V-G25 .3

HYDRO

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Distribution	Title
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Summary/Conclusion/Recommendation

Detection of SAT-biomarkers by GC/MS-analysis of extracted rock samples and mud samples from well 7228/9-1. The study includes analysis of mud products which are used in this well.

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Appendix I, SIR results.
Appendix II, SMIM results.

Keywords
Petroleum geochemistry, Mud samples, SAT-biomarkers

Pages-appendix	Amendment no	Revision no	Revision date
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Telex: 40920 hydro n

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ANALYTICAL PROGRAM

All samples are prepared, extracted and fractionated by the Robertson Group, UK. The SAT-fractions are analysed for biomarkers by GC/MS at Norsk Hydro Research Centre, Bergen, Norway.

Prior to the GC/MS-analysis, all samples were dissolved in the same volume of iso-octane.

Analysed samples and the analytical quality of the standard low resolution GC/MS-SIR analysis and GC/MS-SMIM analysis are listed below:

Sample name, Depth, m	Sample type	Analysis quality	
		SIR	SMIM
1077	DC	OK	
1077	MUD	OK	
1138.0	SWC	OK	
1540	DC	OK	
1537.5	SWC	OK	
1540	MUD	OK	
2493.0	SWC	OK	
2500	DC	OK	
2500	MUD	OK	
3500	MUD	OK	
3932	DC light wash	OK	
3932	DC strong wash	OK	
3932.0	SWC	OK	
4000	MUD	OK	
4292	DC	OK	
4292.0	SWC	OK	
4500	DC	OK	
4500	MUD	OK	
PAC POLYMER REG.	mud product	weak	ND
PAC PLOYMER S	mud product	ND	
PAC POLYMER SL	mud product	ND	
PROBIO-2	mud product	ND	
PROCAP	mud product	OK	weak
PRODEFOAM	mud product	OK	OK
PROLUBE	mud product	ND	
PROPOL REG.	mud product	weak	
THERMOPOL	mud product	weak	
XANTHAN POLYMER	mud product	weak	weak
STD-a/ST25061B	lab. ref.	OK	OK
STD-b	lab. ref.	OK	
STD-c	lab. ref.	OK	
STD-d	lab. ref.	OK	
STD-e	lab. ref.	OK	

ND => Not Detectable

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EXPERIMENTAL

GC/MS Low Resolution Selected Ion Recording (LR-SIR):

The samples were analysed according to standard lab procedures for SAT-biomarker detection.

Instrumentation:	GC: HP-5890 MS: HP-5970B (MSD)
GC-separation:	Capillary column, unpolar methyl silicone phase, 0.2 mm I.D., 0.25 um, 25 m
MS-detection:	Standard selection of common fragment ions for SAT-biomarkers.

The following masses are reported as normalized fragmentograms (mass chromatograms):

191.2 m/z => Common fragment ion for triterpanes
217.2 -"- => Common fragment ion for steranes
218.2 -"- => Favourizing 5α(H),14β(H),21β(H)-steranes (indicating the carbon number distribution).

This semi-quantitative presentation is strictly related to the analytical method. The concentration/response-ratio is not necessarily comparable between different type of compounds. A quantitative comparison of biomarker distributions are hence restricted to a narrow range of concentrations.

The results are presented in Appendix I.

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GC/MS Selected Metastable Ion Monitoring (SMIM):

Standard lab procedures of SMIM are used to detect pre-selected groups of SAT-biomarkers.

Instrumentation:	GC: HP-5890 MS: VG-70E/11-250
GC-separation:	Capillary column, unpolar methyl silicone phase, 0.2 mm I.D., 0.33 um, 25 m
MS-detection:	Standard detection of pre-selected metastable reactions in the 1st. field free region.

Detected metastable transitions are listed below:

Group 1 (low molecular weight biomarkers):

Parent ion	Daughter ion	Carbon number and compound name
360 m/z	191 m/z	C_{26} tricyclic terpanes
346	191	C_{25} -"-
332	191	C_{24} -"-
330	191	C_{24} tetracyclic terpanes
318	191	C_{23} tricyclic terpanes
304	191	C_{22} -"-
290	191	C_{21} -"-
276	191	C_{20} -"-
316	217	C_{23} steranes
302	217	C_{22} -"-
288	217	C_{21} -"-

Group 2:

482 m/z	191 m/z	C_{35} pentacyclic triterpanes
468	191	C_{34} -"-
454	191	C_{33} -"-
440	191	C_{32} -"-
426	191	C_{31} -"-
412	191	C_{30} -"-
398	191	C_{29} -"-
384	191	C_{28} -"-
370	191	C_{27} -"-
414	217	C_{30} steranes
400	217	C_{29} -"-
386	217	C_{28} -"-
372	217	C_{27} -"-

The relative distribution of the analysed SAT-biomarkers are presented in bargraphs,- measured as peak heights and normalized to the most abundant compound:

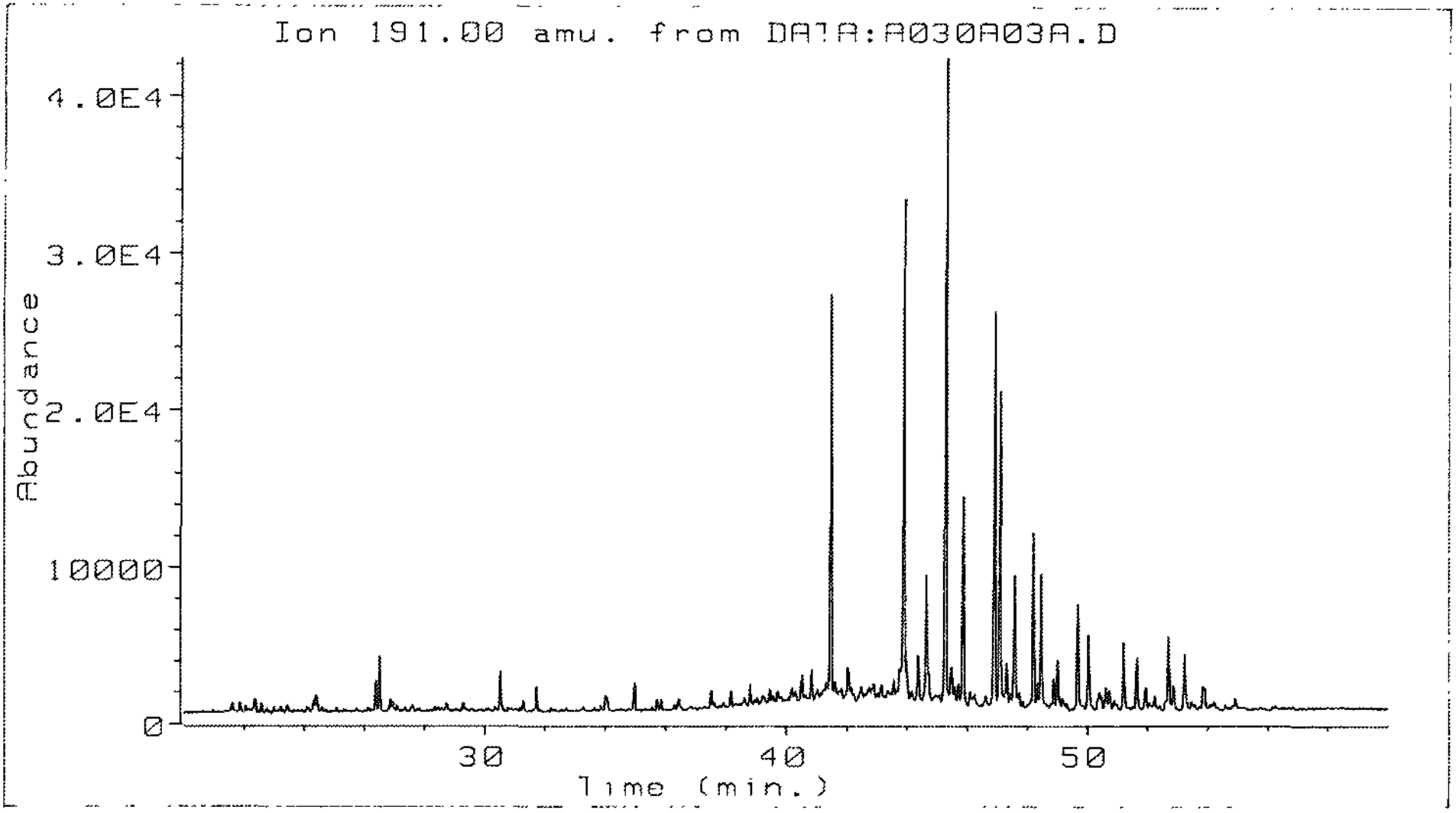
This semi-quantitative presentation is strictly related to the analytical method. The concentration/response ratio is not necessarily comparable between different type of compounds. A quantitative comparison of biomarker distributions are hence restricted to a narrow range of concentrations.

The abbreviation codes and identities of detected SAT-biomarkers, peak data and normalized bargraphs are reported in Appendix II.

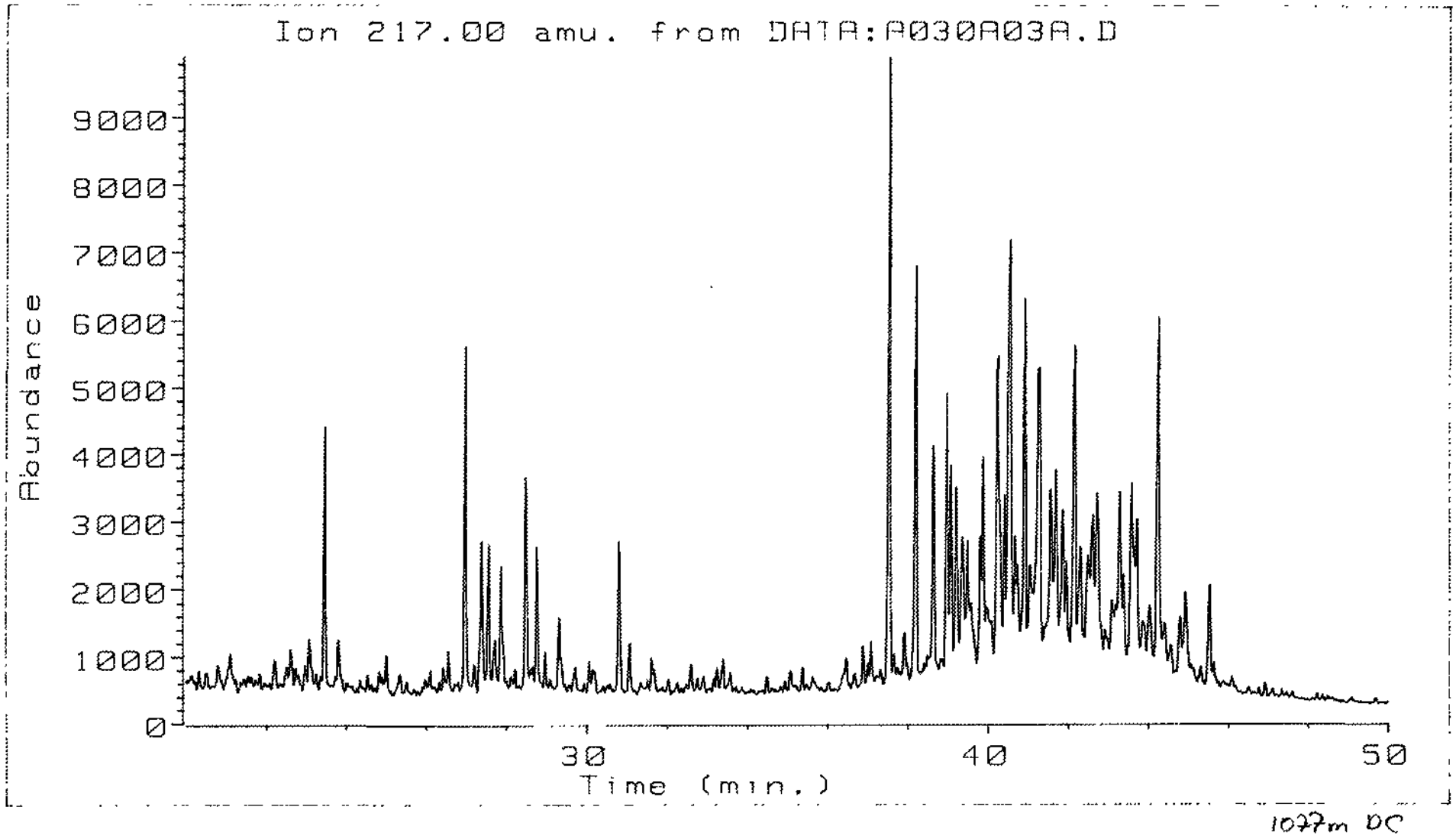
Appendix I

GC/MS LR-SIR of saturated biomarkers
in the SAT-fraction.

Fragmentograms of fragment
ions 191, 217 and 218 m/z


Ion 191.00 amu. from DATA:A030A03A.D
4.0E4
3.0E4
2.0E4
10000
0
Abundance
30
40
50
Time (min.)

1077m DC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Abundance
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7000
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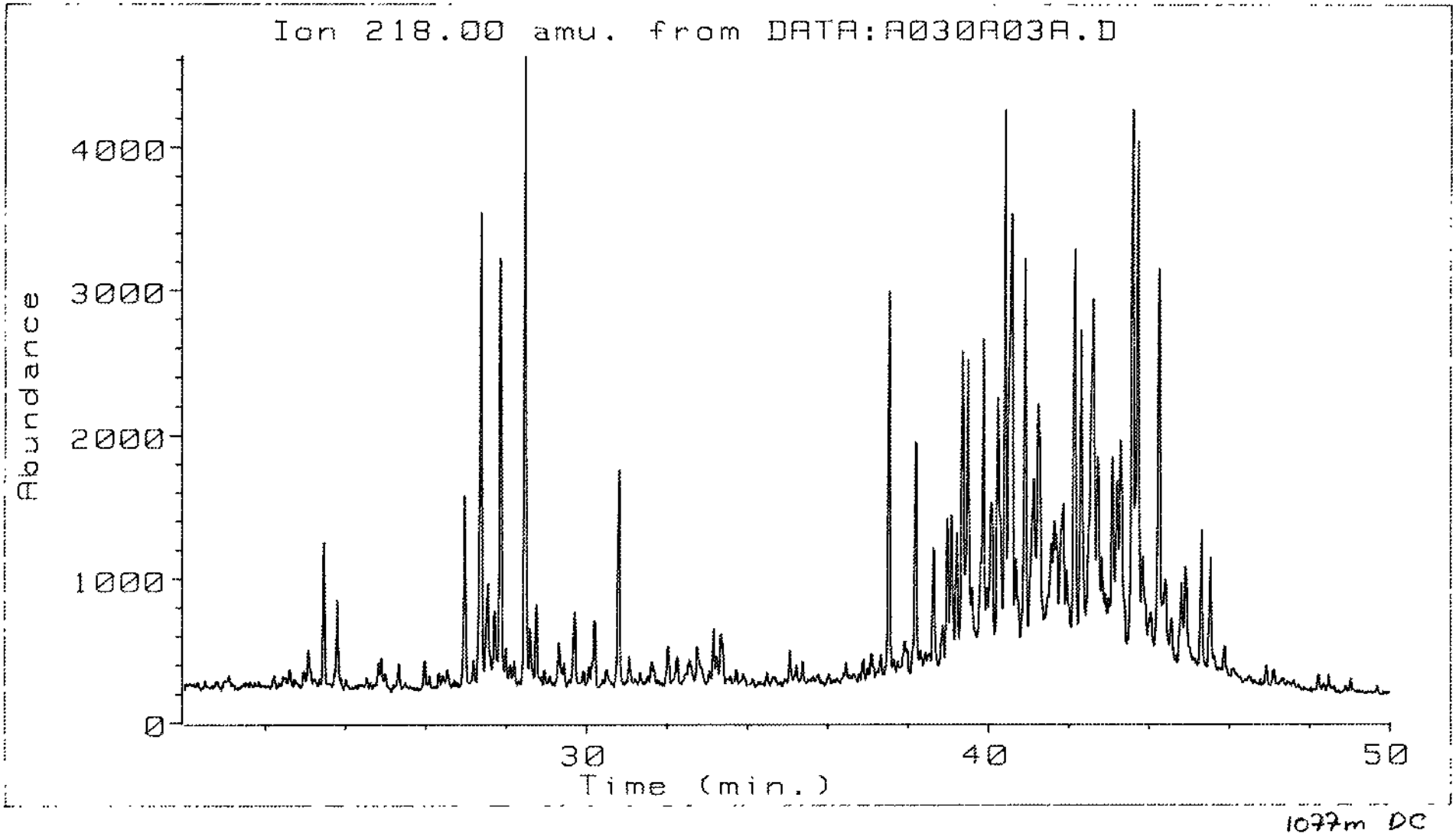
3000
2000
1000
0
30
40
50
Time (min.)

1077m DC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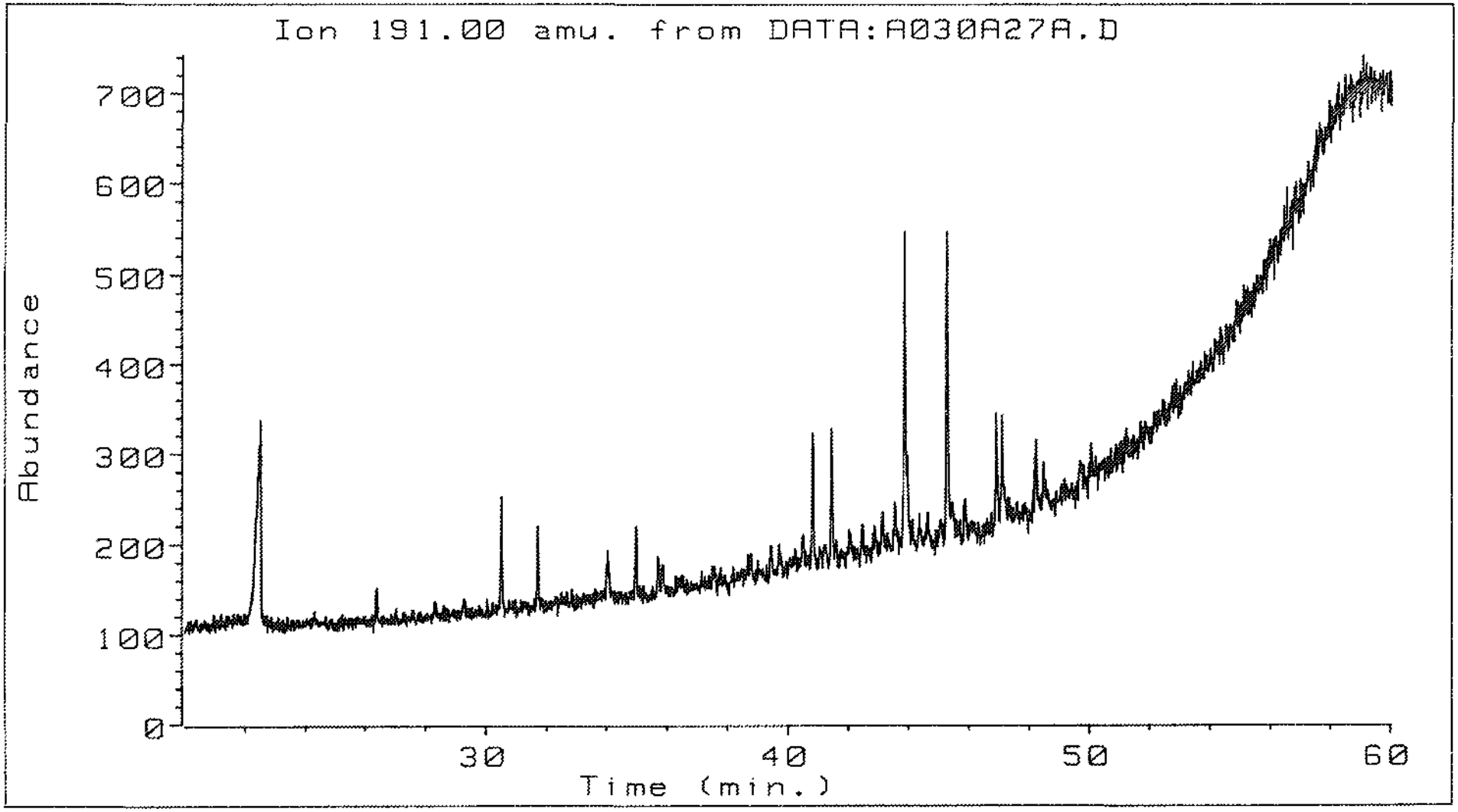
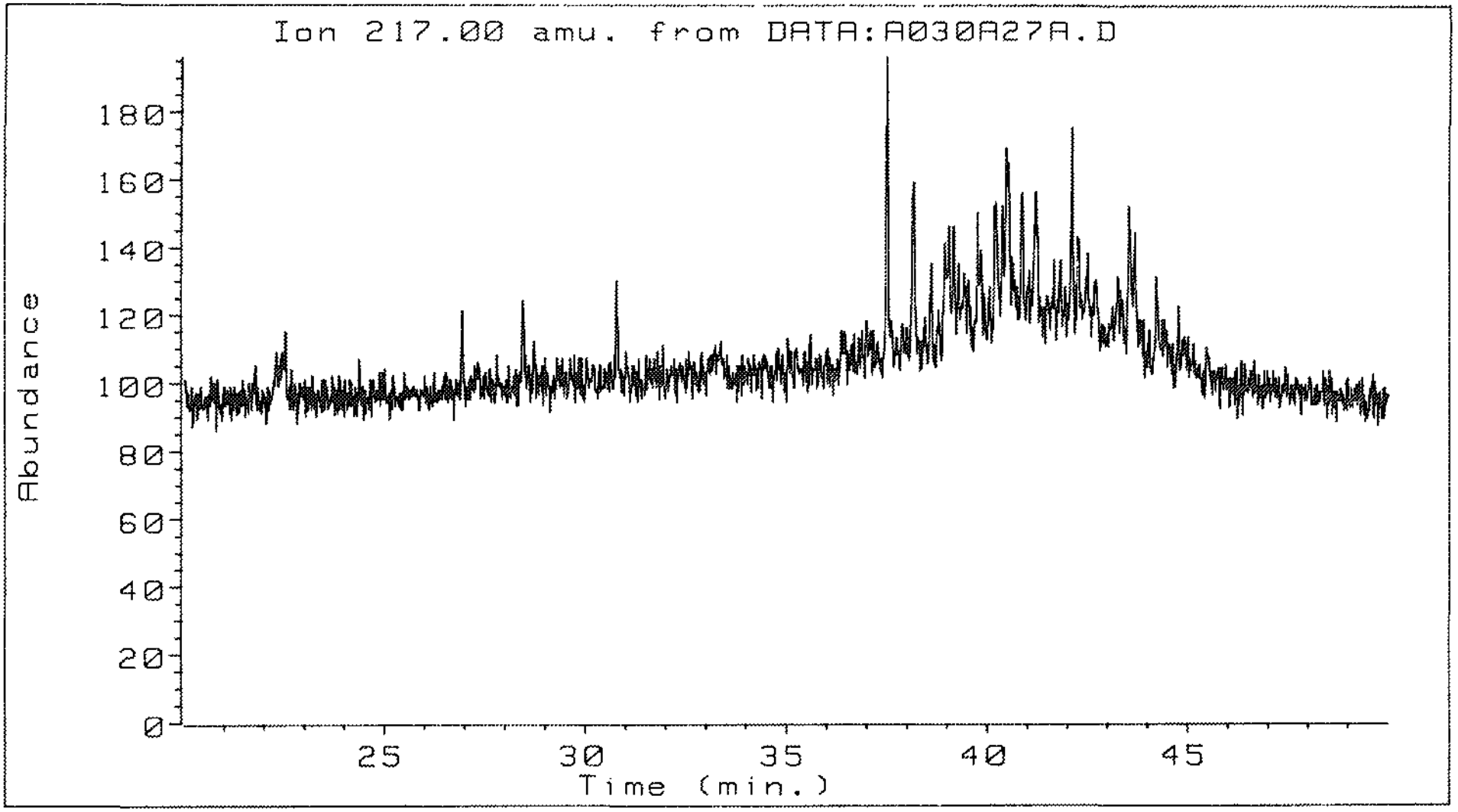
Abundance
4000
3000
2000
1000
0
30
40
50
Time (min.)

1077m DC


Ion 191.00 amu. from DATA:A030A27A.D
Abundance
700
600
500
400
300
200
100
0
30
40
50
60
Time (min.)

1077 m mud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Abundance
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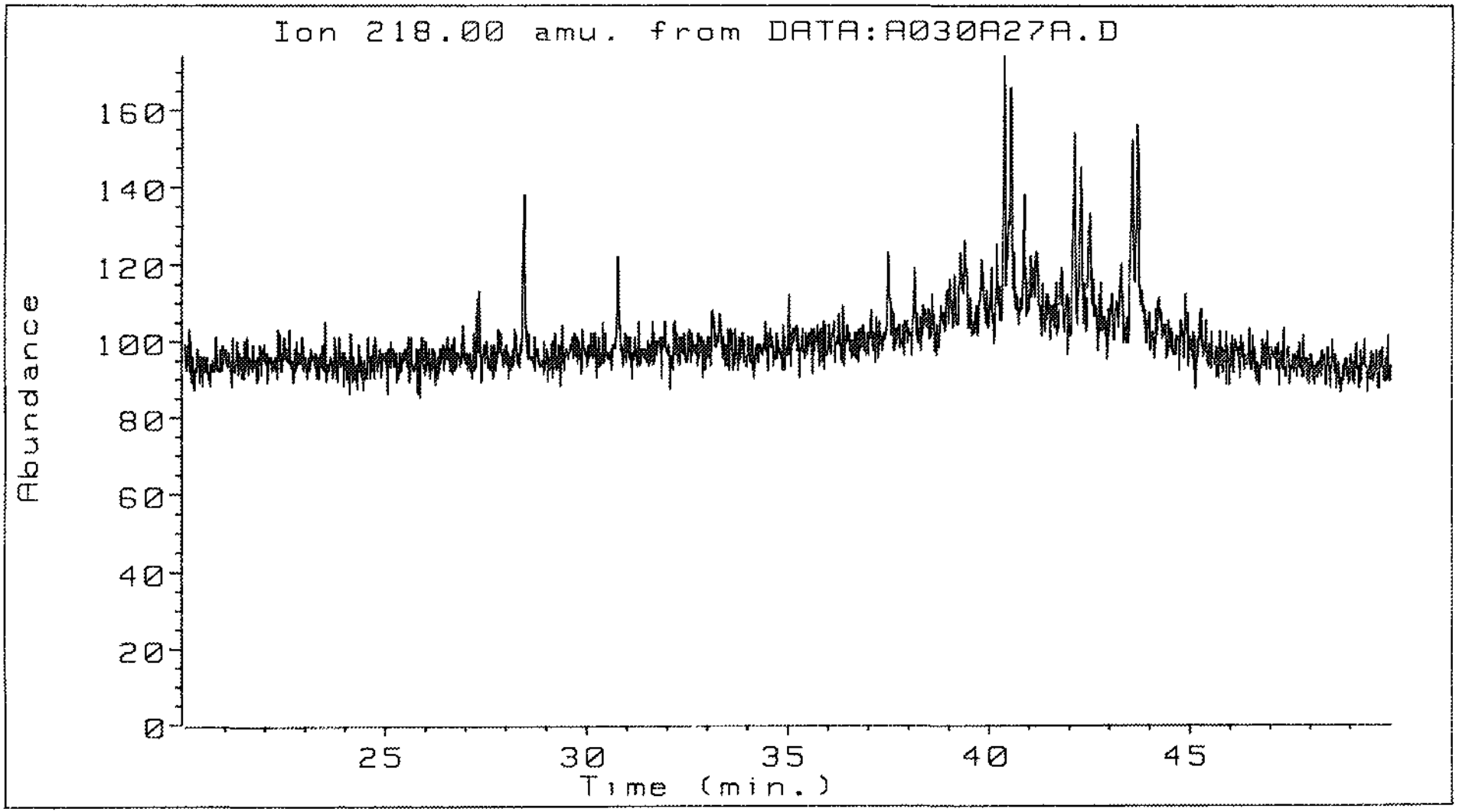
120
100
80
60
40
20
0
25
30
35
40
45
Time (min.)

1077m mud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120
100
80
60
40
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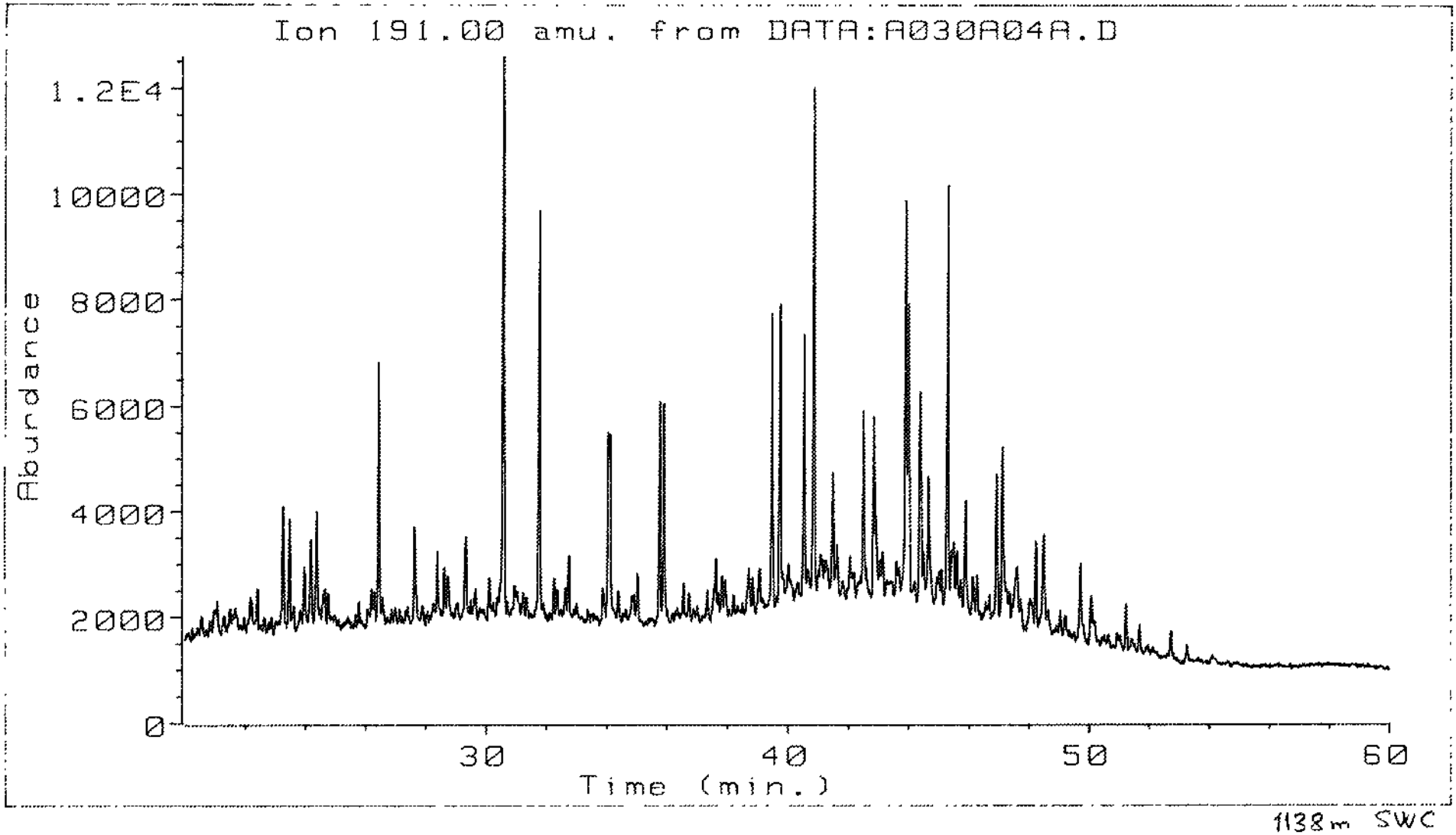
0
25
30
35
40
45
Time (min.)

1077m MUD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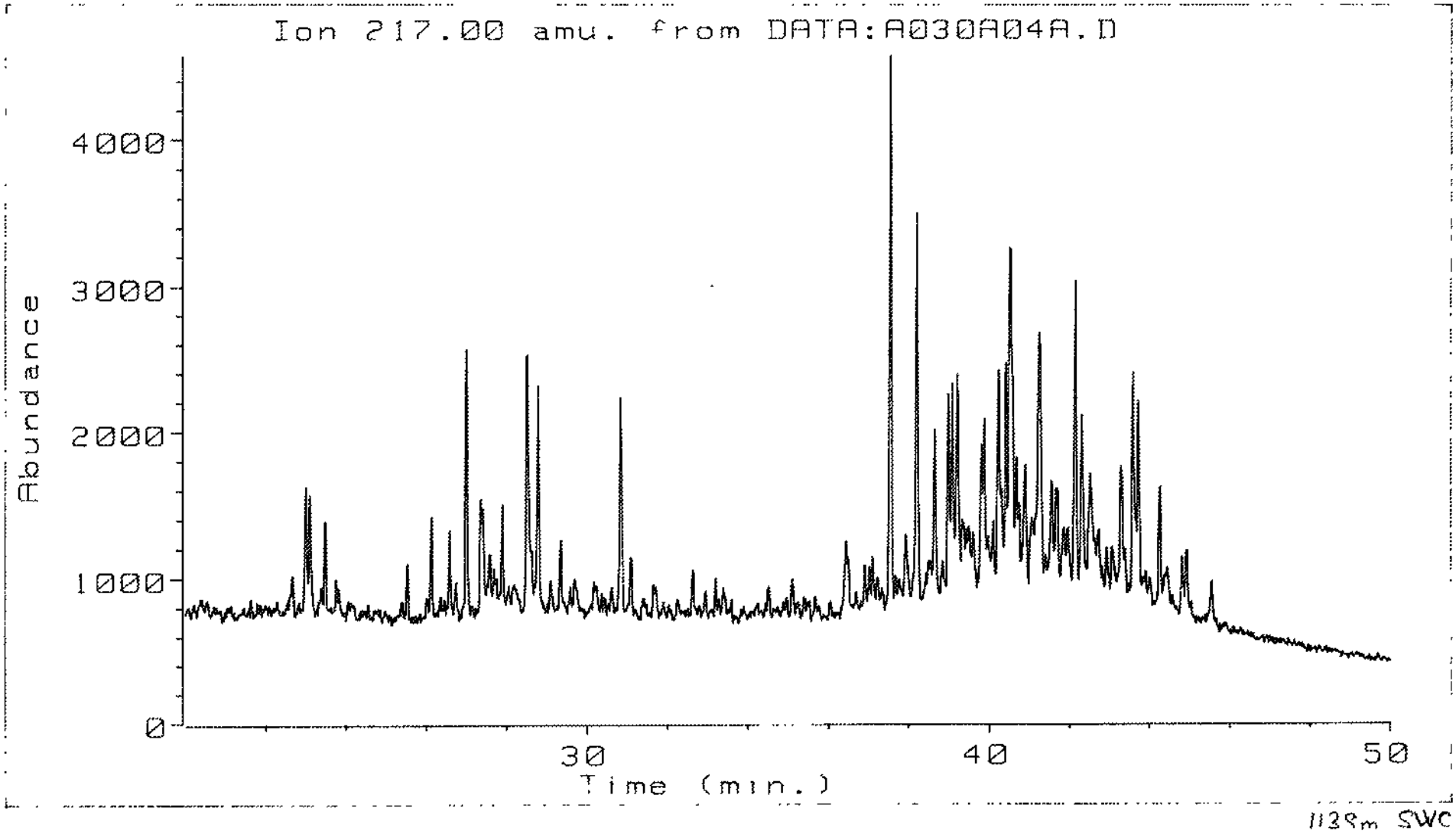
Abundance
1.2E4
10000
8000
6000
4000
2000
0
30
40
50
60
Time (min.)
1138m SWC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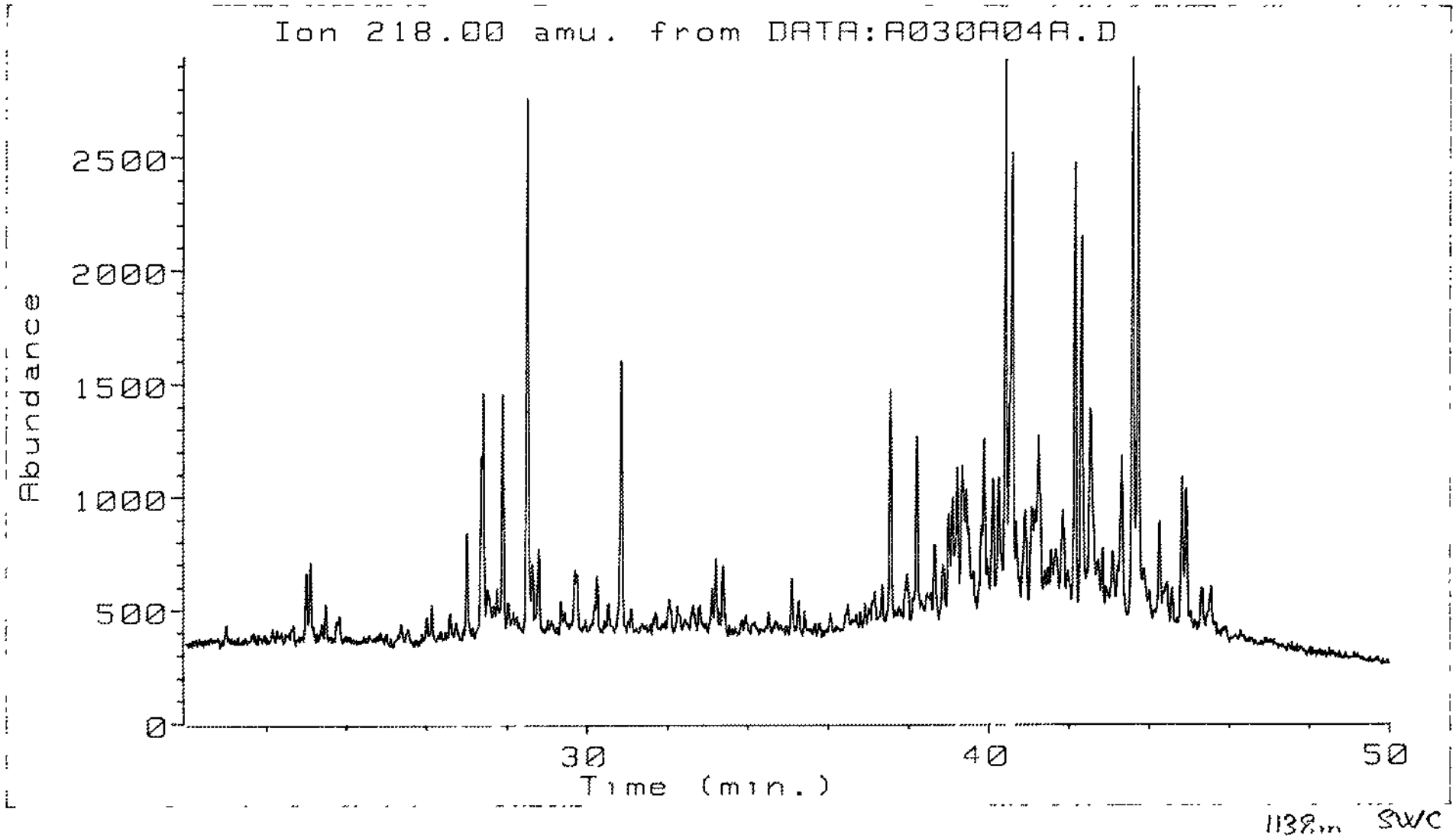
1000
0
30
40
50
Time (min.)

1139m SWC


Ion 218.00 amu. from DATA:A030A04A.D
Abundance
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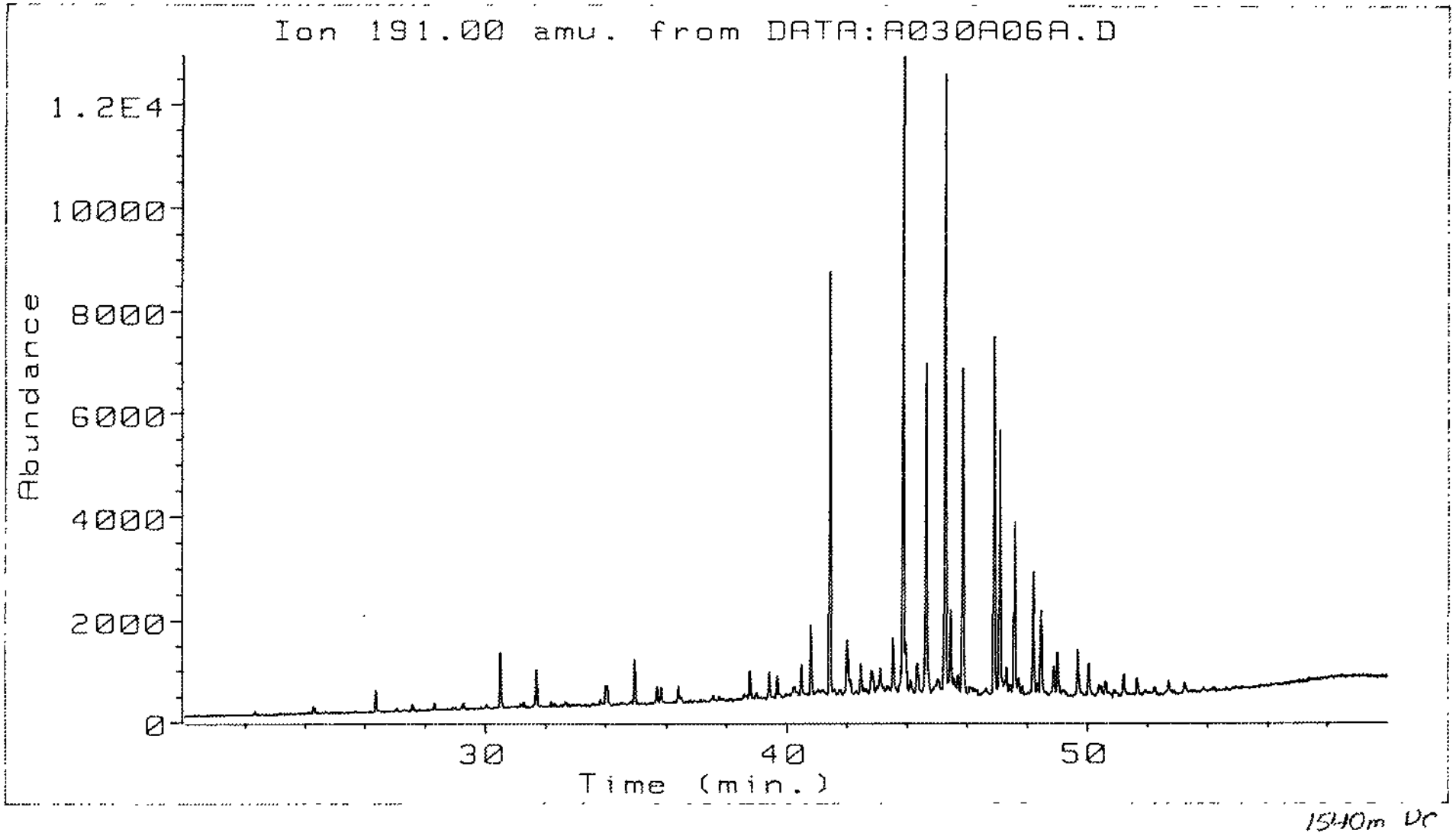
1000
500
0
30
40
50
Time (min.)

