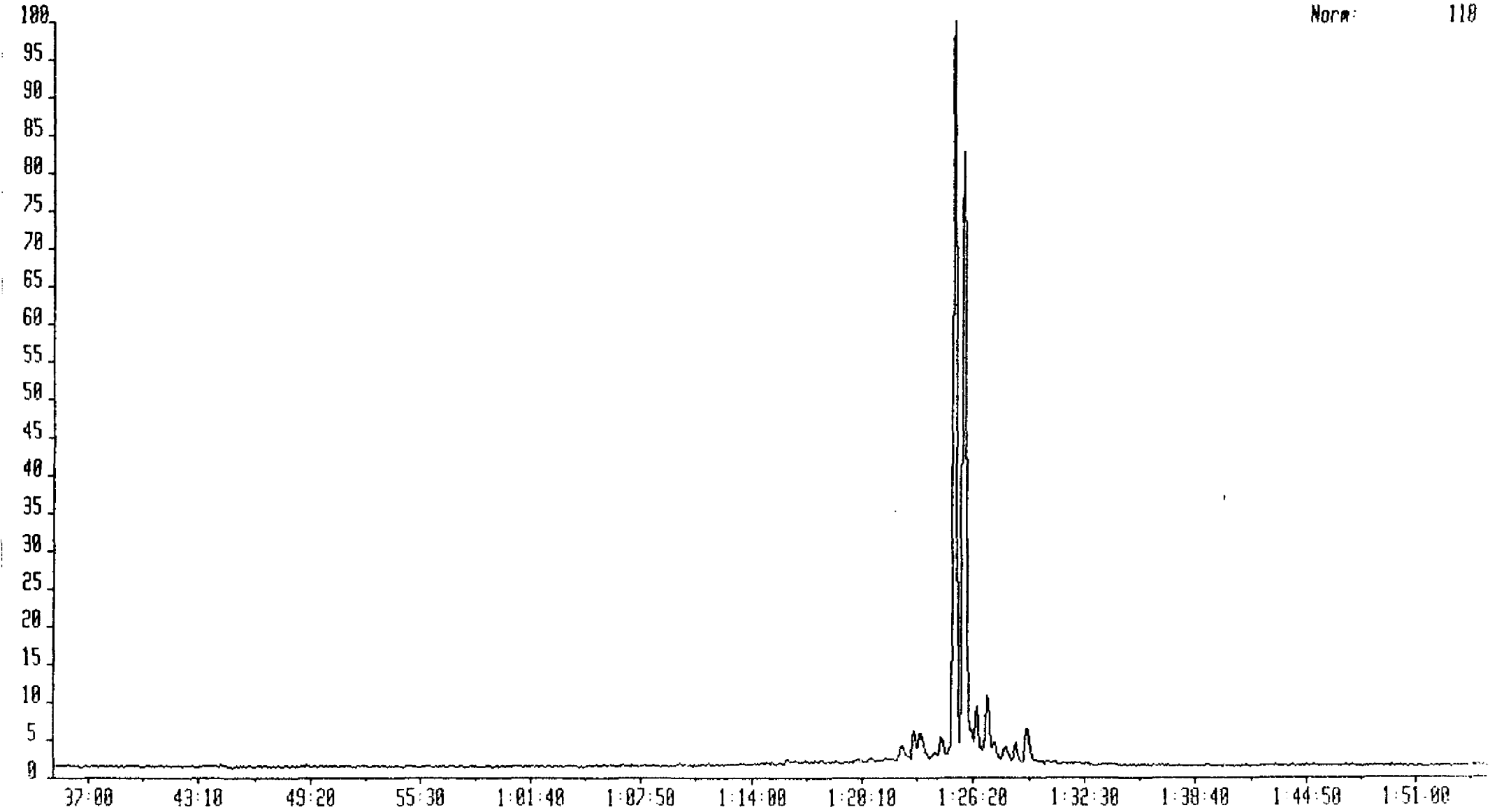
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 4 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:2495-2515



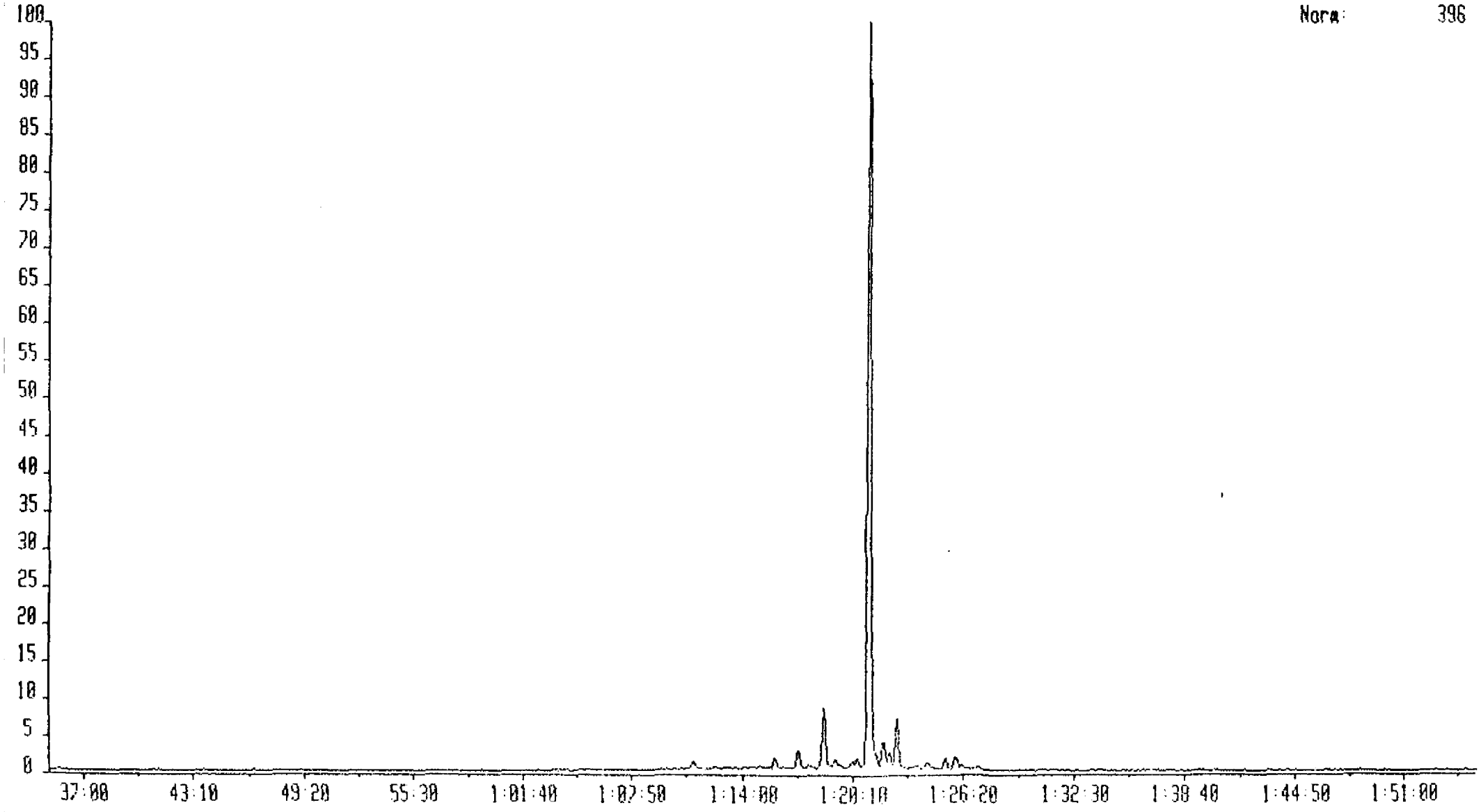
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 4 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:2495-2515



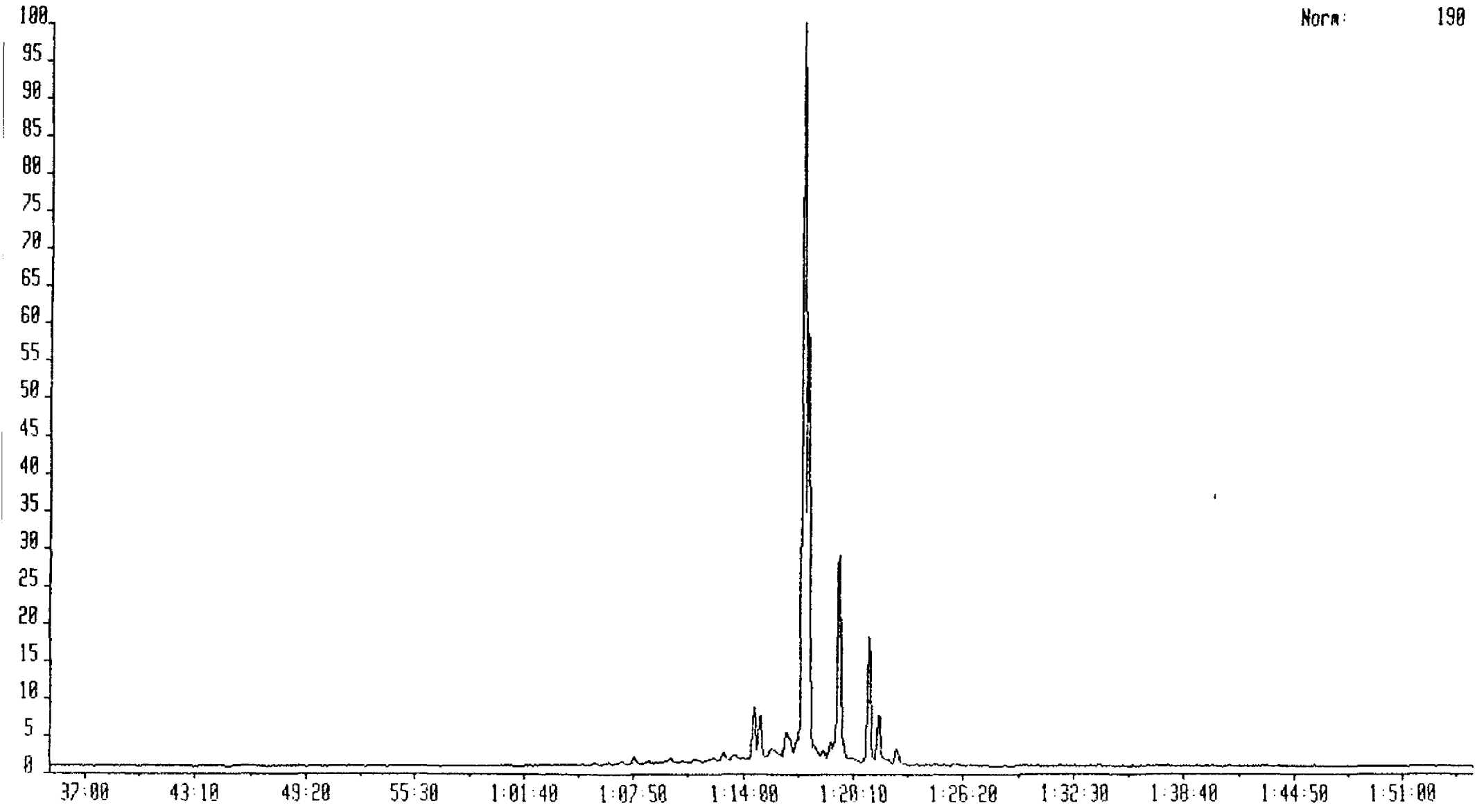
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 4 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:2495-2515



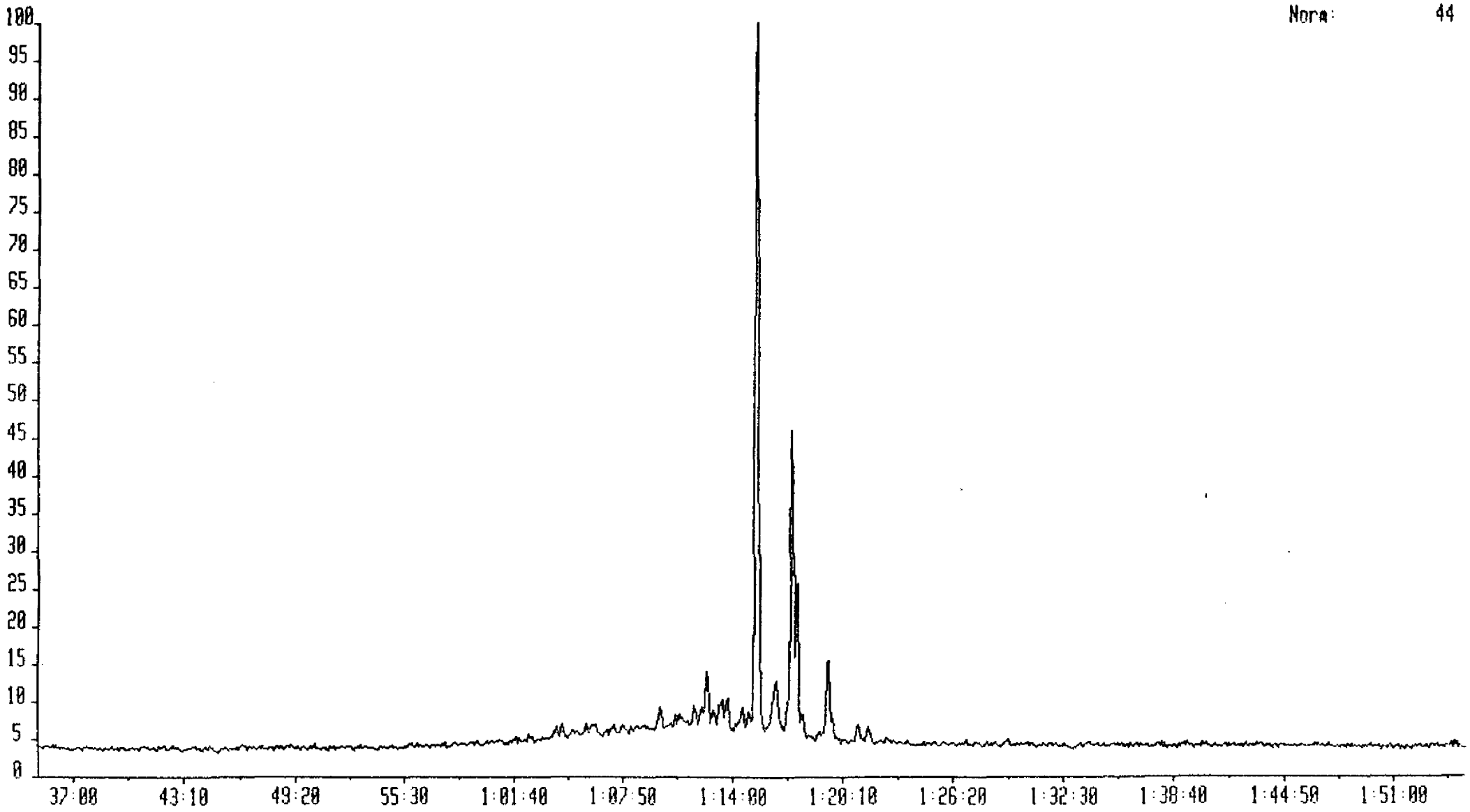
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 4 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:2495-2515



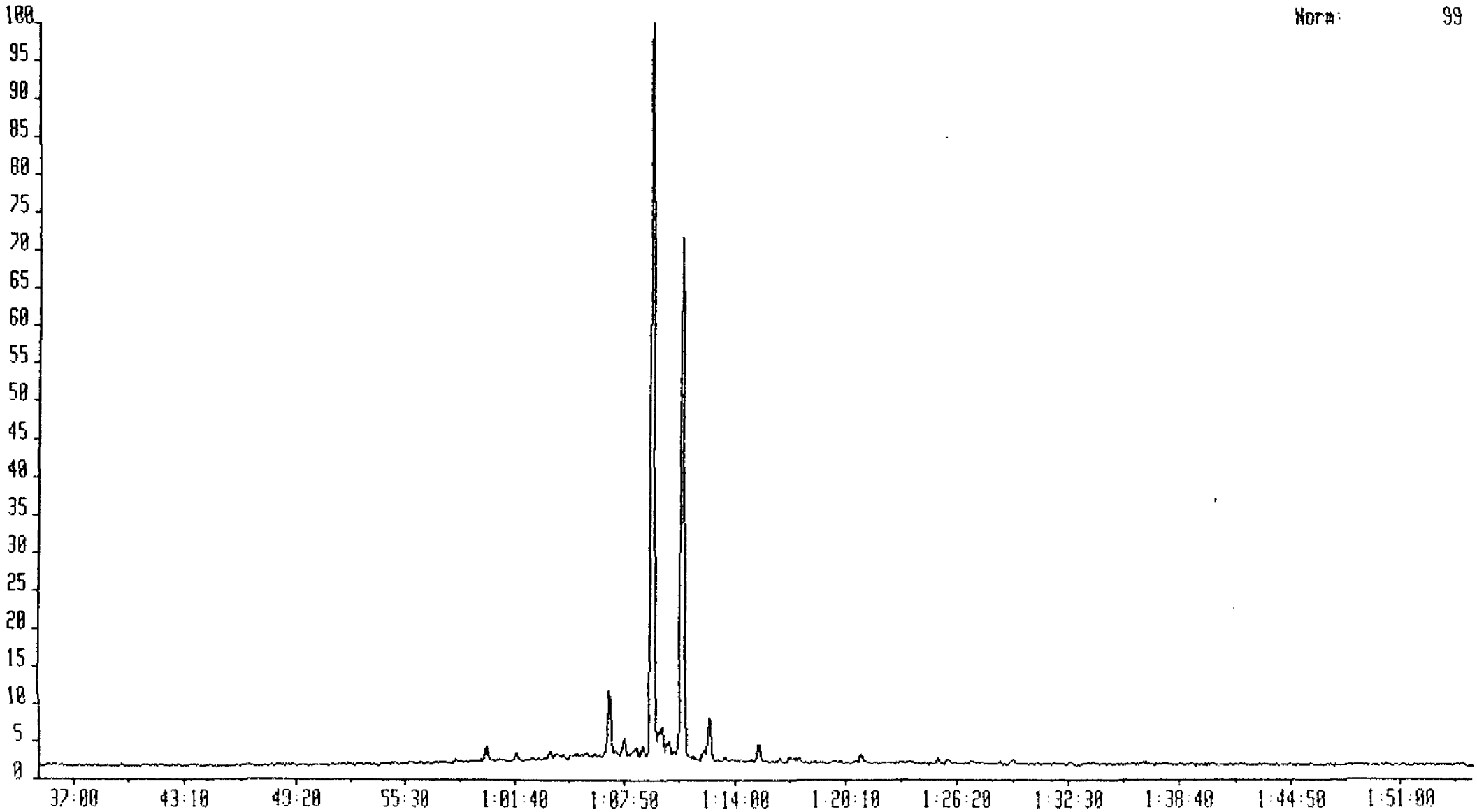
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 4 Injection 1 Group 1 Mass 91.6600 398.0000->191.0000
Text:2495-2515



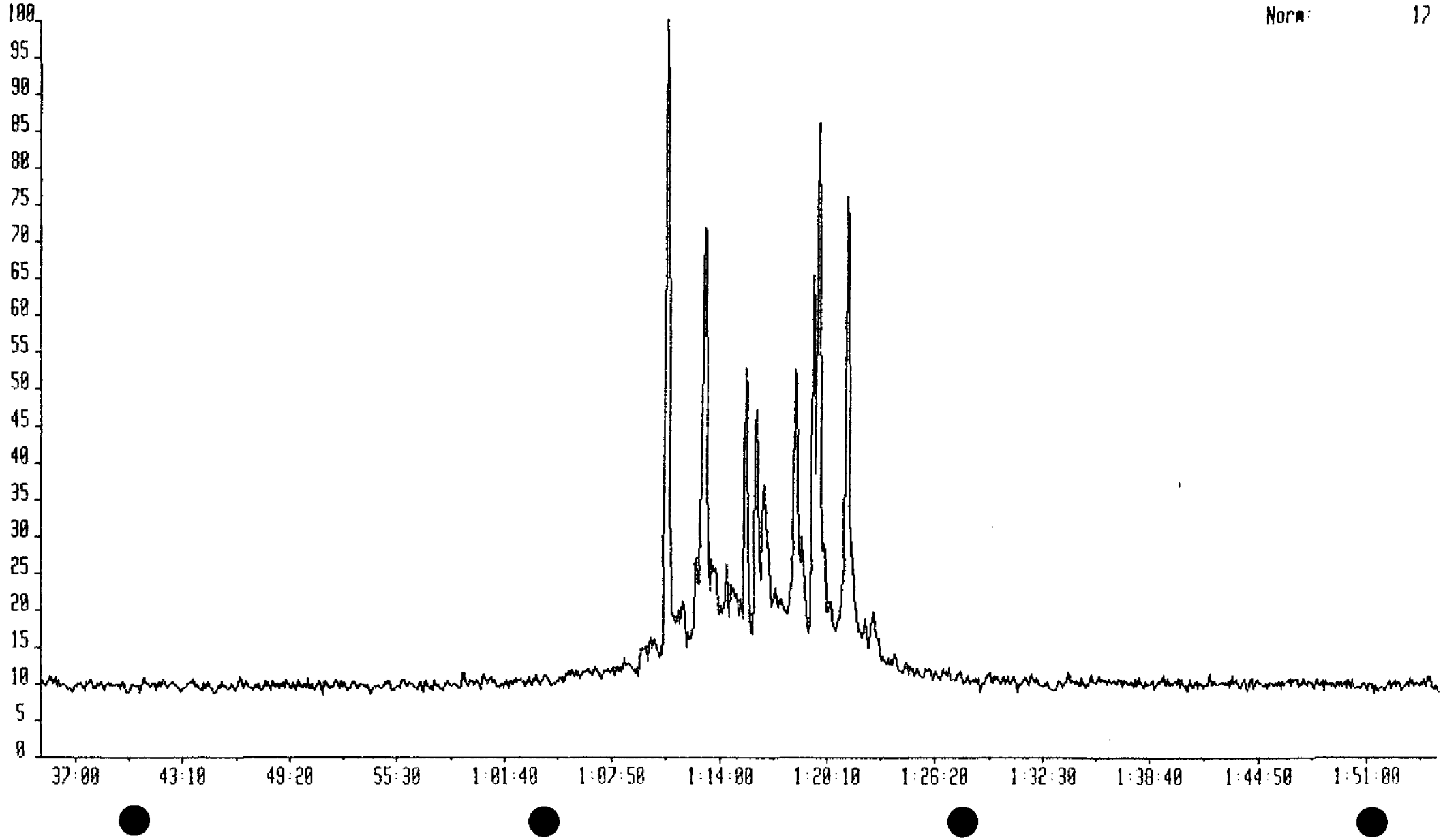
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 4 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:2495-2515



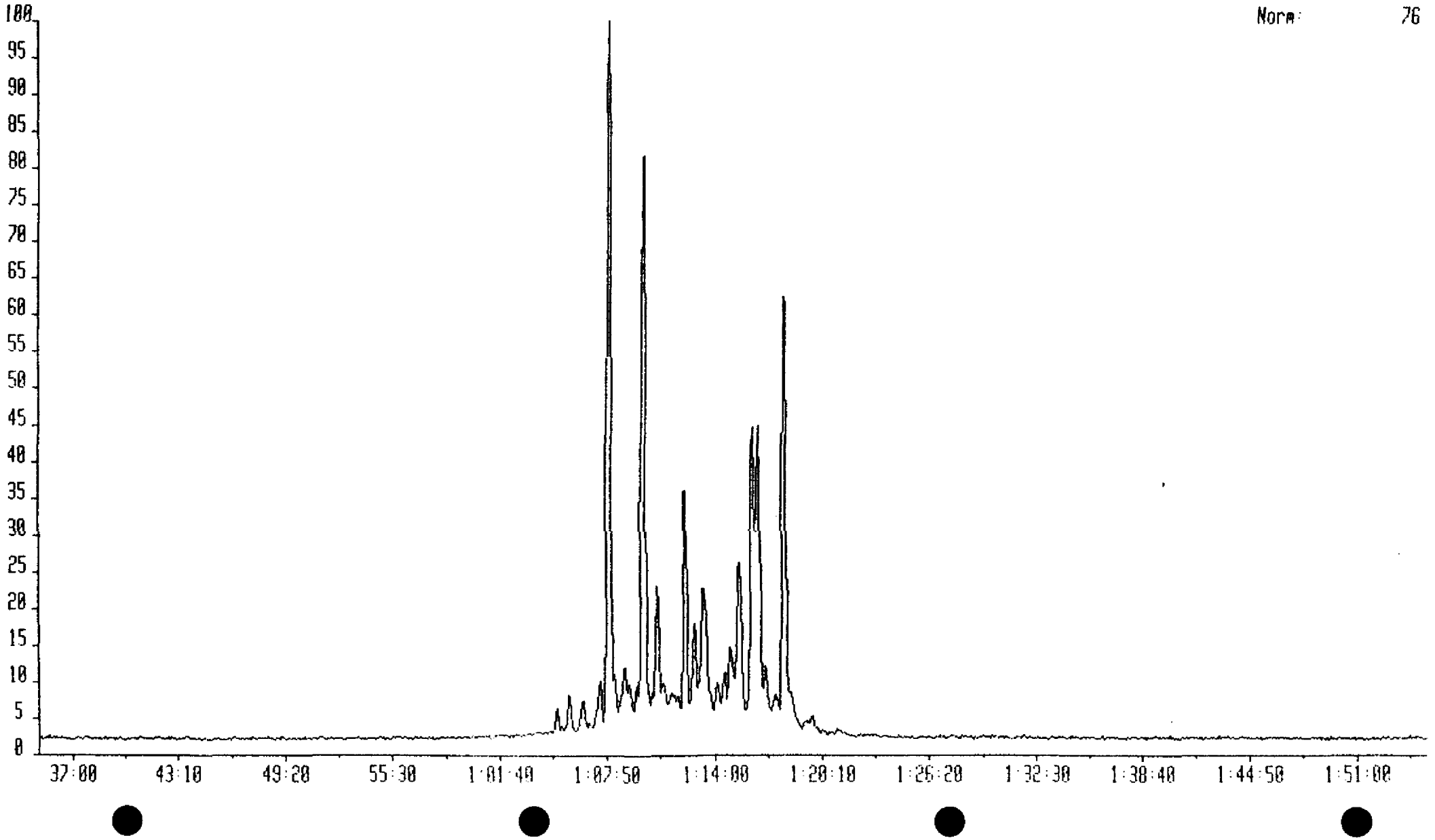
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 4 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:2495-2515



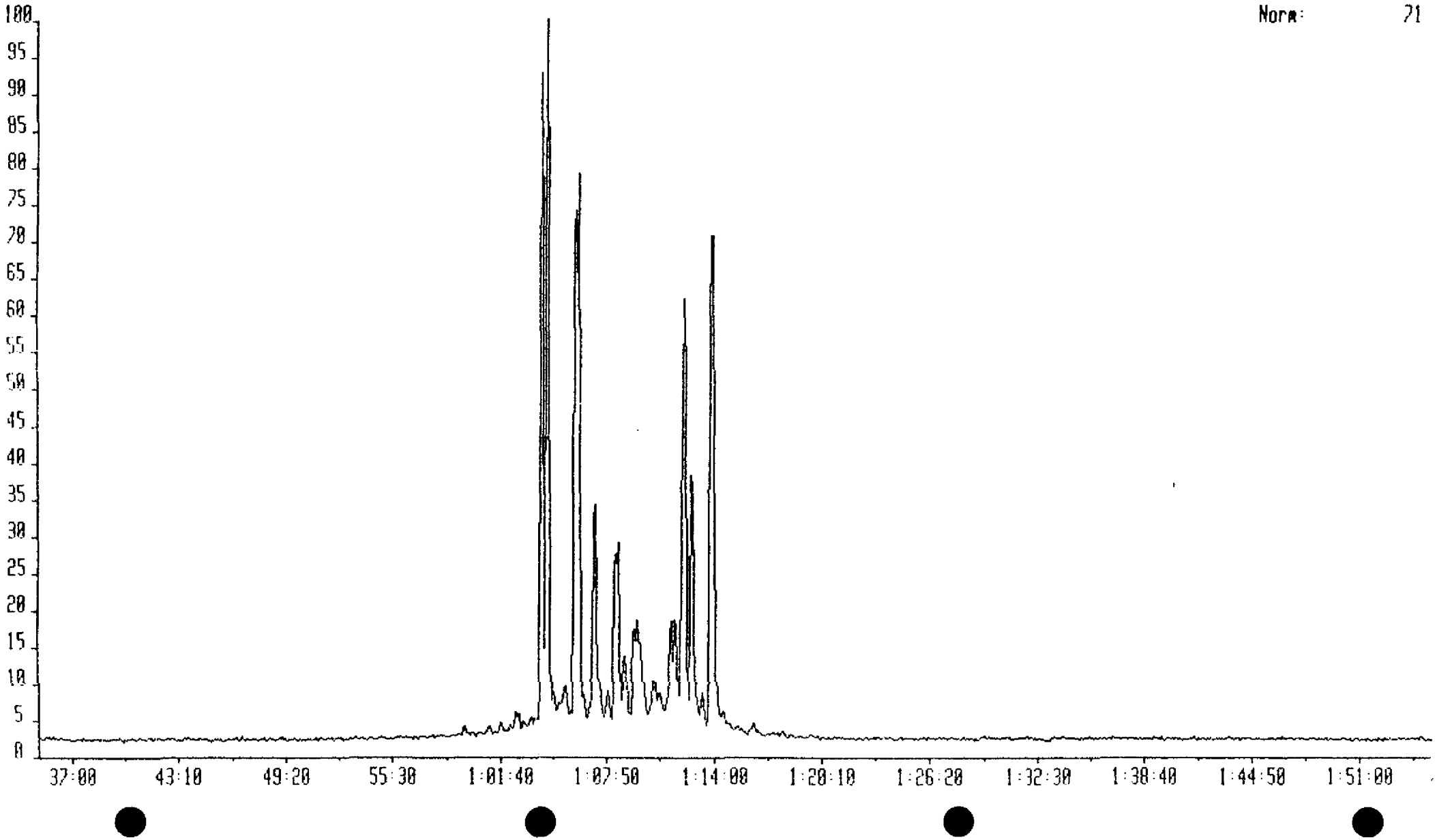
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 4 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:2495-2515



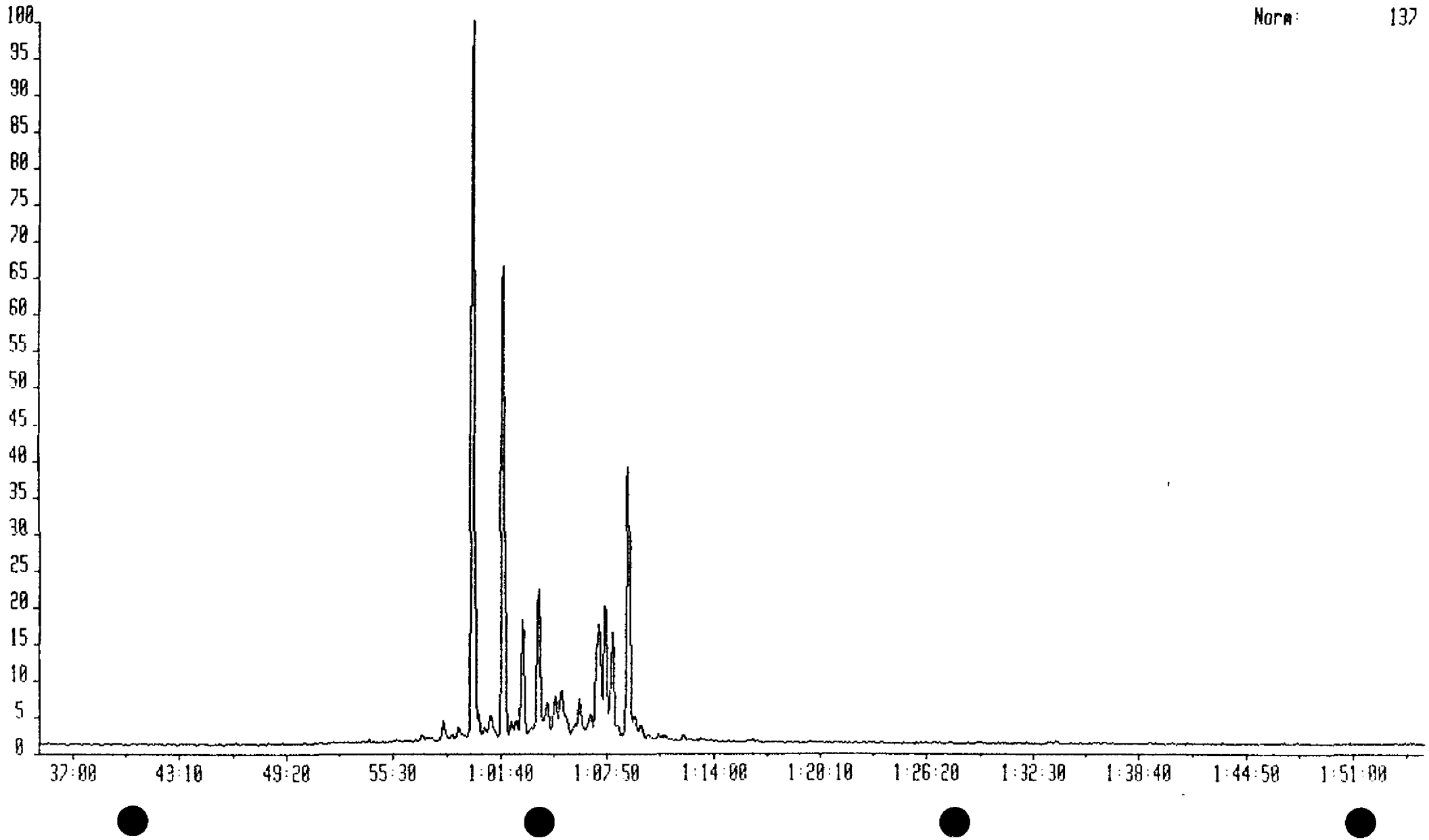
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 4 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:2495-2515



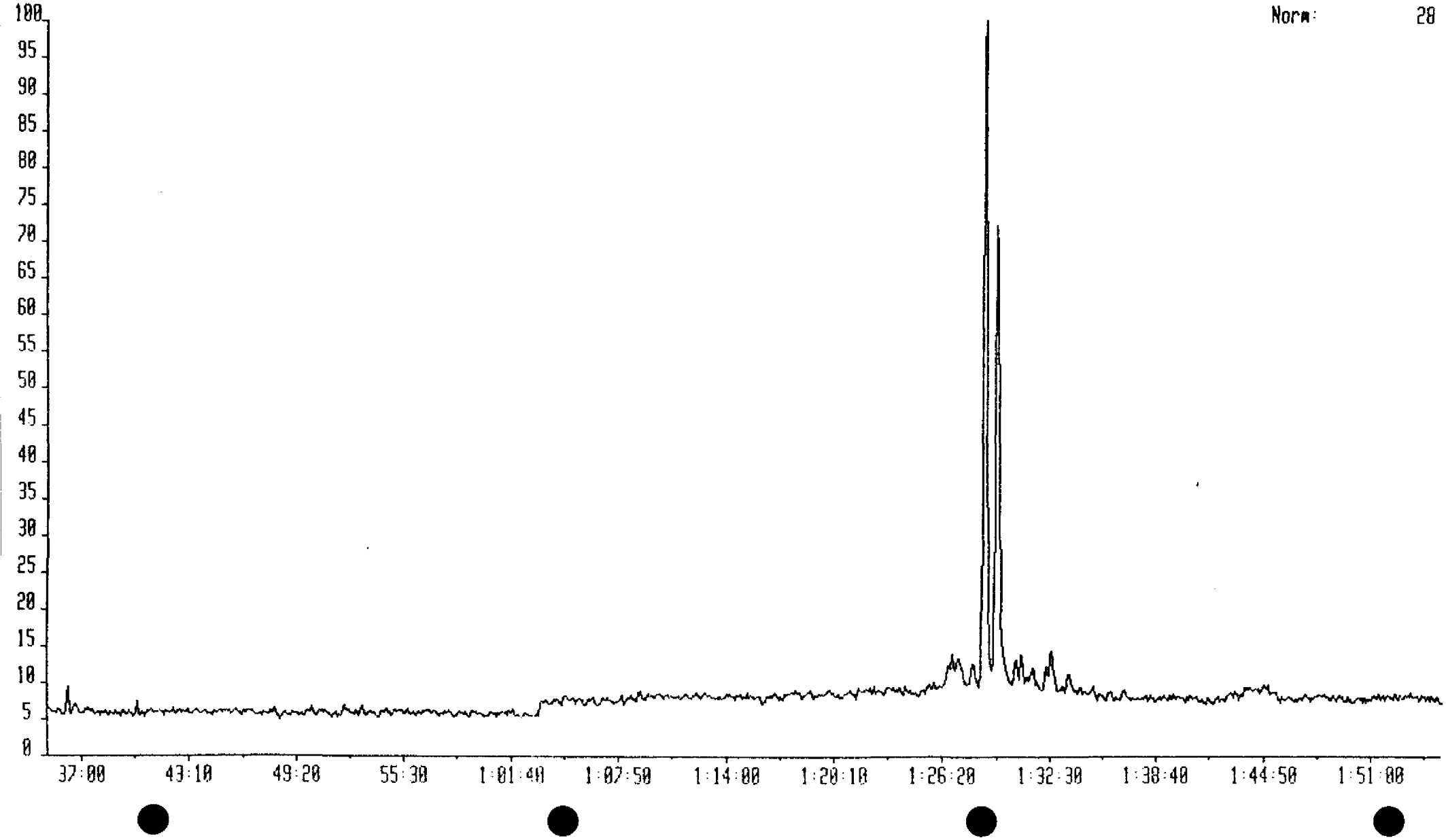
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 4 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:2495-2515



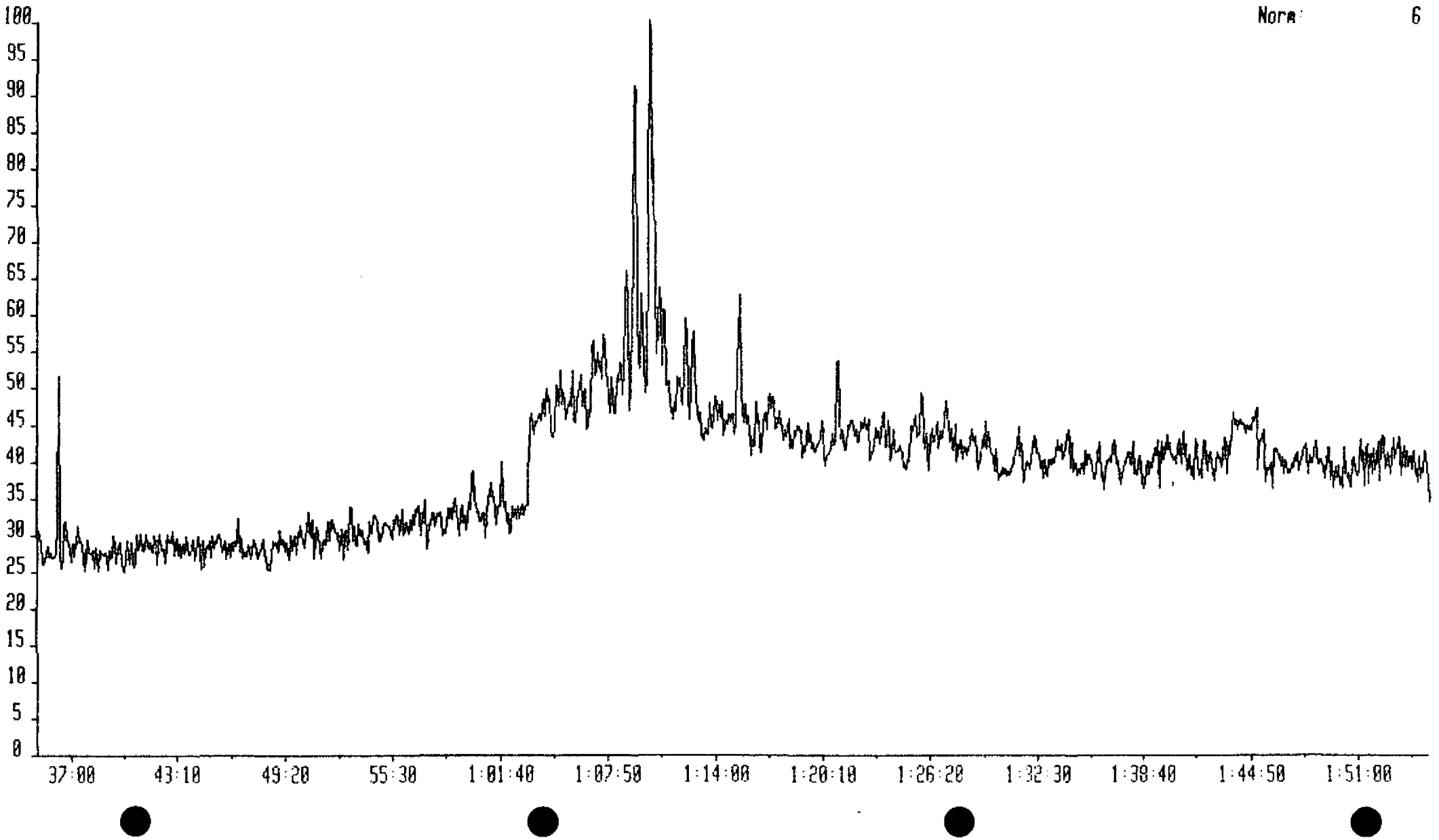
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 4 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:2495-2515



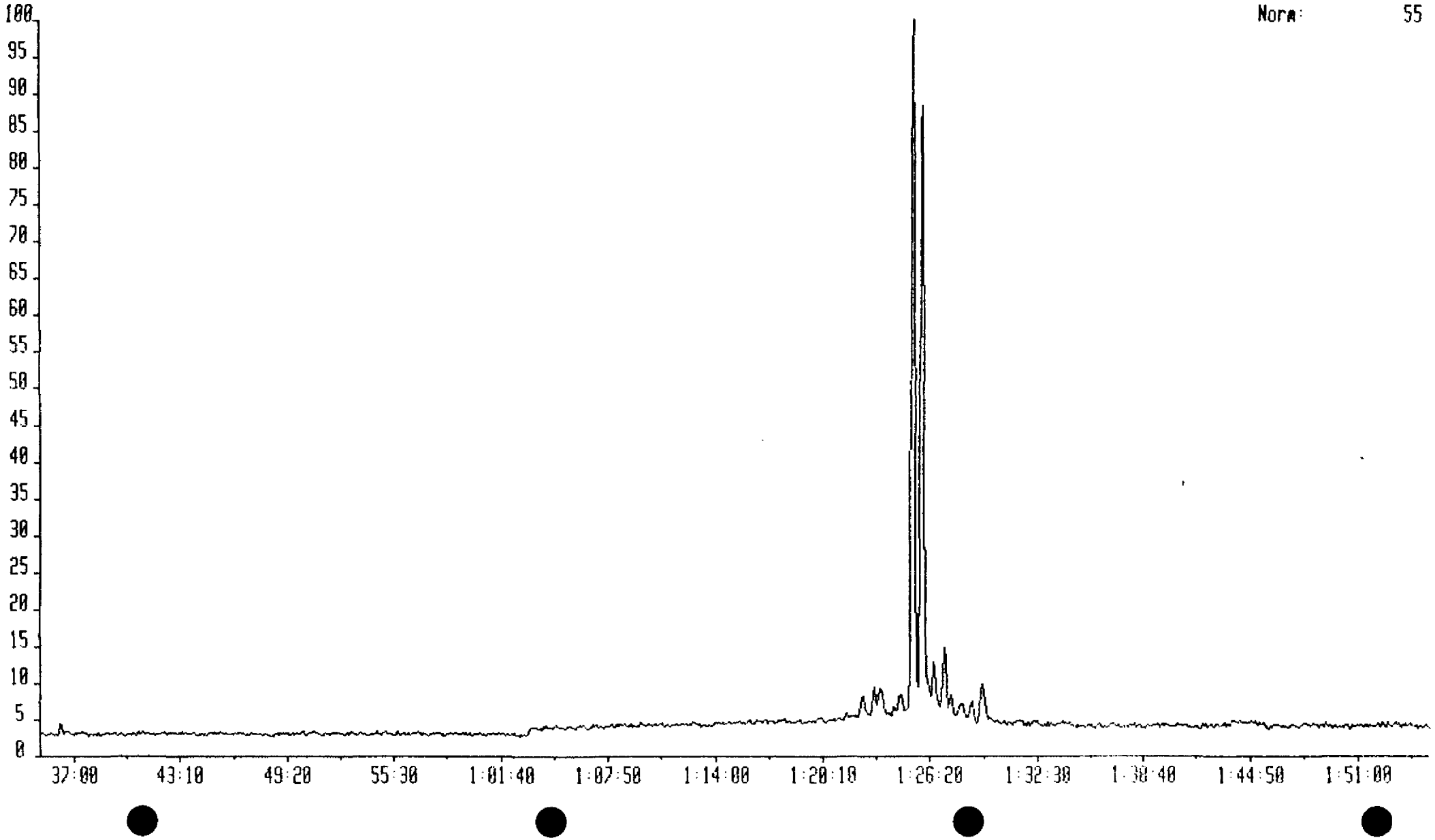
AS810037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 5 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:2515-30



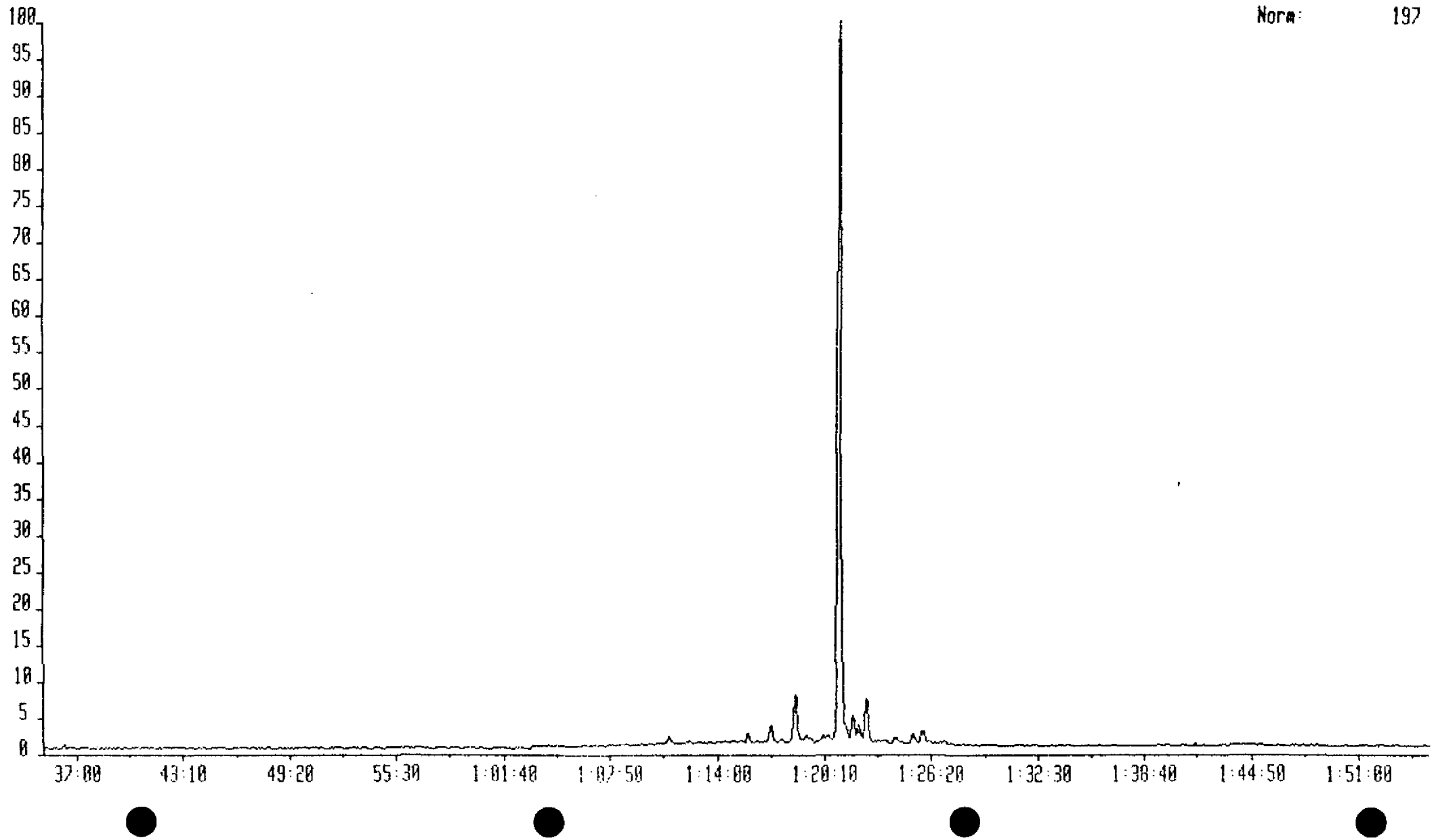
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 5 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:2515-30



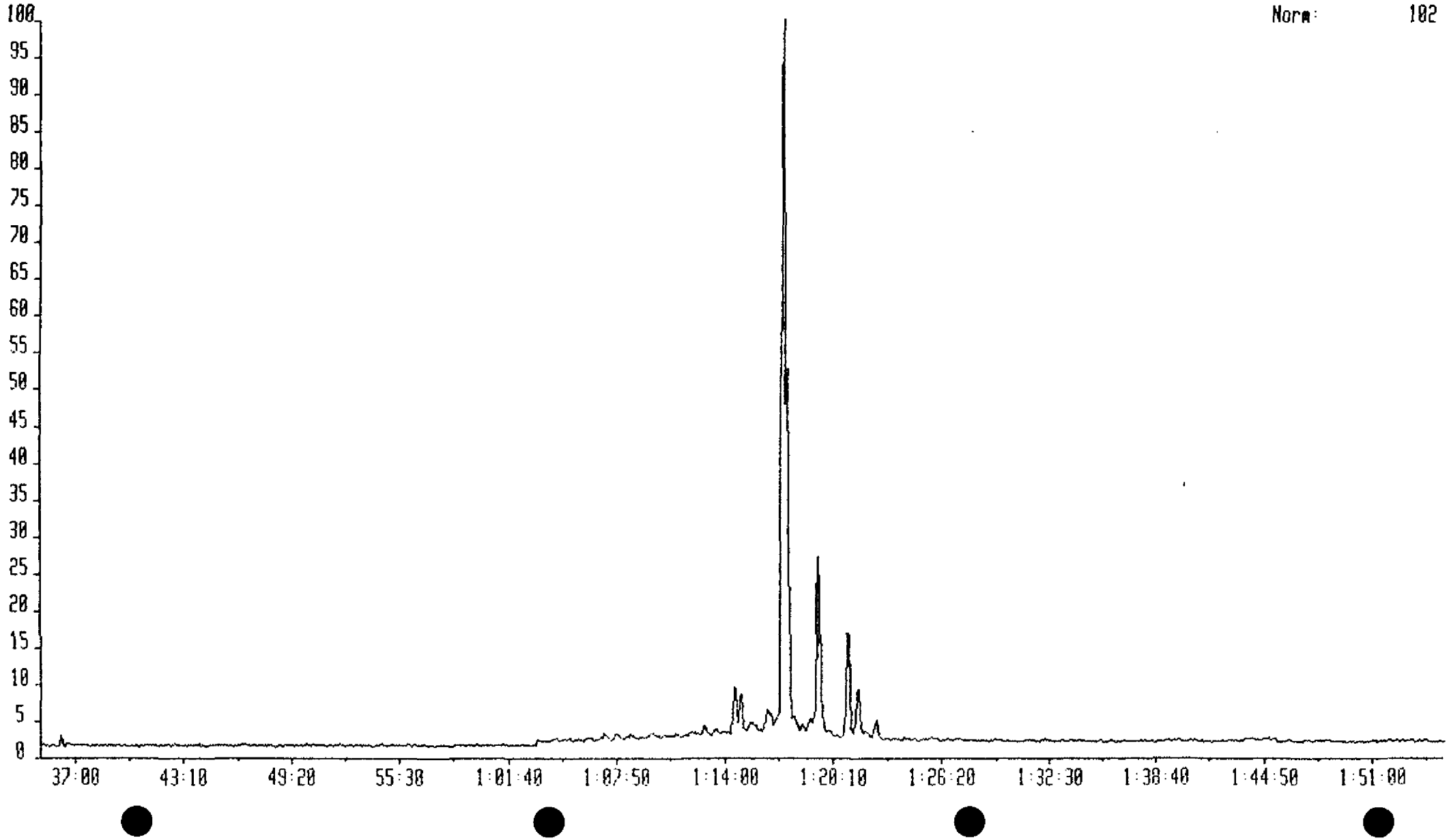
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 5 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:2515-30



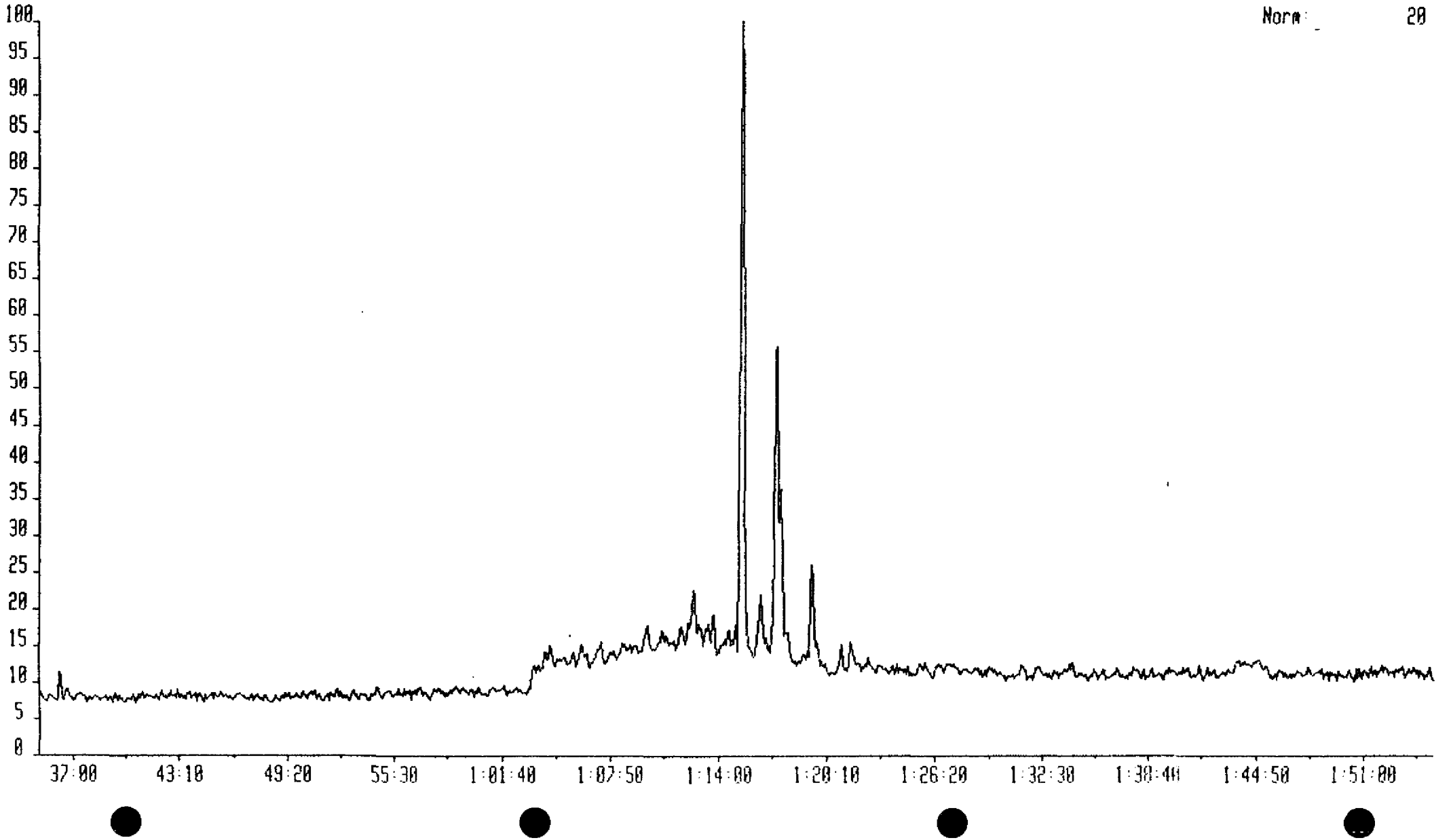
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 5 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:2515-30



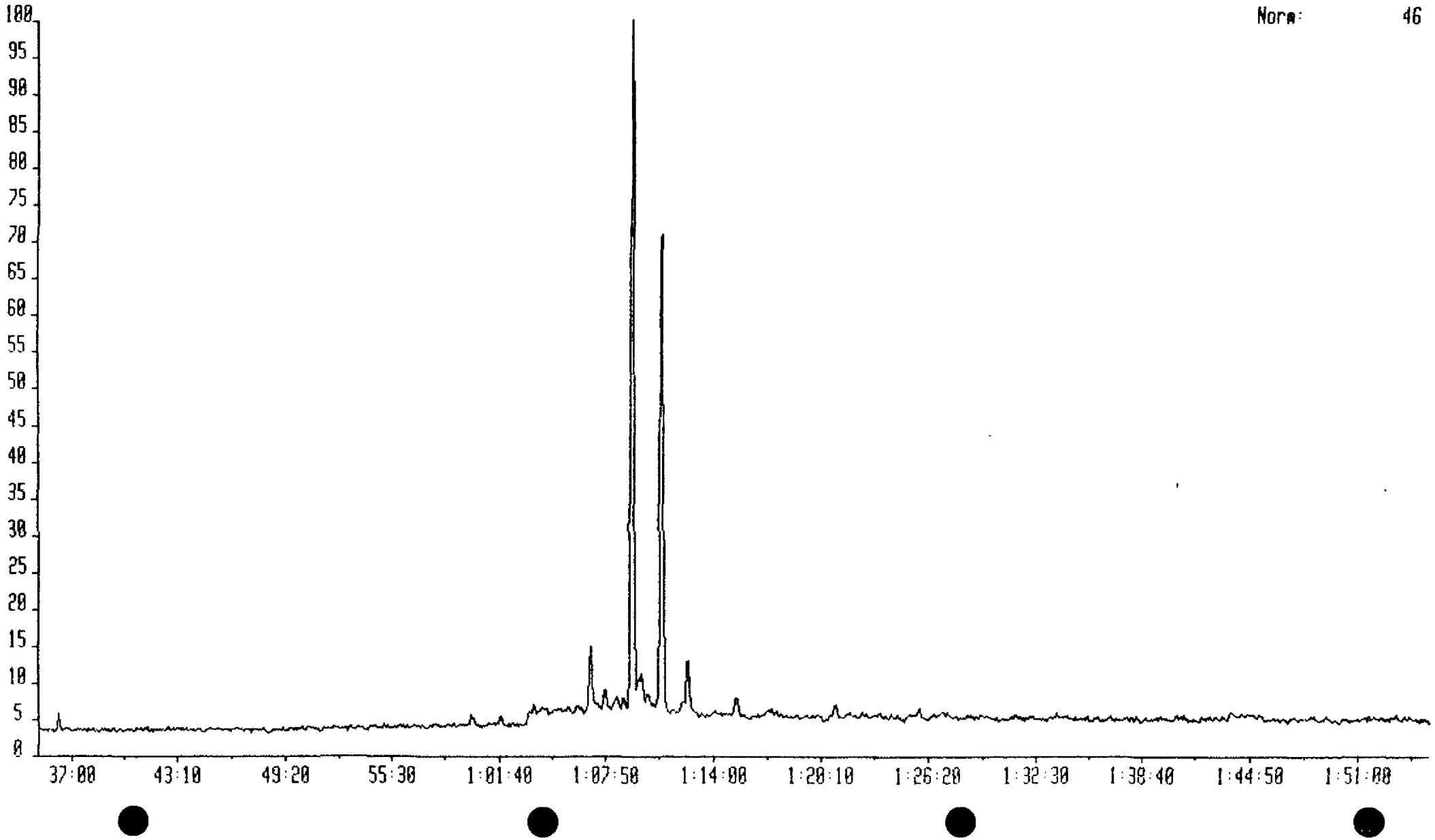
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 5 Injection 1 Group 1 Mass 91.6608 398.0000->191.0000
Text:2515-30



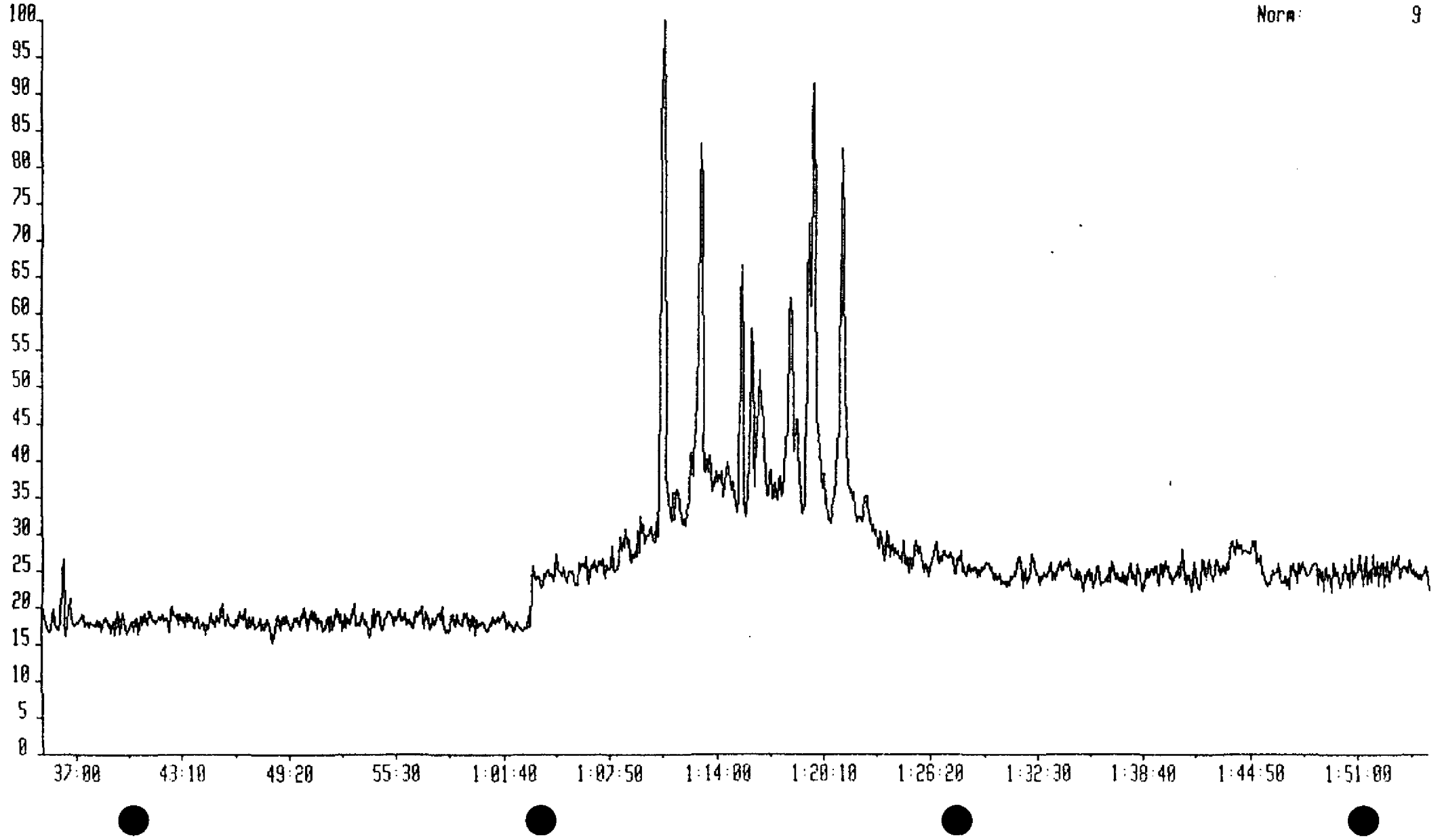
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 5 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:2515-30



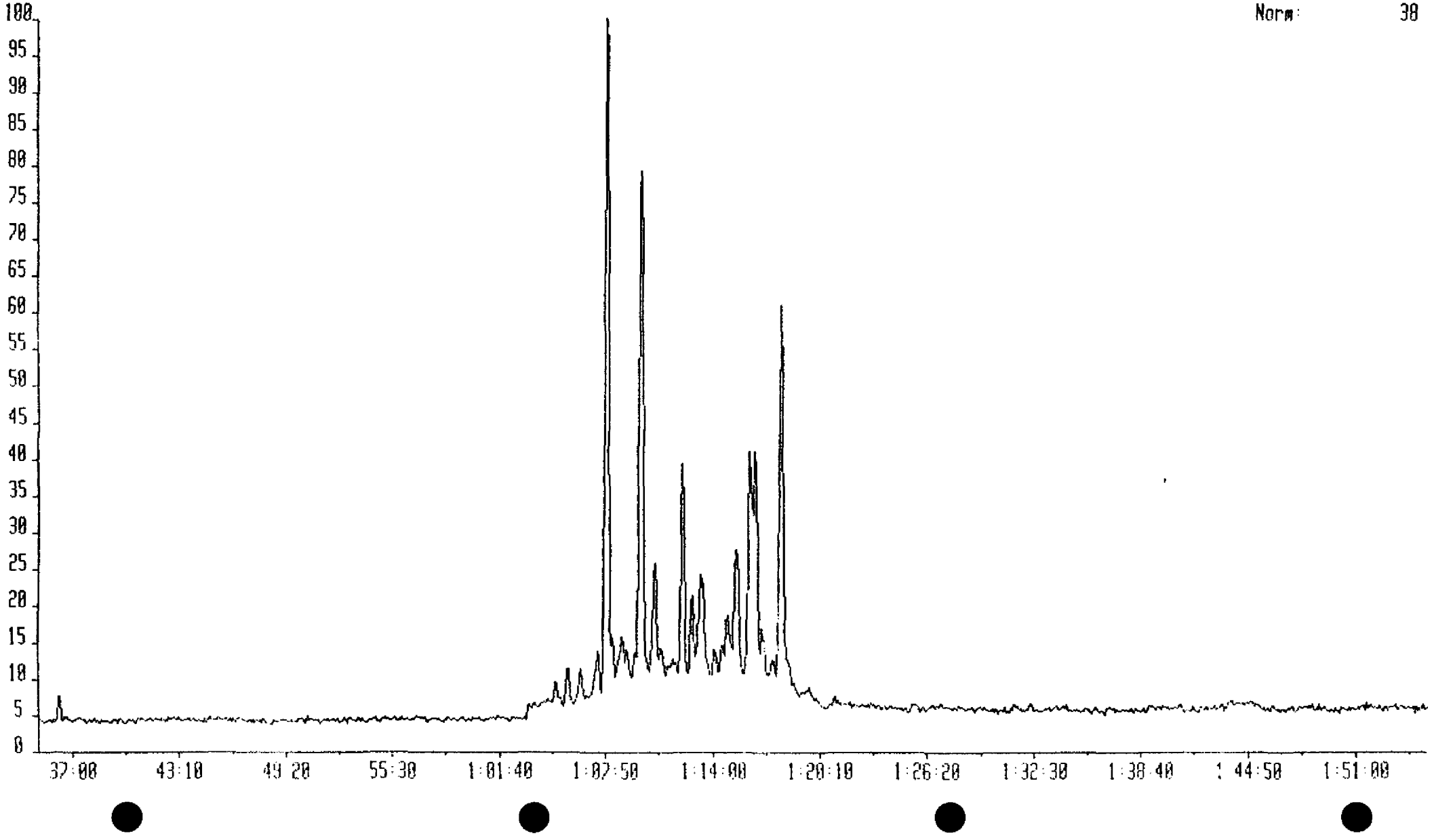
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 5 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:2515-30