1138.m SWC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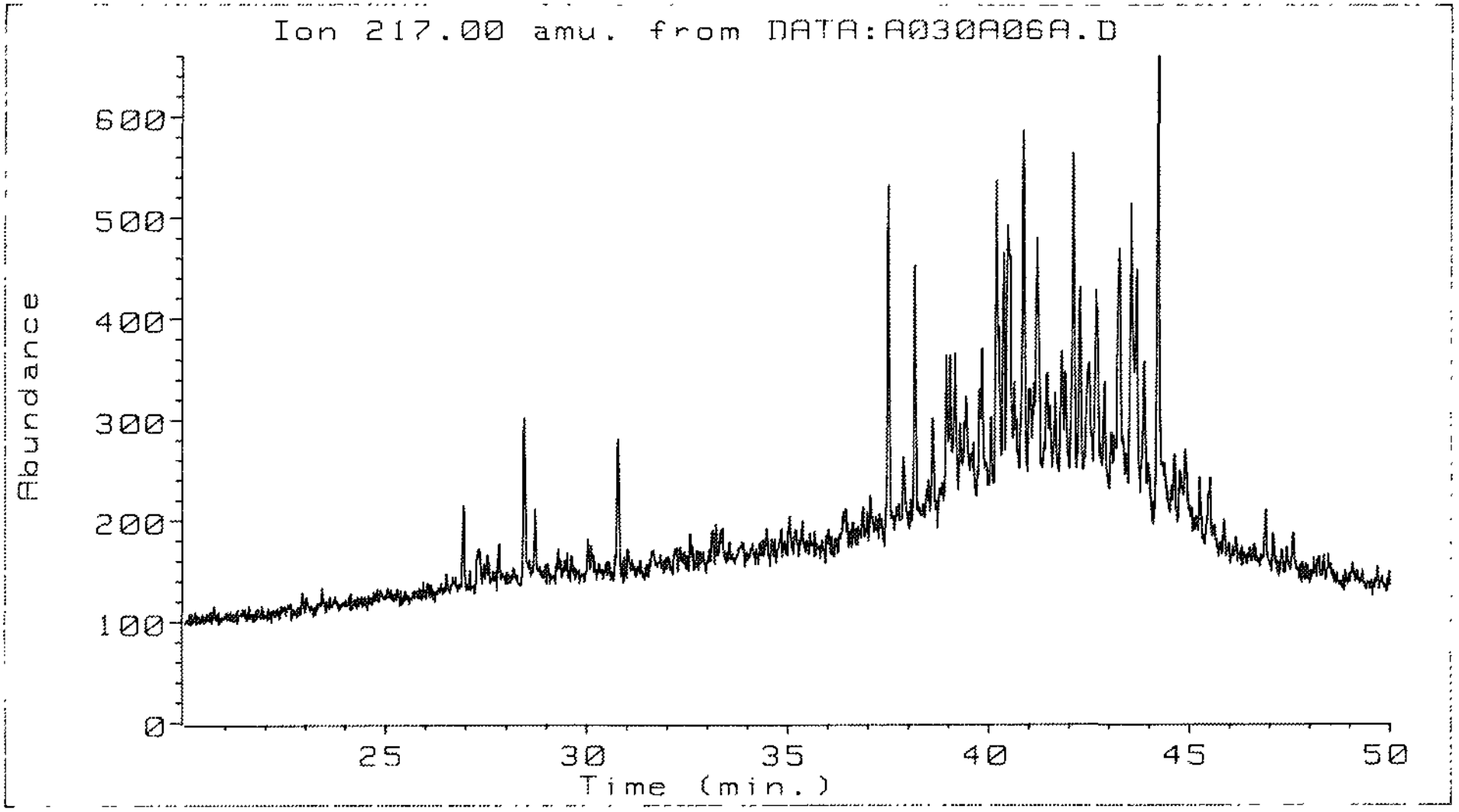
4000
2000
0
Abundance
30
40
50
Time (min.)

1540m DC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Abundance
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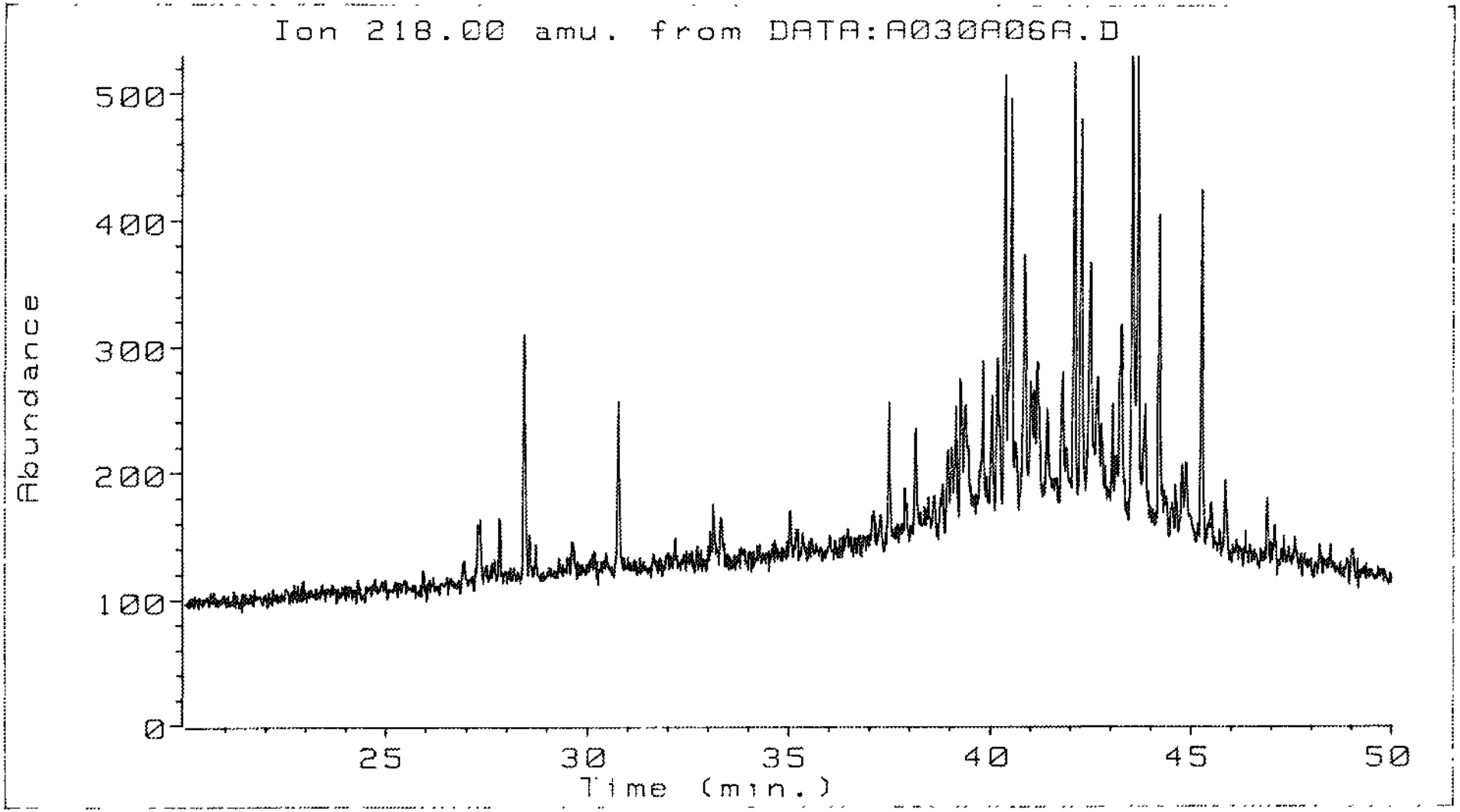
500
400
300
200
100
0
25
30
35
40
45
50
Time (min.)

1540m DC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Abundance
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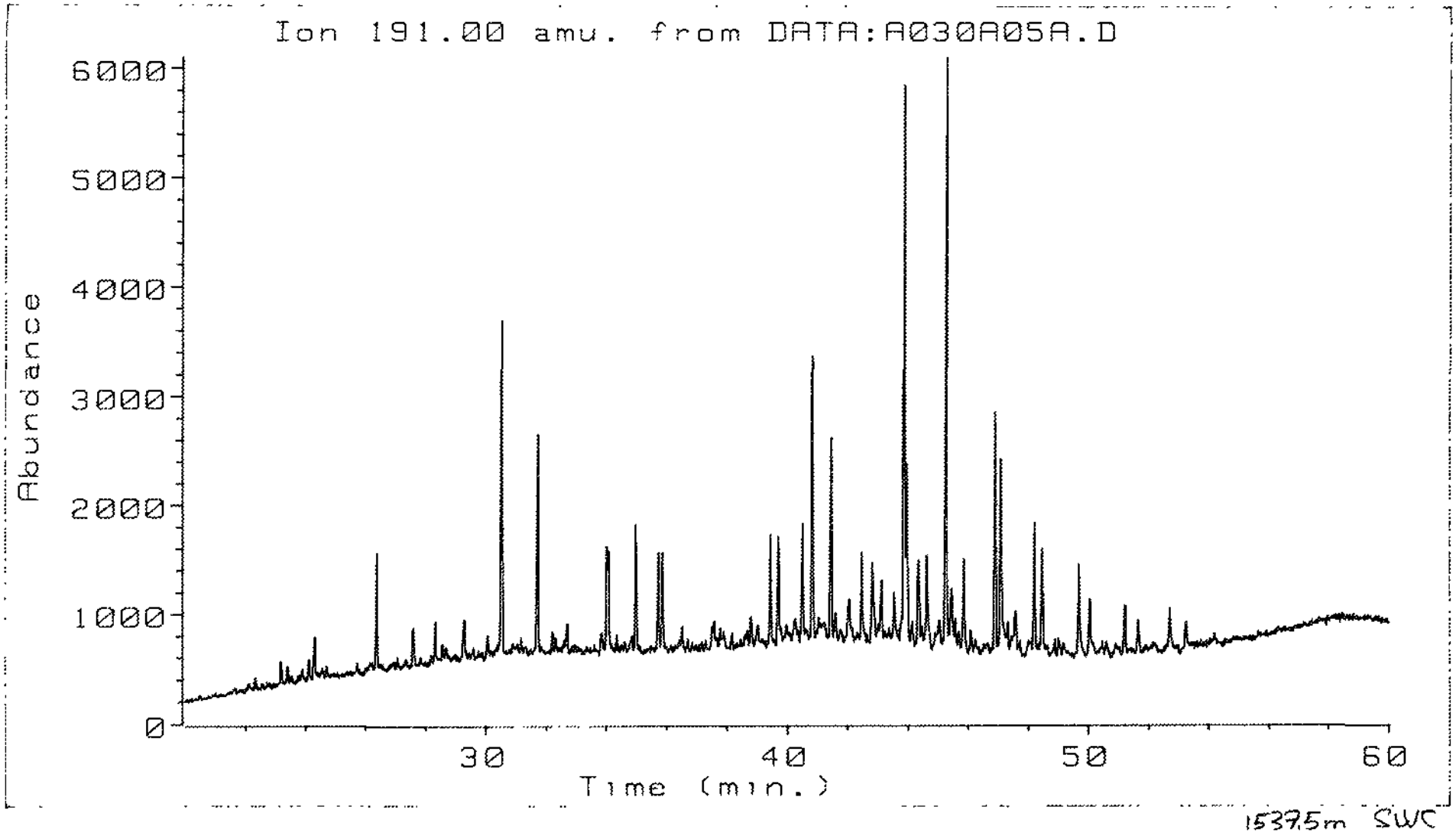
400
300
200
100
0
25
30
35
40
45
50
Time (min.)

1540m DC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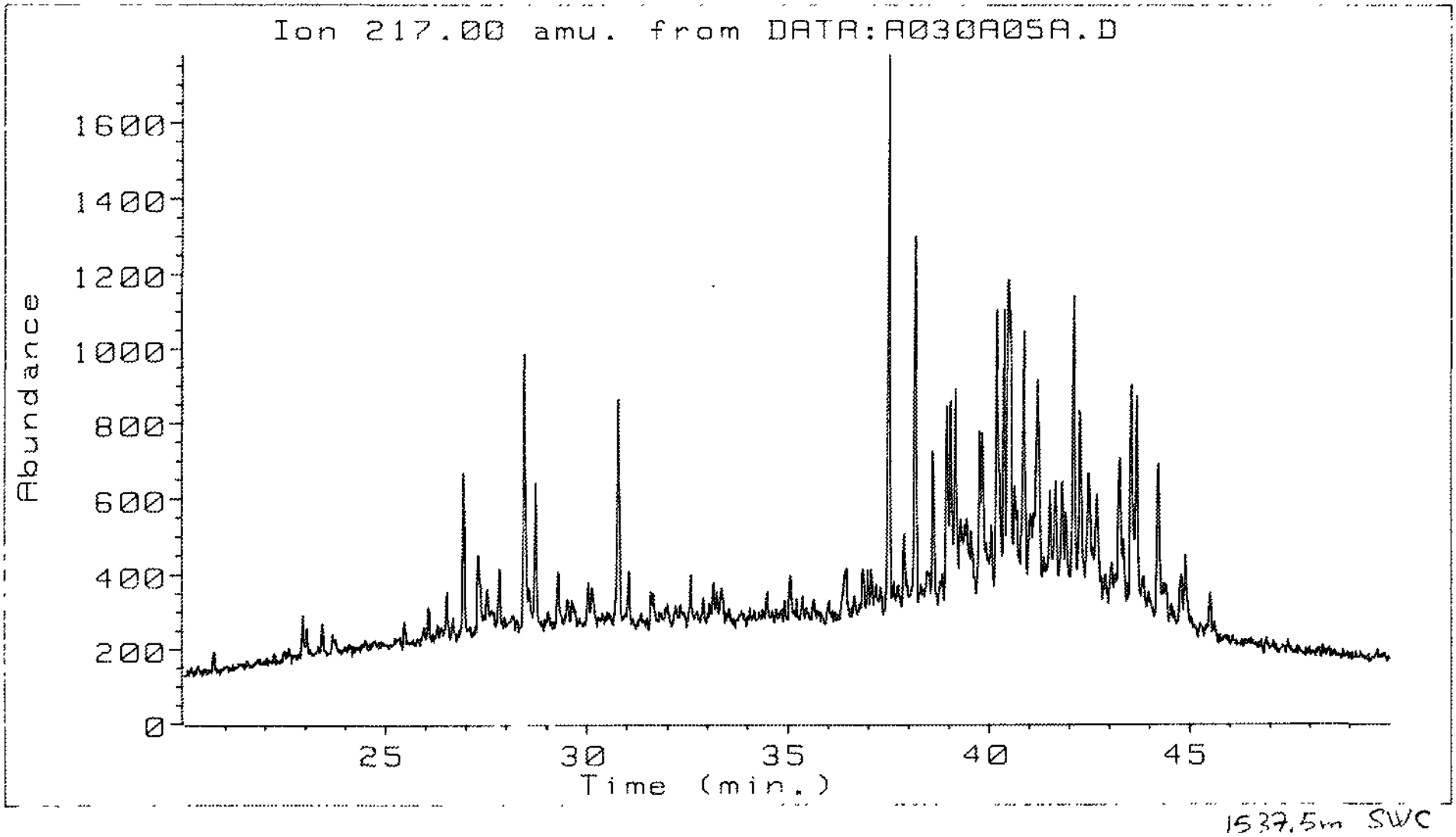
2000
1000
0
30
40
50
60
Time (min.)

1537.5m SWC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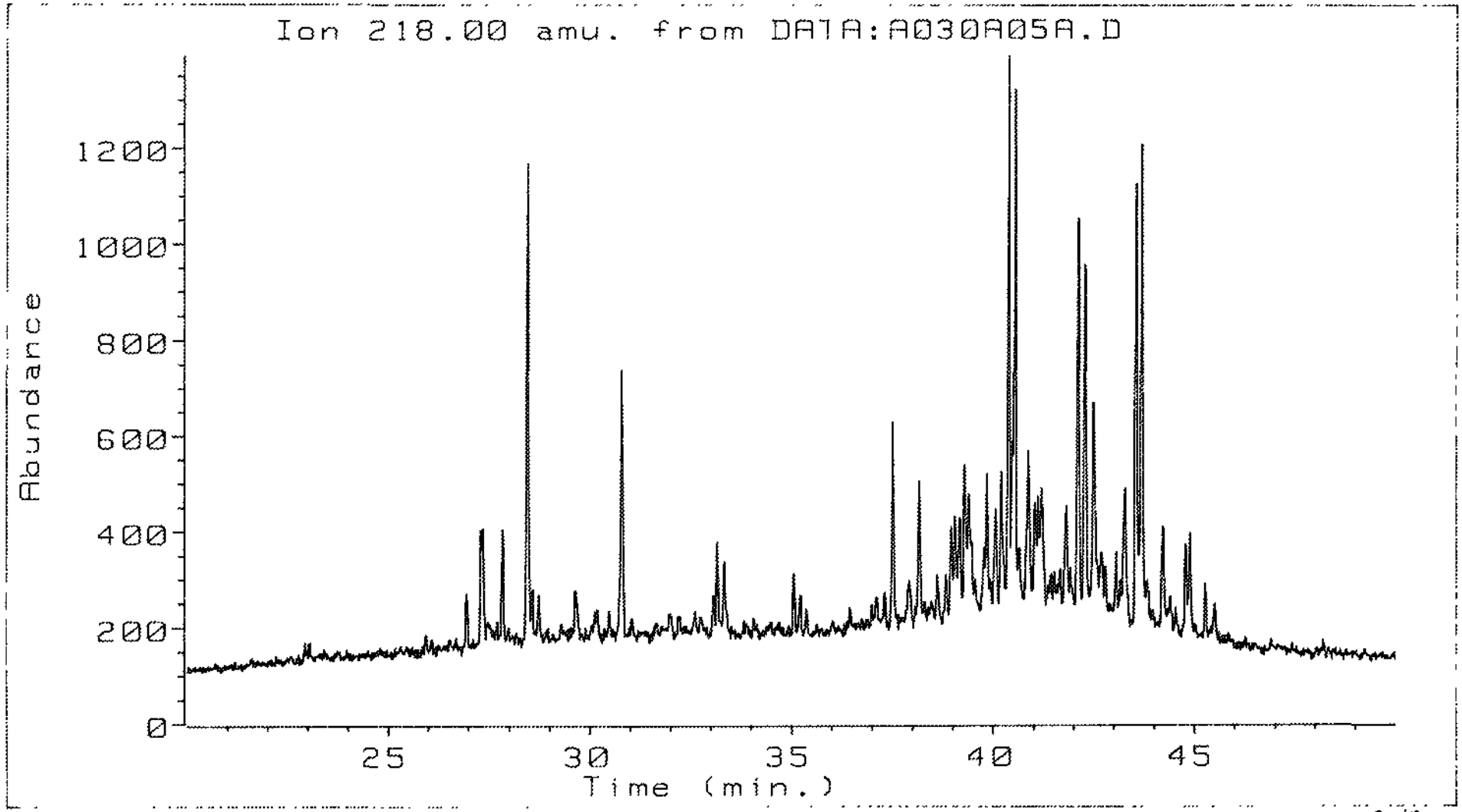
1400
1200
1000
800
600
400
200
0
25
30
35
40
45
Time (min.)

1537.5m SWC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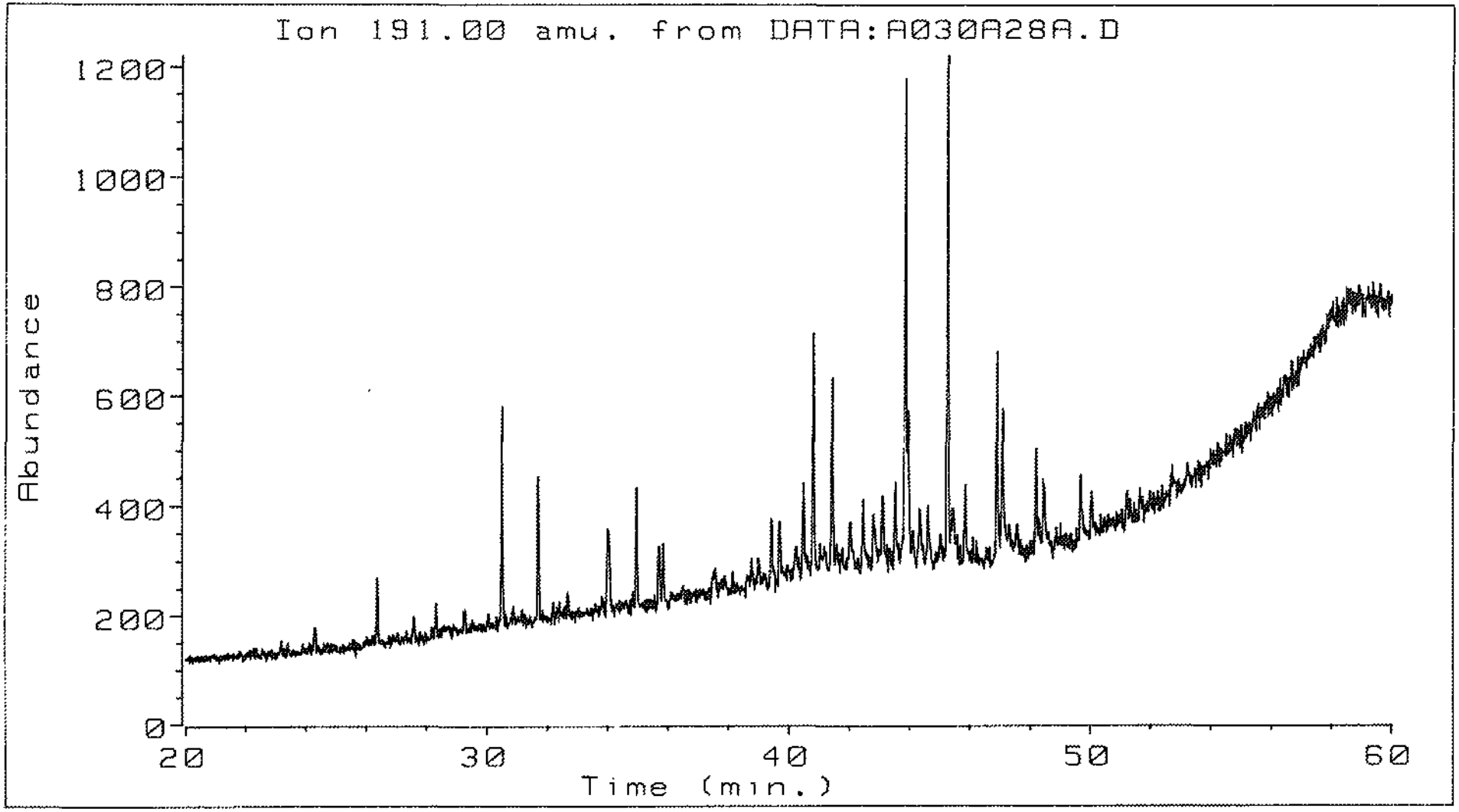
800
600
400
200
0
25
30
35
40
45
Time (min.)

1537.5m SW/C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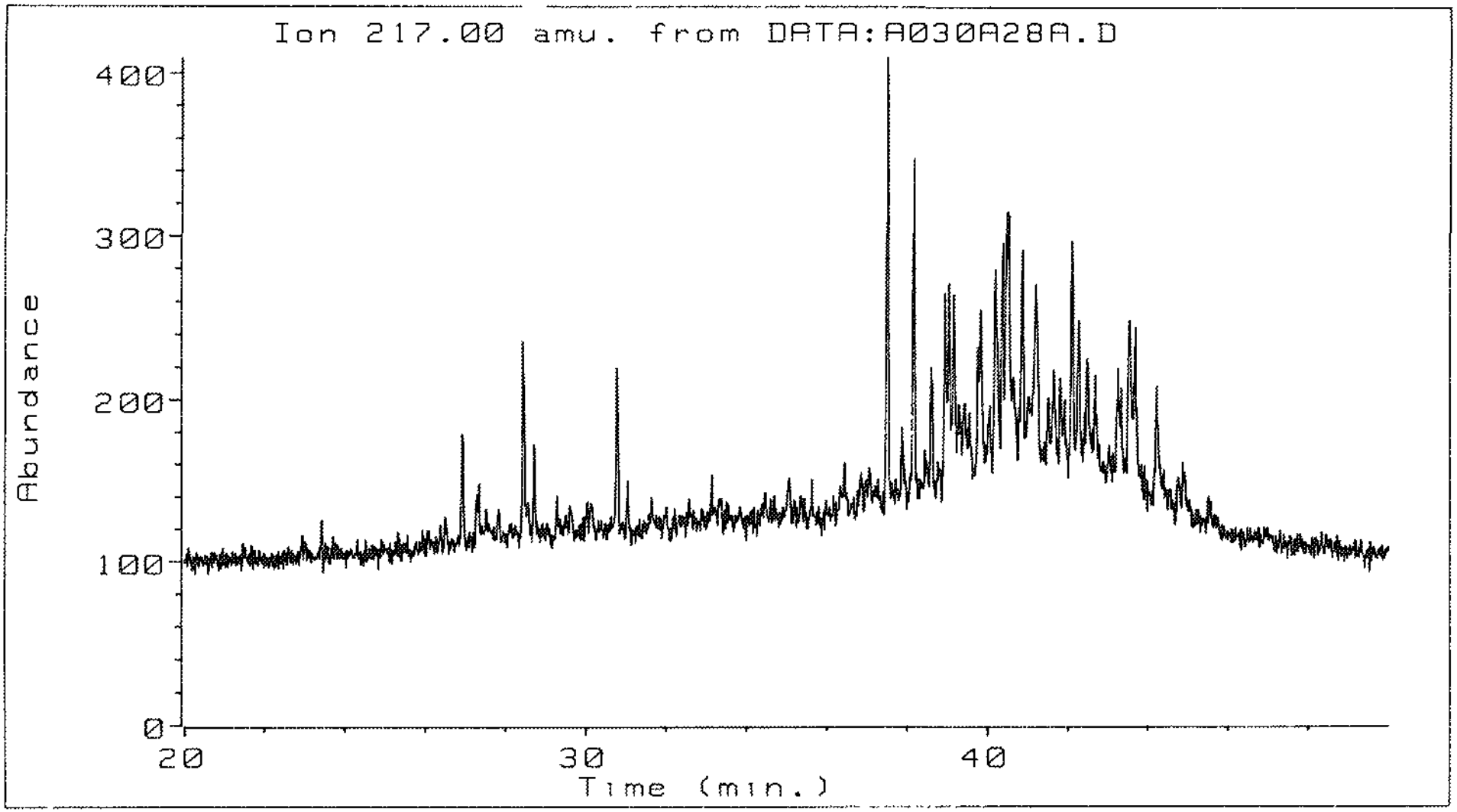
1000
800
600
400
200
0
20
30
40
50
60
Time (min.)

1540m mvd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Abundance
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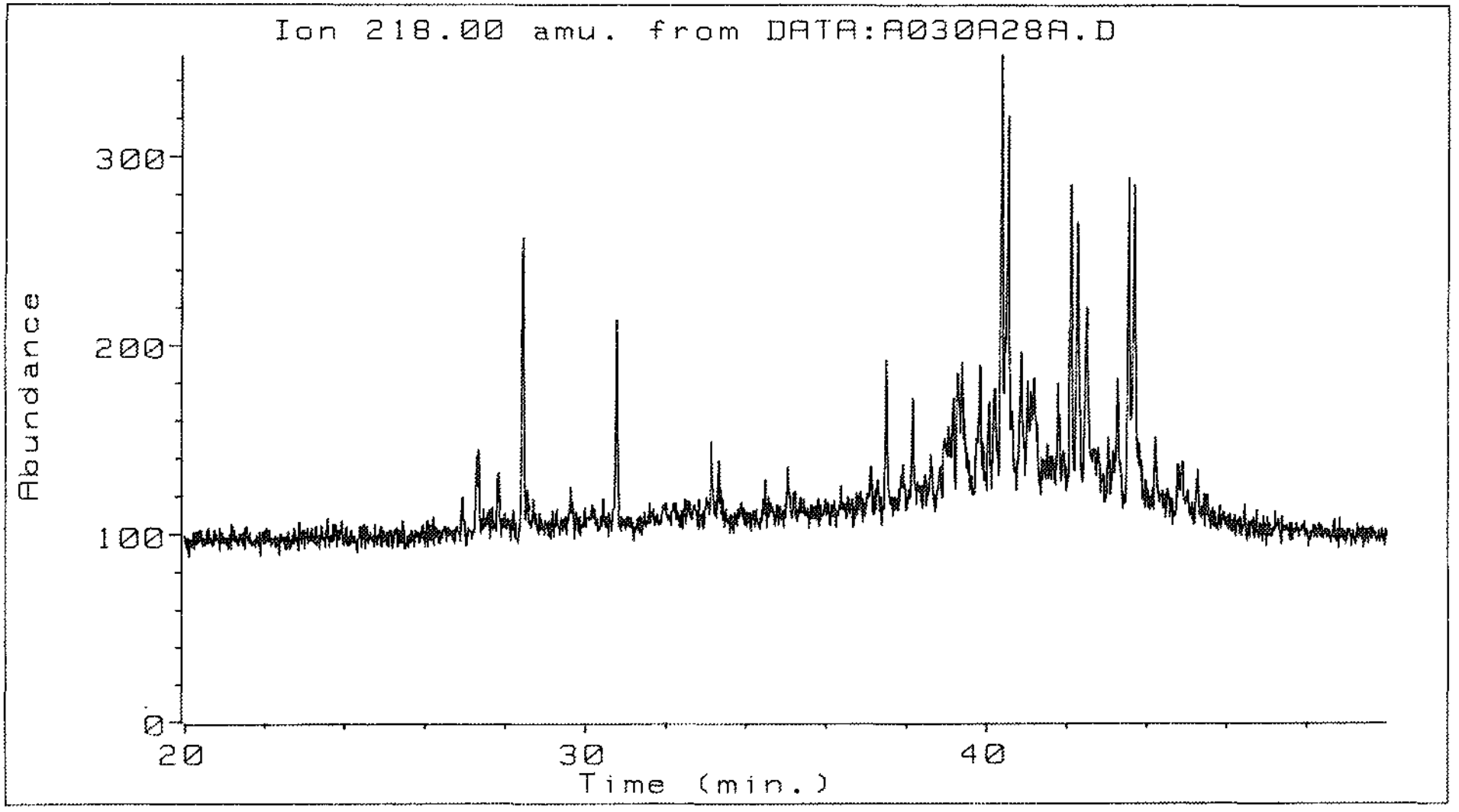
300
200
100
0
20
30
40
Time (min.)

1510m m'd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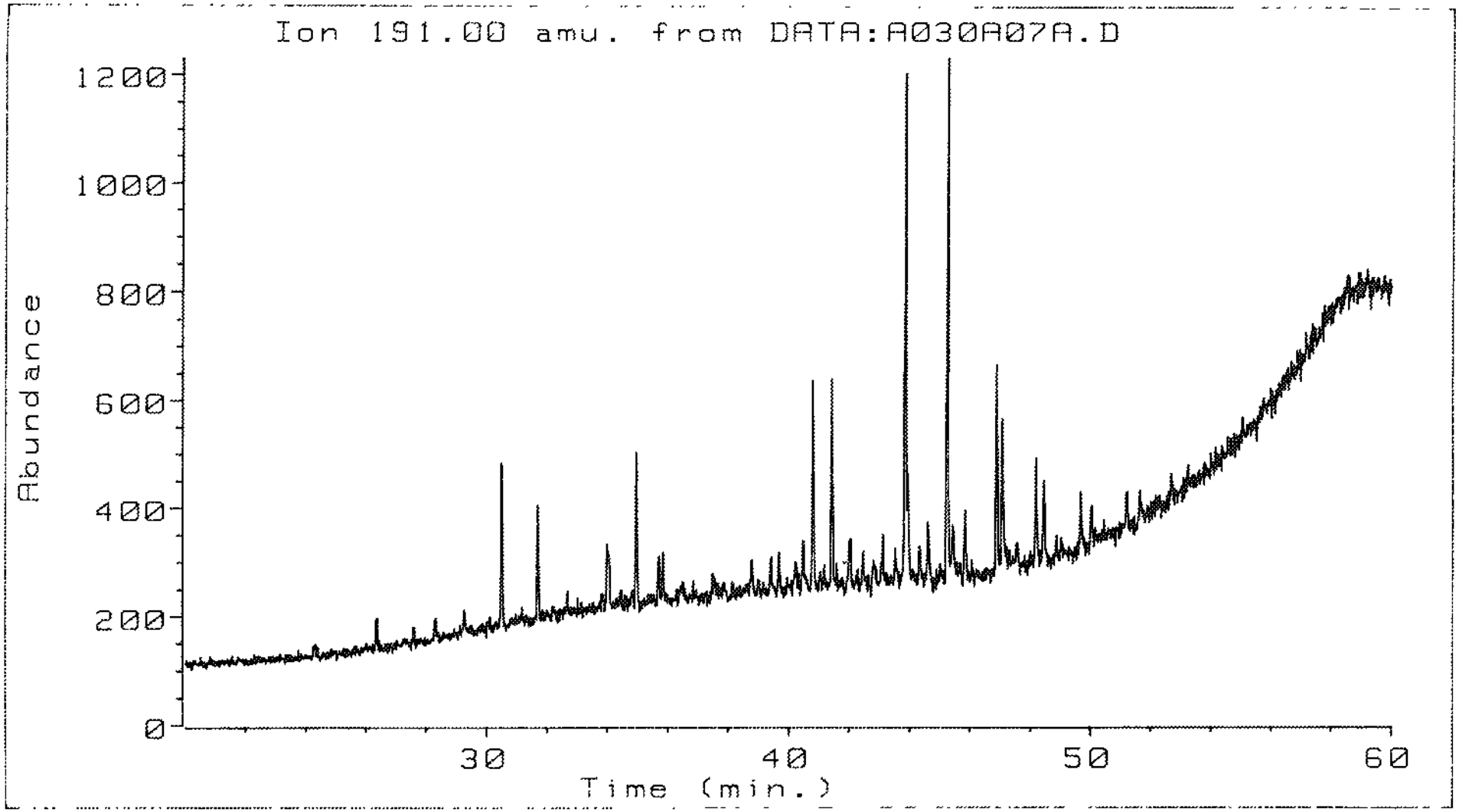
200
100
0
20
30
40
Time (min.)

1540m nm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800
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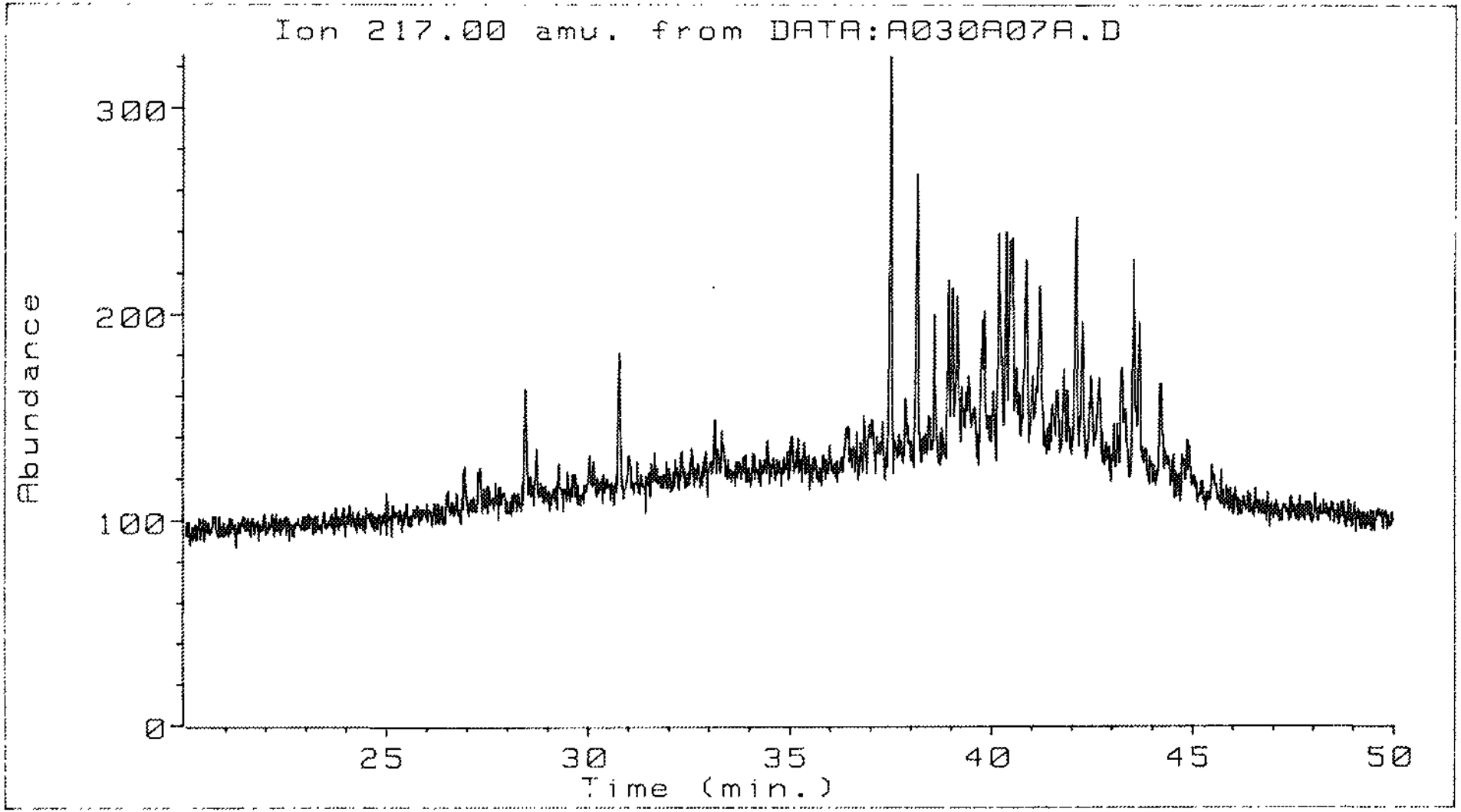
400
200
0
30
40
50
60
Time (min.)

2493m SWC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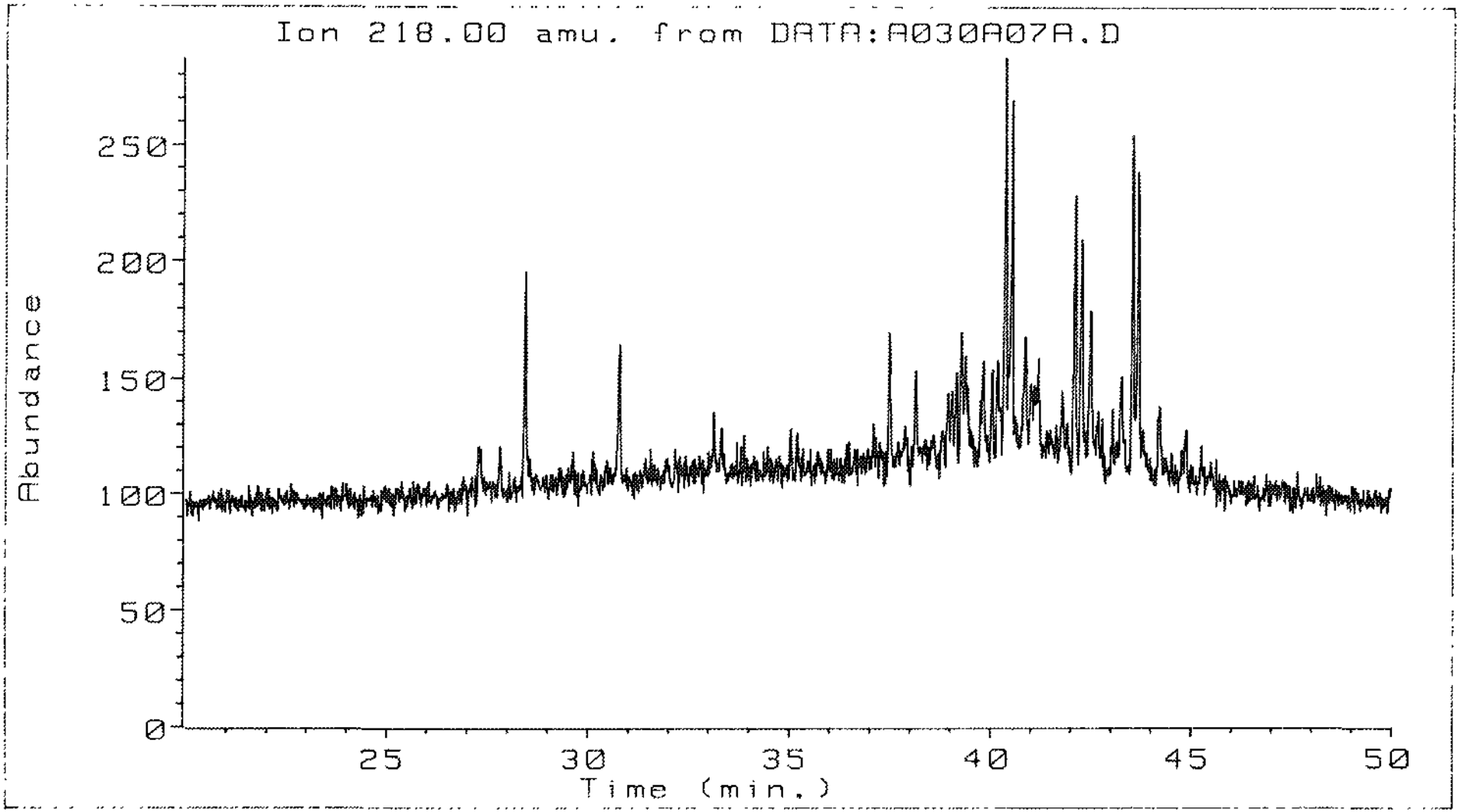
25
30
35
40
45
50
Time (min.)

2473m SWC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Abundance
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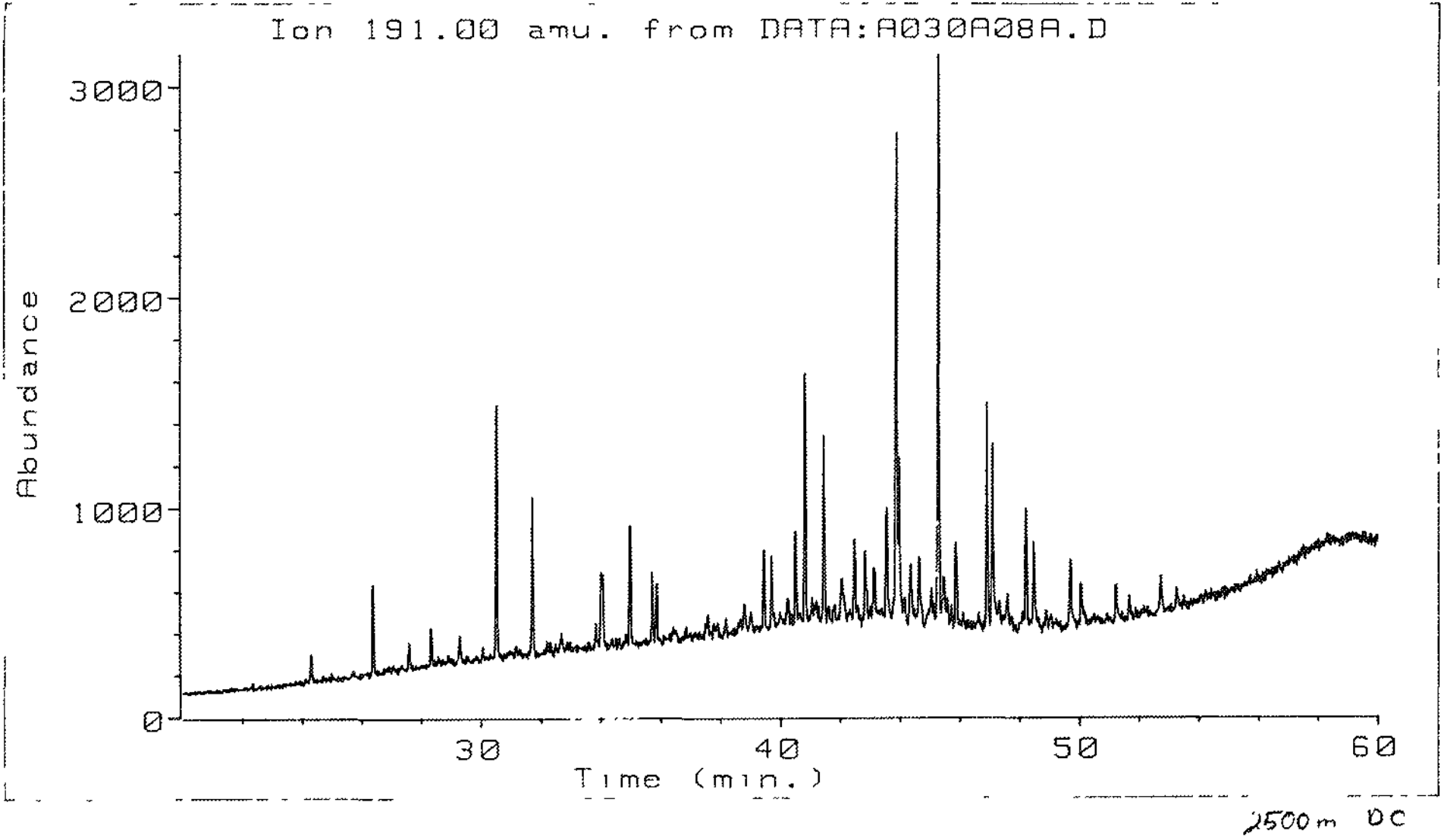
200
150
100
50
0
25
30
35
40
45
50
Time (min.)

2493m SWC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Abundance
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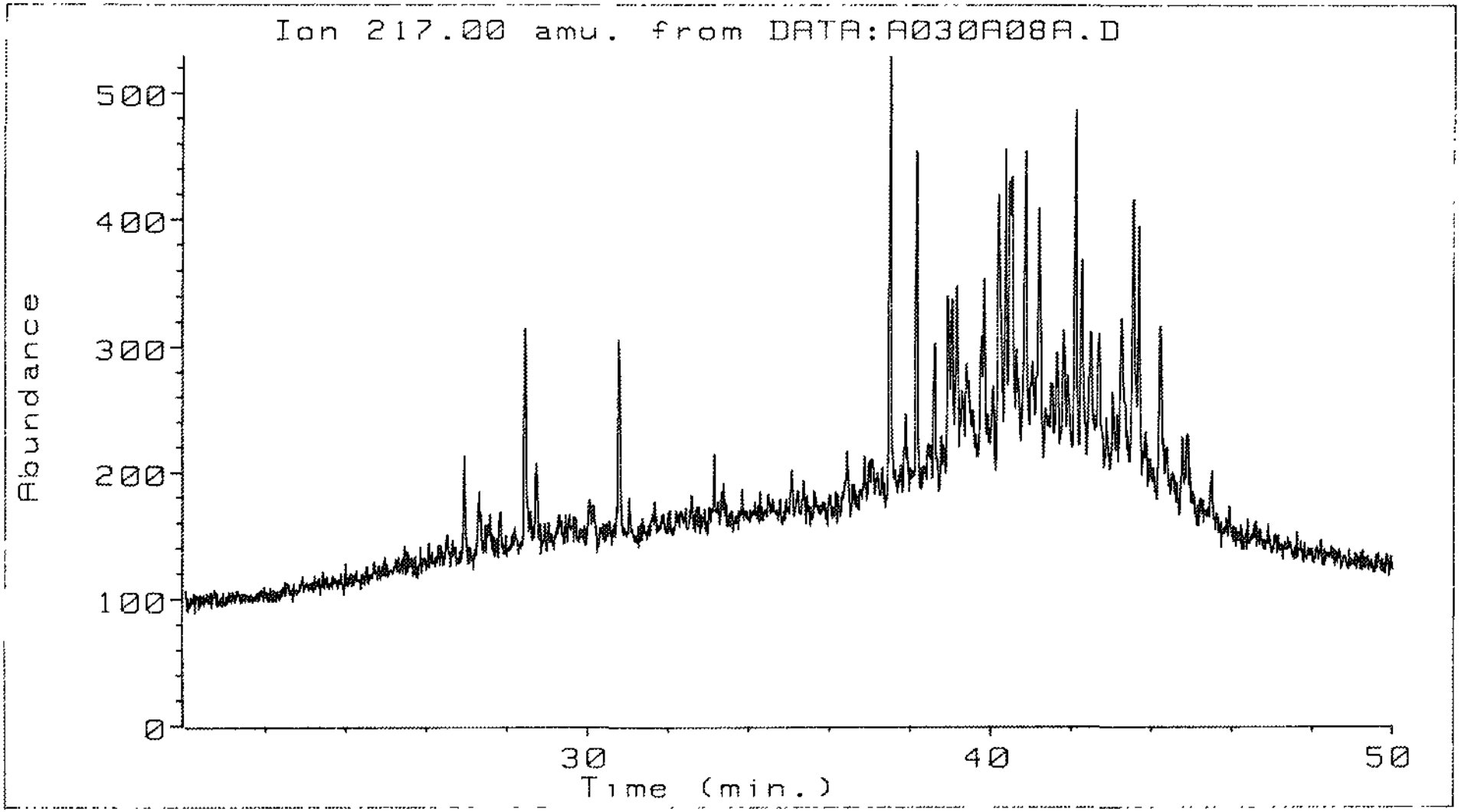
2000
1000
0
30
40
50
60
Time (min.)

2500m DC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Abundance
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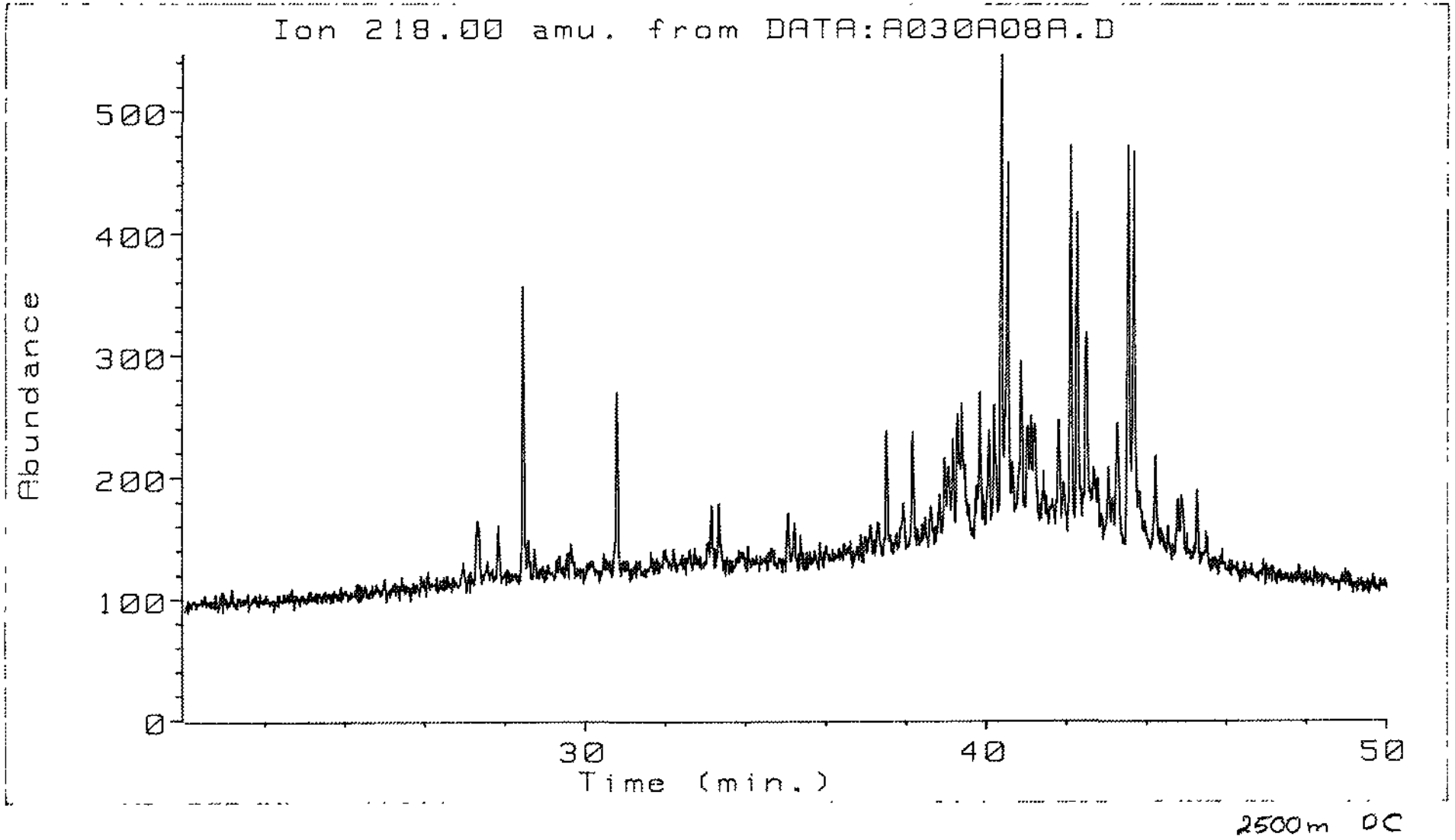
400
300
200
100
0
30
40
50
Time (min.)

2500m OC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Abundance
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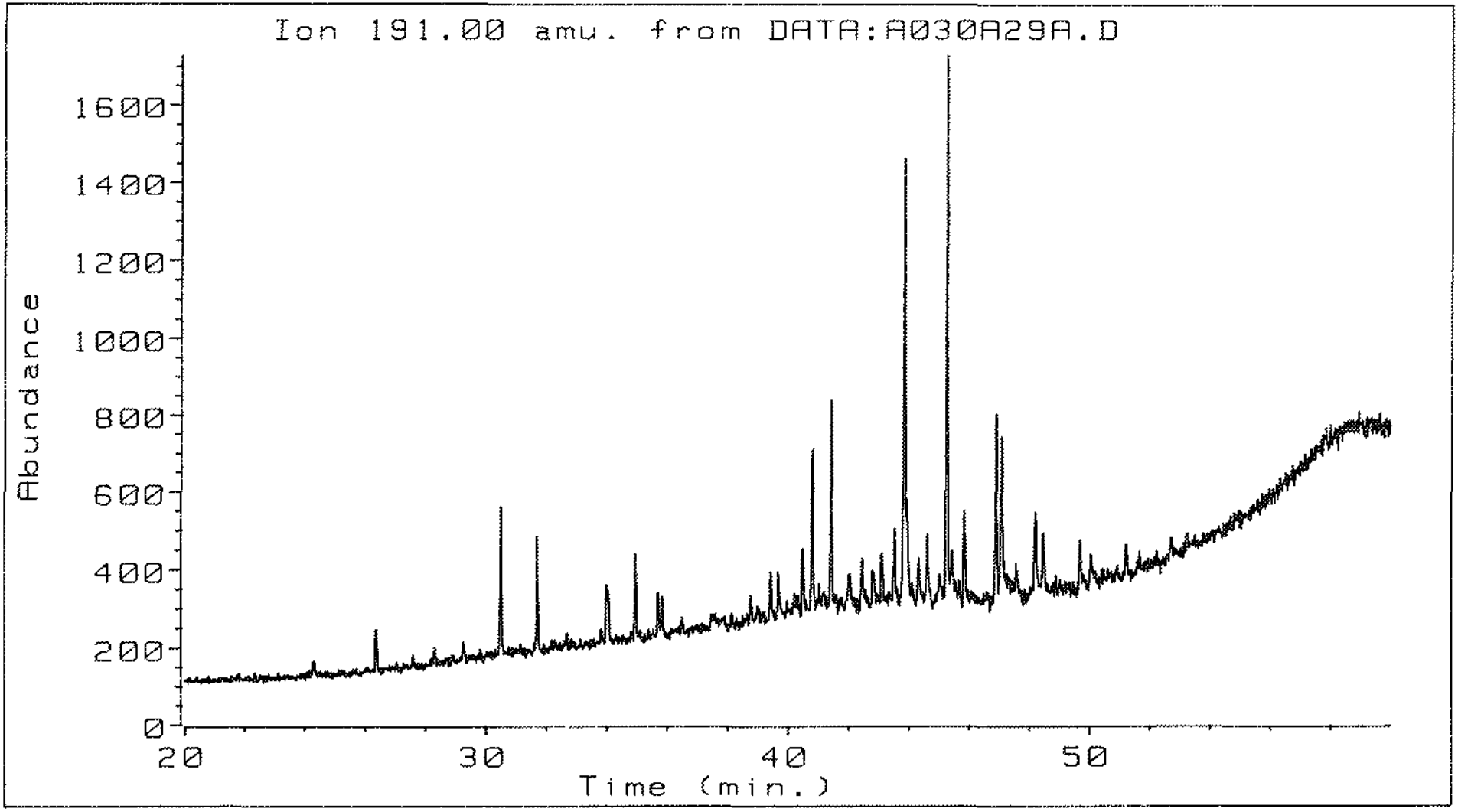
200
100
0
30
40
50
Time (min.)
2500m DC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Abundance
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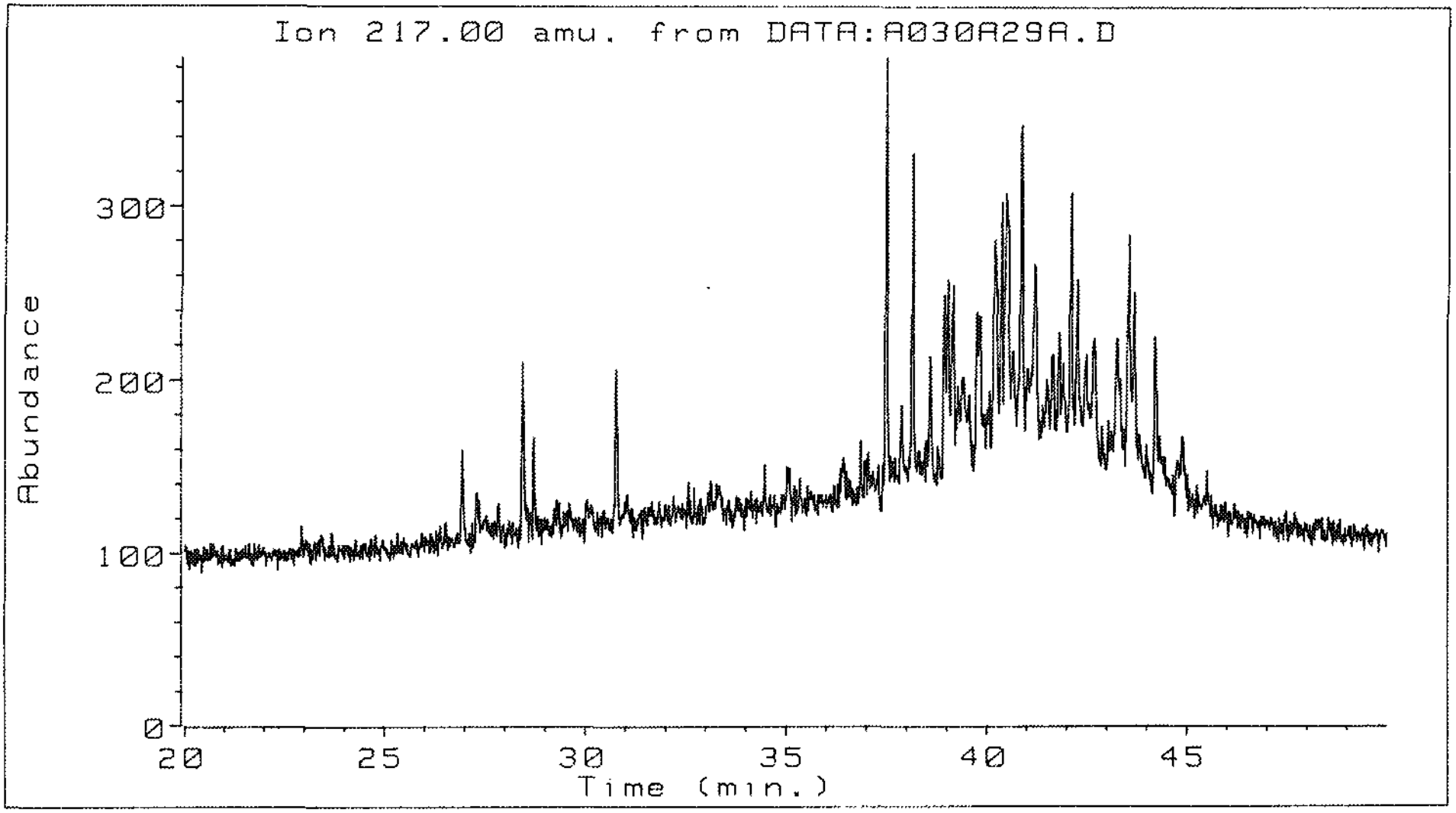
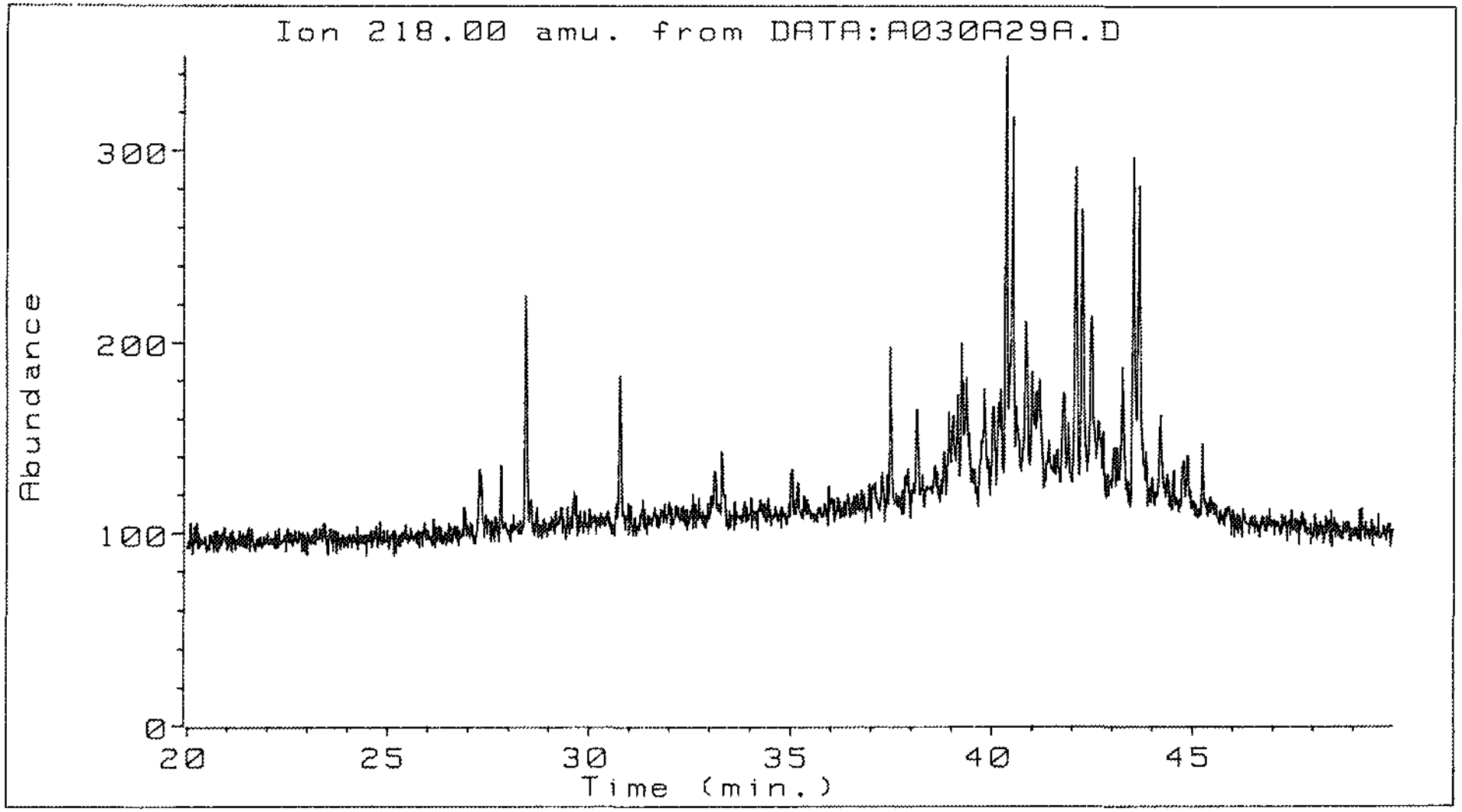
1400
1200
1000
800
600
400
200
0
20
30
40
50
Time (min.)

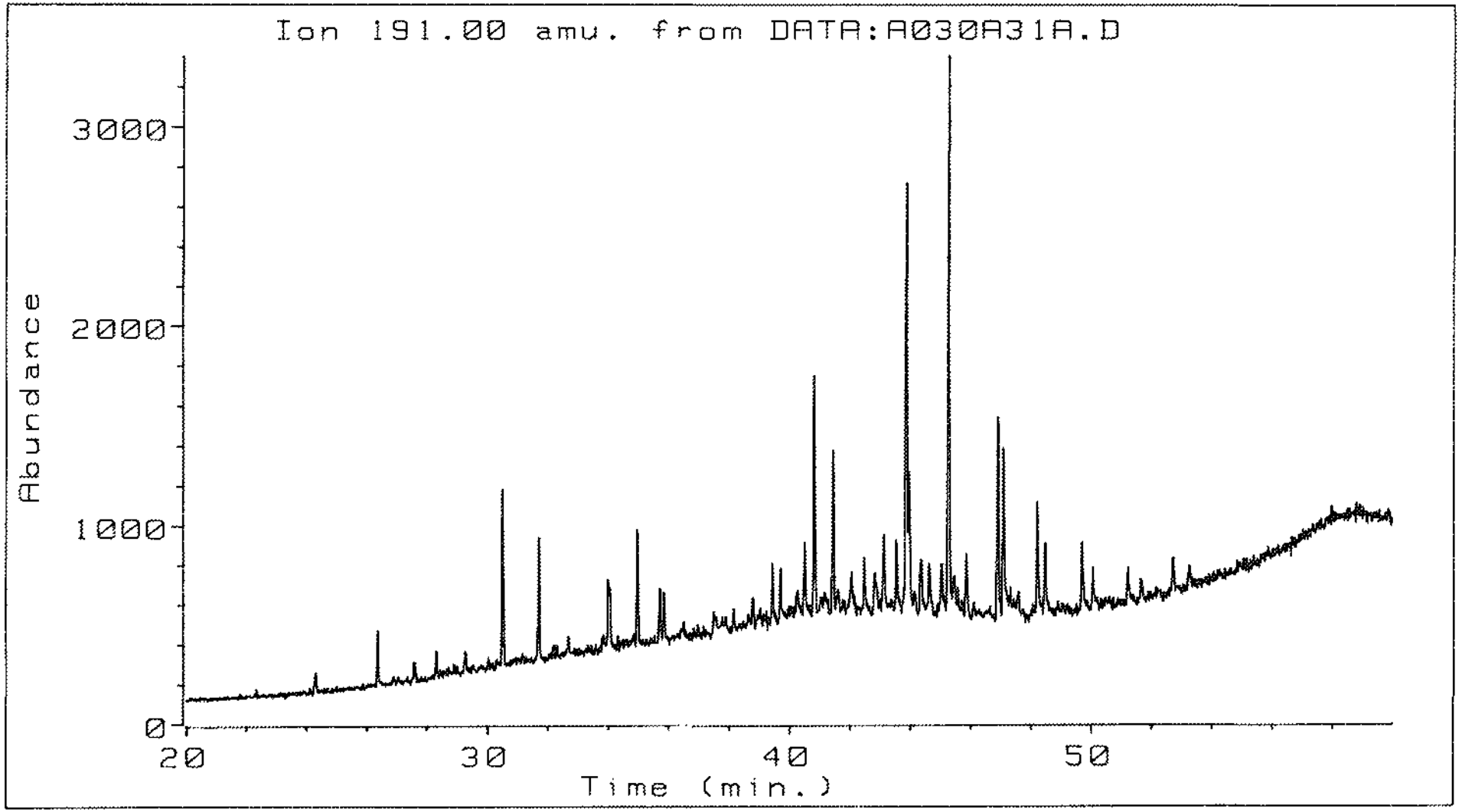
2500m MUD


Ion 217.00 amu. from DATA:A030A29A.D
Abundance
300
200
100
0
20
25
30
35
40
45
Time (min.)

2500 in MCD


Ion 218.00 amu. from DATA:A030A29A.D
Abundance
300
200
100
0
20
25
30
35
40
45
Time (min.)

2500 m MUD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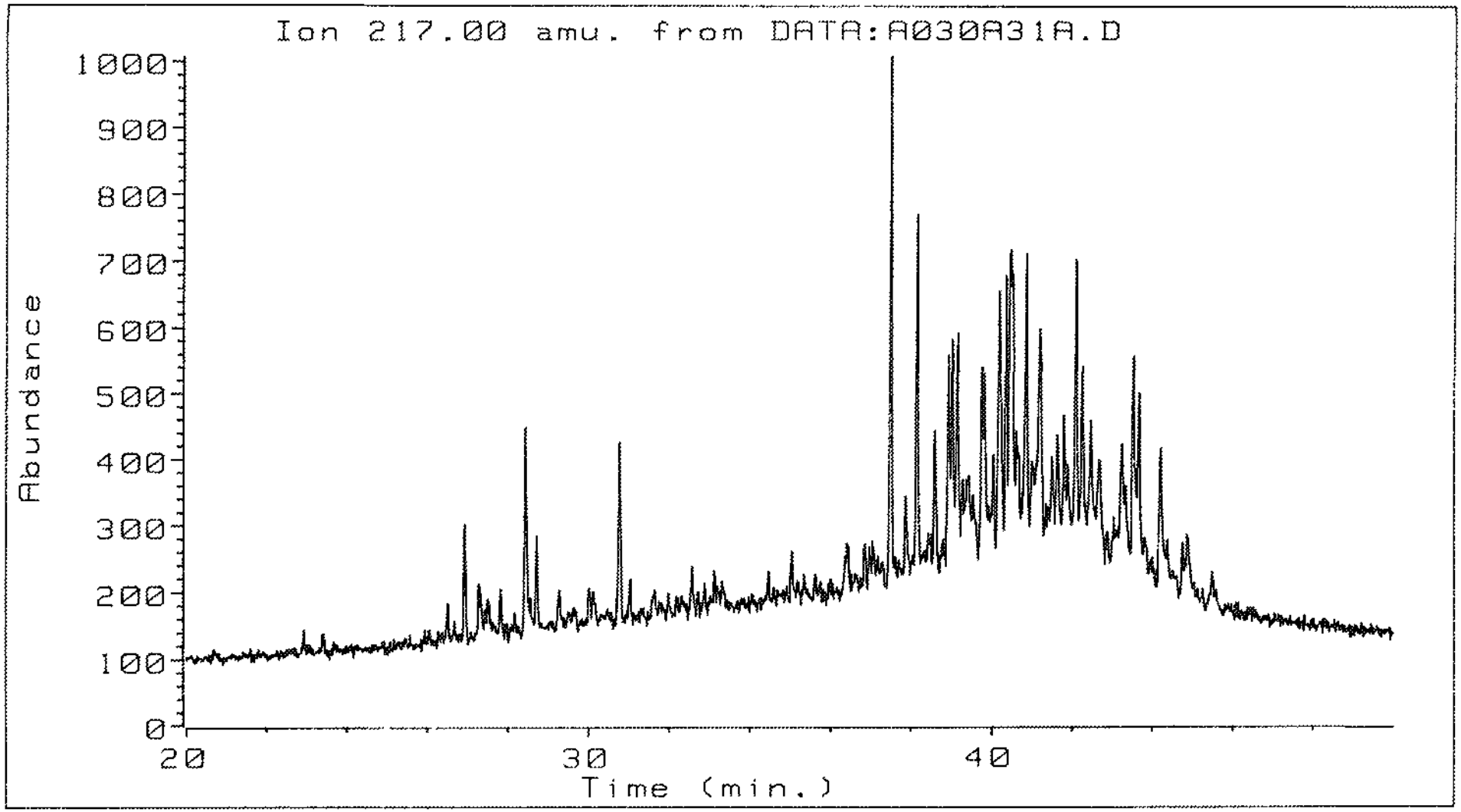
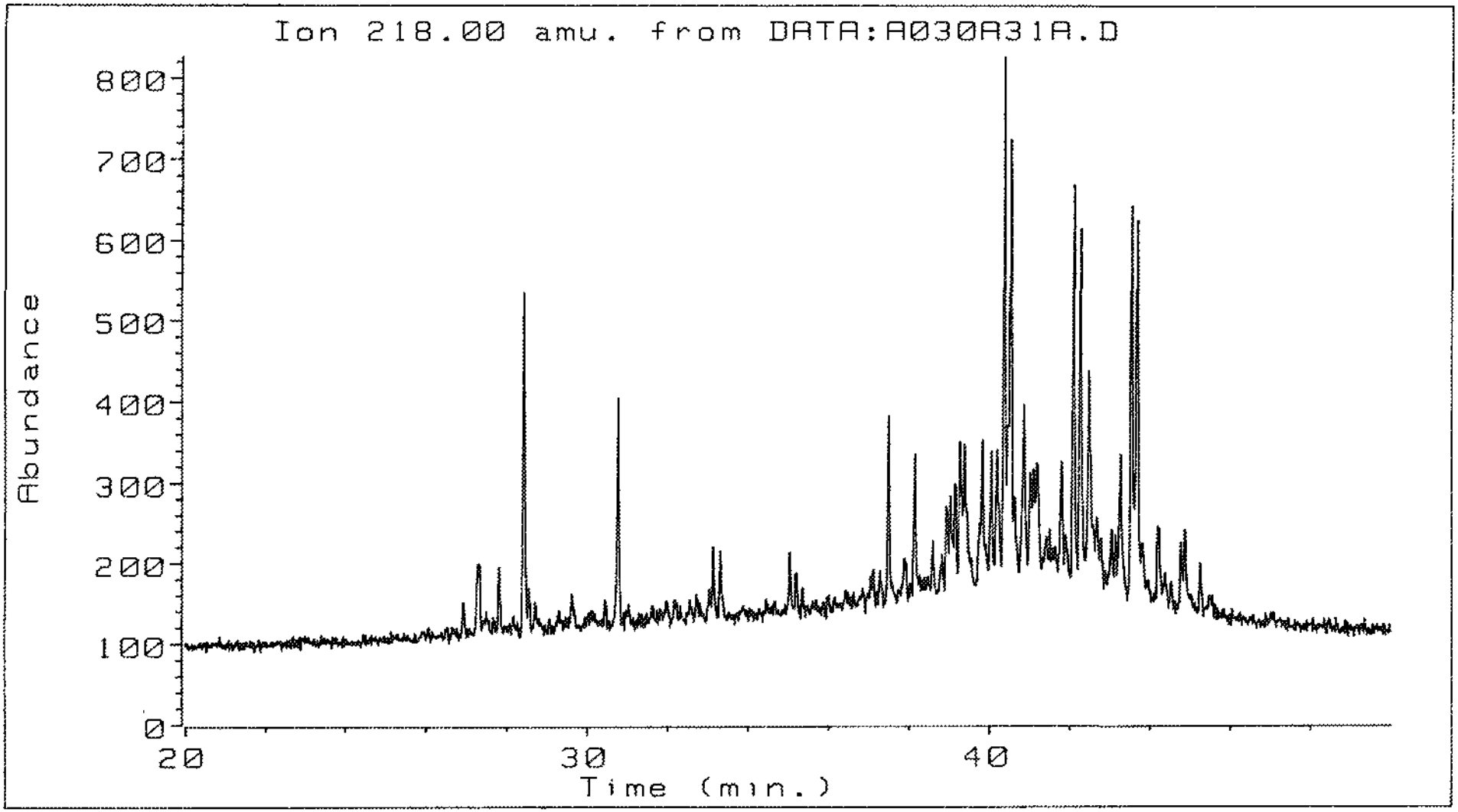
Abundance
3000
2000
1000
0
20
30
40
50
Time (min.)

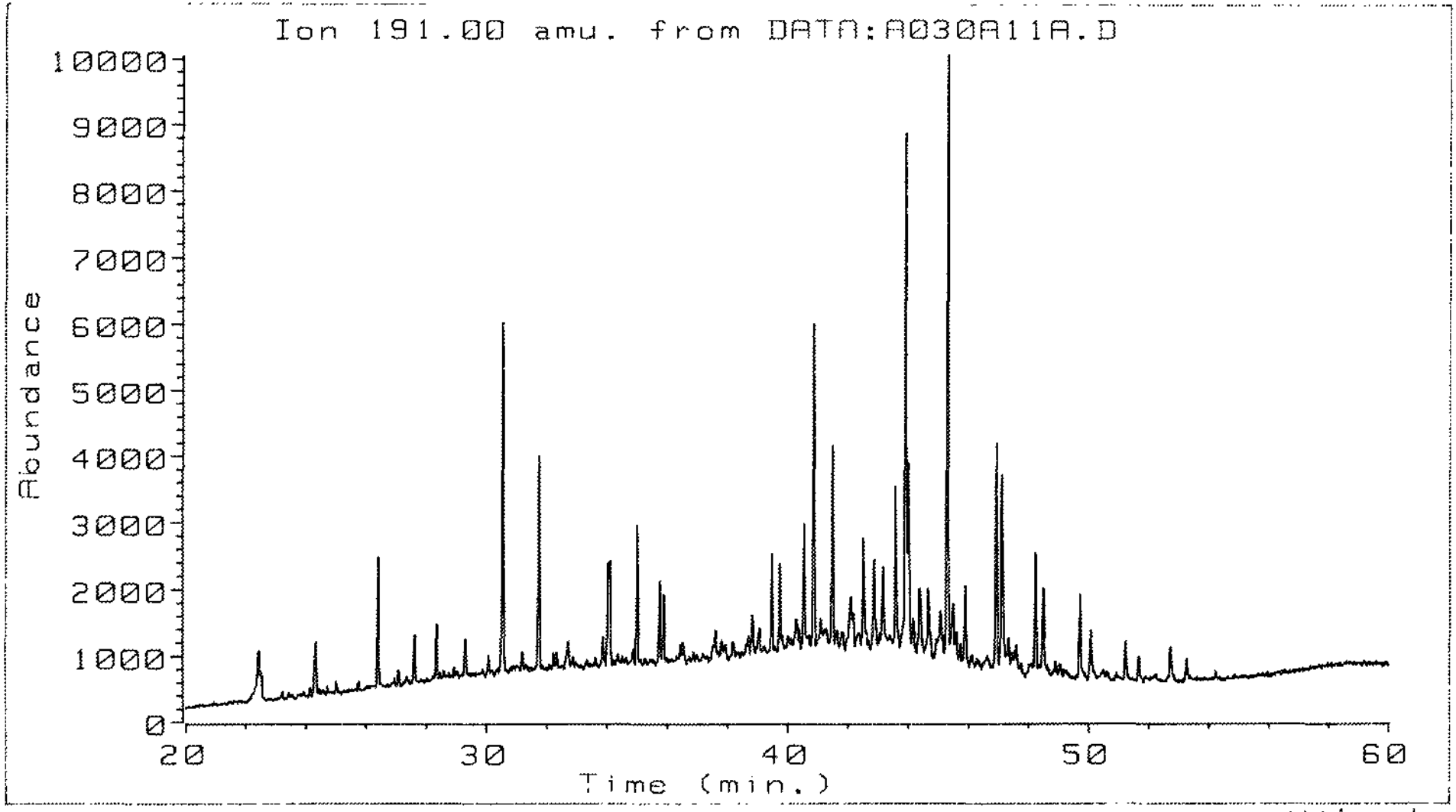
3500 m MUD


Ion 217.00 amu. from DATA:A030A31A.D
Abundance
1000
900
800
700
600
500
400
300
200
100
0
20
30
40
Time (min.)

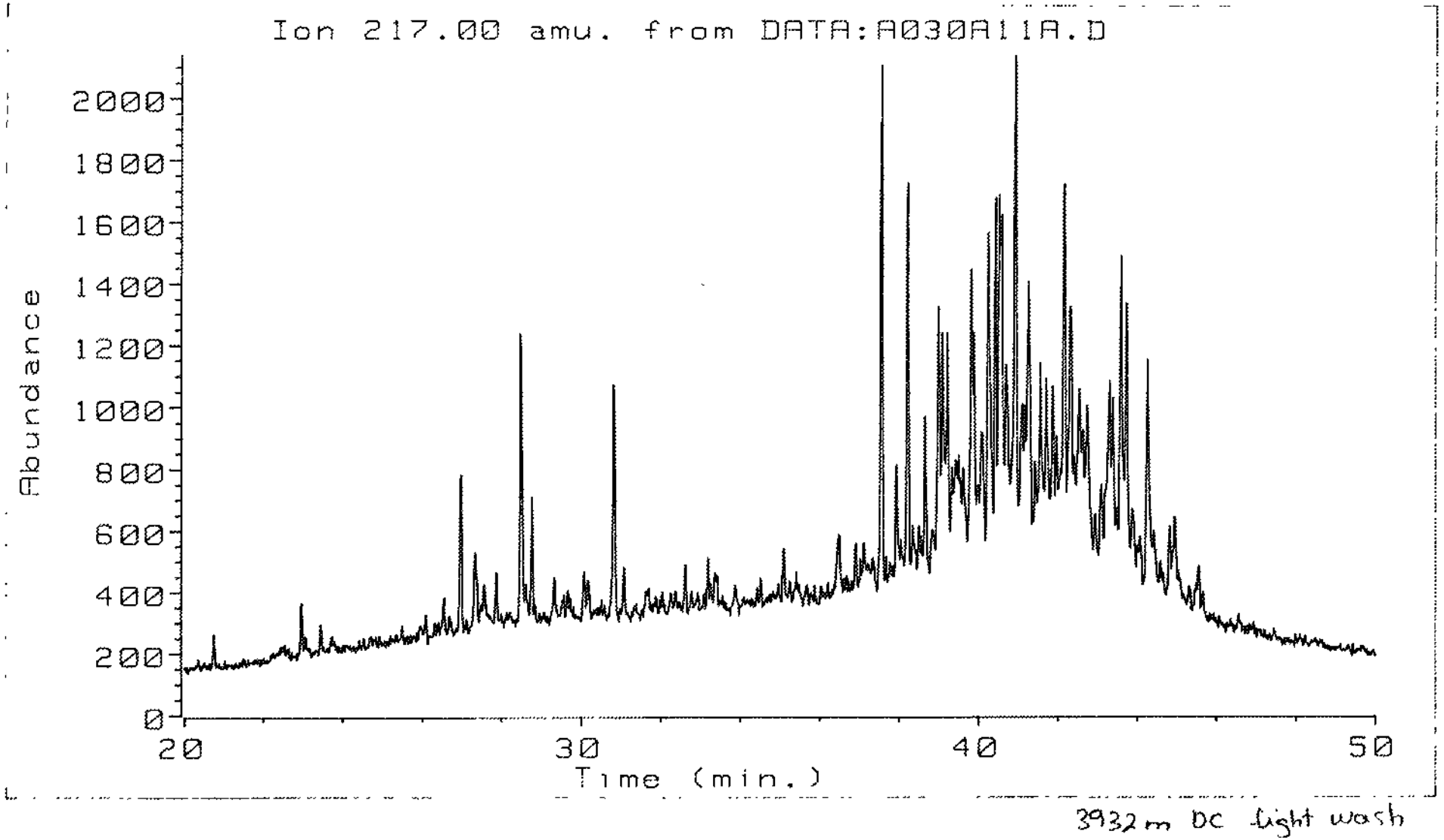
3500 m MUD


Ion 218.00 amu. from DATA:A030A31A.D
Abundance
800
700
600
500
400
300
200
100
0
20
30
40
Time (min.)