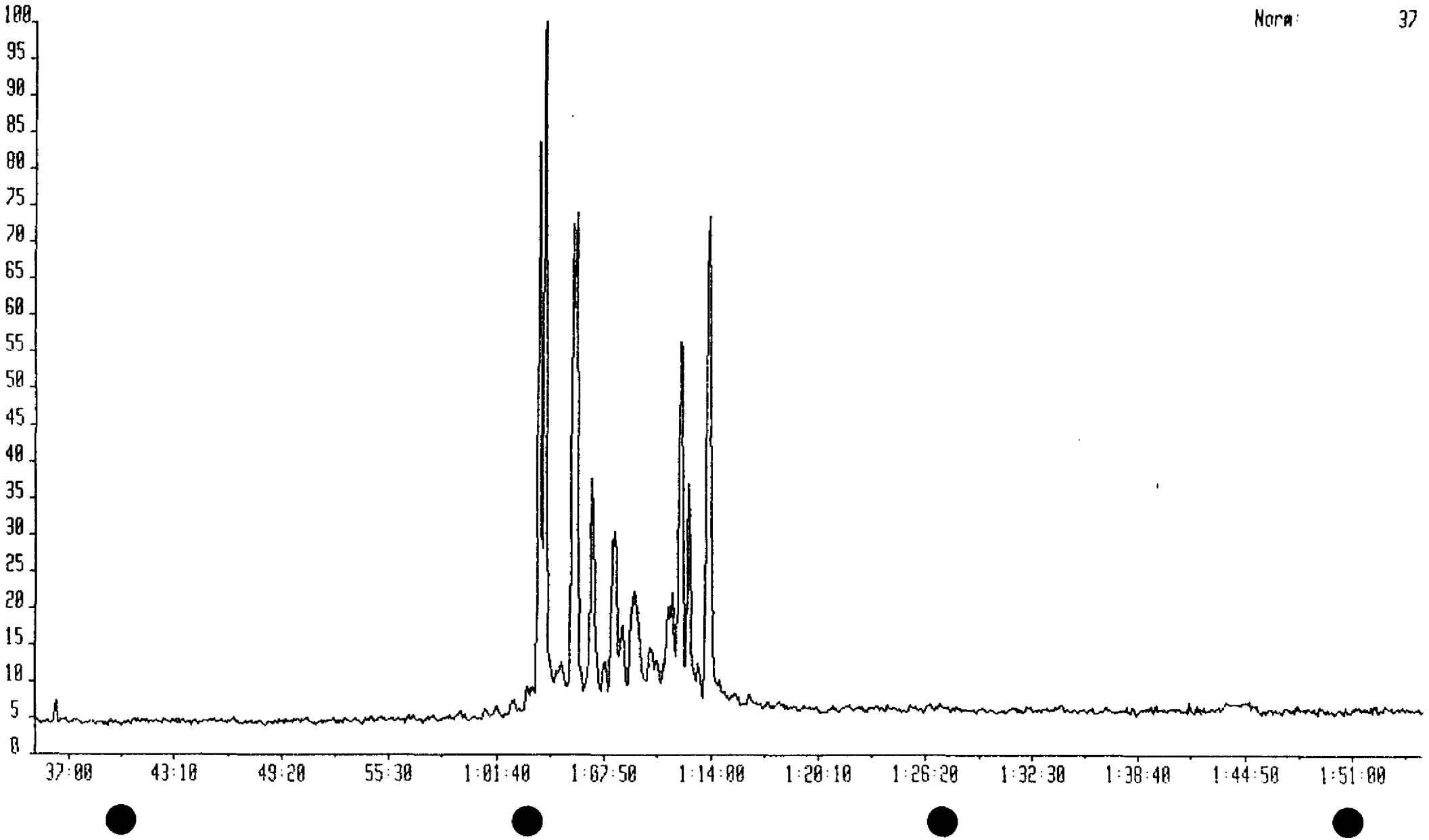
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 5 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:2515-30



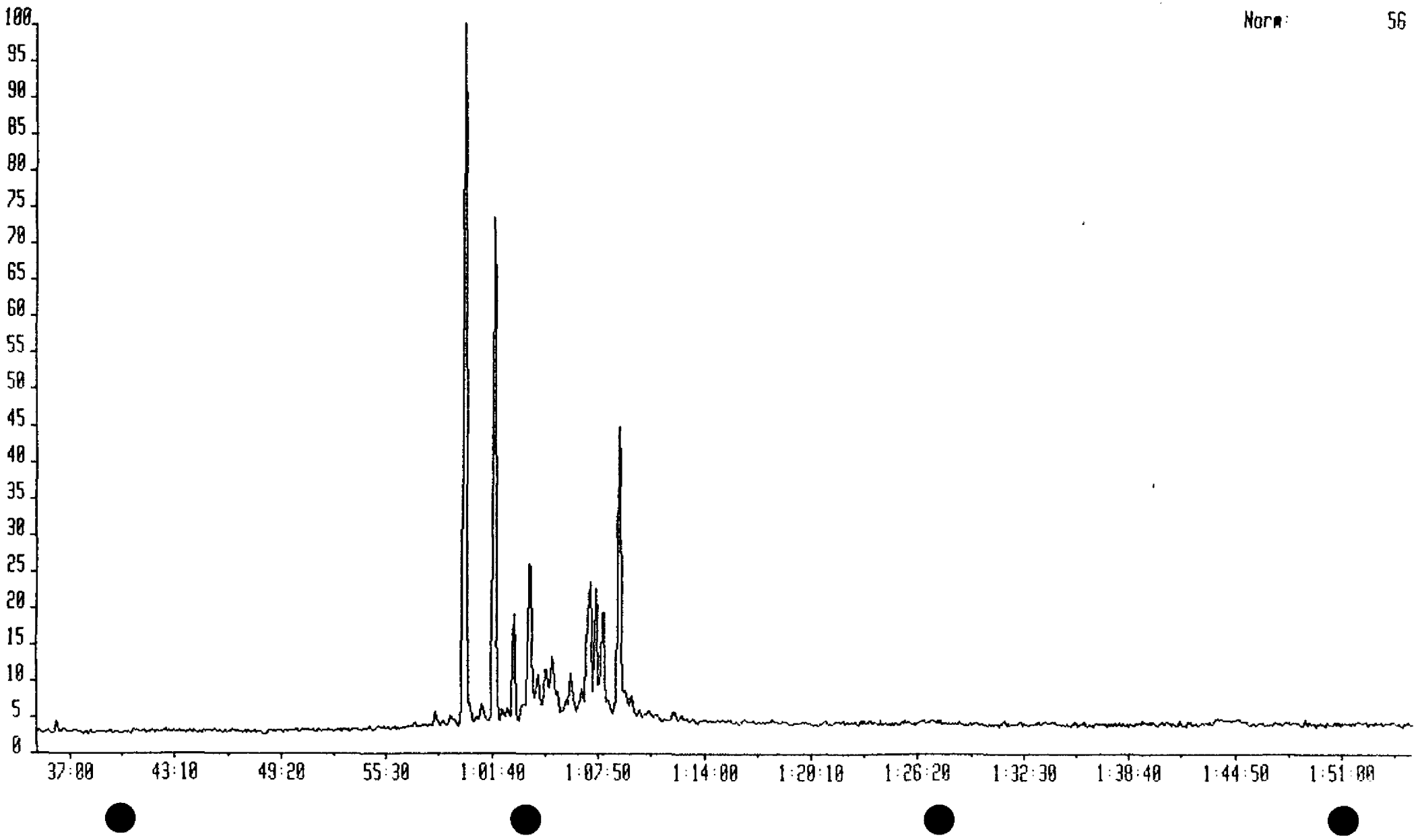
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 5 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:2515-30



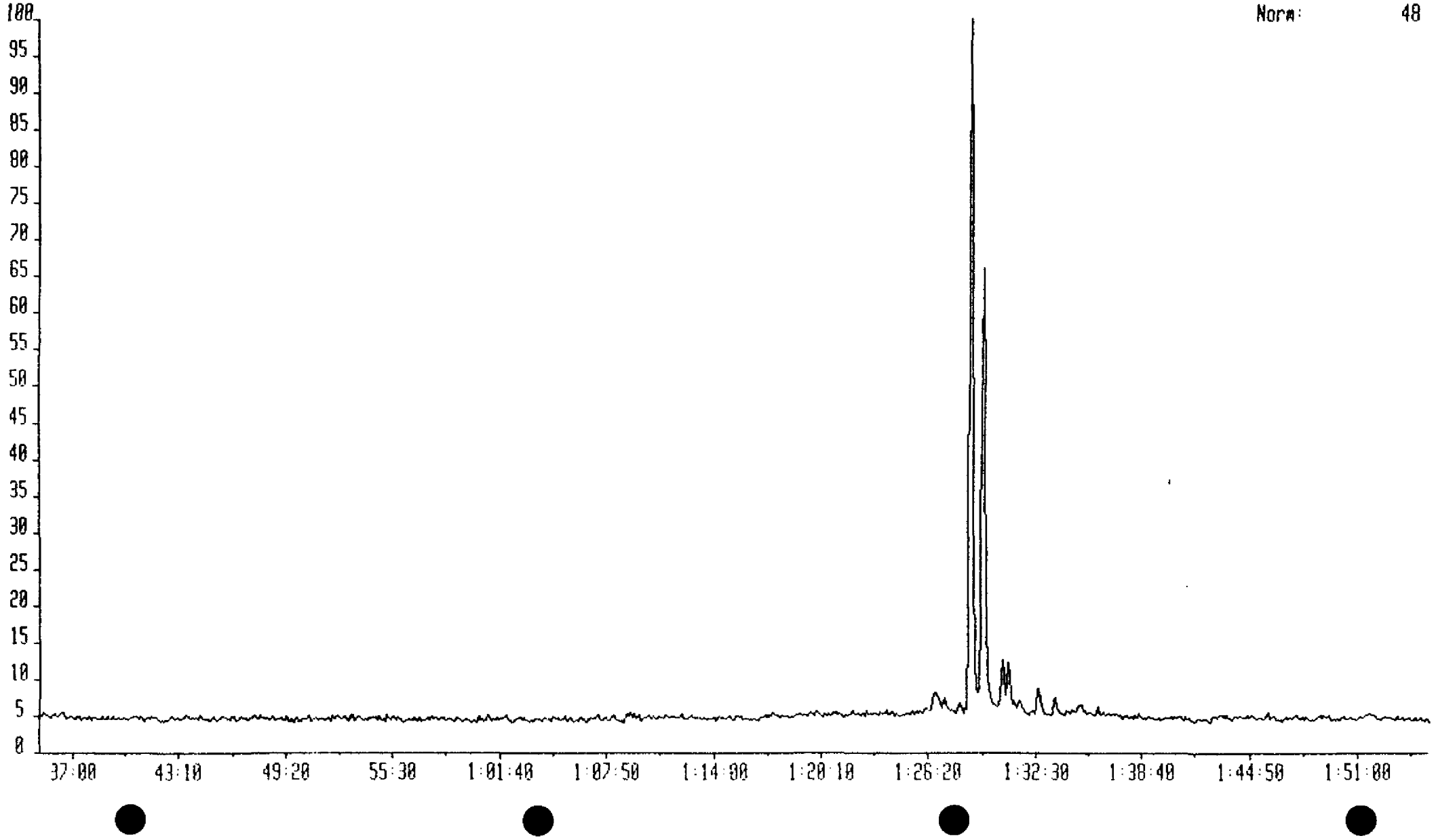
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 5 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:2515-30



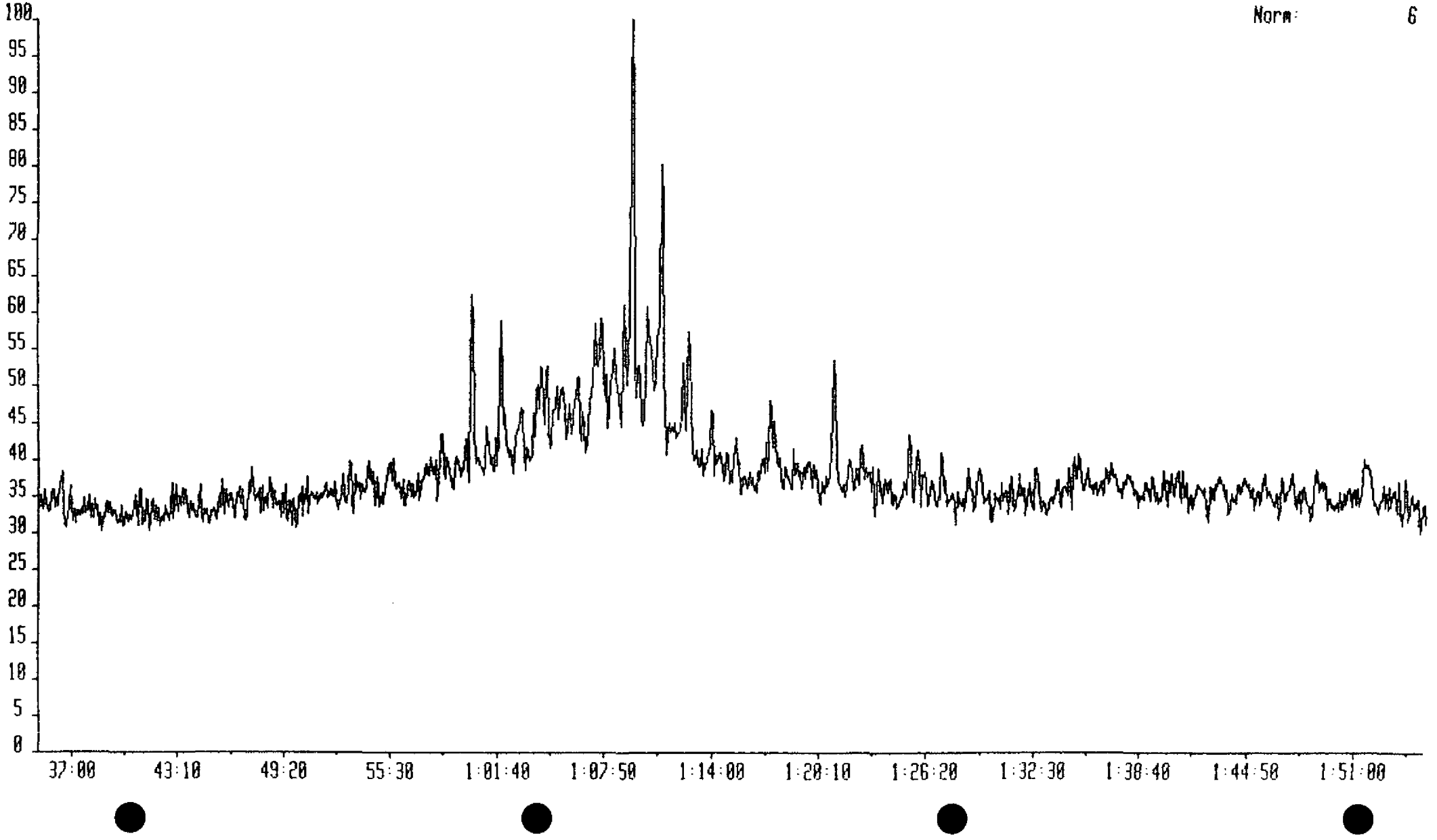
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 5 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:2515-30



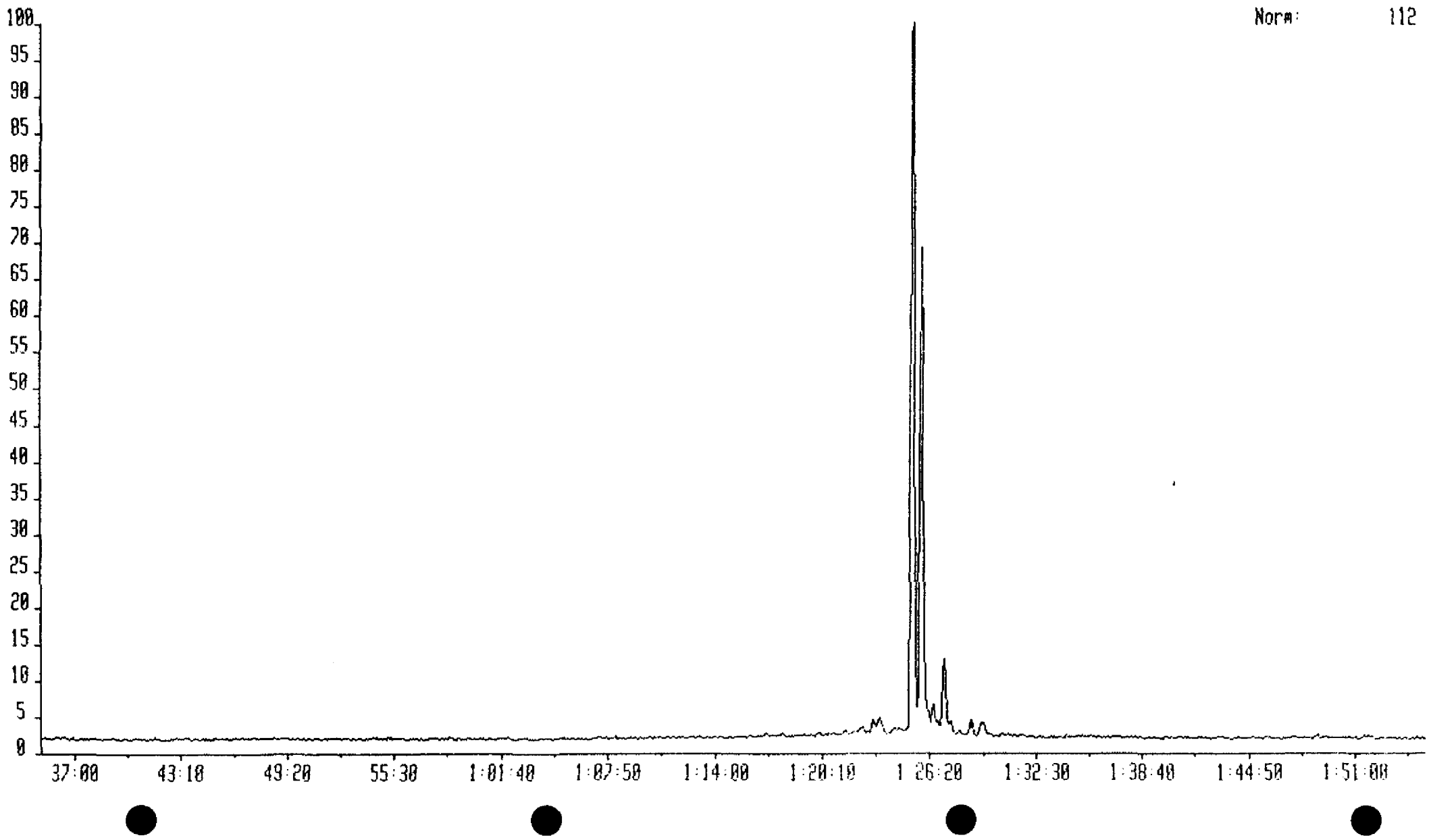
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 6 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:2898.5



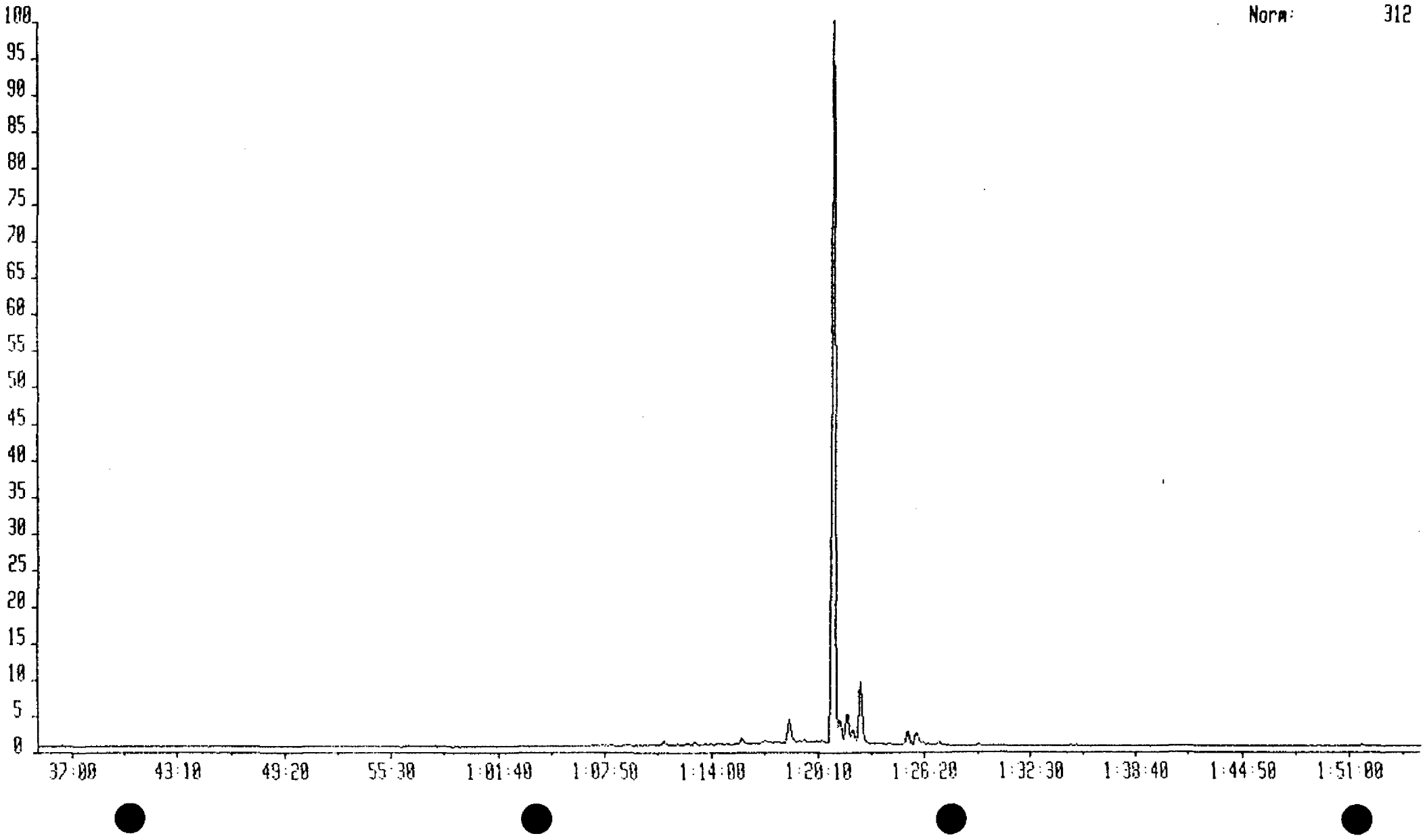
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 6 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:2898.5



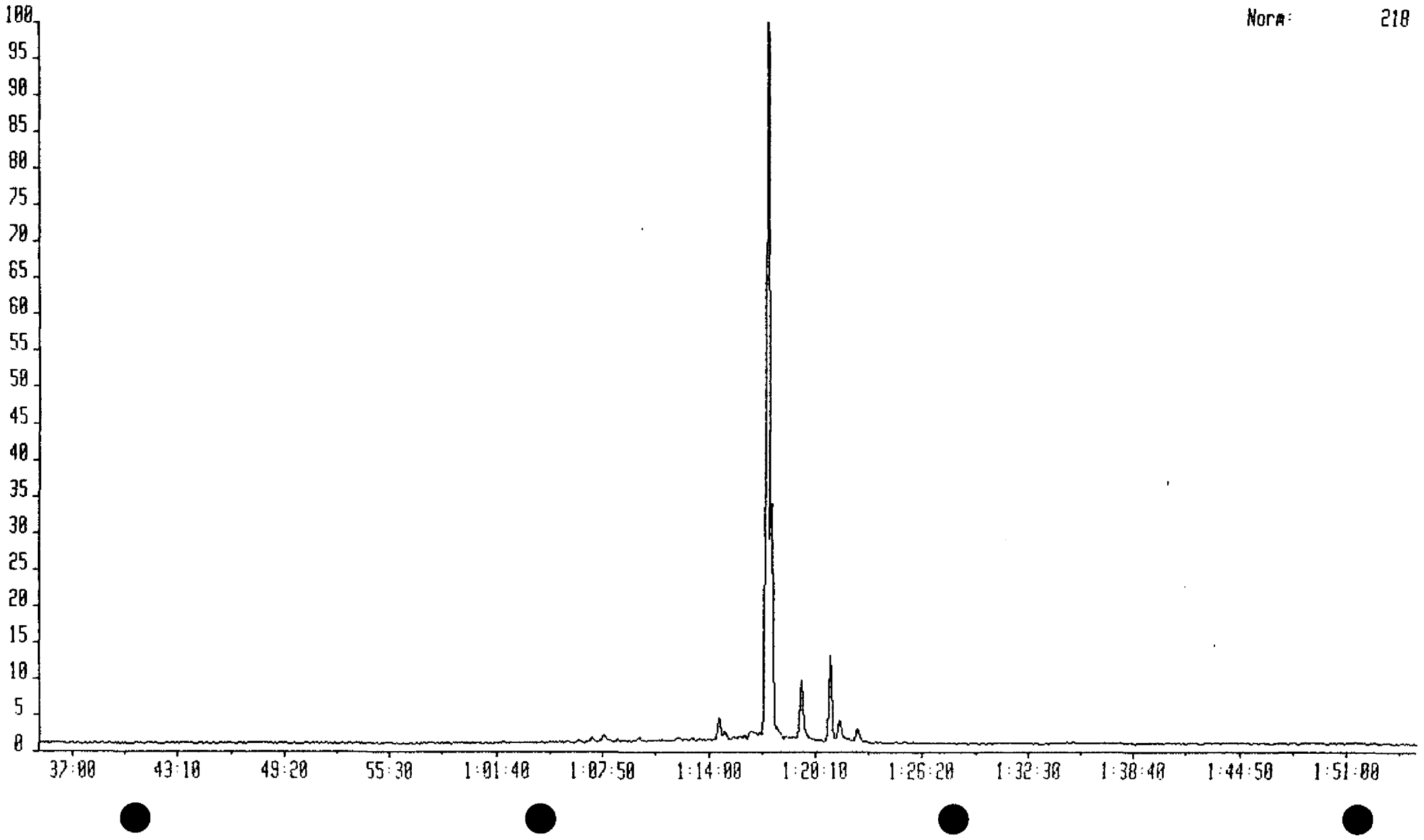
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 6 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:2898.5



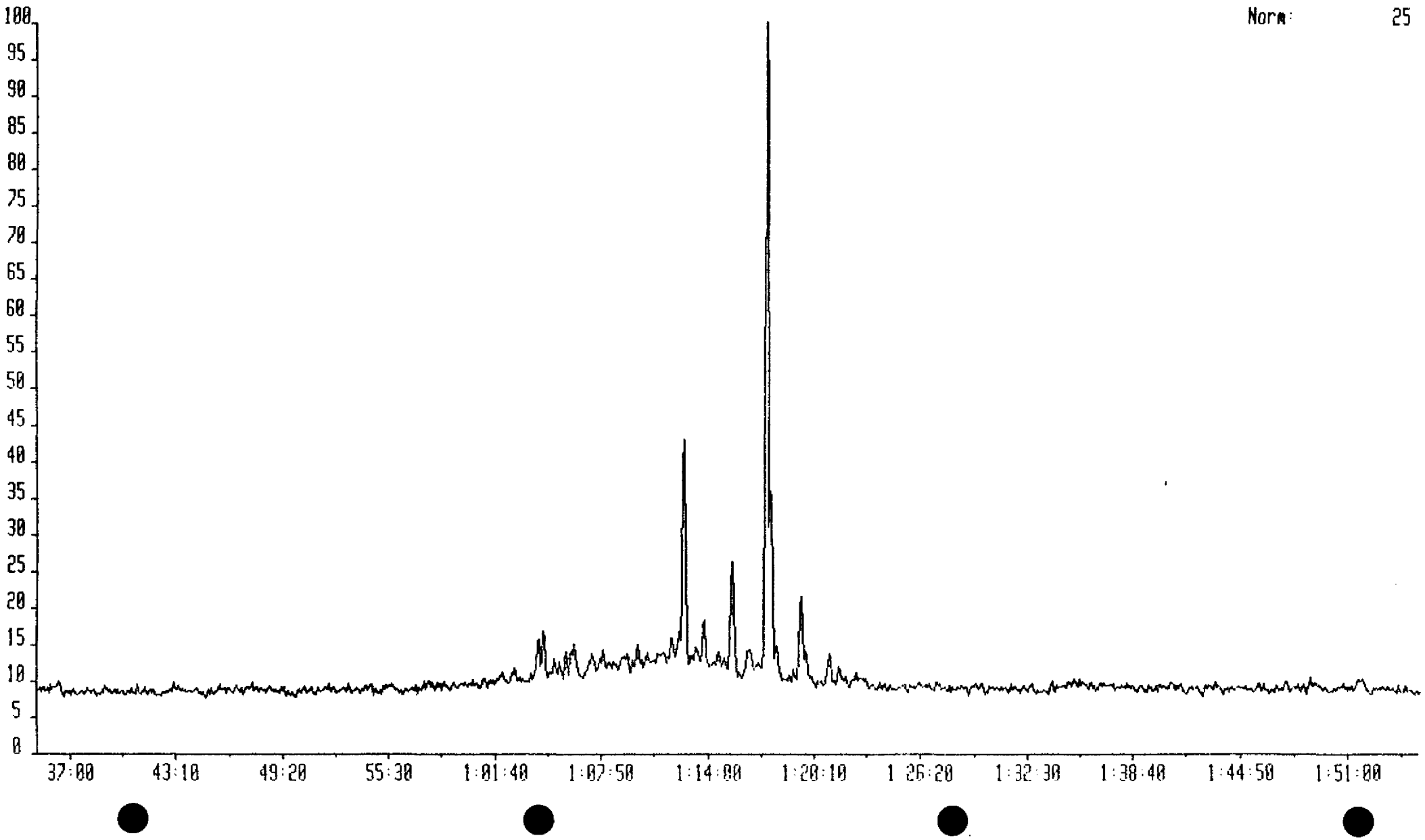
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 6 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:2898.5



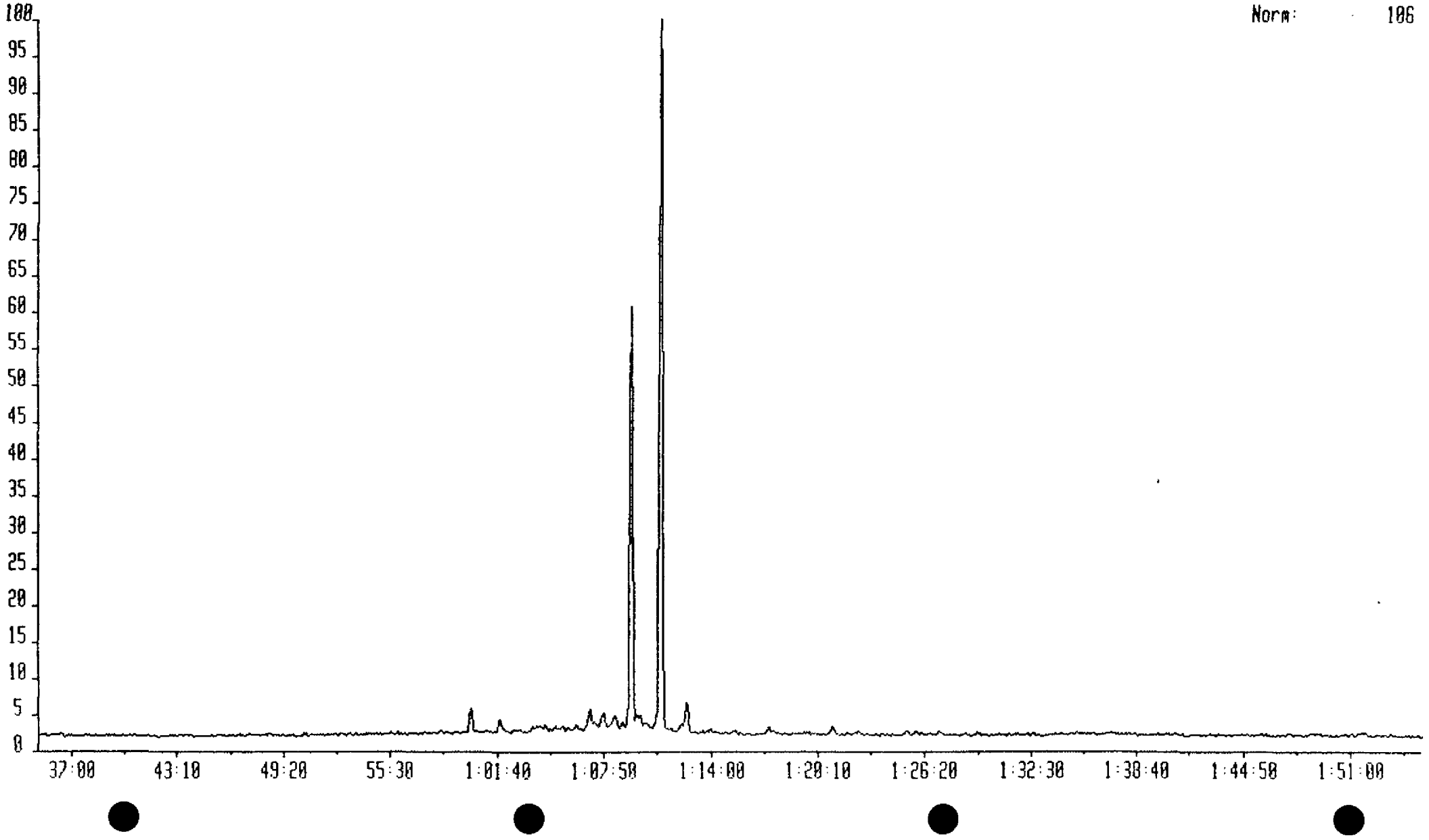
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 6 Injection 1 Group 1 Mass 91.6608 398.0000->191.0000
Text:2898.5



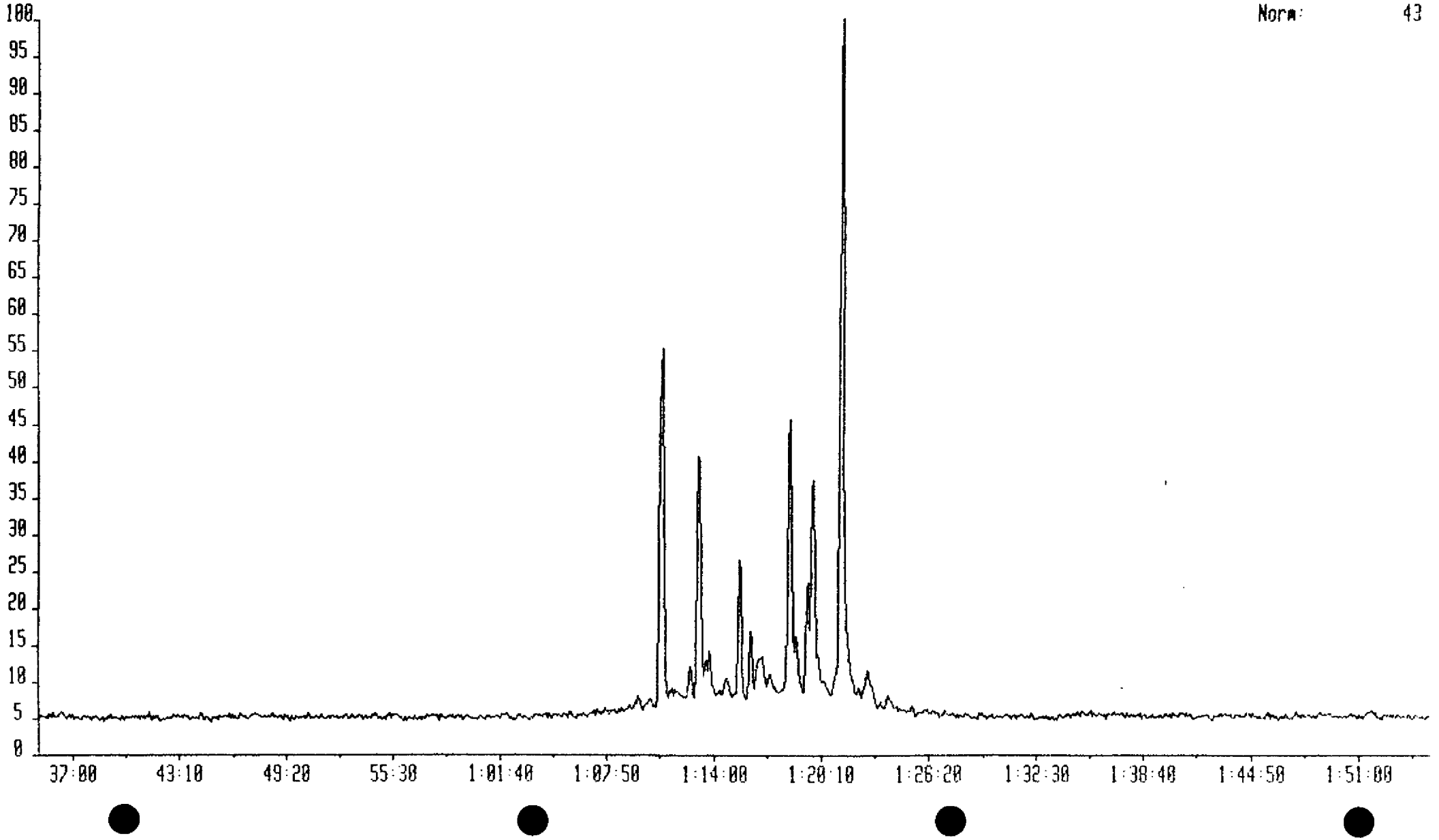
AS810037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 6 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:2898.5



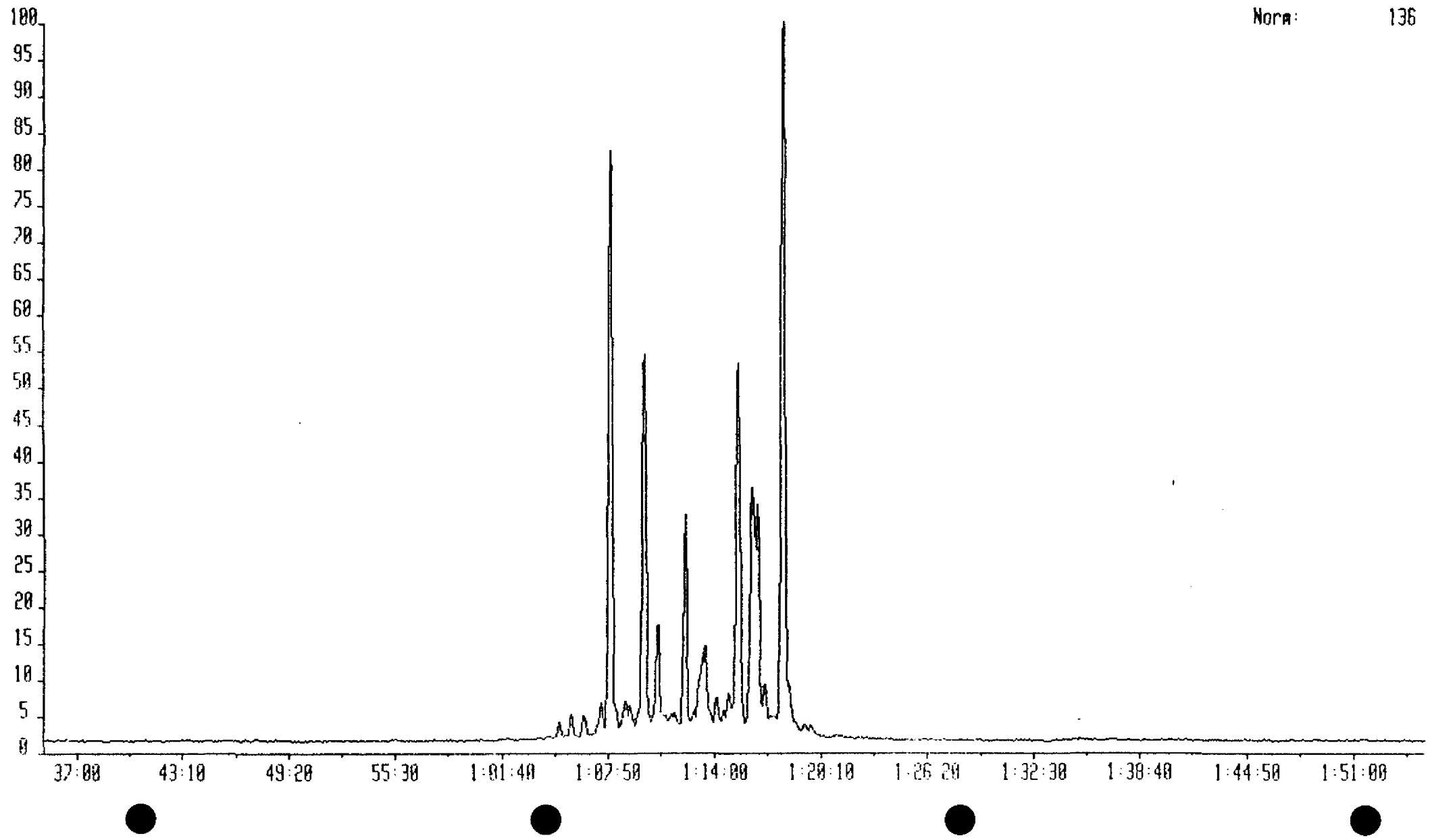
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 6 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:2898.5



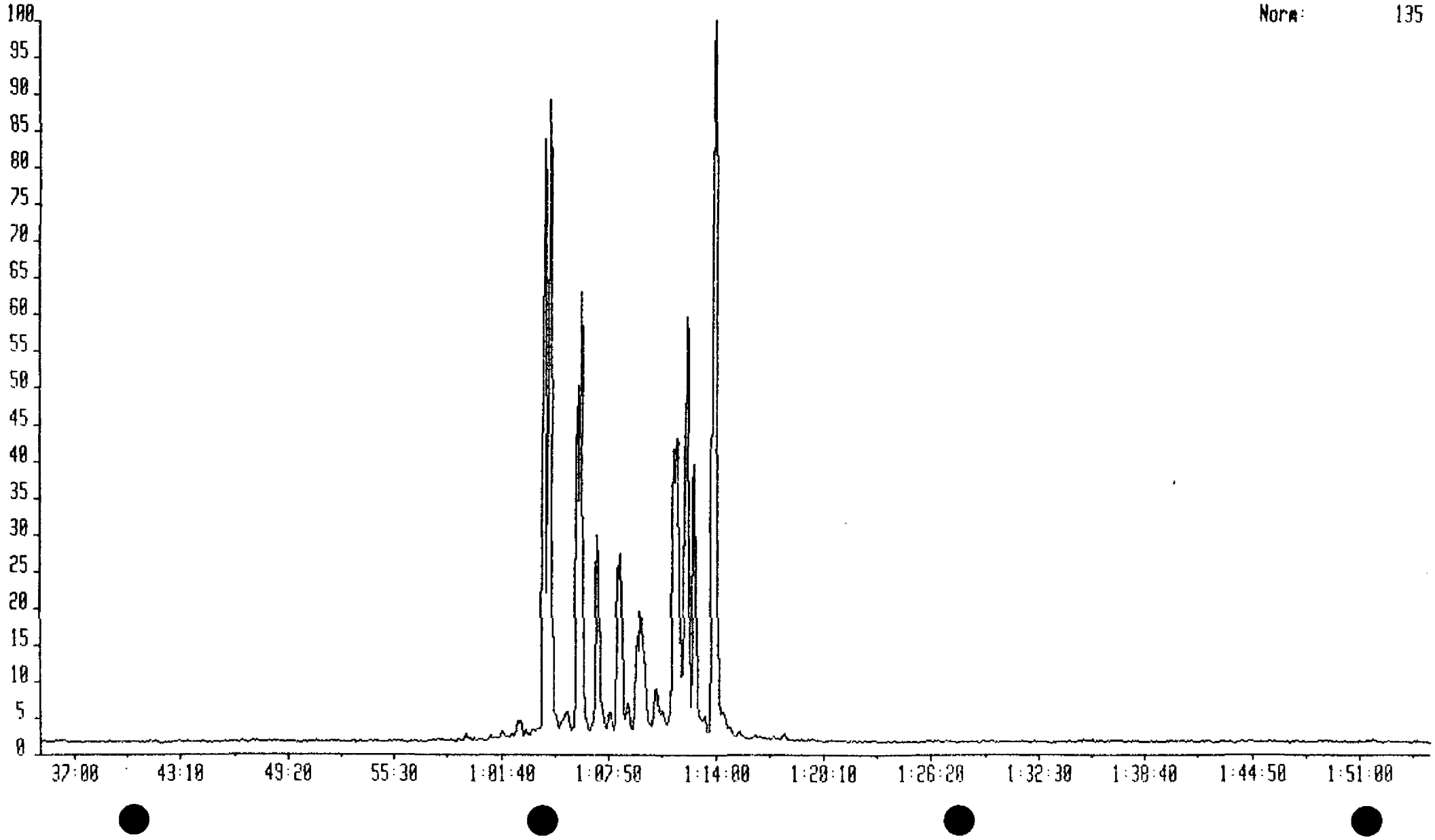
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 6 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:2898.5



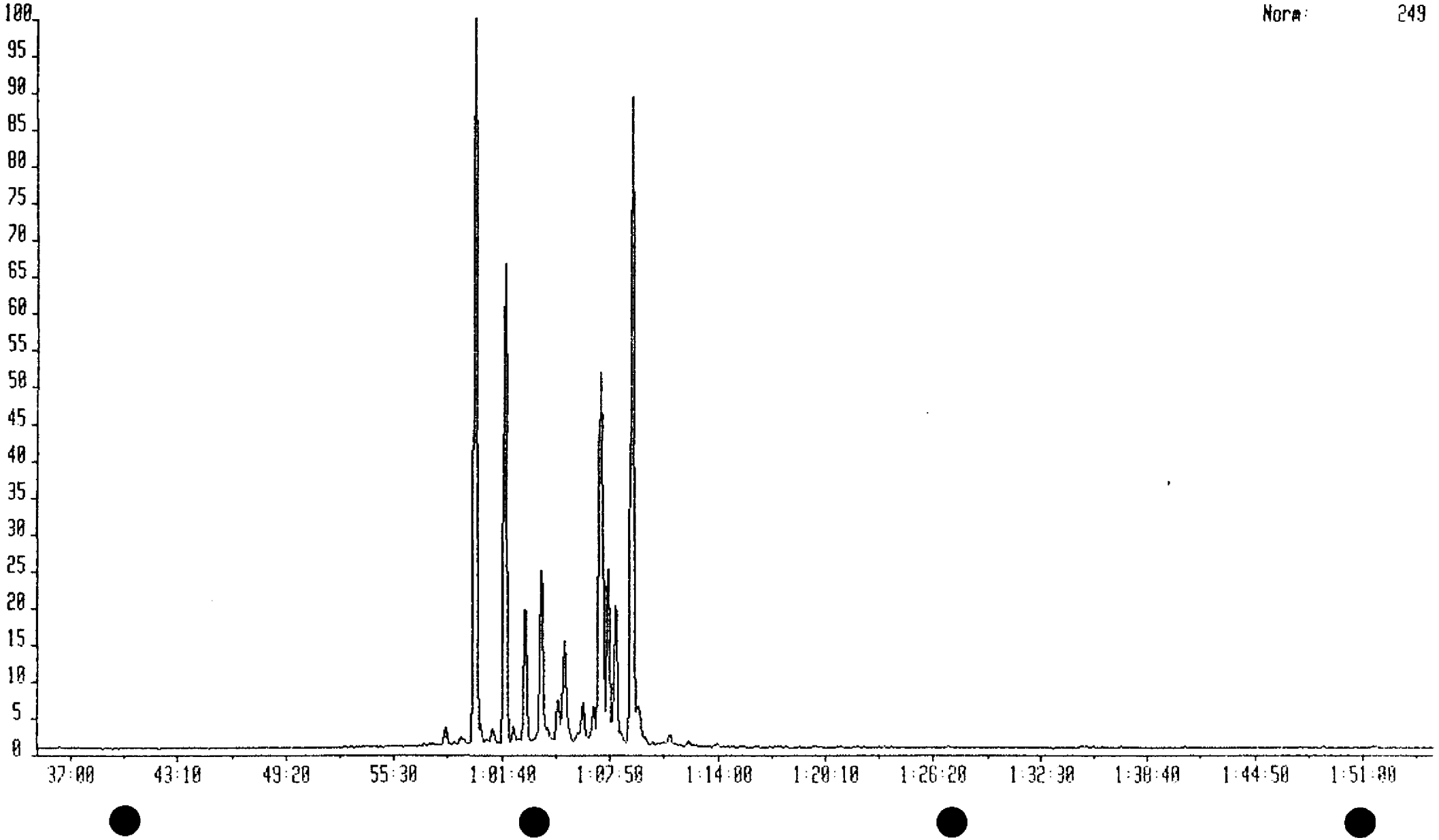
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 6 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:2898.5



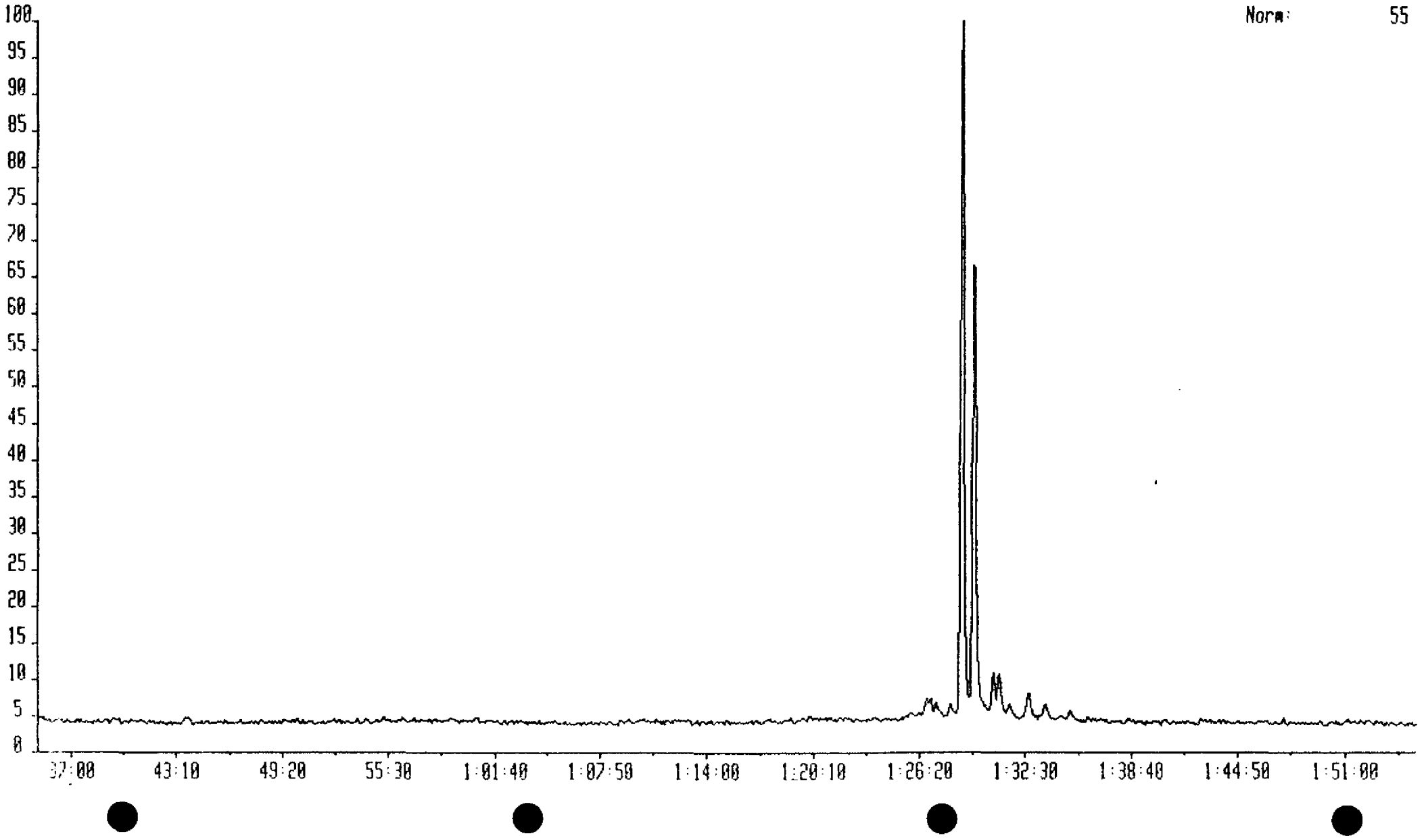
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 6 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:2898.5

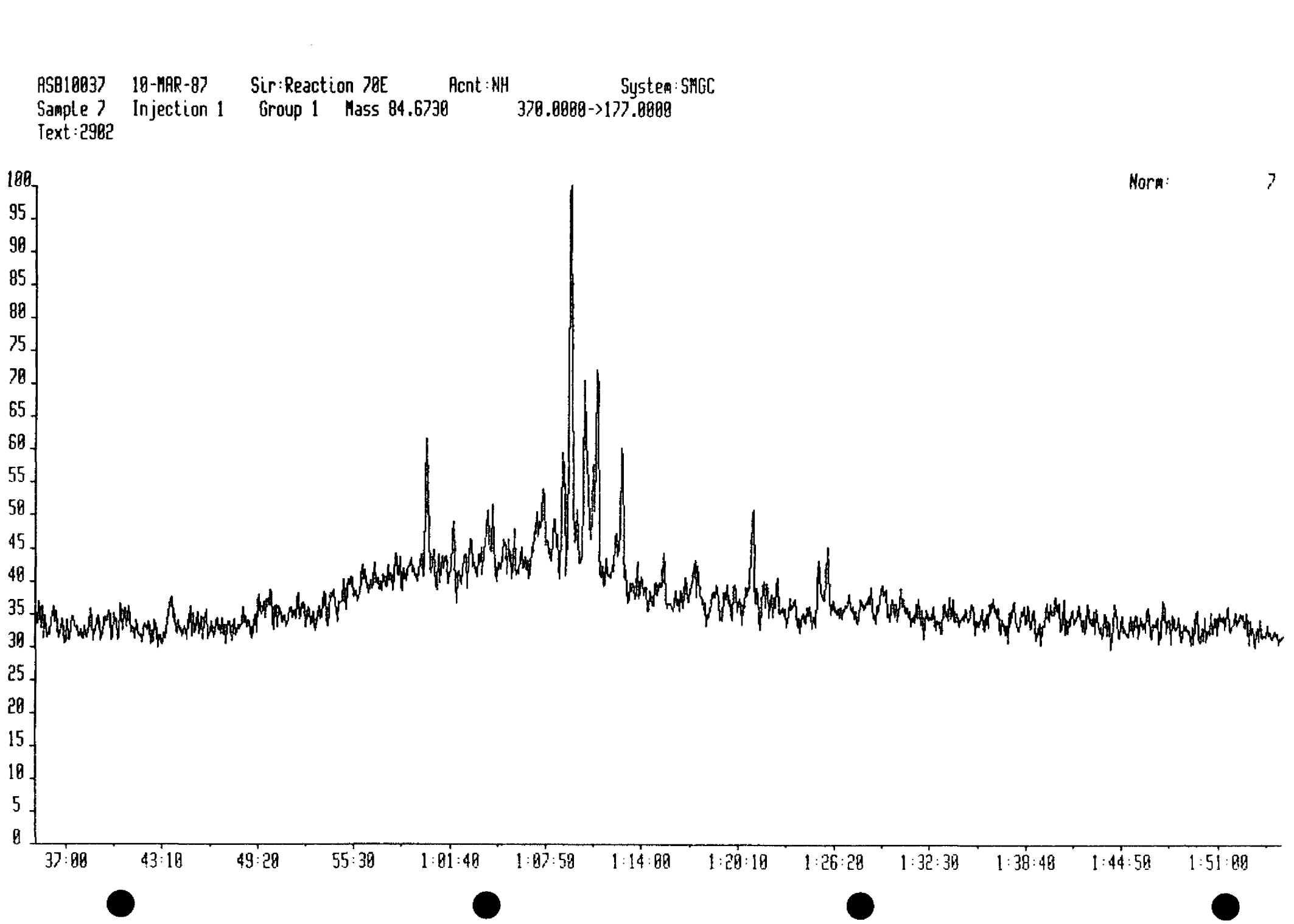


ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 6 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:2898.5



ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 7 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:2902




RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 7 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:2902
Norm: 7
100
95
90
85
80
75
70
65
60
55
50
45
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35
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25
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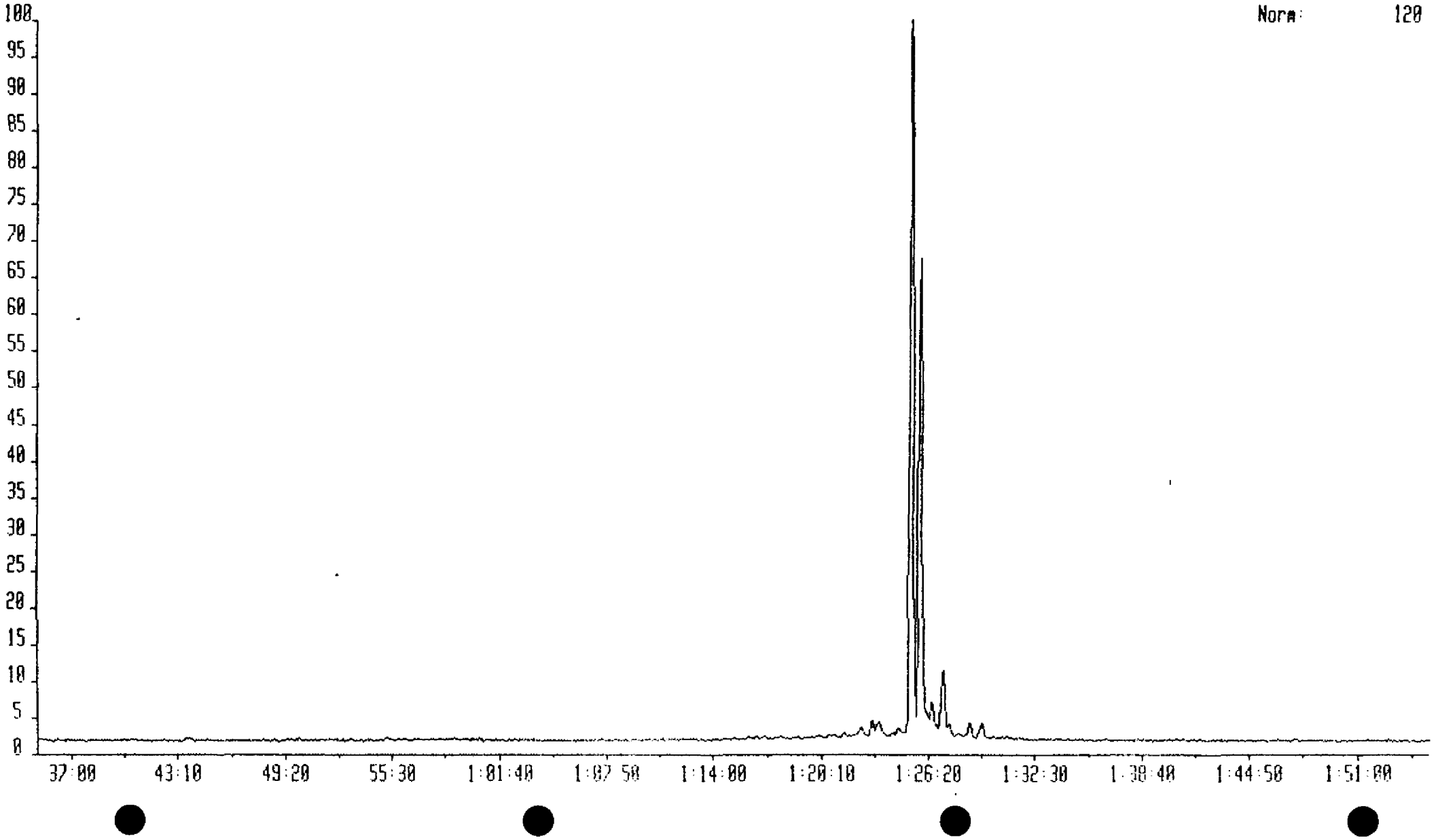
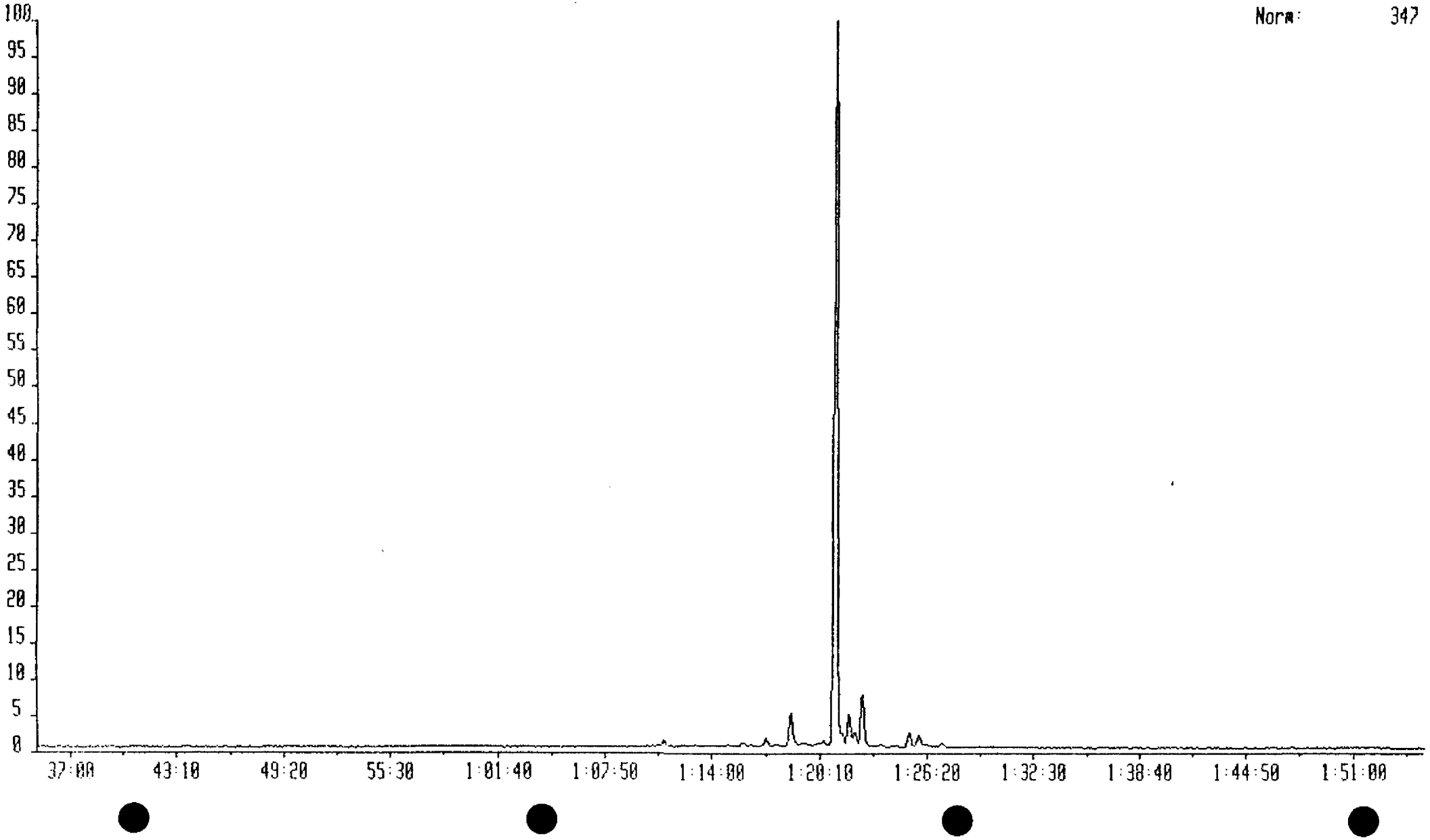
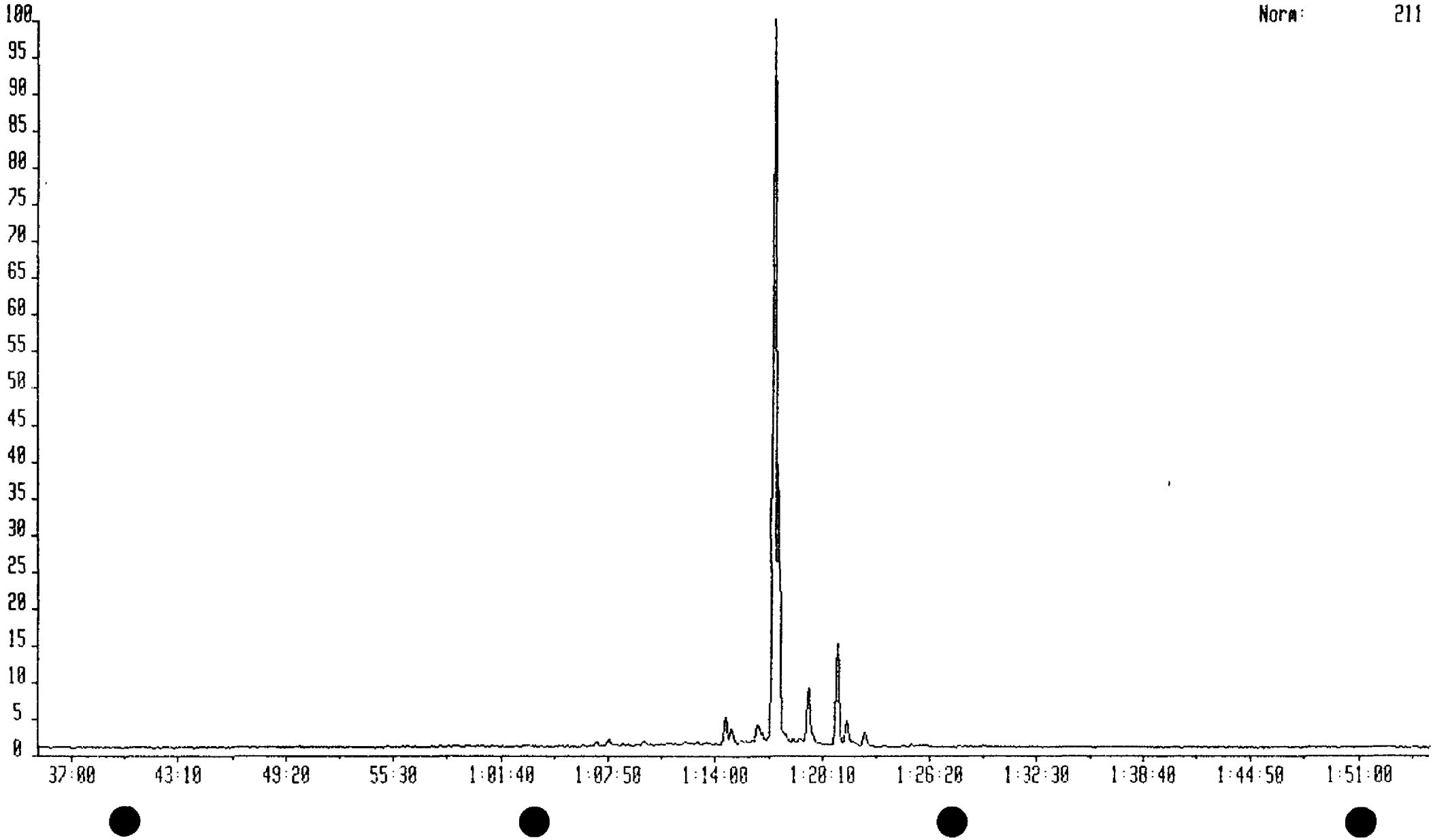
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 7 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:2902



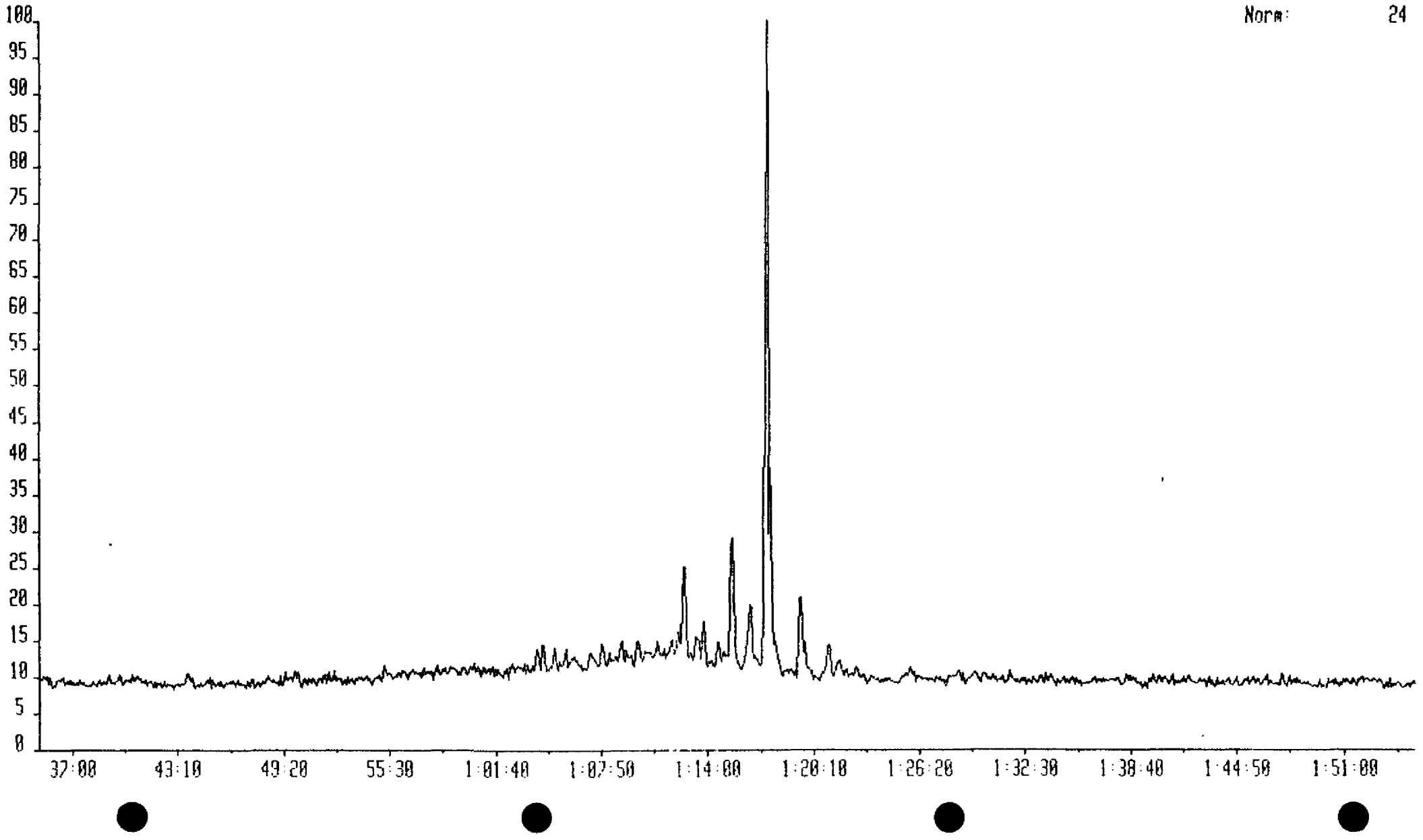
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 7 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:2302