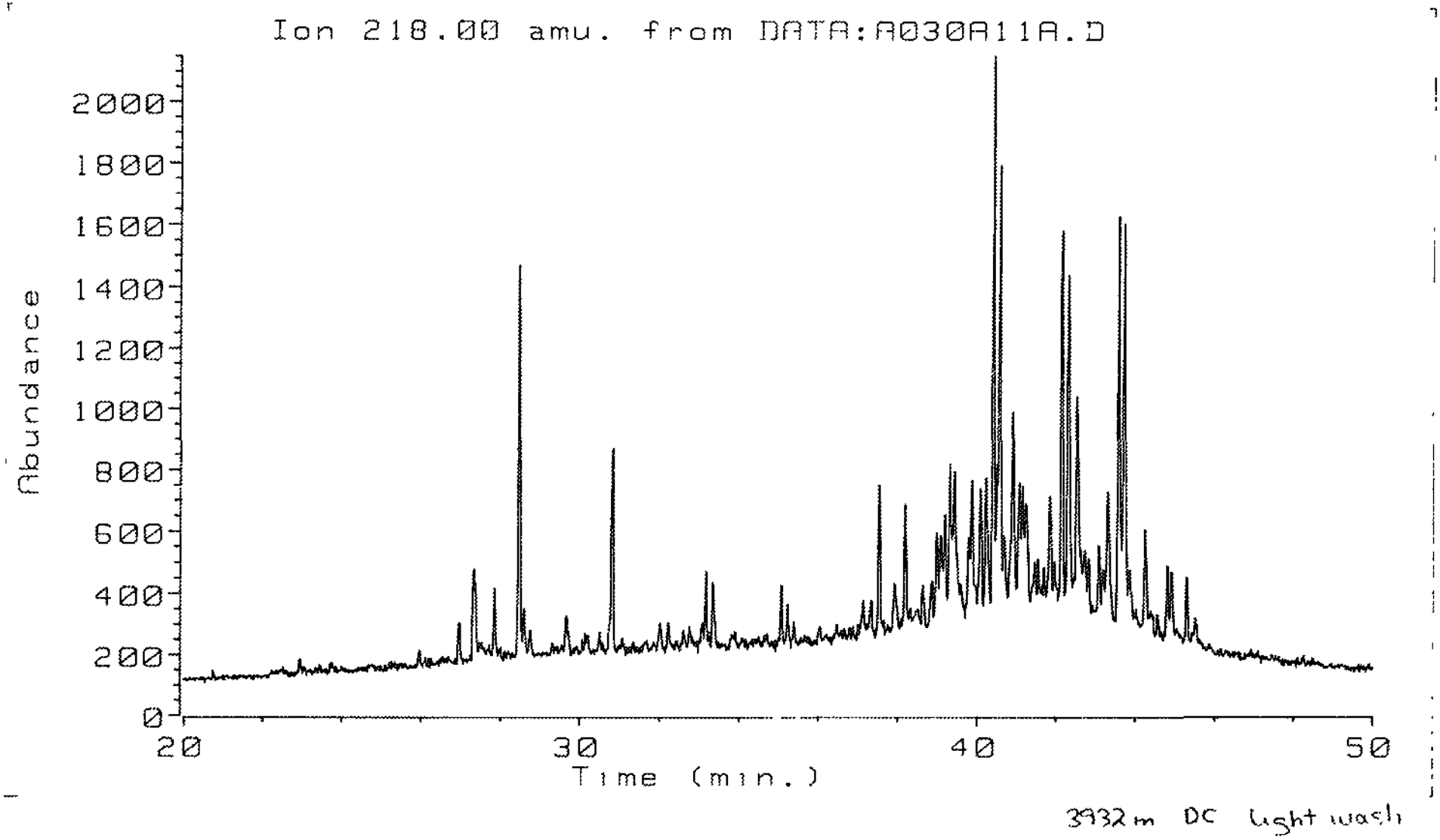
3500 m mud



3932m DC light wash



3932 m DC light wash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Abundance
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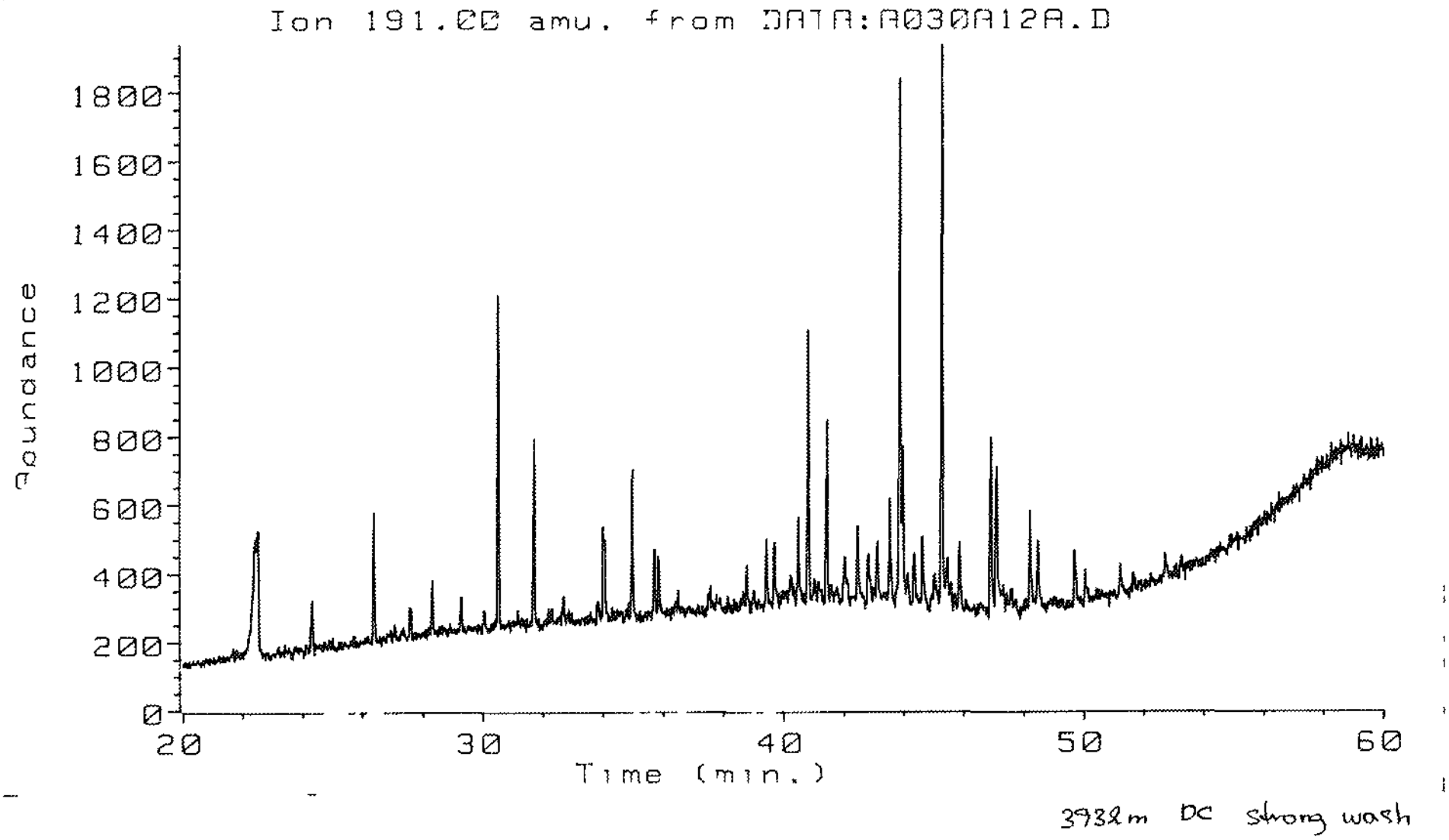
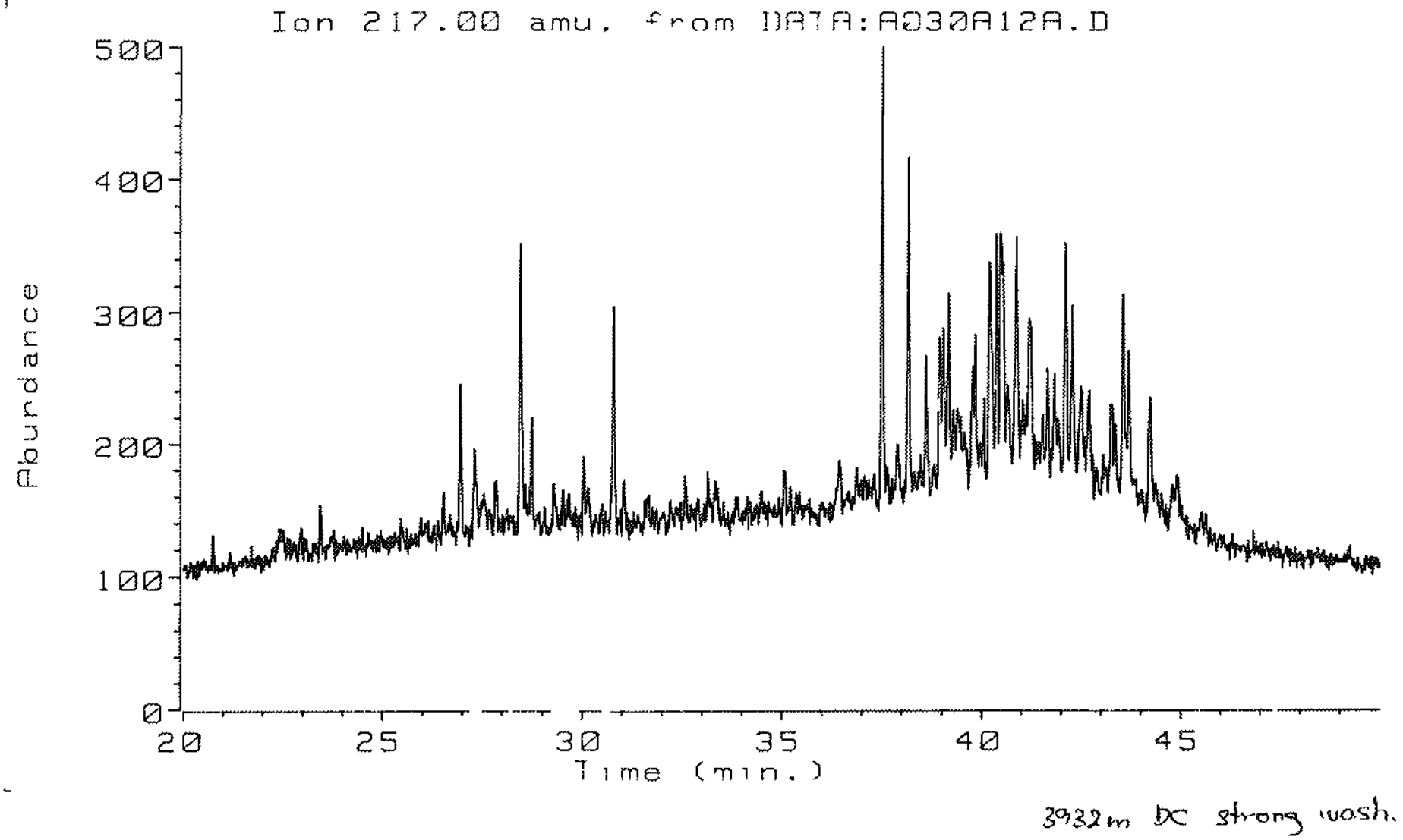
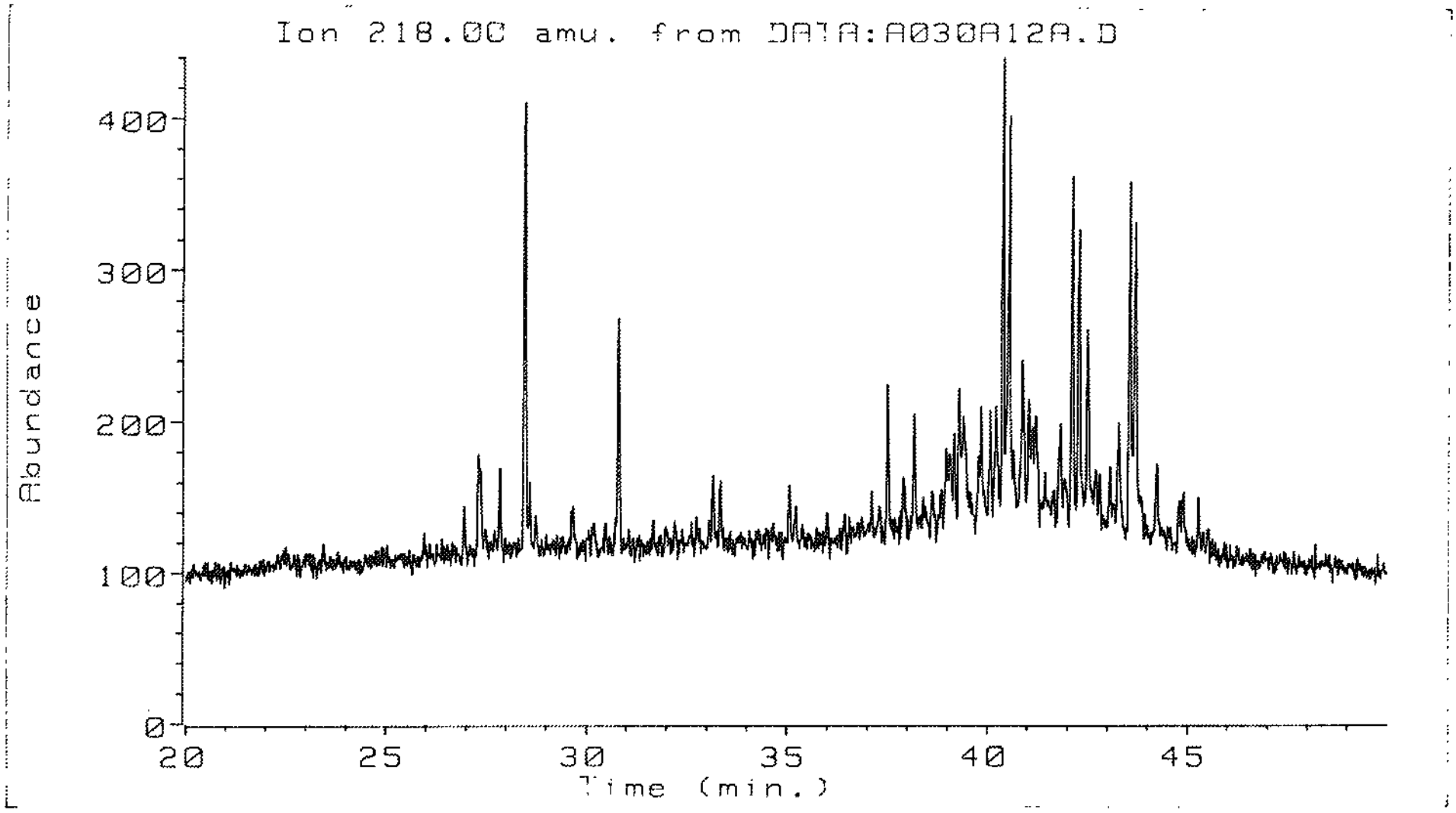
Time (min.)
3932 m DC light wash



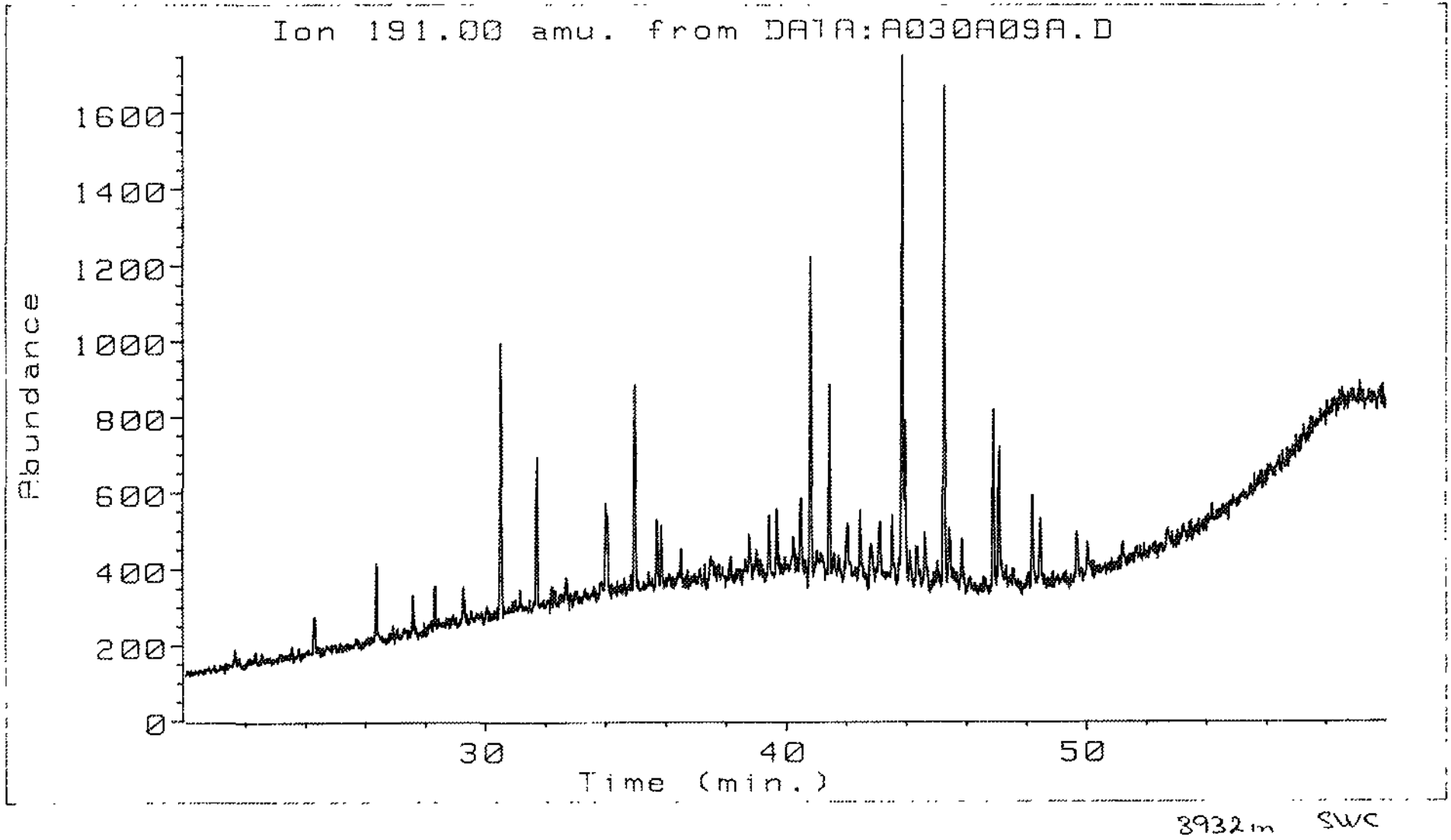
3938m DC strong wash



3932m DC strong wash.



3932m DC strong wash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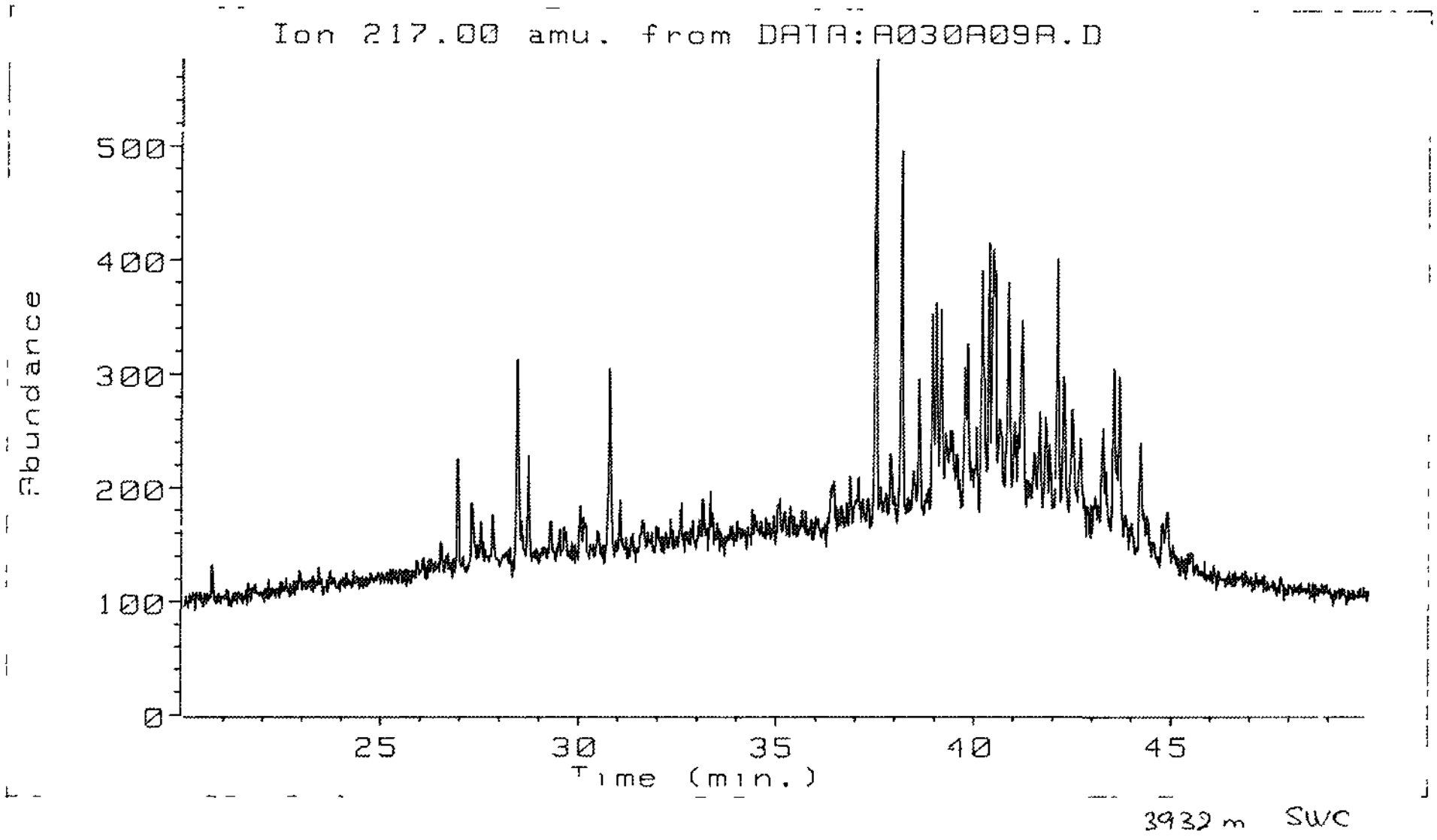
Time (min.)

3932m SWC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Time (min.)
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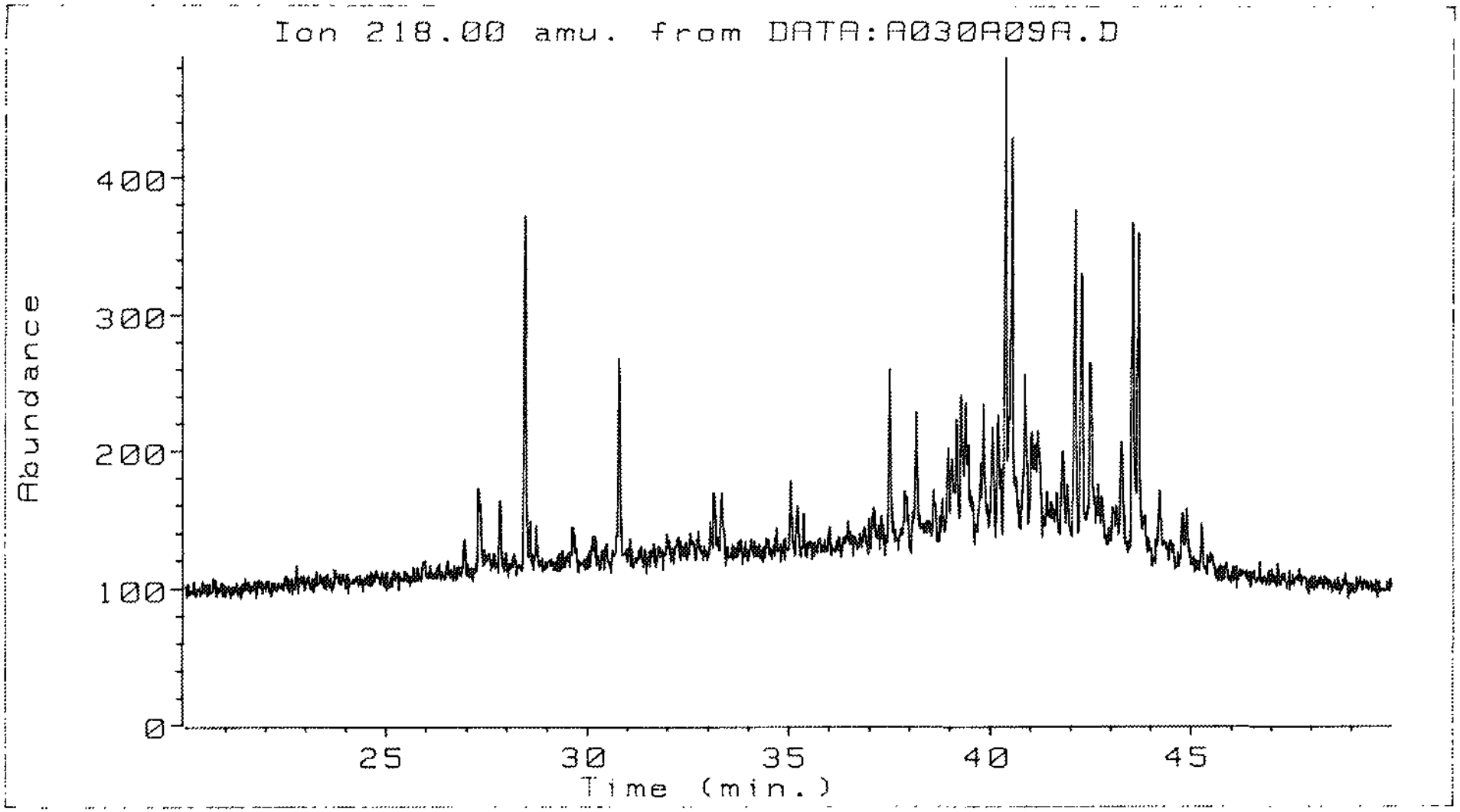
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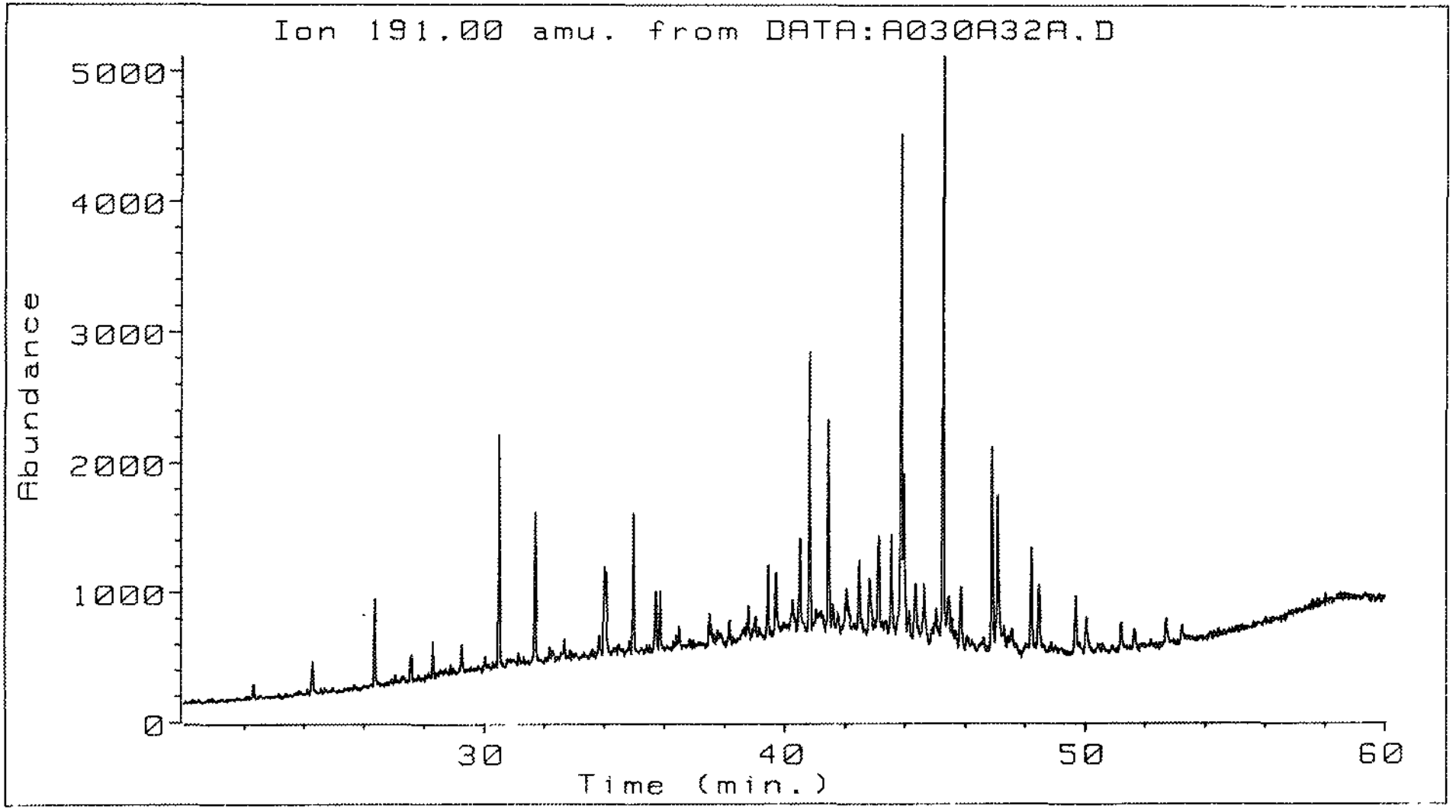
Time (min.)

3932 m SWC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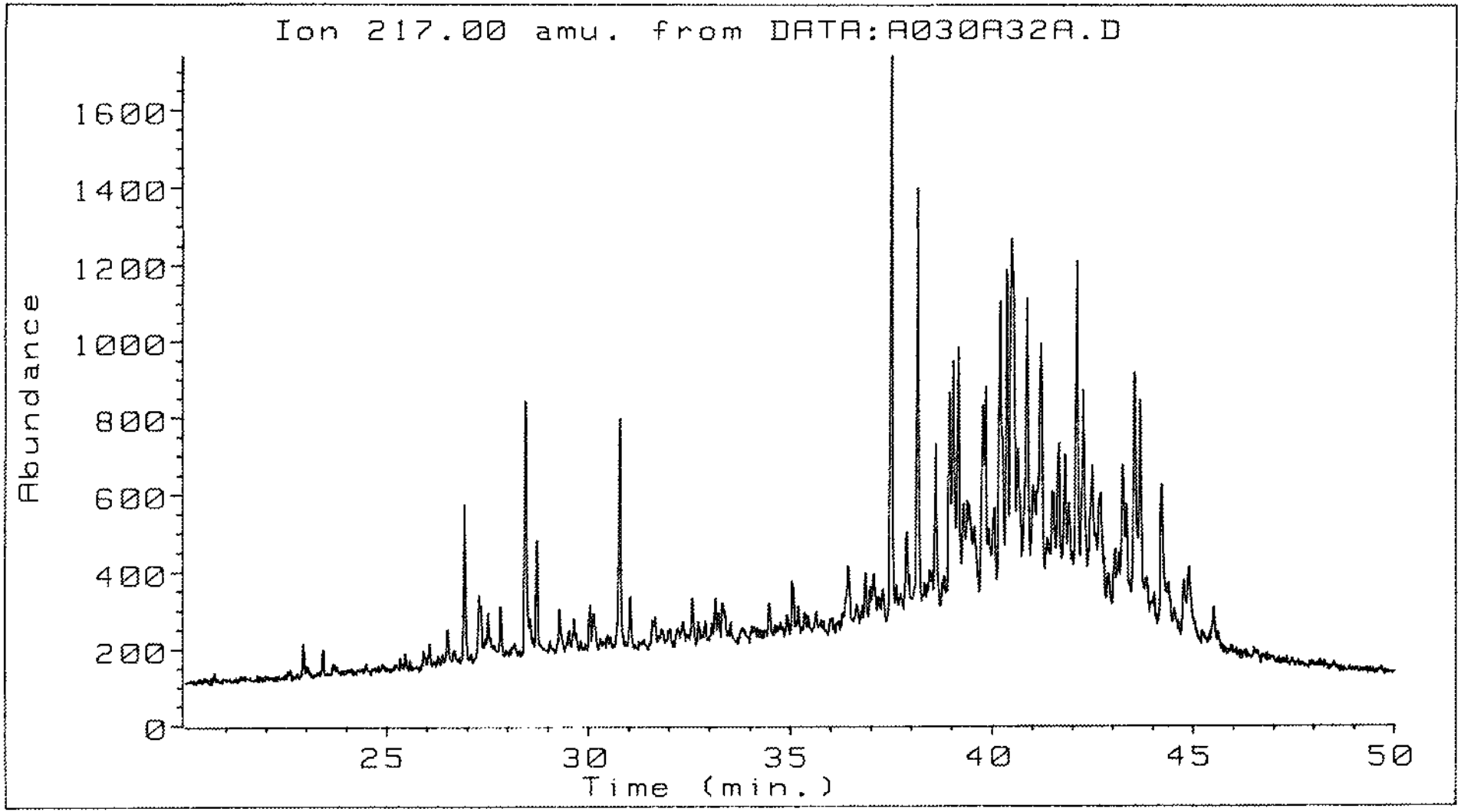
60
Time (min.)

4000m mUD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Abundance
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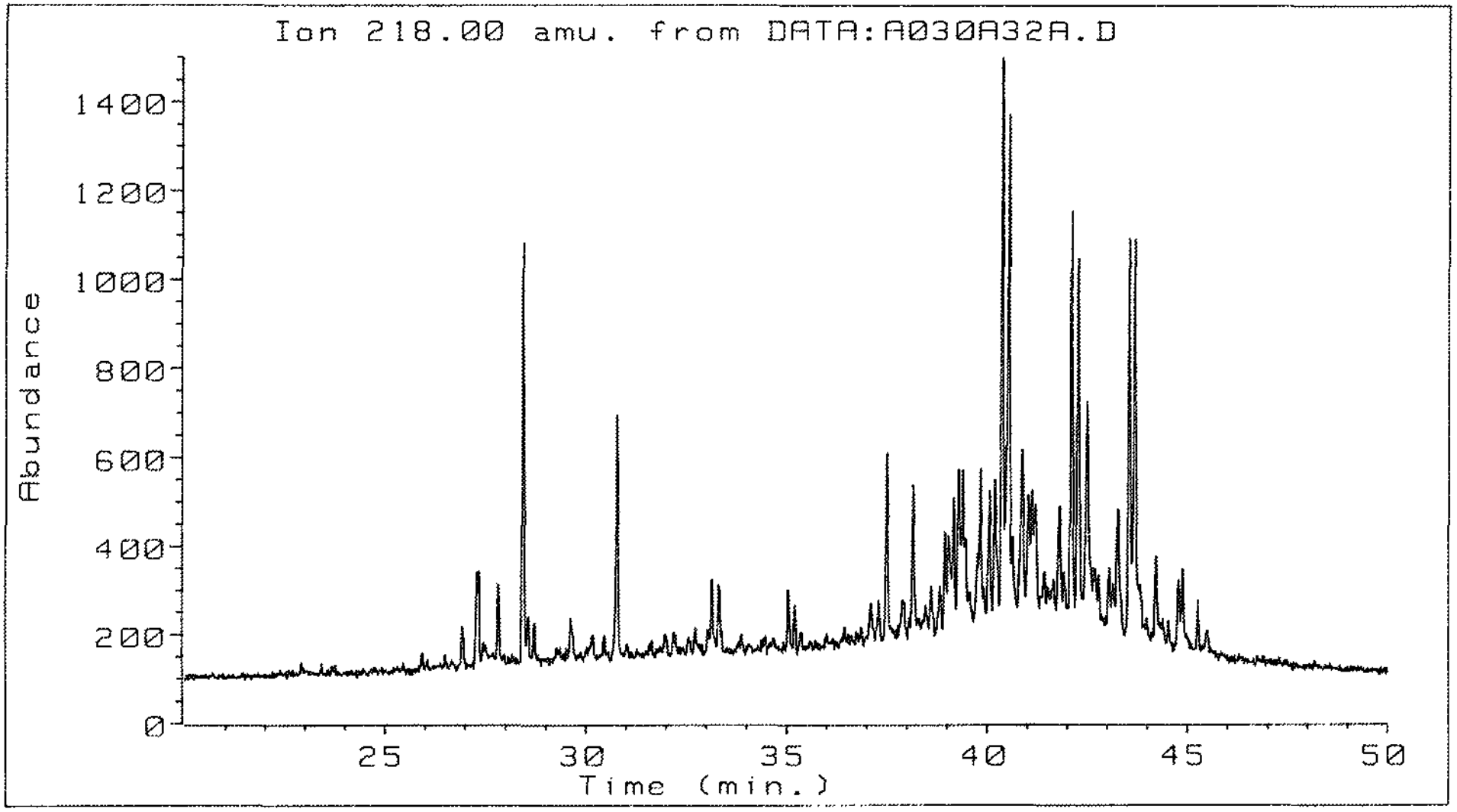
50
Time (min.)

4000m MUD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Abundance
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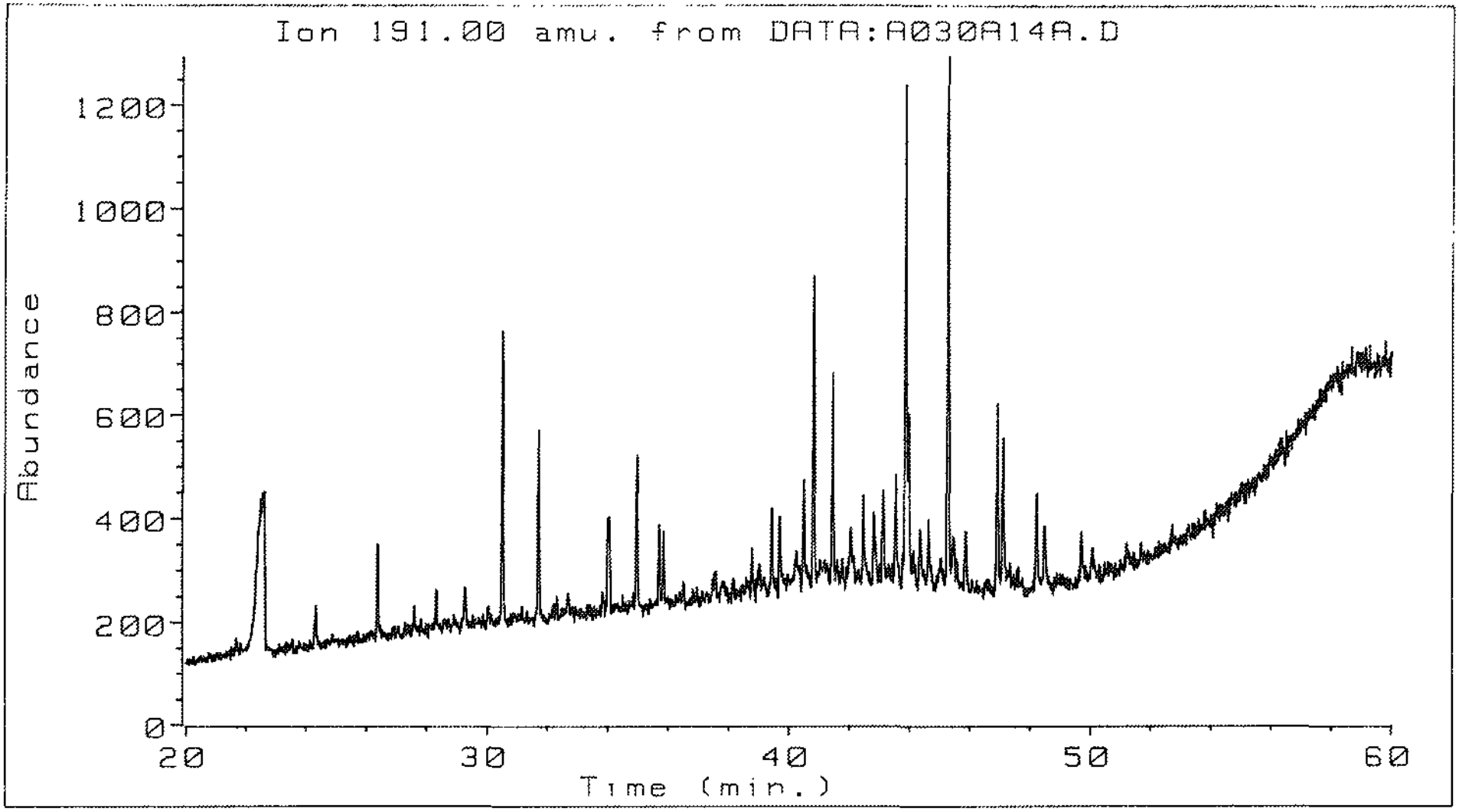
Time (min.)

4000m MUD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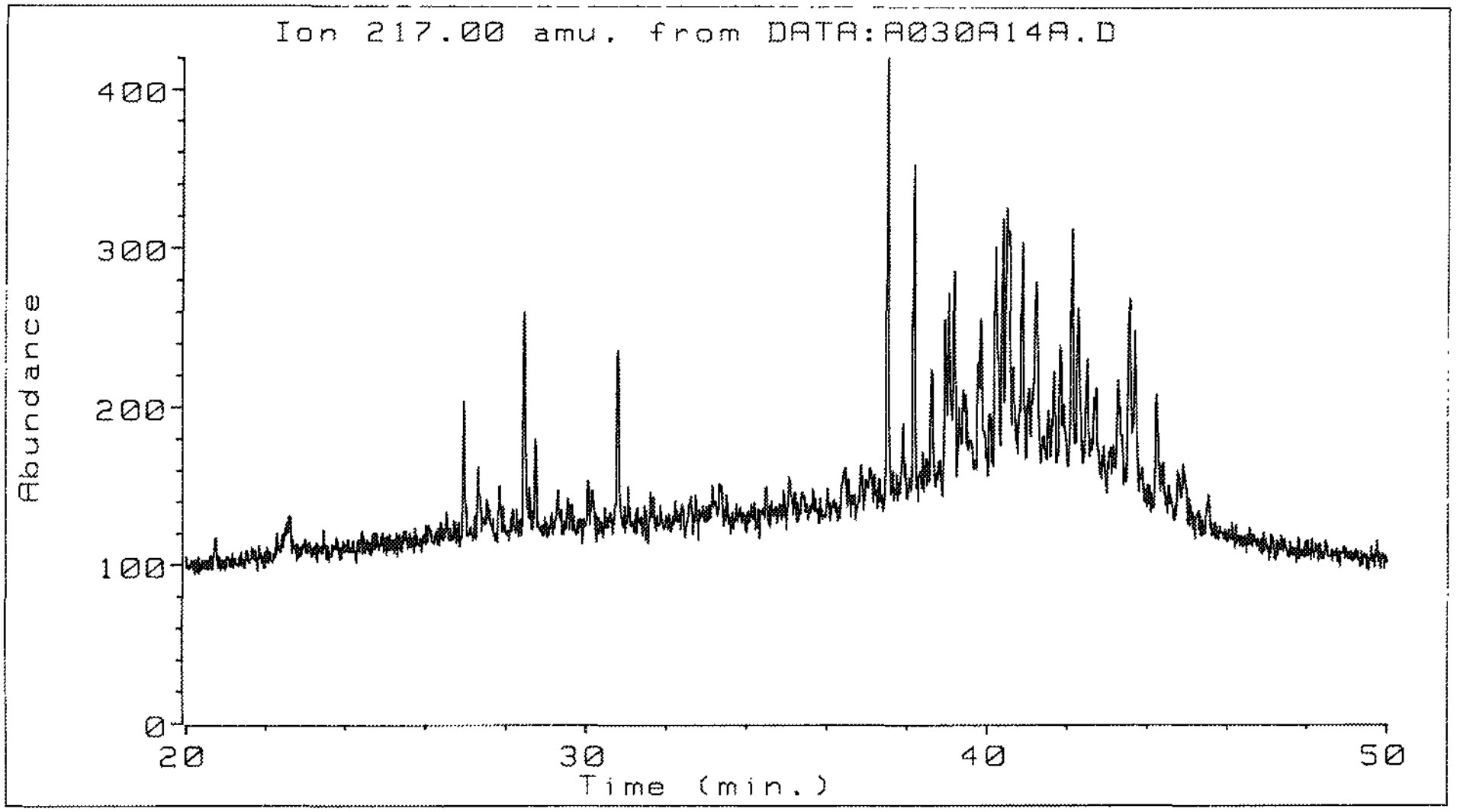
60
Time (min.)

4292 m OC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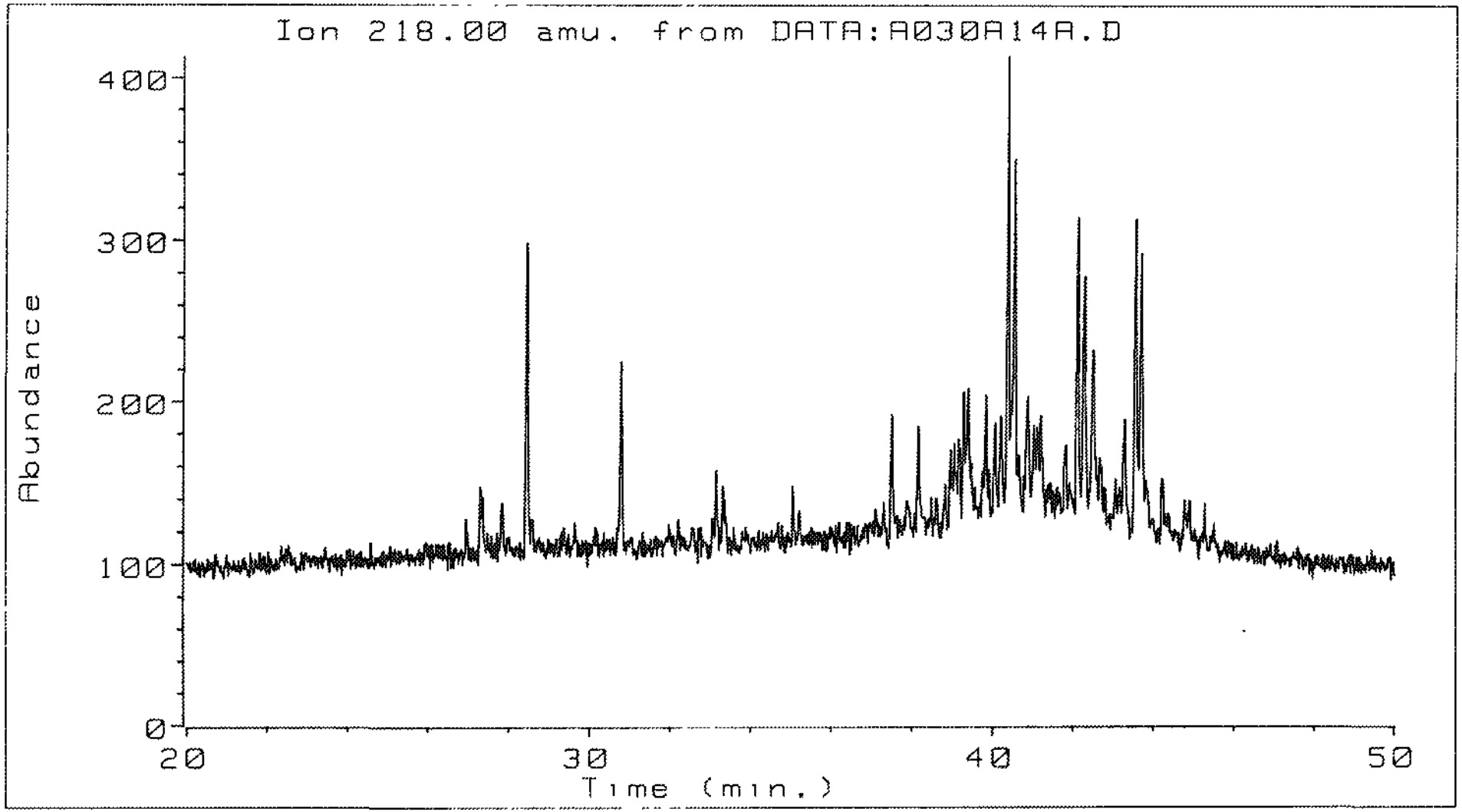
Time (min.)

4292 m DC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Abundance
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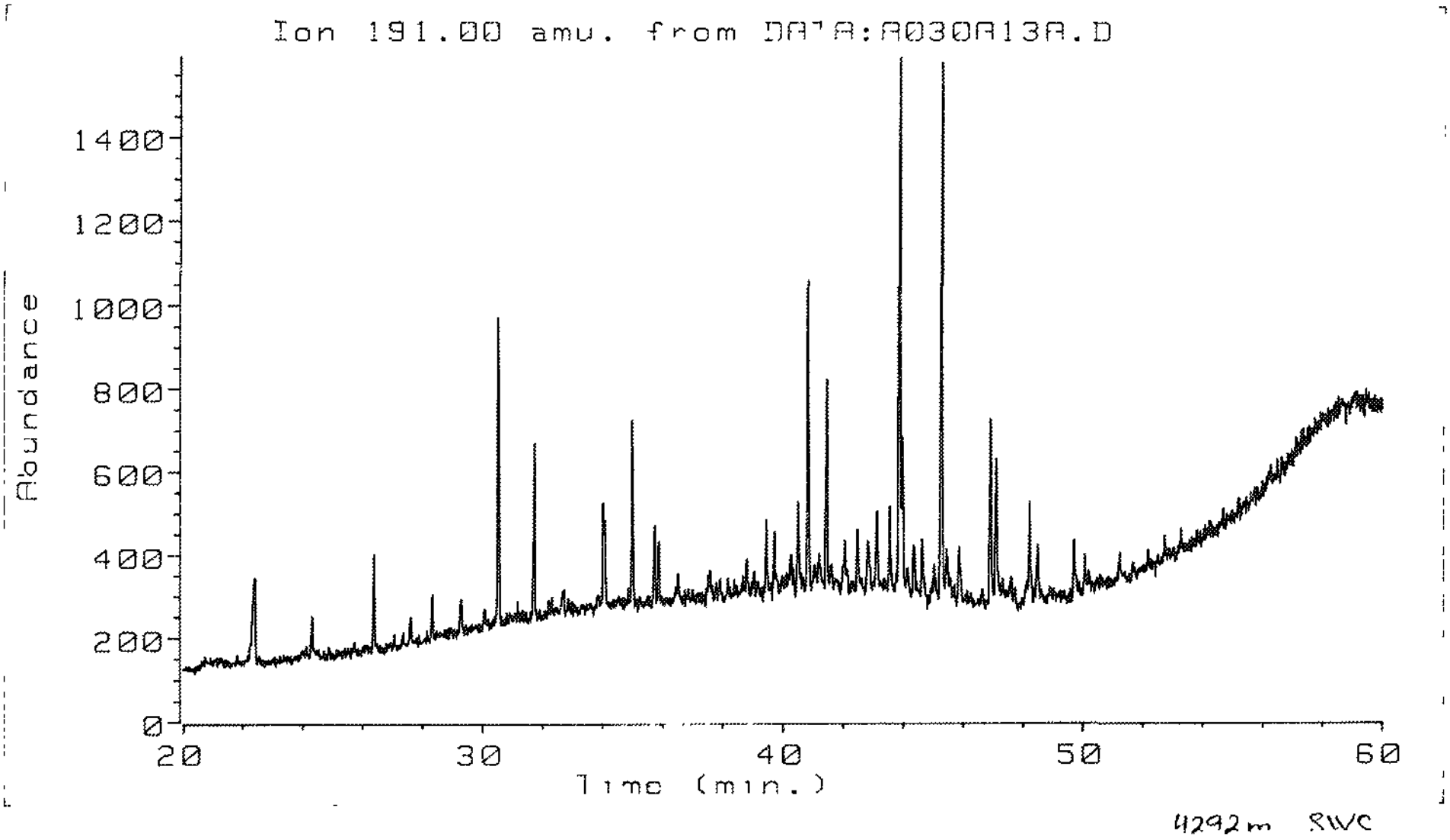
Time (min.)

4292 m DC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Abundance
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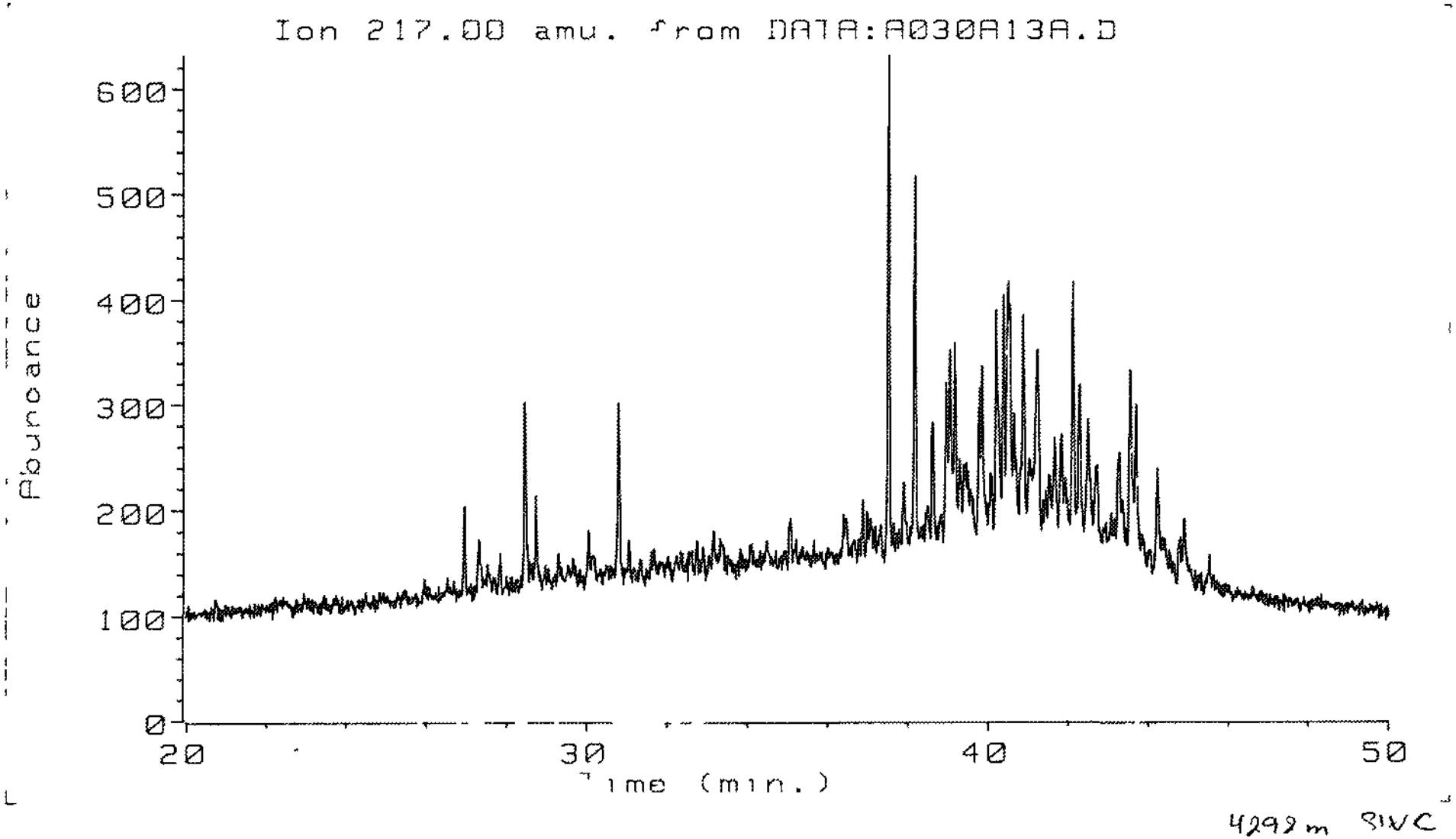
60
Time (min.)
4292m SWC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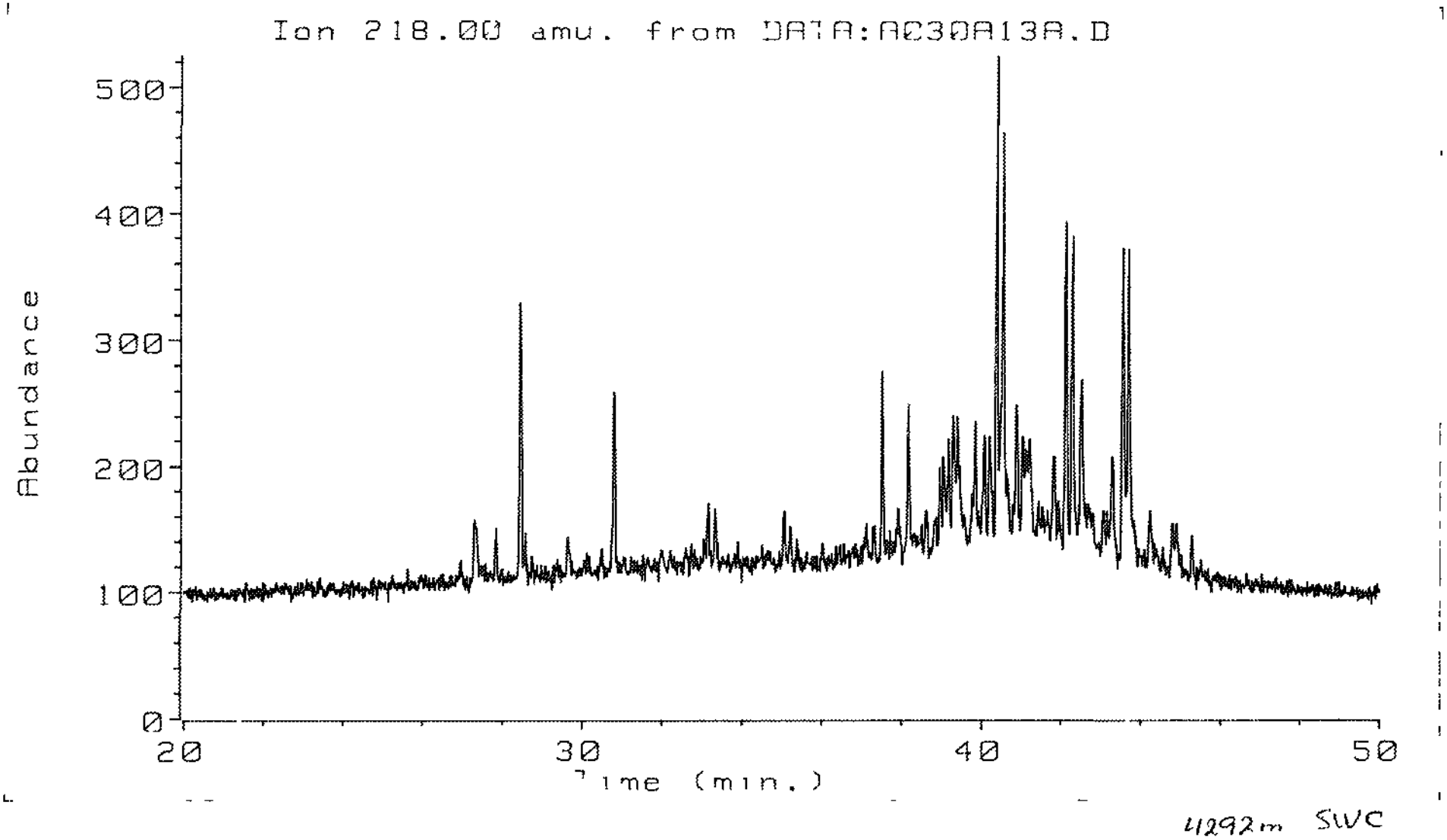
Time (min.)
4292 m SIVC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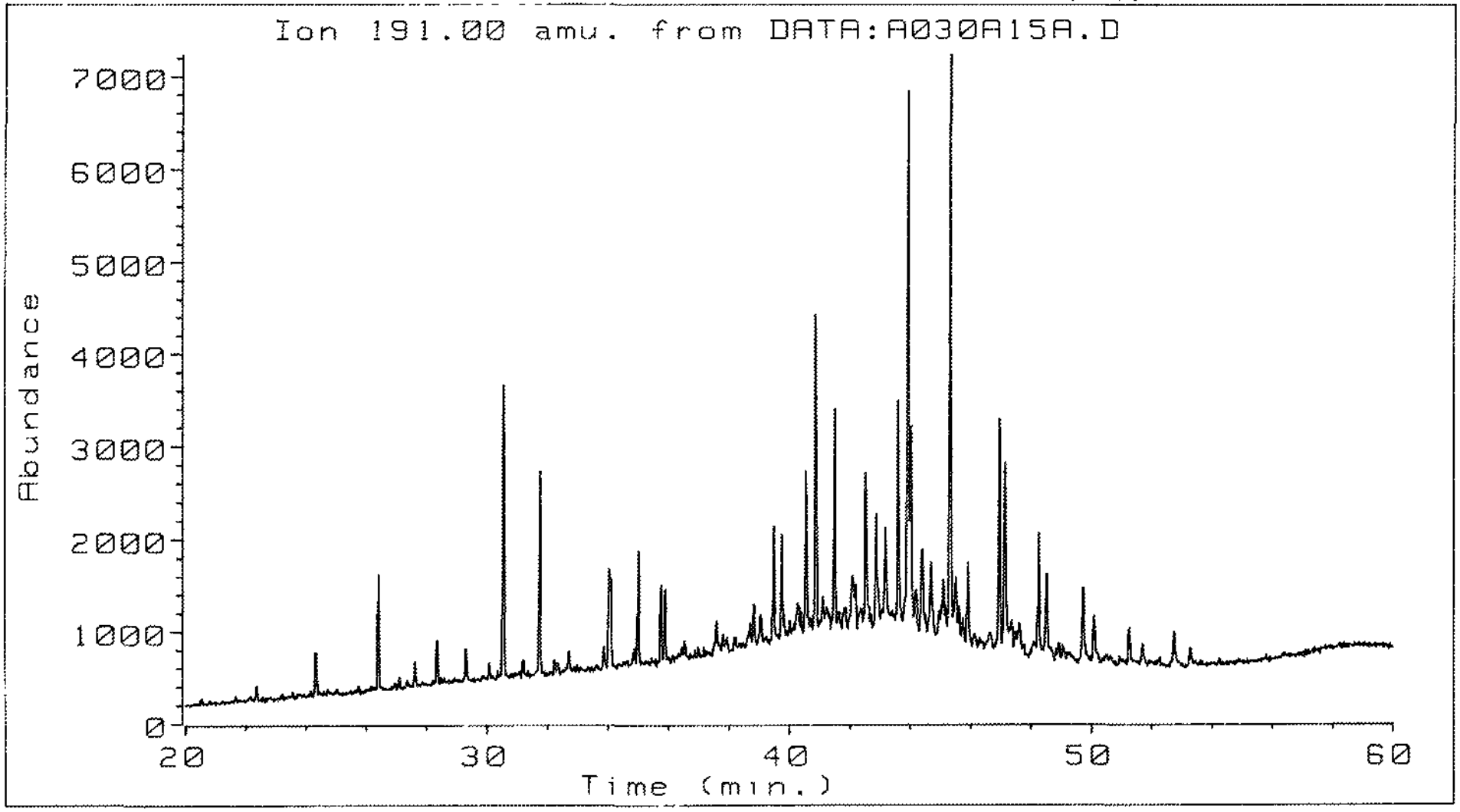
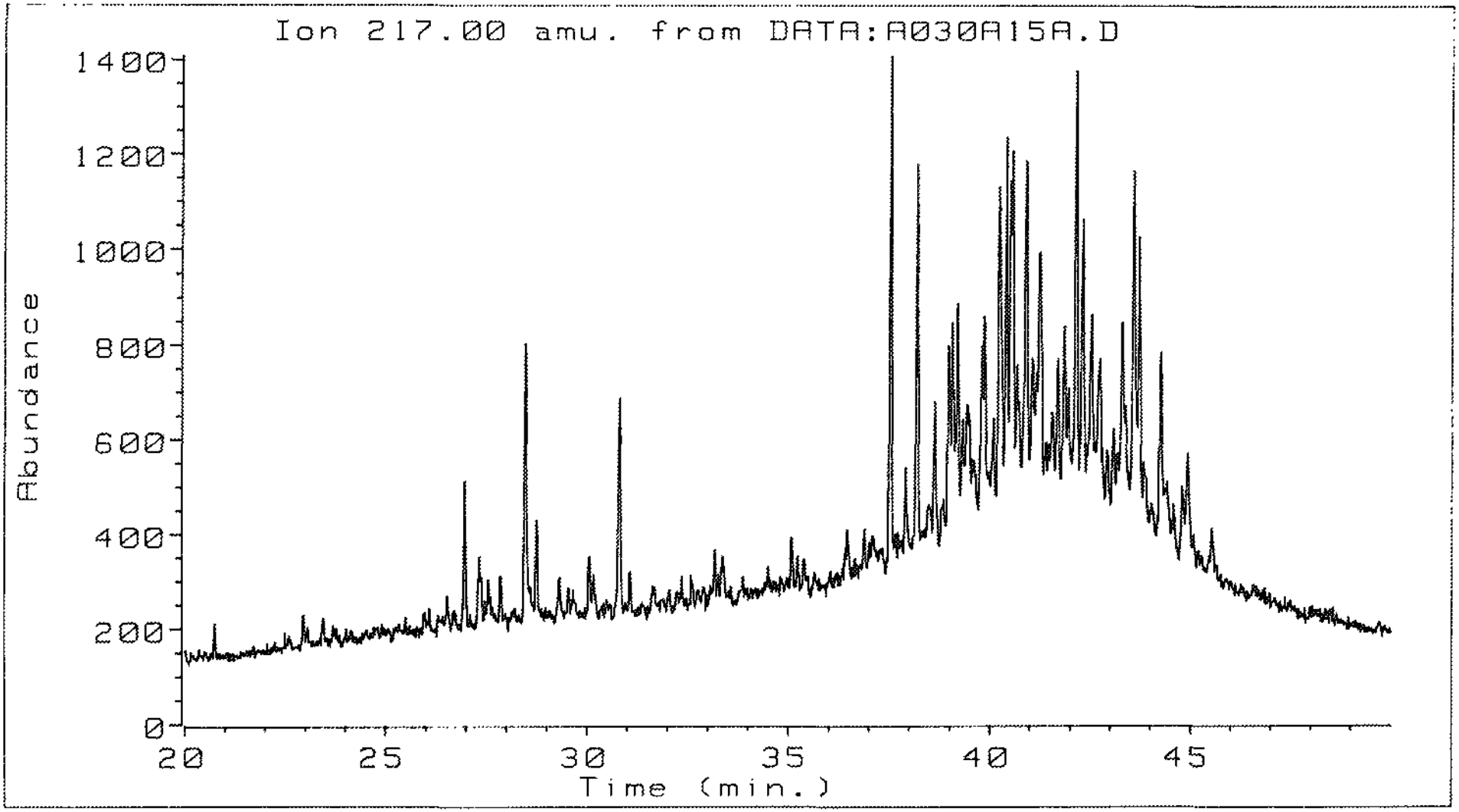
Time (min.)

41292m SWC

7221/9-1 4500 DC



4500 m DC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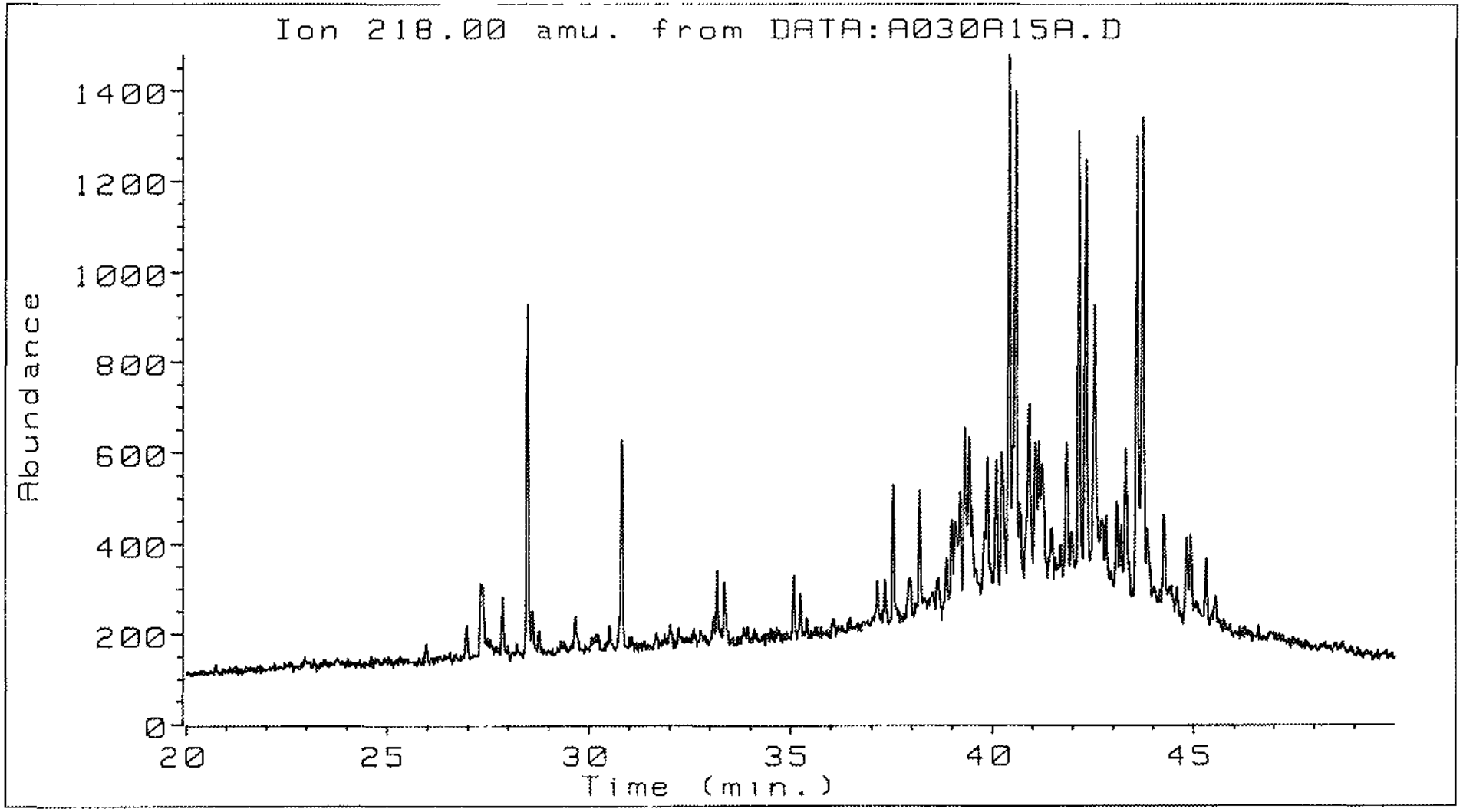
40
45
Time (min.)

4500 m DC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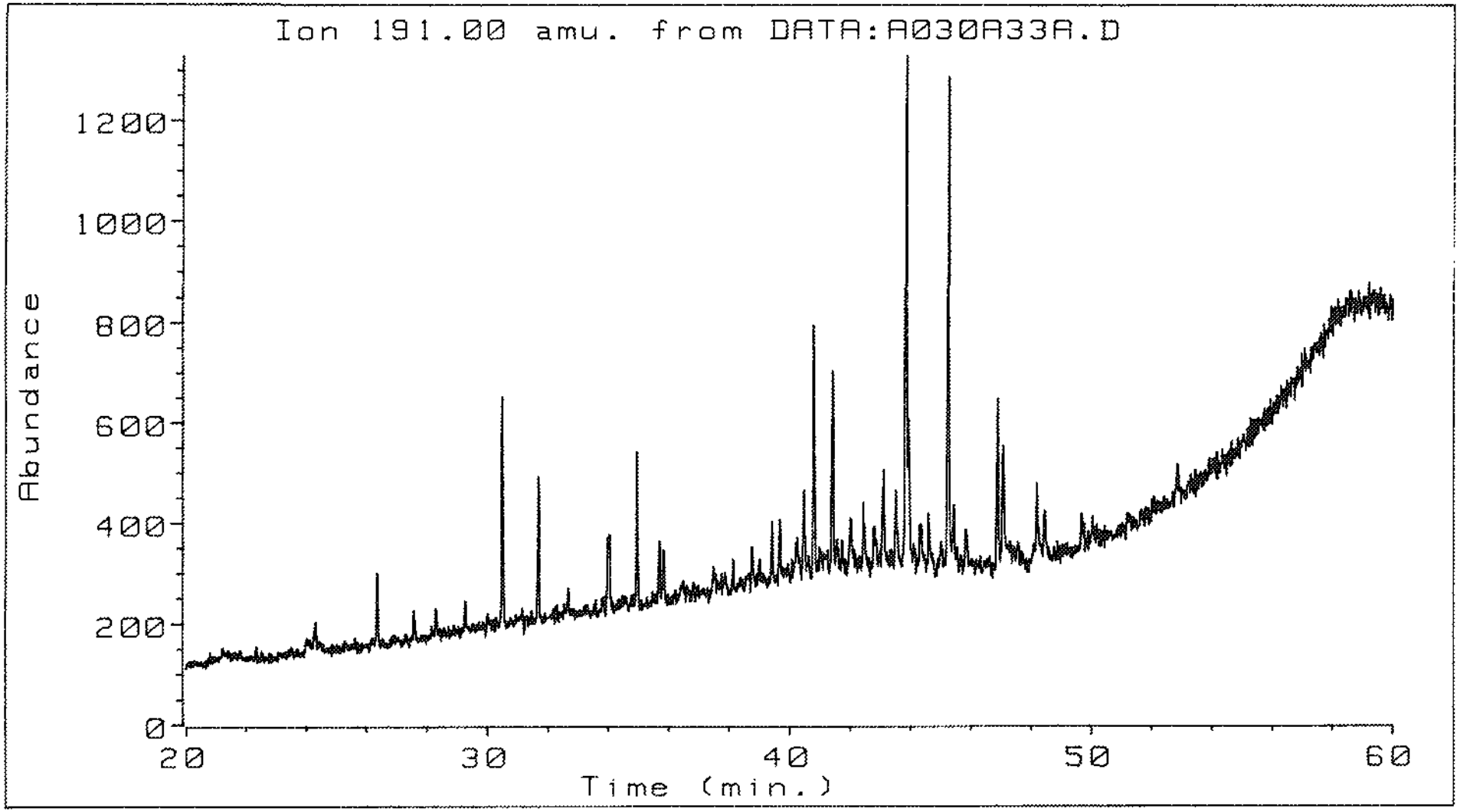
Time (min.)

4500 m DC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Abundance
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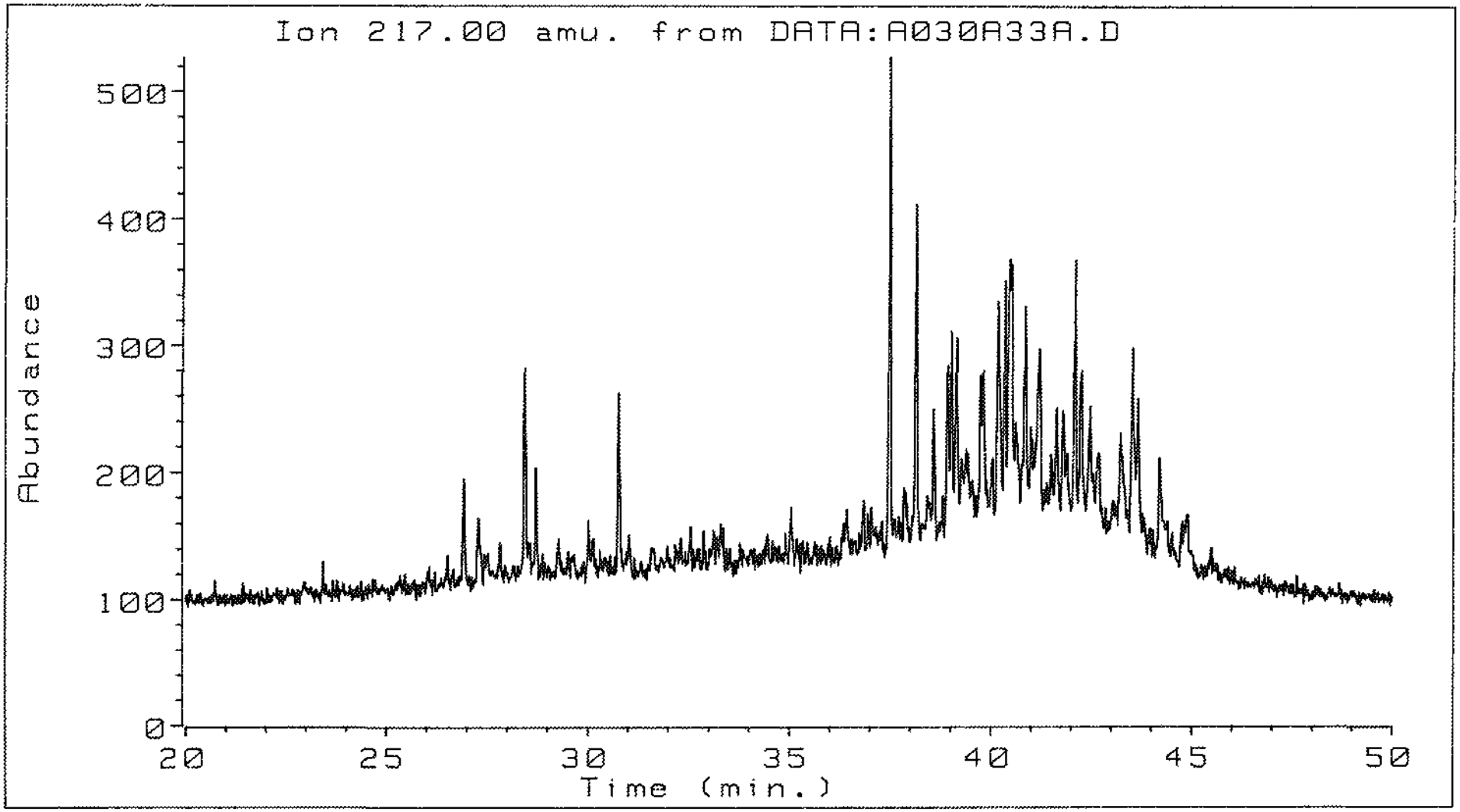
60
Time (min.)

4500 m mob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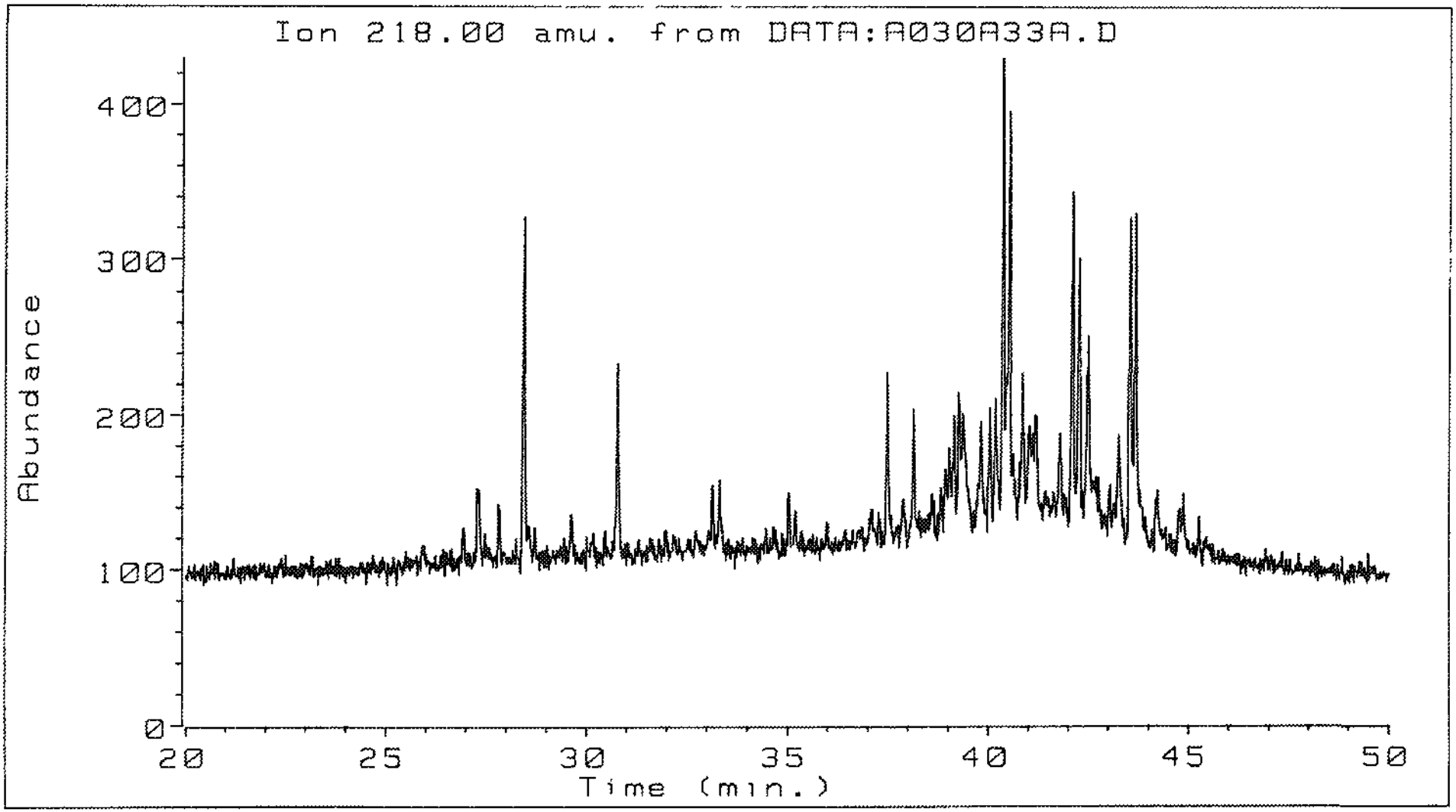
Time (min.)