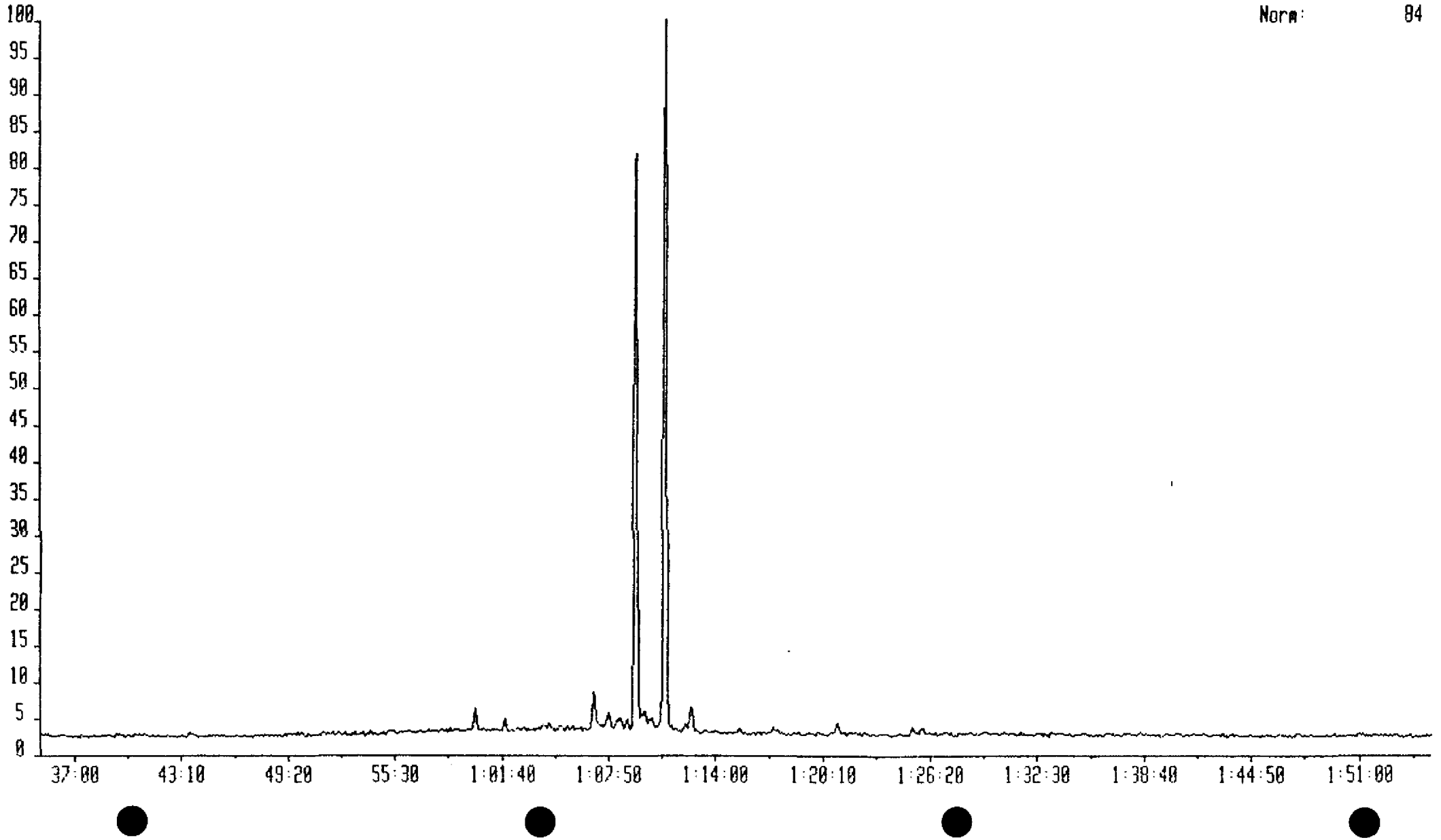
ASB10037 10-MAR-07 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 7 Injection 1 Group 1 Mass 91.6600 398.0000->191.0000
Text:2902



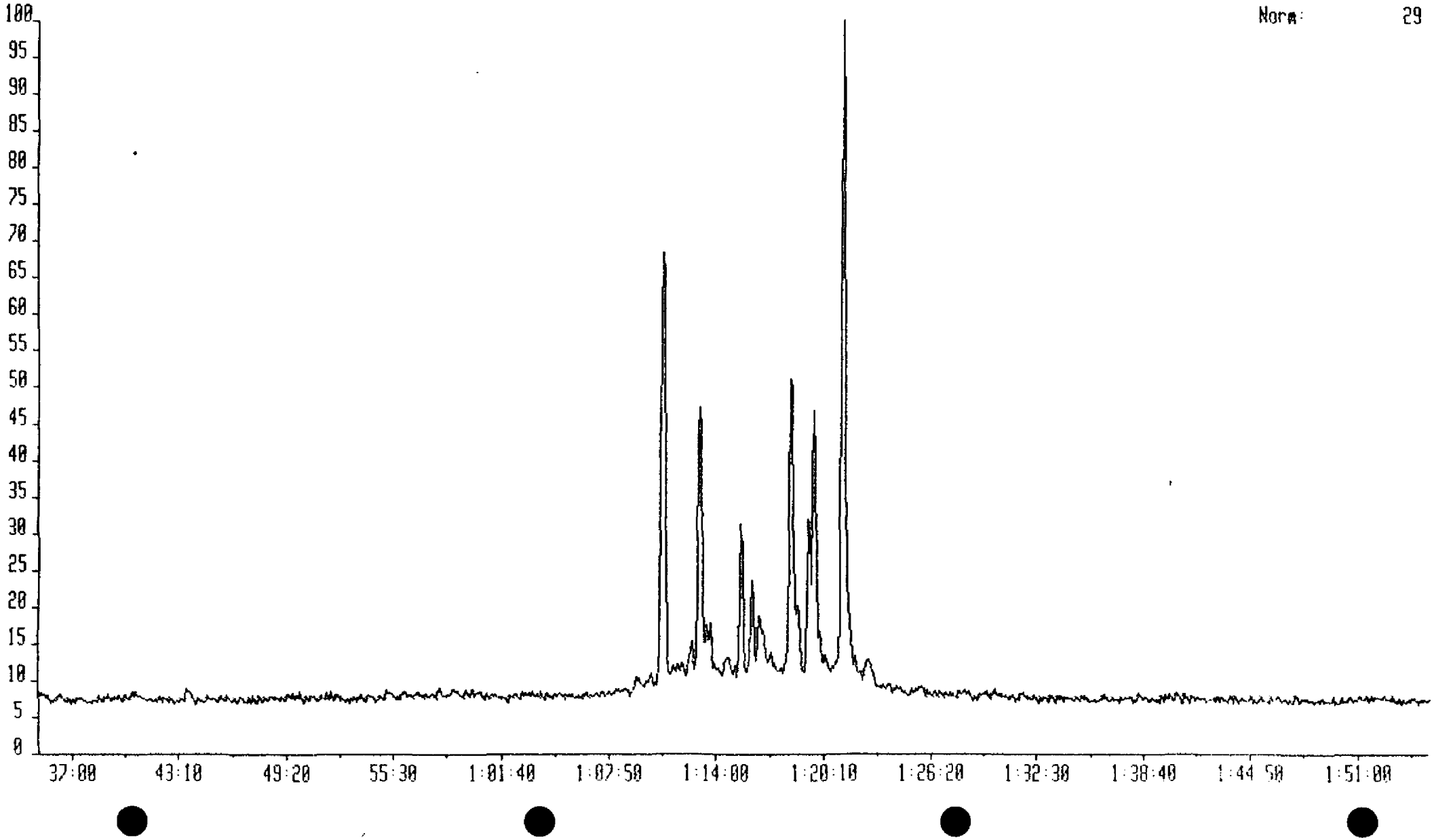
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 7 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:2902



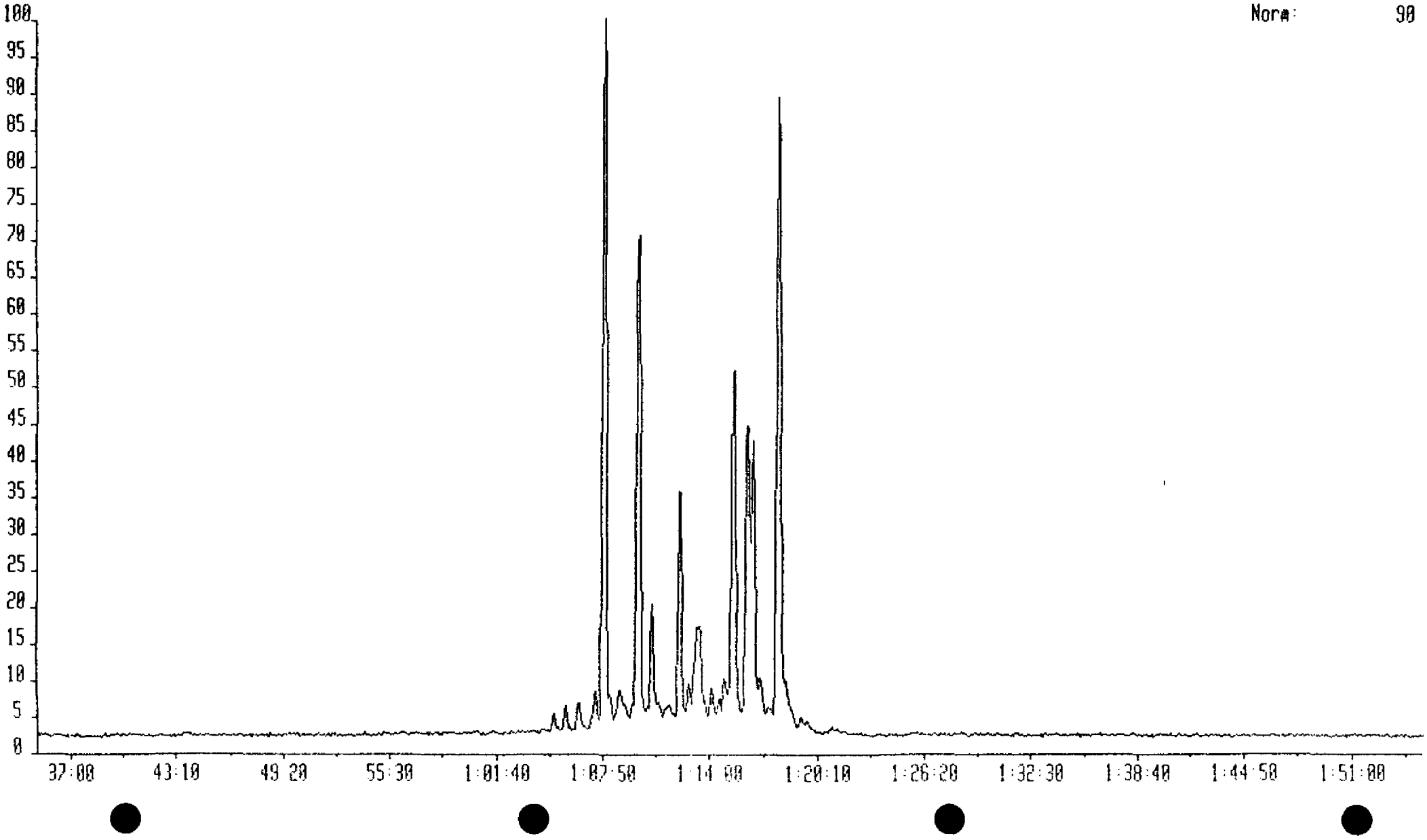
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 7 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:2902



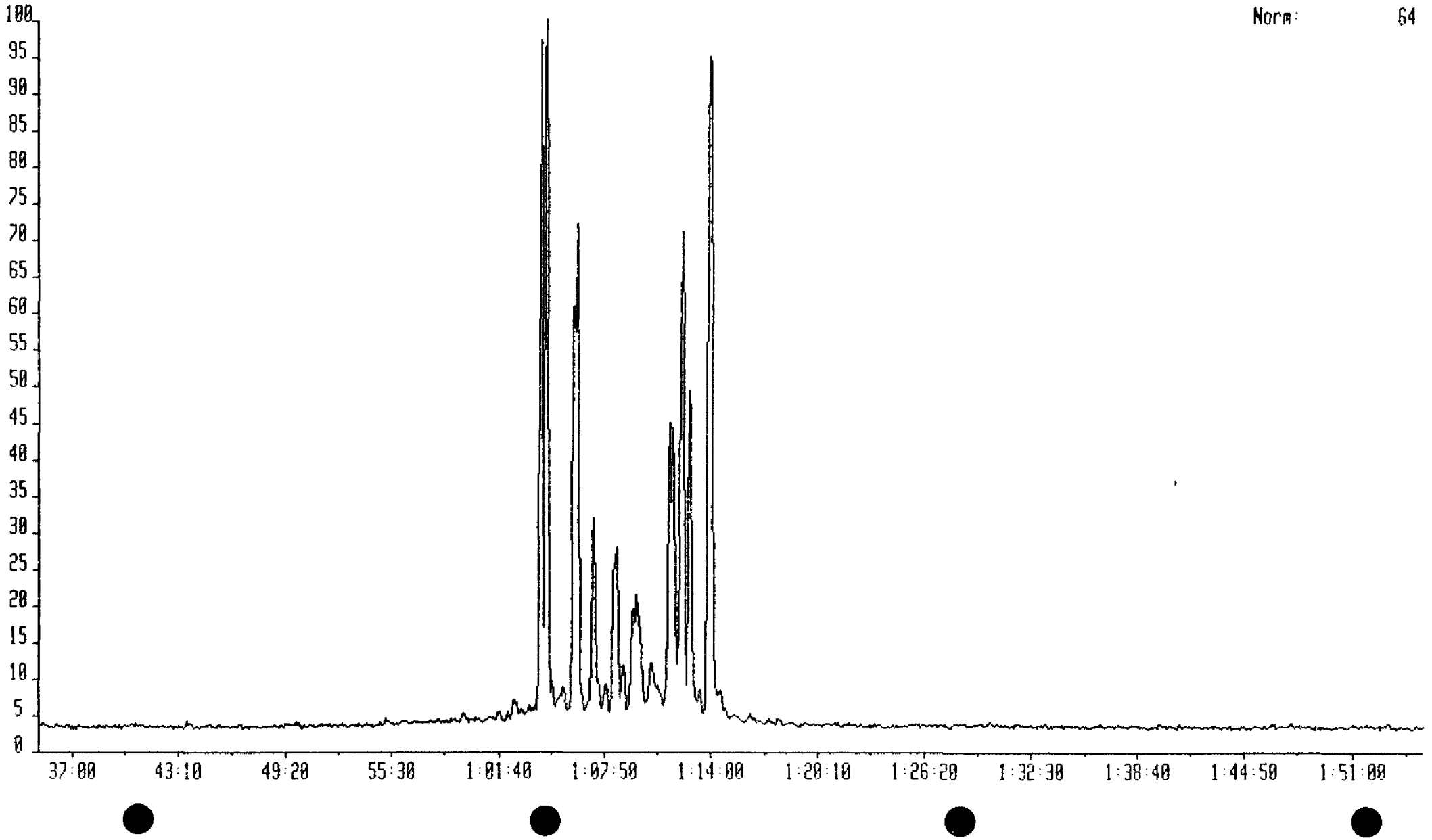
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 7 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:2902



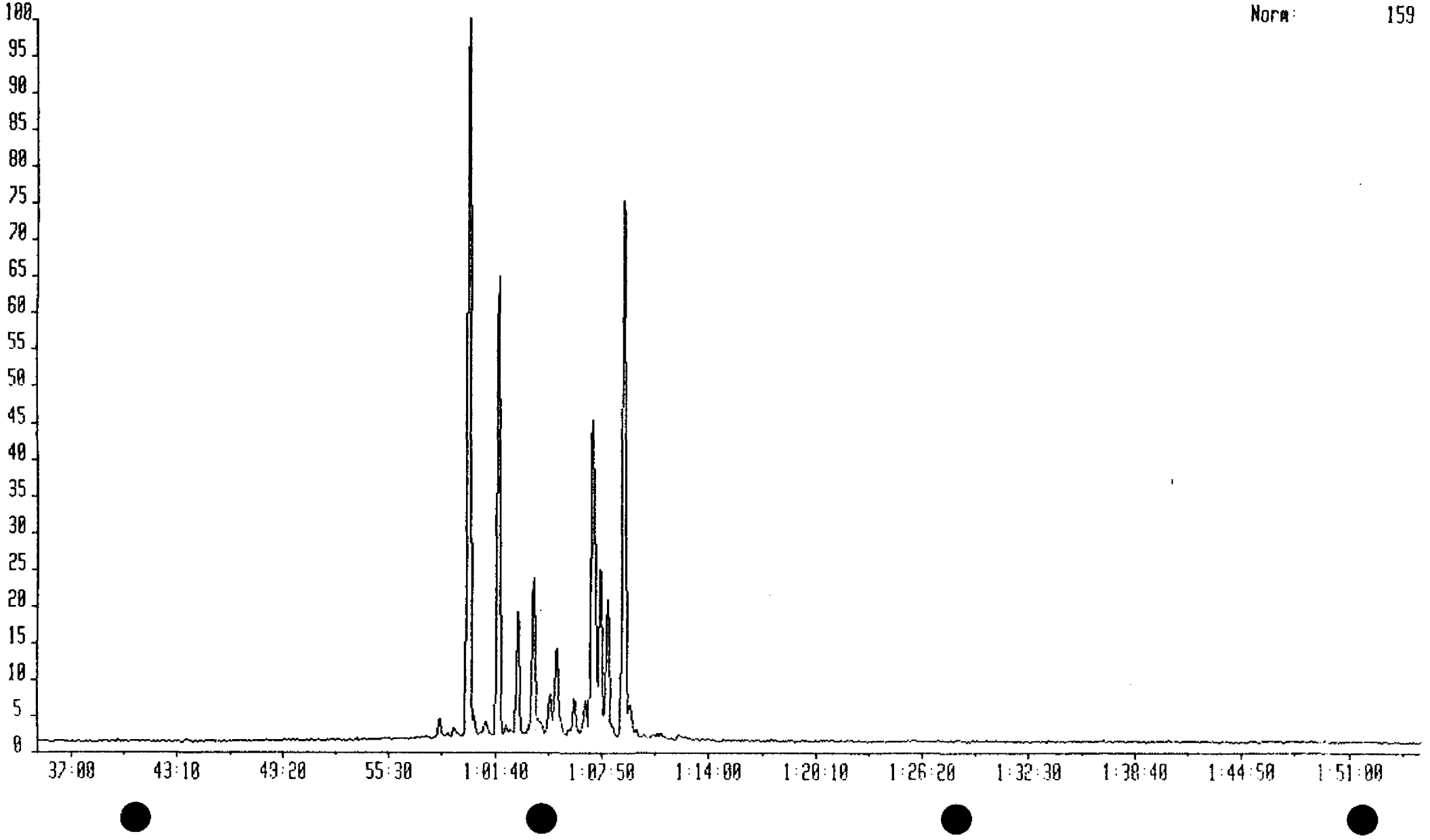
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 7 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:2902



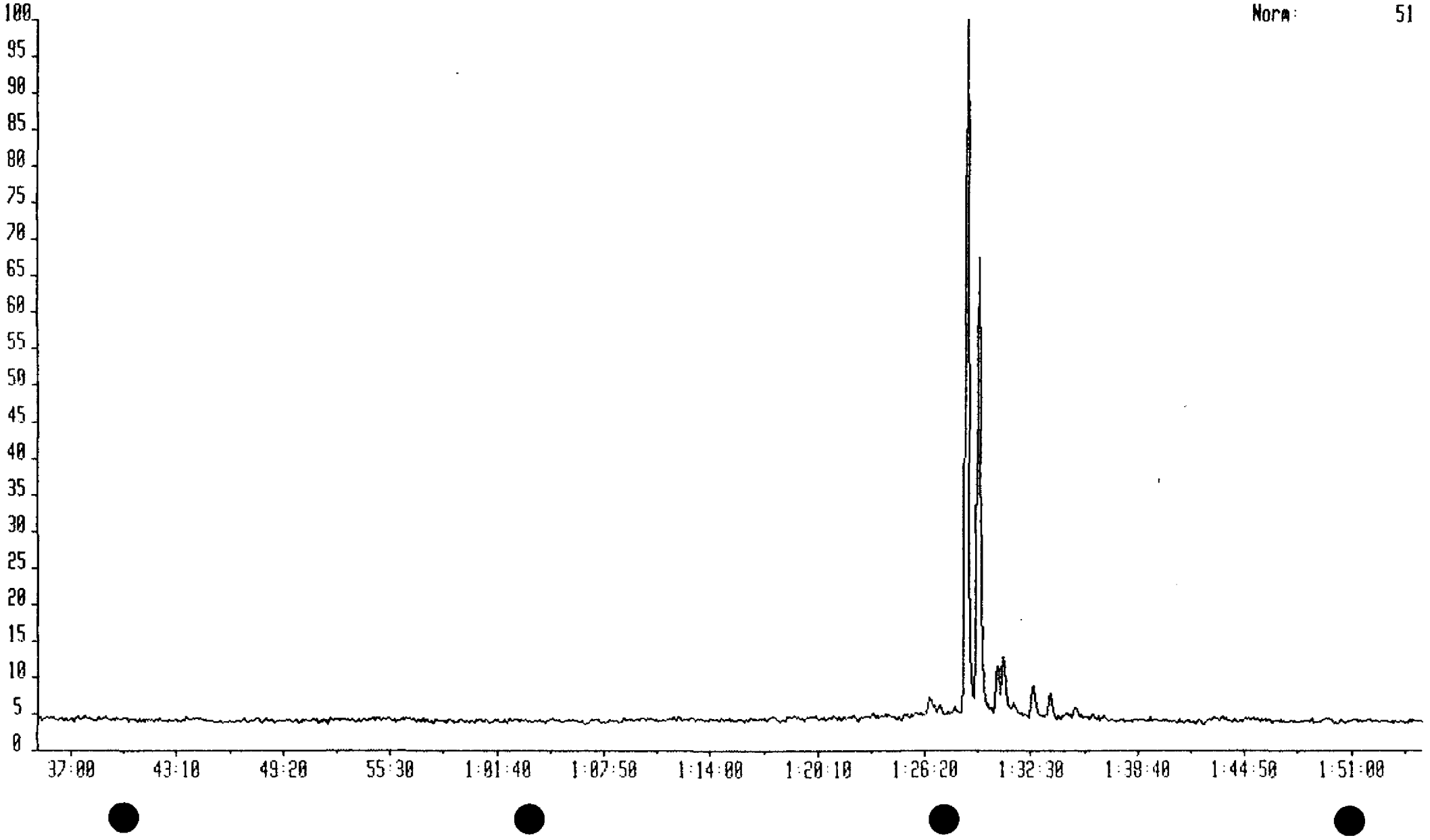
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 7 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:2902



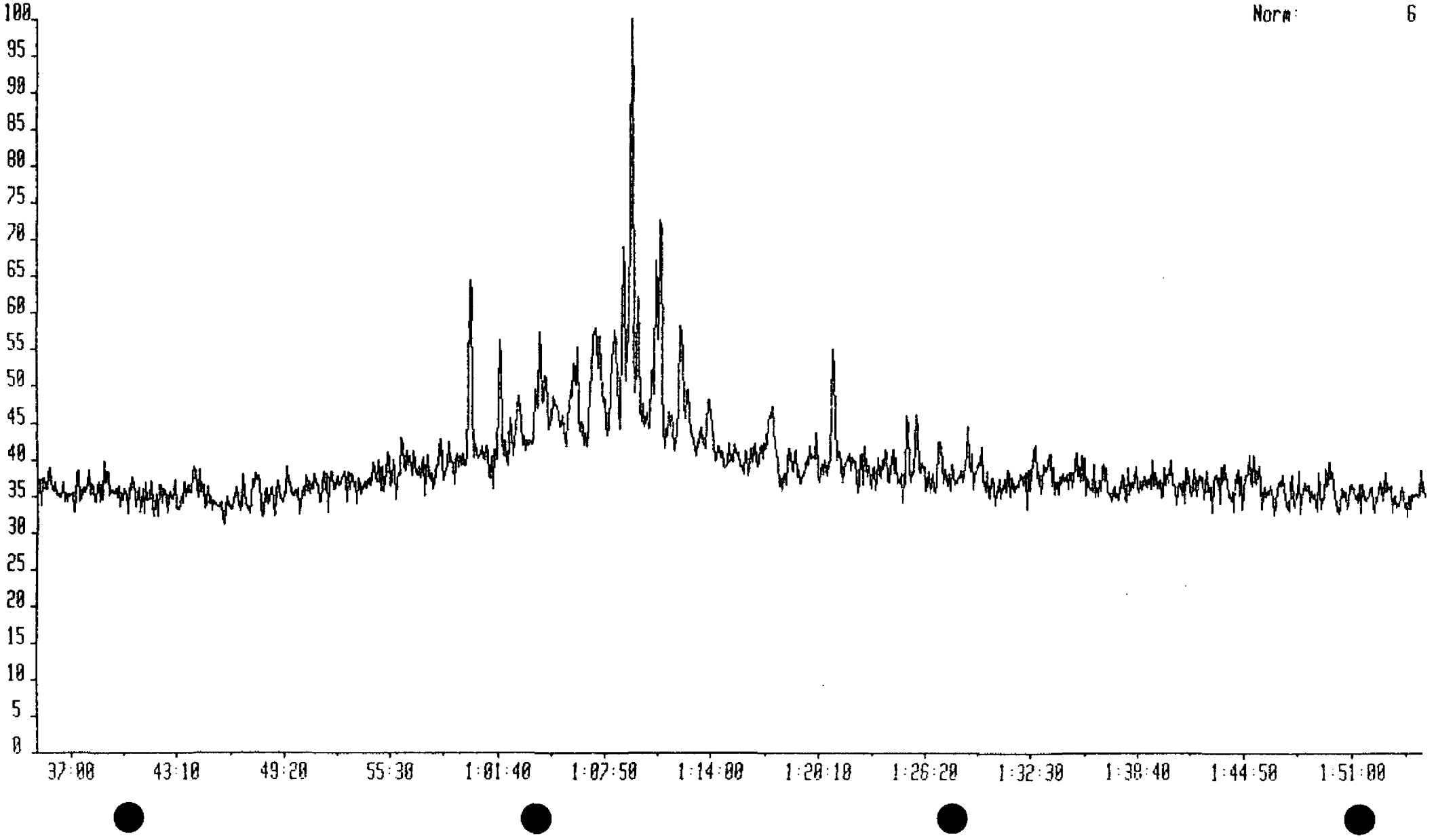
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 7 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:2902



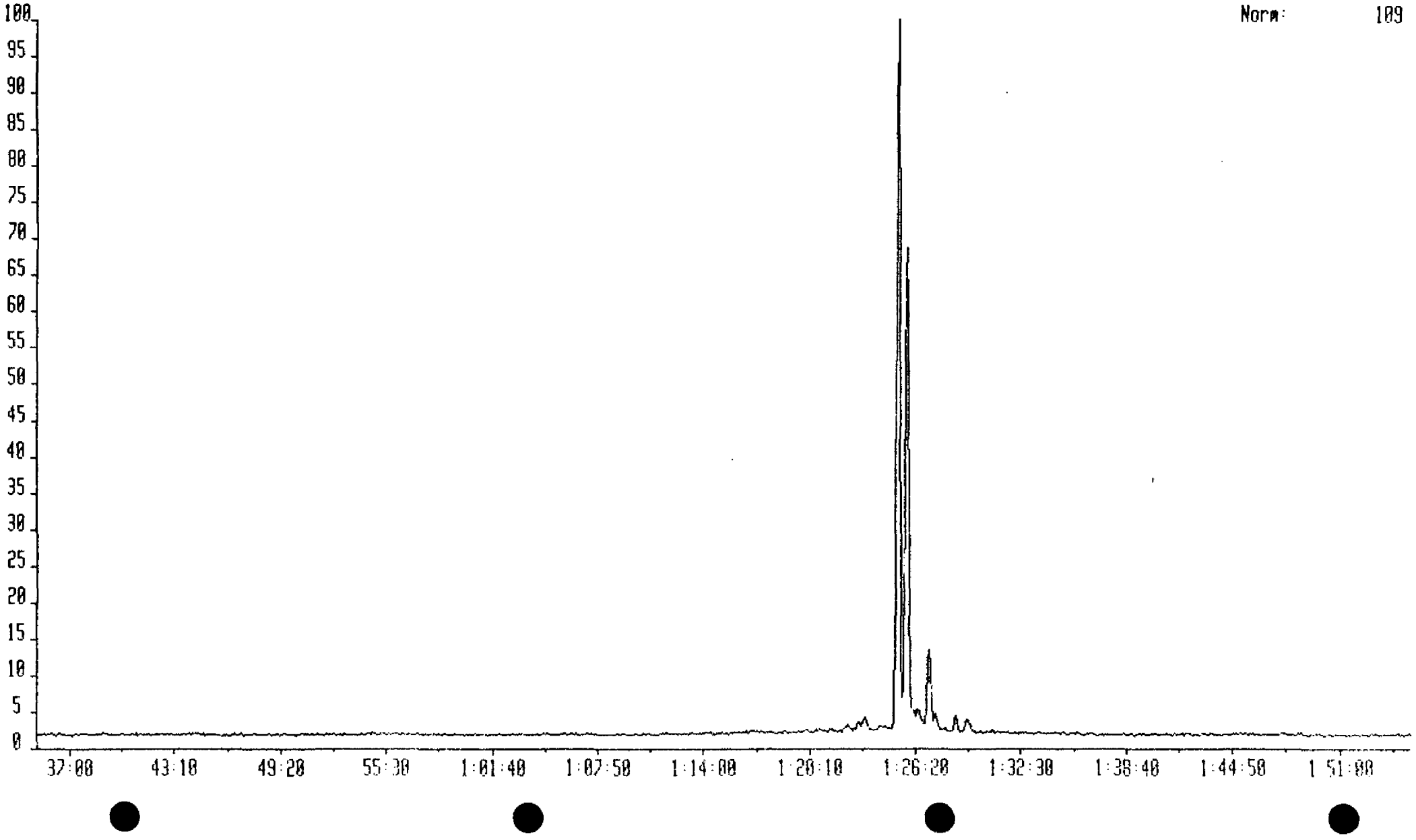
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 8 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:2905



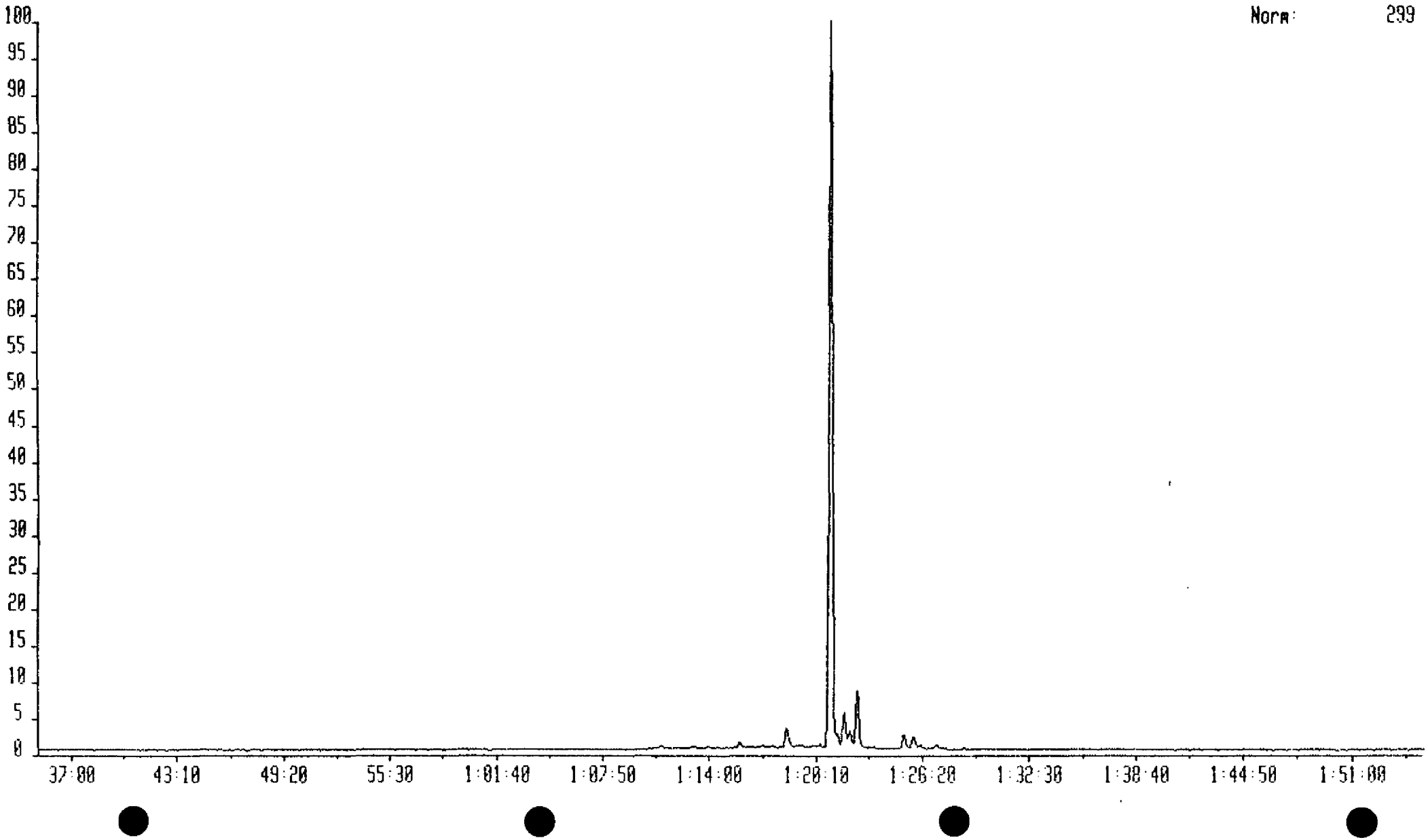
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 8 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:2905



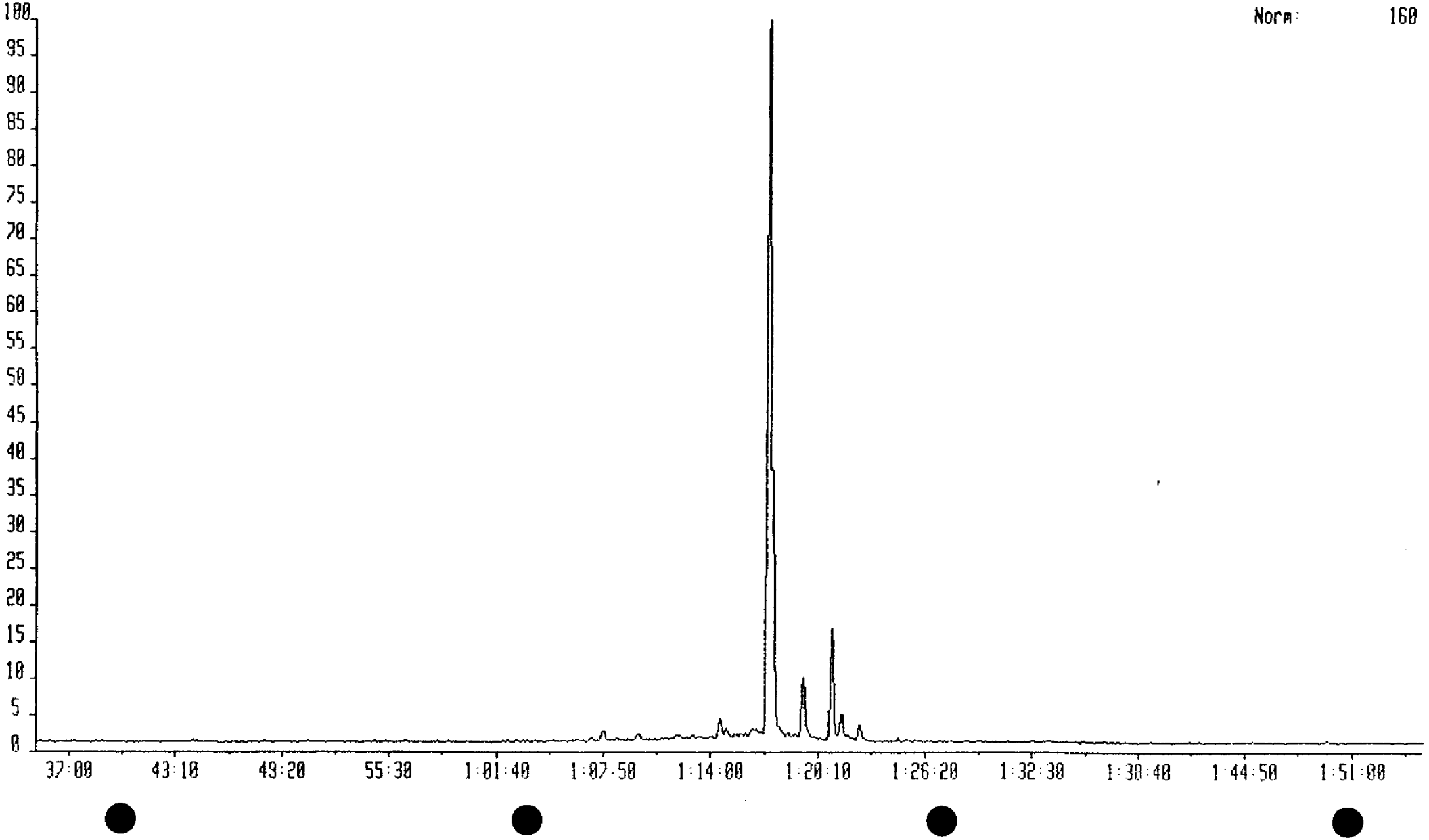
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 8 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:2905



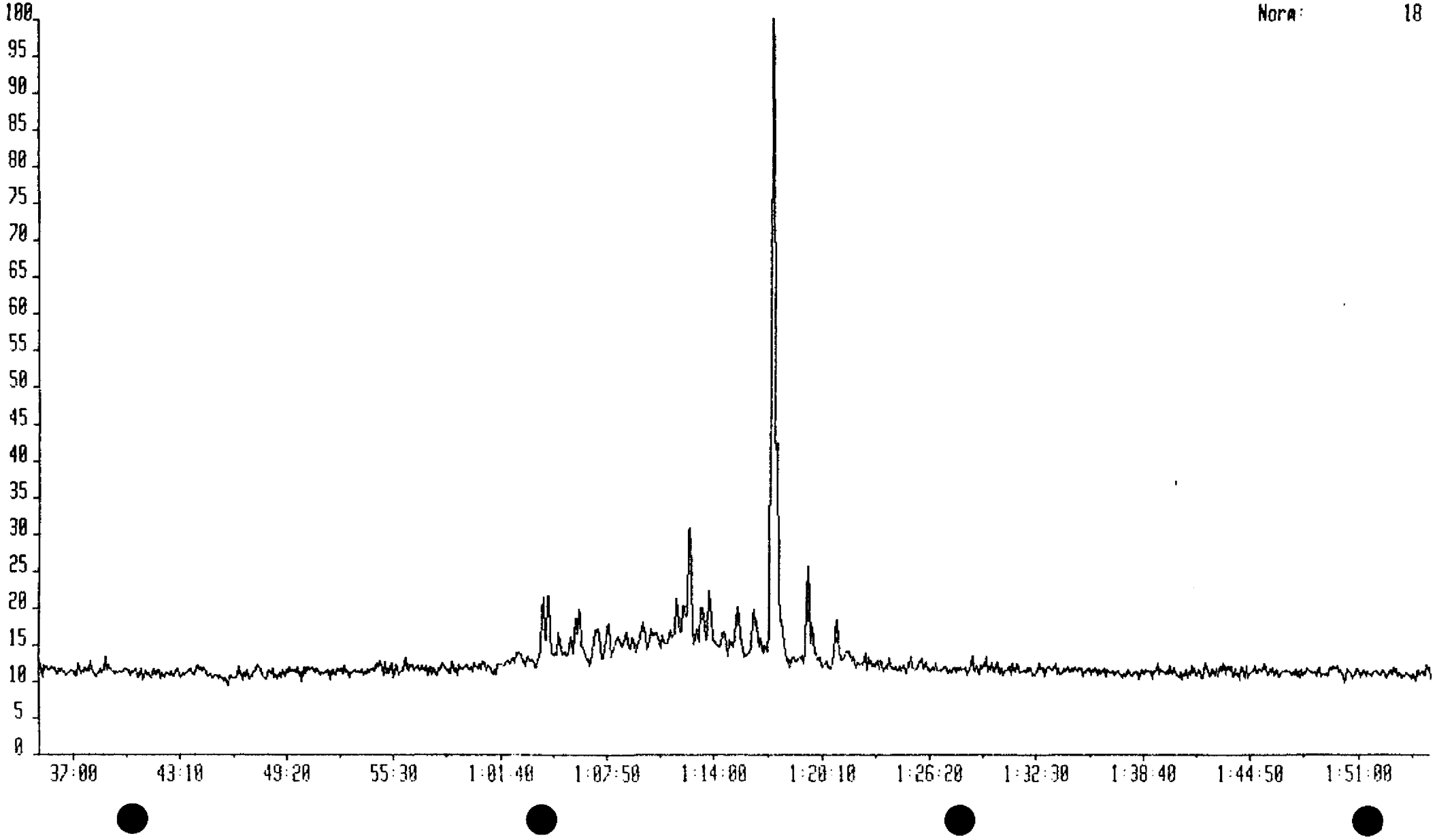
ASB10037 10-MAR-07 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 8 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:2905



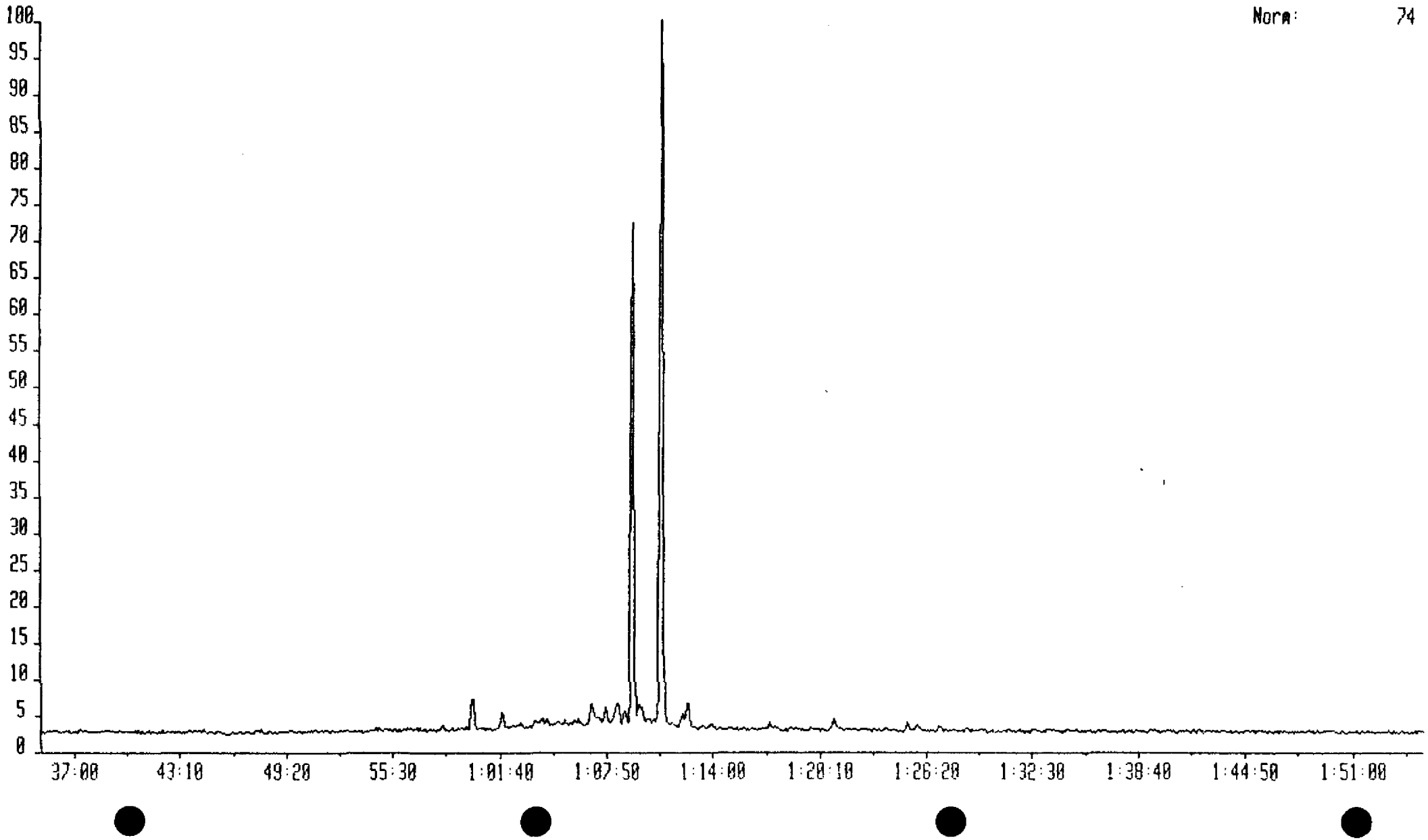
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 8 Injection 1 Group 1 Mass 91.6608 398.0000->191.0000
Text:2905



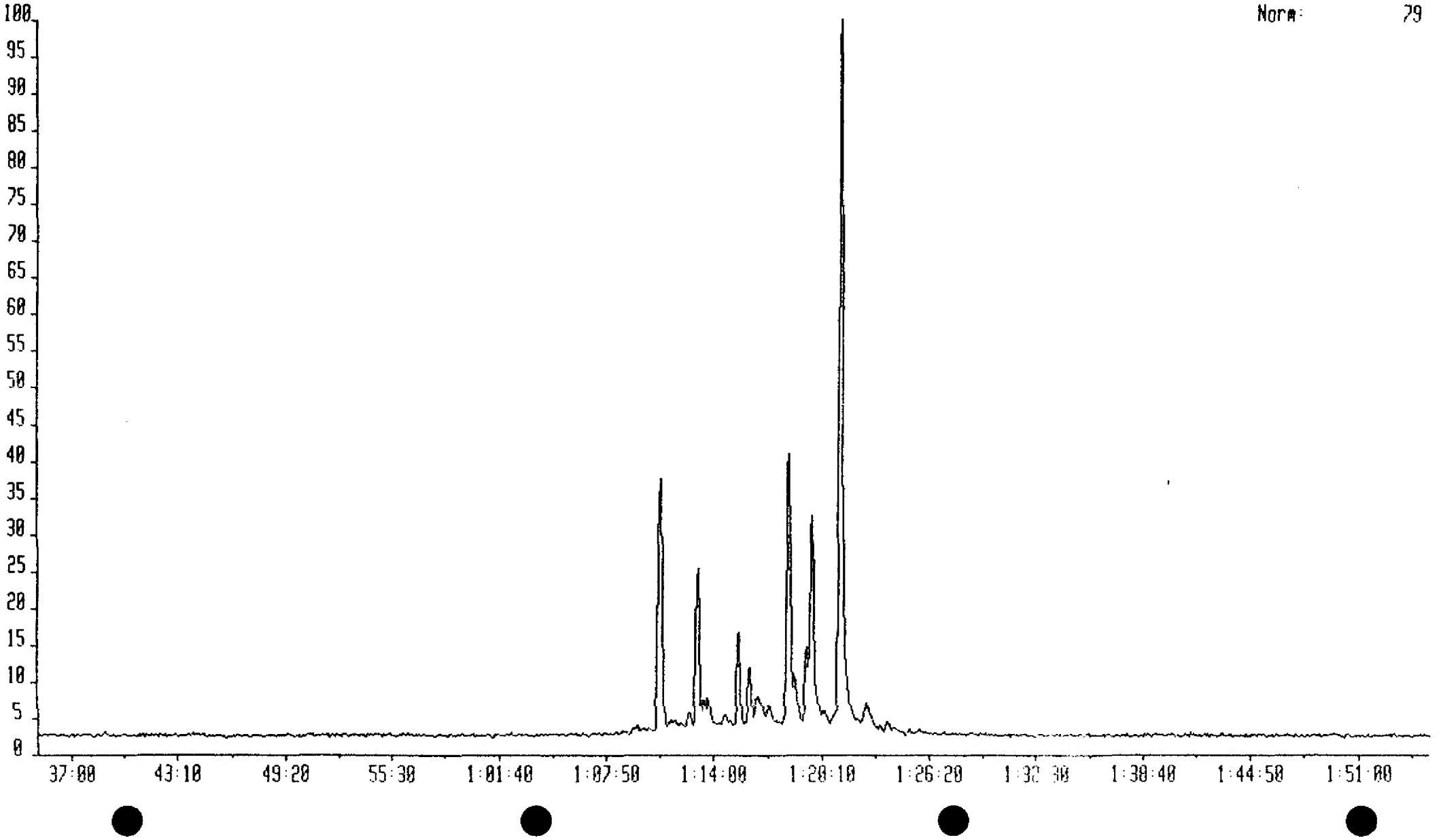
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 8 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:2905



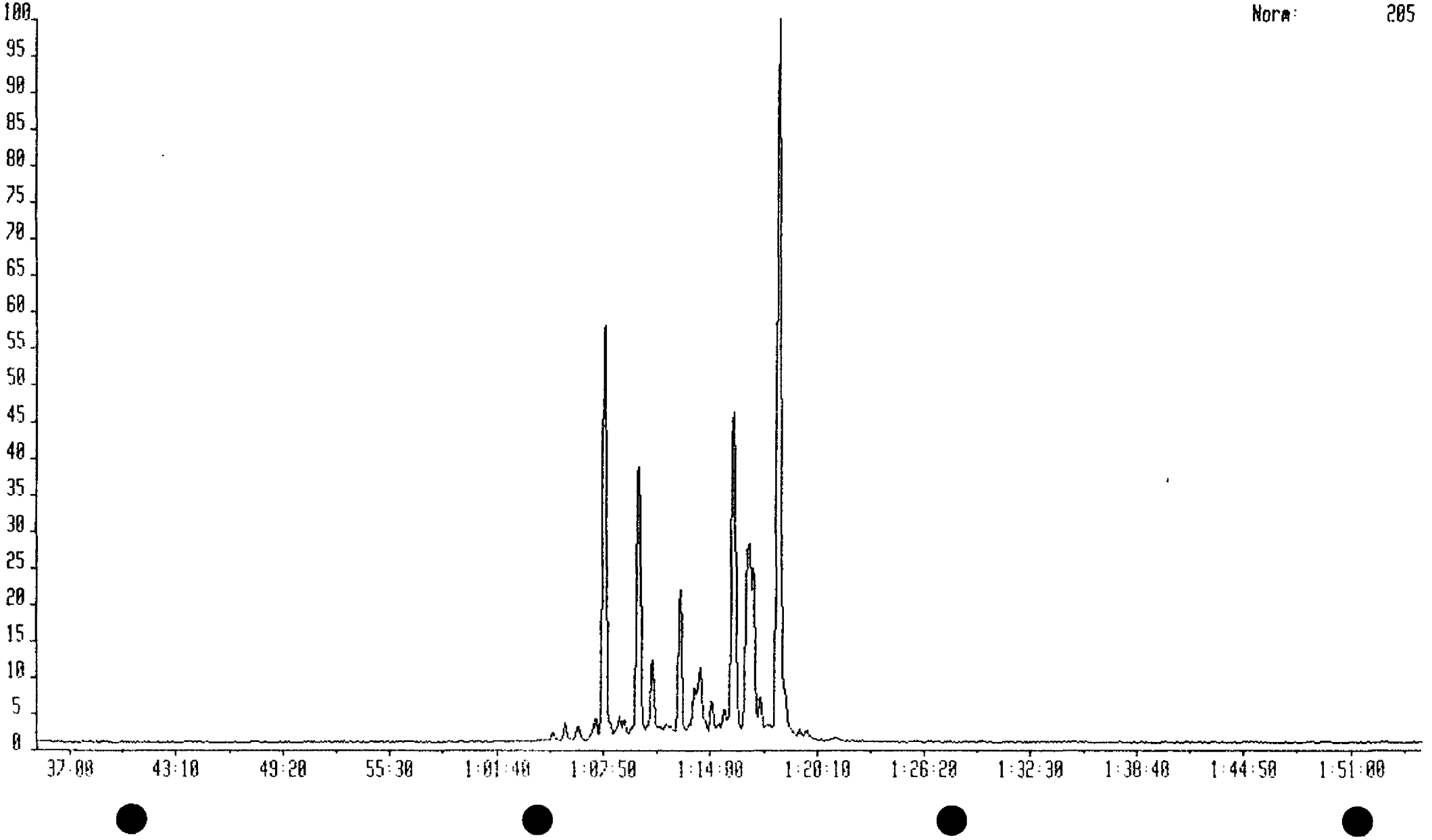
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 8 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:2905



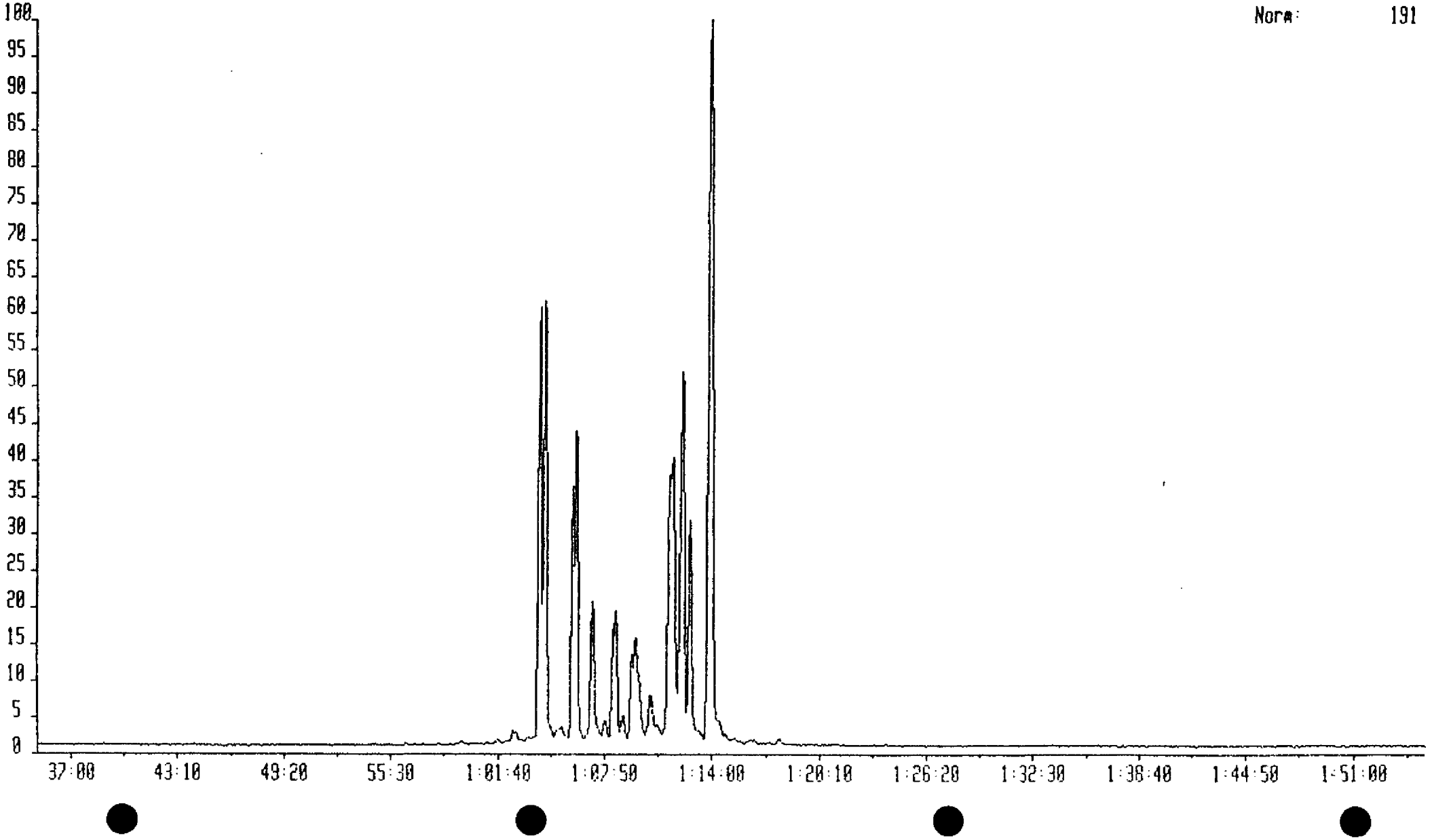
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 0 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:2905



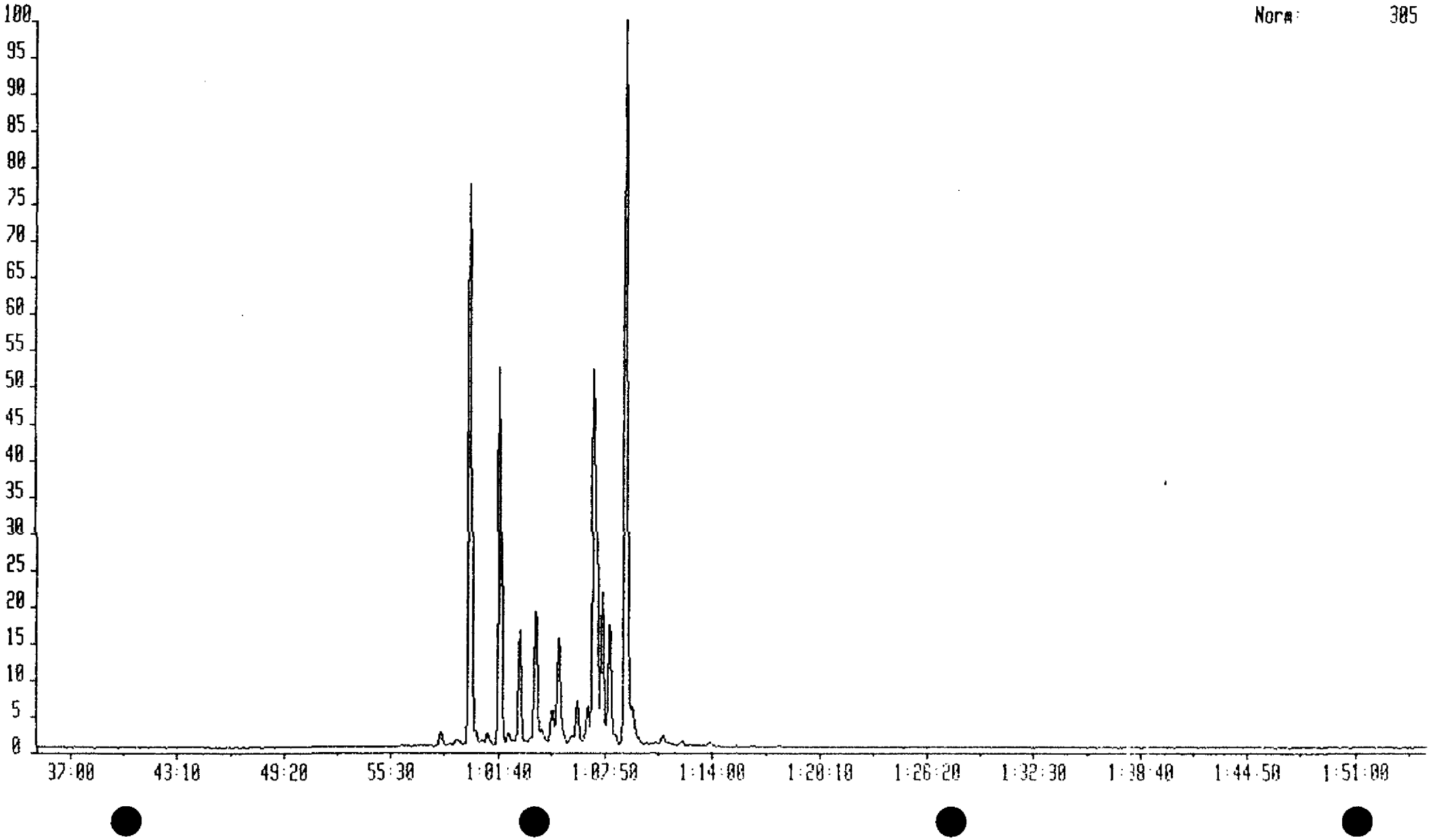
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 8 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:2905



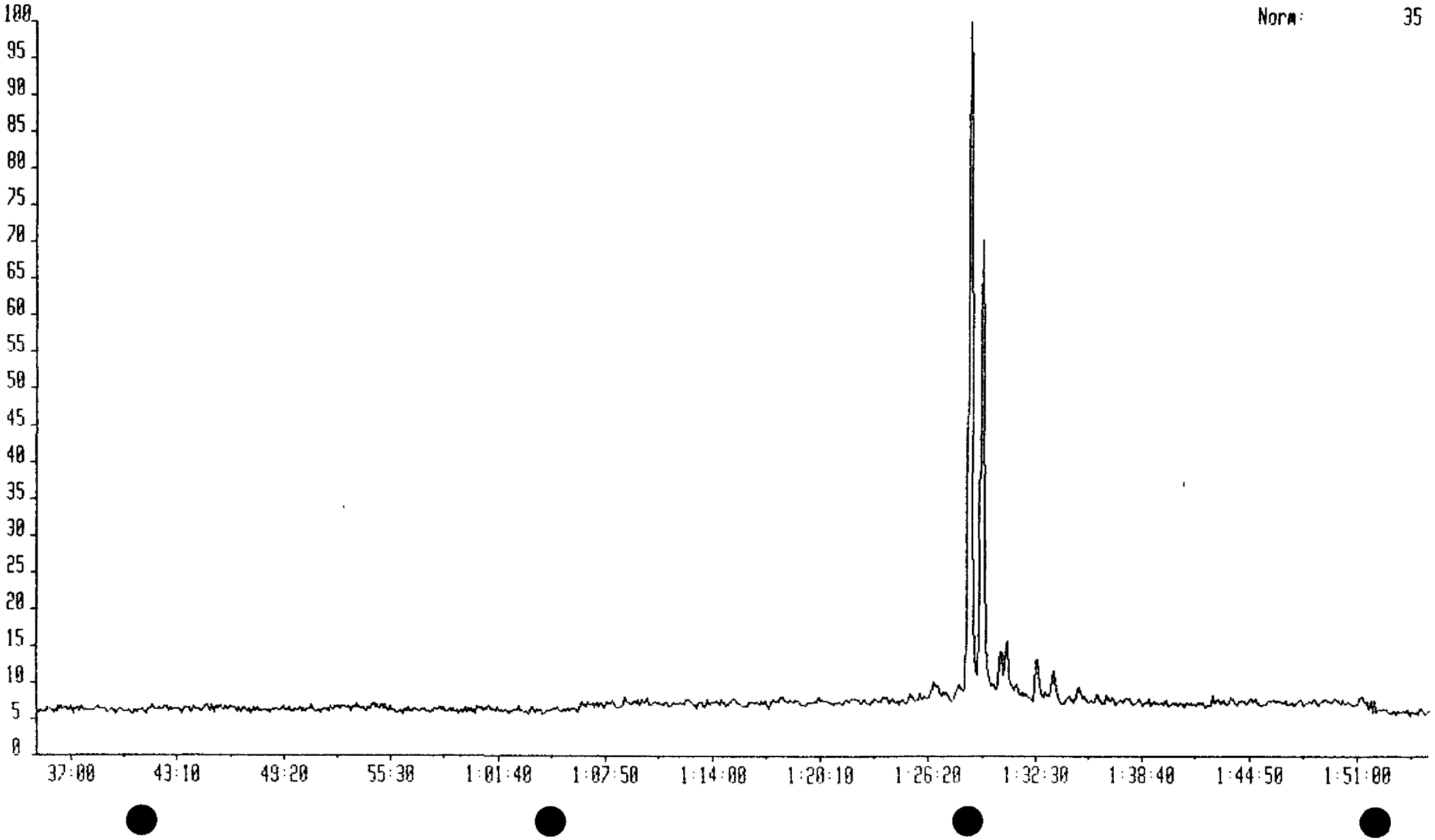
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 8 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:2905



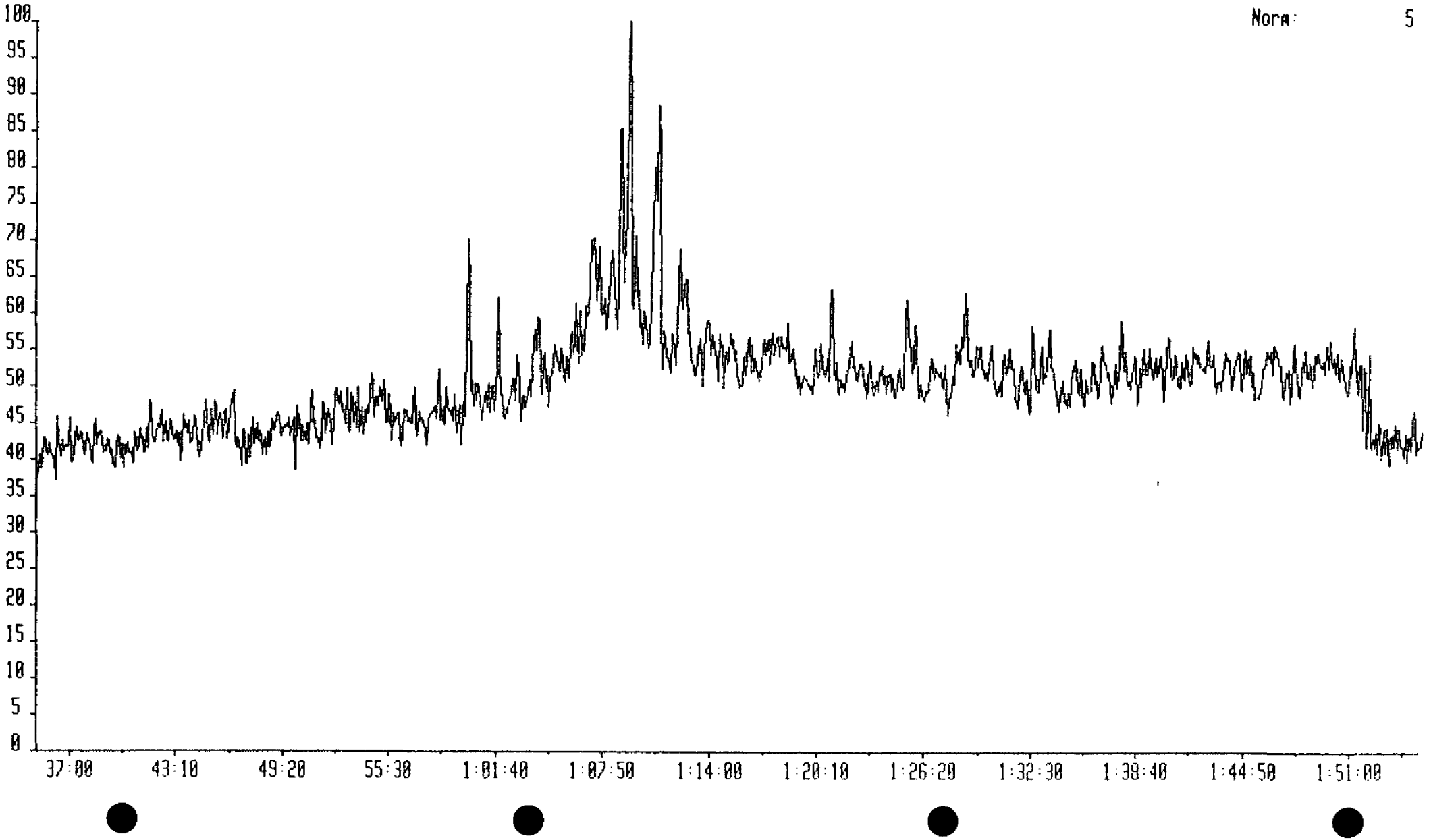
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 8 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:2905