4500 m MUD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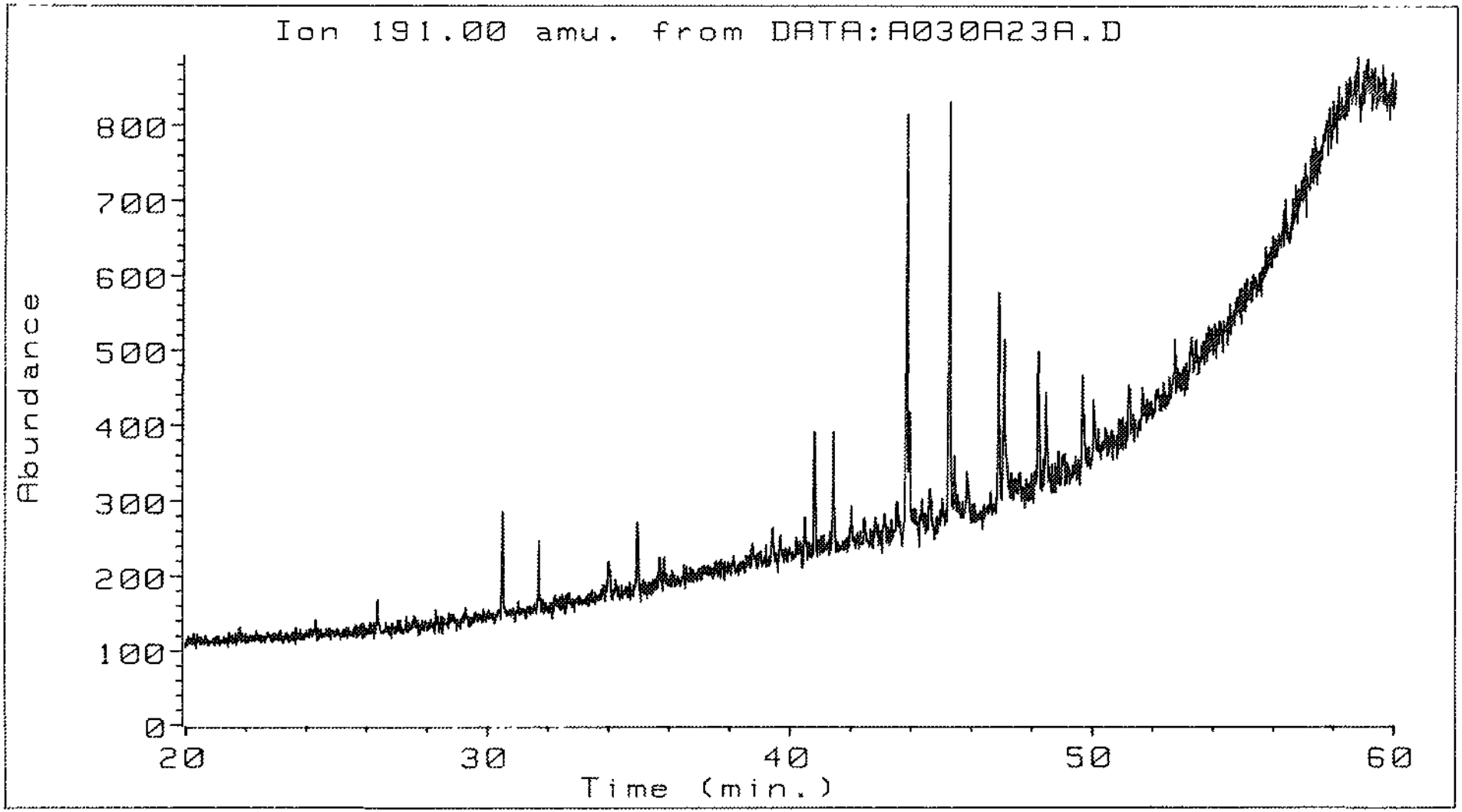
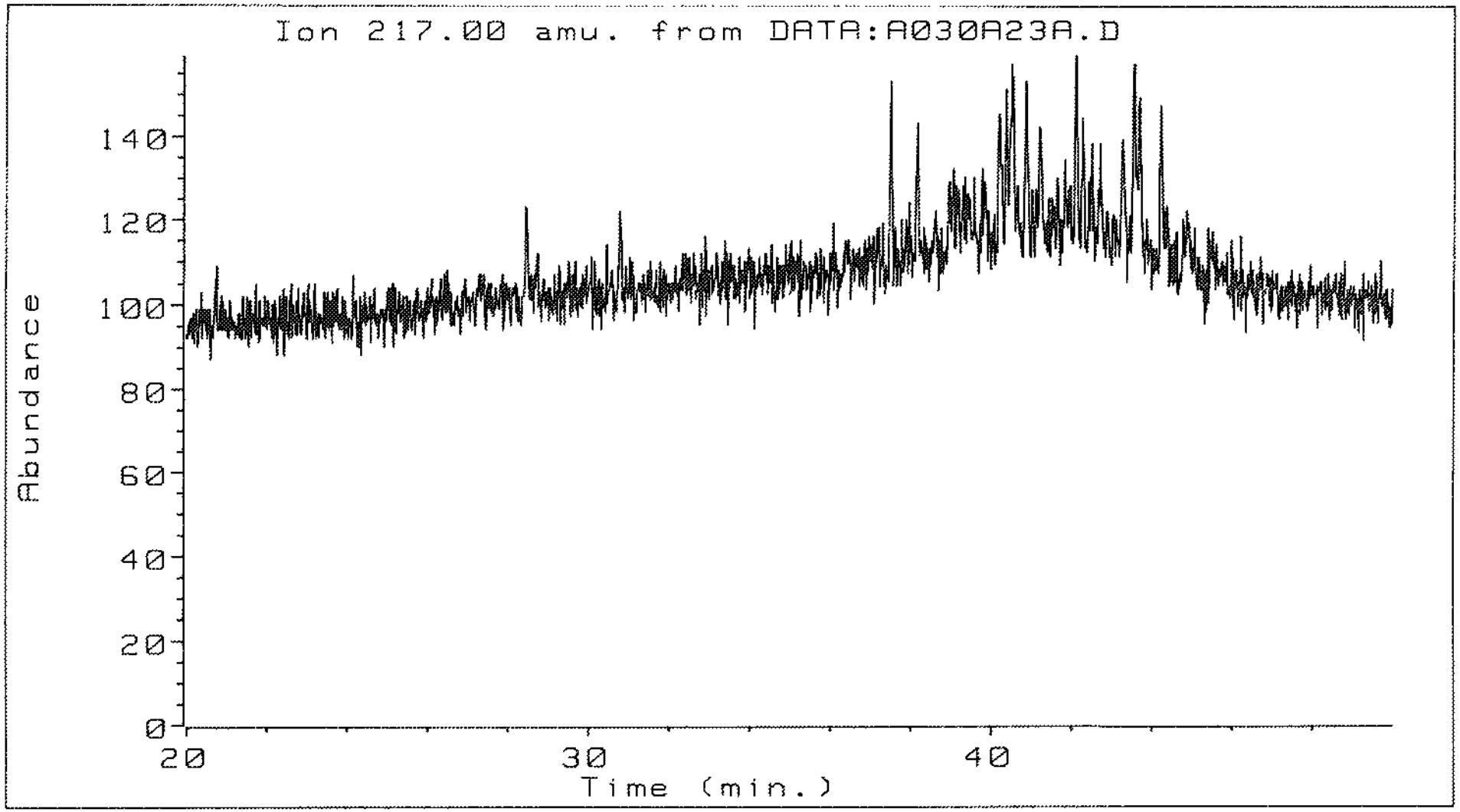
Time (min.)

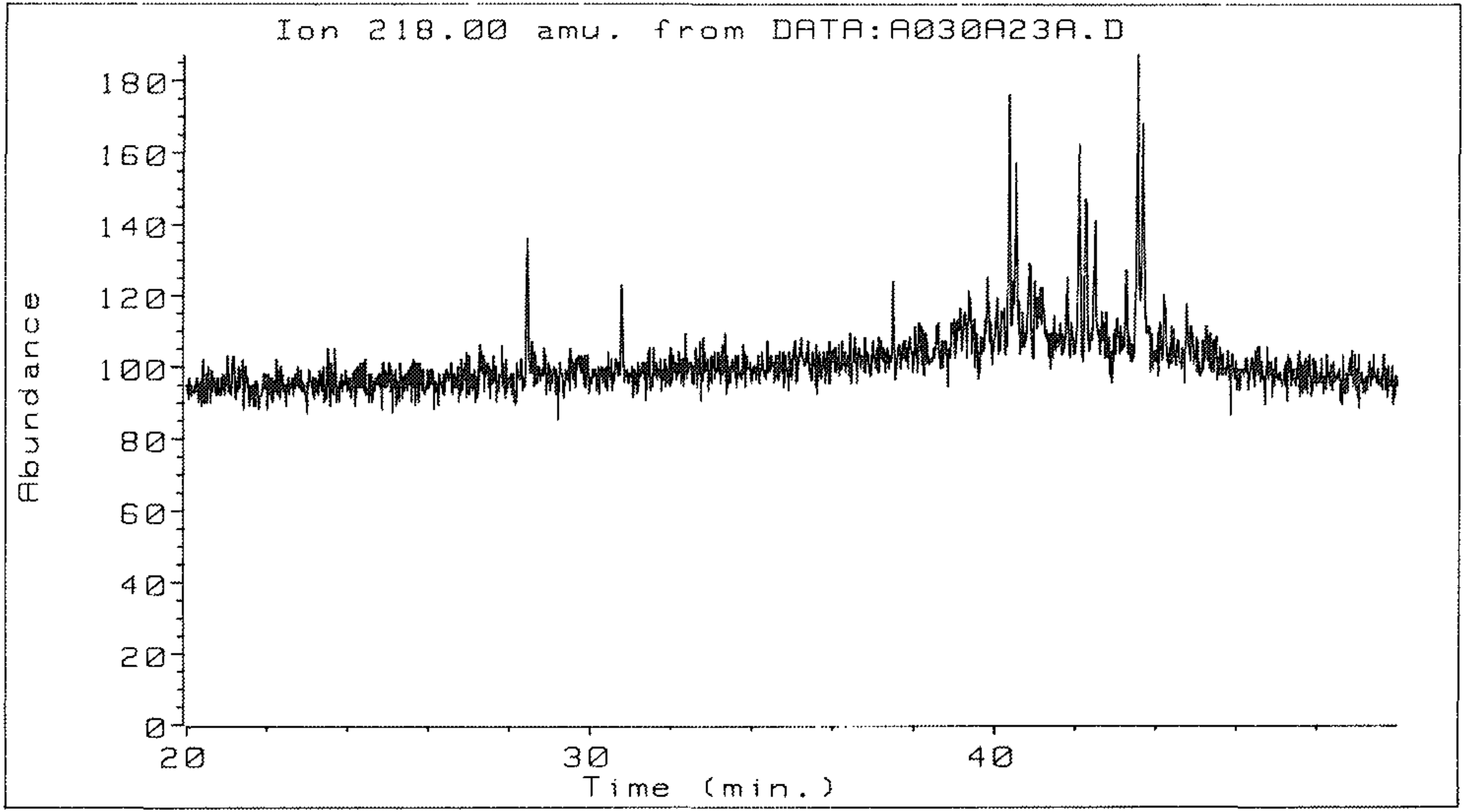
4500m MUD



Pac polymer 1cg.



Pac polymer reg.



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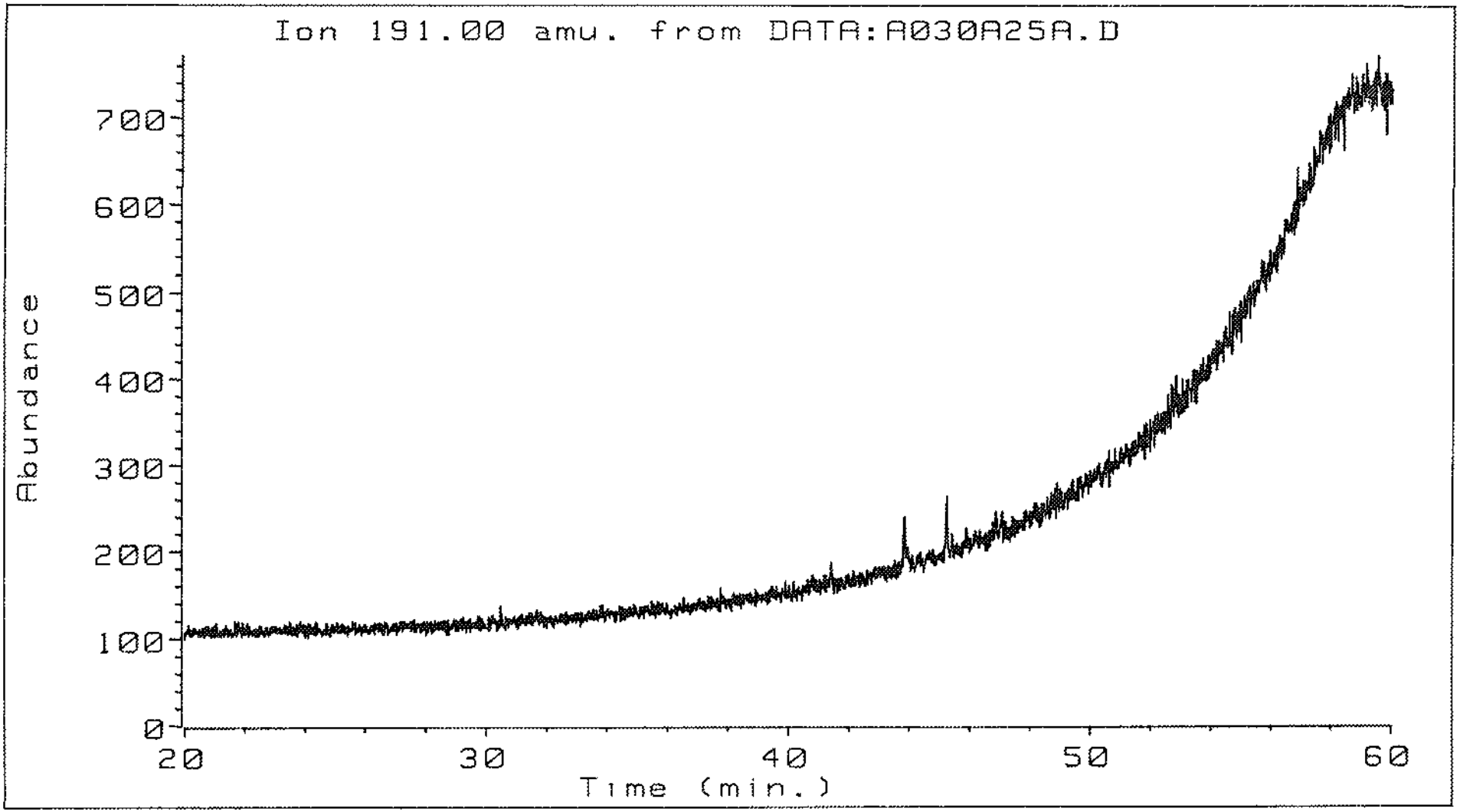
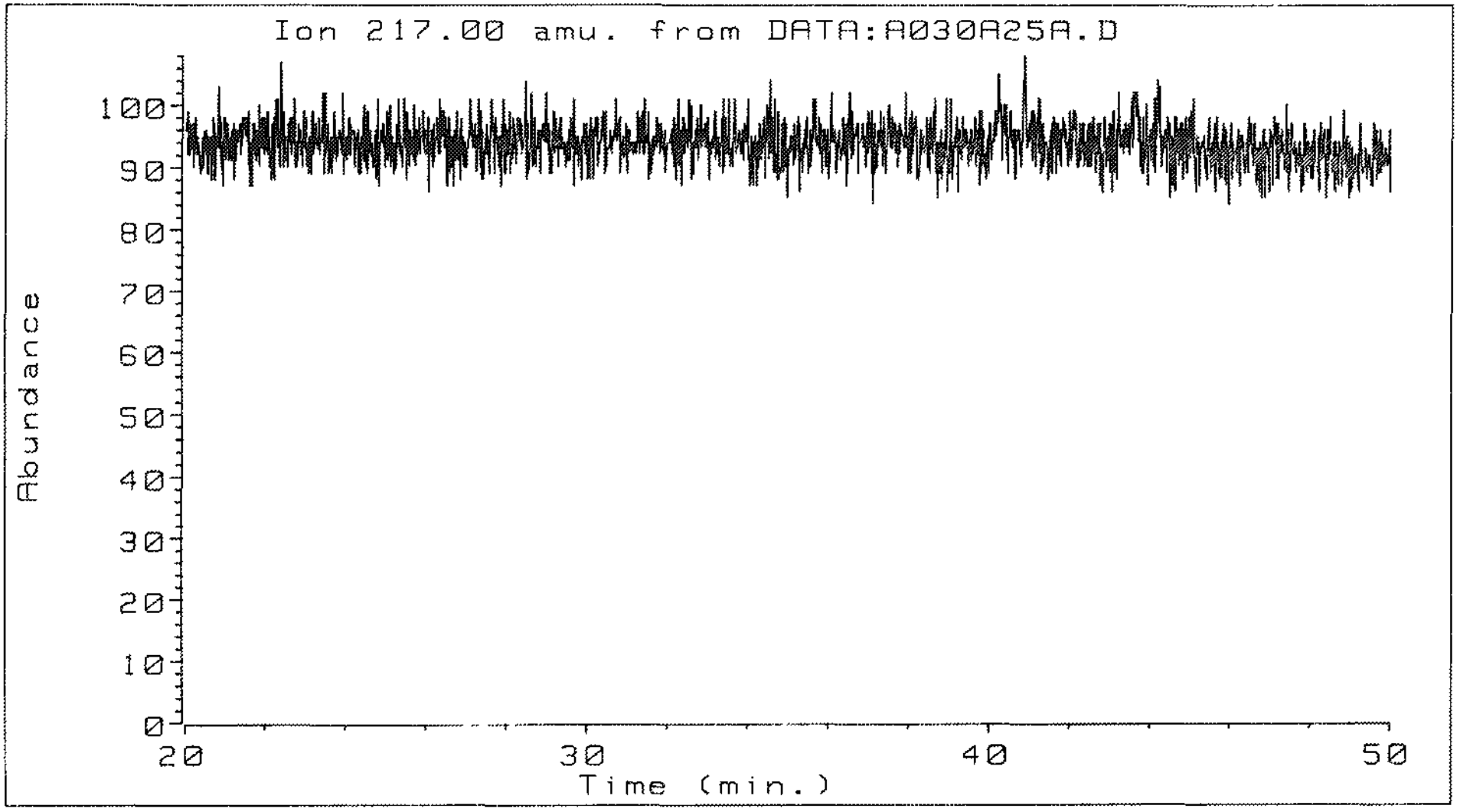
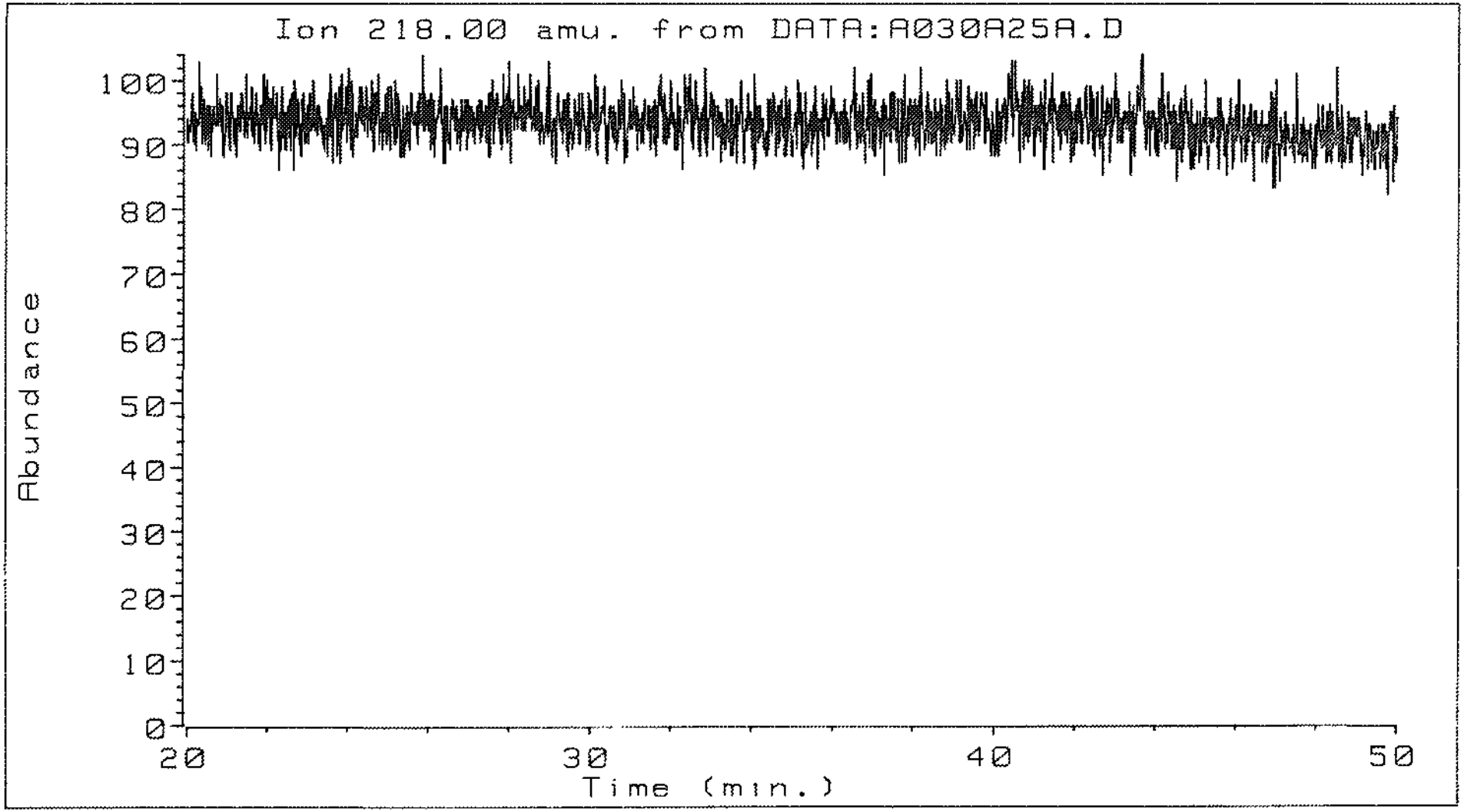


Pac polymer S



Pac polymer S



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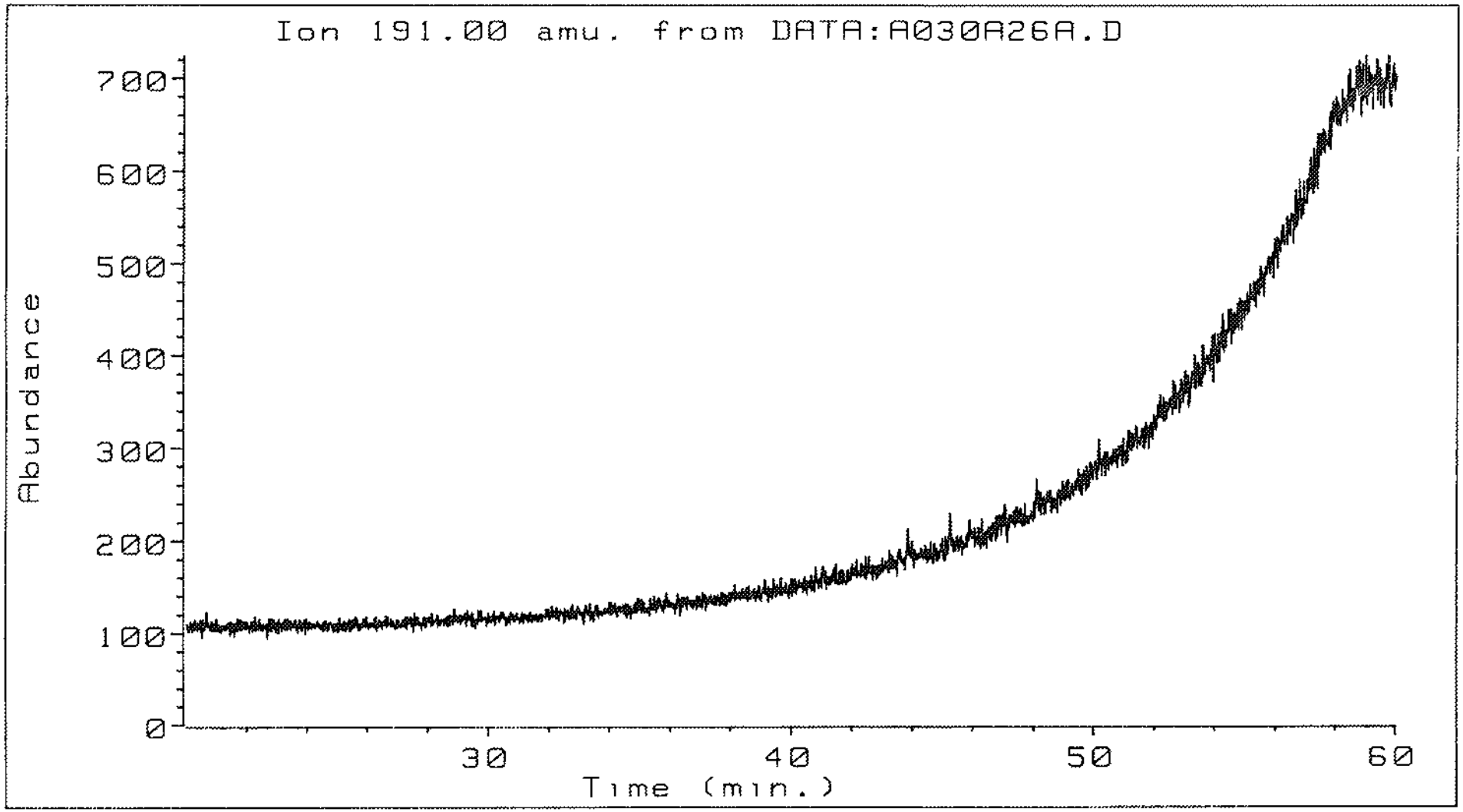
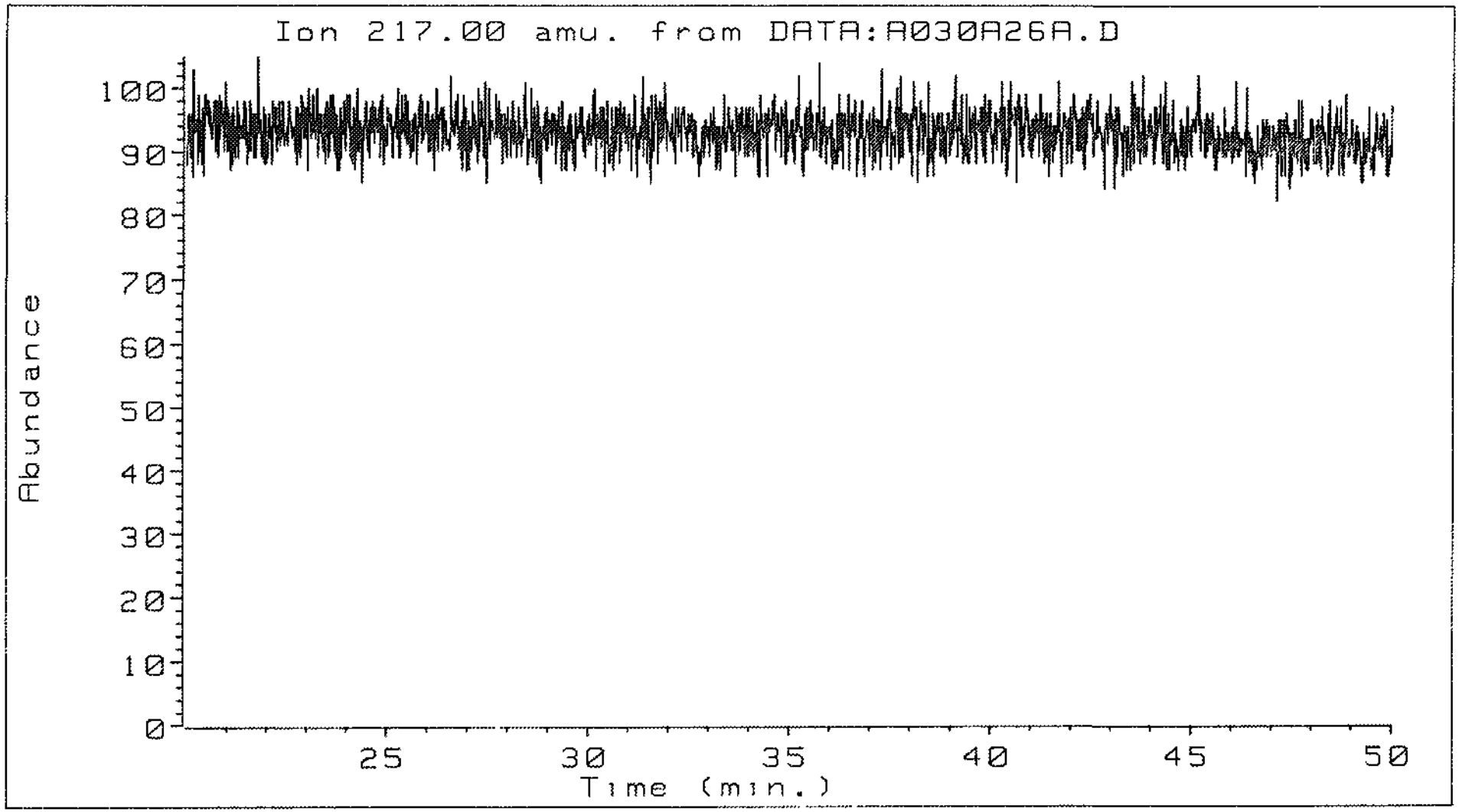
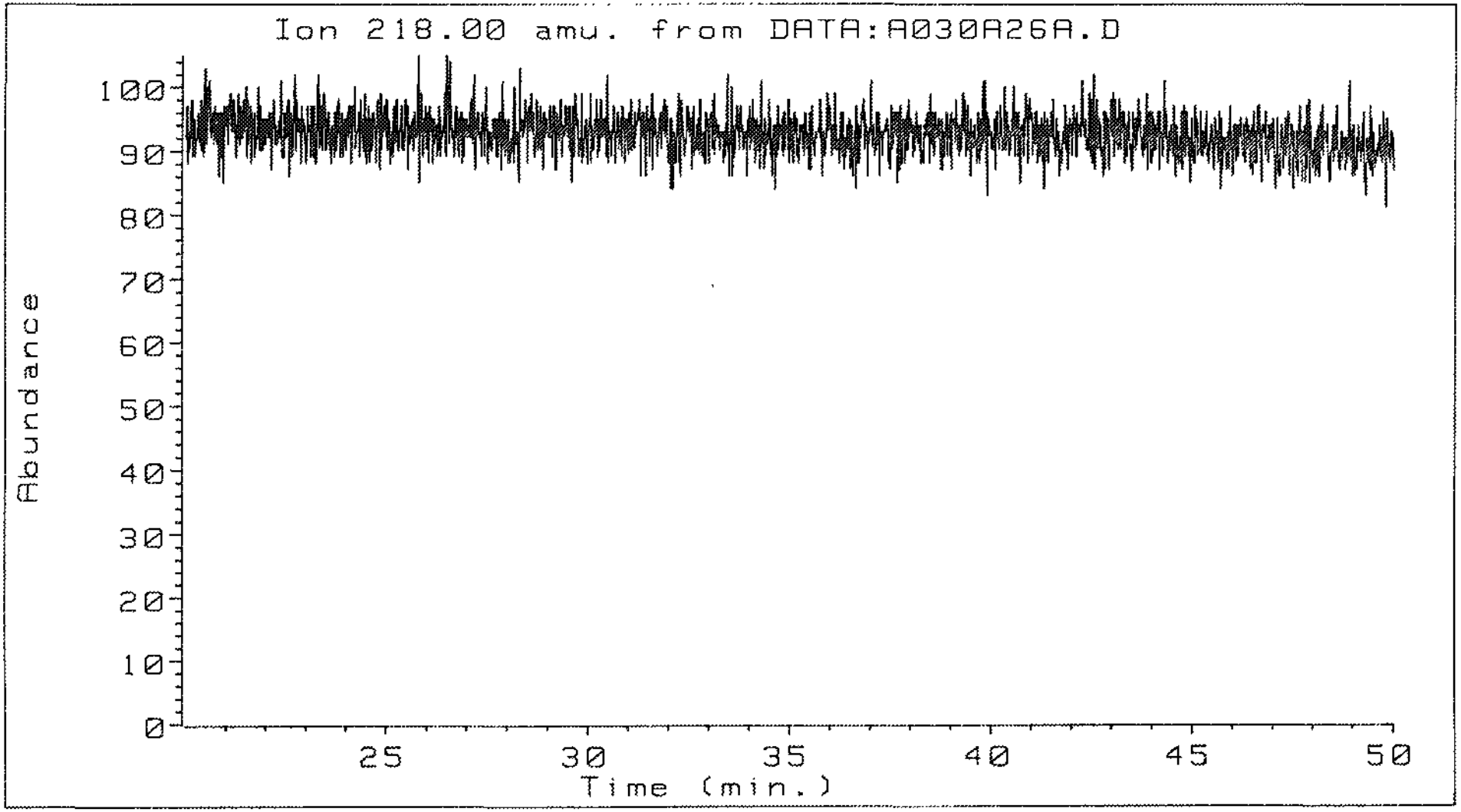


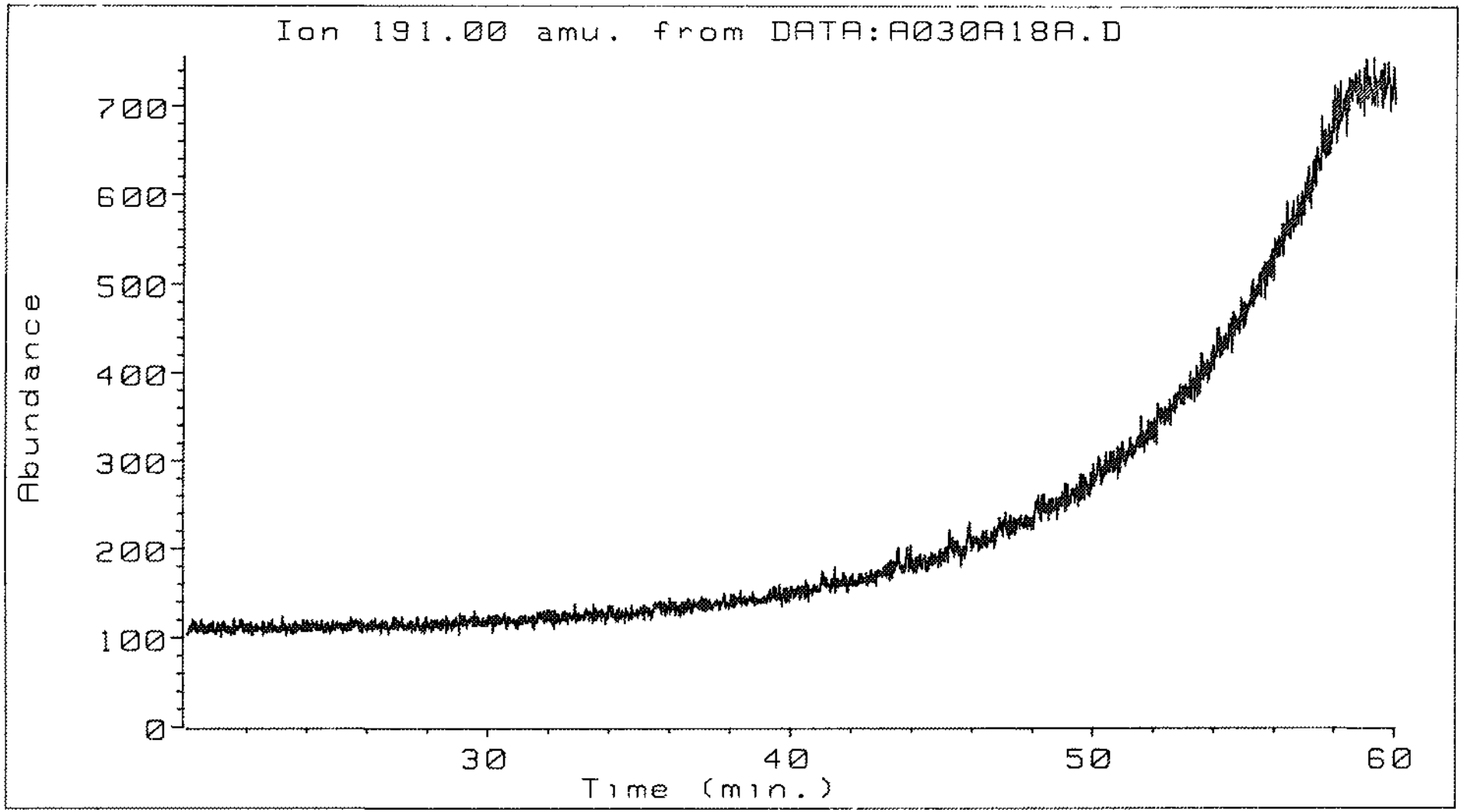
Pac polymer SL



Pac polymer SL



Pac polymer SL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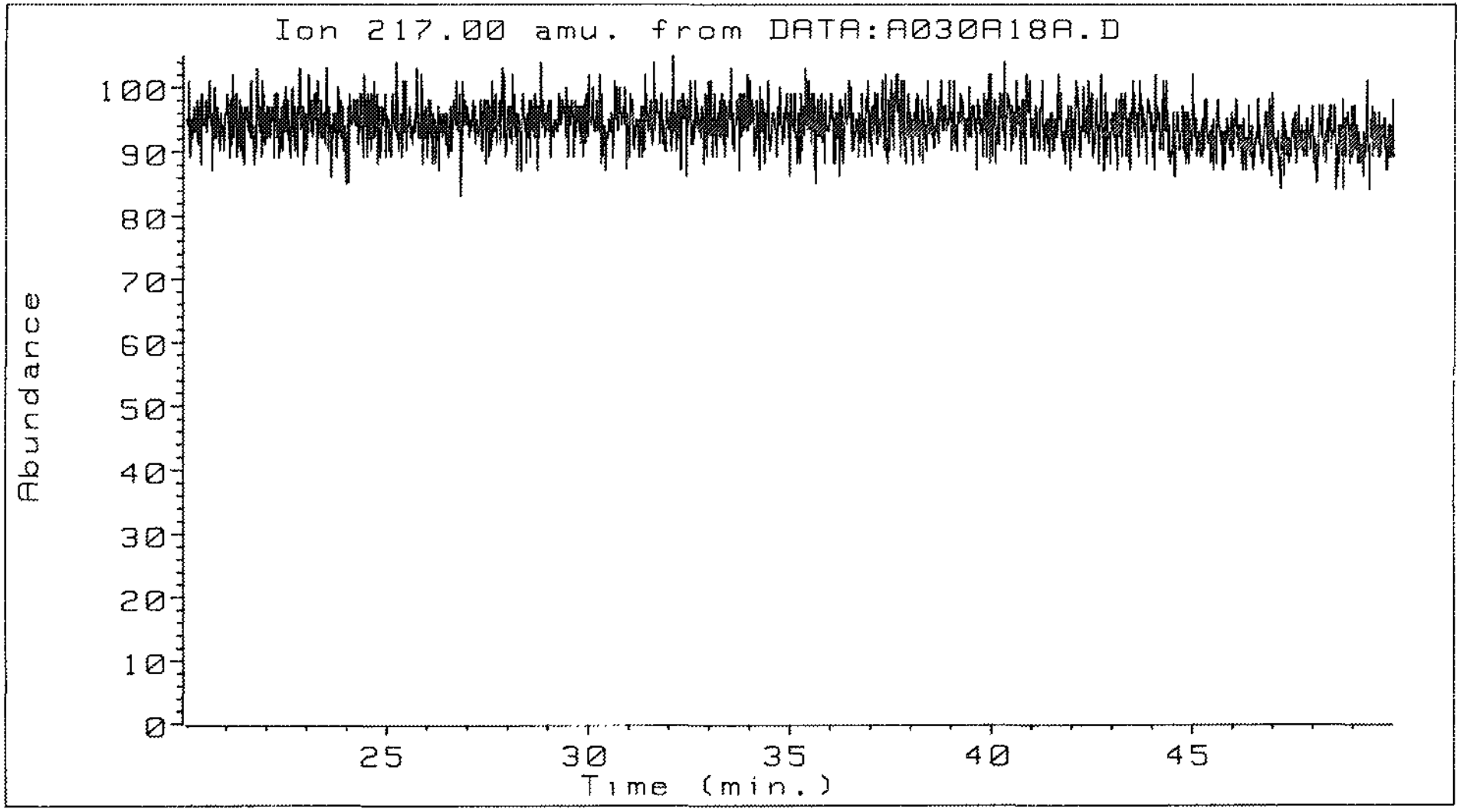
Time (min.)

Probio-2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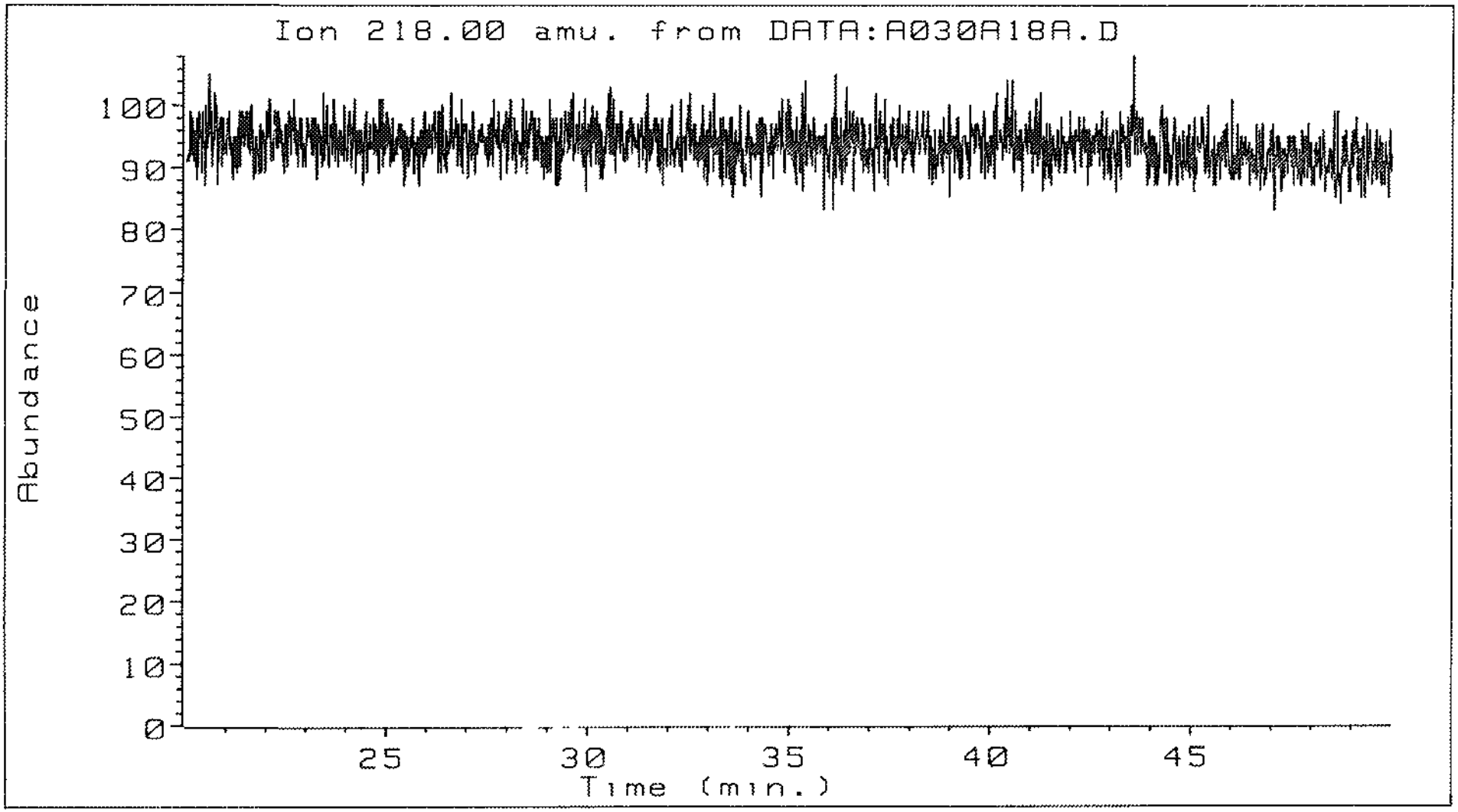
45
Time (min.)