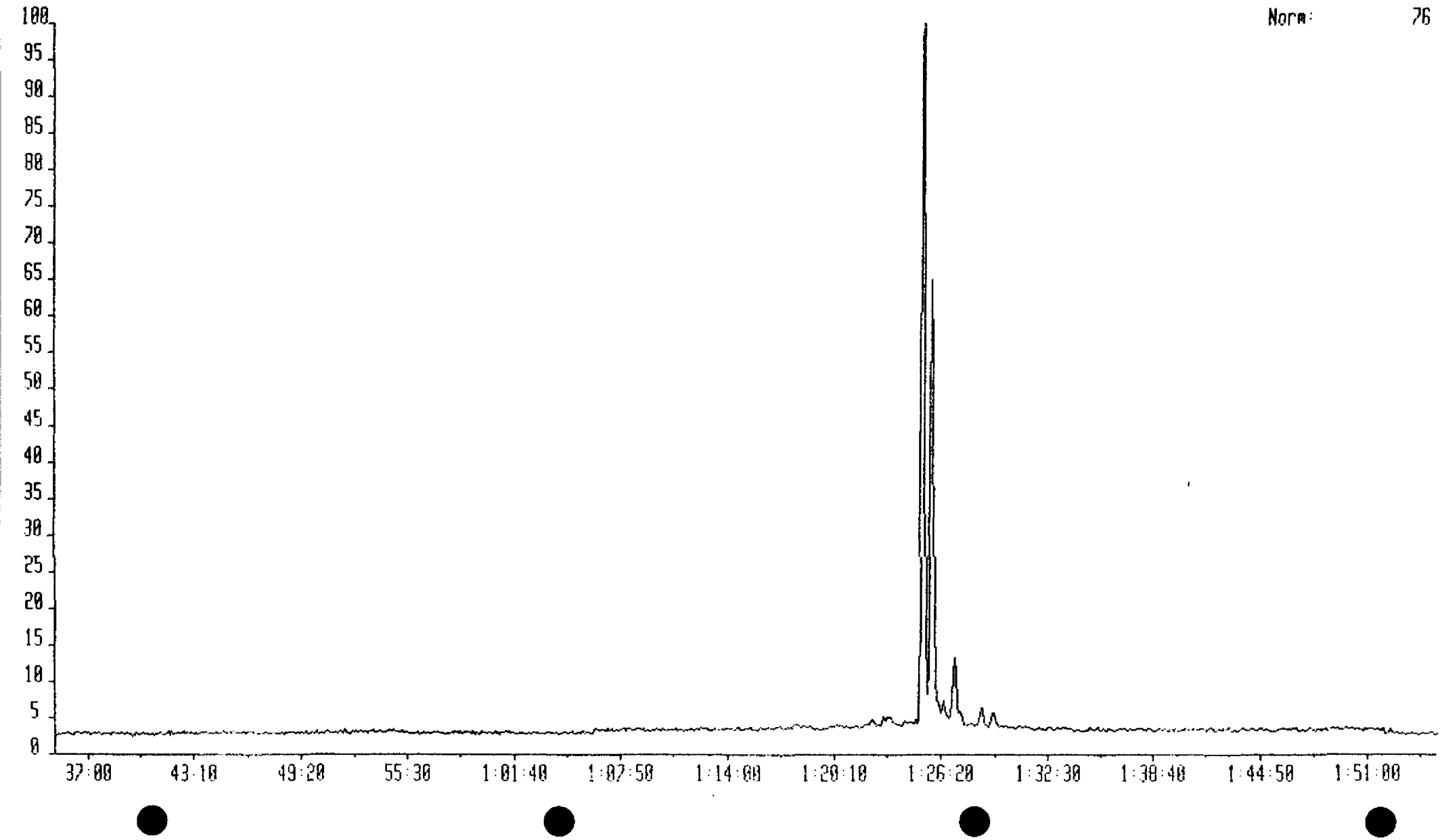
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 9 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:2908



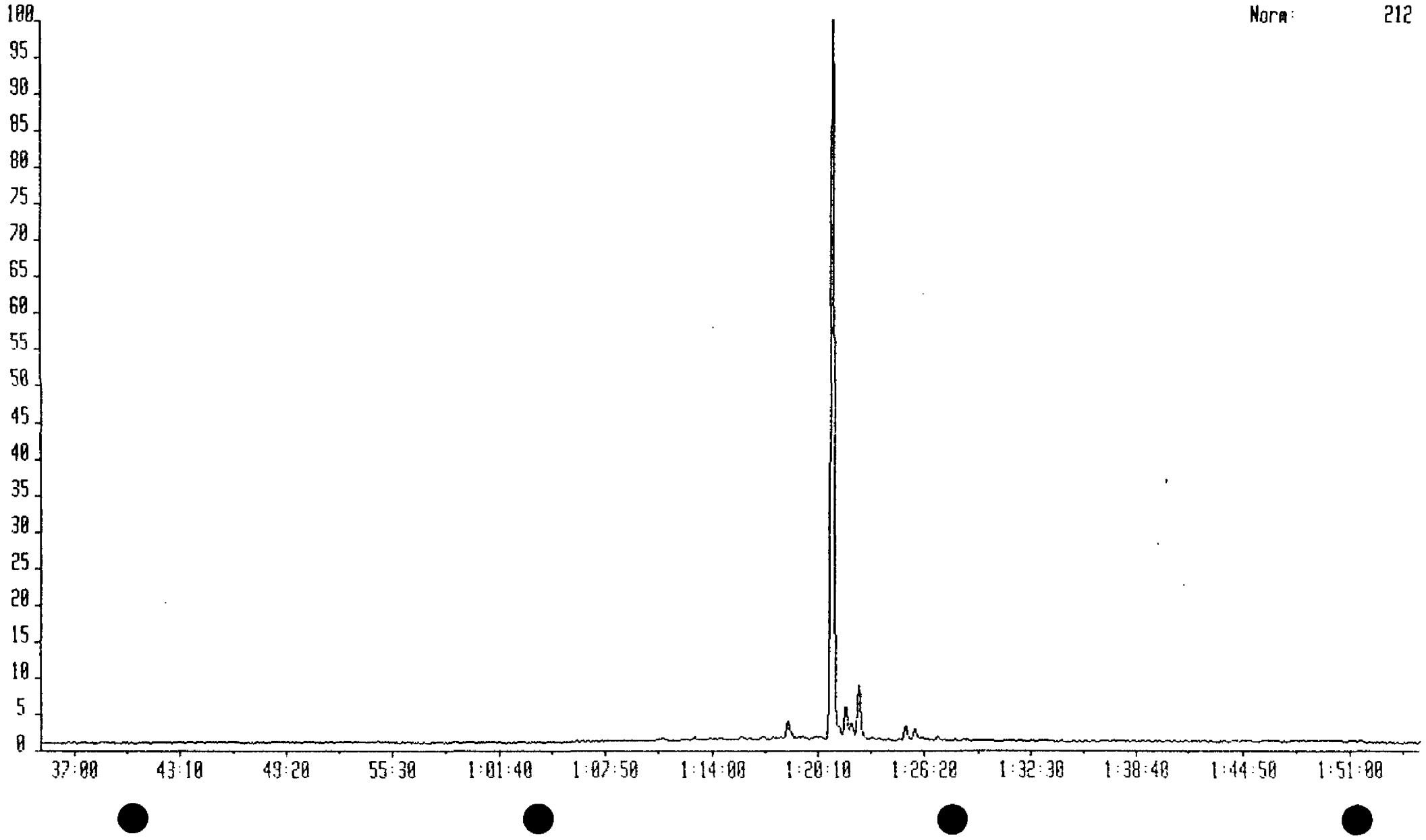
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 9 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:2908



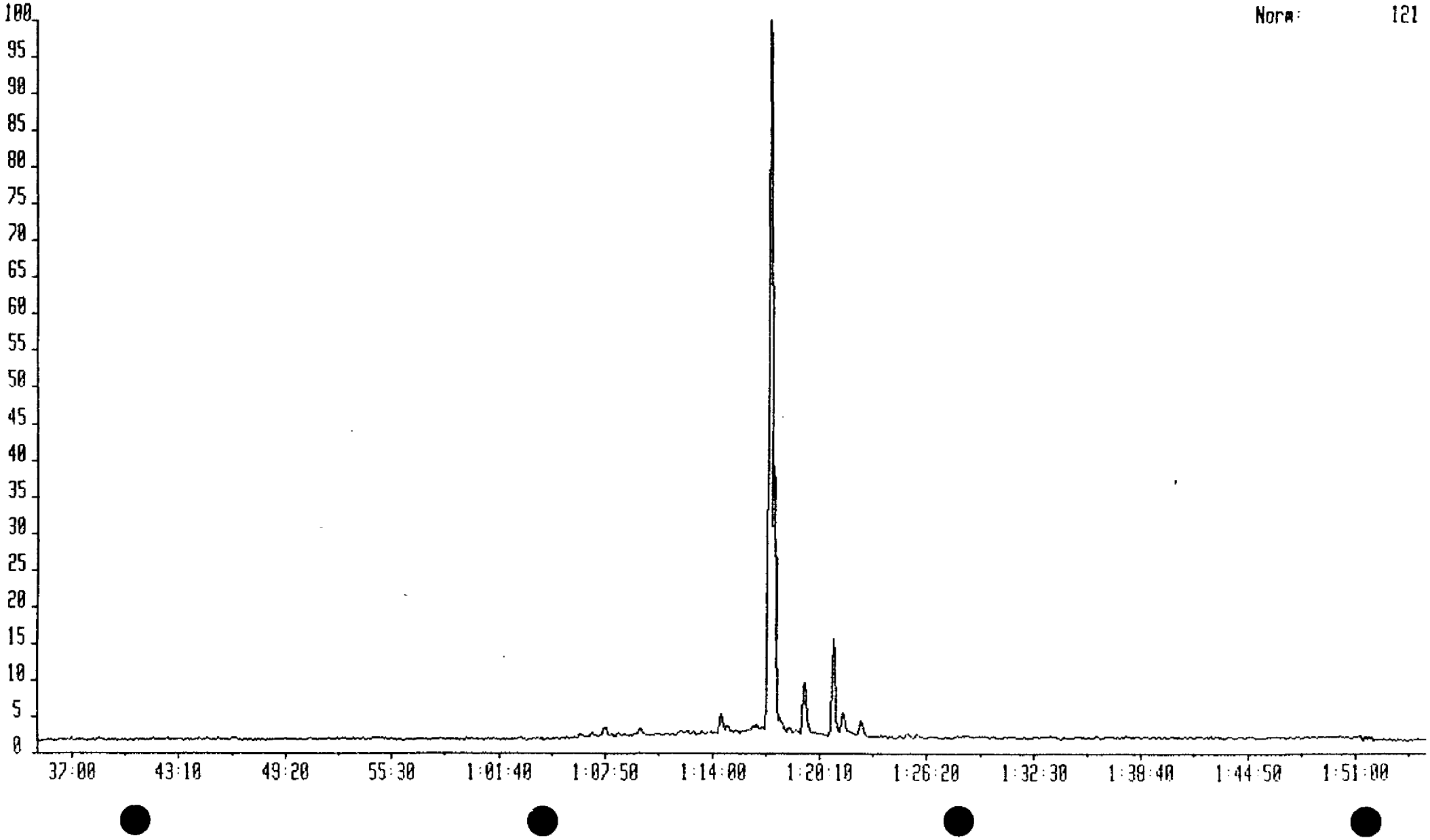
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 9 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:2900



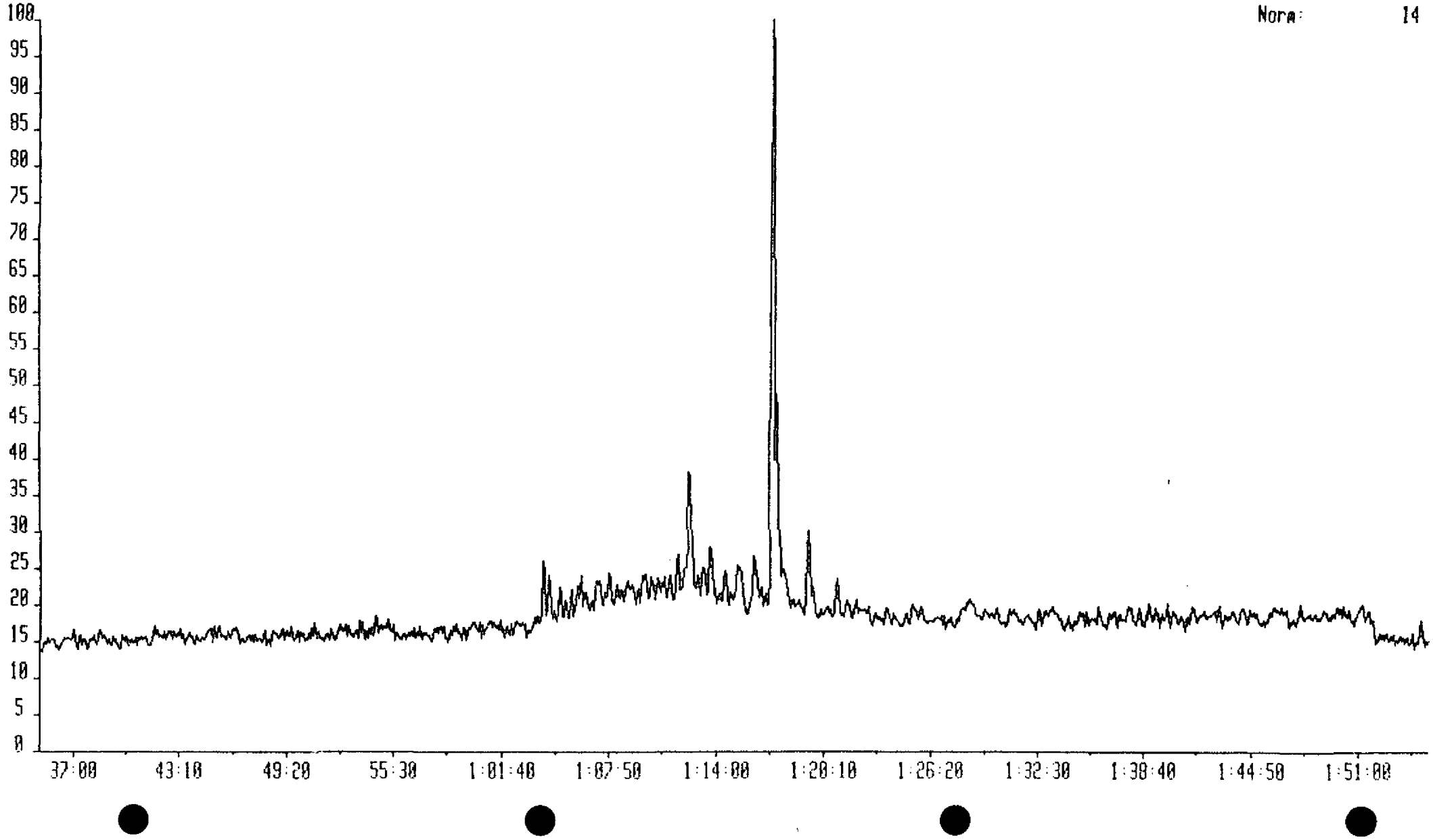
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 9 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:2908



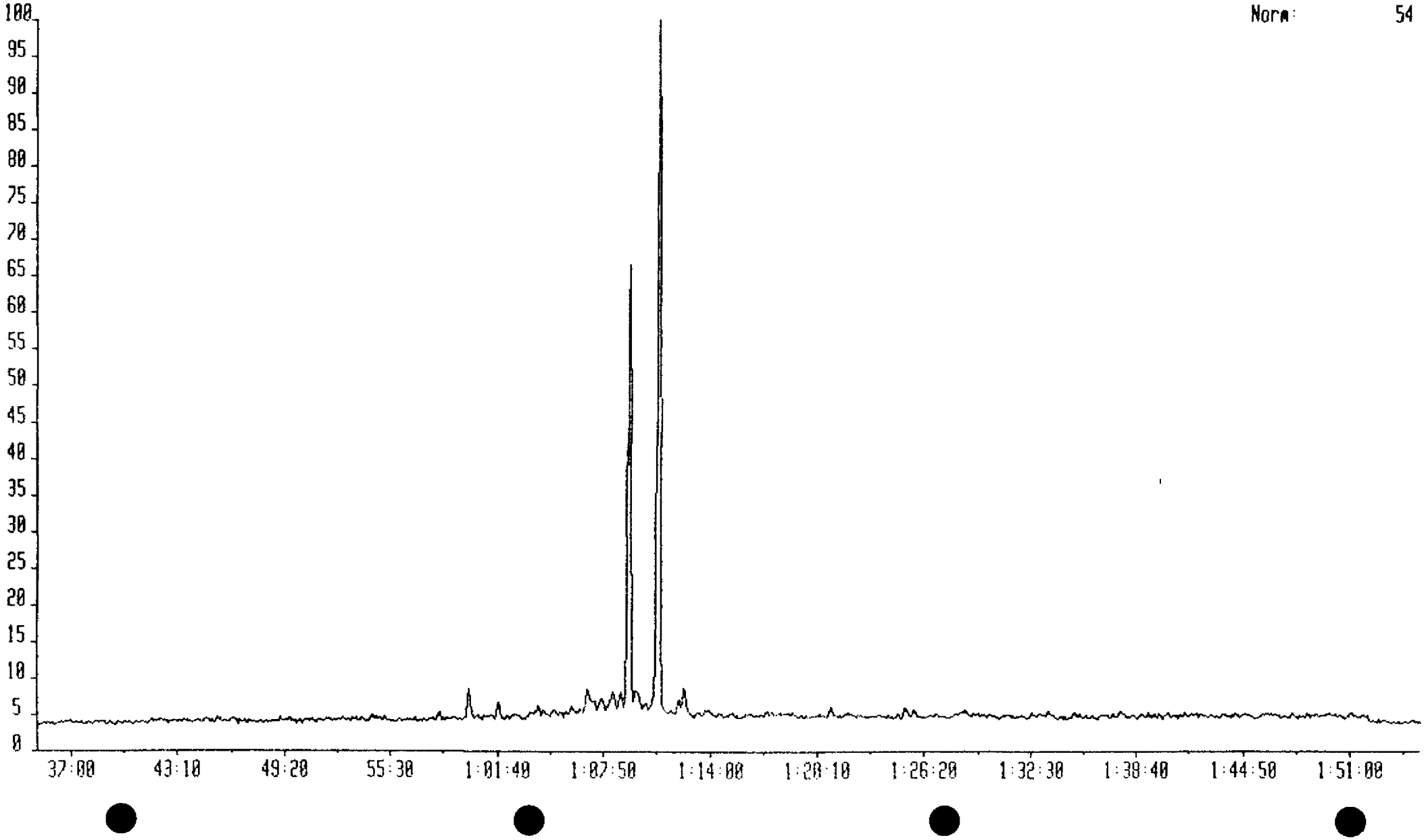
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 9 Injection 1 Group 1 Mass 91.6600 398.0000->191.0000
Text:2900



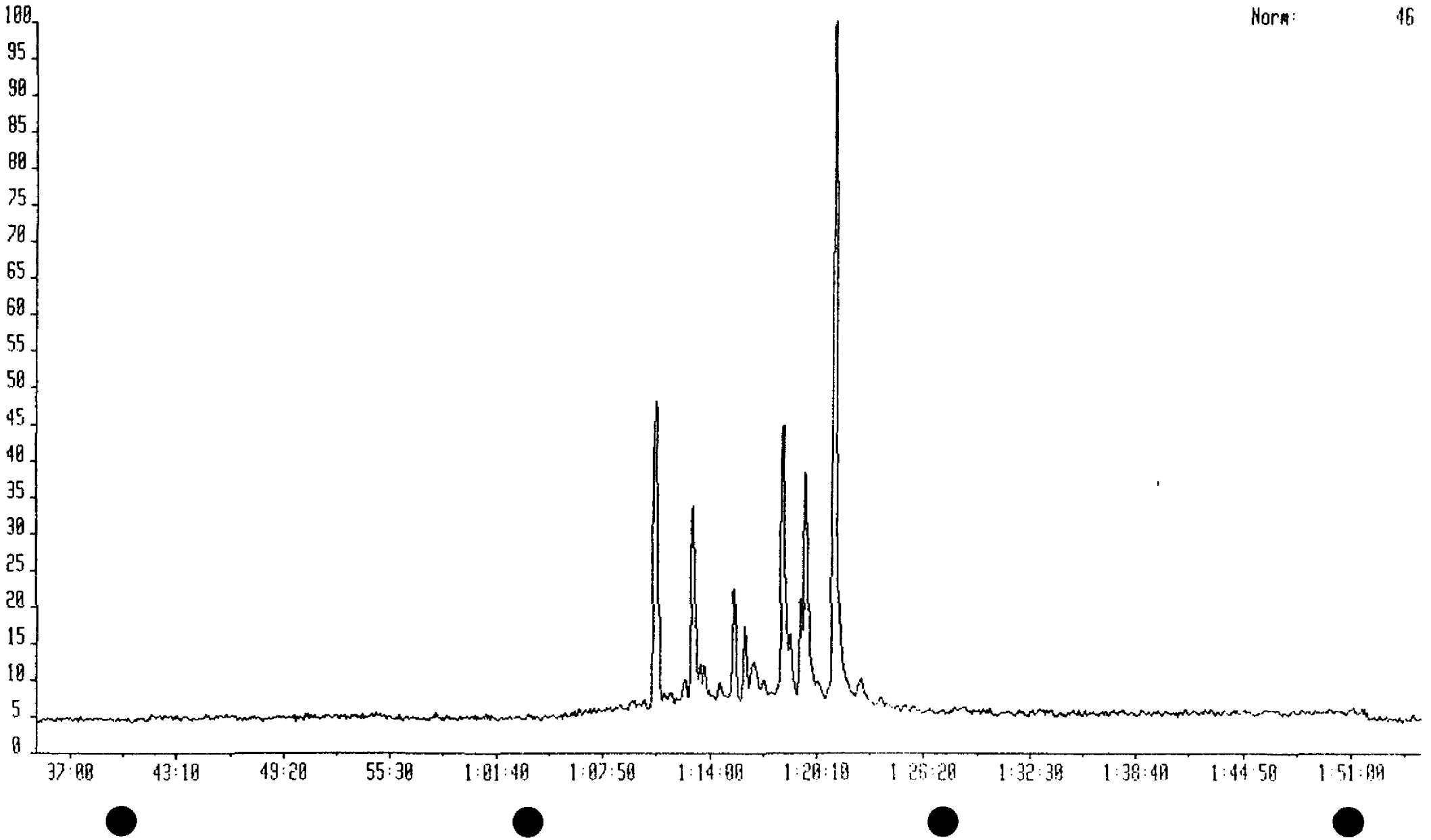
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 9 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:2900



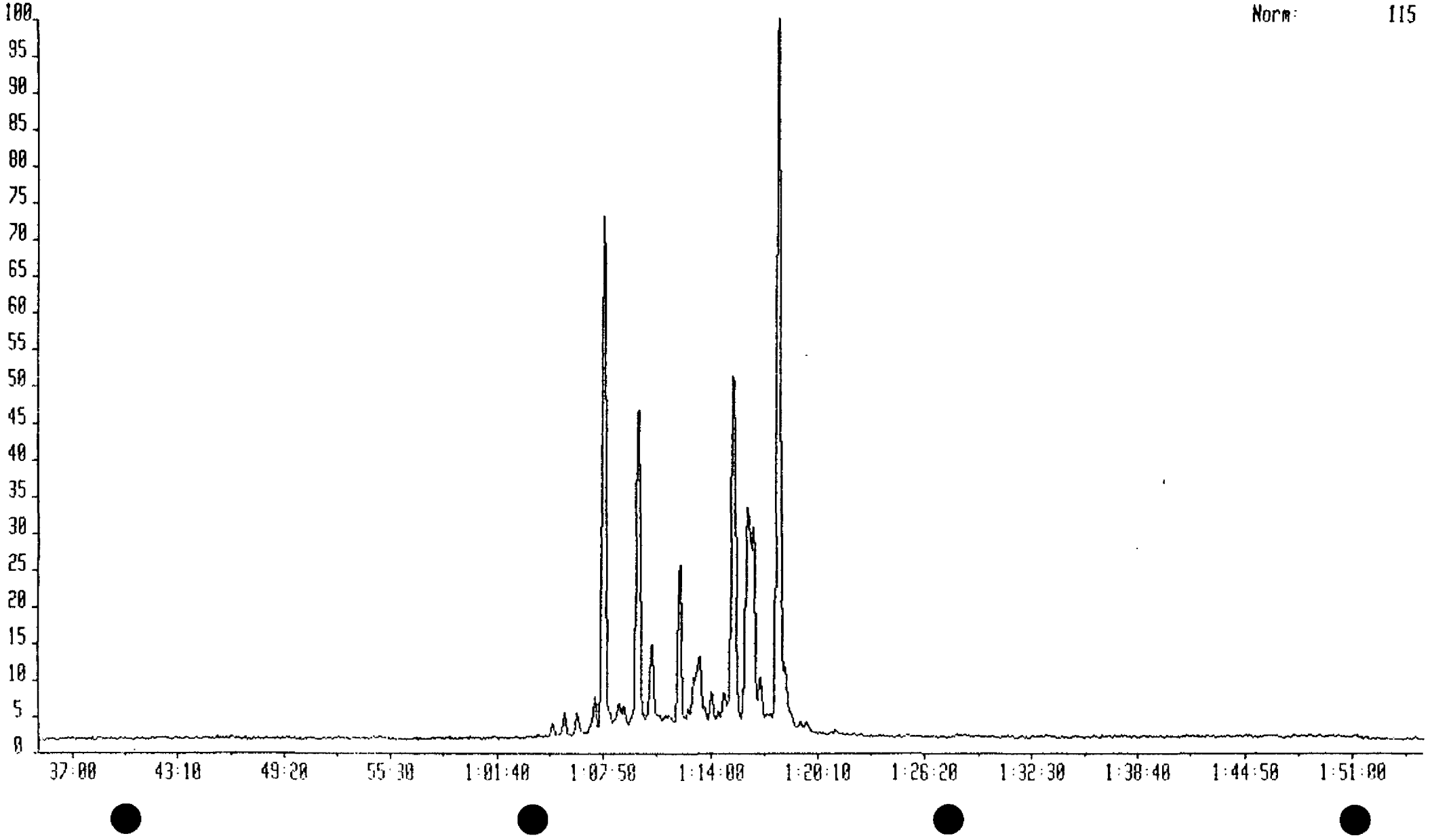
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 9 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:2908



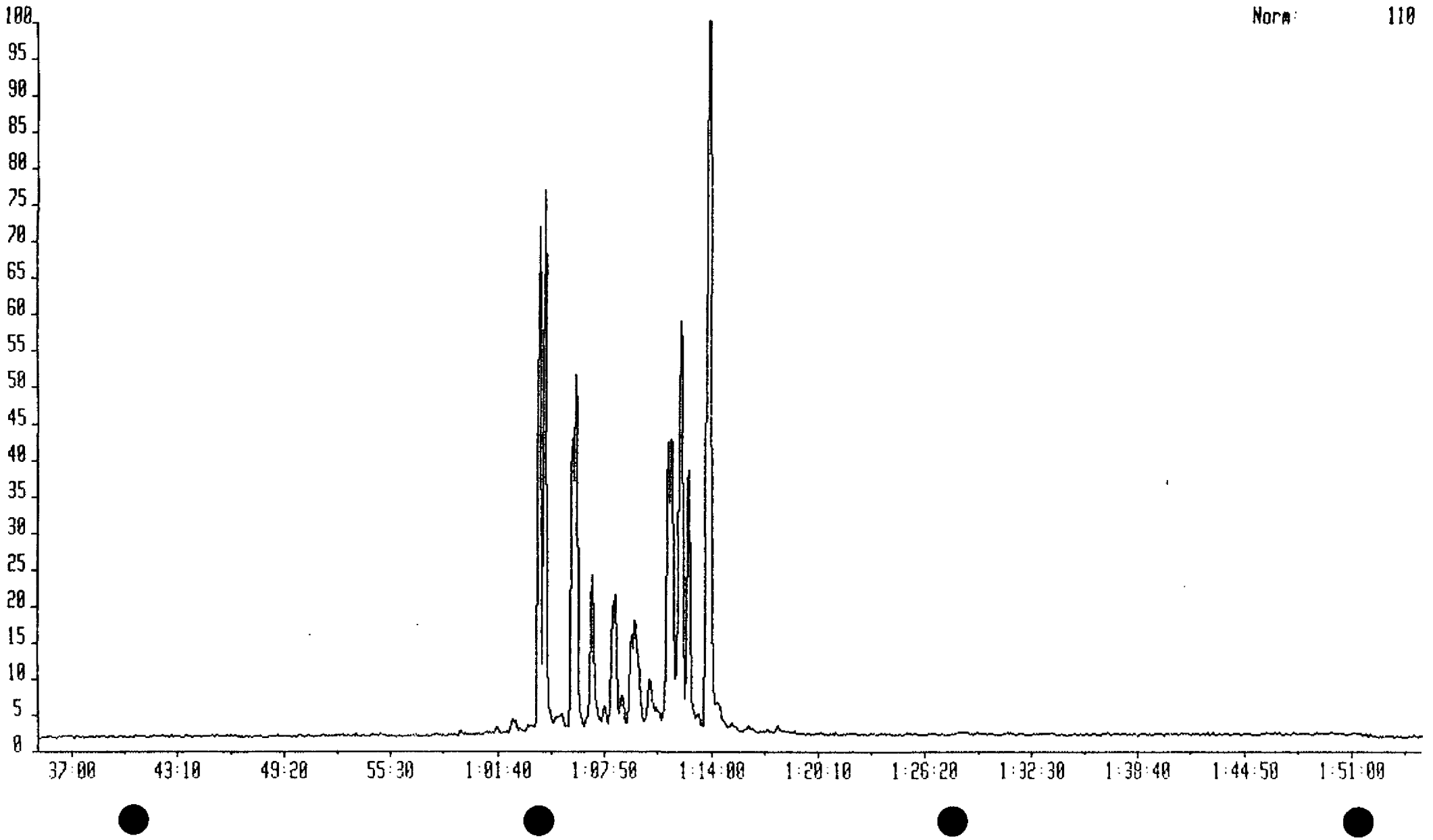
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 9 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:2900



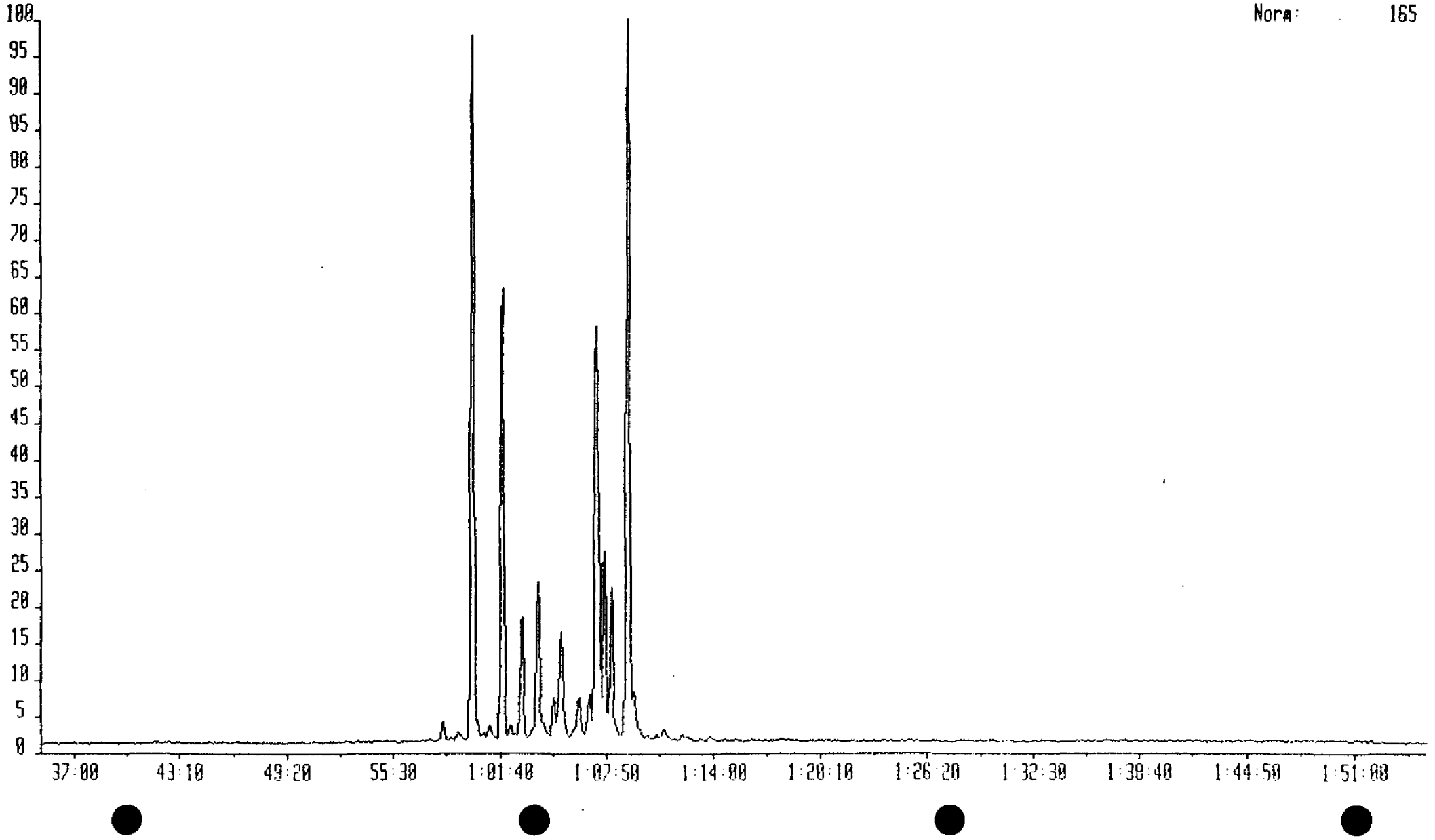
ASB10037 10-MAR-07 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 9 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:2900

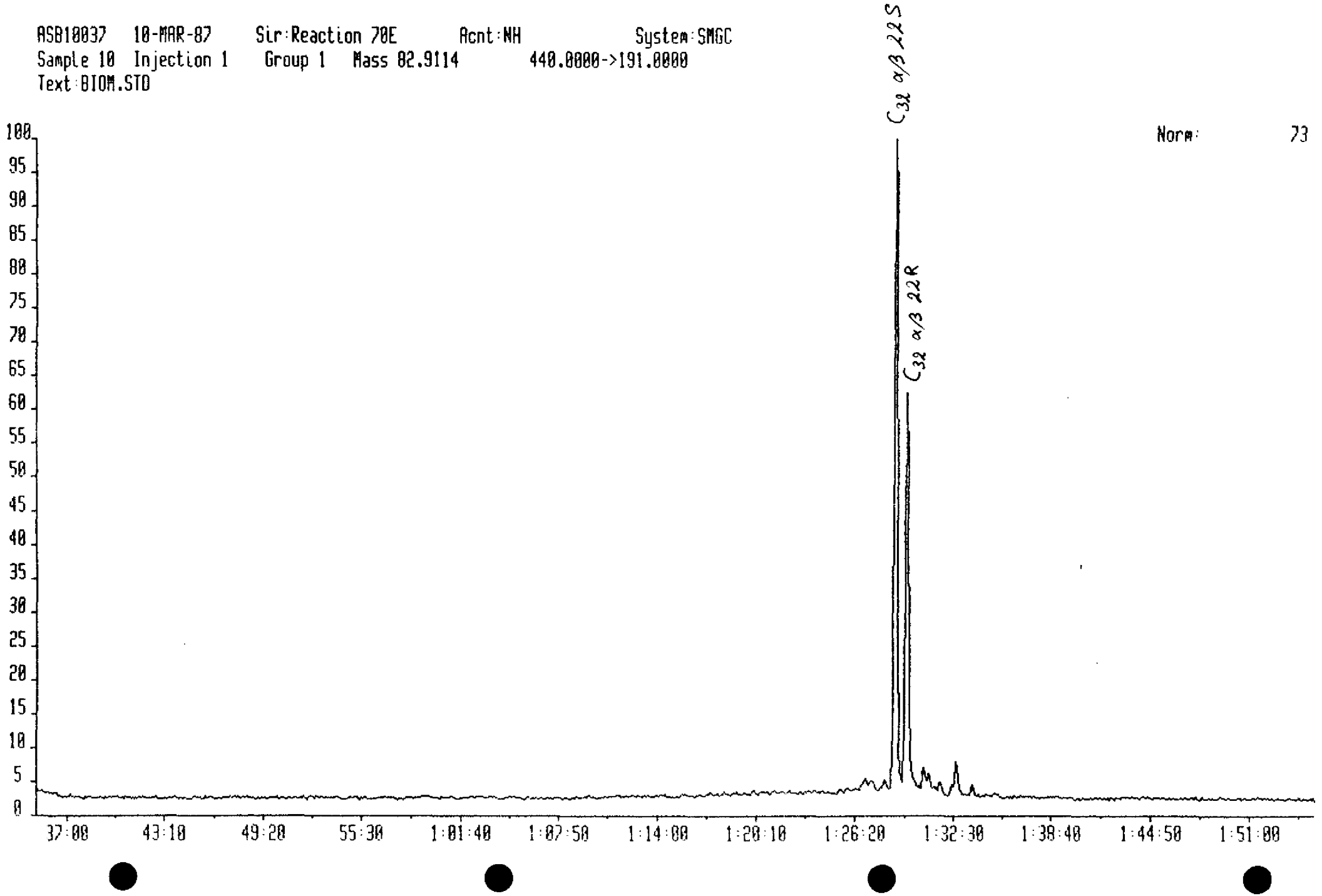


ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 9 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:2908

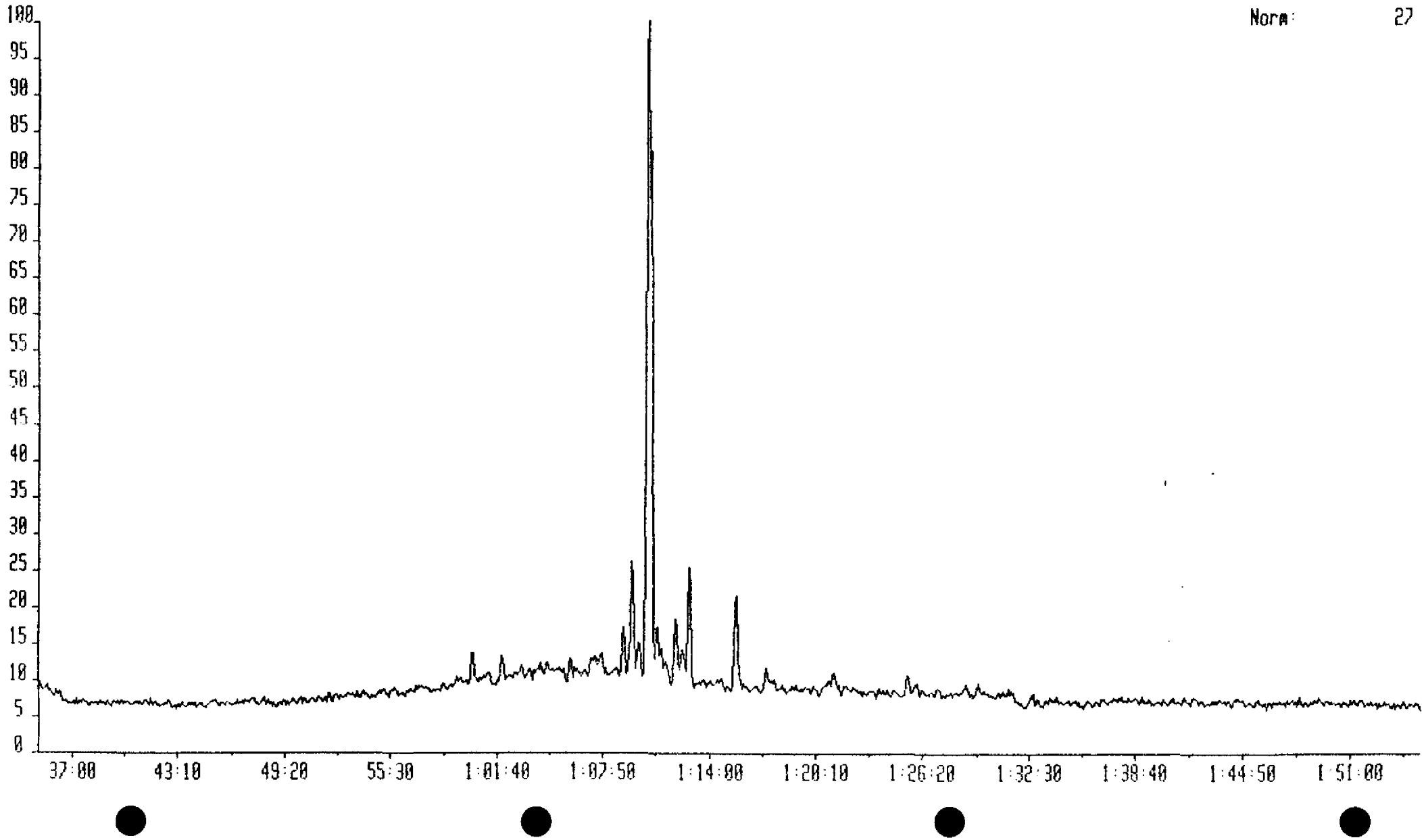


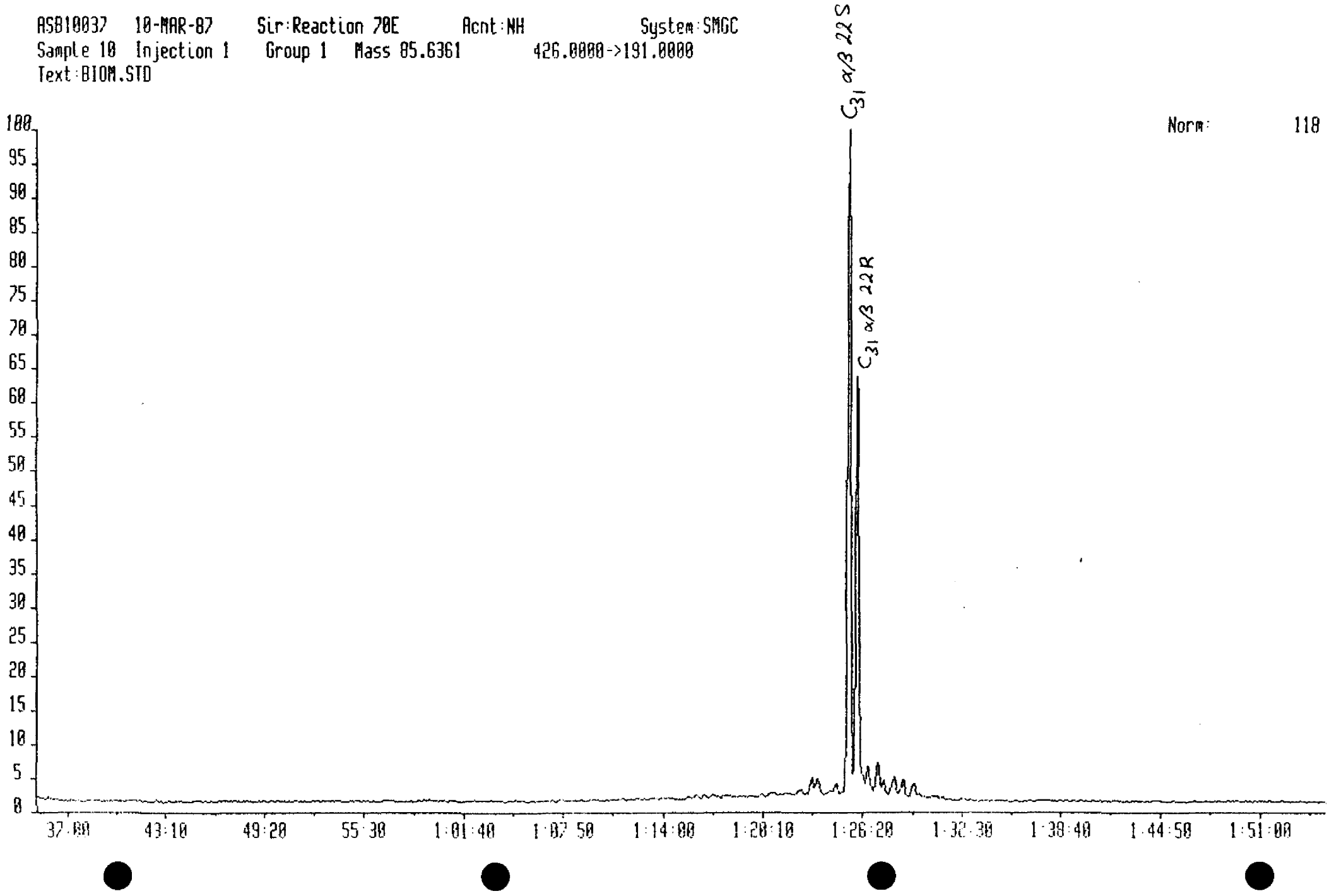
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 9 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:2900

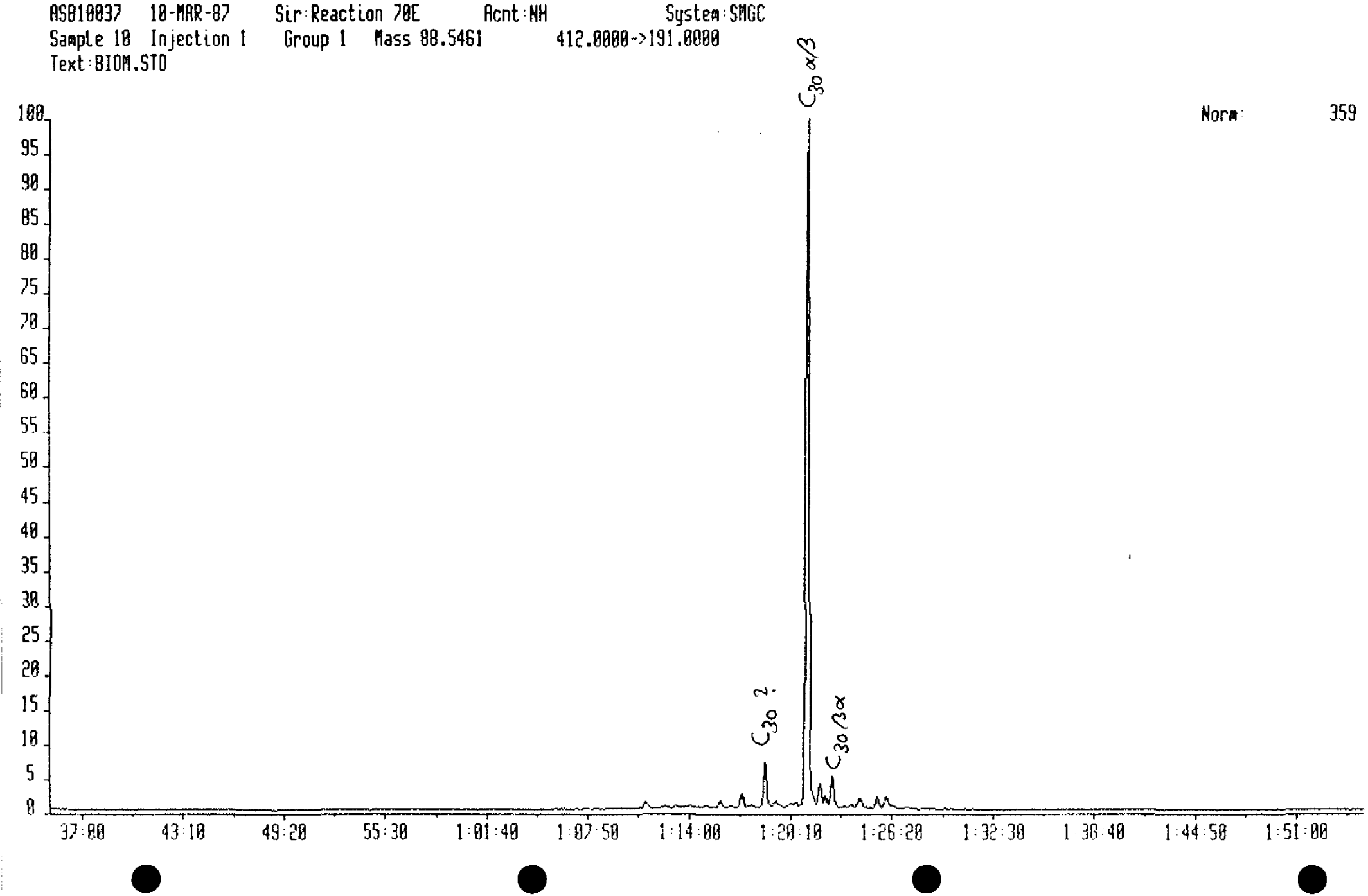


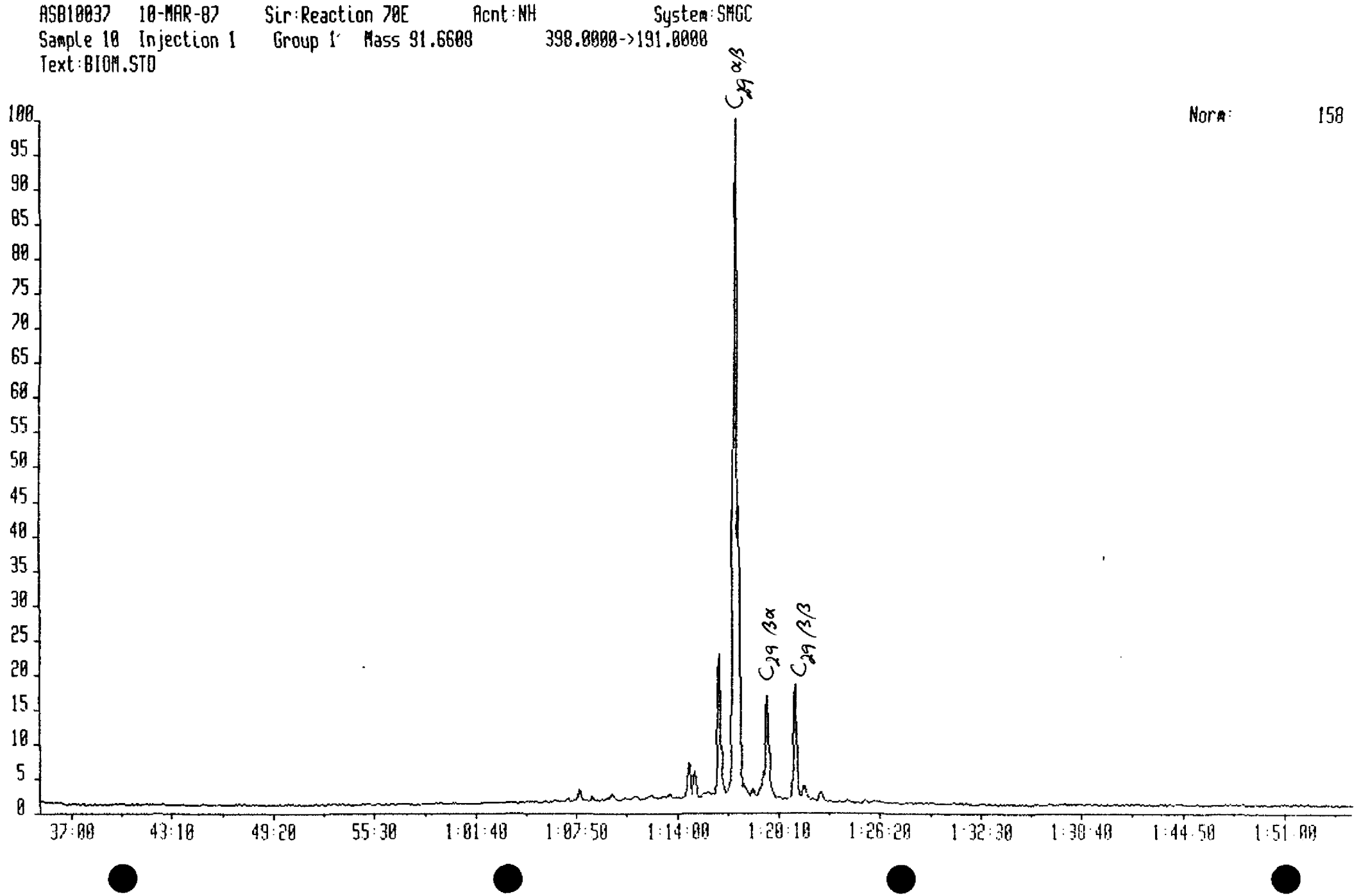

ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 10 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:BIOM.STD
Norm: 73
C32 α/β 22S
C32 α/β 22R
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
37:00
43:10
49:20
55:30
1:01:40
1:07:50
1:14:00
1:20:10
1:26:20
1:32:30
1:38:40
1:44:50
1:51:00

ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 10 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:BIOM.STD

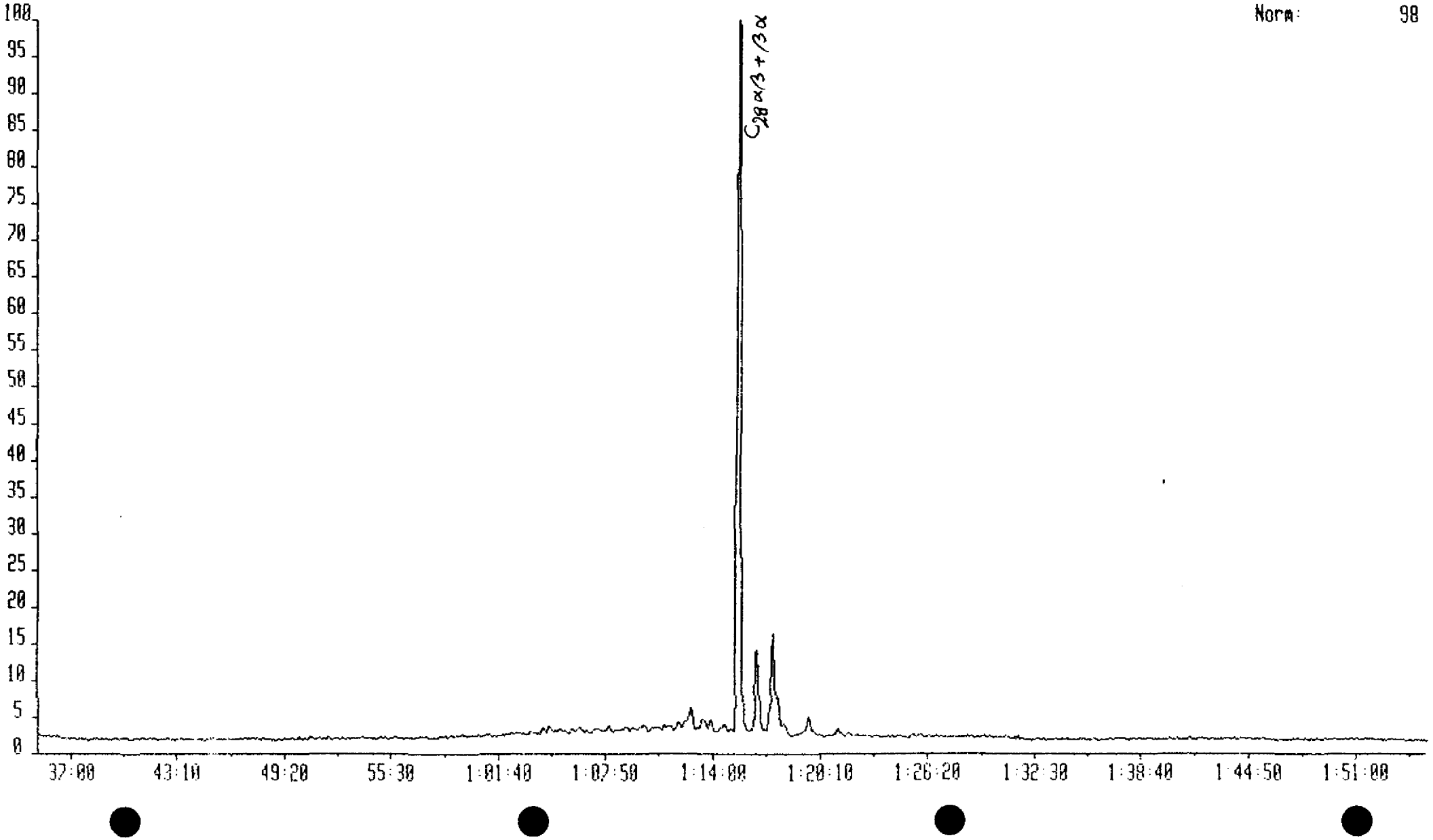



ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 10 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:BIOM.STD
Norm: 118
C31 α/β 22S
C31 α/β 22R
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
37:00
43:10
49:20
55:30
1:01:40
1:07:50
1:14:00
1:20:10
1:26:20
1:32:30
1:38:40
1:44:50
1:51:00

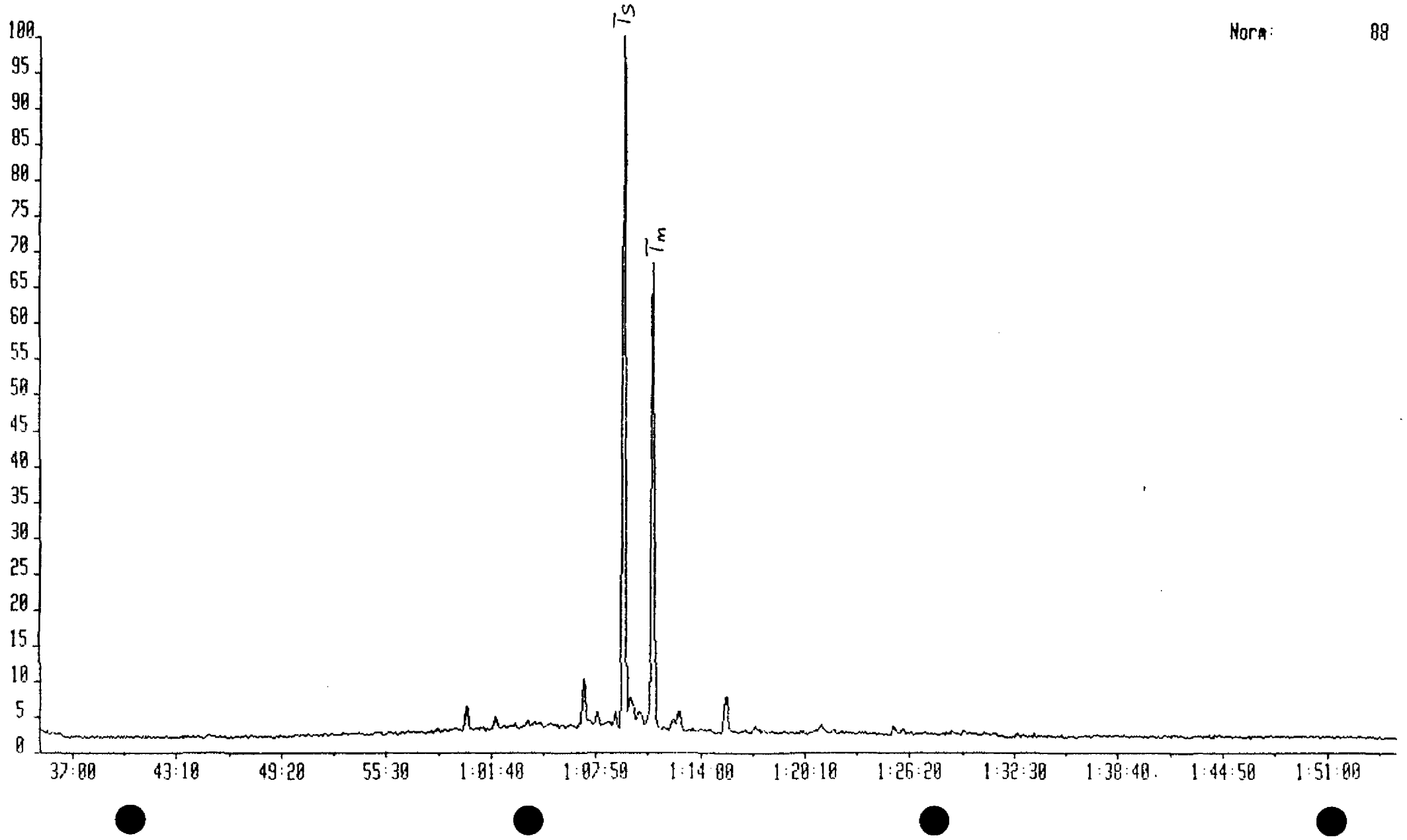

ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 10 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:BIOM.STD
Norm: 359
C30 α/β
C30 2.
C30 βα
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
37:00
43:10
49:20
55:30
1:01:40
1:07:50
1:14:00
1:20:10
1:26:20
1:32:30
1:38:40
1:44:50
1:51:00


ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 10 Injection 1 Group 1 Mass 91.6600 398.0000->191.0000
Text:BIOM.STD
Norm: 158
C29 α/β
C29 βα
C29 ββ
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
37:00
43:10
49:20
55:30
1:01:40
1:07:50
1:14:00
1:20:10
1:26:20
1:32:30
1:38:40
1:44:50
1:51:00

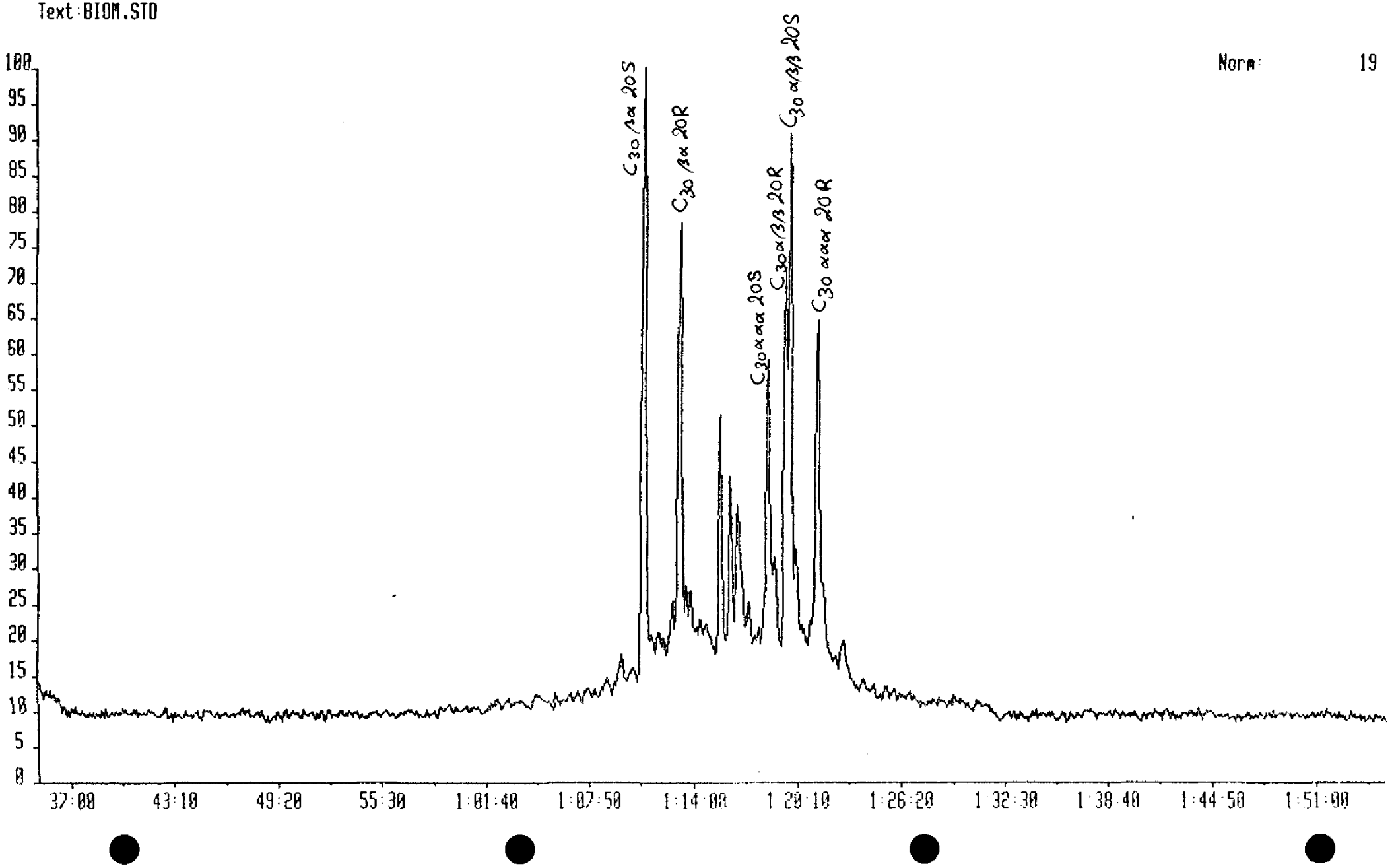
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 10 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:BIOM.STD



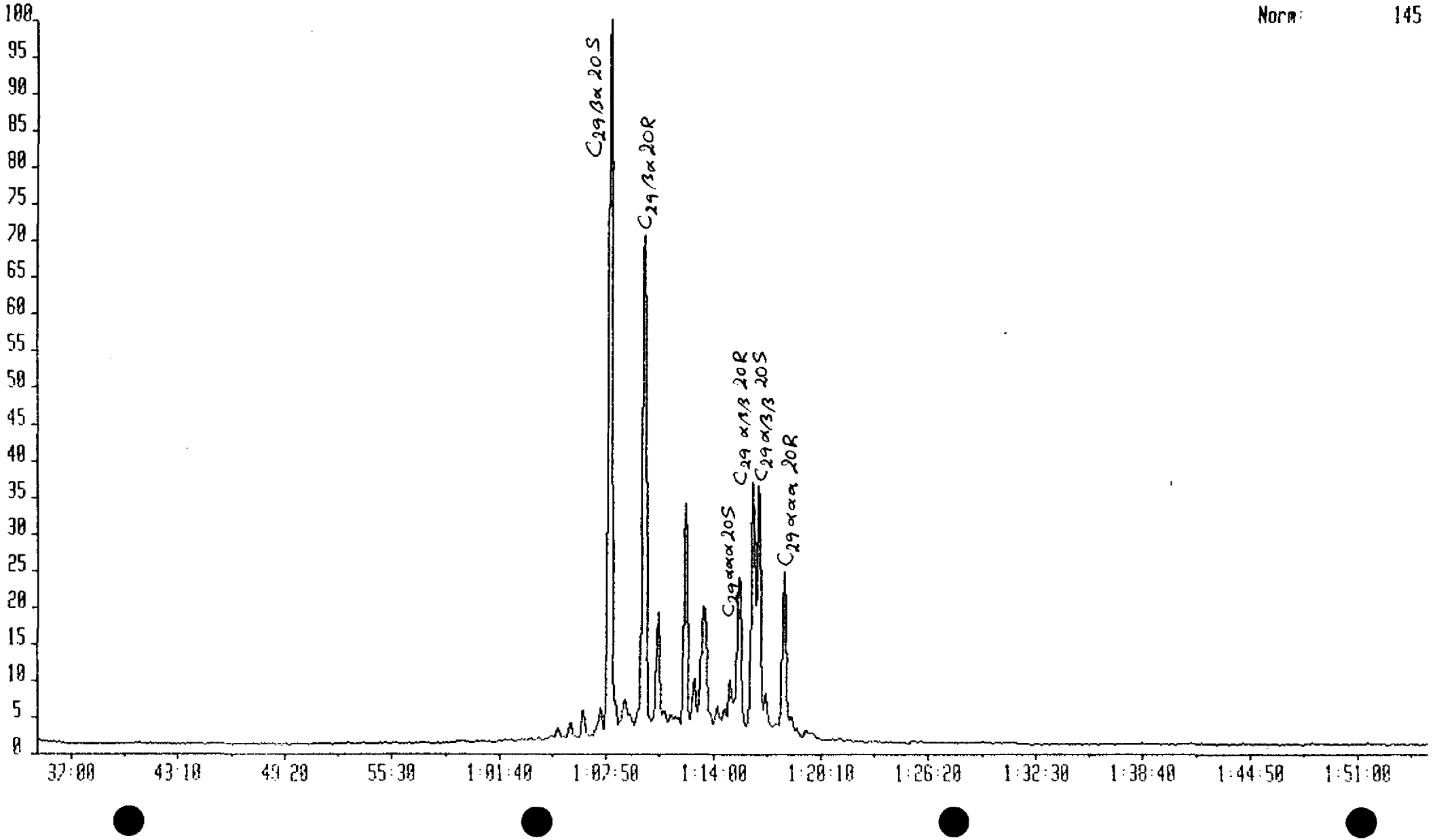
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 10 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:BIOM.STD