Probio-2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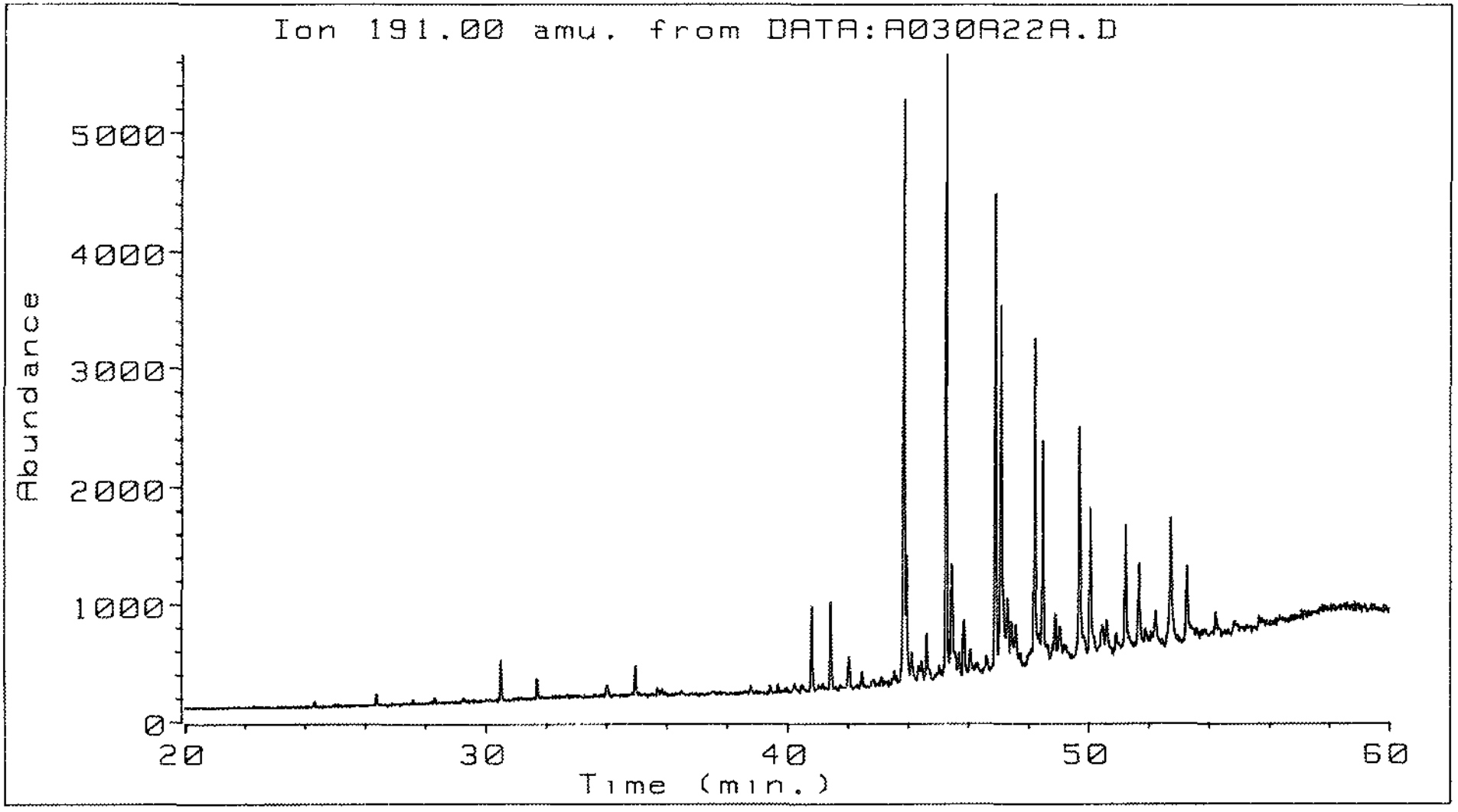
45
Time (min.)

Probio-2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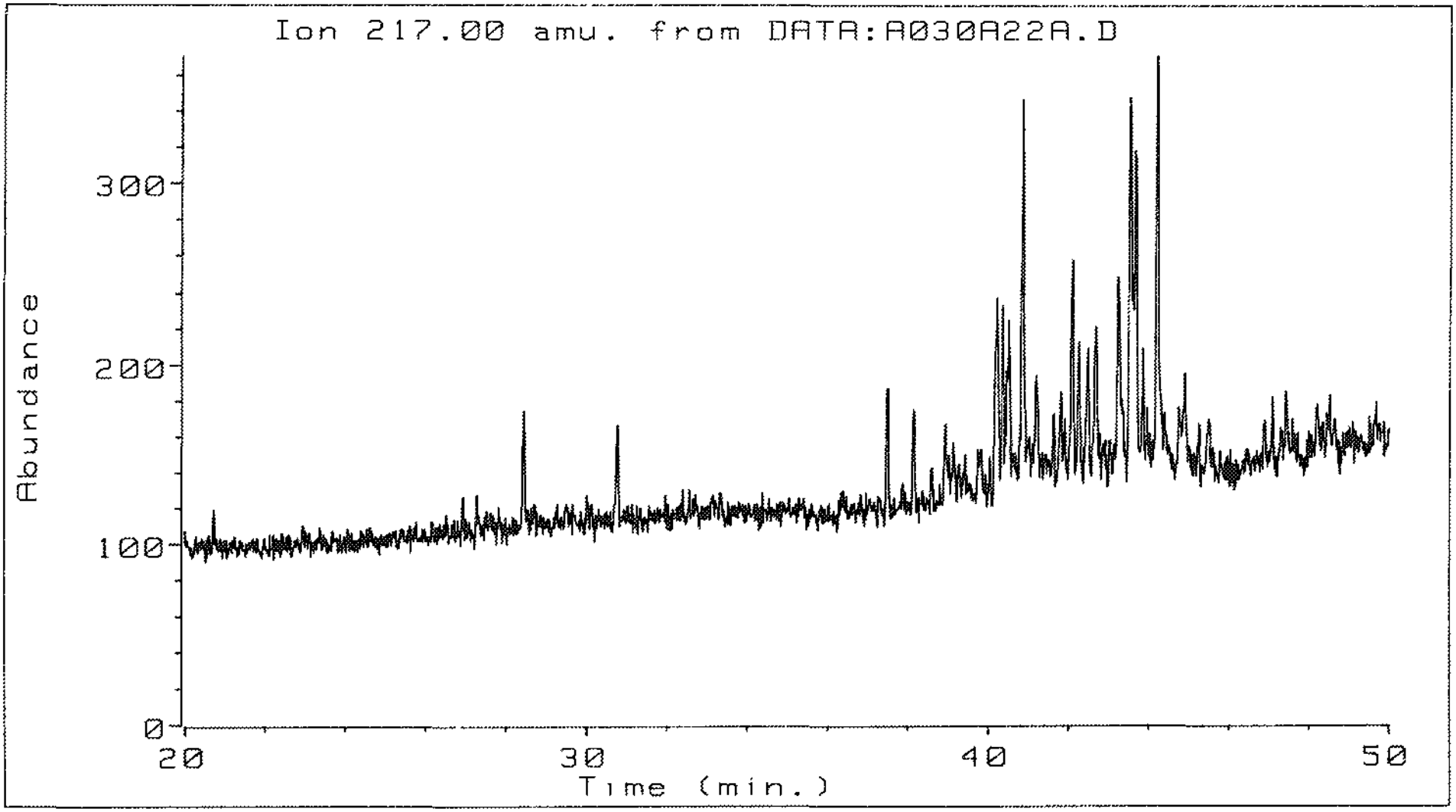
Time (min.)

Procap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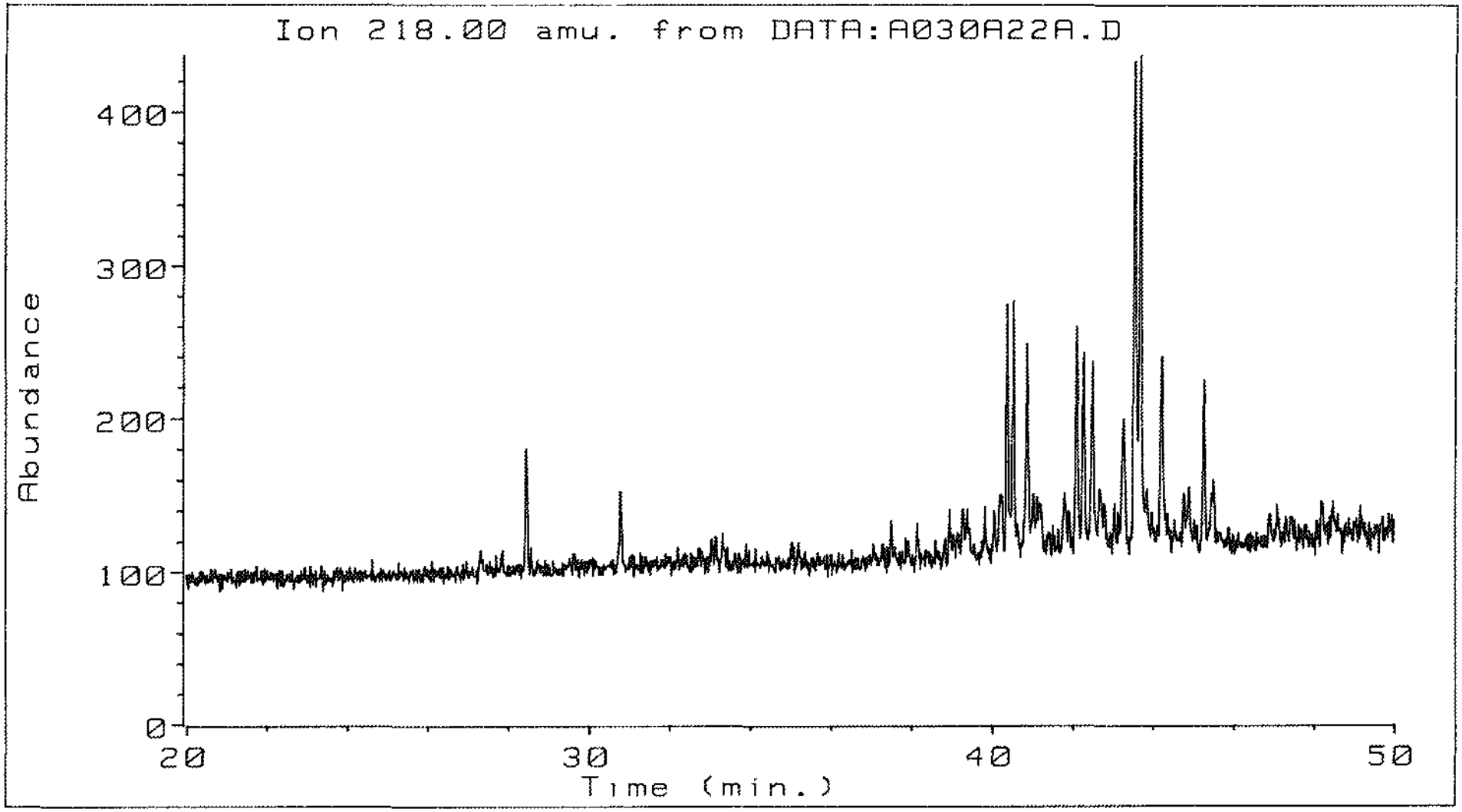
Time (min.)

Procap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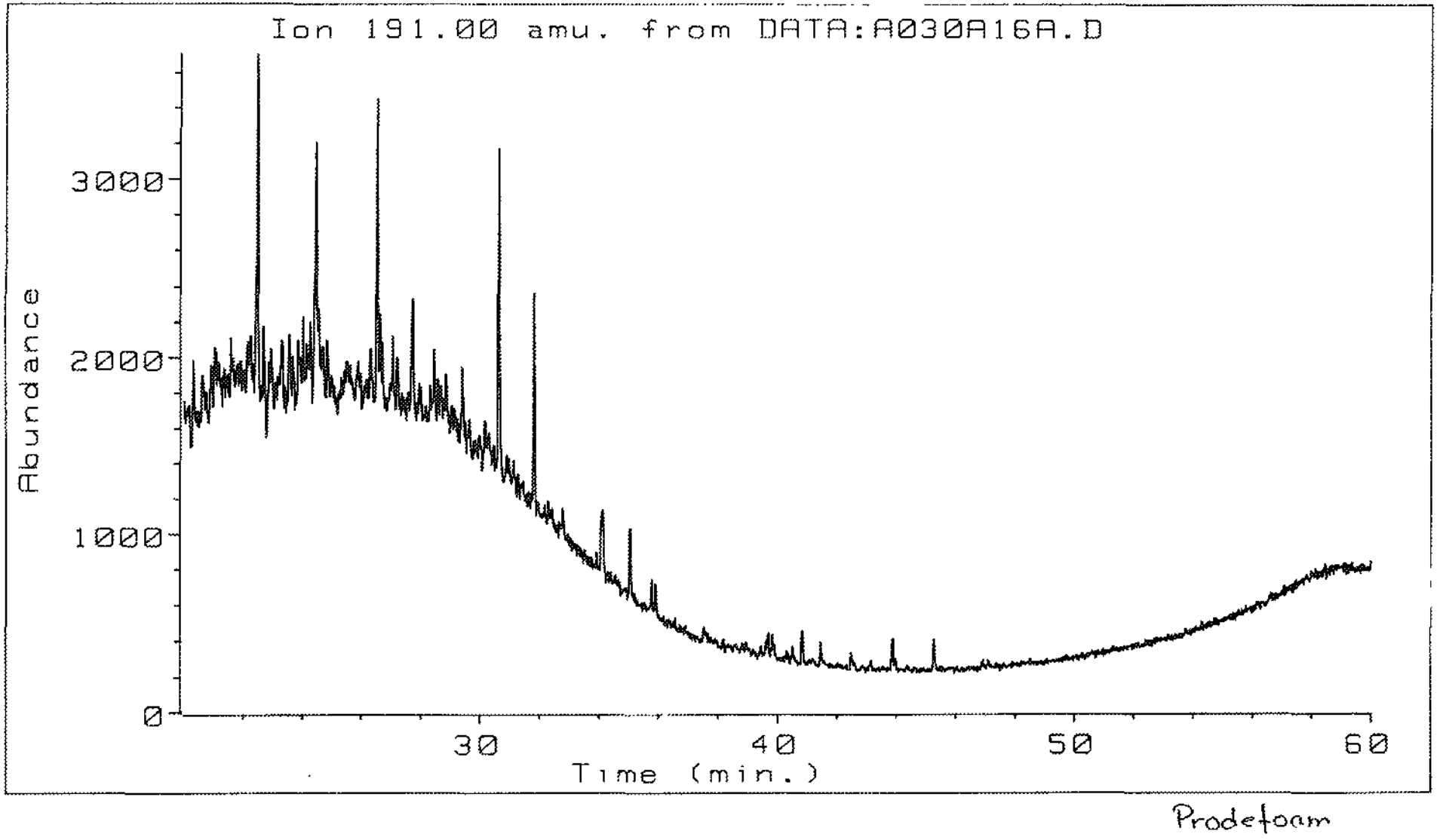
Time (min.)

Procap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Time (min.)
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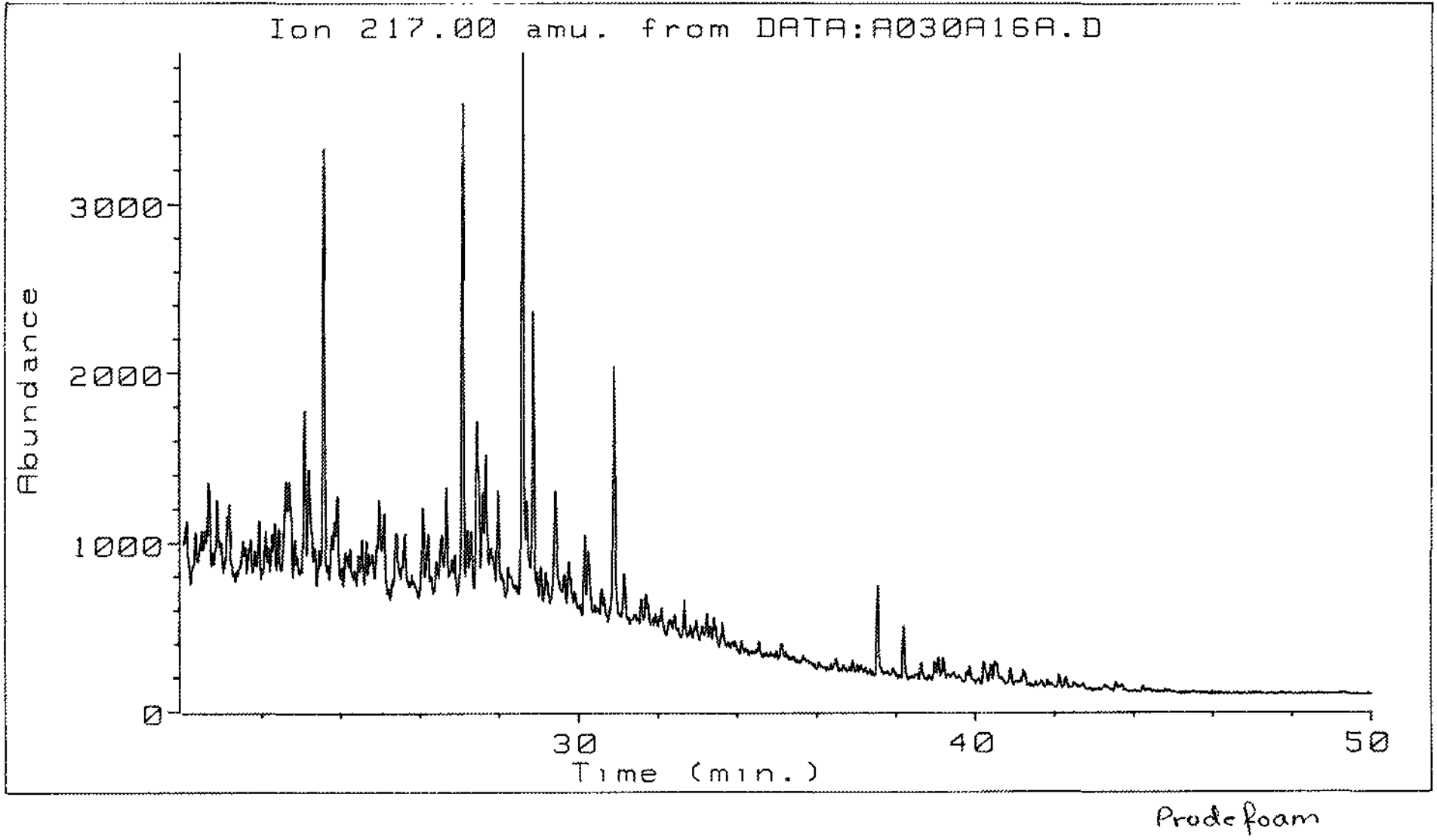
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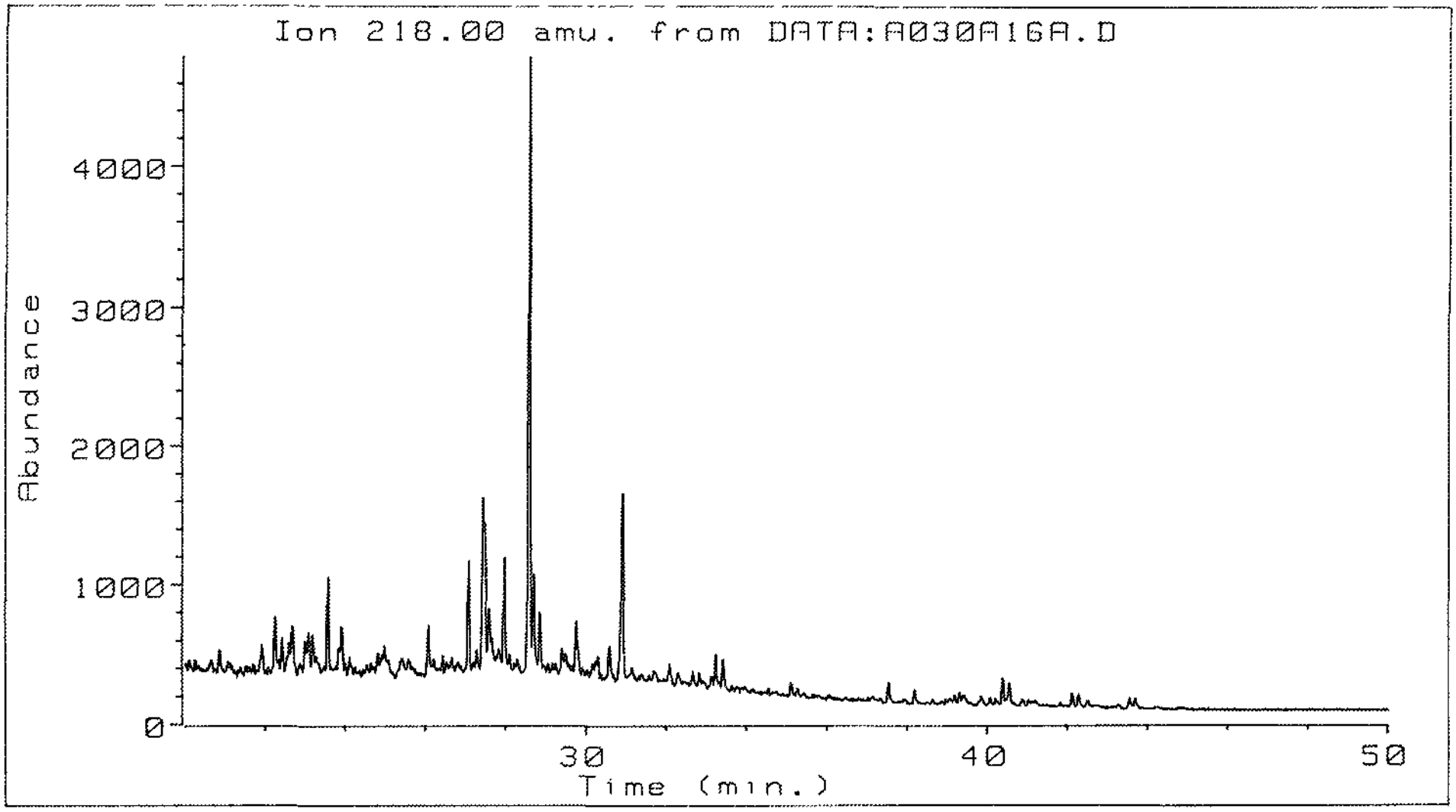
Time (min.)
Prodefoam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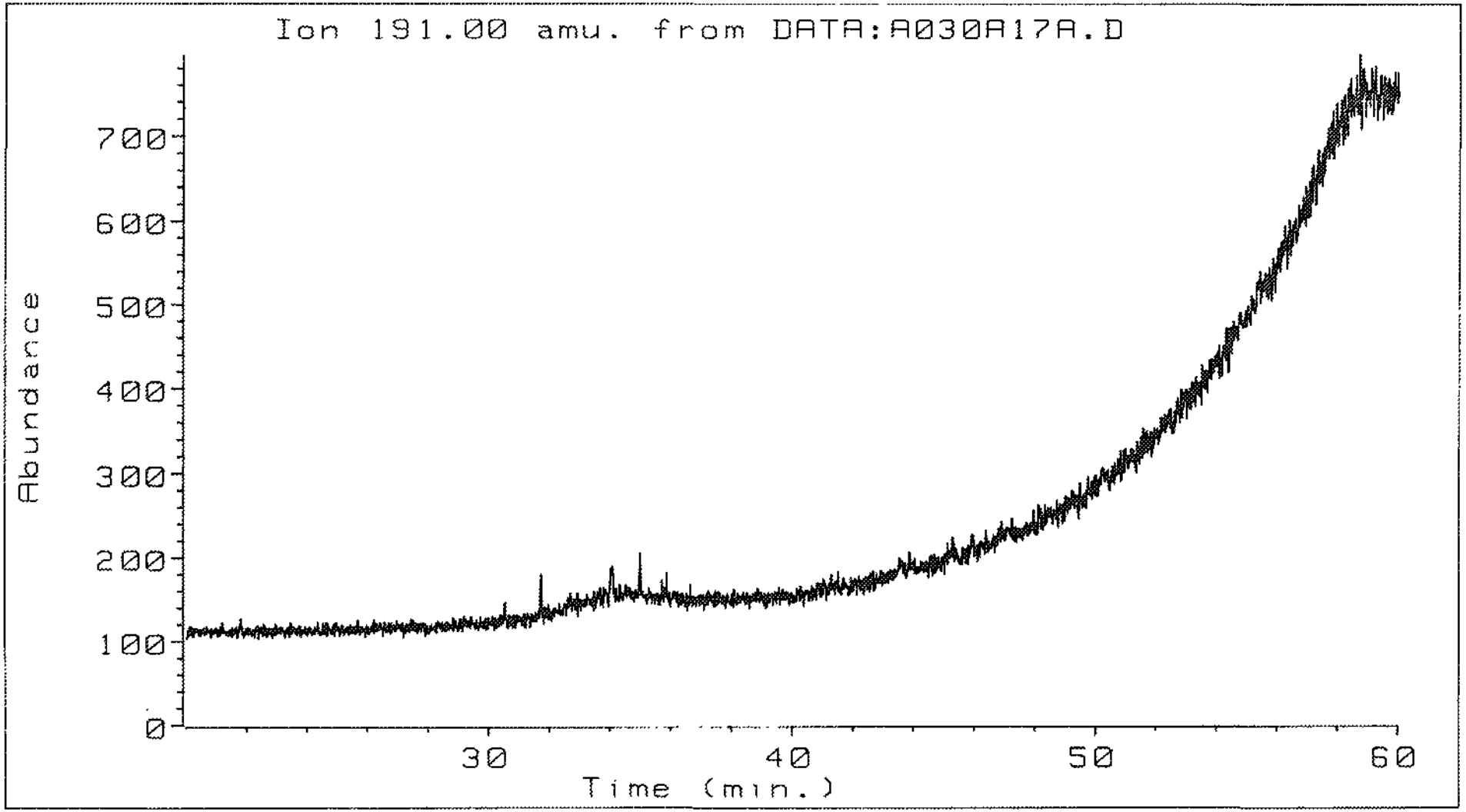
Time (min.)

Prodefoam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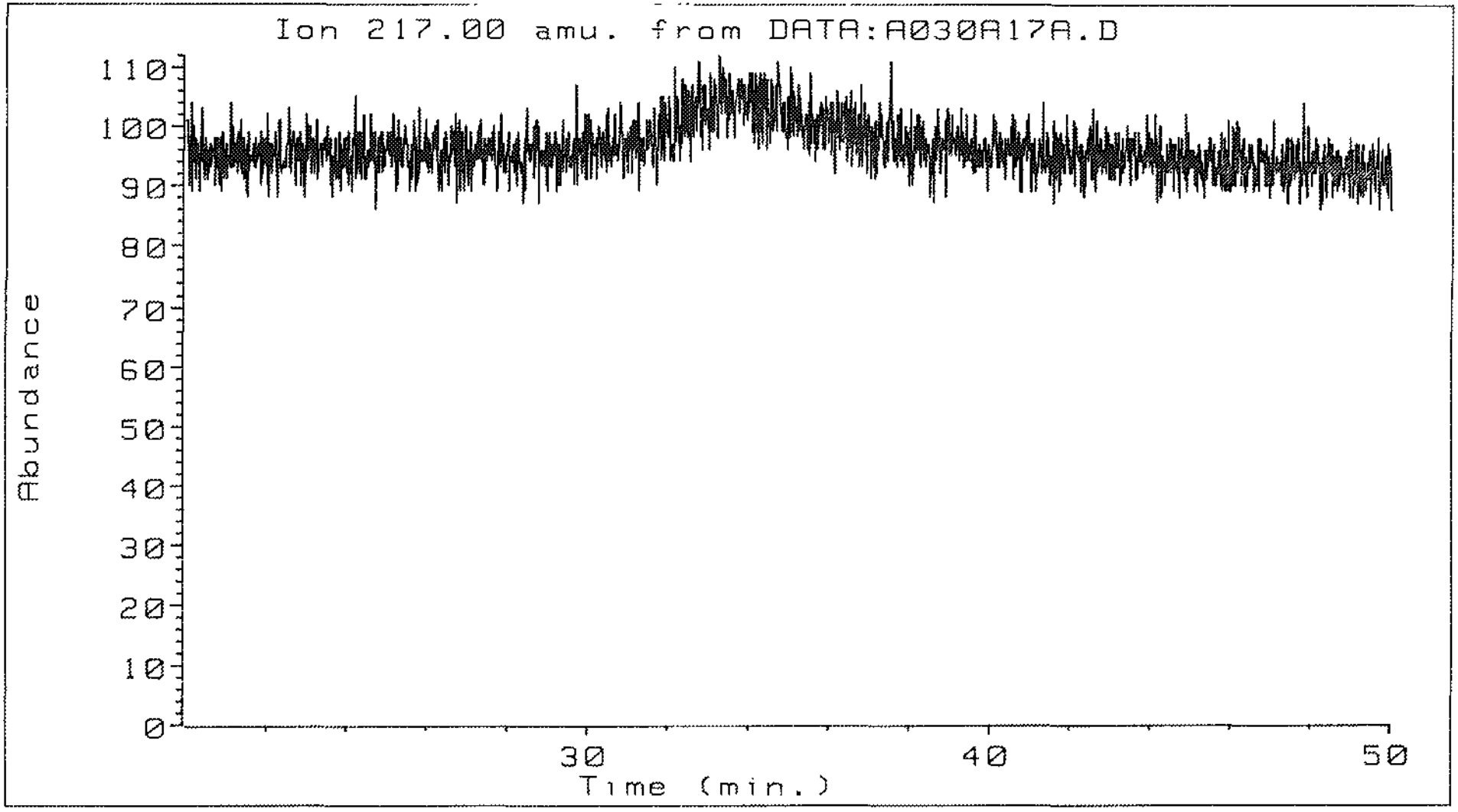
Time (min.)
Prolube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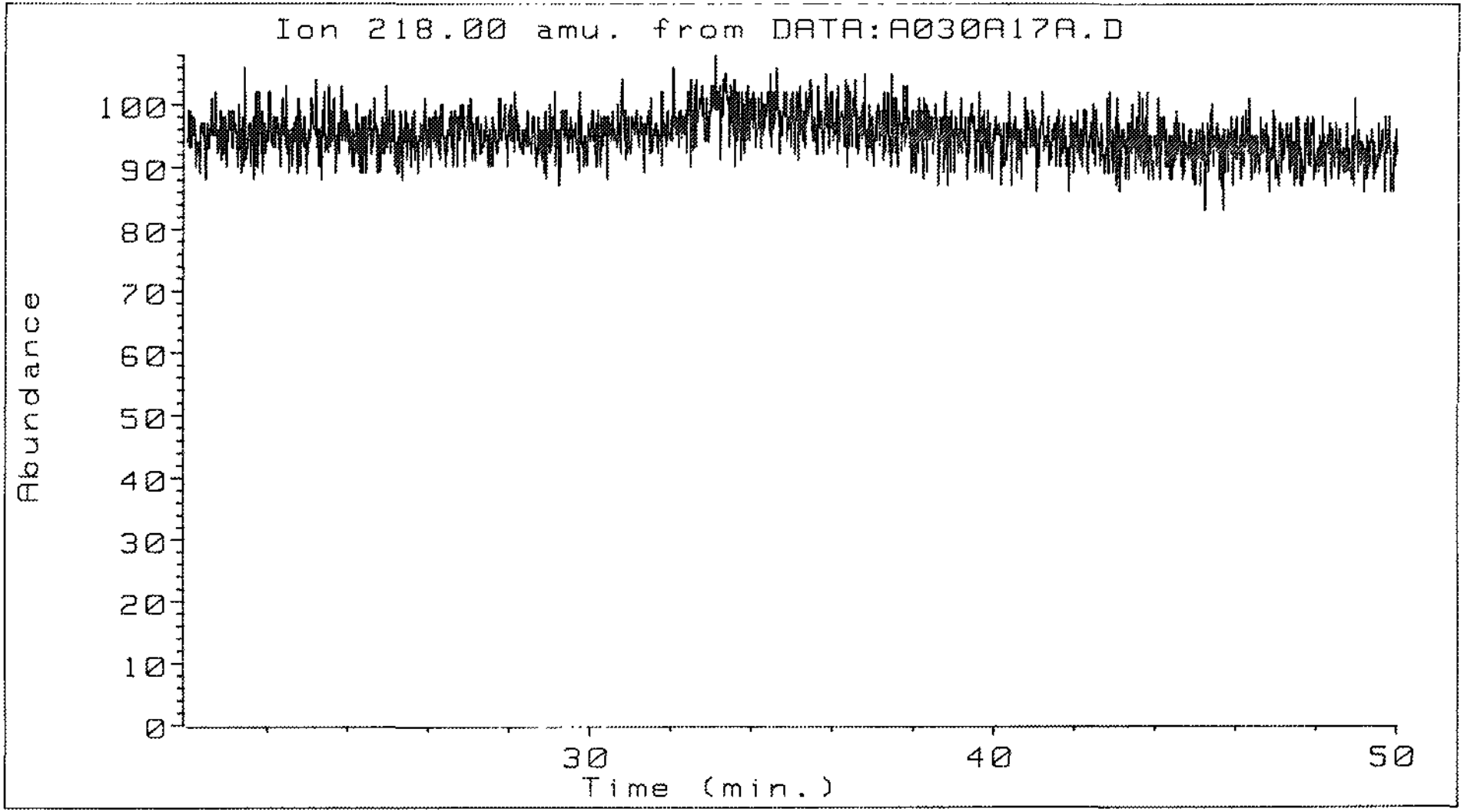
30
40
50
Time (min.)

Prolube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Abundance
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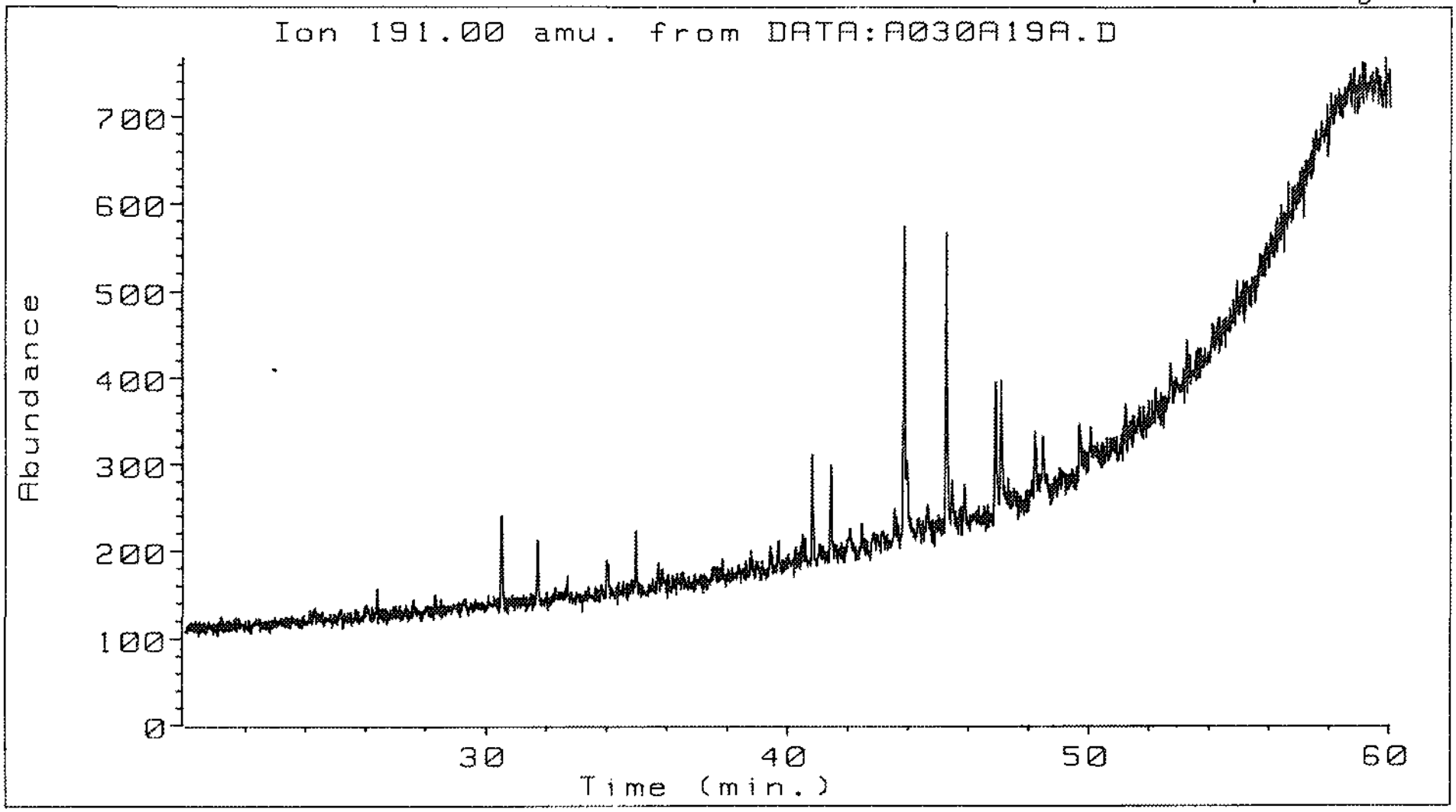
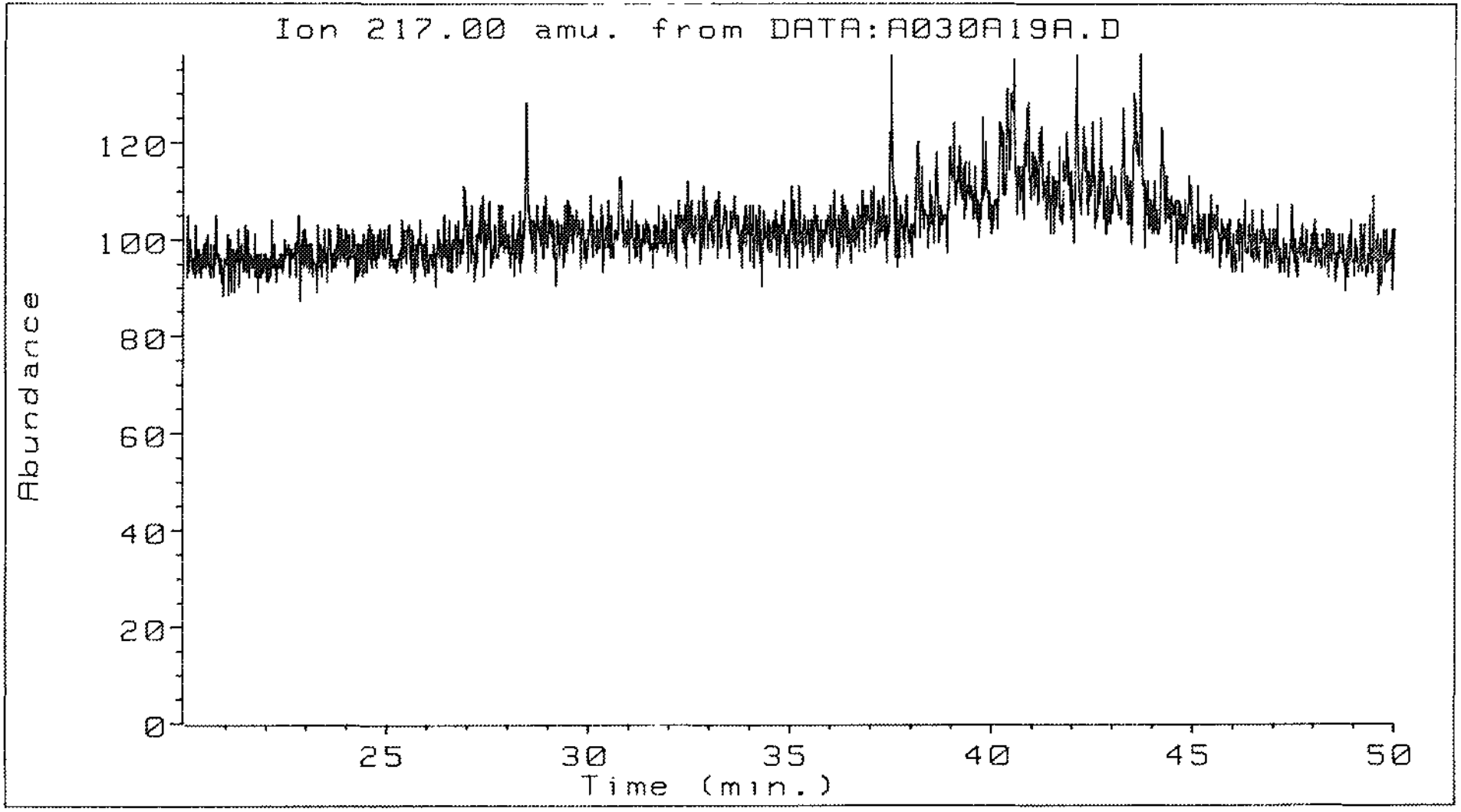
Time (min.)

Prolube

Propol rg.



Propol rg.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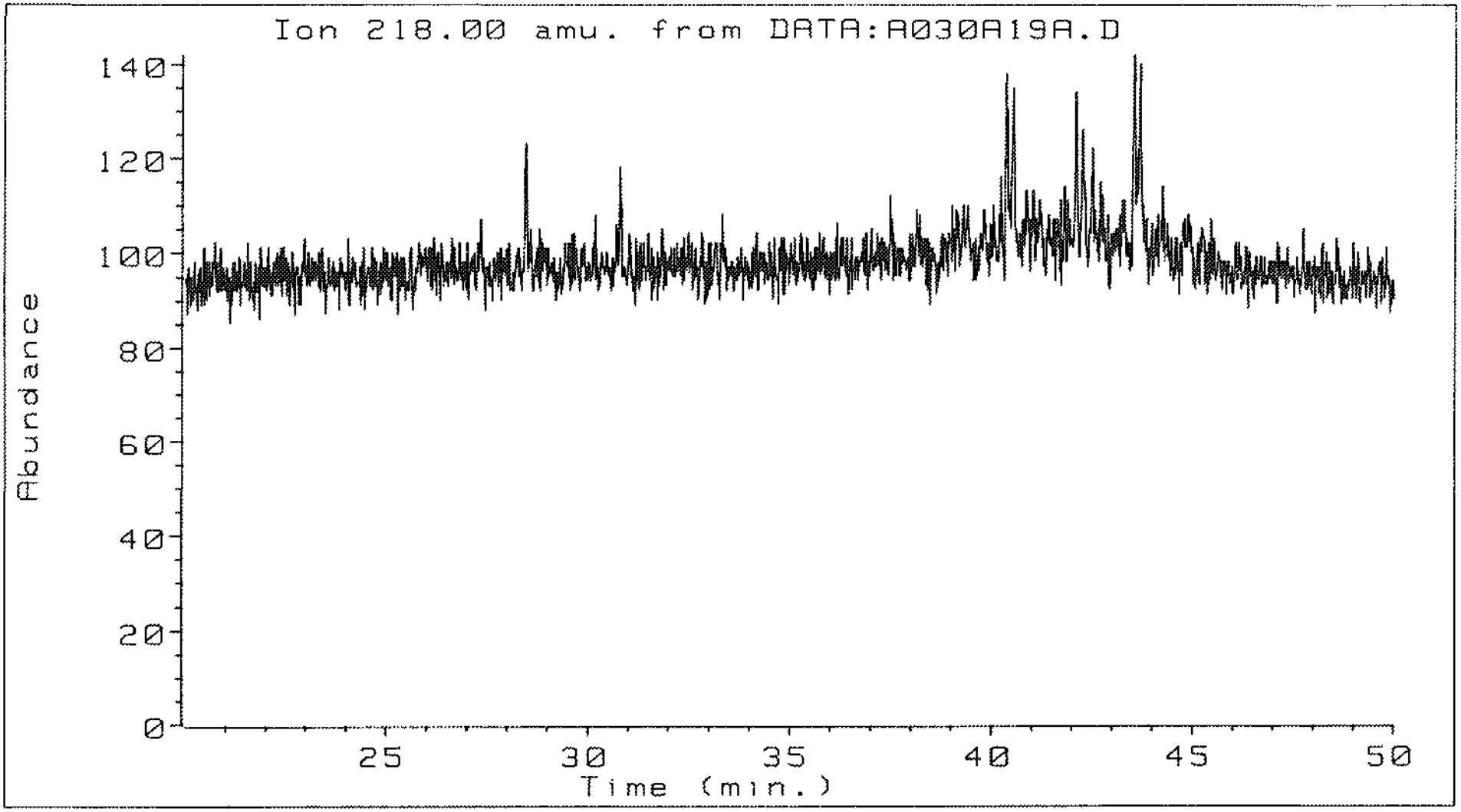
35
40
45
50
Time (min.)