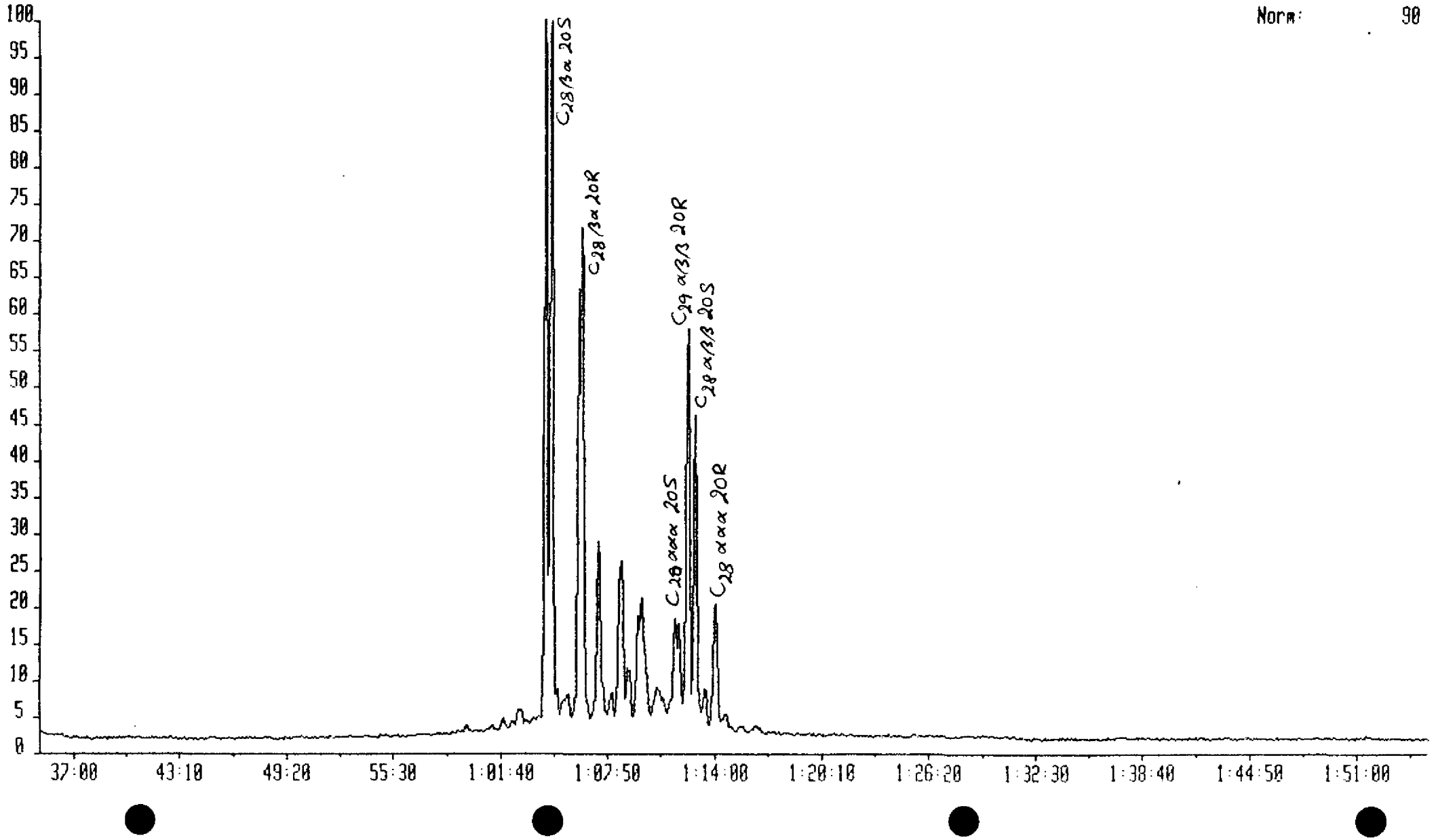
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 10 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:BIOM.STD



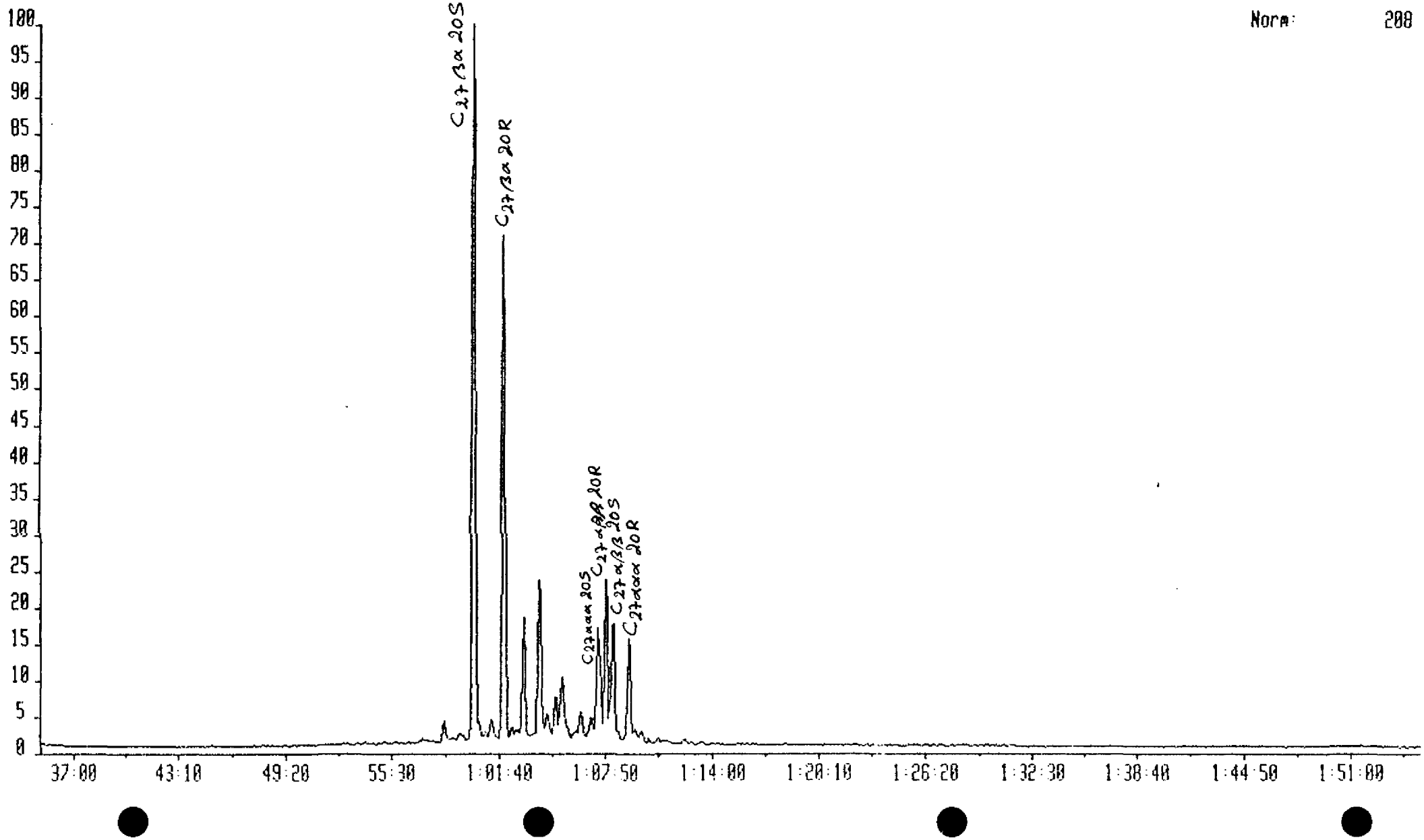
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 10 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:BIOM.STD



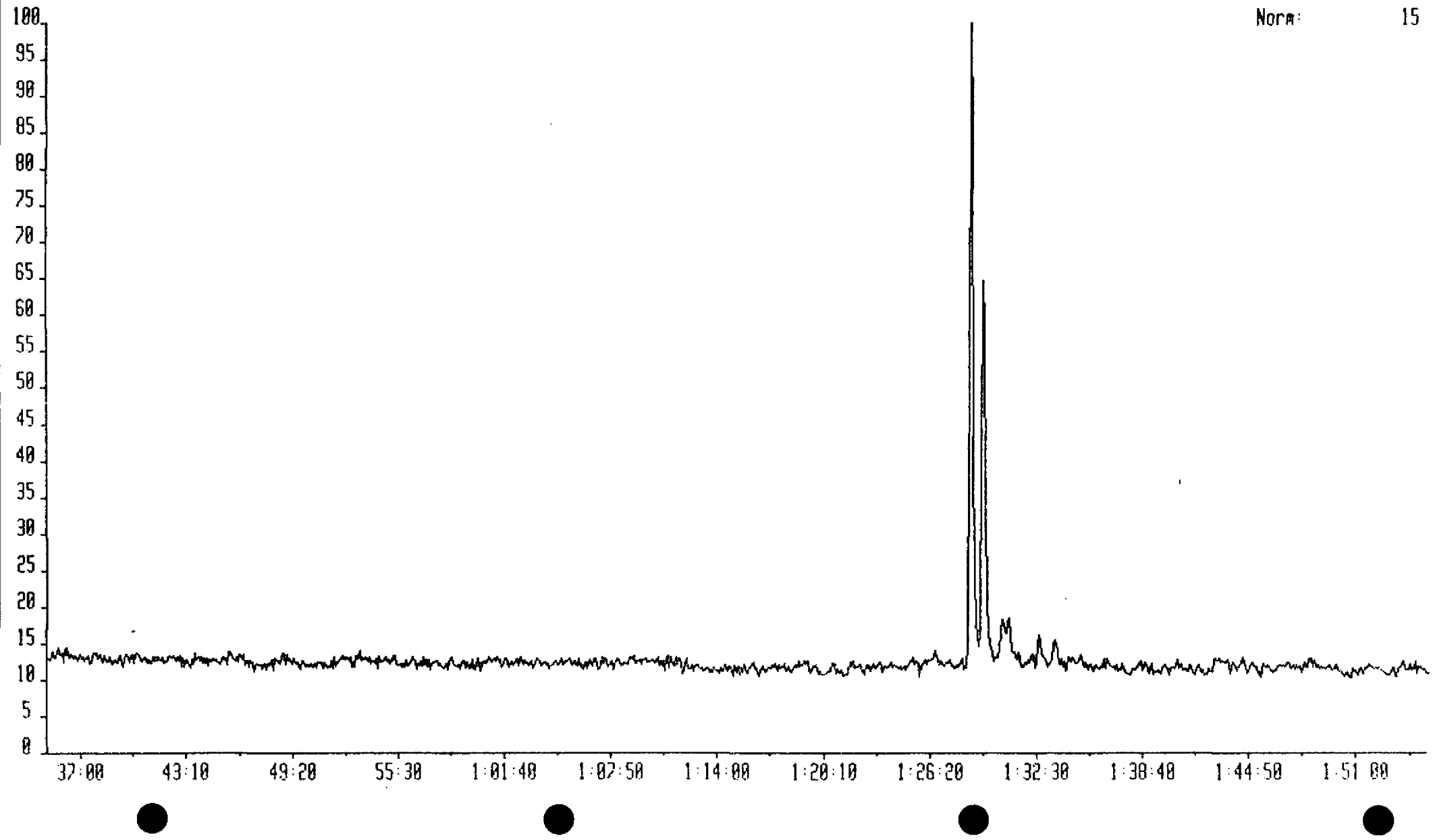
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 10 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:BIOM.STD



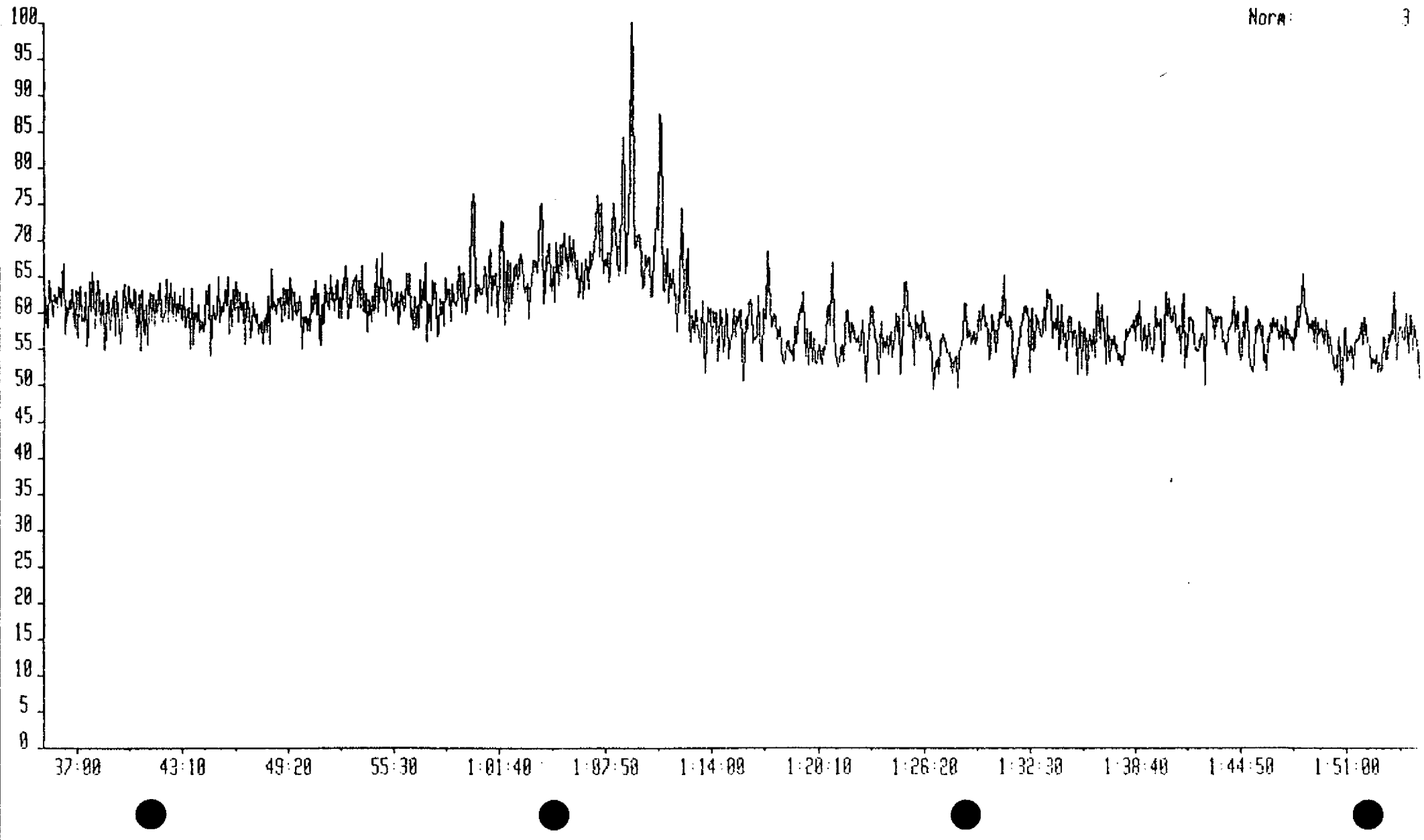
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 10 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:BIOM.STD



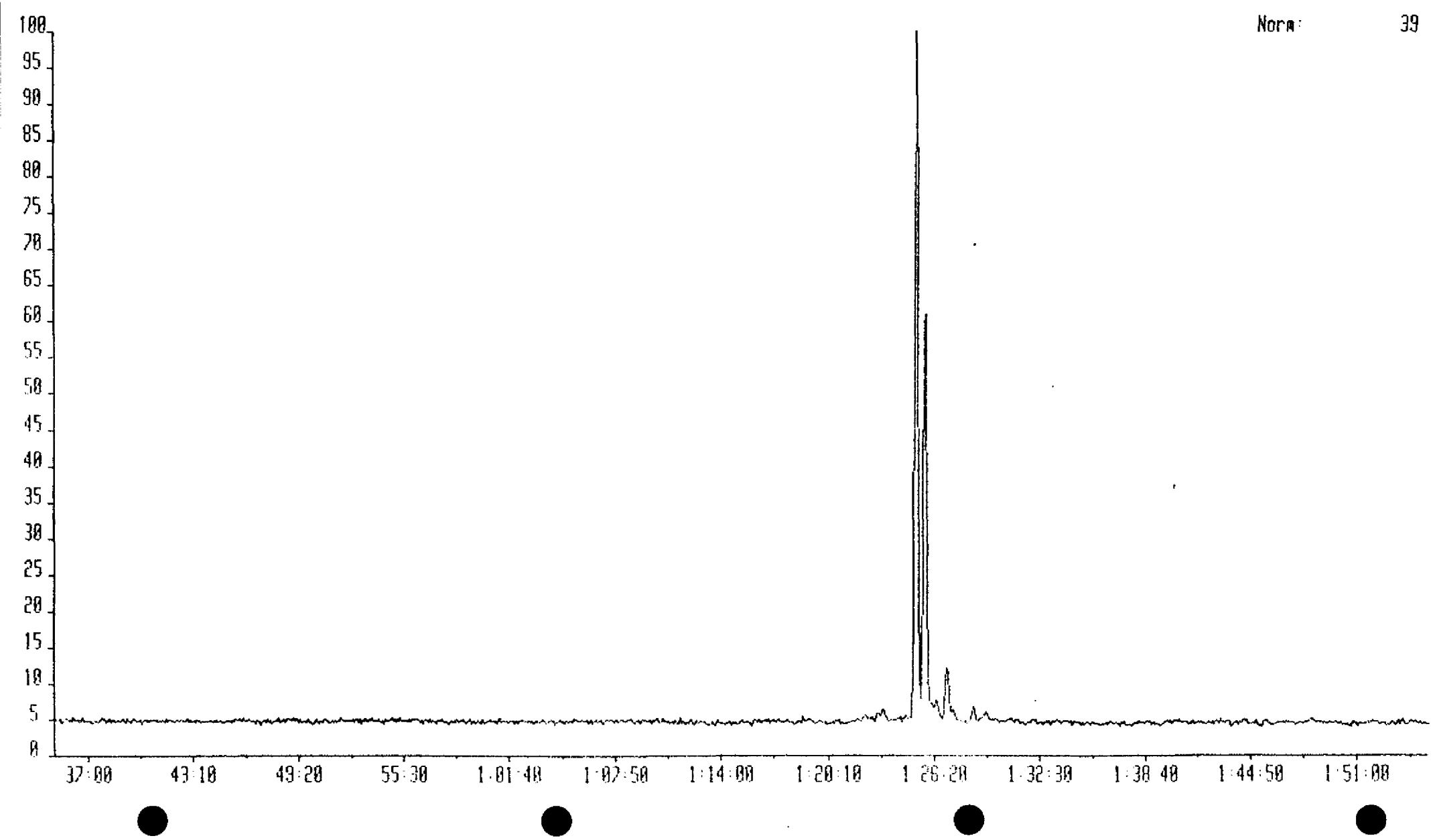
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 11 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:2911



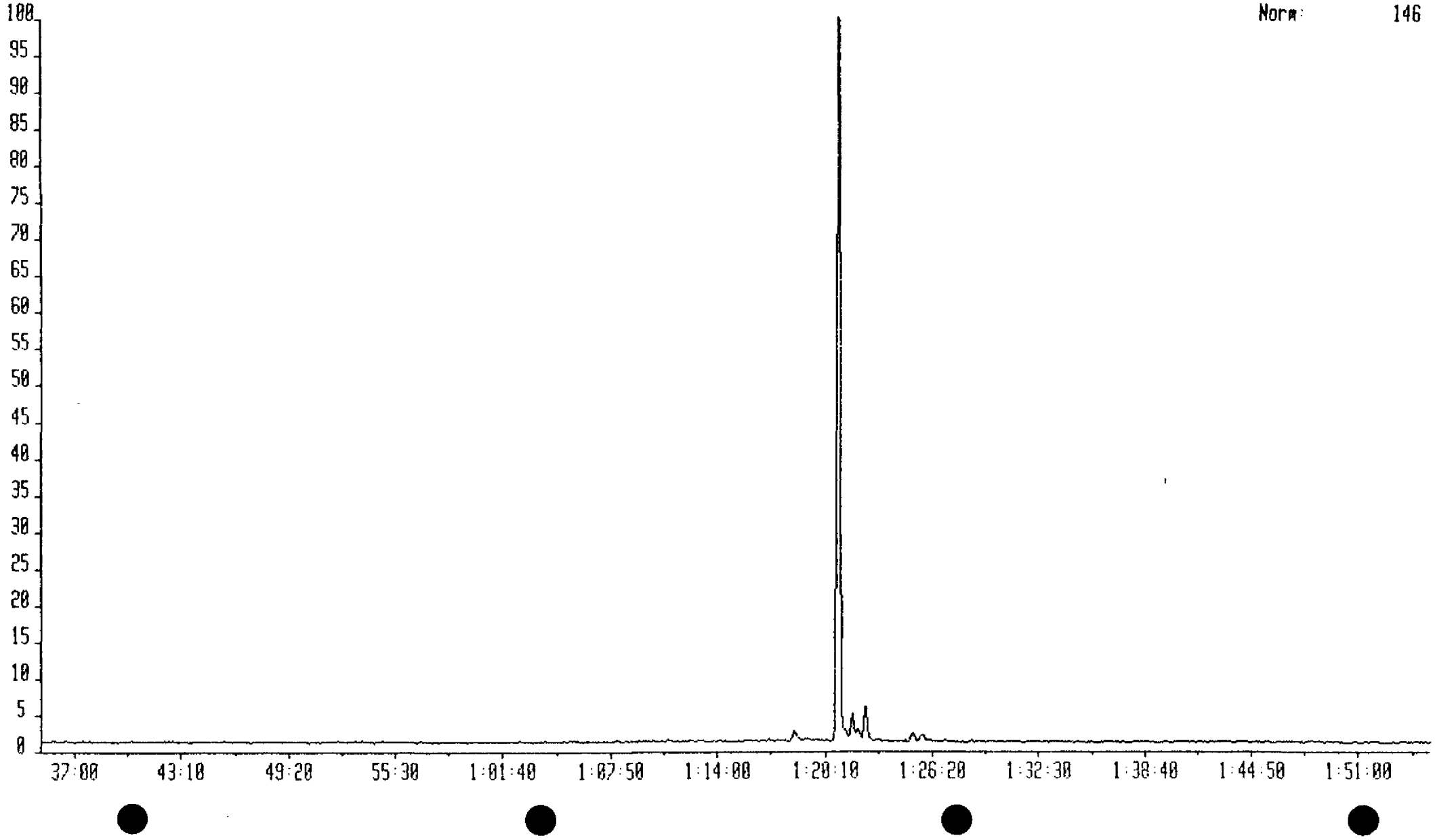
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 11 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:2911



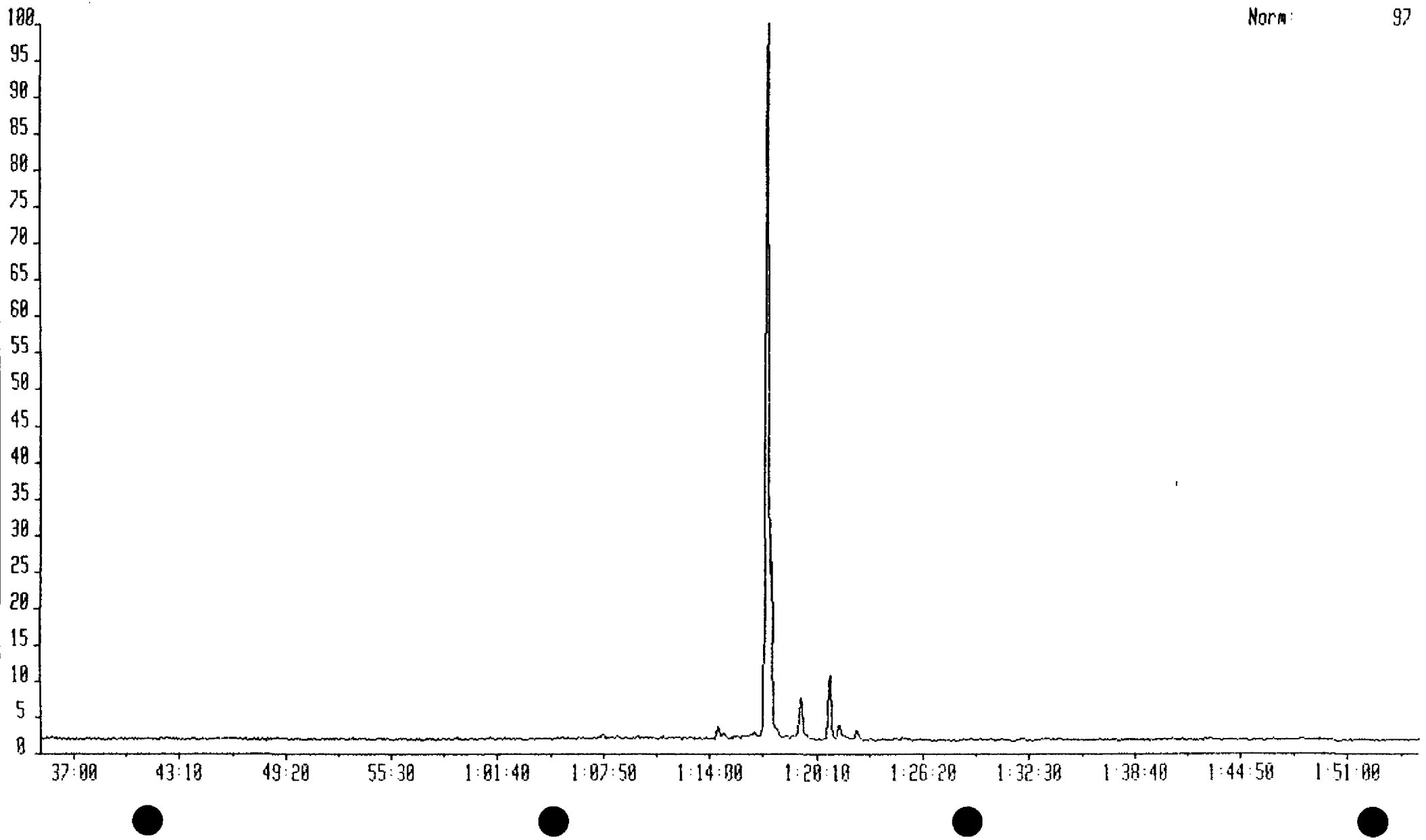
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 11 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:2911



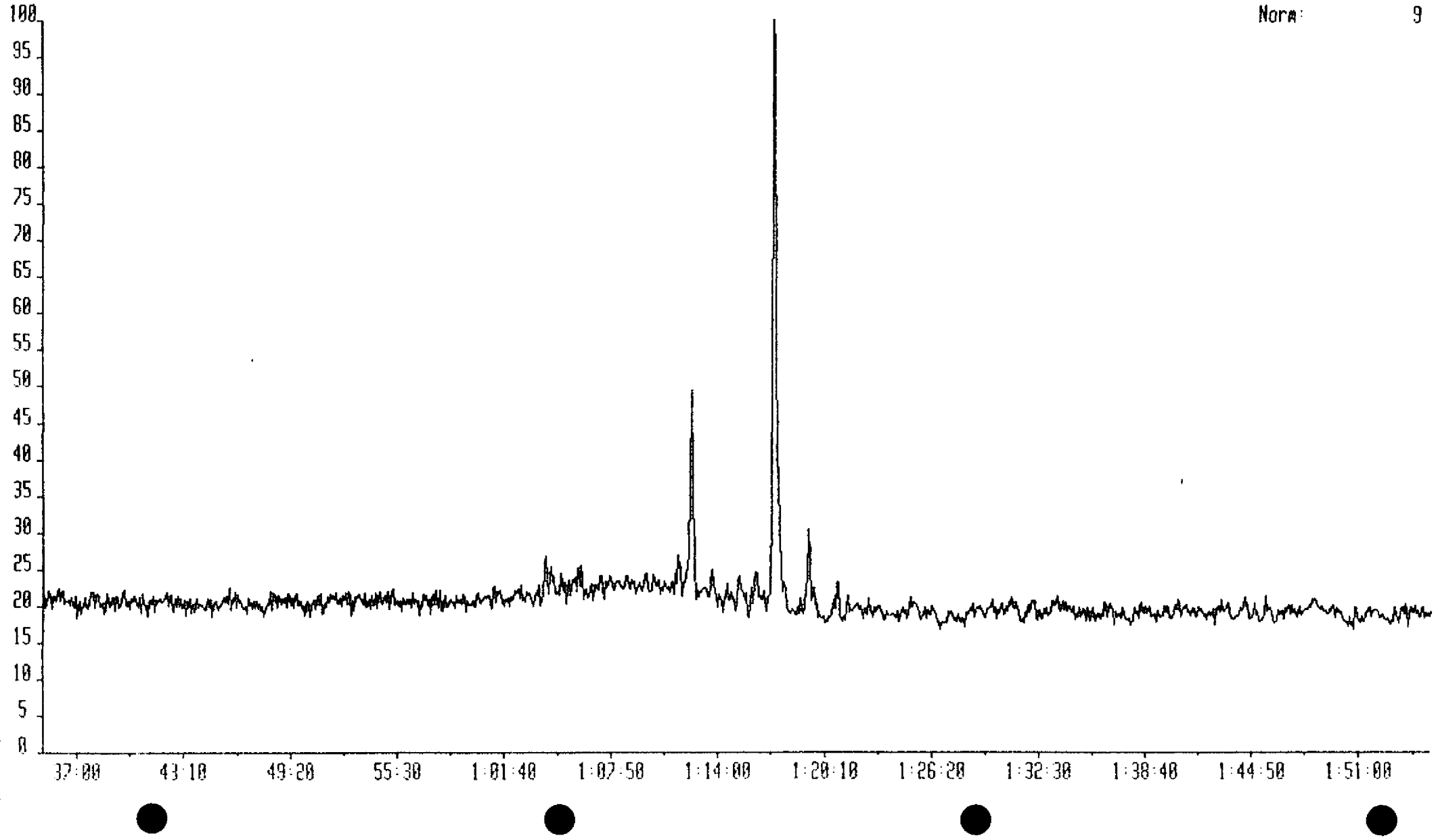
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 11 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:2911



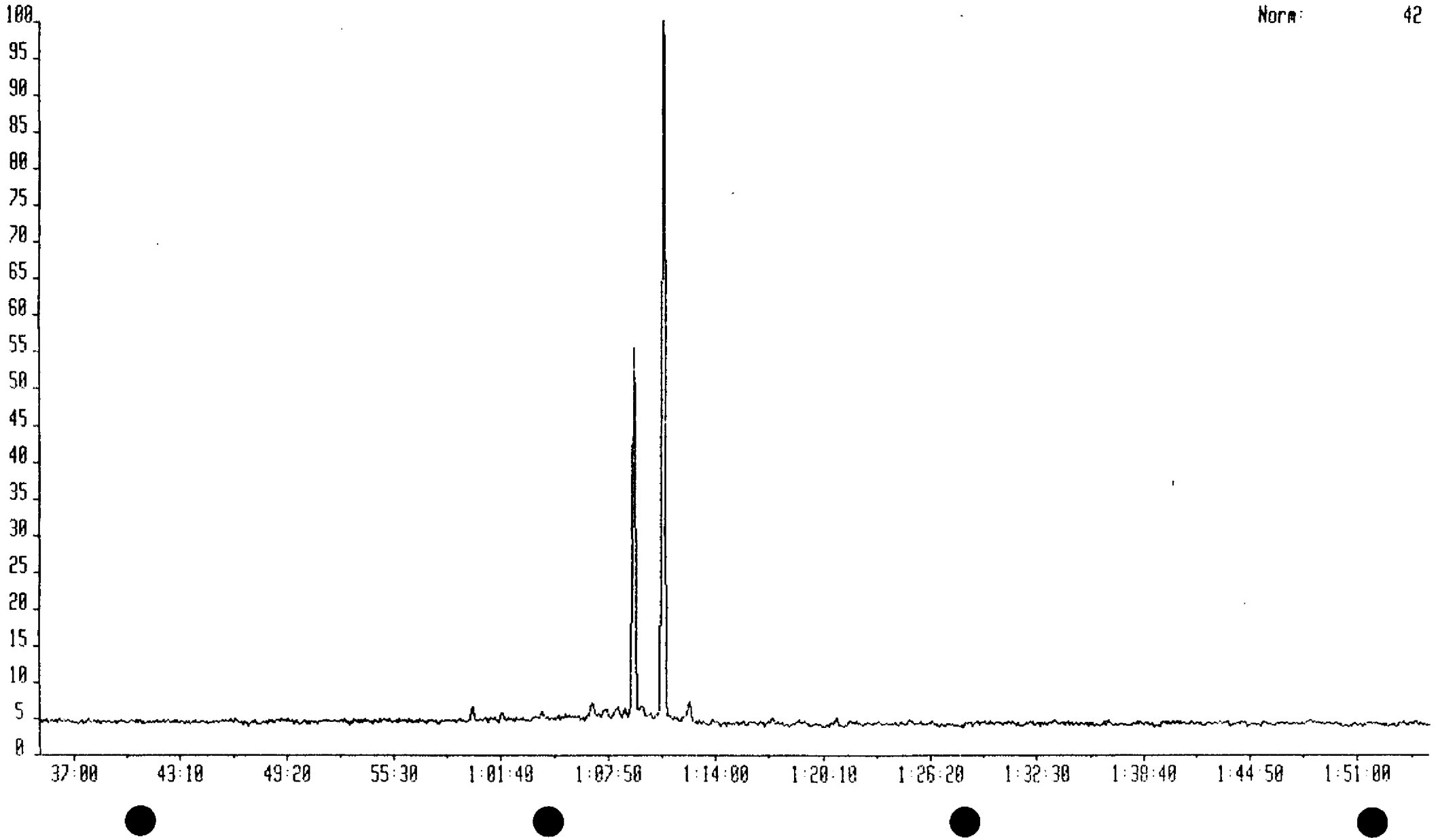
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 11 Injection 1 Group 1 Mass 91.6600 398.0000->191.0000
Text:2911



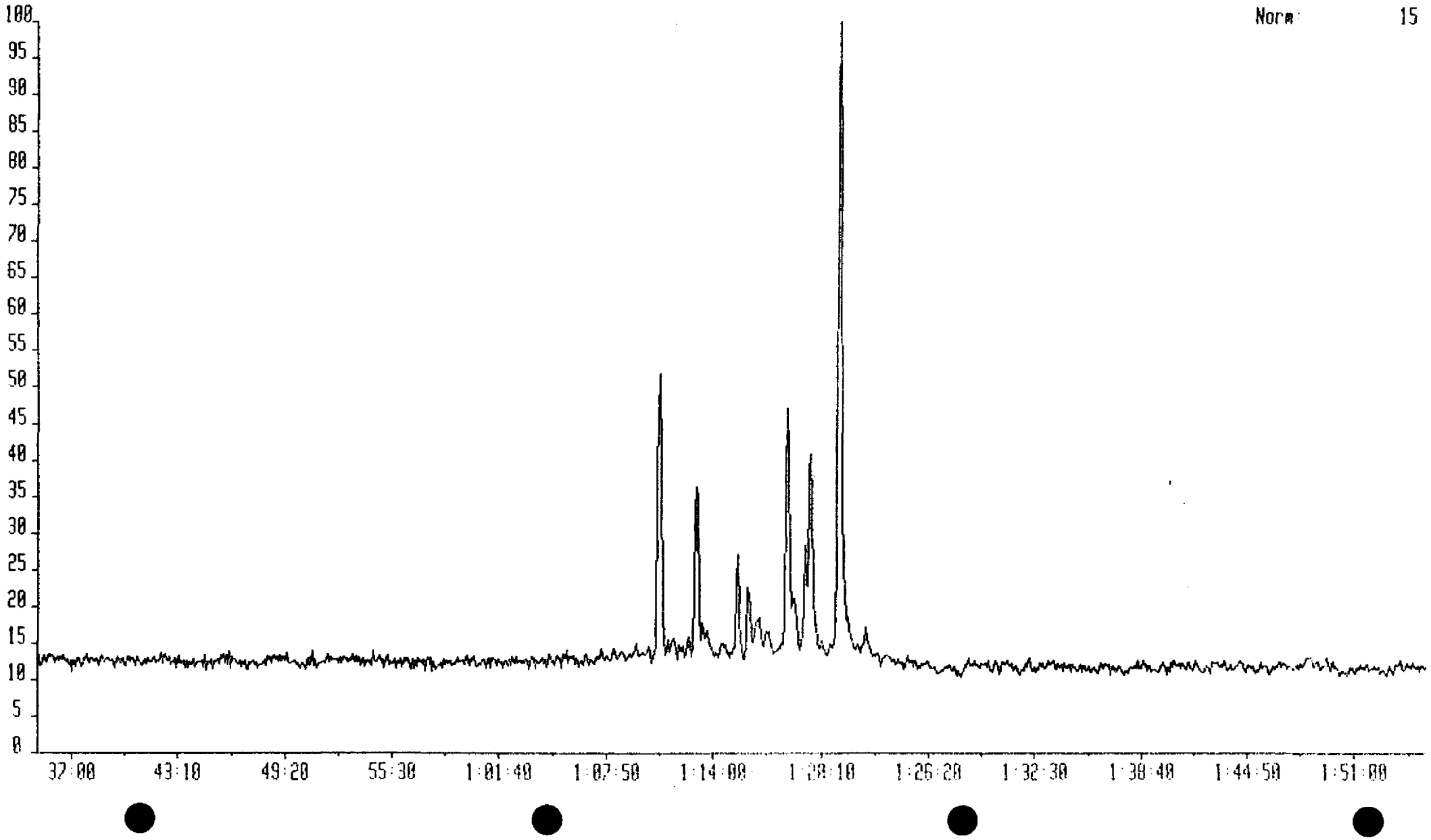
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 11 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:2911



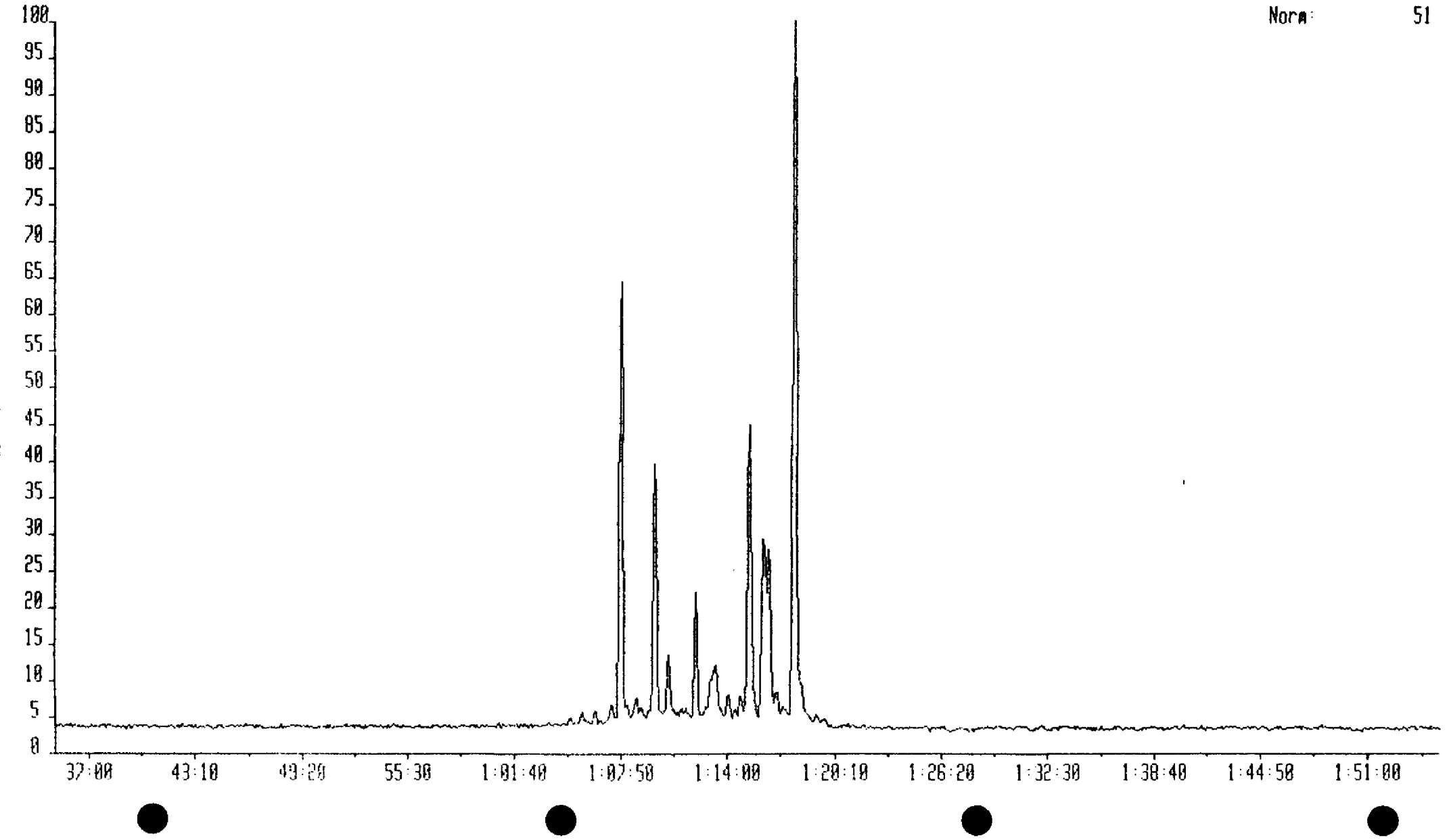
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 11 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:2911



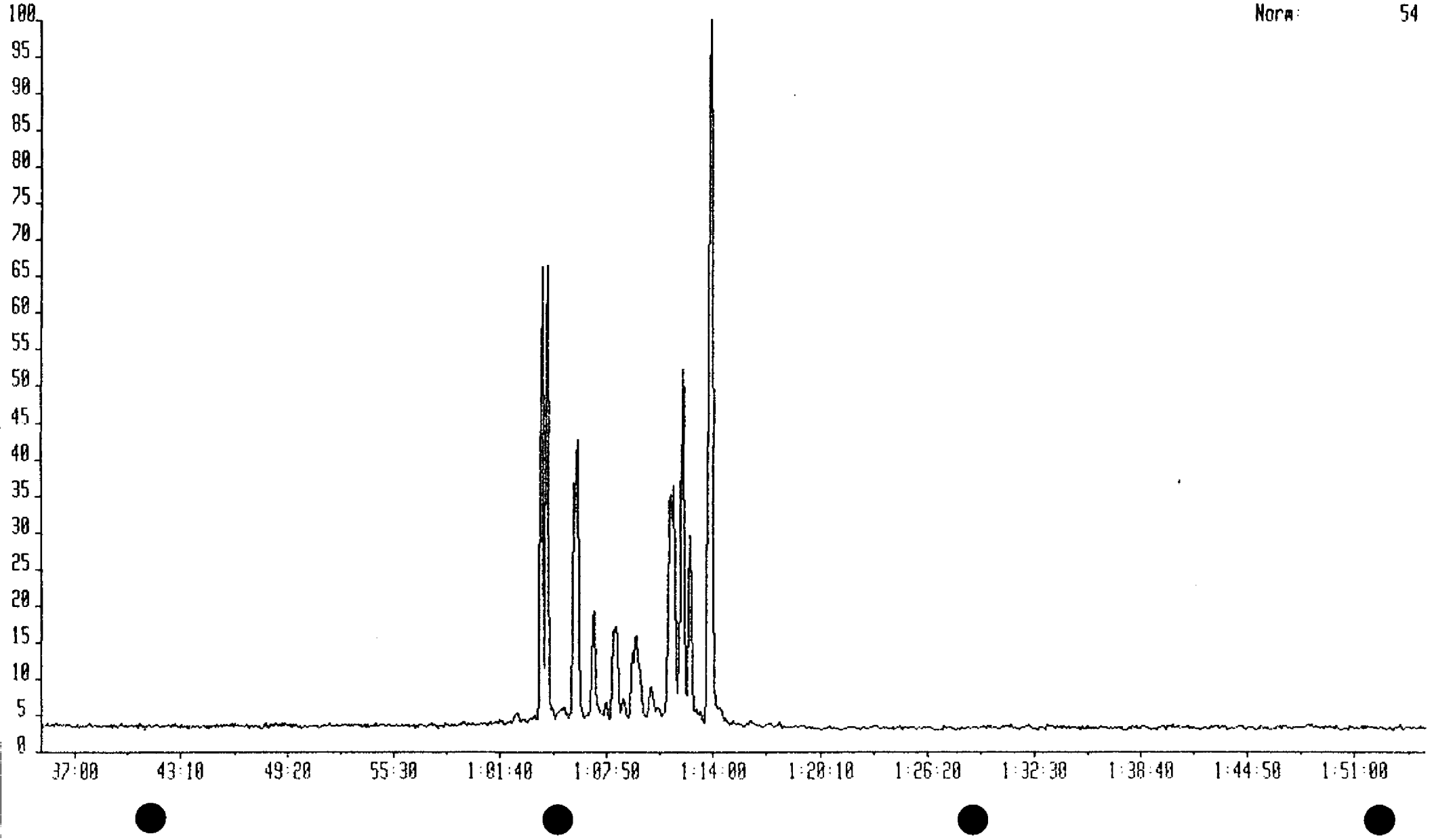
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 11 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:2911



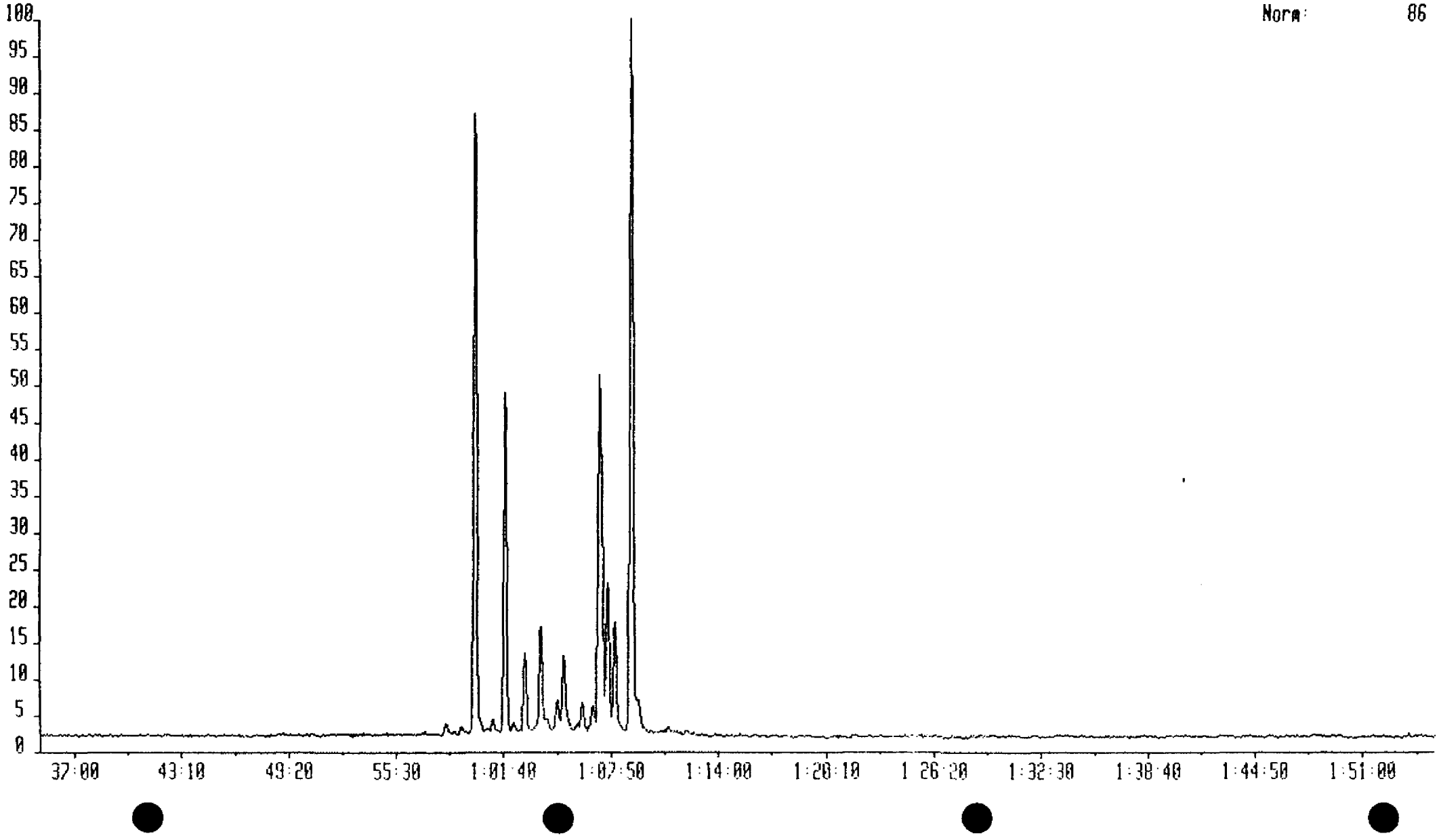
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 11 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:2911



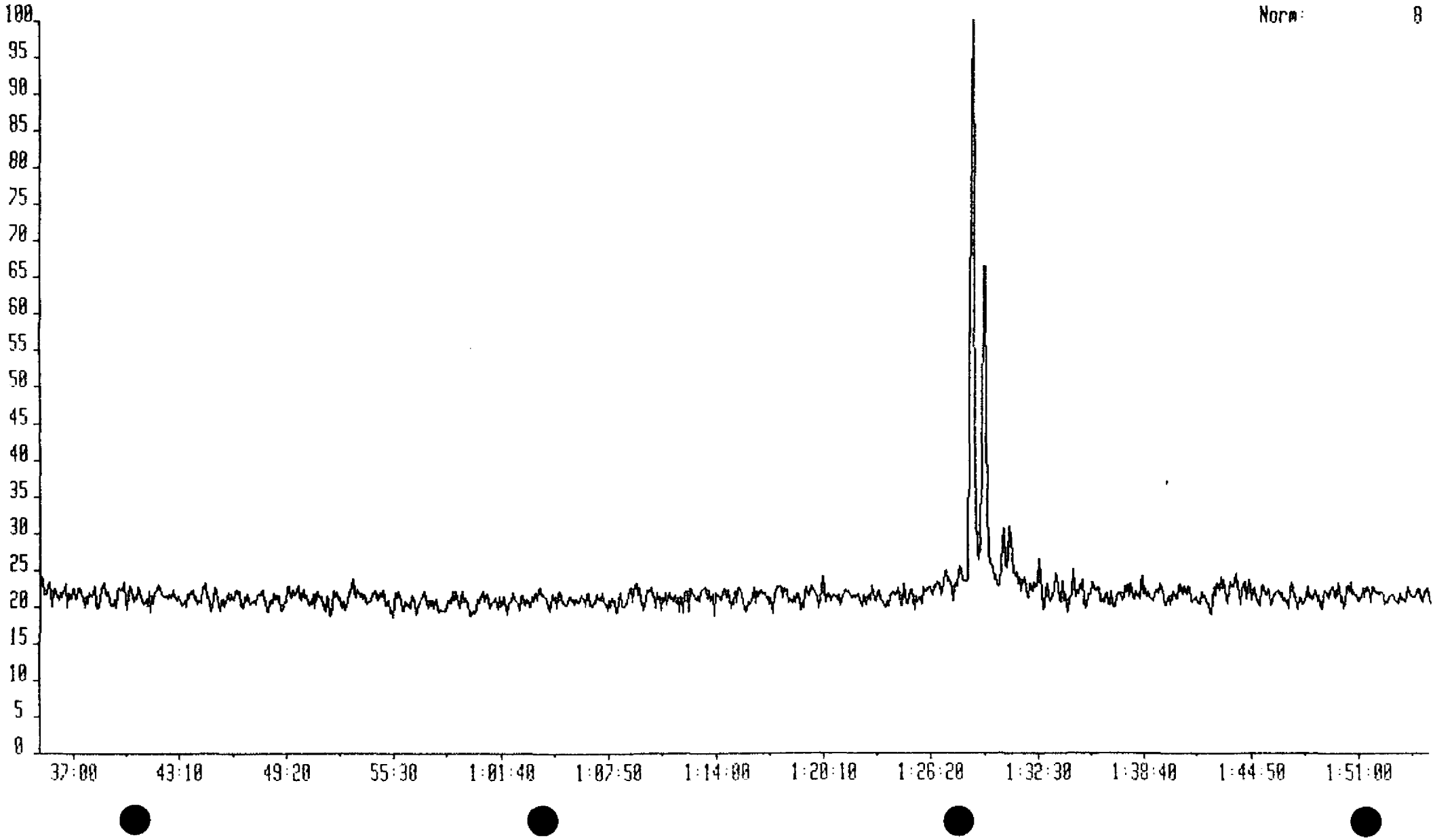
RSB10837 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 11 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:2911



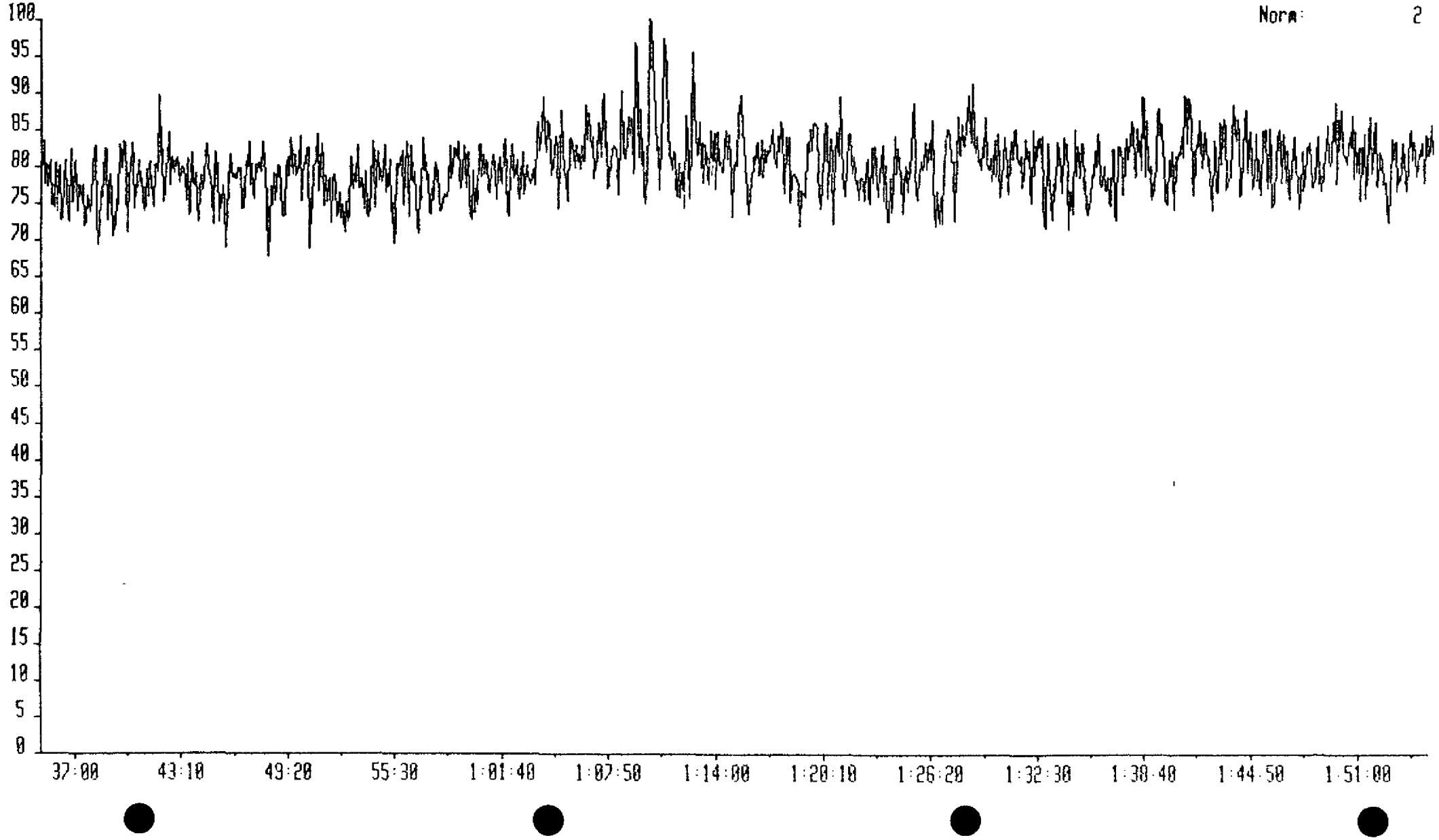
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 11 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:2911



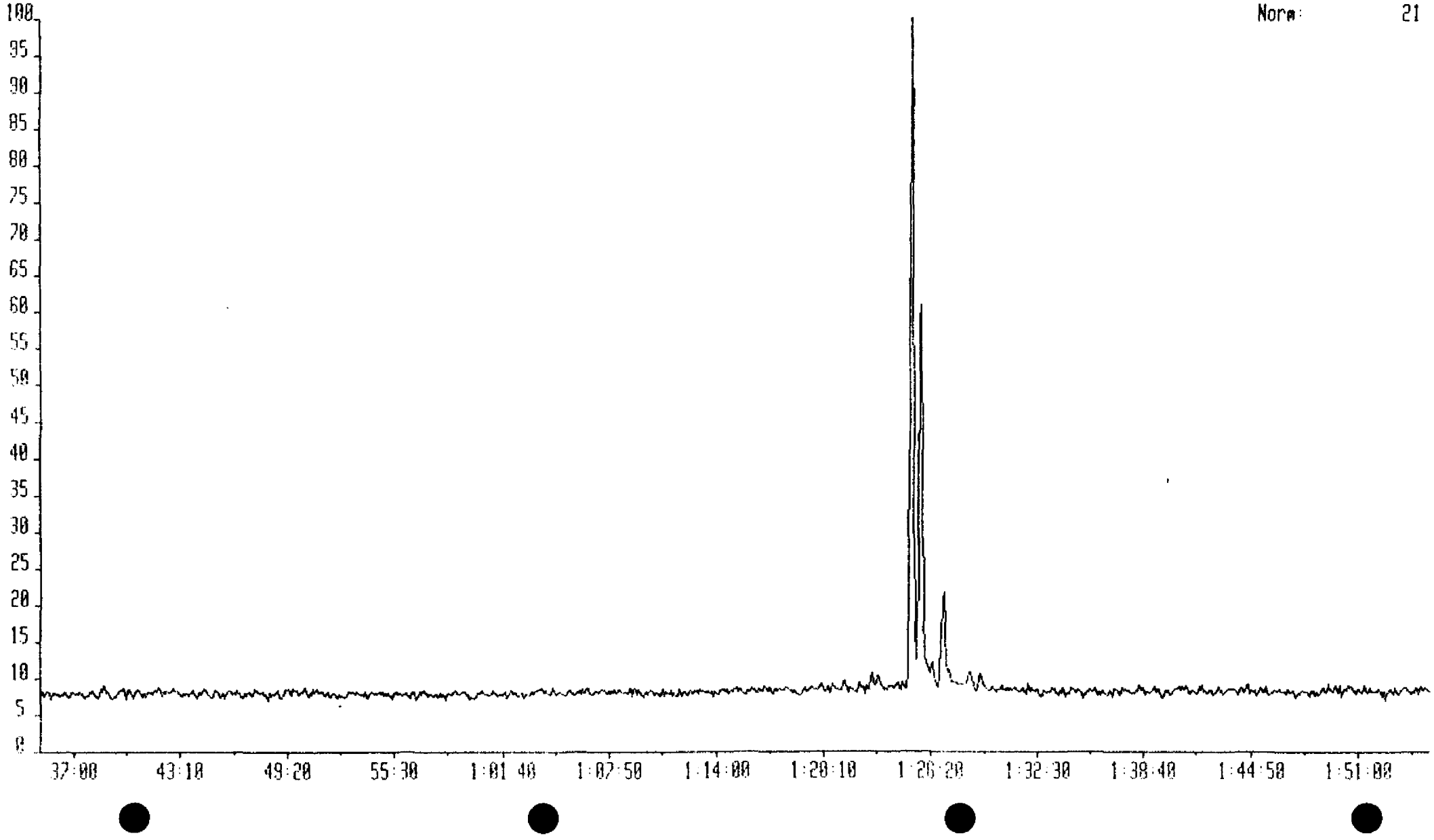
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 12 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:2917



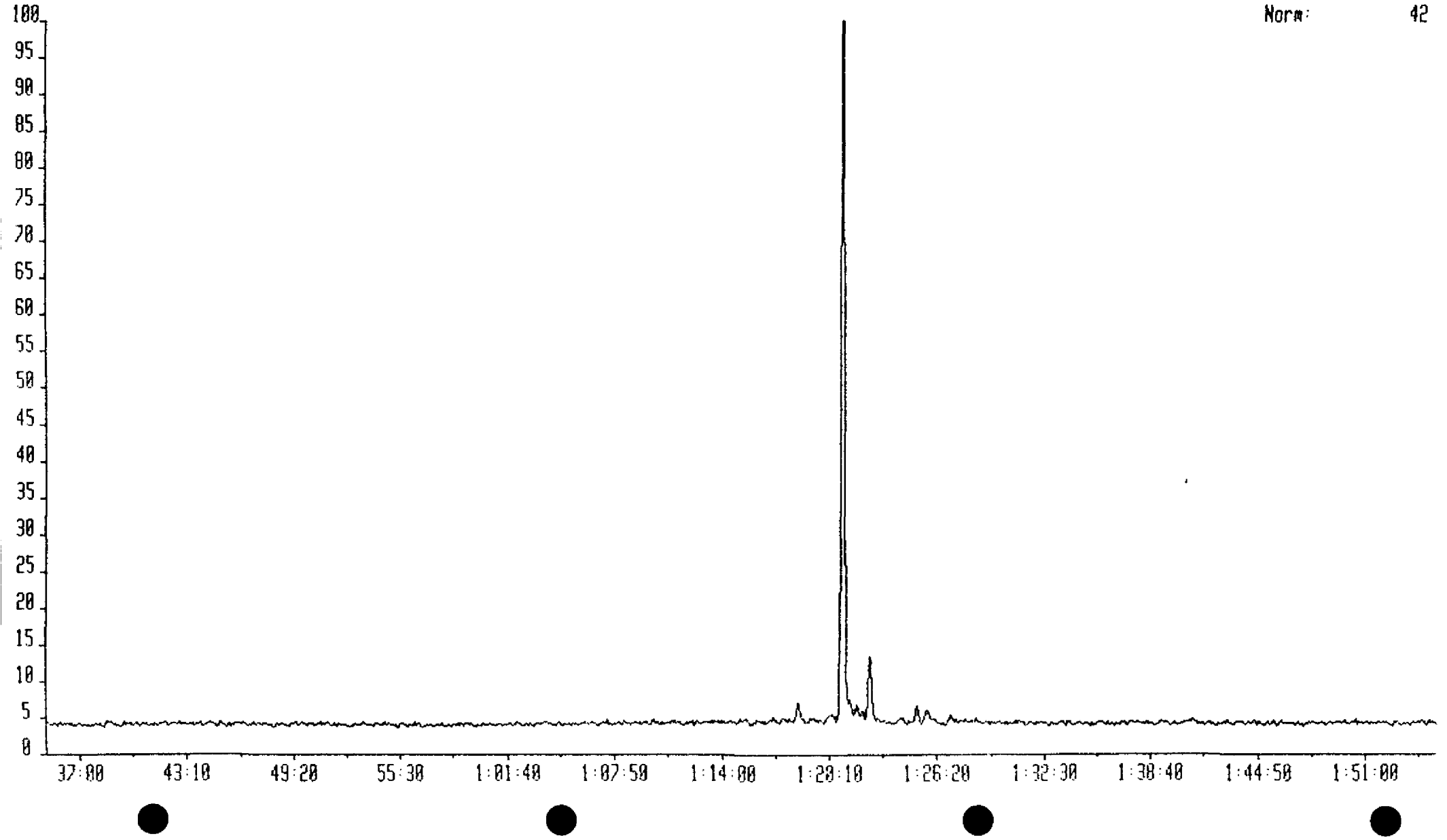
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 12 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:2917



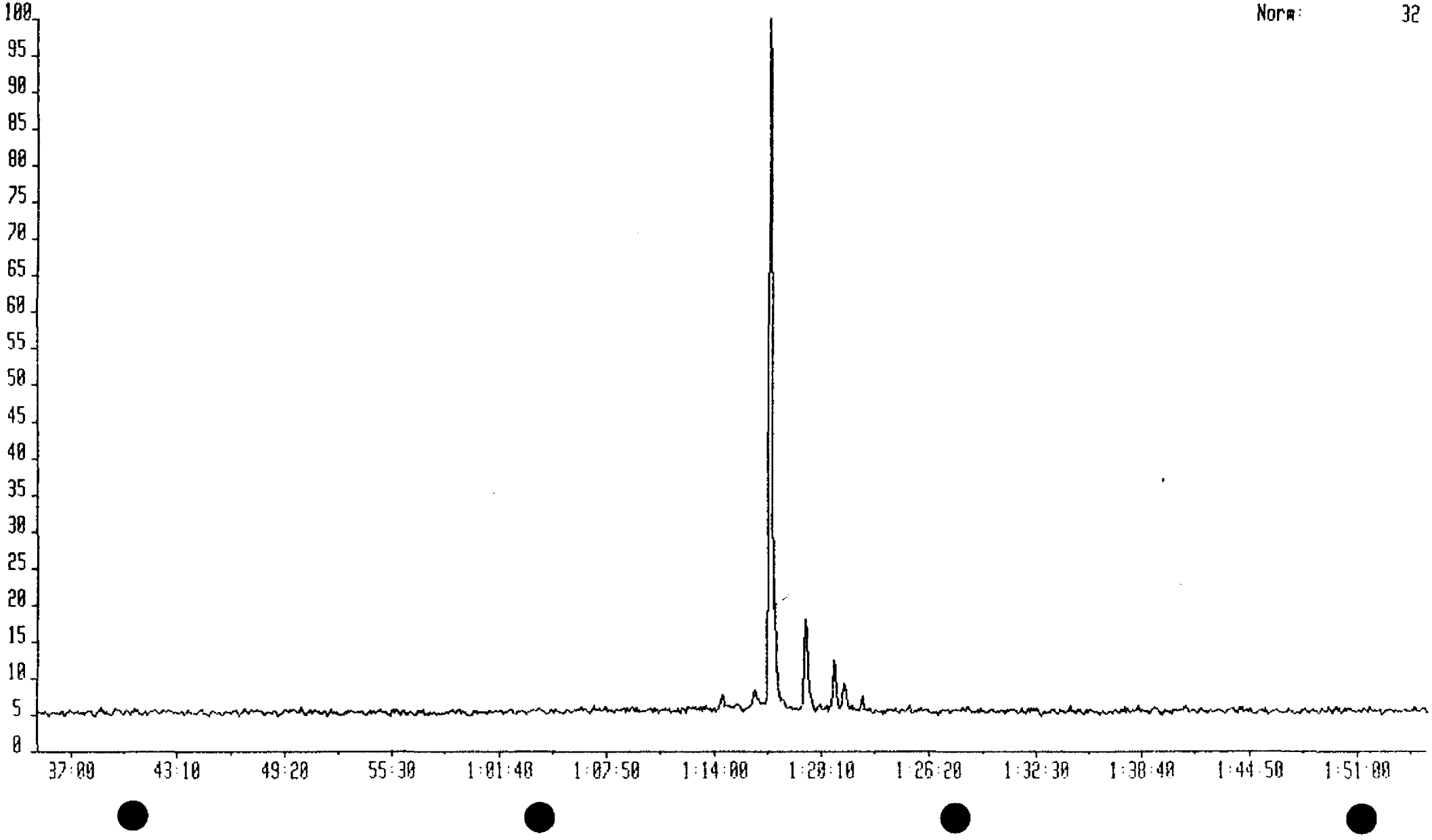
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 12 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:2917



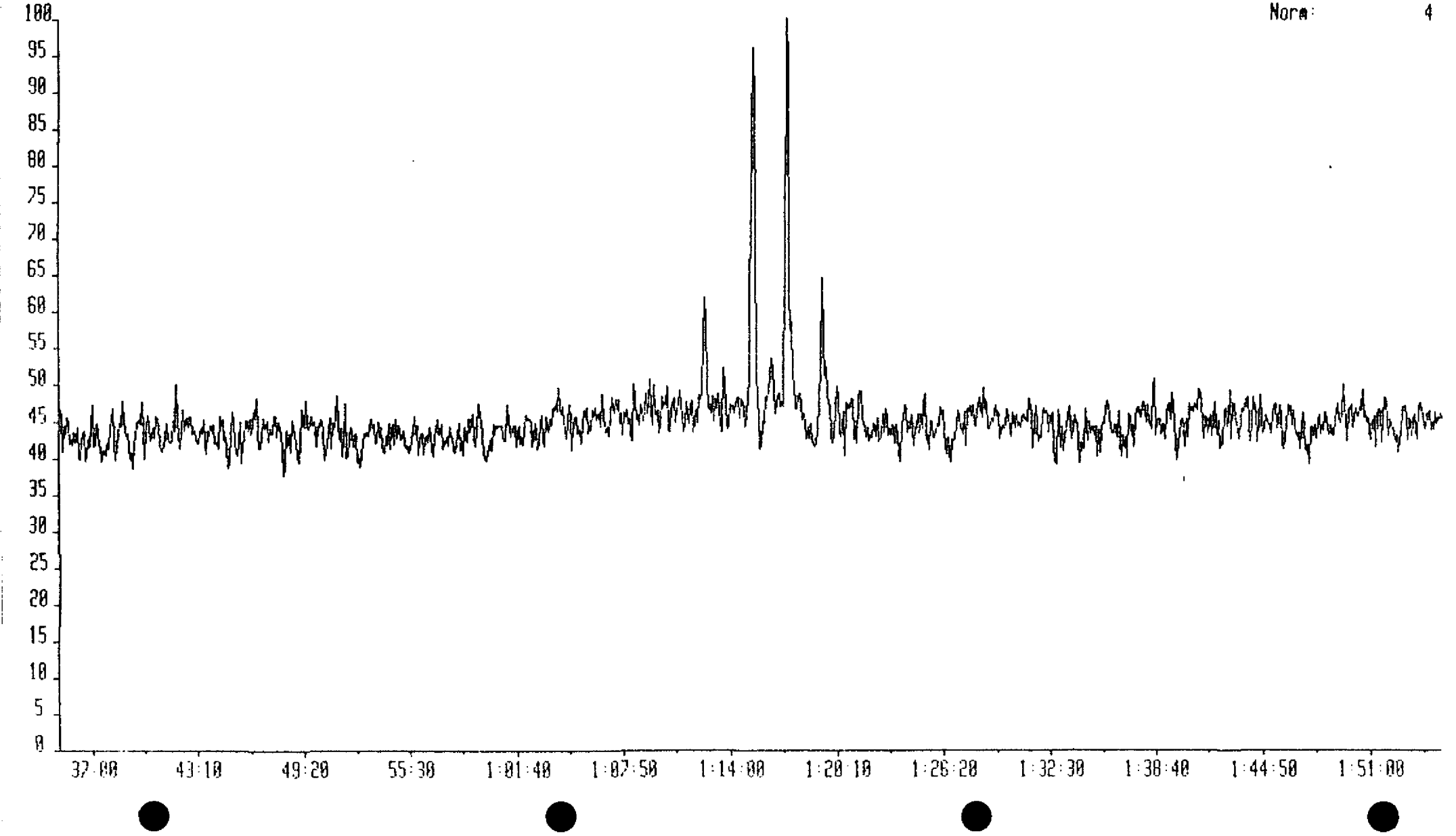
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 12 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:2917



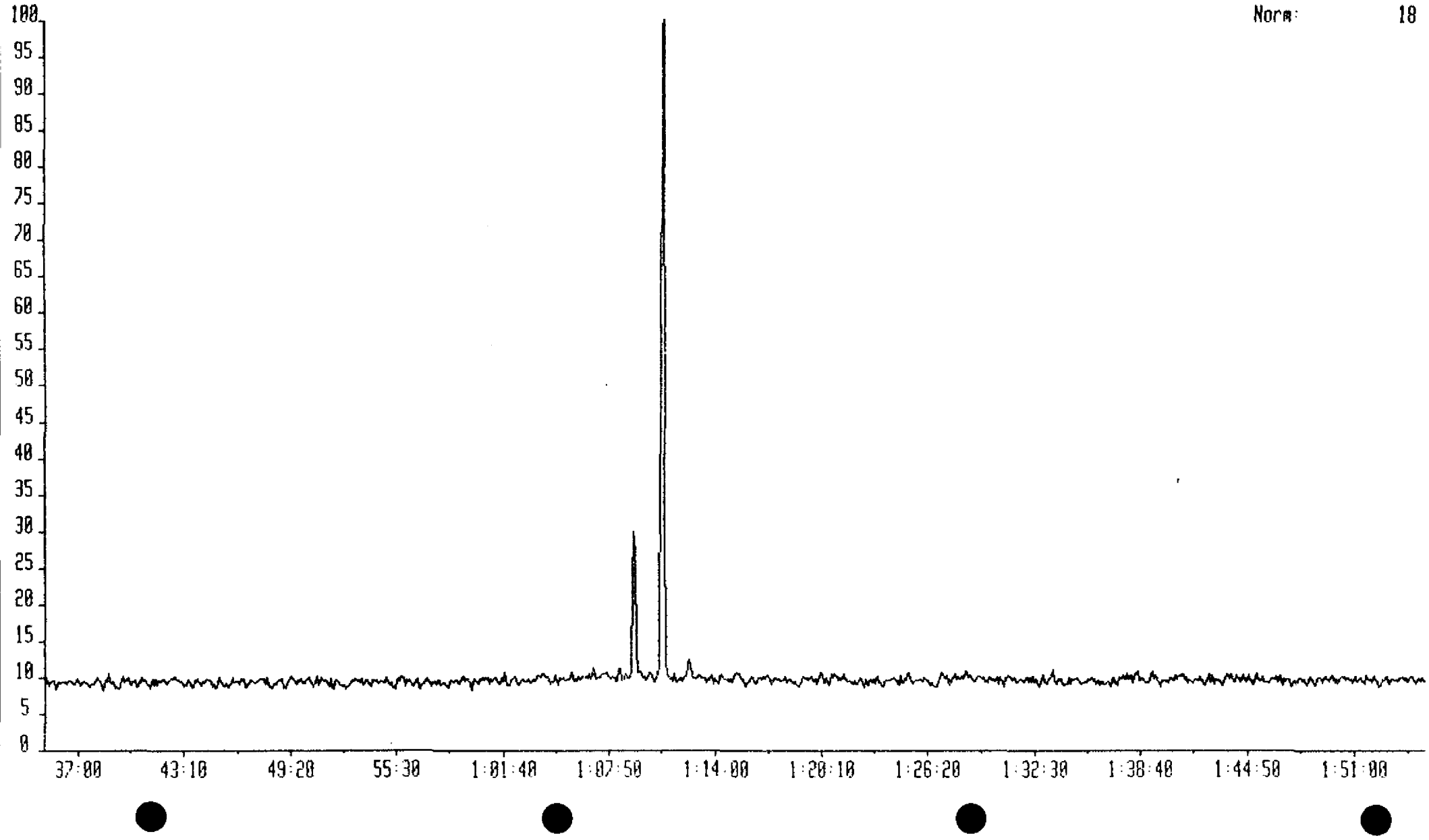
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 12 Injection 1 Group 1 Mass 91.6600 398.0000->191.0000
Text:2917



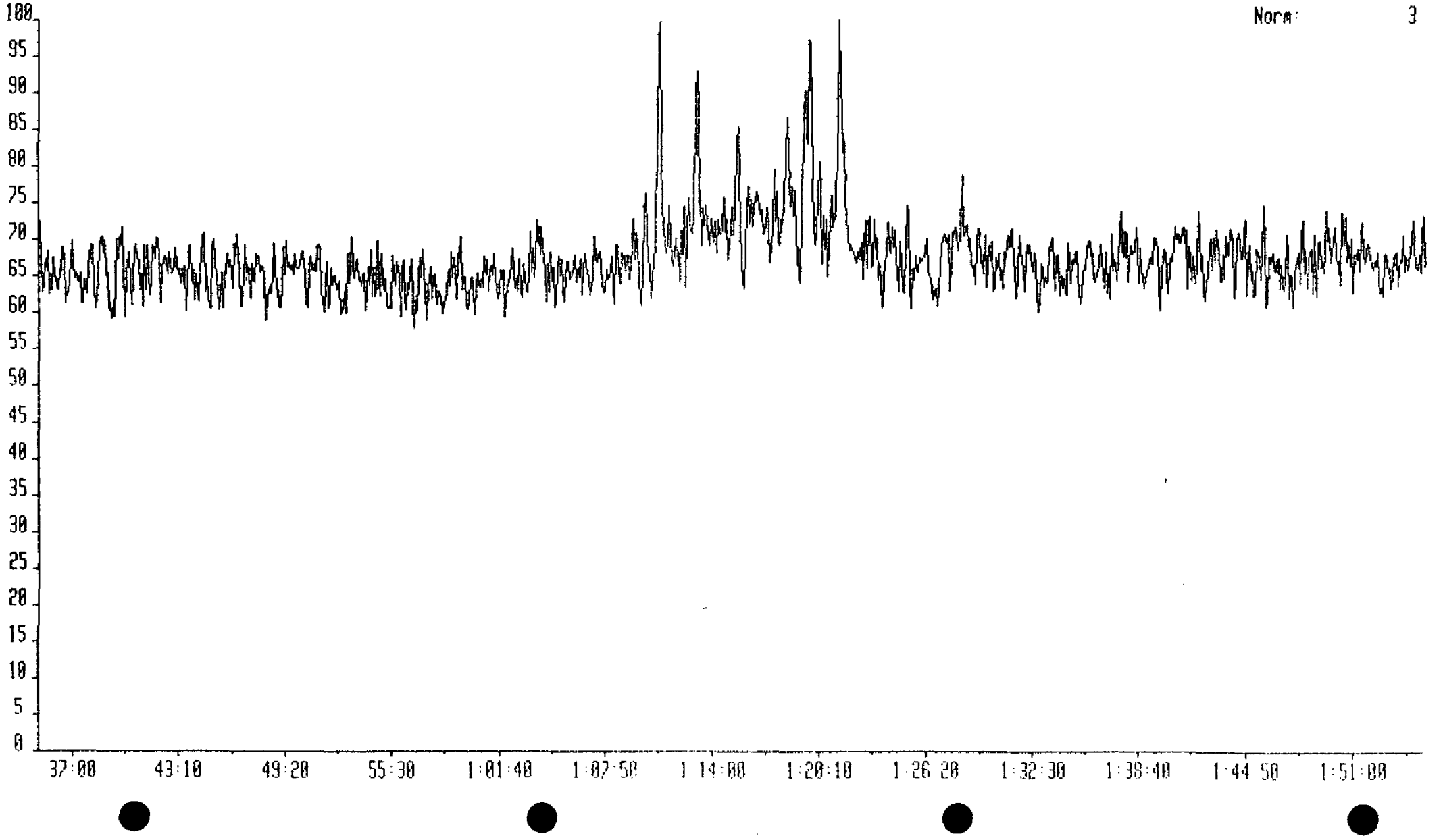
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 12 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:2917



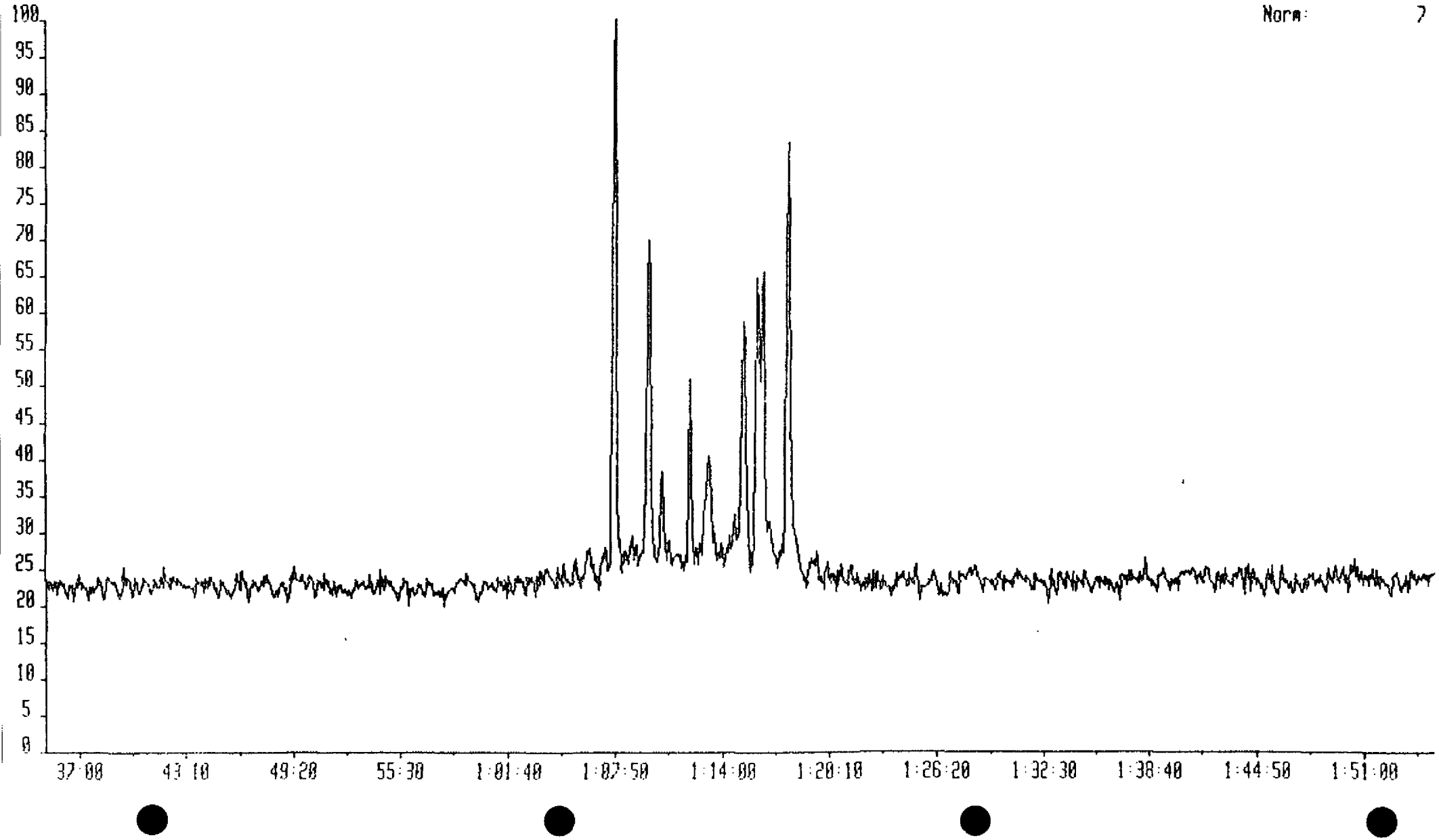
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 12 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:2917



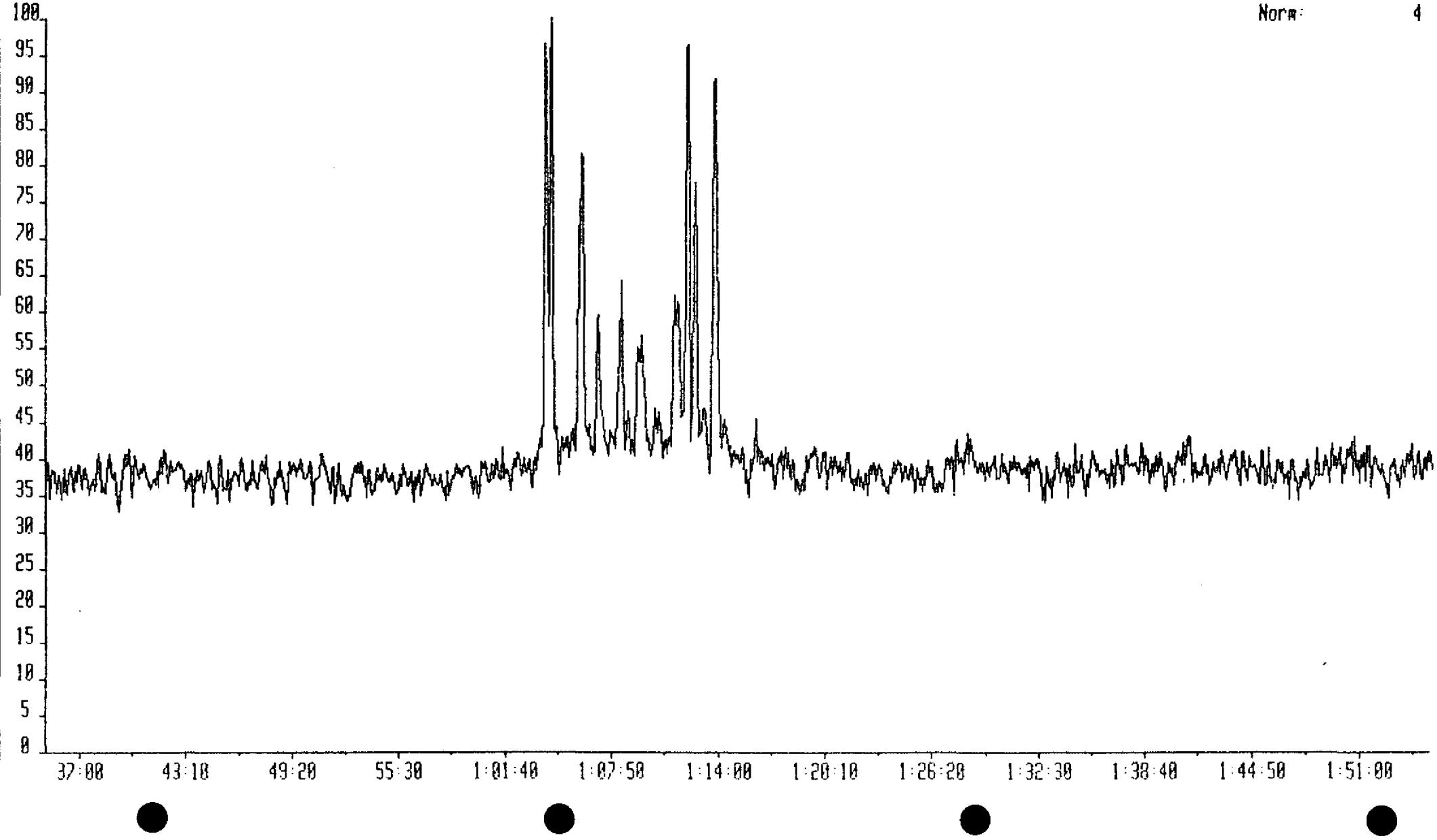
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 12 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:2917



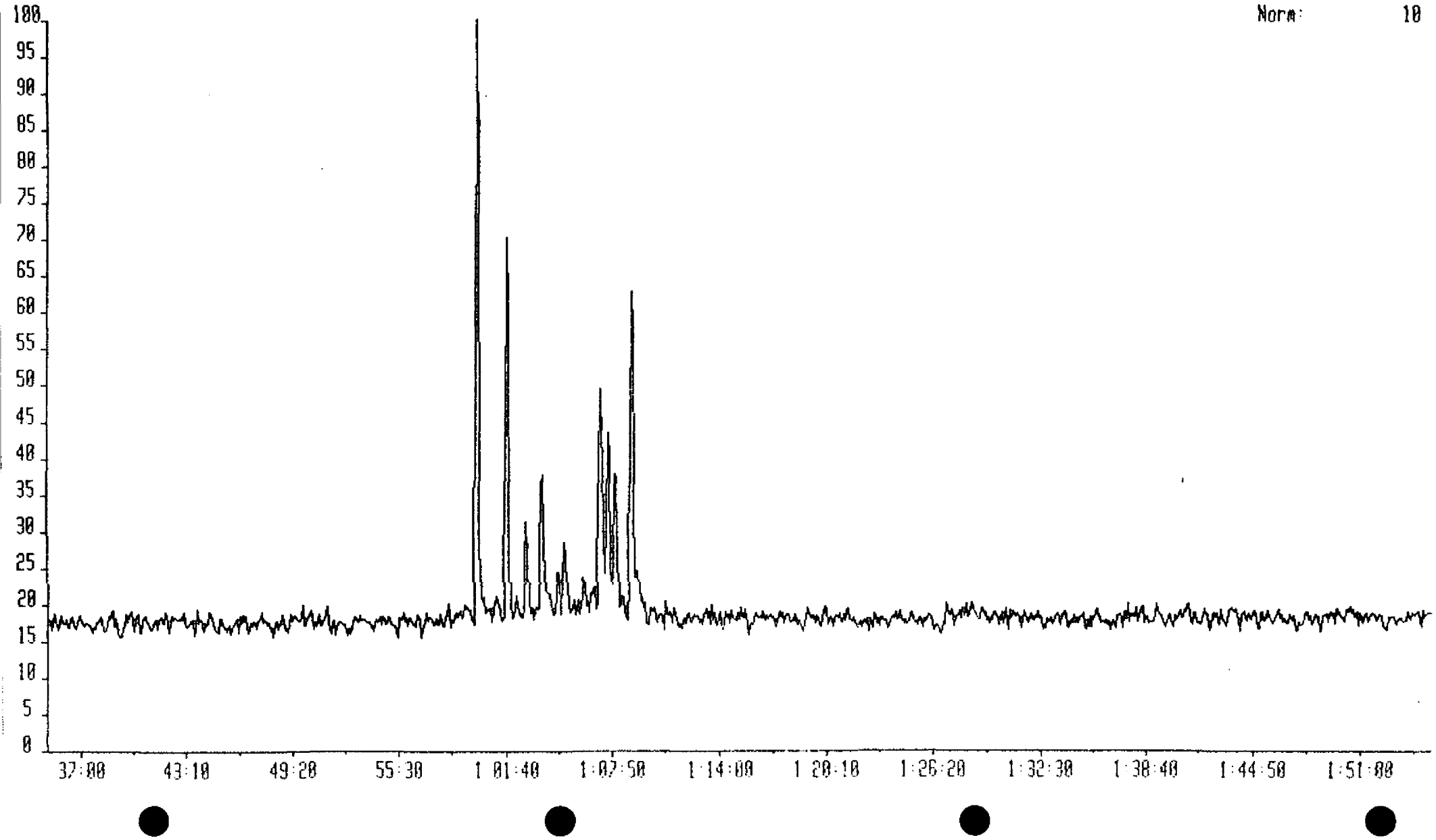
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 12 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:2917



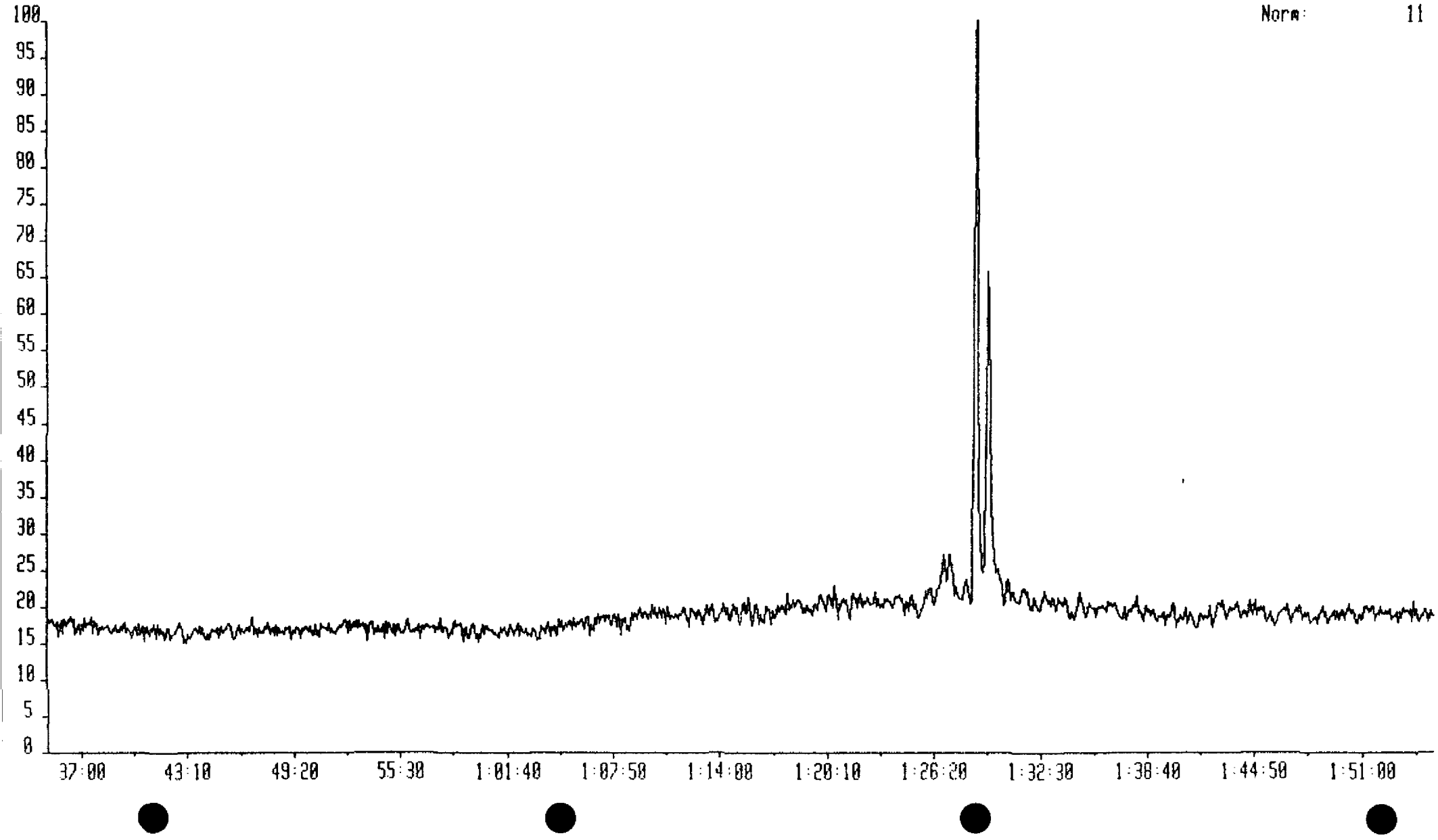
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 12 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:2917



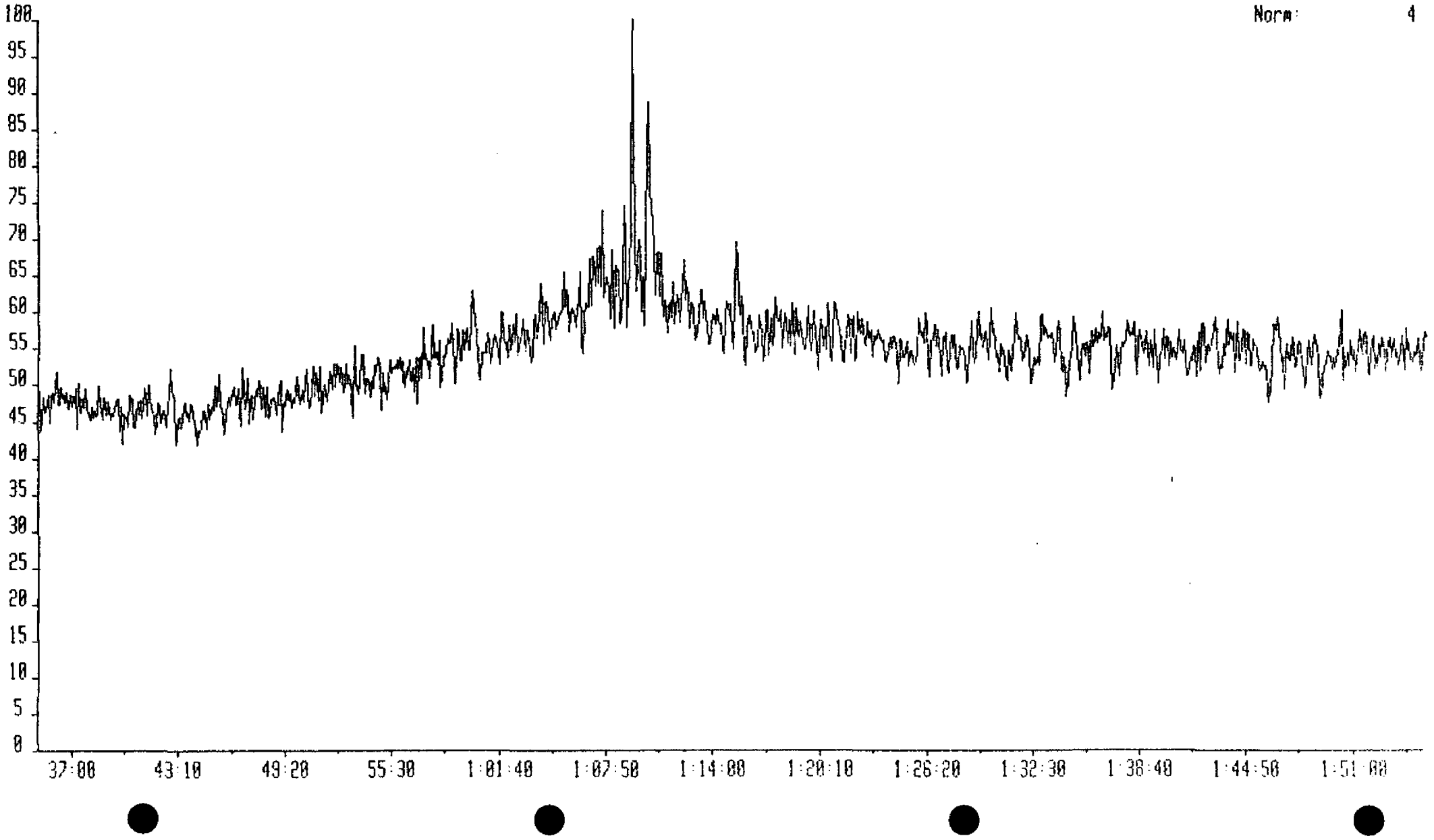
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 12 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:2917



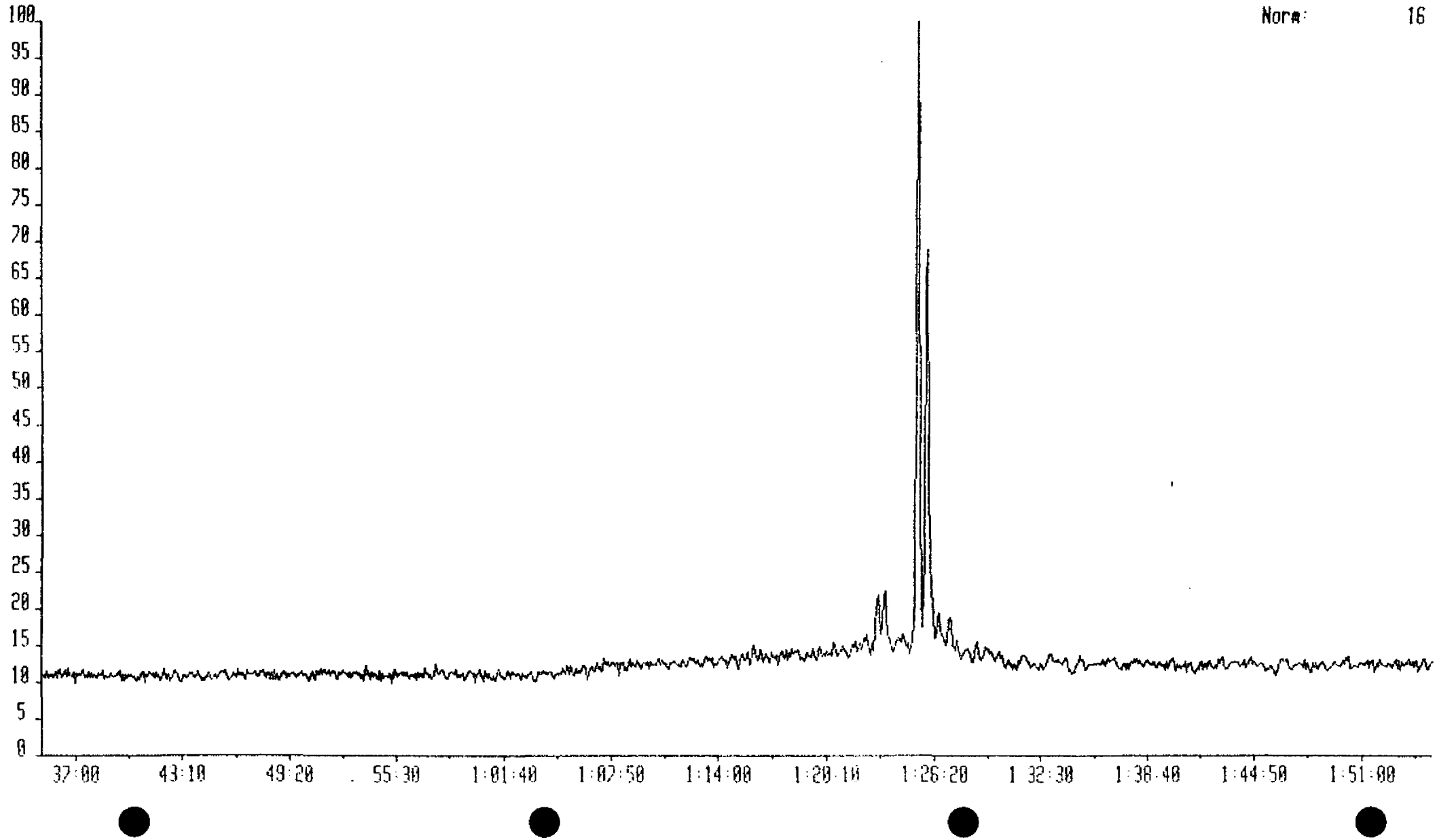
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 13 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:STD



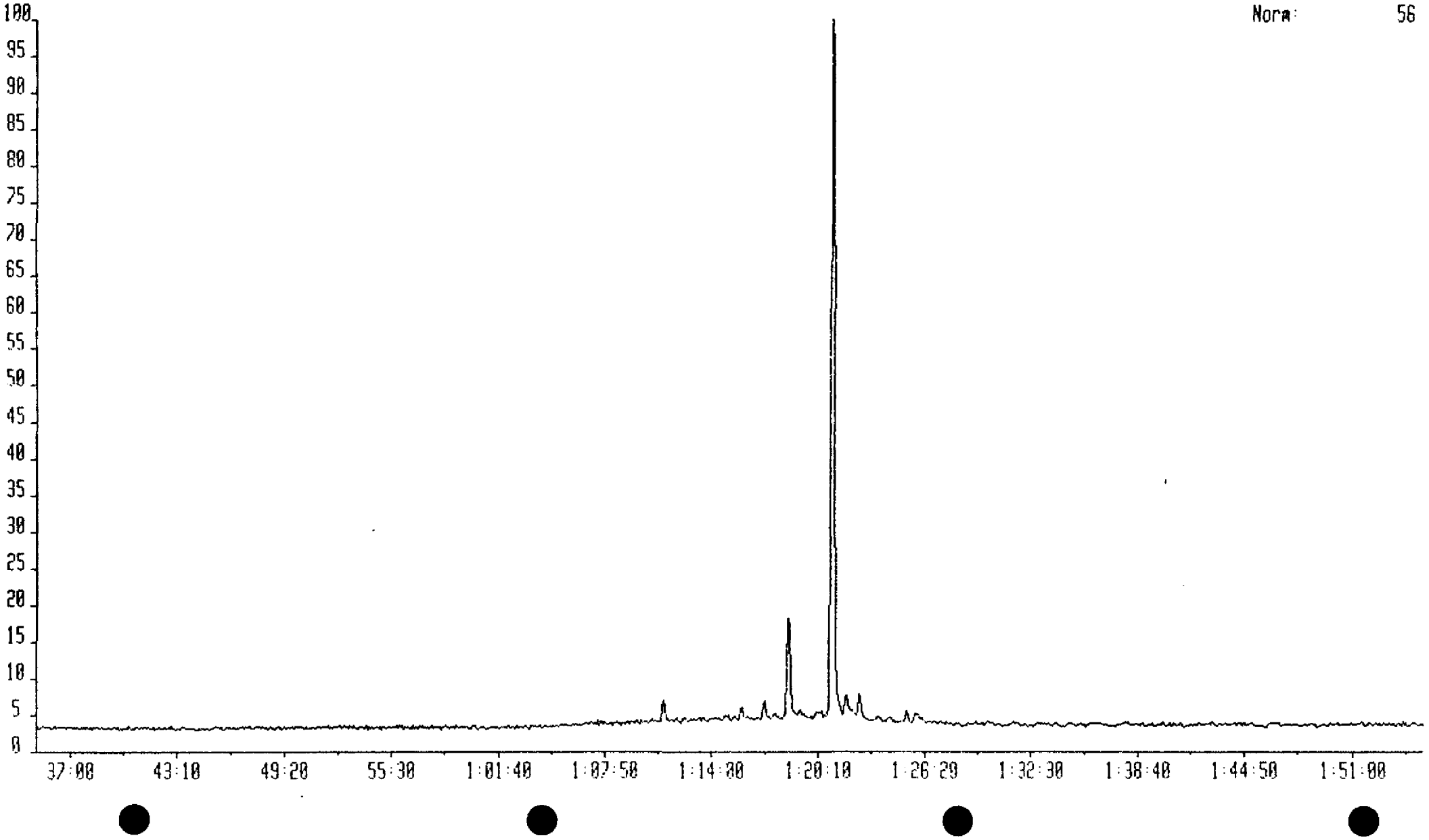
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 13 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:STD



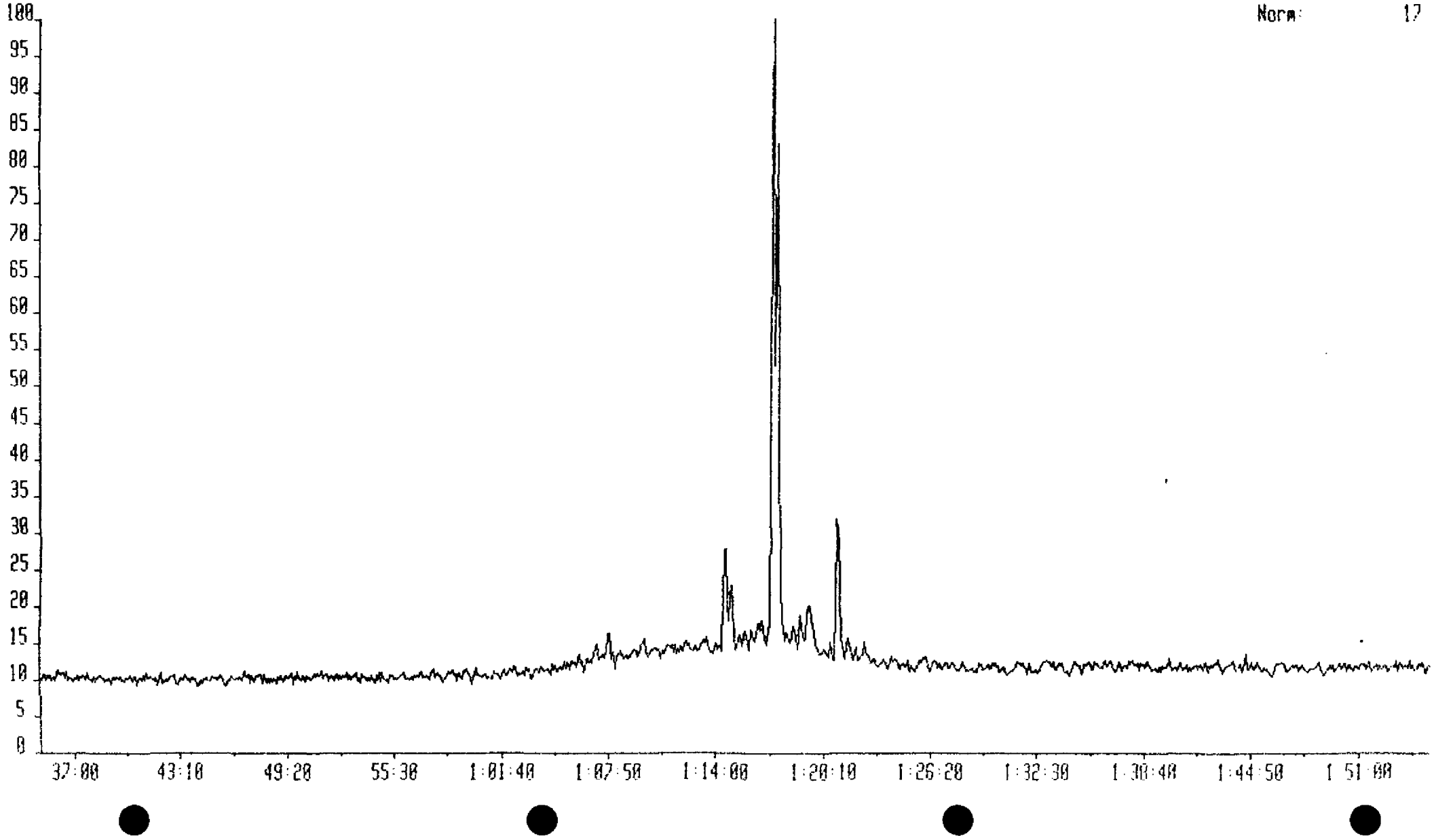
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 13 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:STD



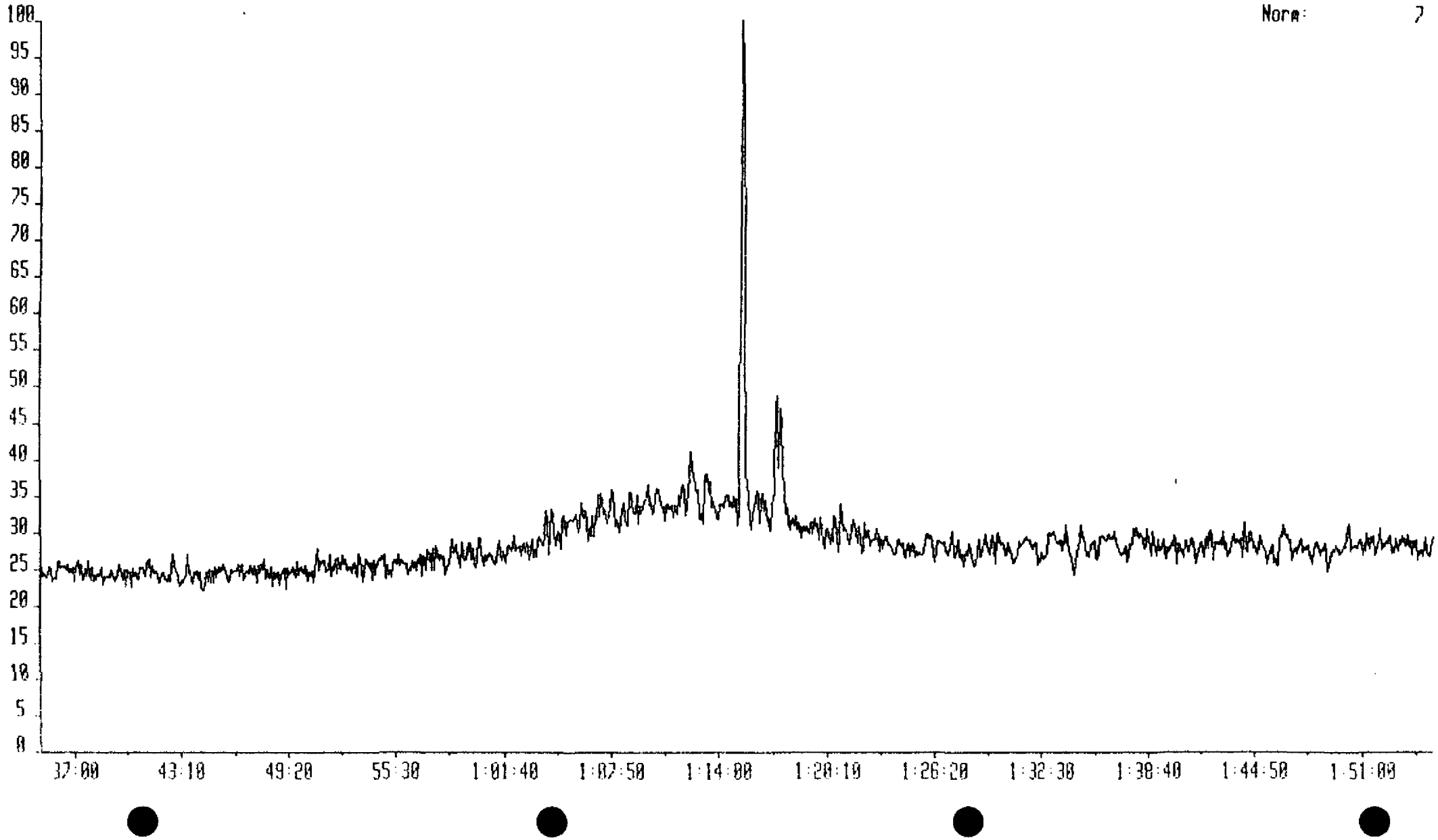
ASB10037 10-MAR-87 Sir:Reaction 70E Rcnt:NH System:SMGC
Sample 13 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:STD



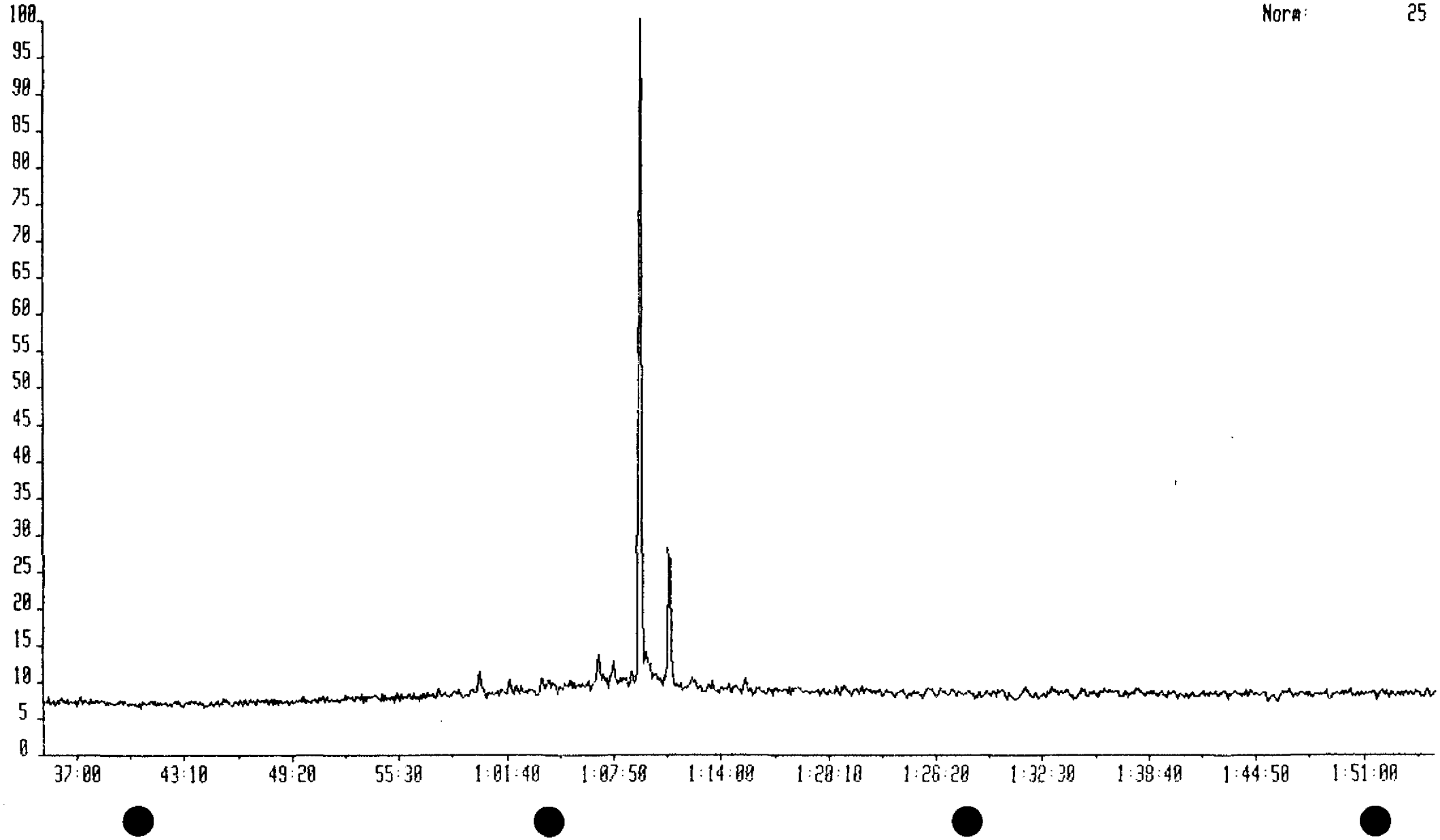
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 13 Injection 1 Group 1 Mass 91.6608 398.0000->191.0000
Text:STD



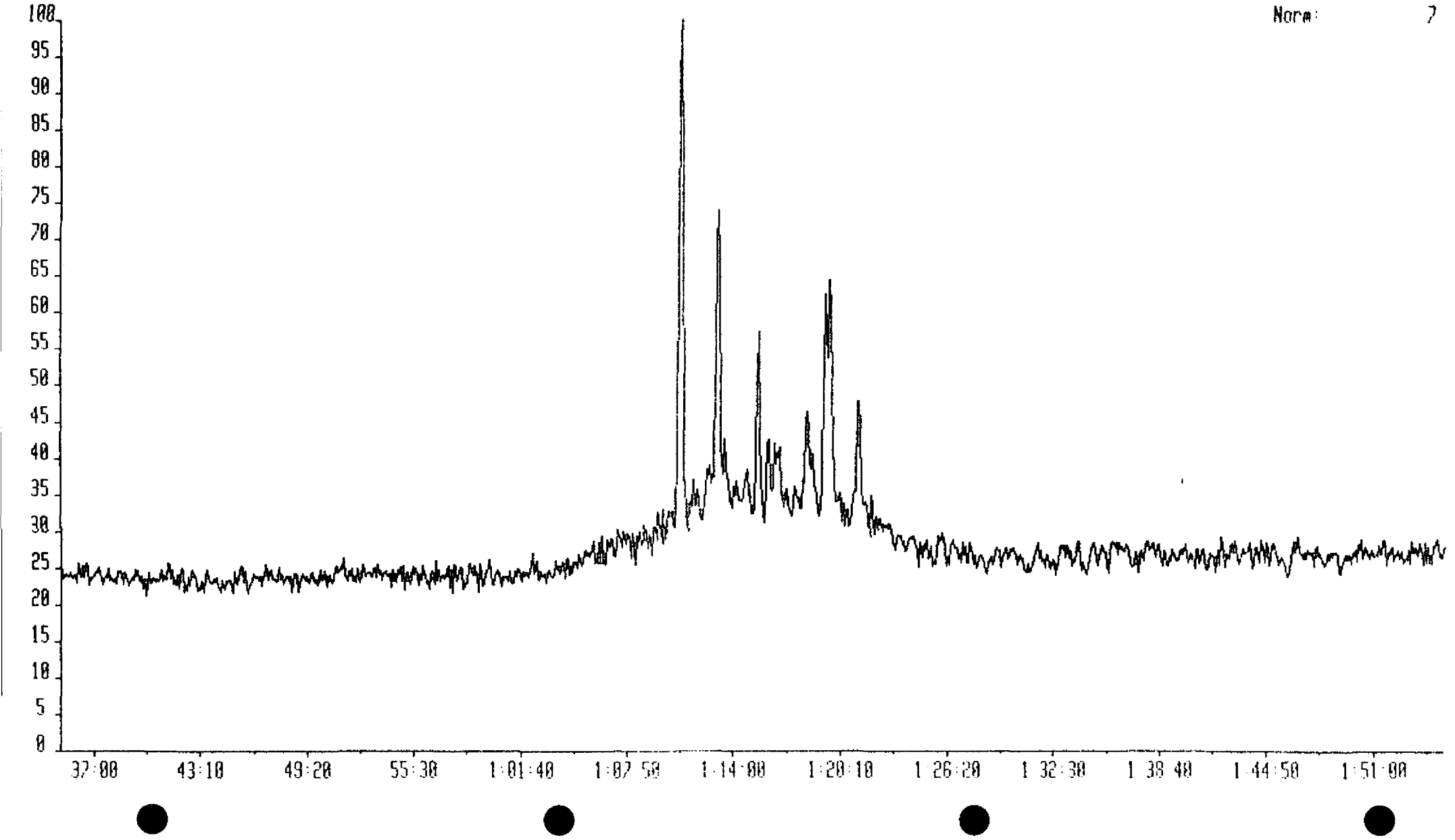
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 13 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:STD



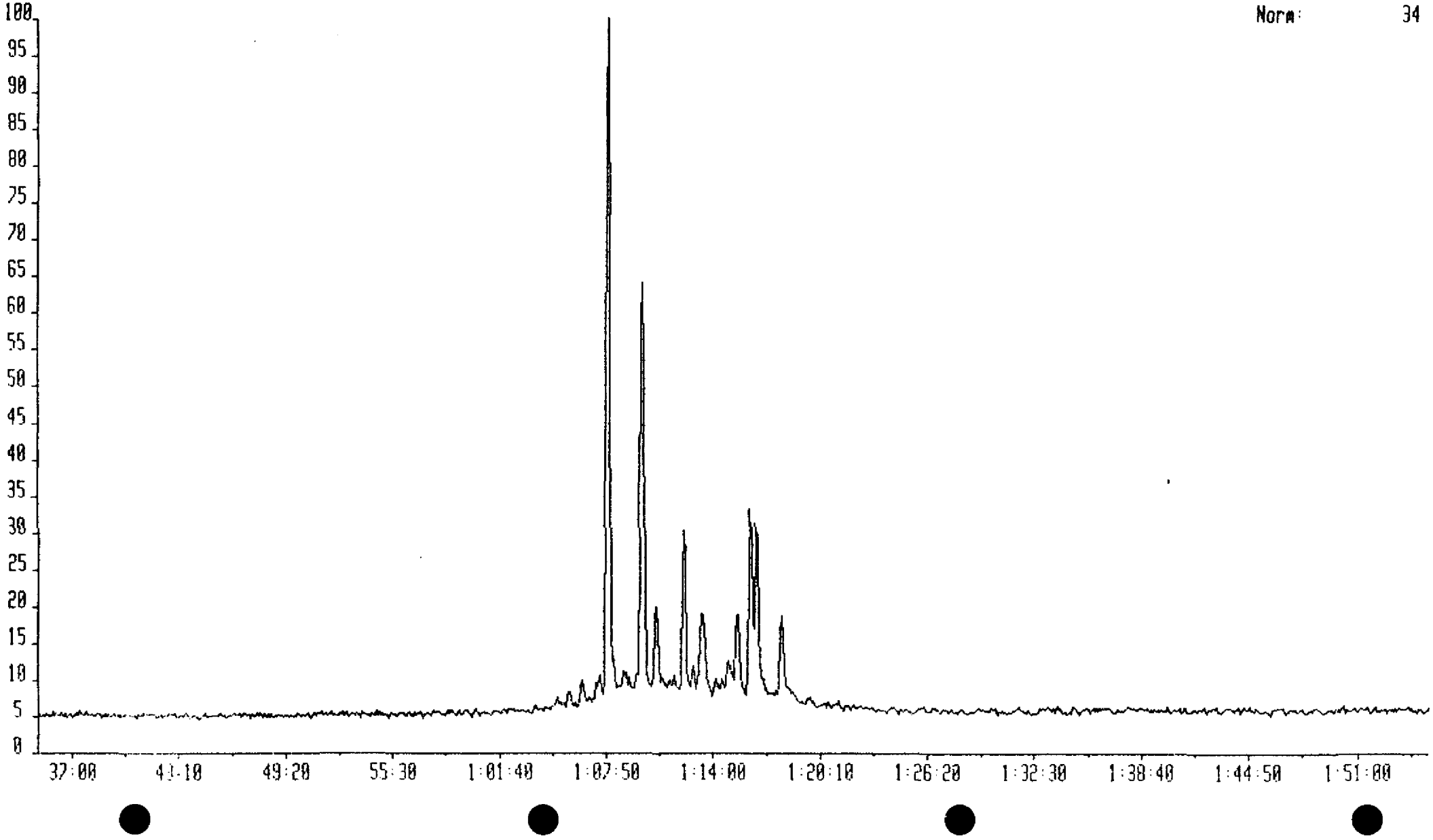
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 13 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:STD



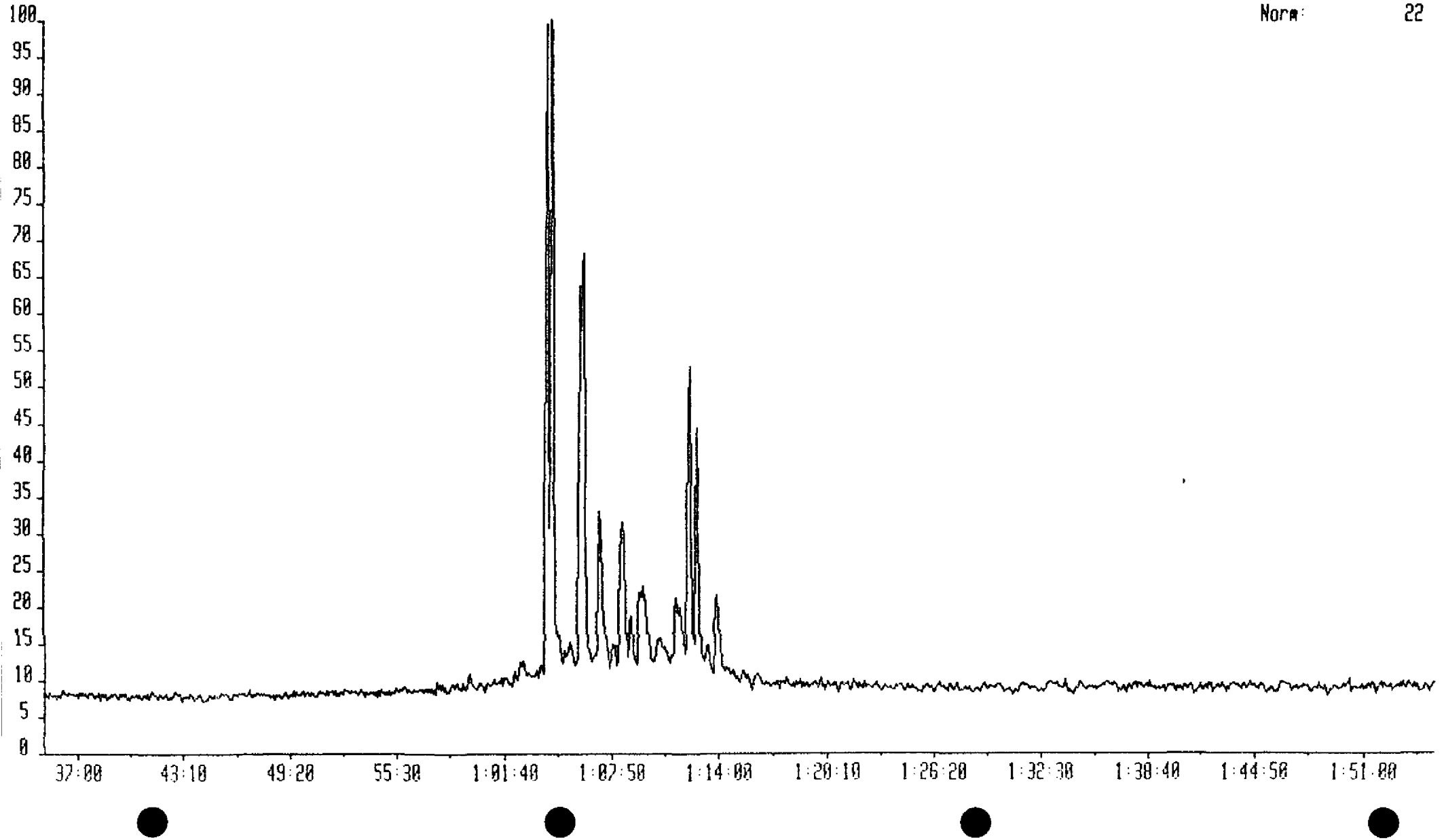
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 13 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:STD



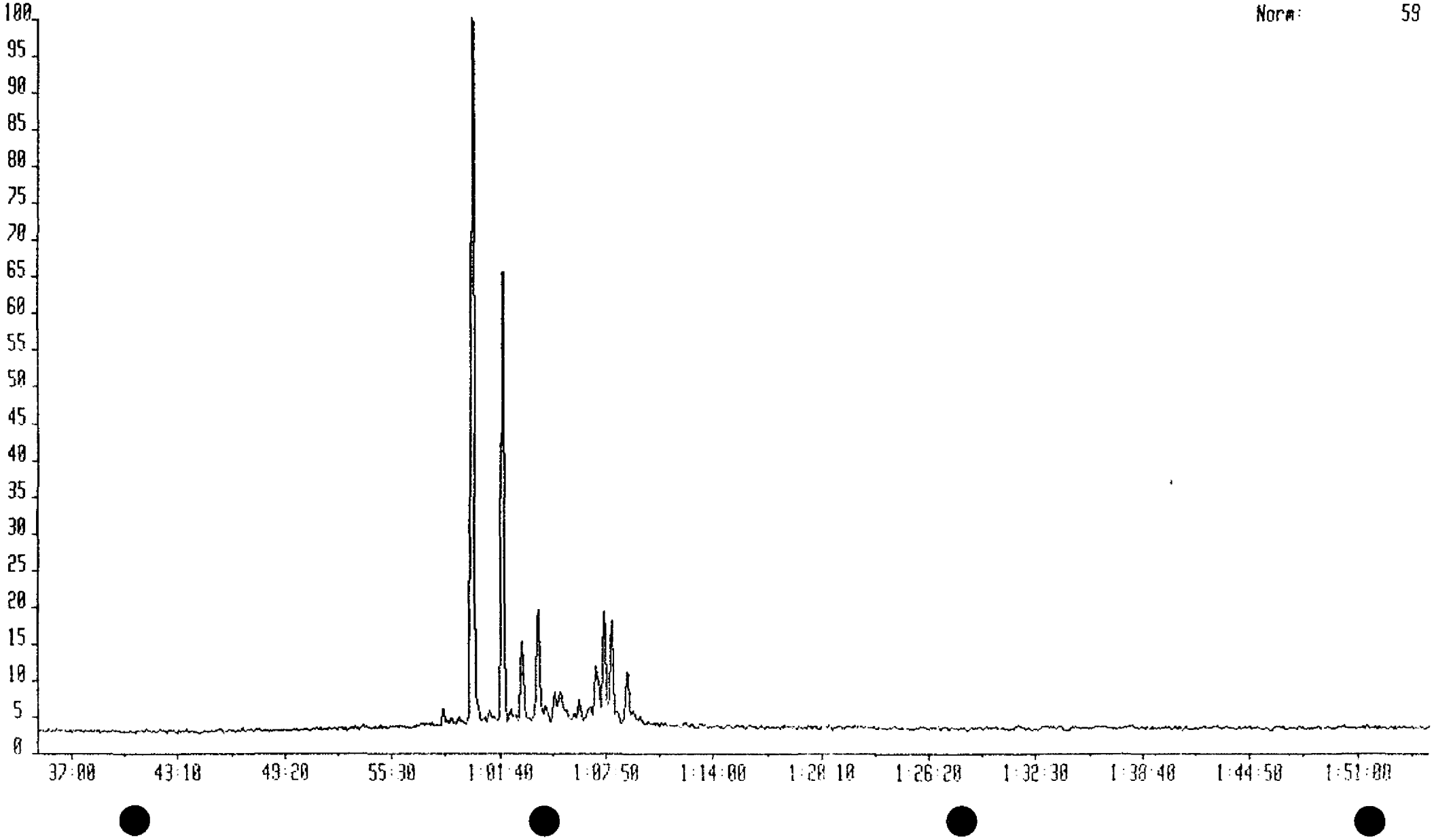
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 13 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:STD



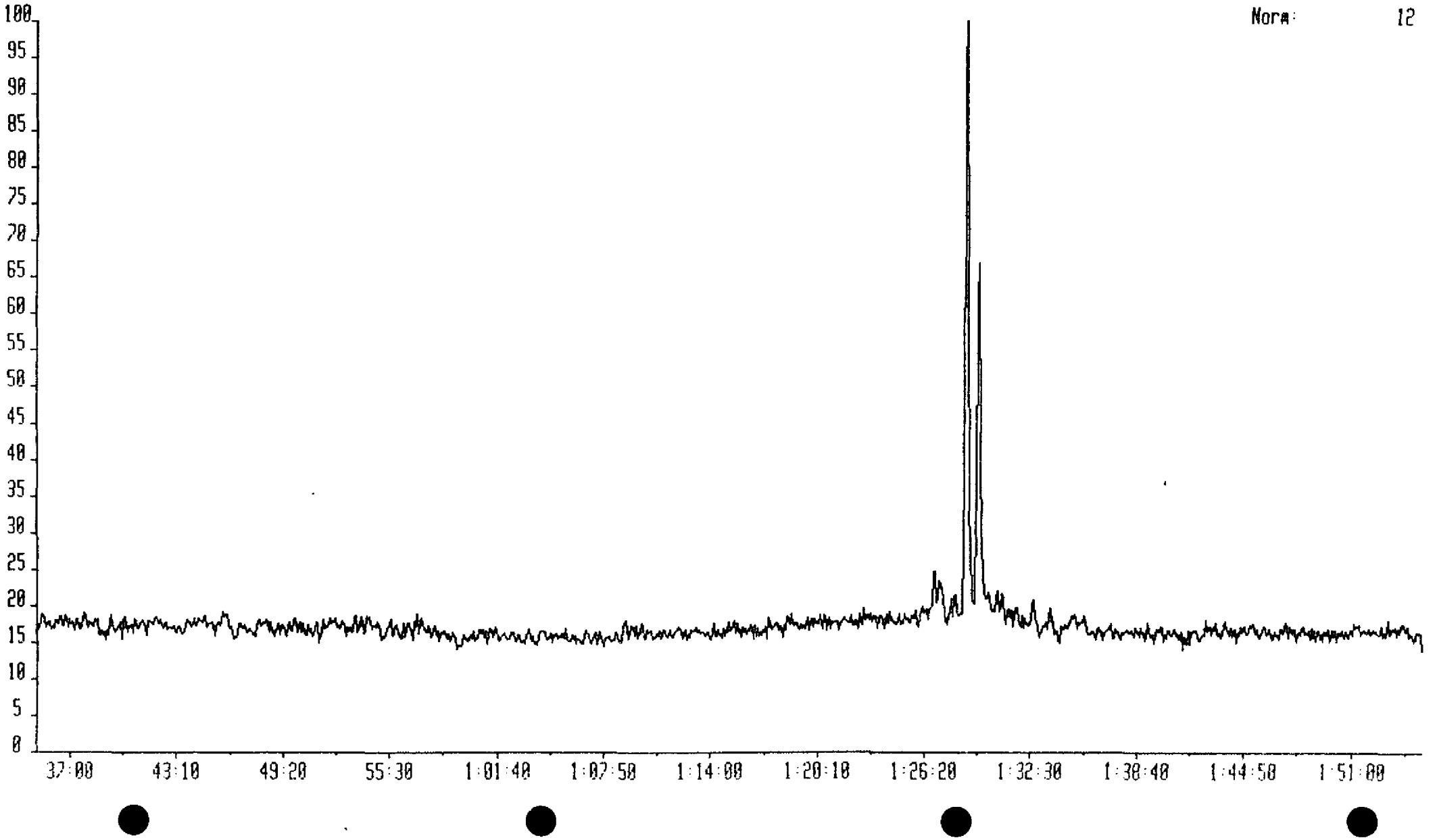
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 13 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:STD



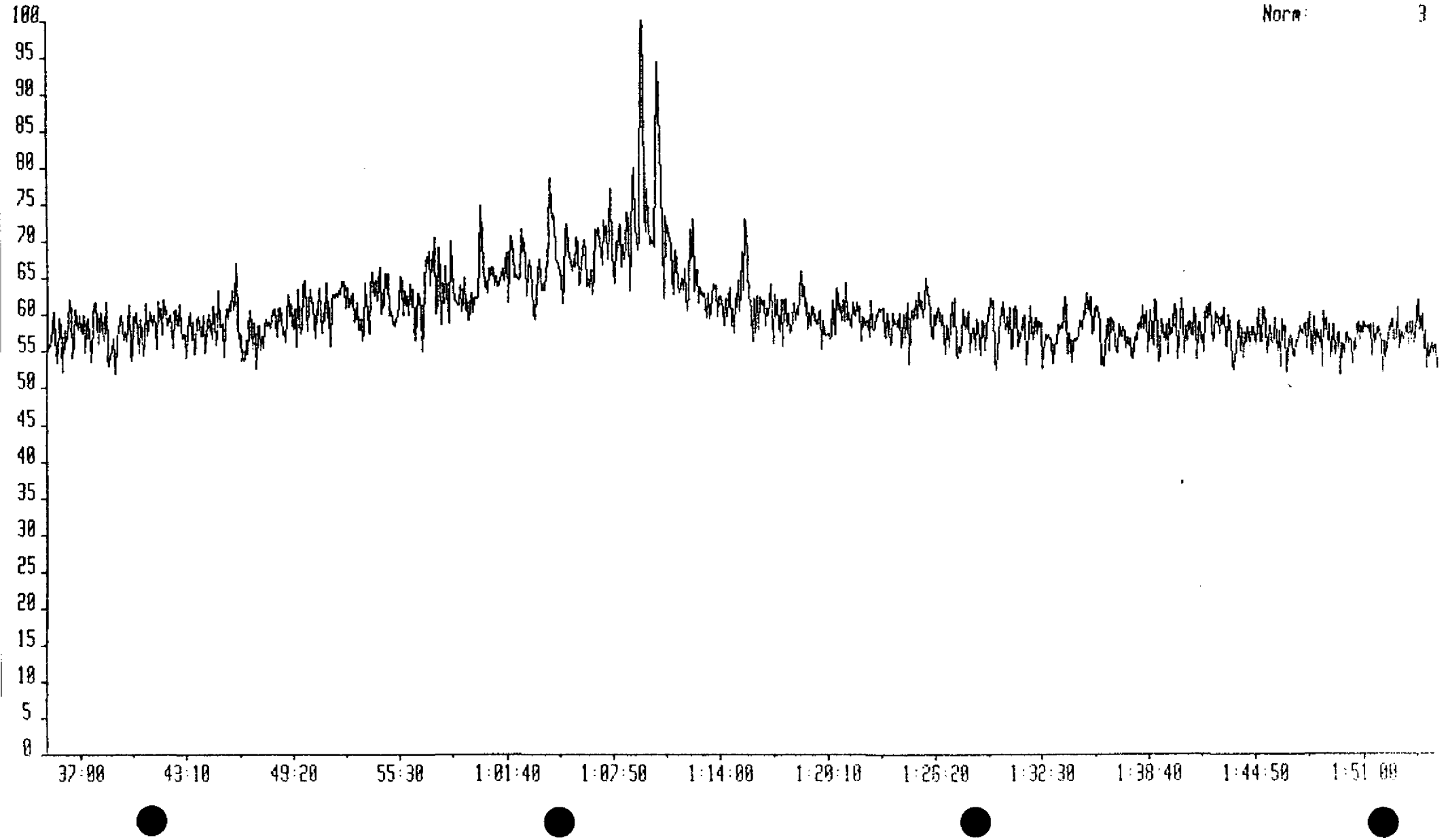
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 13 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:STD



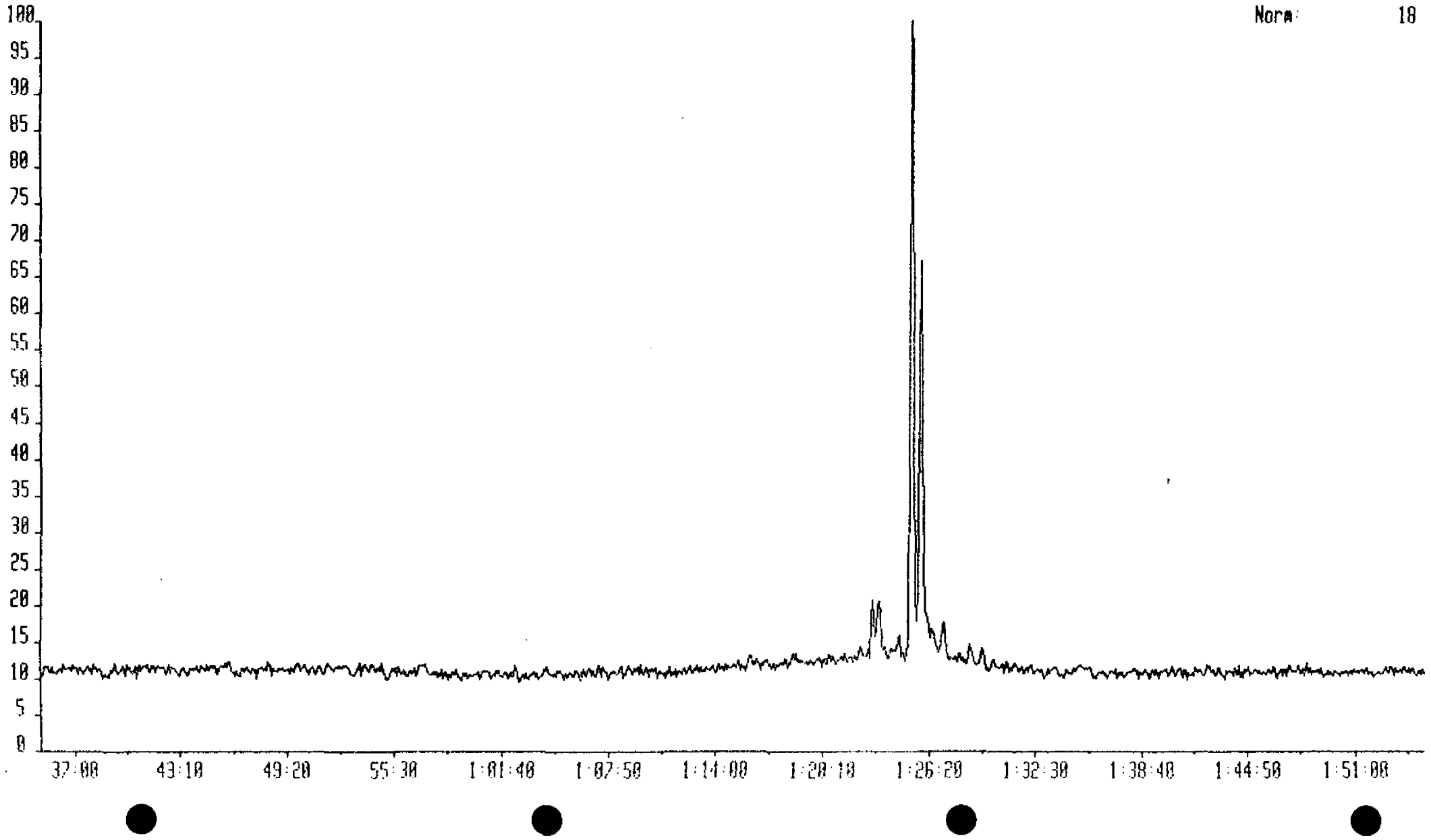
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 14 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:DST 2



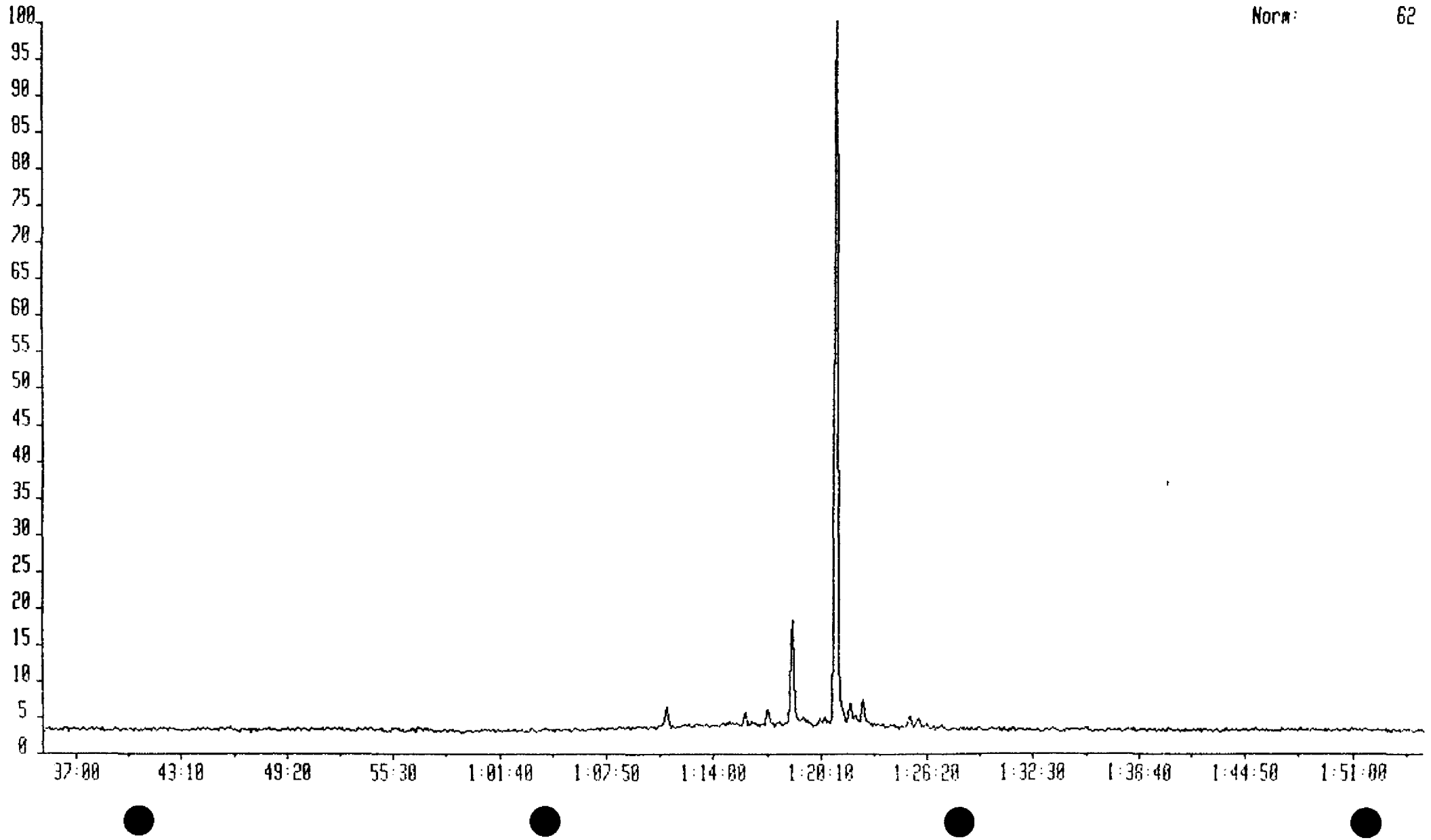
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 14 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:DST 2



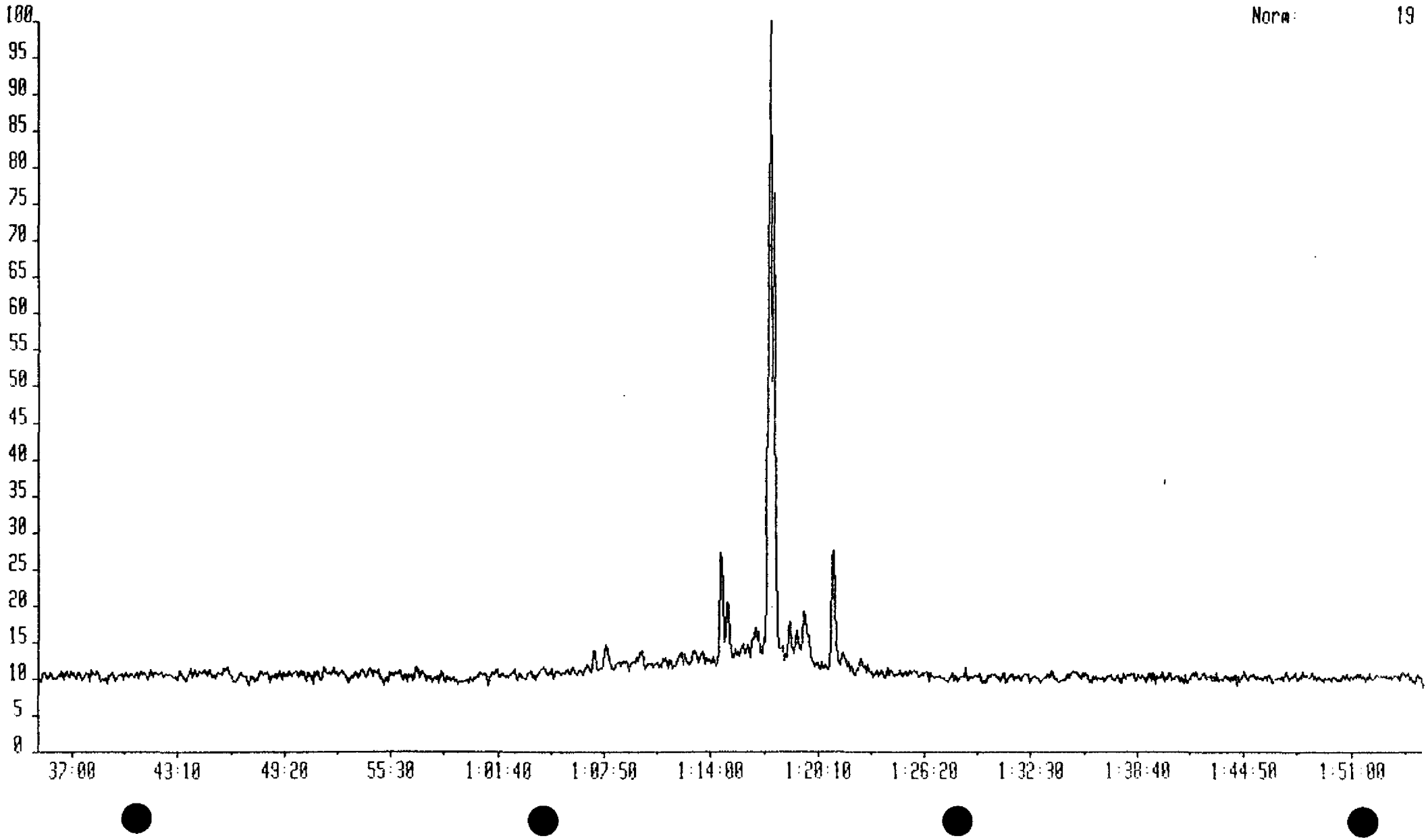
ASB10037 10-MAR-07 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 14 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:DST 2



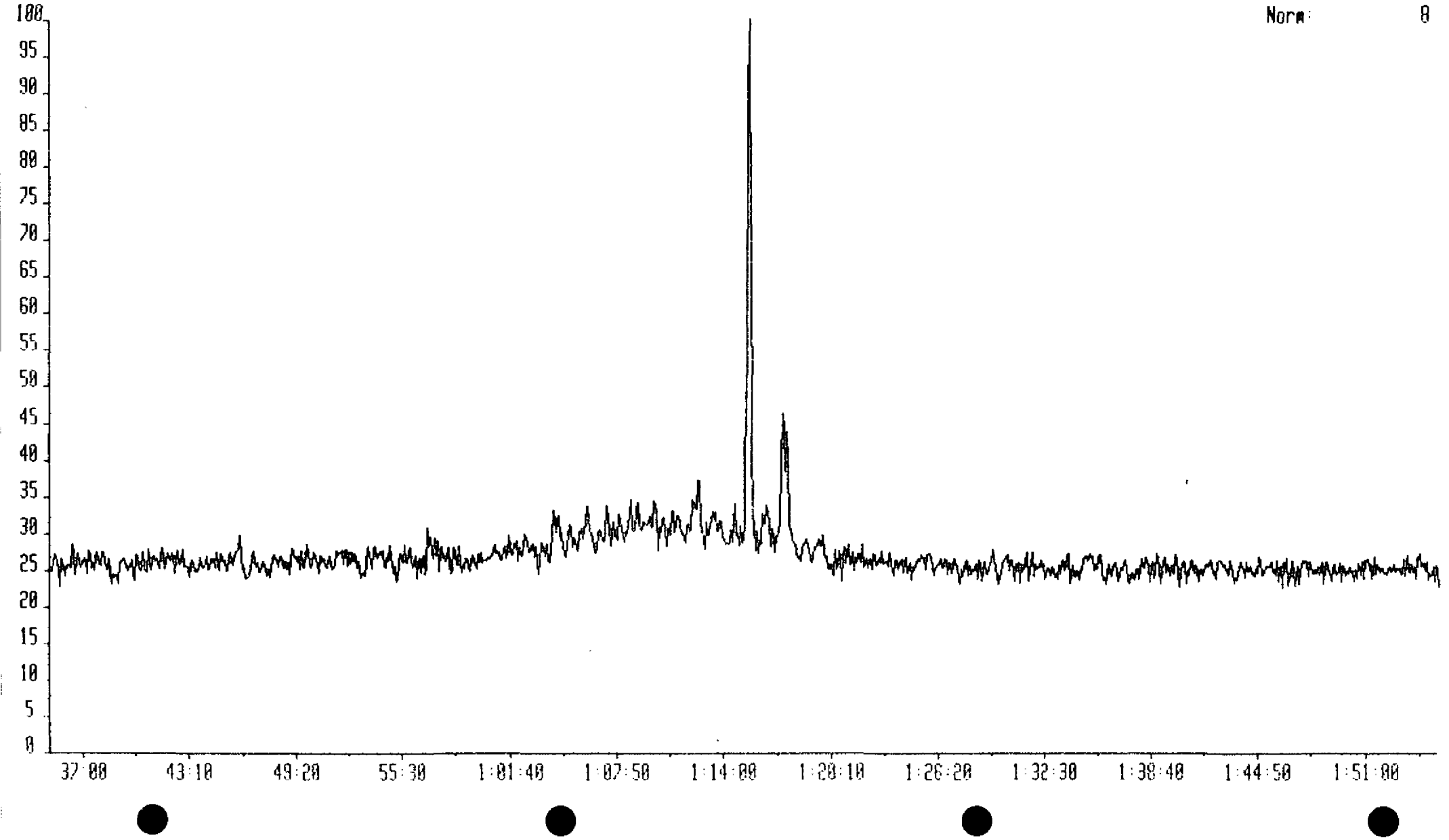
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 14 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:DST 2



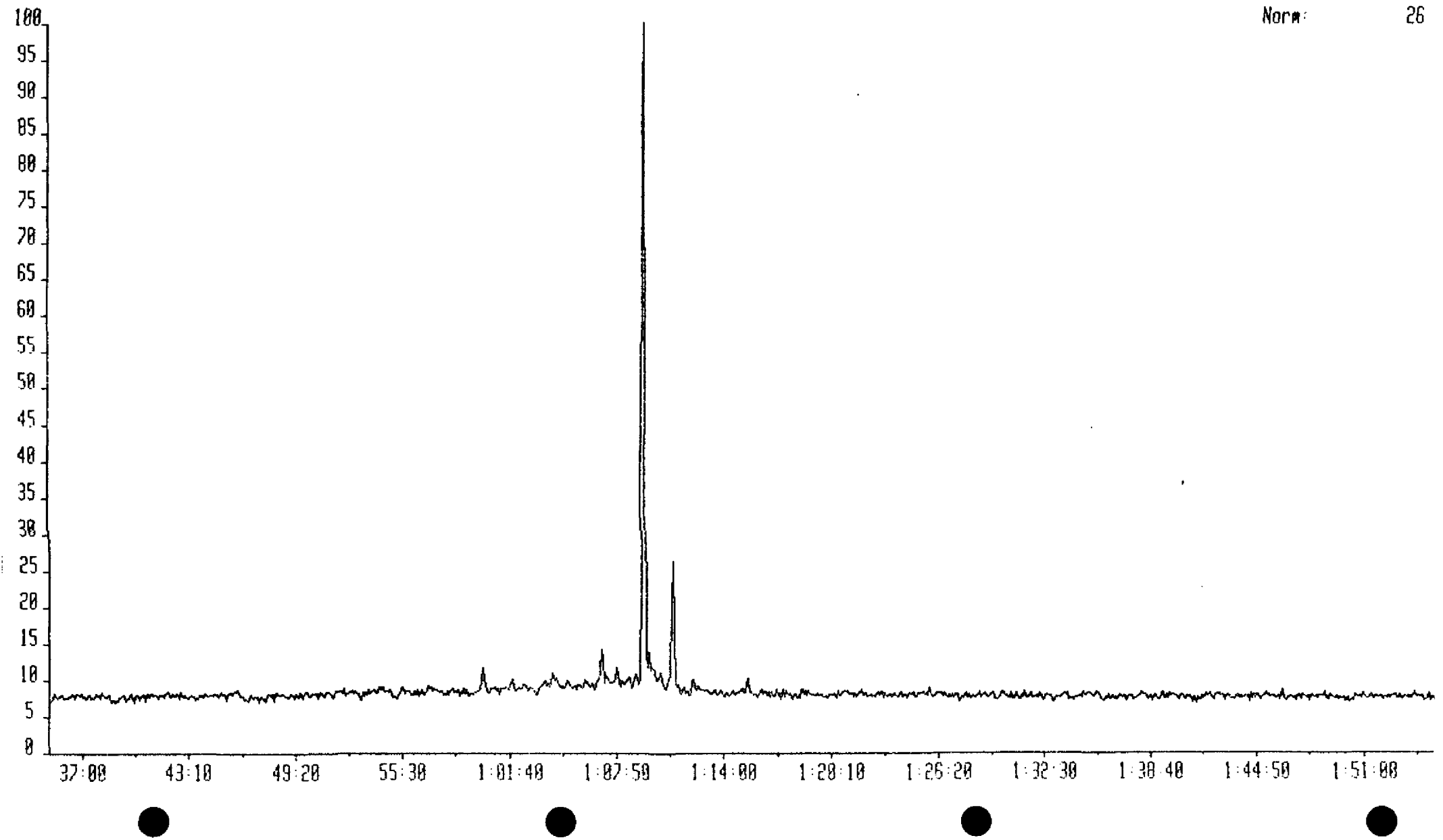
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 14 Injection 1 Group 1 Mass 91.6600 398.0000->191.0000
Text:DST 2



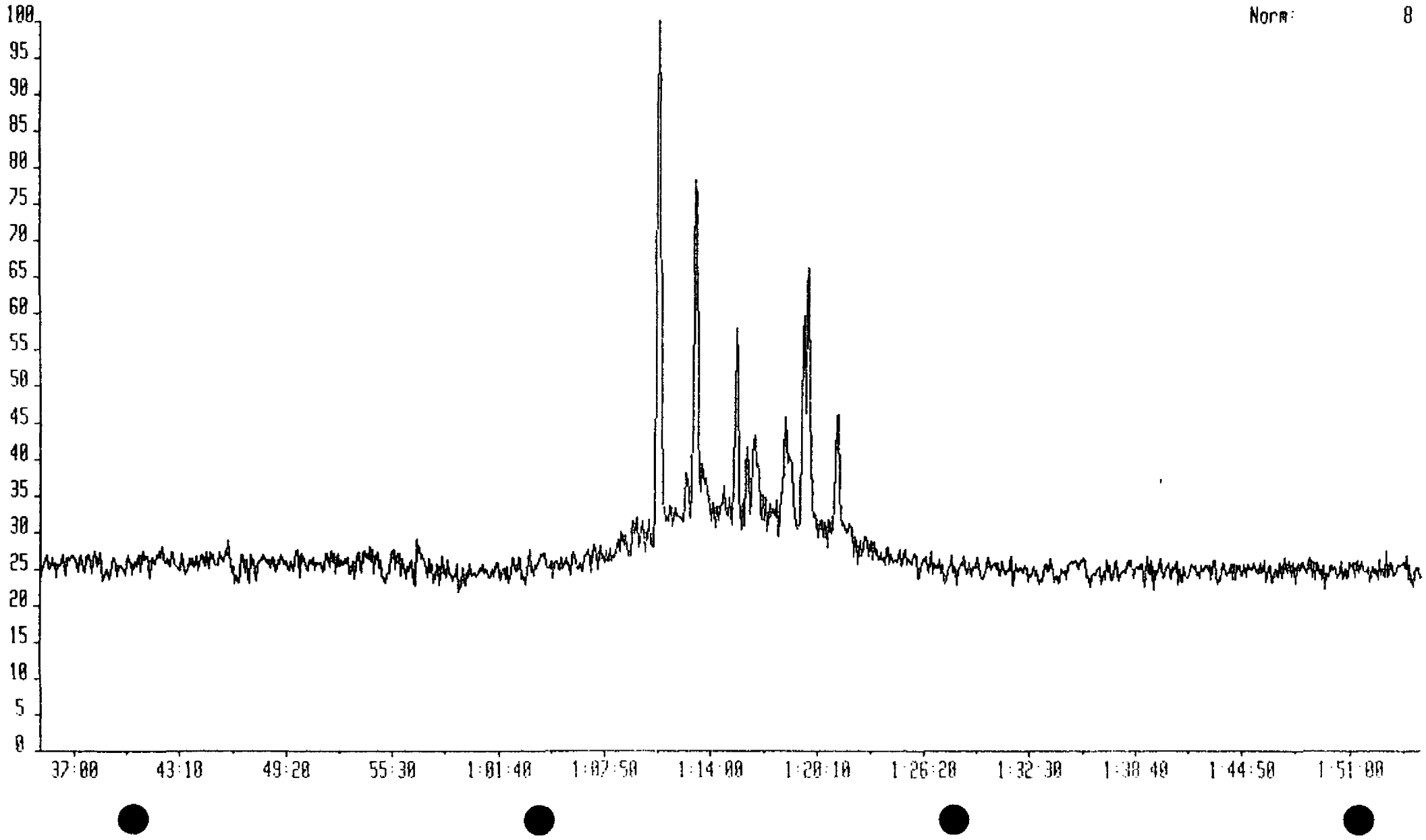
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 14 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:OST 2



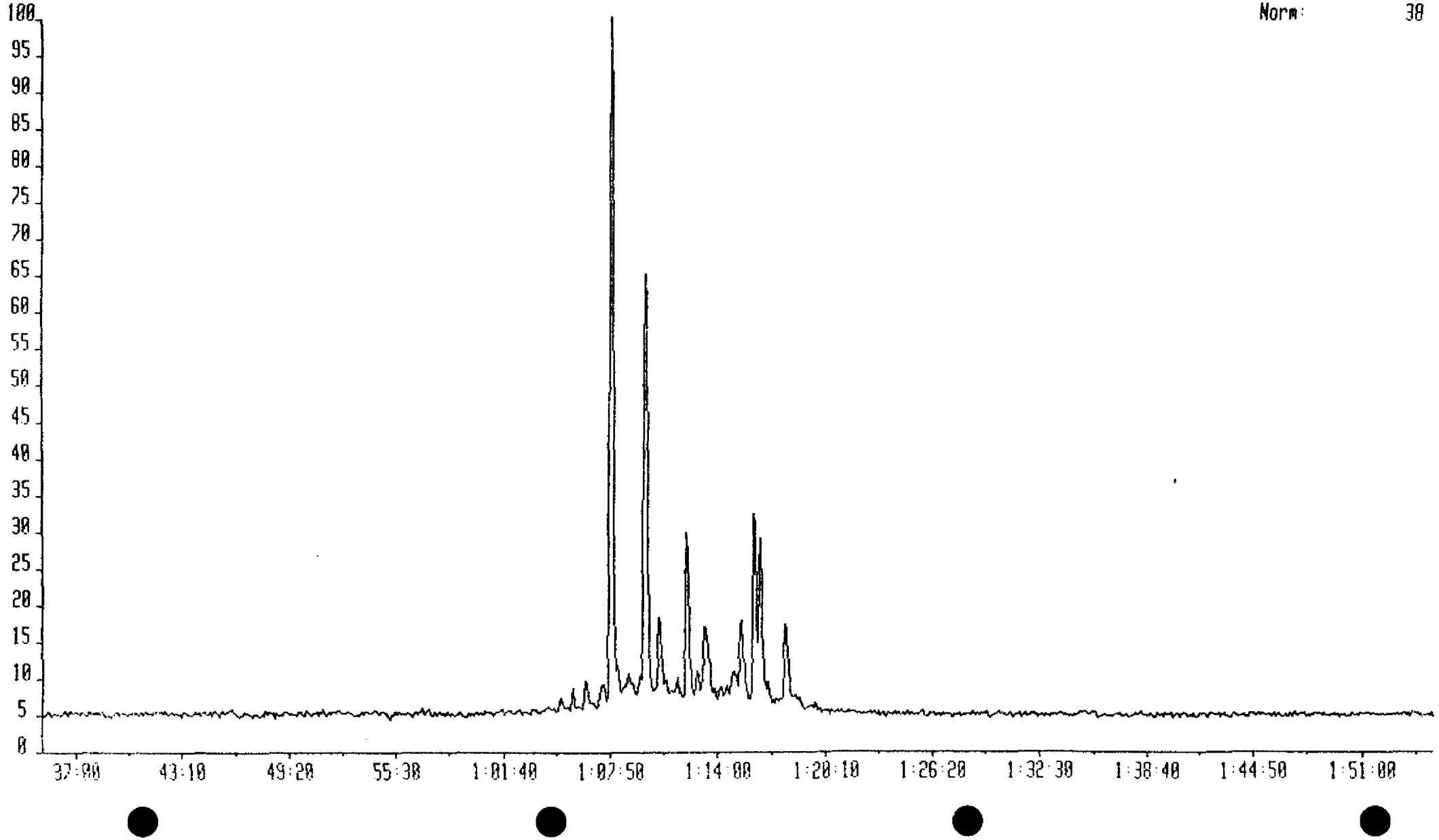
AS810037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 14 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:DST 2



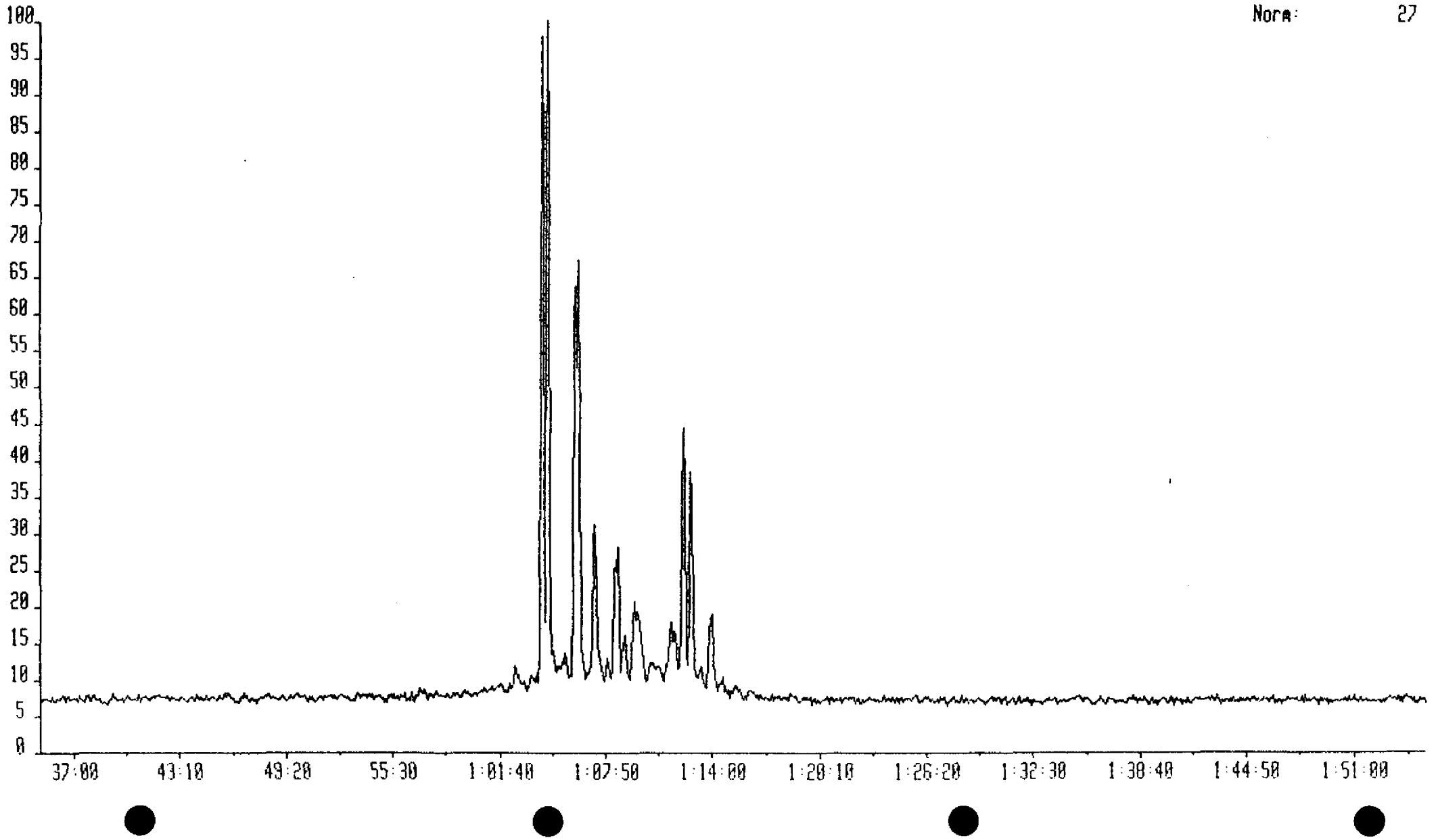
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 14 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:DST 2



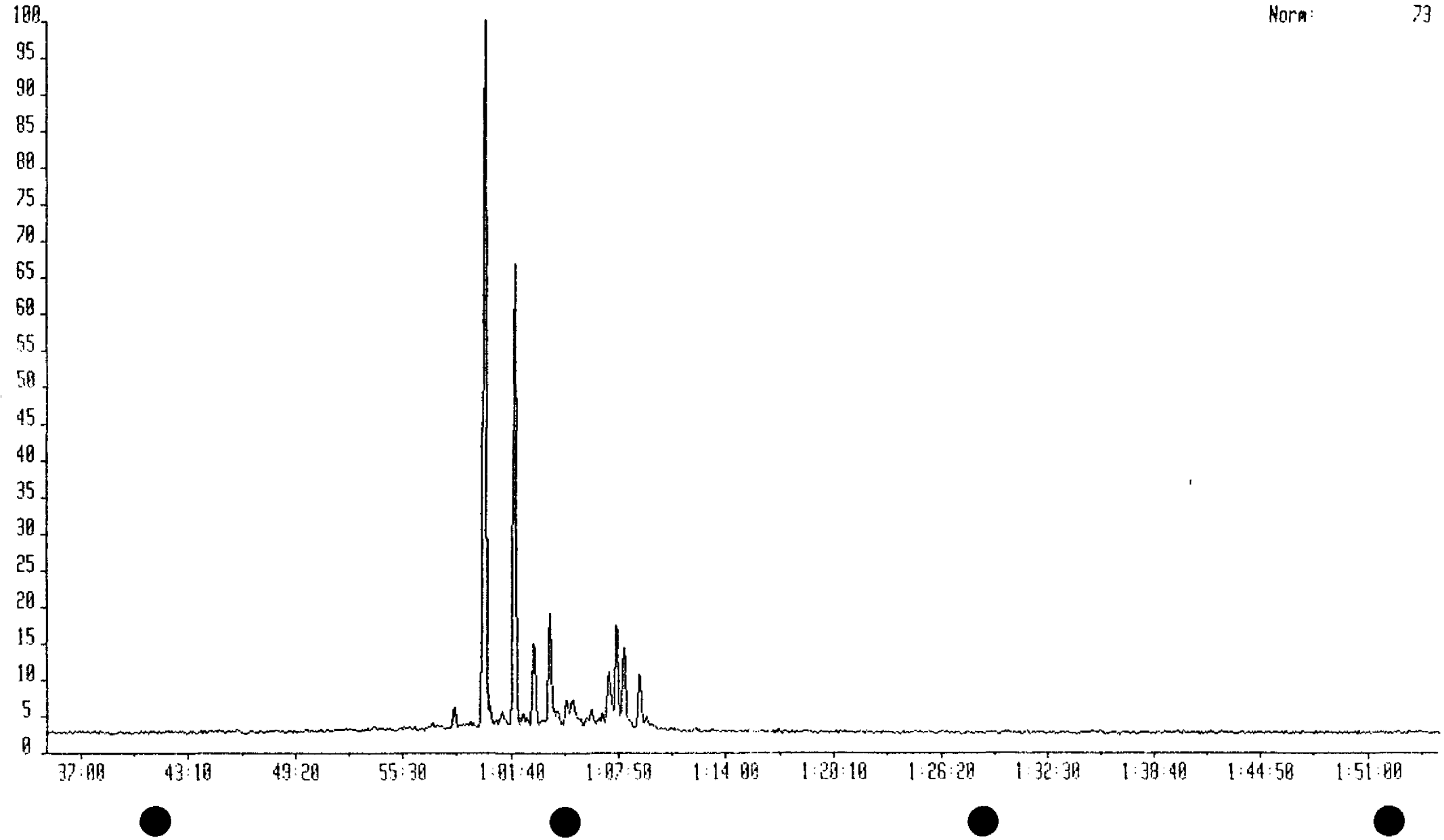
AS810037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 14 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:DST 2



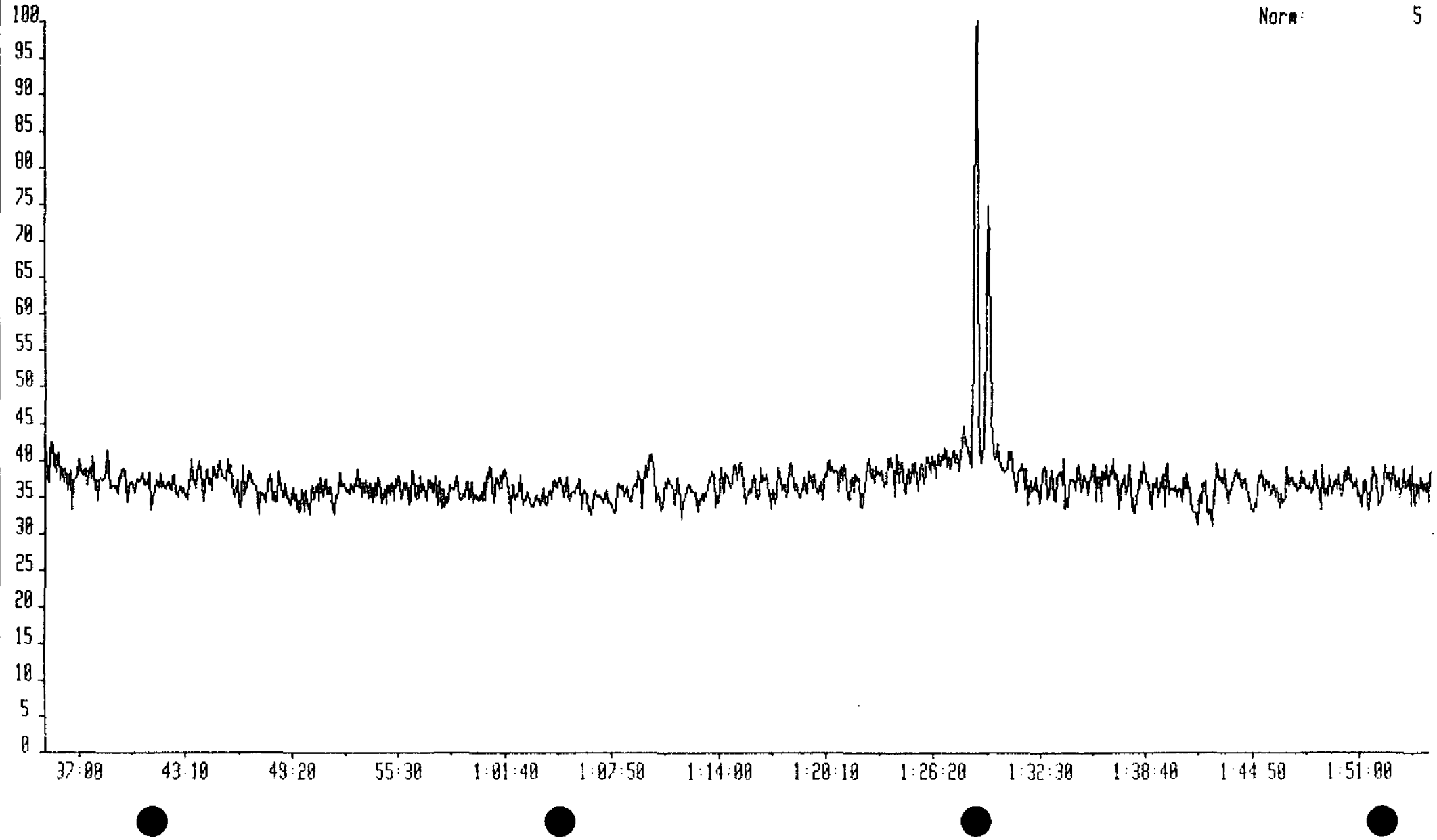
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 14 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:DST 2



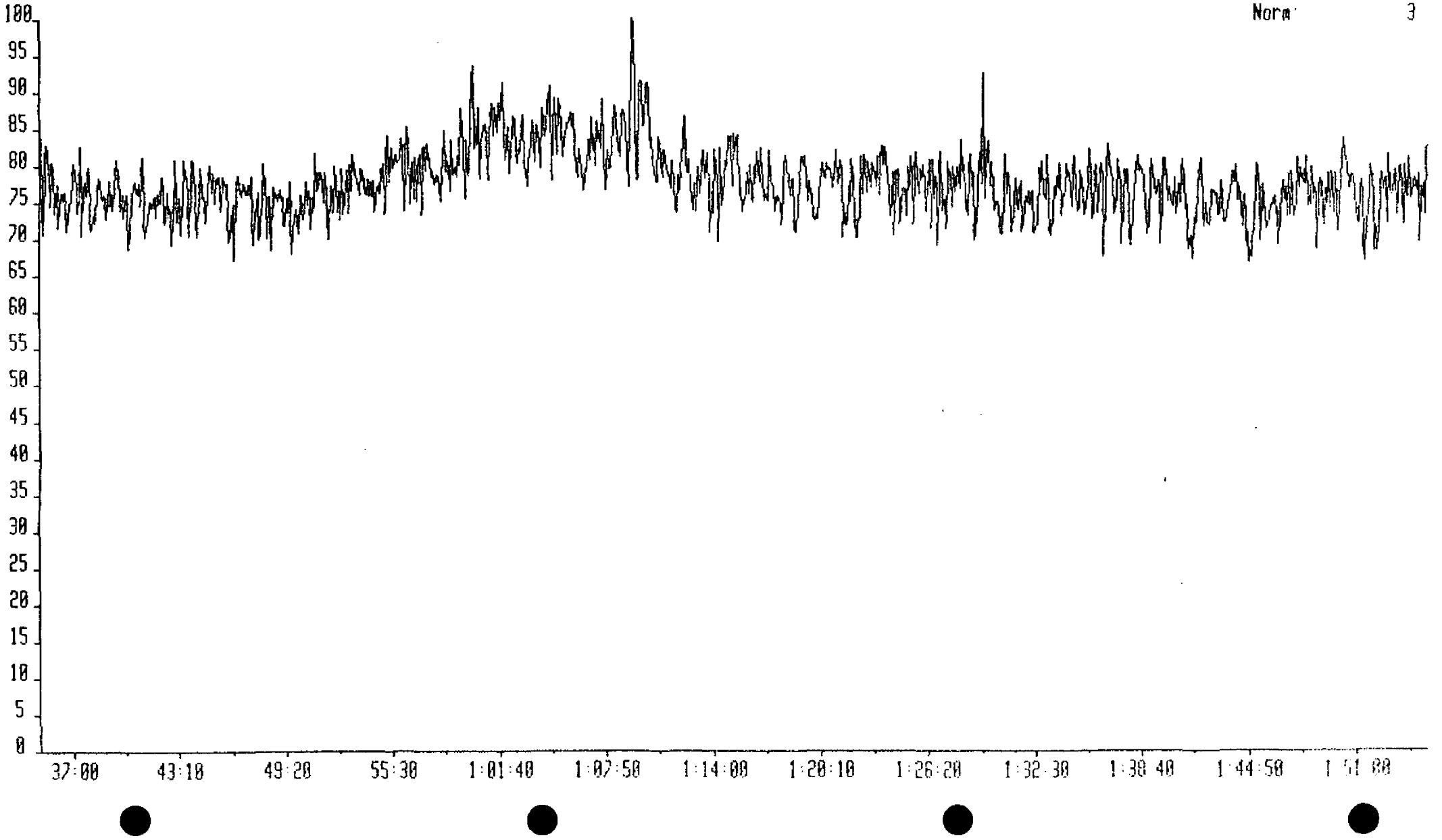
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 14 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:DST 2



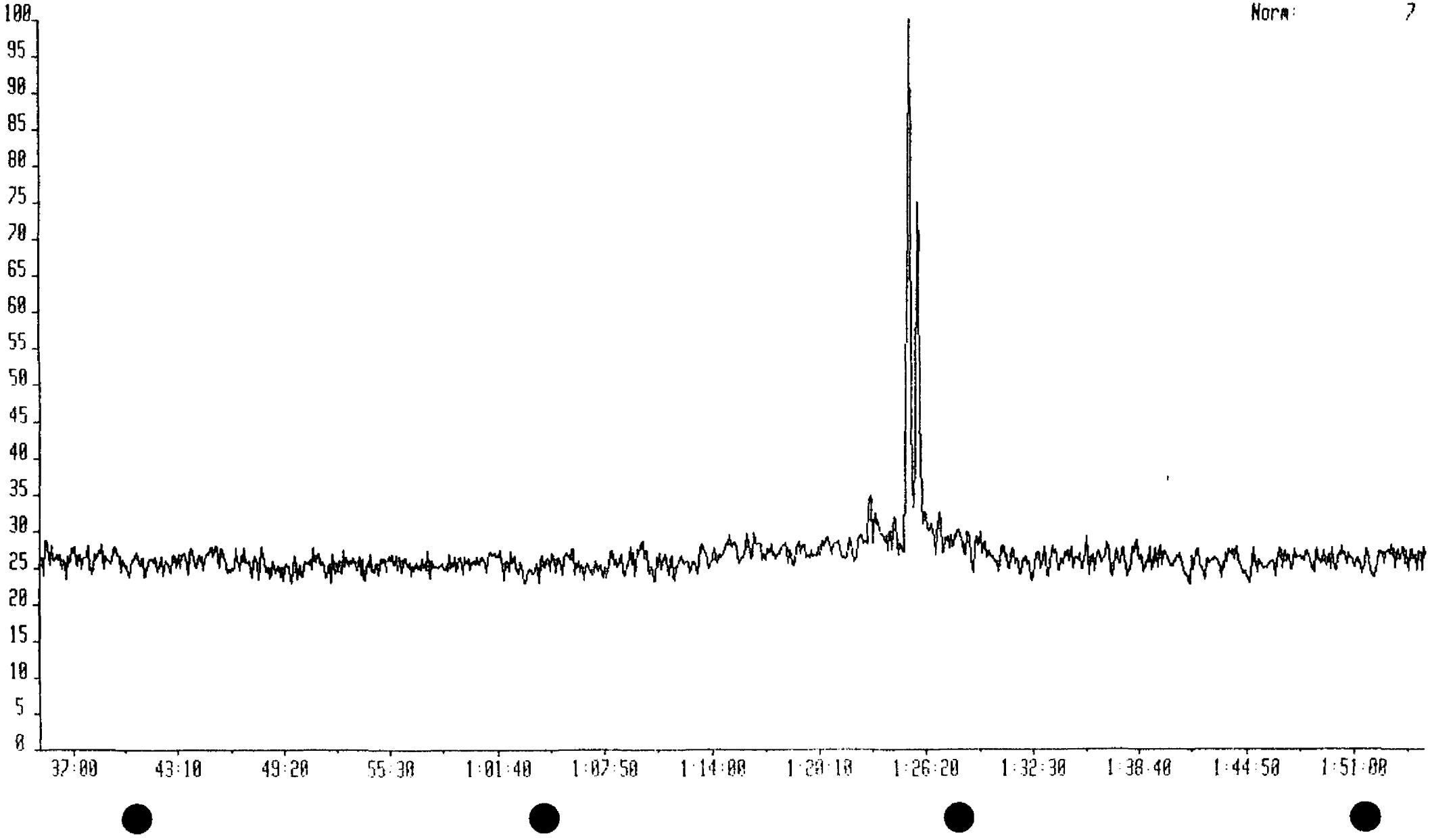
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 15 Injection 1 Group 1 Mass 82.9114 440.0000->191.0000
Text:TEST 3



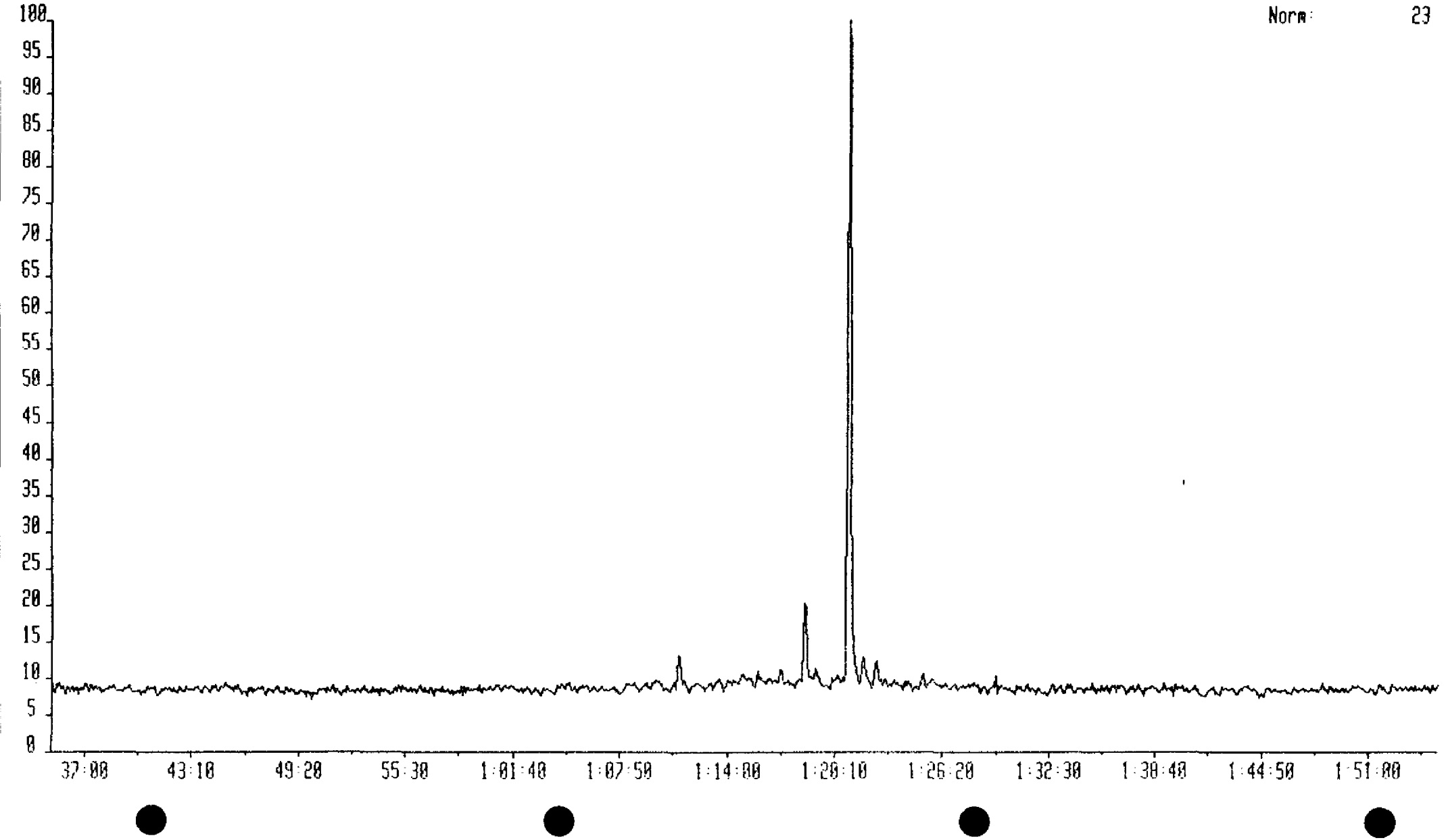
RSB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 15 Injection 1 Group 1 Mass 84.6730 370.0000->177.0000
Text:TEST 3



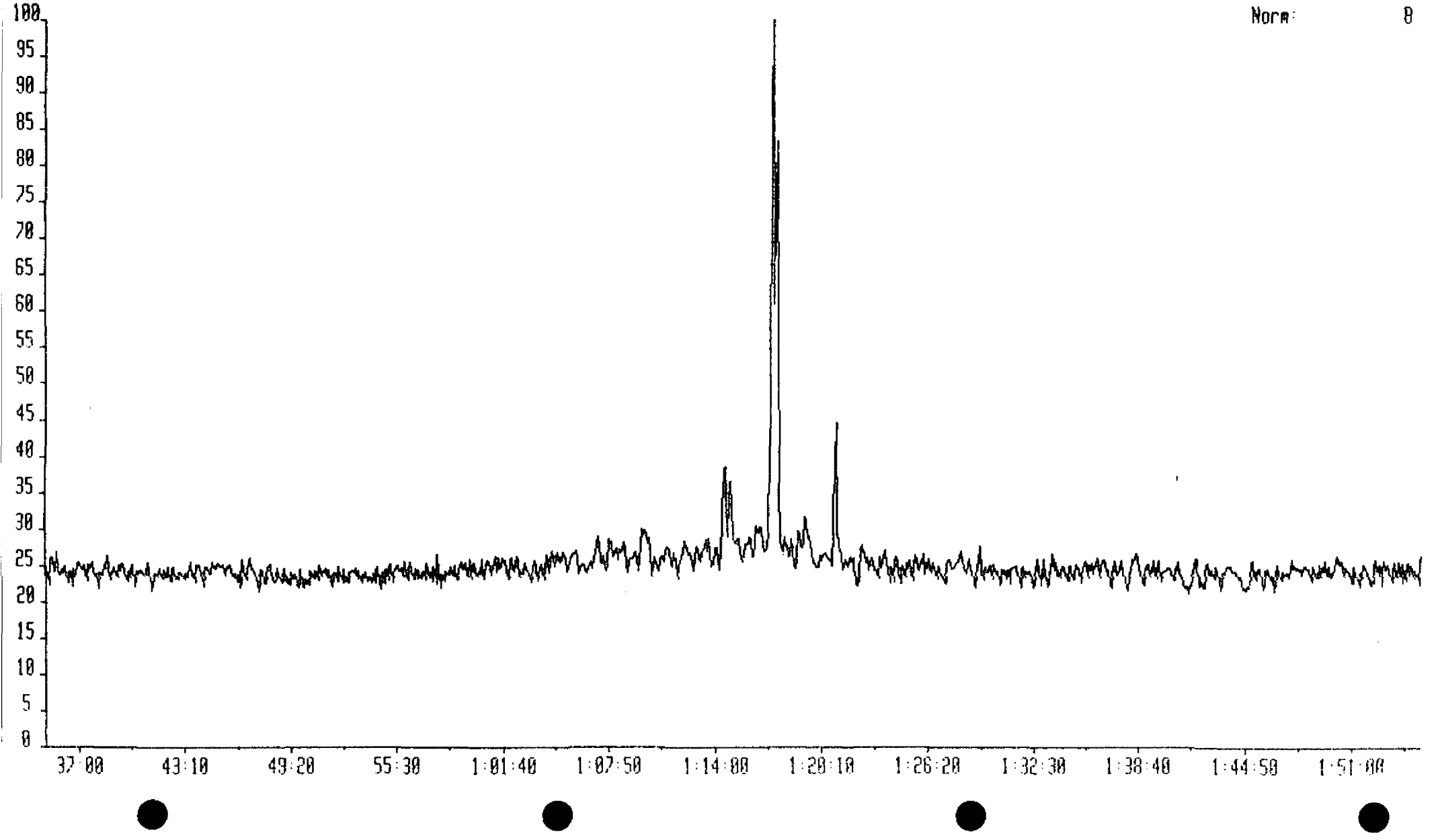
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 15 Injection 1 Group 1 Mass 85.6361 426.0000->191.0000
Text:TEST 3



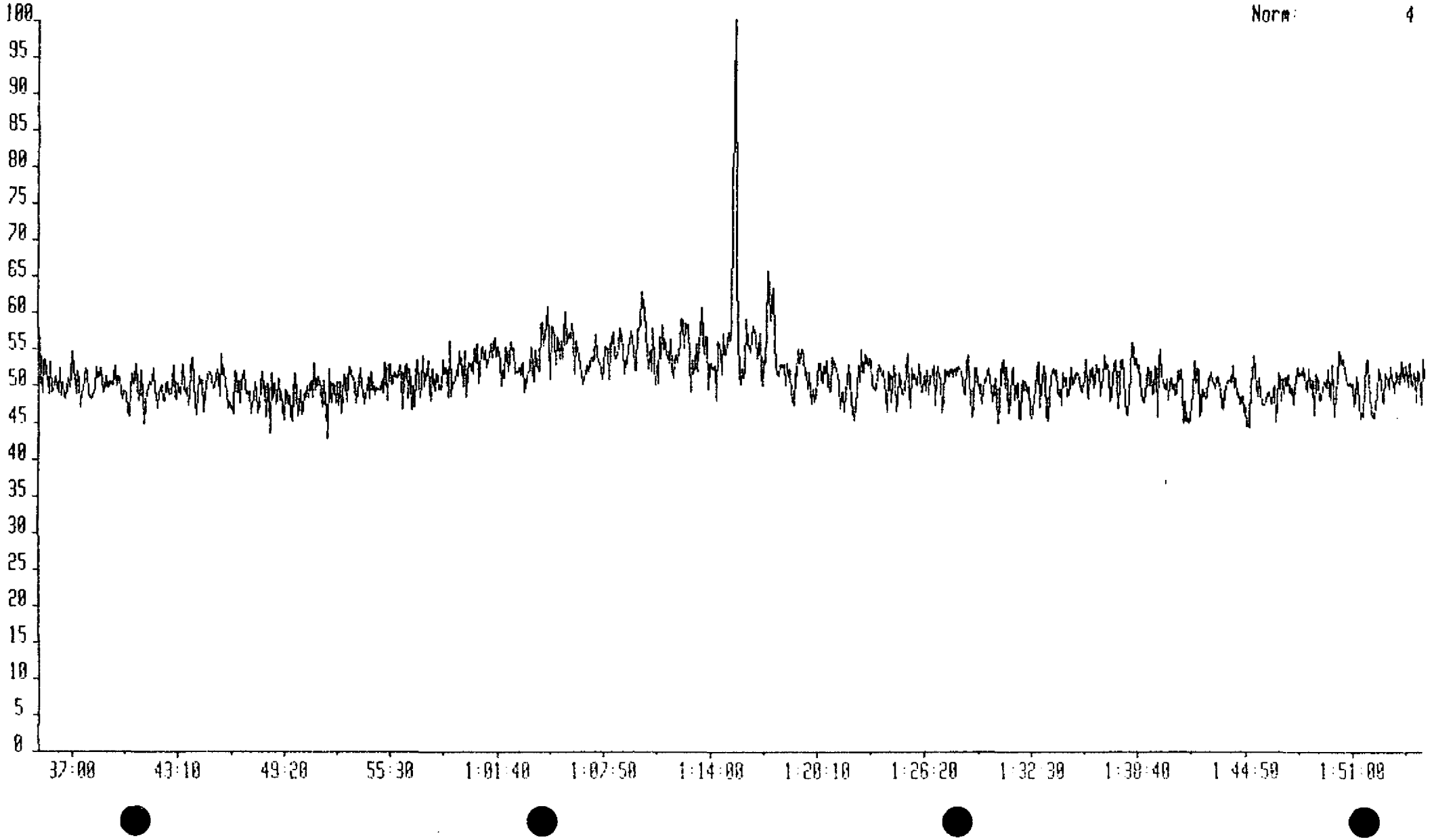
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 15 Injection 1 Group 1 Mass 88.5461 412.0000->191.0000
Text:TEST 3



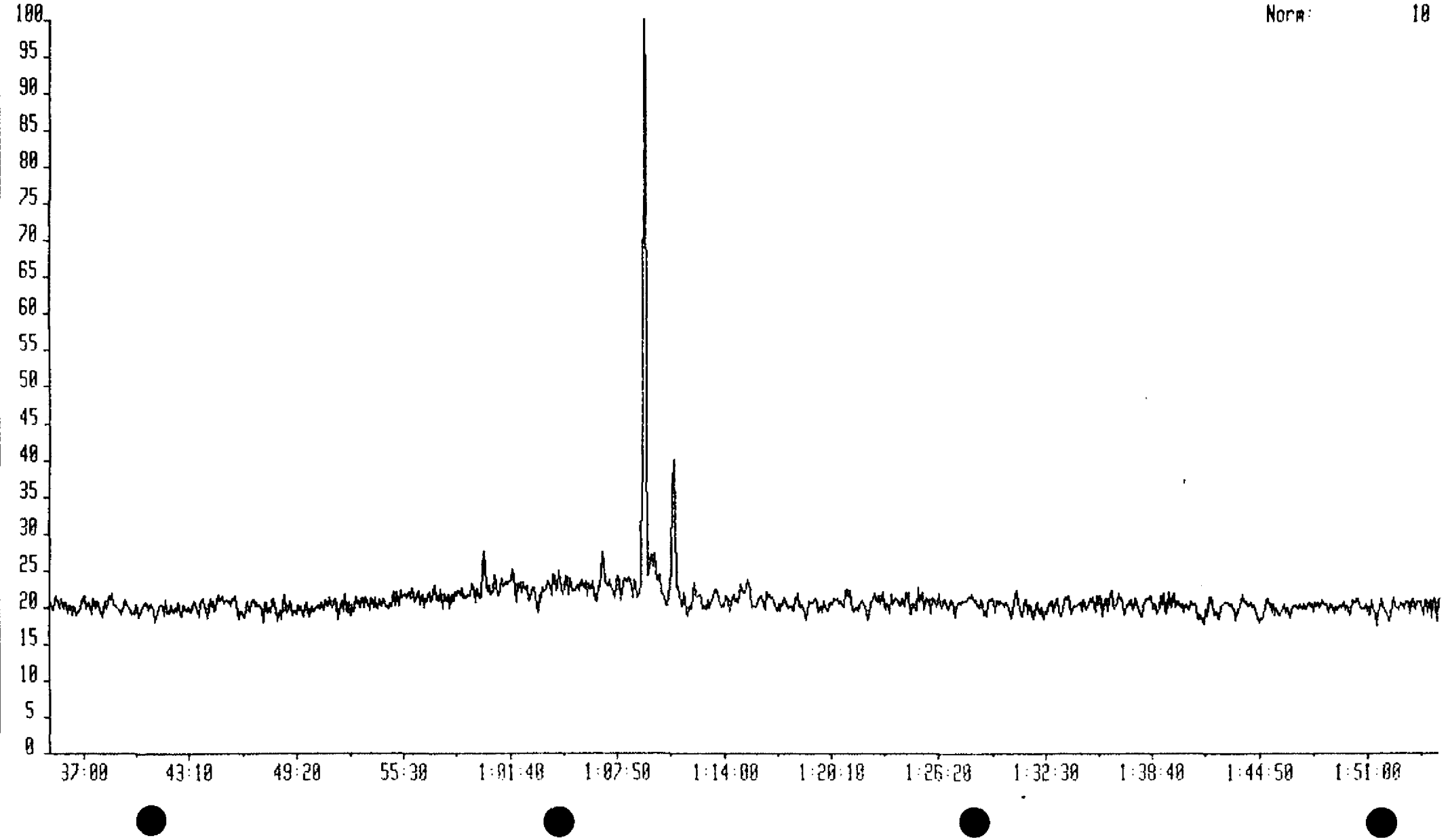
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 15 Injection 1 Group 1 Mass 91.6608 398.0000->191.0000
Text:TEST 3



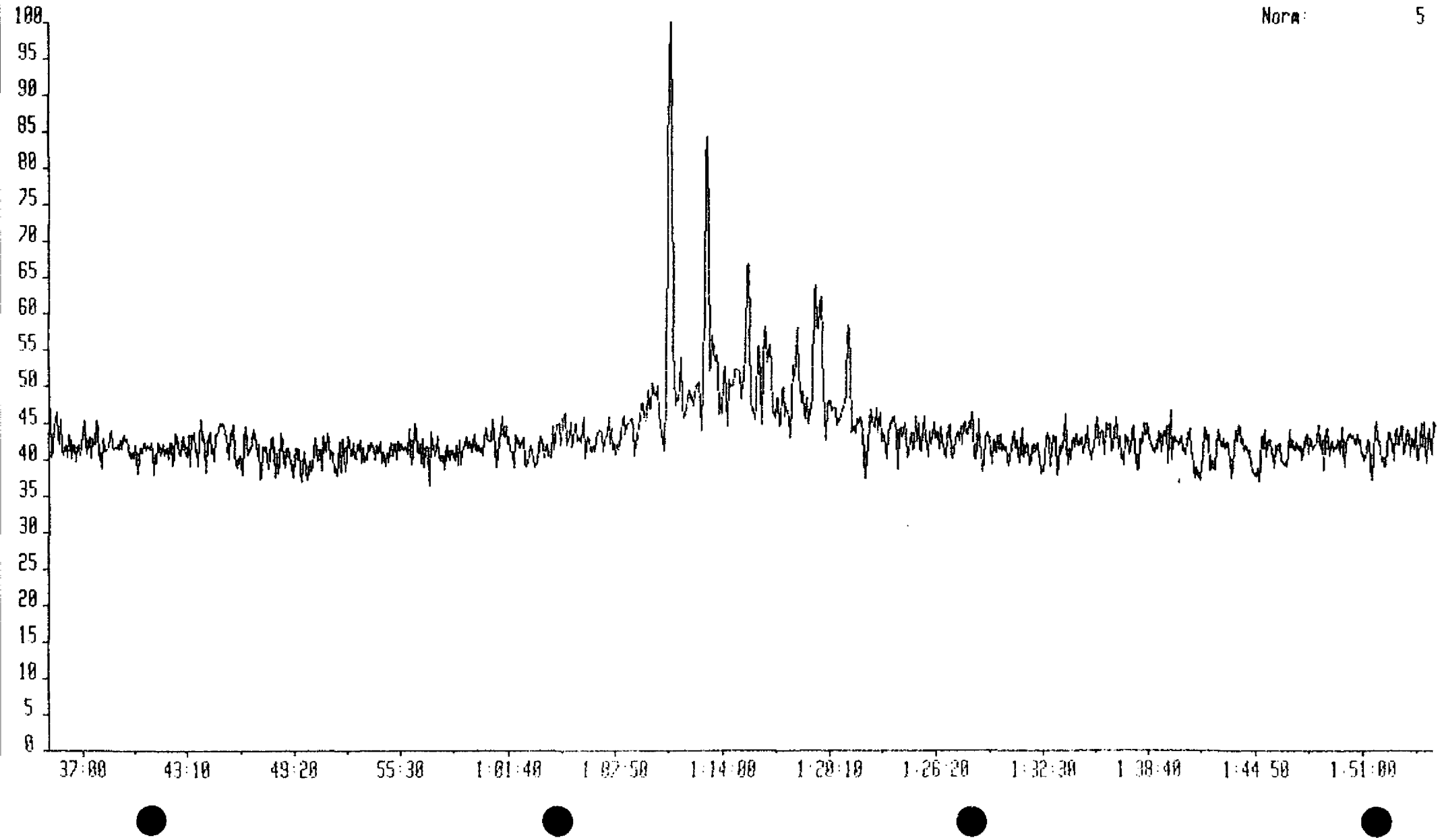
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 15 Injection 1 Group 1 Mass 95.0026 384.0000->191.0000
Text:TEST 3



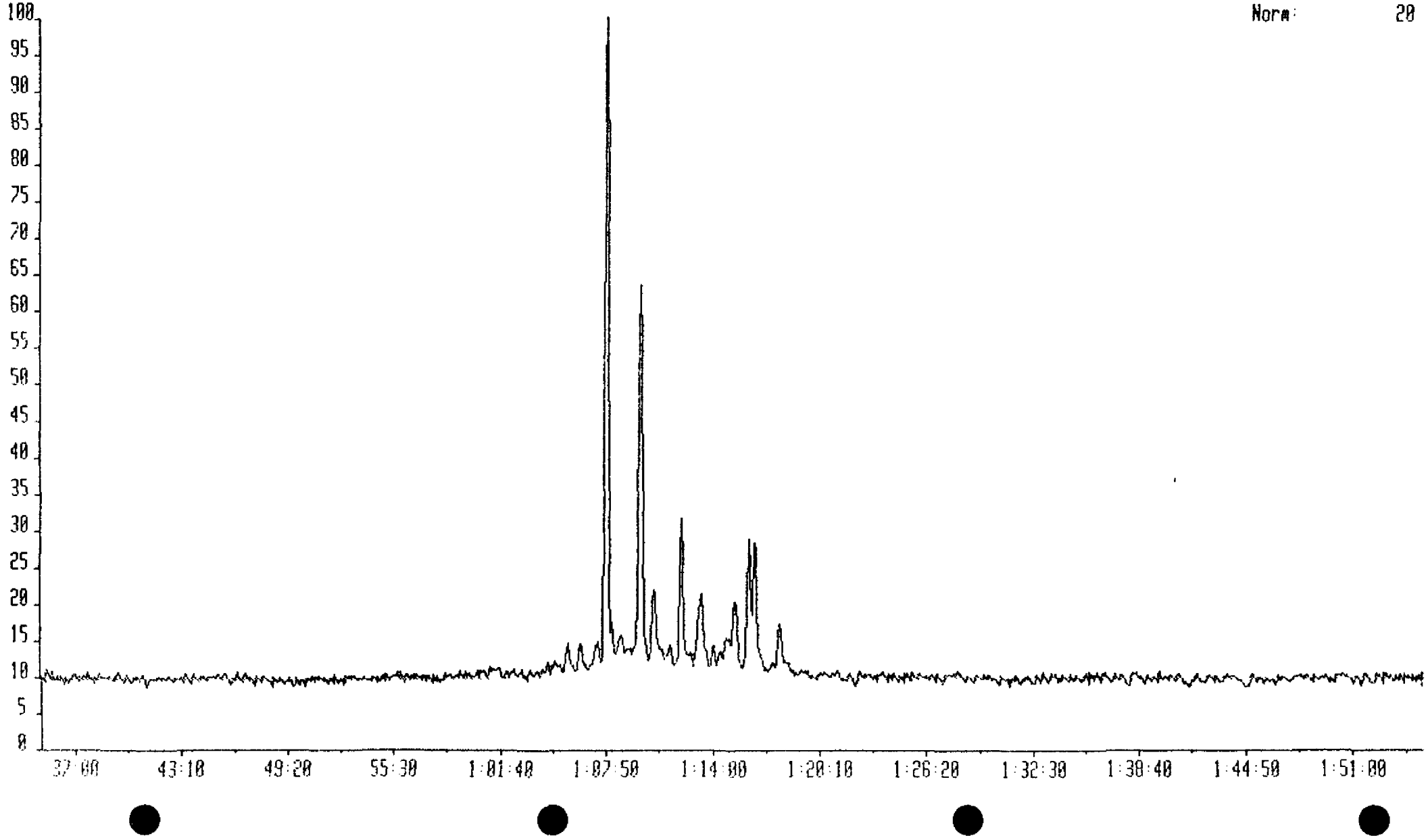
ASB10037 10-MAR-87 Sir:Reaction 70E Rcnt:NH System:SMGC
Sample 15 Injection 1 Group 1 Mass 98.5973 370.0000->191.0000
Text:TEST 3



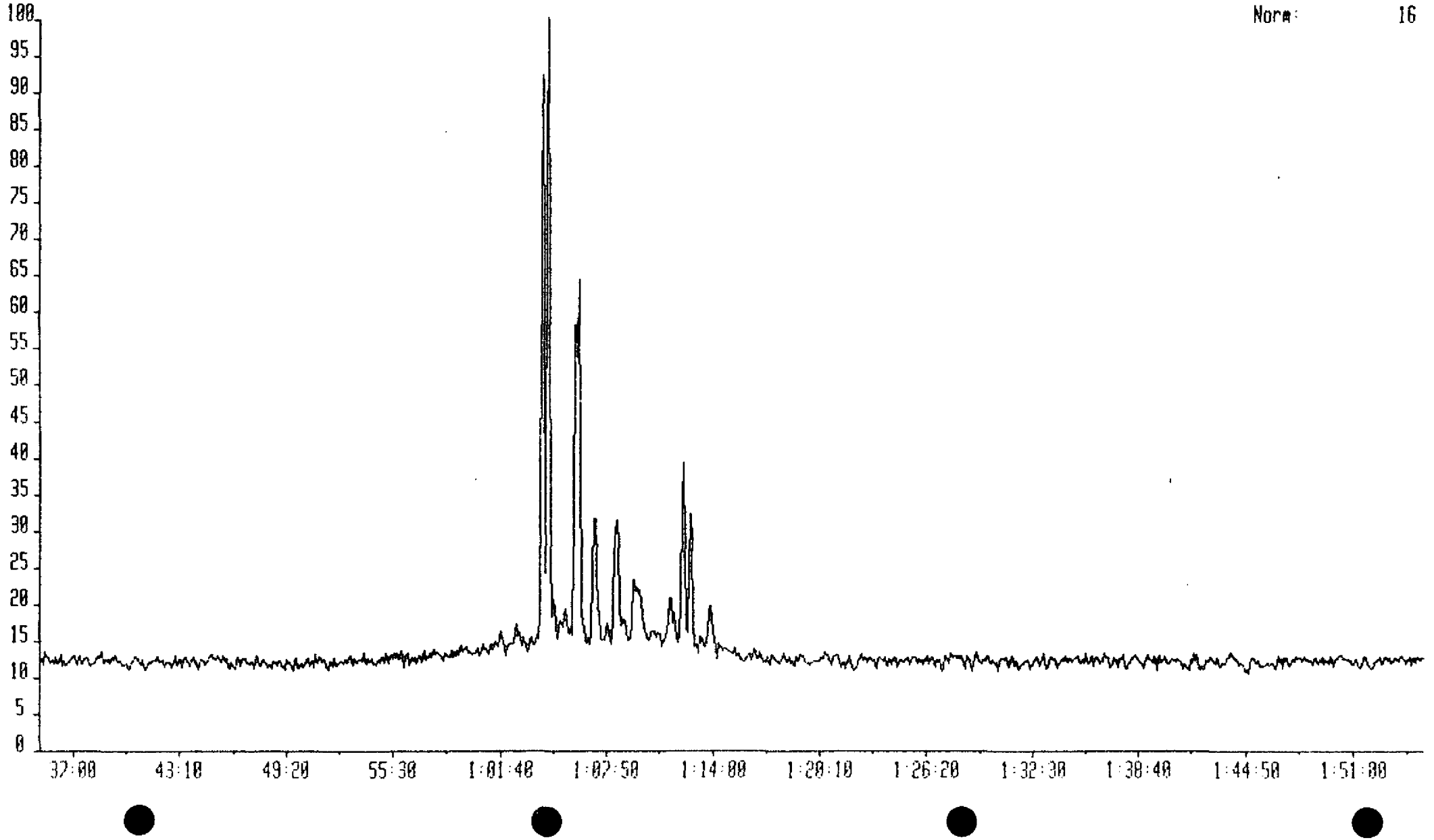
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 15 Injection 1 Group 1 Mass 113.7415 414.0000->217.0000
Text:TEST 3



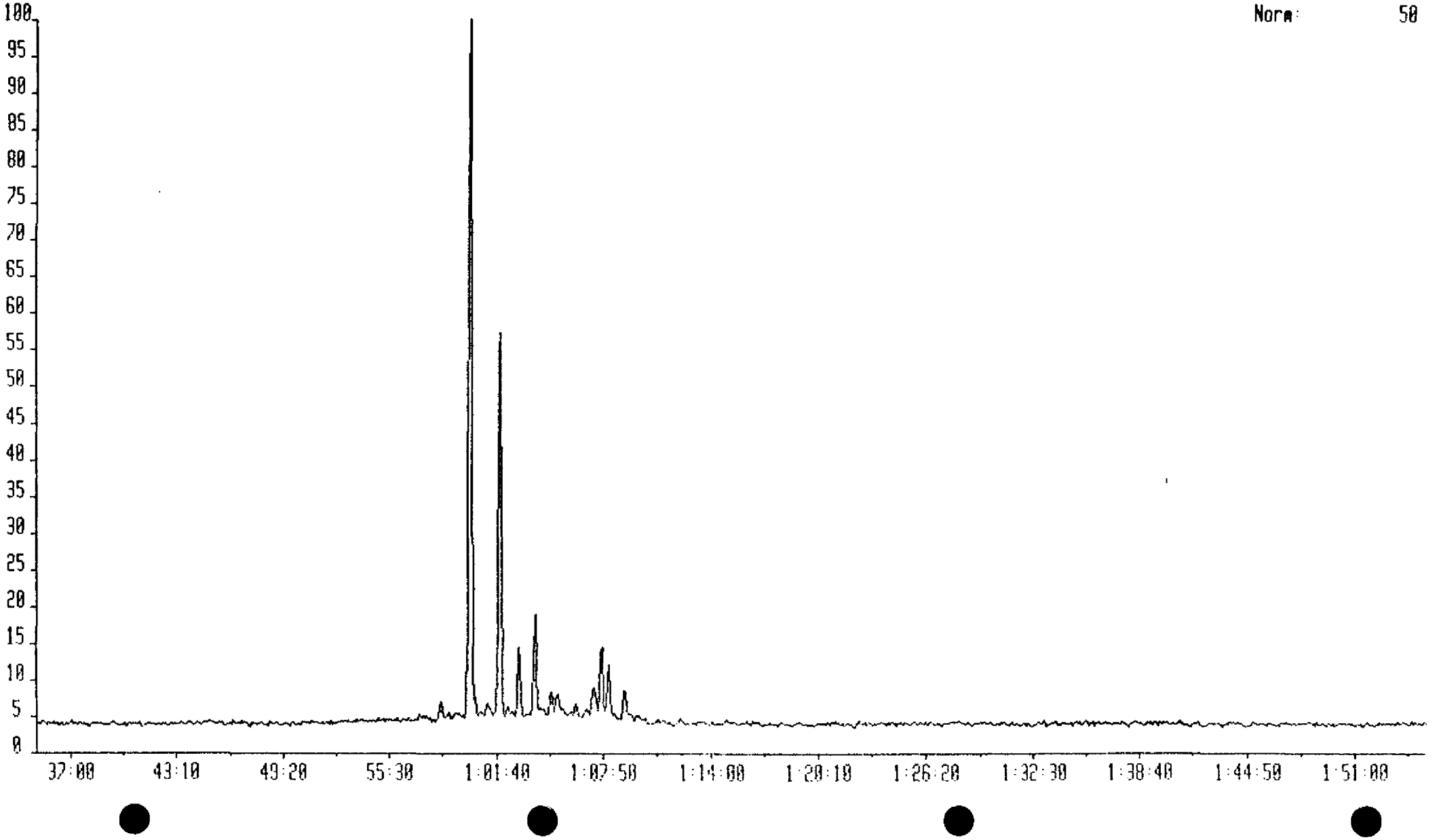
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 15 Injection 1 Group 1 Mass 117.7225 400.0000->217.0000
Text:TEST 3



ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 15 Injection 1 Group 1 Mass 121.9922 386.0000->217.0000
Text:TEST 3



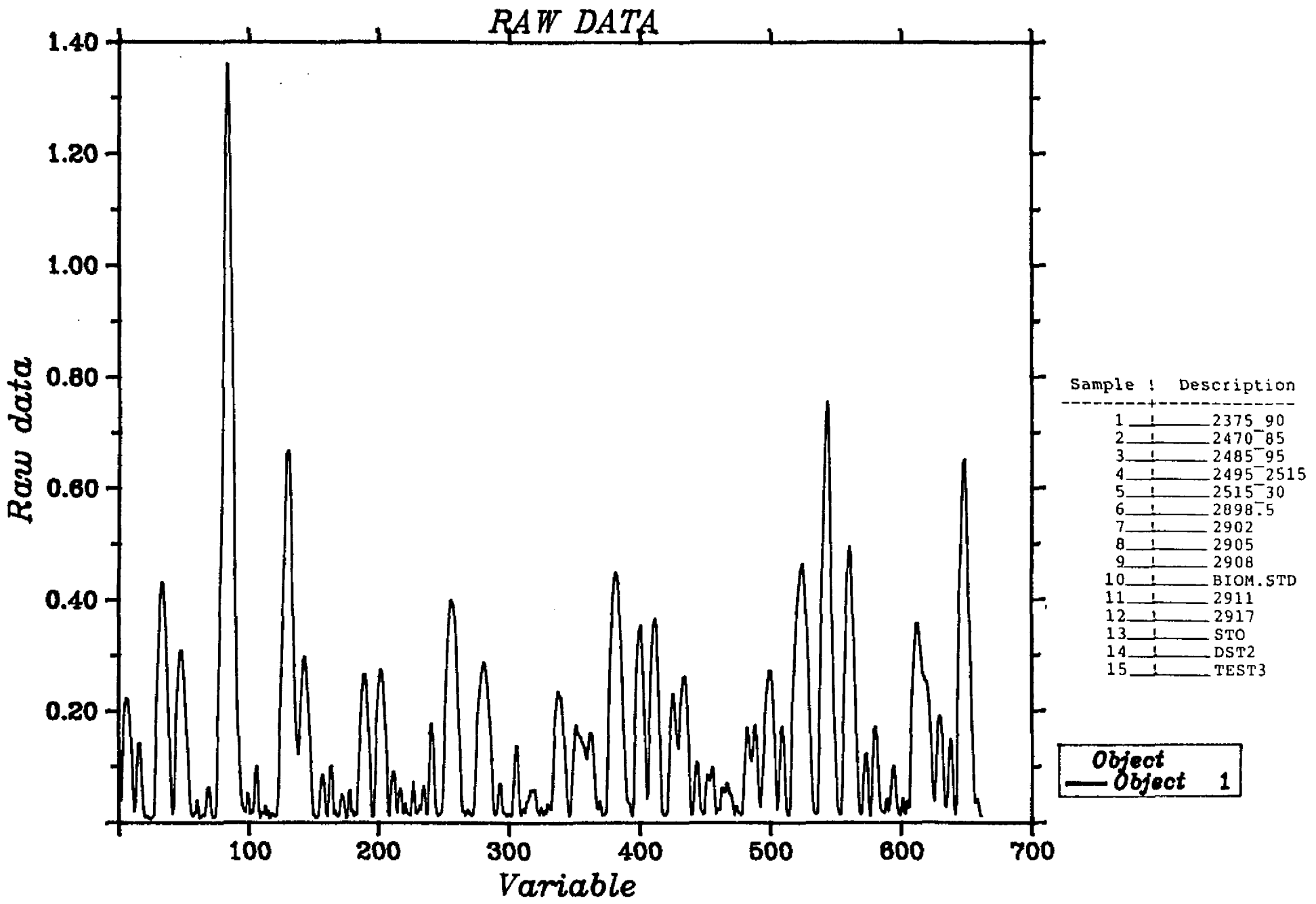
ASB10037 10-MAR-87 Sir:Reaction 70E Acnt:NH System:SMGC
Sample 15 Injection 1 Group 1 Mass 126.5833 372.0000->217.0000
Text:TEST 3



Biomarker fingerprints based on data reduction according to relative significance:

These added fragmentogram of each sample are the raw data for the multivariate comparison.

Peak I.D. of group compounds are indicated on sample #10 (biom.std).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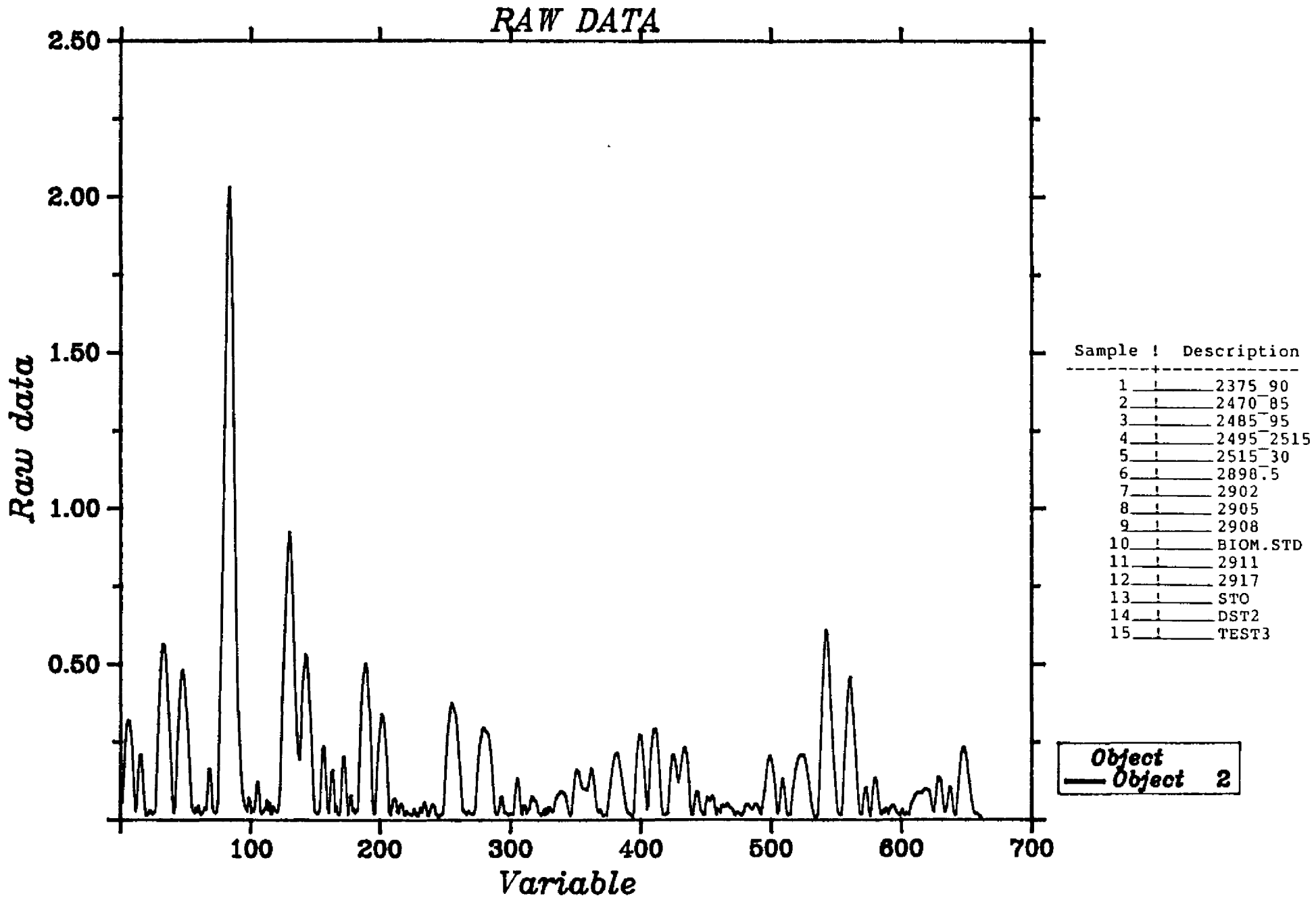
1.00
0.80
0.60
0.40
0.20
Raw data
100
200
300
400
500
600
700
Variable
Sample ! Description
1 ! 2375_90
2 ! 2470_85
3 ! 2485_95
4 ! 2495_2515
5 ! 2515_30
6 ! 2898.5
7 ! 2902
8 ! 2905
9 ! 2908
10 ! BIOM.STD
11 ! 2911
12 ! 2917
13 ! STO
14 ! DST2
15 ! TEST3
Object
Object 1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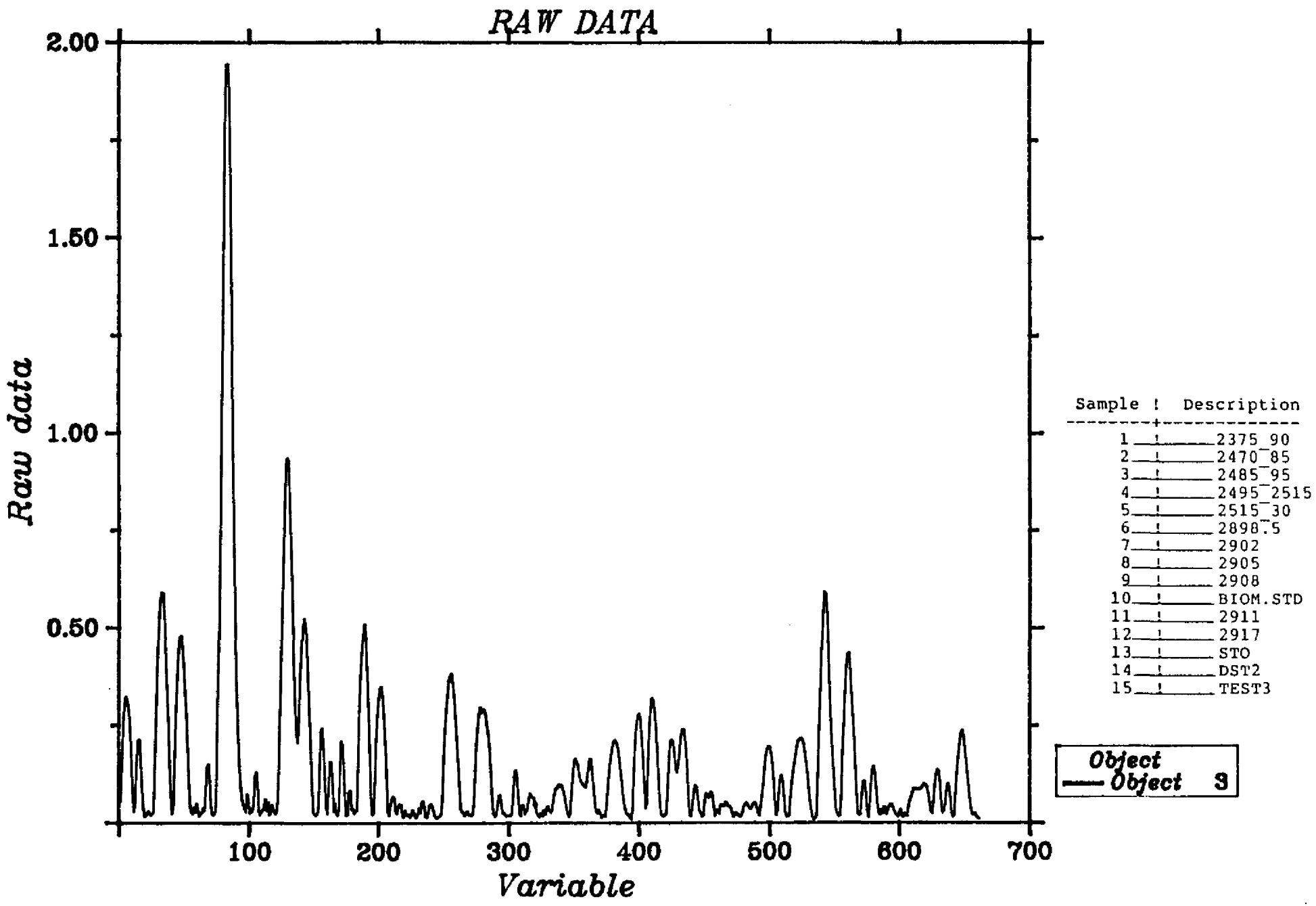
2.00
1.50
1.00
0.50
Raw data
100
200
300
400
500
600
700
Variable
Sample ! Description
1 ! 2375_90
2 ! 2470_85
3 ! 2485_95
4 ! 2495_2515
5 ! 2515_30
6 ! 2898.5
7 ! 2902
8 ! 2905
9 ! 2908
10 ! BIOM.STD
11 ! 2911
12 ! 2917
13 ! STO
14 ! DST2
15 ! TEST3
Object
Object 2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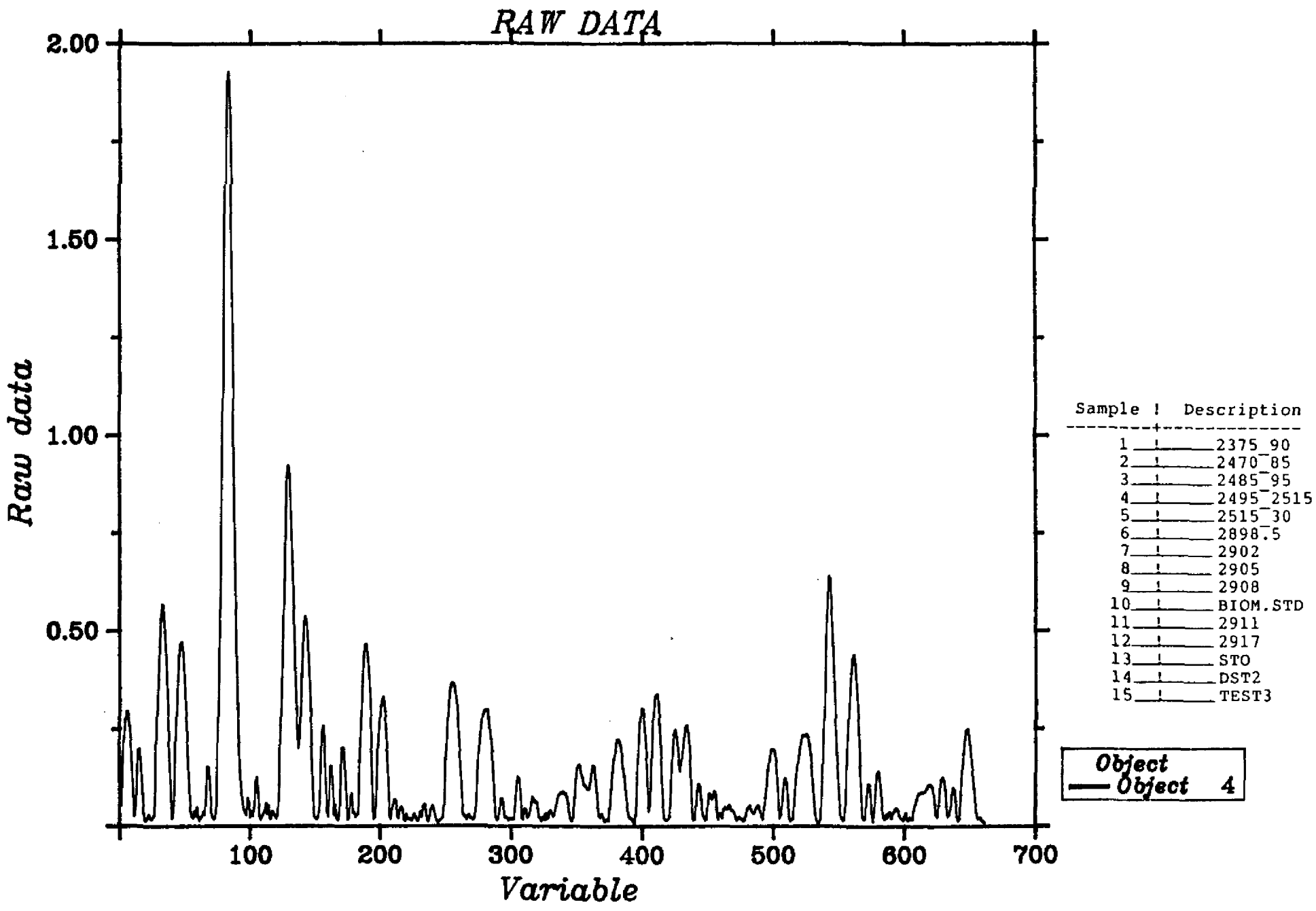
1.50
1.00
0.50
Raw data
100
200
300
400
500
600
700
Variable
Sample ! Description
1 ! 2375_90
2 ! 2470_85
3 ! 2485_95
4 ! 2495_2515
5 ! 2515_30
6 ! 2898.5
7 ! 2902
8 ! 2905
9 ! 2908
10 ! BIOM.STD
11 ! 2911
12 ! 2917
13 ! STO
14 ! DST2
15 ! TEST3
Object
Object 3


RAW DATA
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1.50
1.00
0.50
Raw data
100
200
300
400
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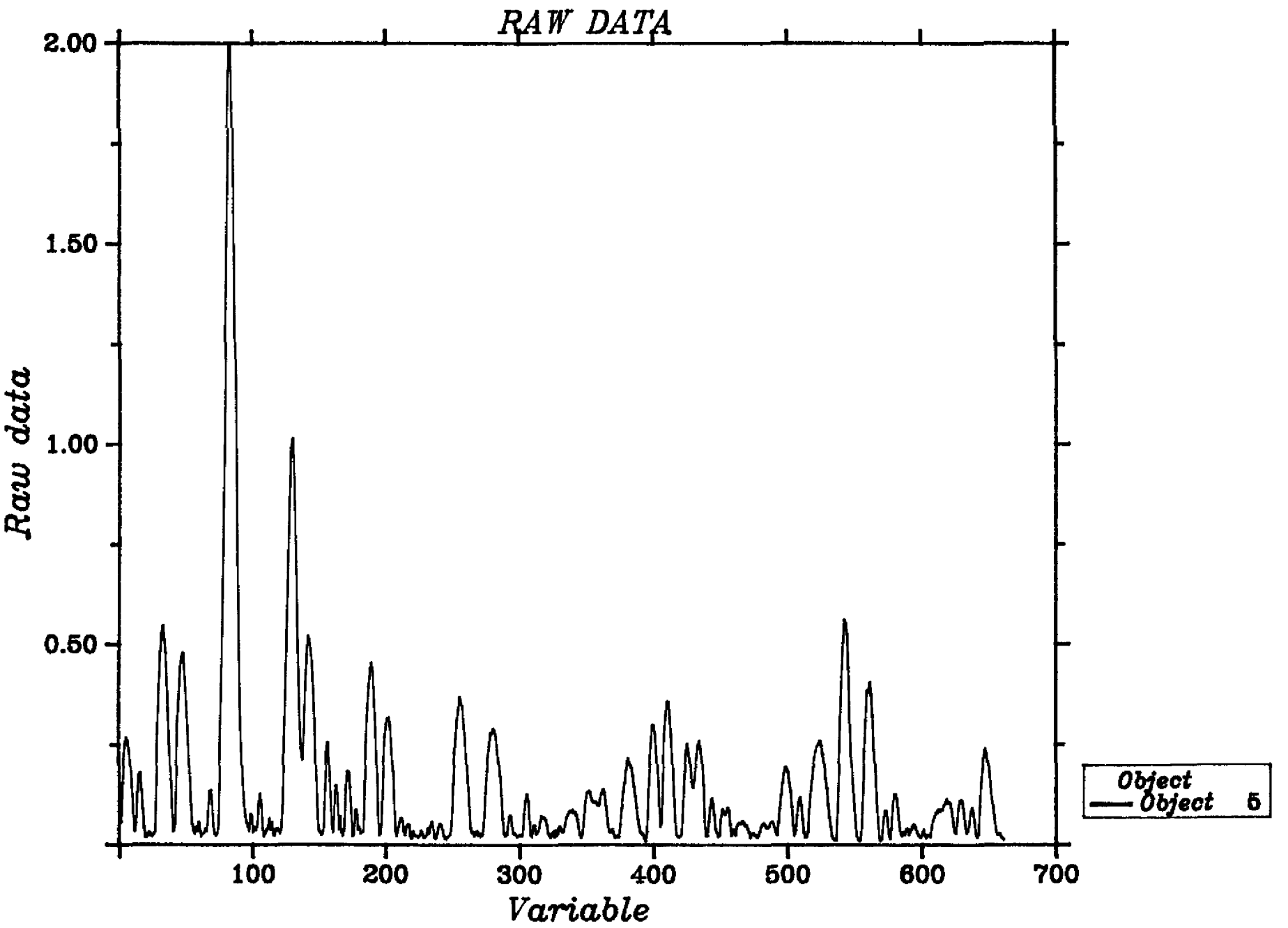
600
700
Variable
Sample ! Description
1 ! 2375_90
2 ! 2470_85
3 ! 2485_95
4 ! 2495_2515
5 ! 2515_30
6 ! 2898.5
7 ! 2902
8 ! 2905
9 ! 2908
10 ! BIOM.STD
11 ! 2911
12 ! 2917
13 ! STO
14 ! DST2
15 ! TEST3
Object
Object 4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Raw data
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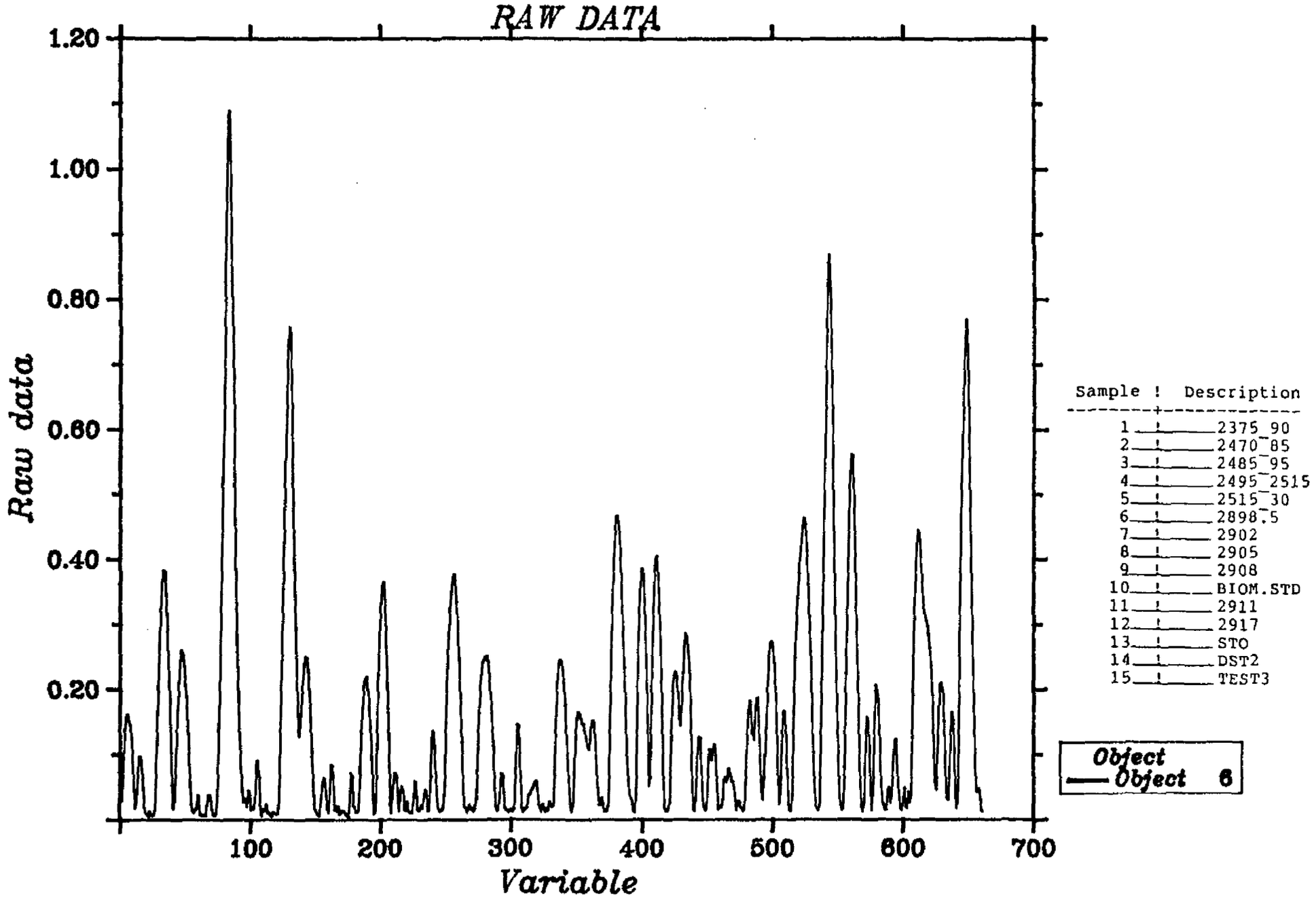
200
300
400
500
600
700
Variable
Object
Object 5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0.60
0.40
0.20
Raw data
100
200
300
400
500
600
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Variable
Sample ! Description
1 ! 2375_90
2 ! 2470_85
3 ! 2485_95
4 ! 2495_2515
5 ! 2515_30
6 ! 2898.5
7 ! 2902
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10 ! BIOM.STD
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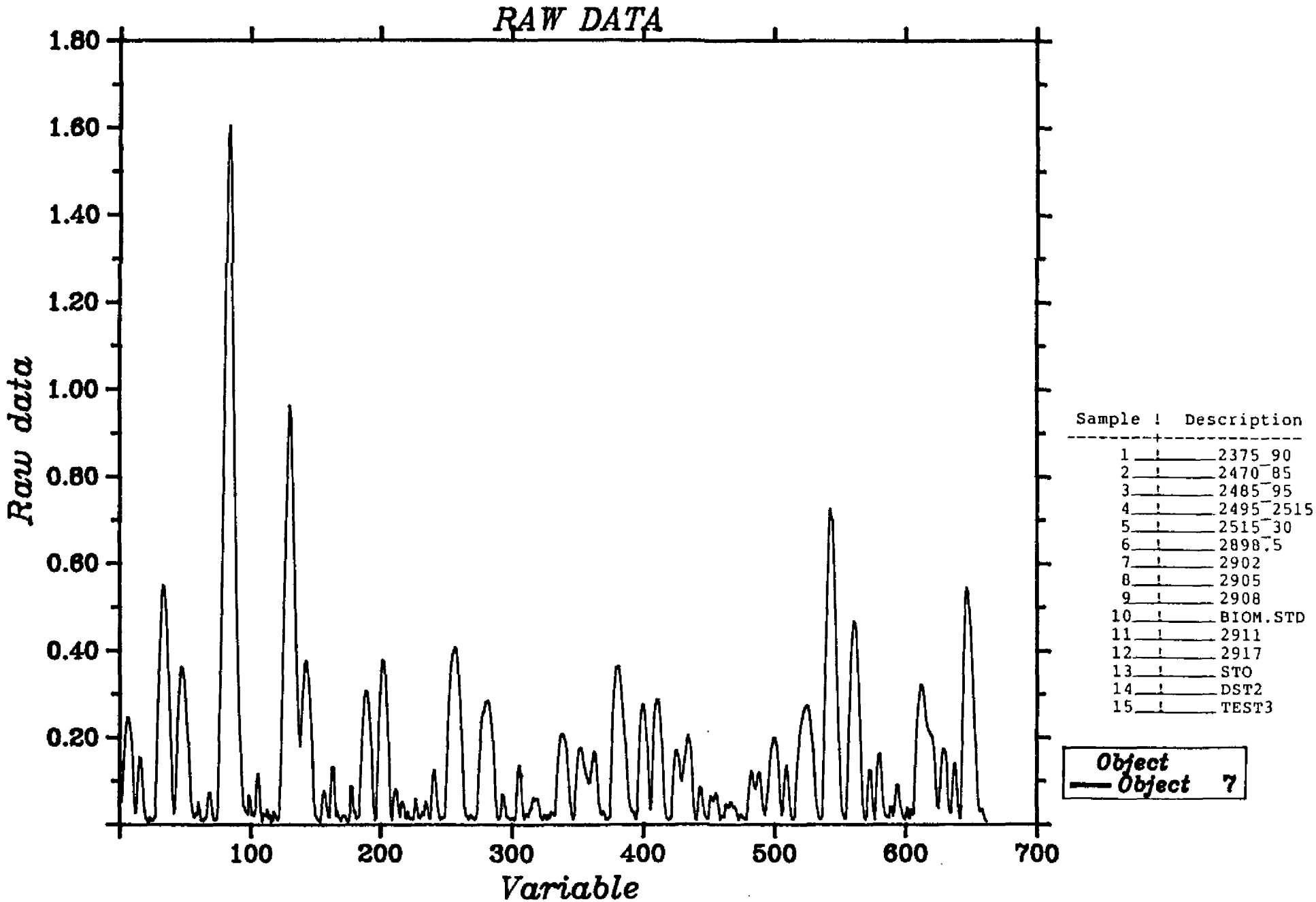
12 ! 2917
13 ! STO
14 ! DST2
15 ! TEST3
Object
Object 6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Variable
Sample ! Description
1 ! 2375_90
2 ! 2470_85
3 ! 2485_95
4 ! 2495_2515
5 ! 2515_30
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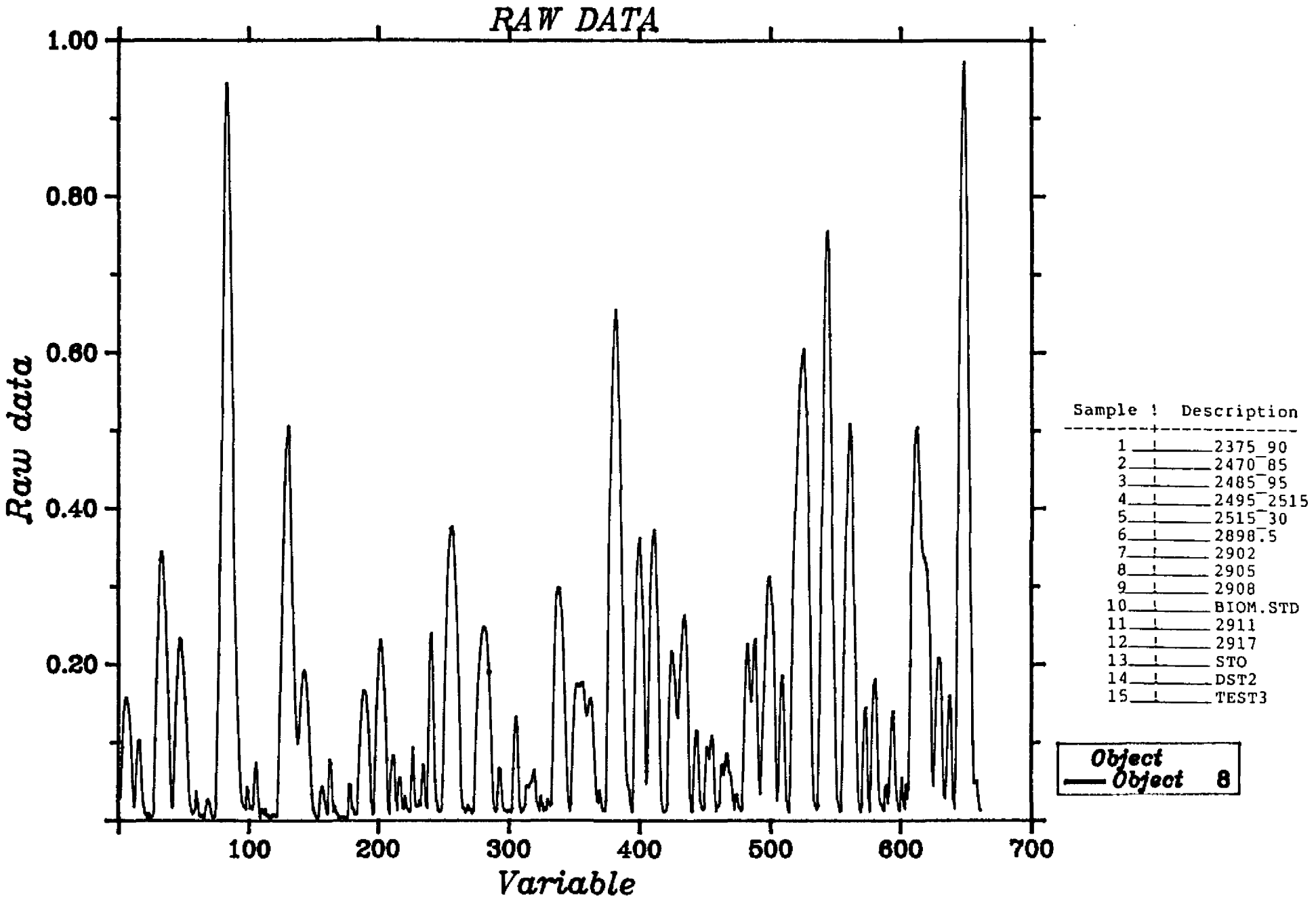
Object
Object 7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Variable
Sample ! Description
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2 ! 2470_85
3 ! 2485_95
4 ! 2495_2515
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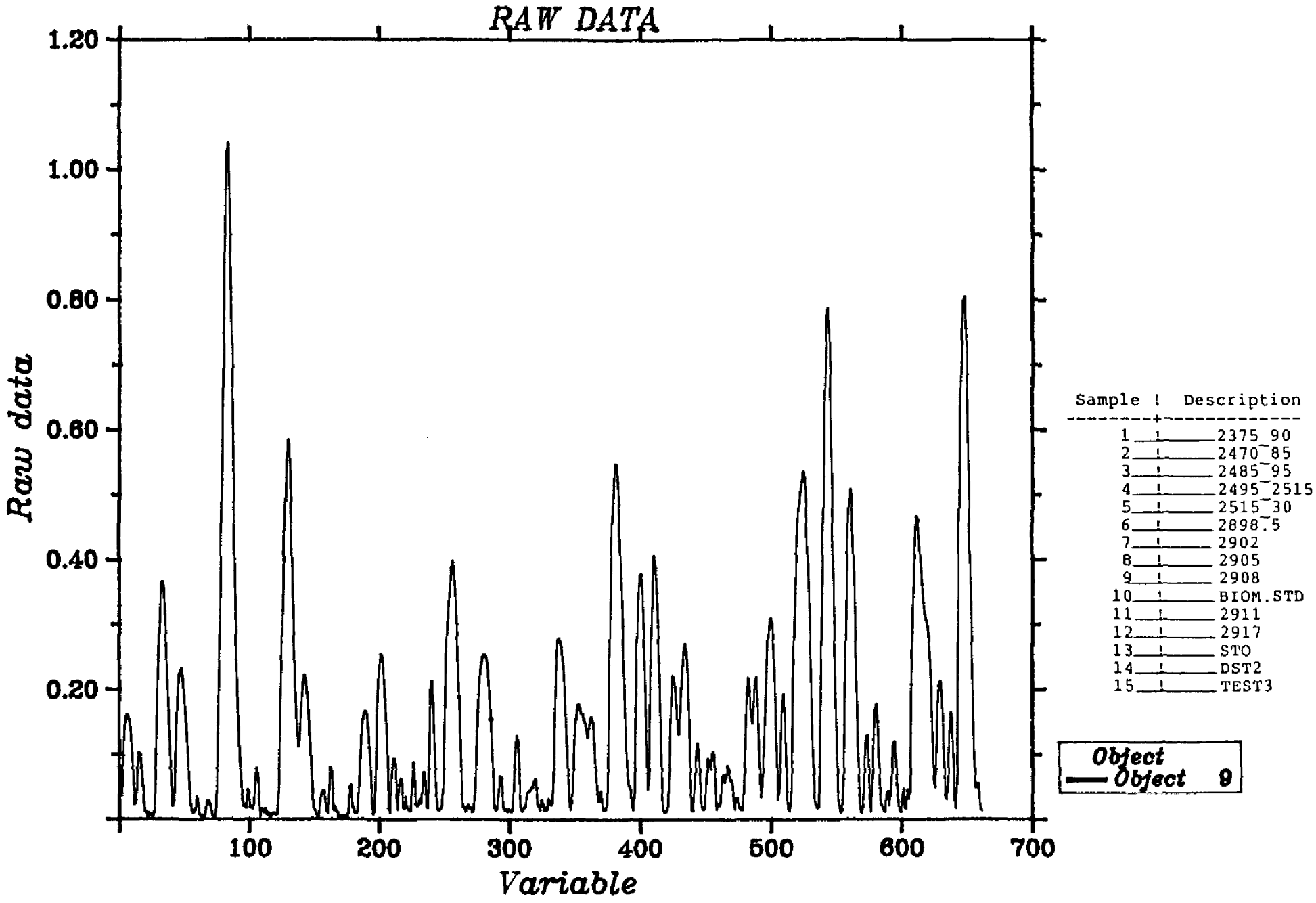
Object 8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Sample ! Description
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2 ! 2470_85
3 ! 2485_95
4 ! 2495_2515
5 ! 2515_30
6 ! 2898.5
7 ! 2902
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12 ! 2917
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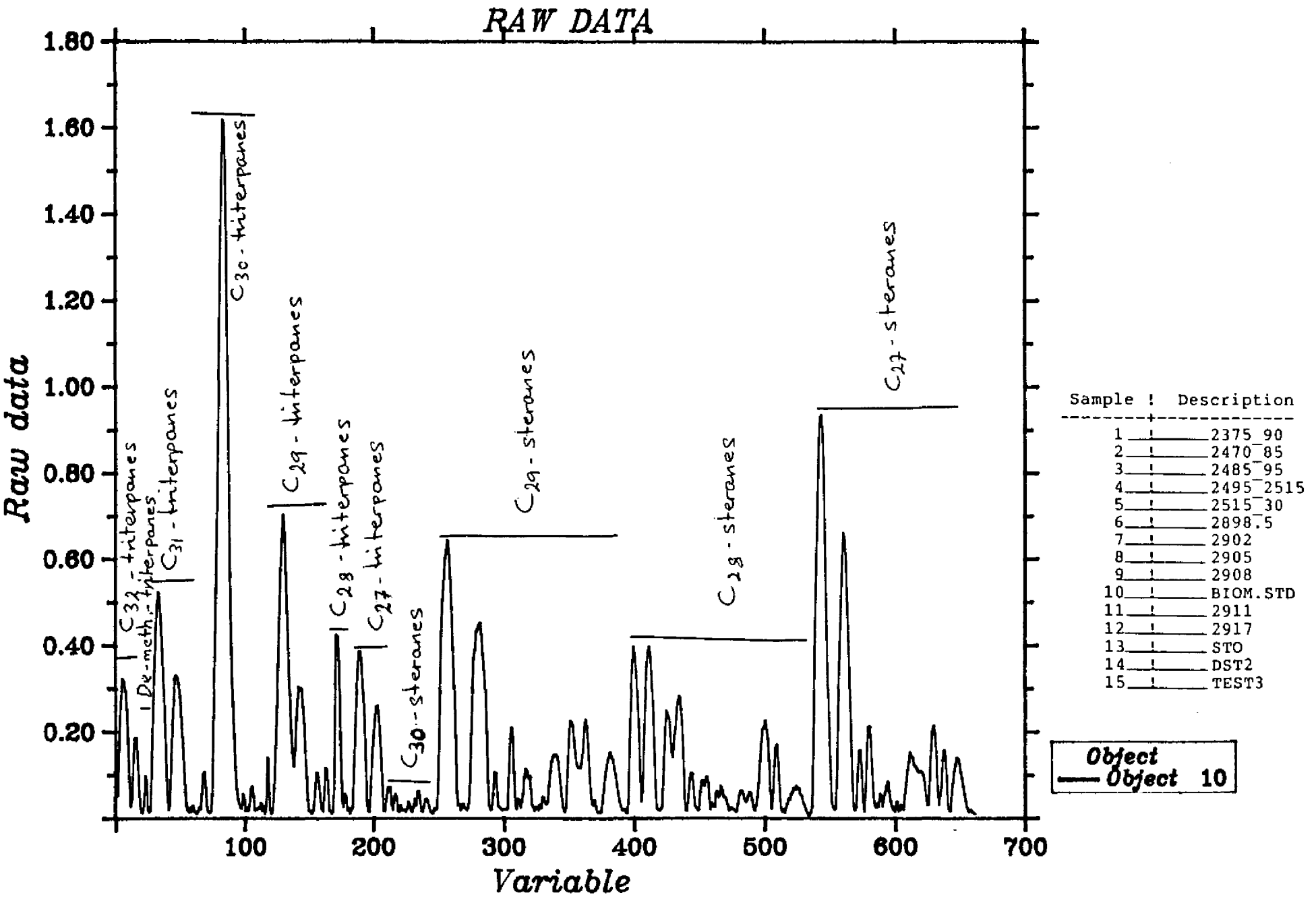
14 ! DST2
15 ! TEST3
Object
Object 9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De-meth.-triterpanes
C31 - triterpanes
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C28 - triterpanes
C27 - triterpanes
C30 - steranes
C29 - steranes
C28 - steranes
C27 - steranes
Sample ! Description
1 ! 2375_90
2 ! 2470_85
3 ! 2485_95
4 ! 2495_2515
5 ! 2515_30
6 ! 2898.5
7 ! 2902
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10 ! BIOM.STD
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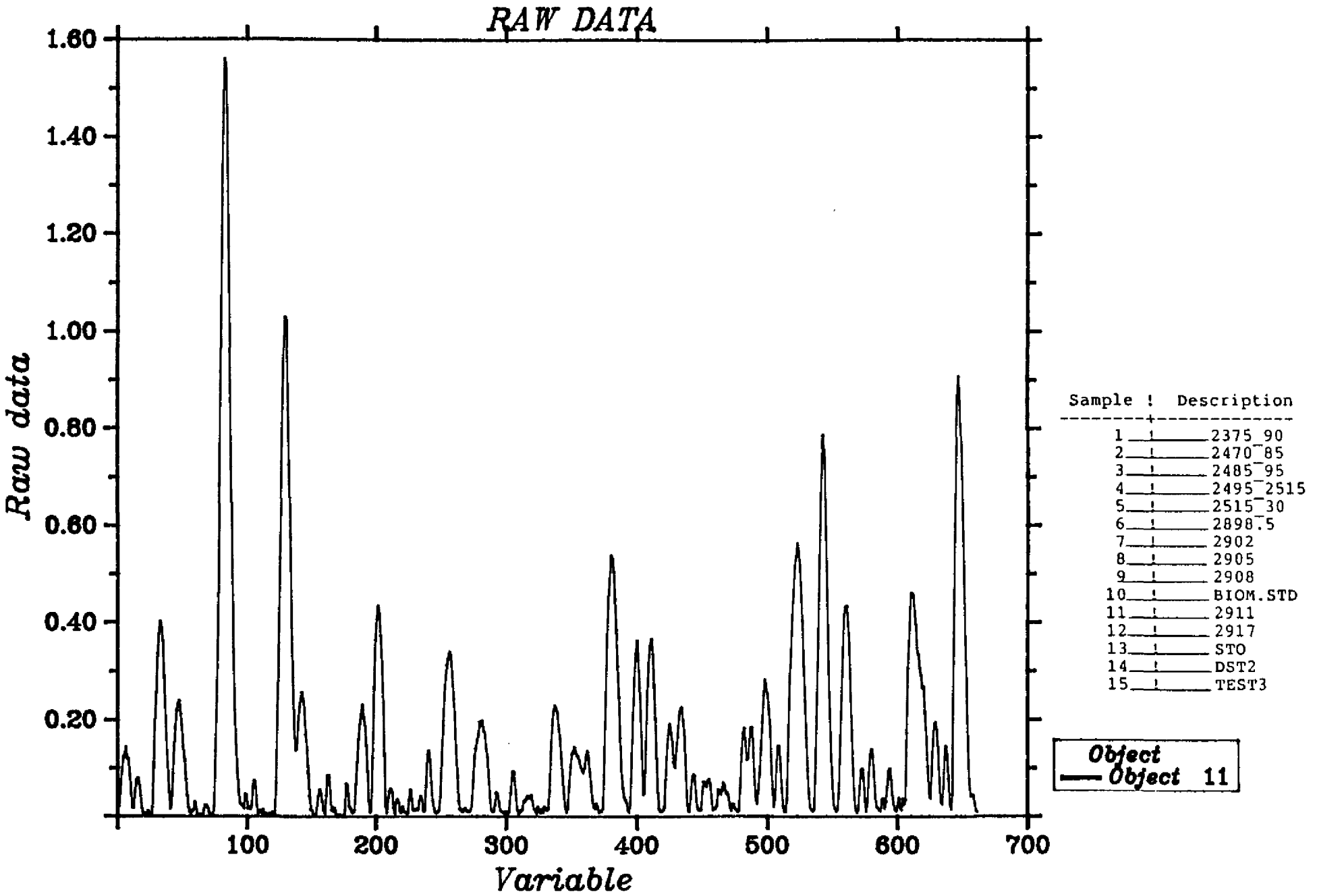
12 ! 2917
13 ! STO
14 ! DST2
15 ! TEST3
Object
Object 10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Sample ! Description
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2 ! 2470_85
3 ! 2485_95
4 ! 2495_2515
5 ! 2515_30
6 ! 2898.5
7 ! 2902
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10 ! BIOM.STD
11 ! 2911
12 ! 2917
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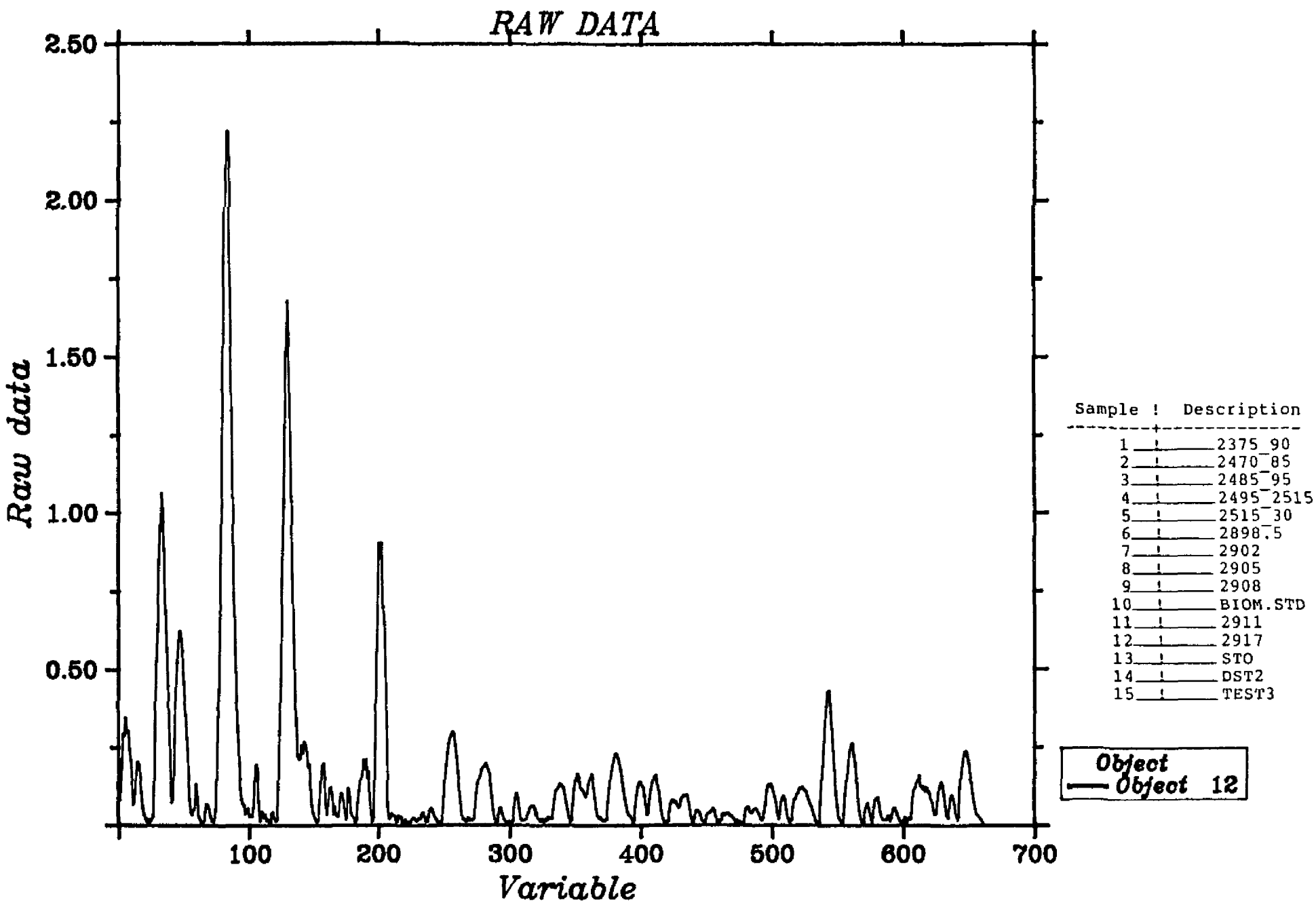
14 ! DST2
15 ! TEST3
Object
Object 11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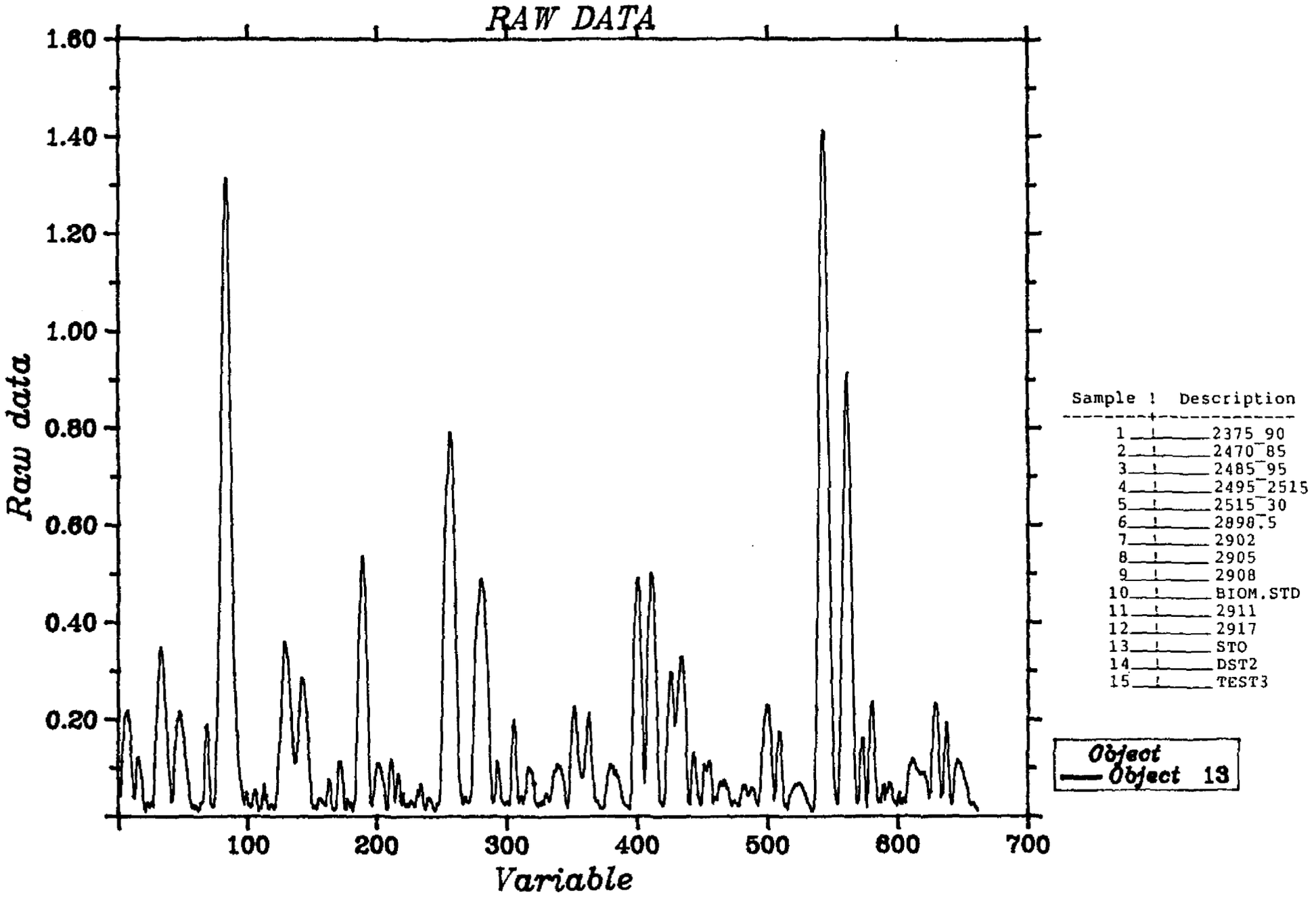
12 ! 2917
13 ! STO
14 ! DST2
15 ! TEST3
Object
Object 12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700
Variable
Sample ! Description
1 ! 2375 90
2 ! 2470 85
3 ! 2485 95
4 ! 2495 2515
5 ! 2515 30
6 ! 2898.5
7 ! 2902
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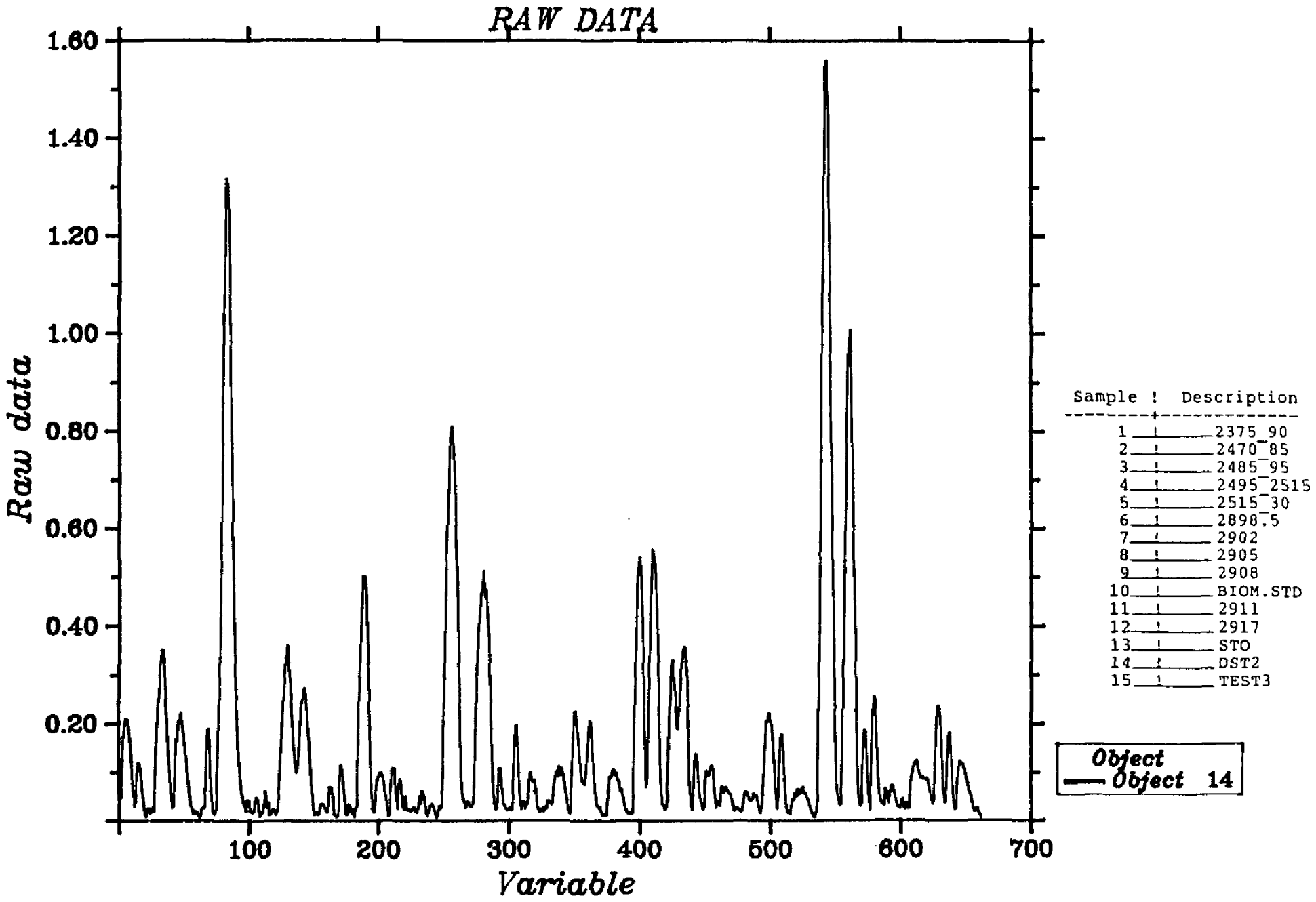
11 ! 2911
12 ! 2917
13 ! STO
14 ! DST2
15 ! TEST3
Object
Object 13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Variable
Sample ! Description
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2 ! 2470_85
3 ! 2485_95
4 ! 2495_2515
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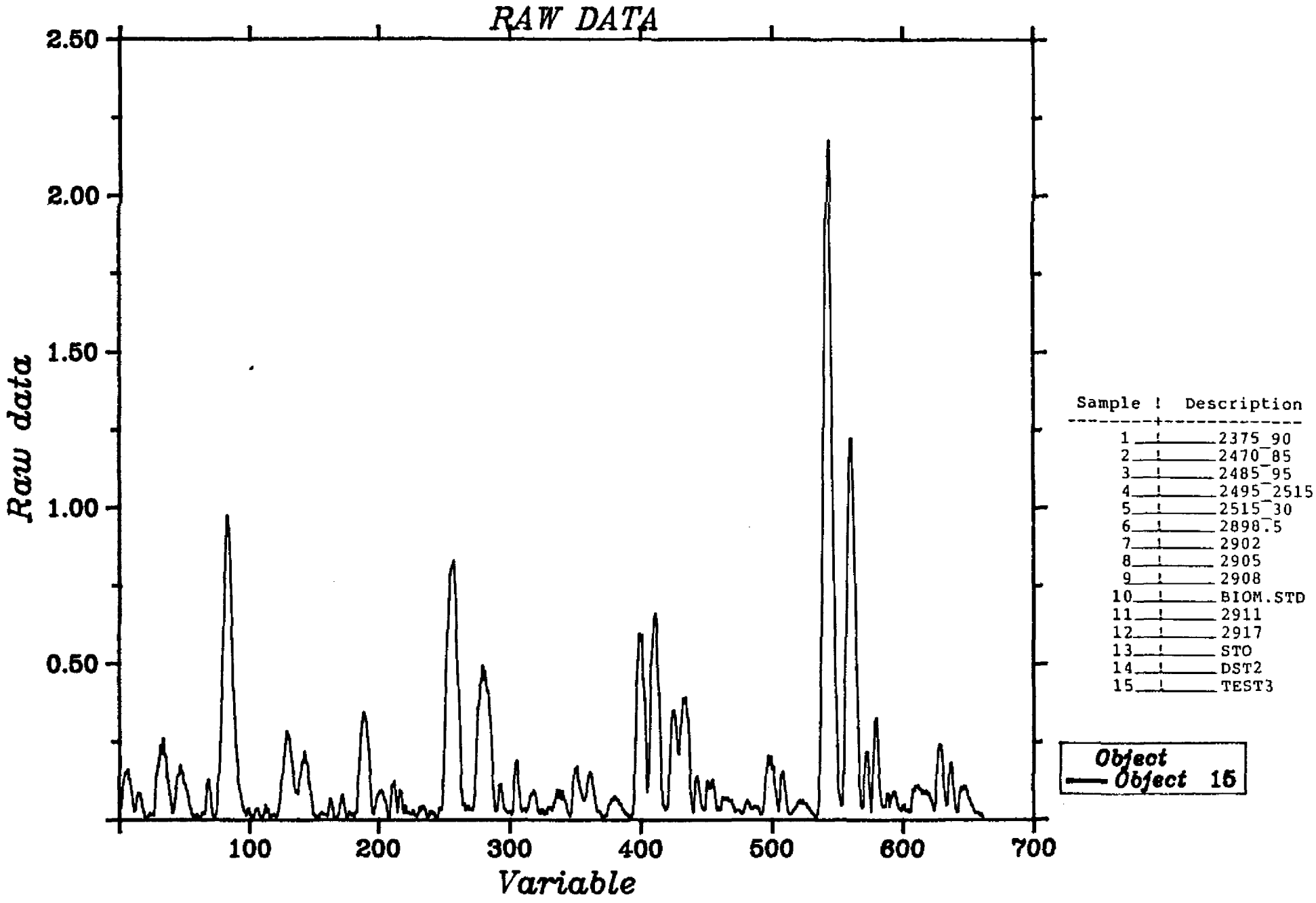
14 ! DST2
15 ! TEST3
Object
Object 14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Variable
Sample ! Description
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3 ! 2485_95
4 ! 2495_2515
5 ! 2515_30
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7 ! 2902
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11 ! 2911
12 ! 2917
13 ! STO
14 ! DST2
15 ! TEST3
Object
Object 15