Propol reg.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Abundance
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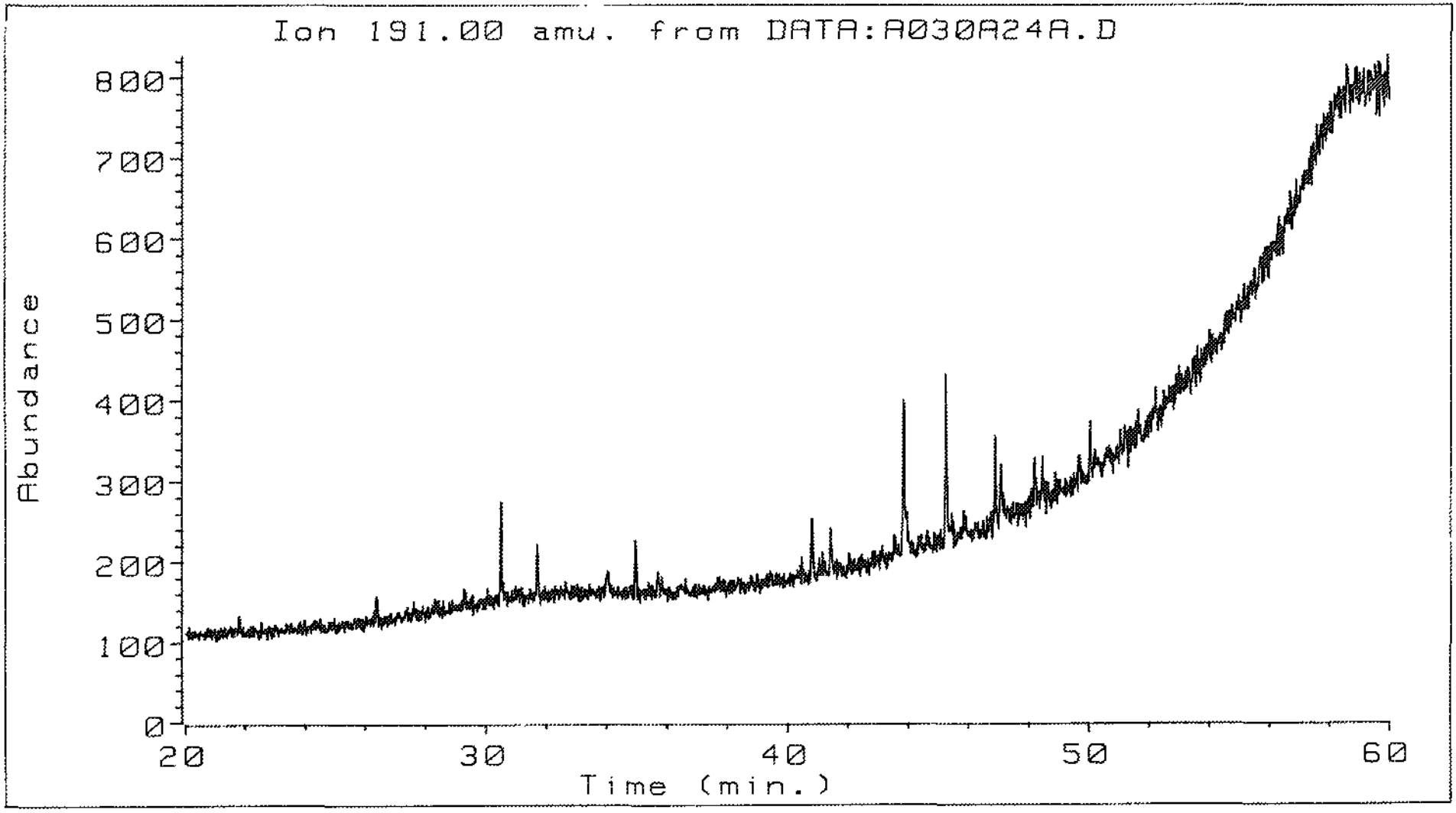
120
100
80
60
40
20
0
25
30
35
40
45
50
Time (min.)

Propol mg.


Ion 191.00 amu. from DATA:A030A24A.D
Abundance
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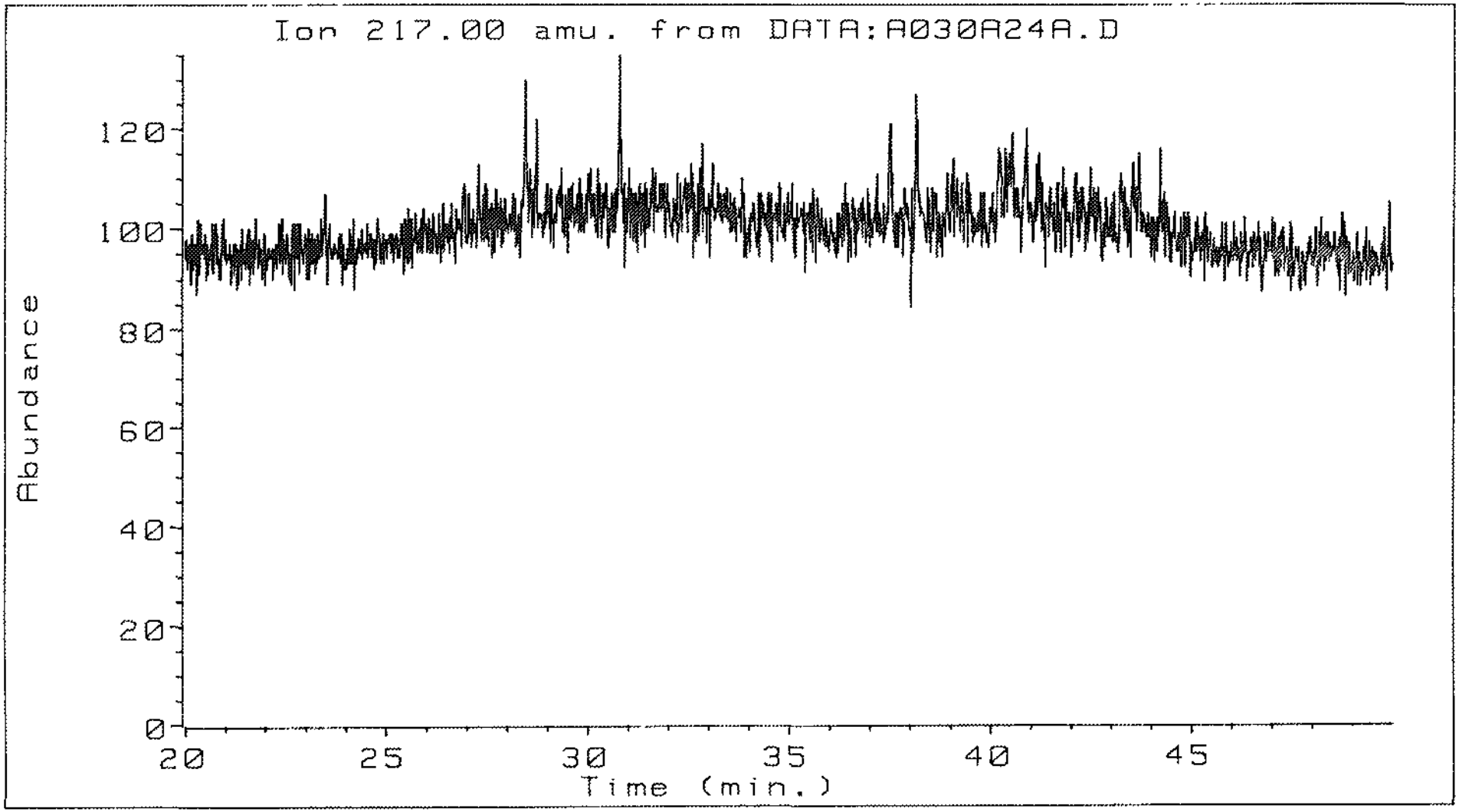
700
600
500
400
300
200
100
0
20
30
40
50
60
Time (min.)

Thermopal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Abundance
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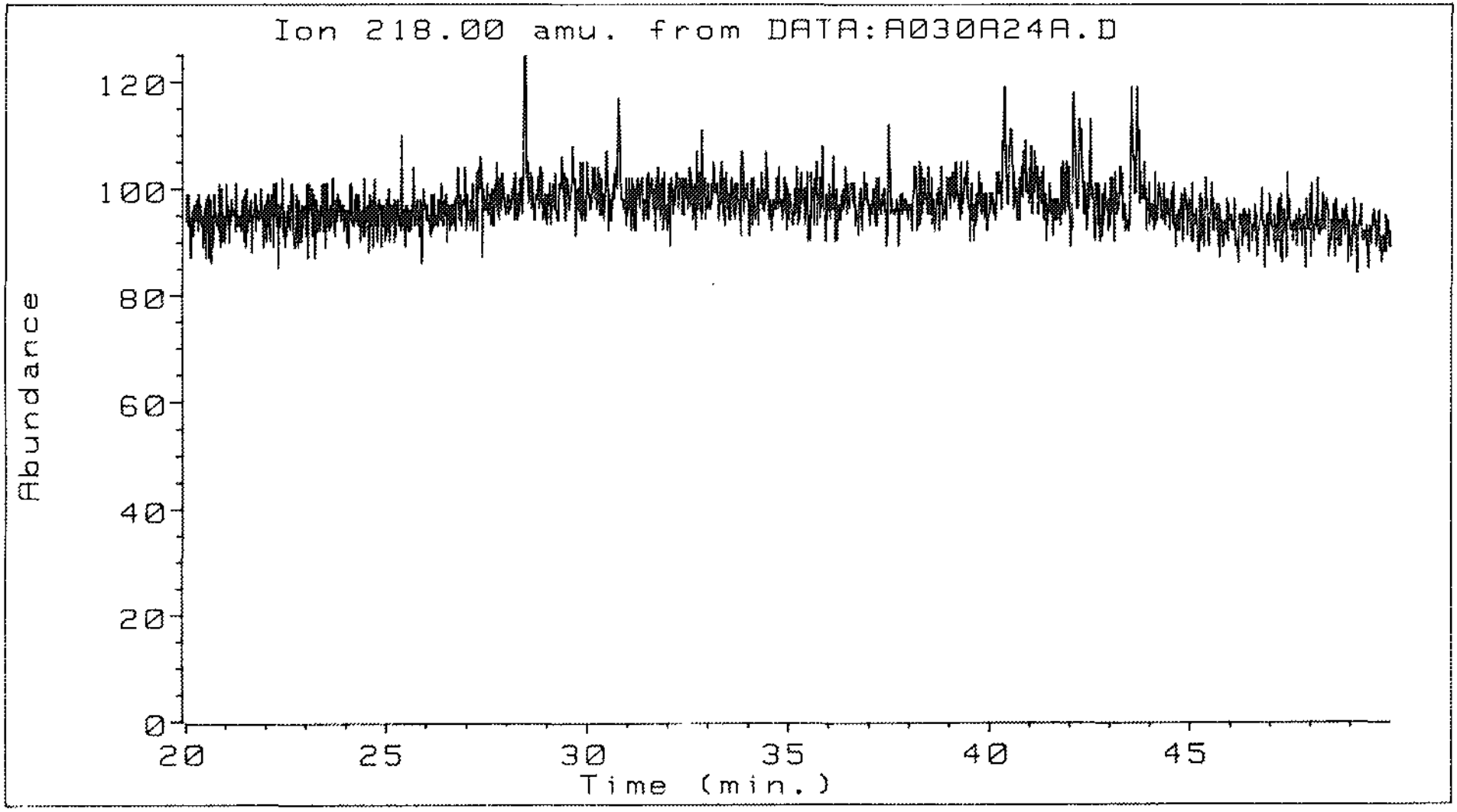
100
80
60
40
20
0
20
25
30
35
40
45
Time (min.)

Thermopol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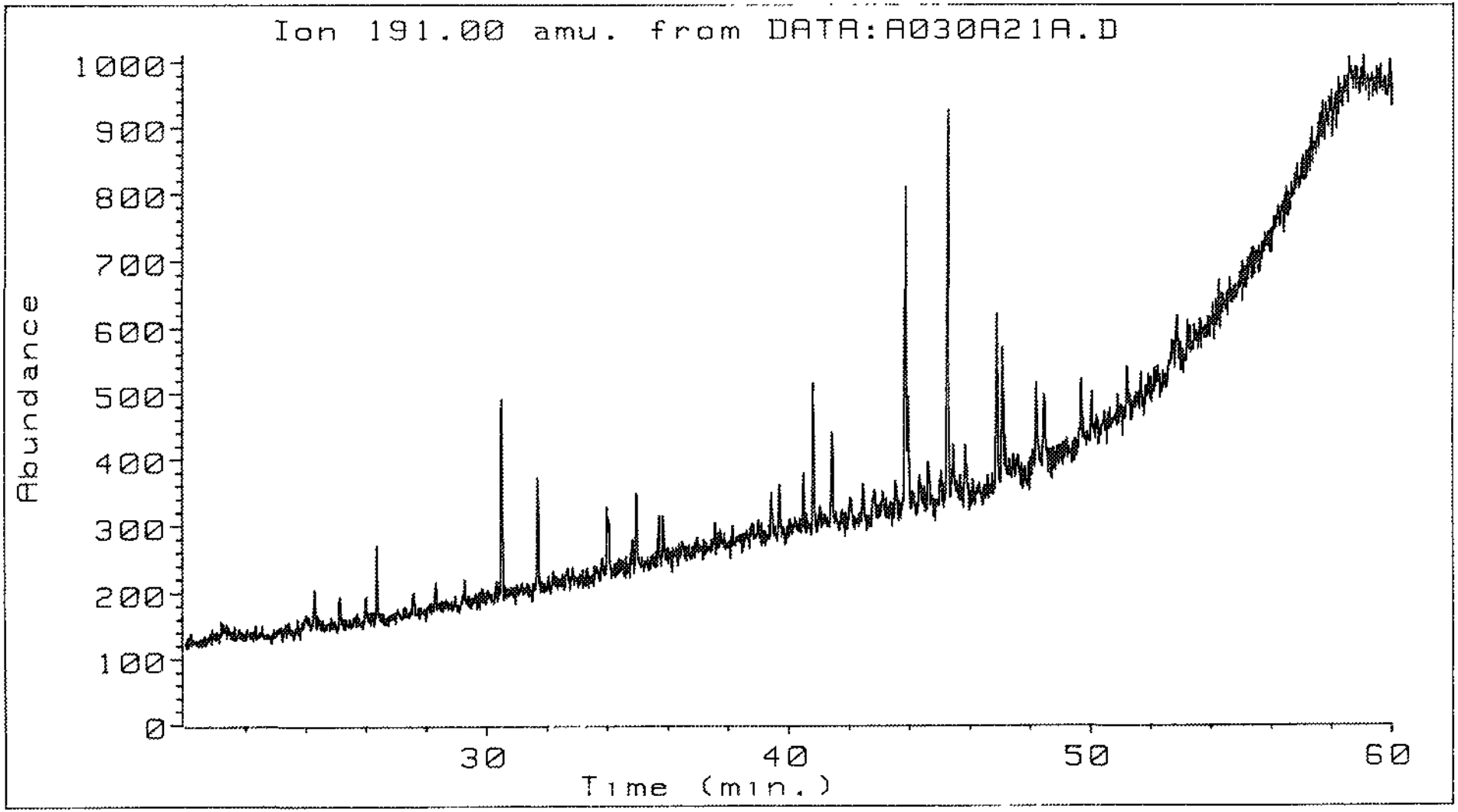
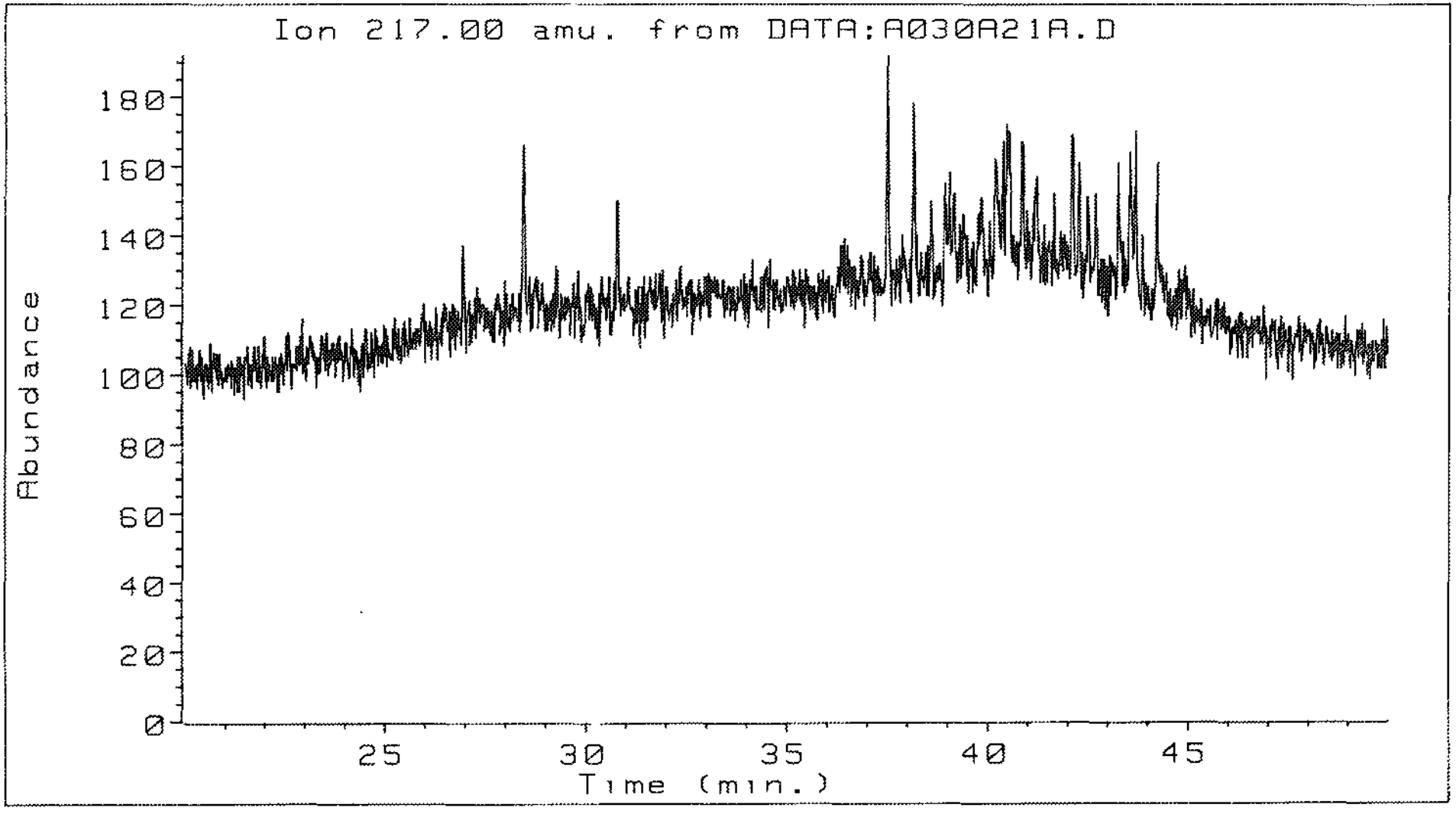
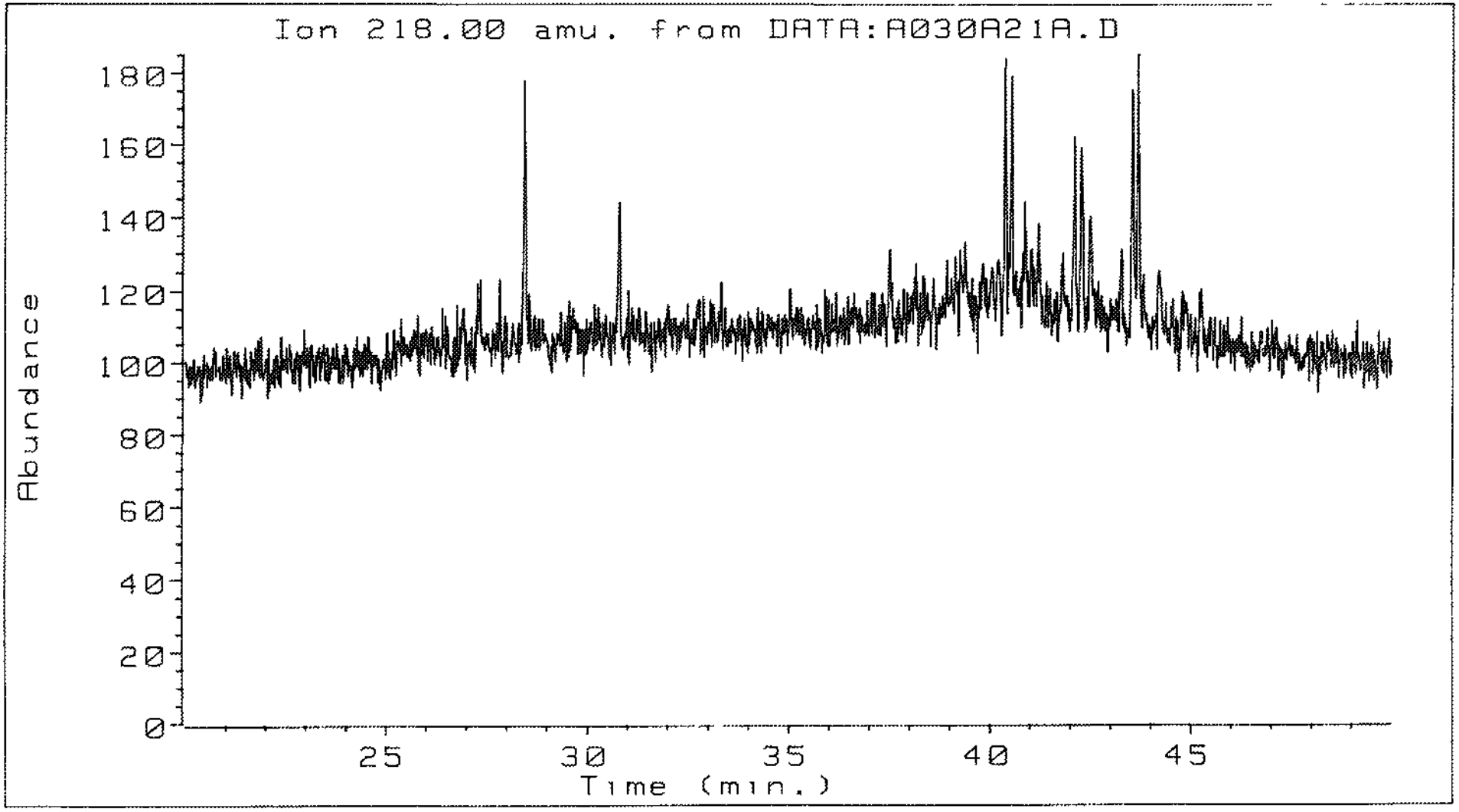
Abundance
120
100
80
60
40
20
0
20
25
30
35
40
45
Time (min.)
Thermopol



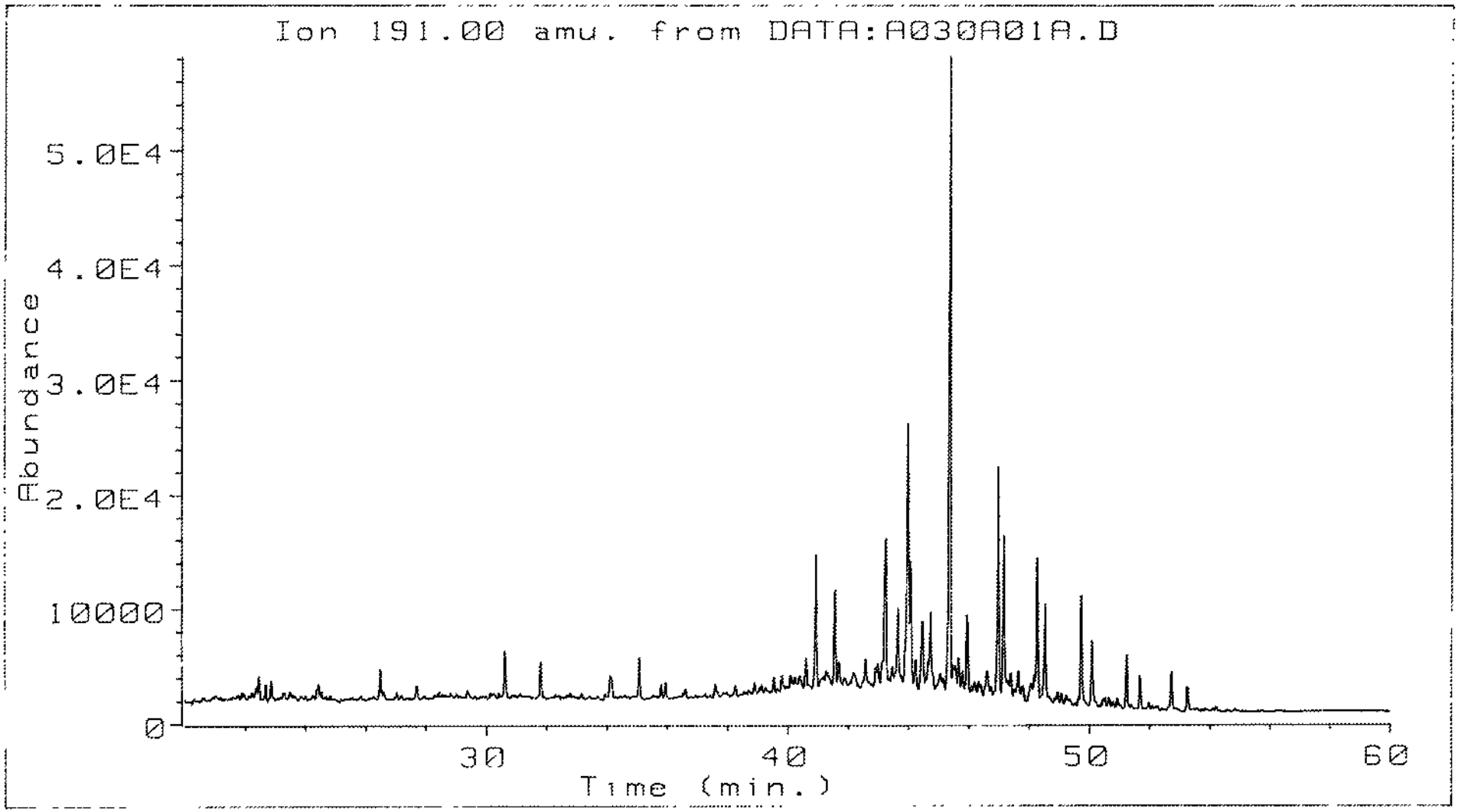
Xanthan polymer



Xanthan polymer



Xanthan polymer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Abundance
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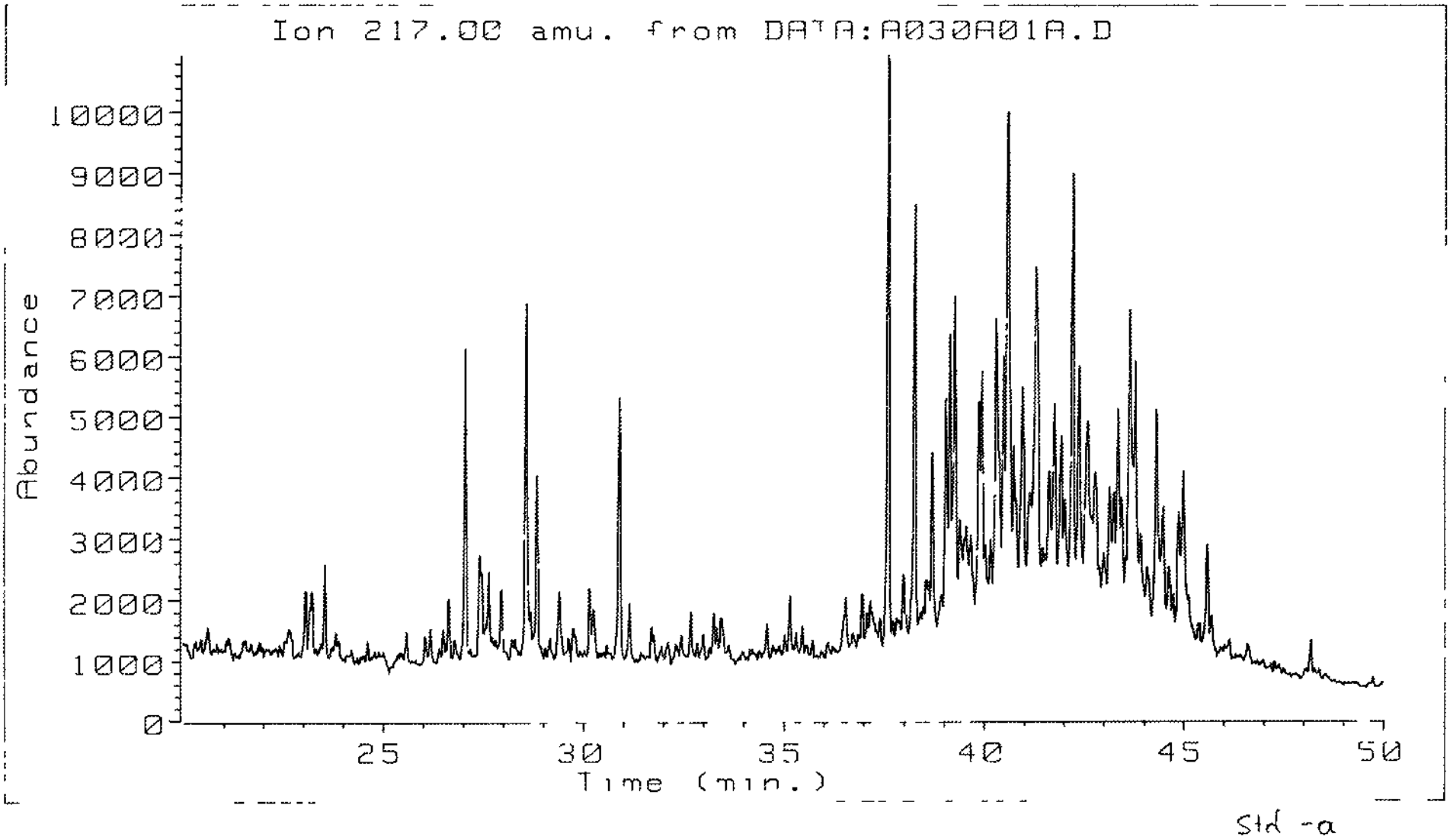
4.0E4
3.0E4
2.0E4
10000
0
30
40
50
60
Time (min.)

Std.-a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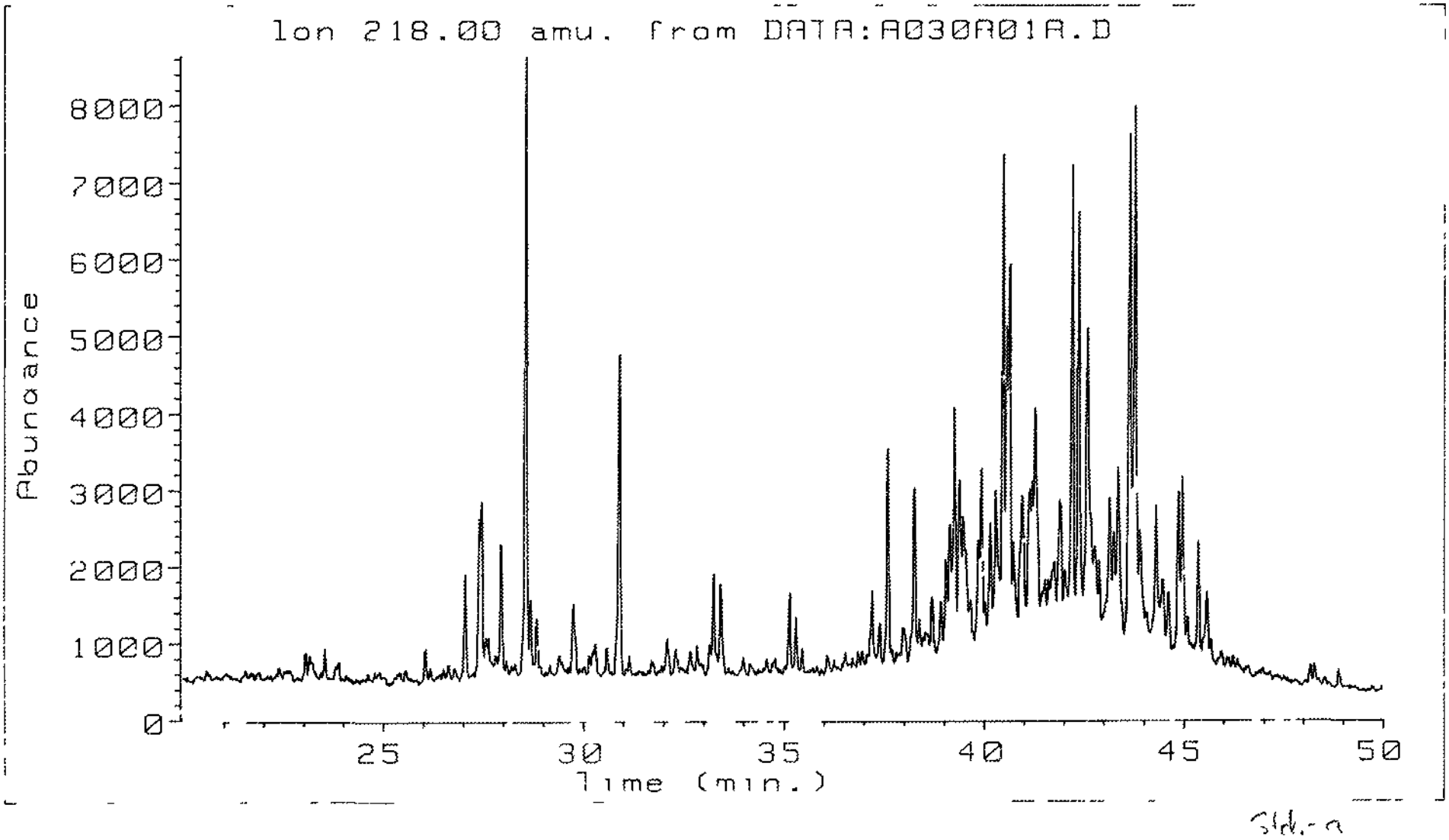
Abundance
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
25
30
35
40
45
50
Time (min.)
Std -a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Abundance
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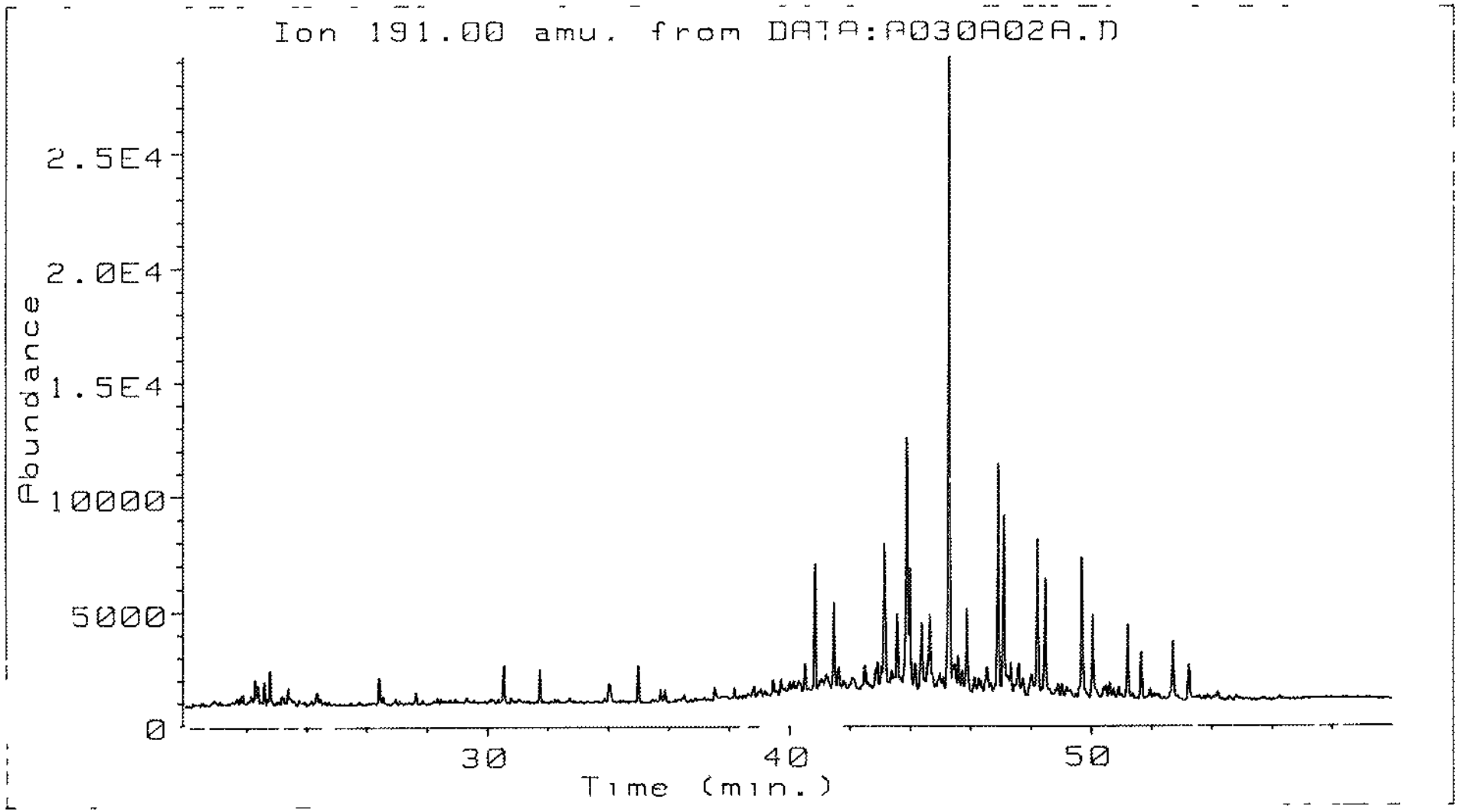
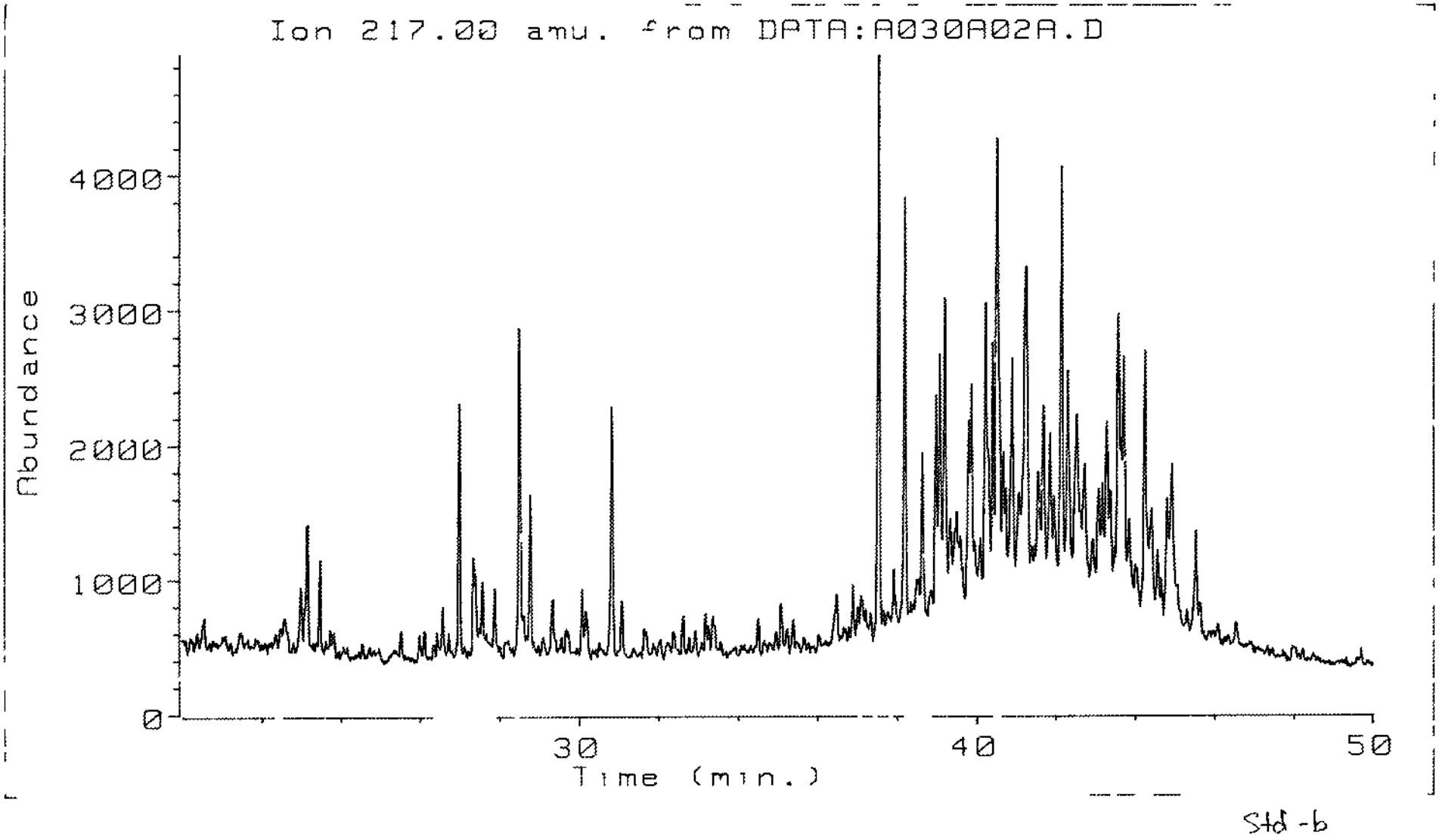
6000
5000
4000
3000
2000
1000
0
25
30
35
40
45
50
Time (min.)

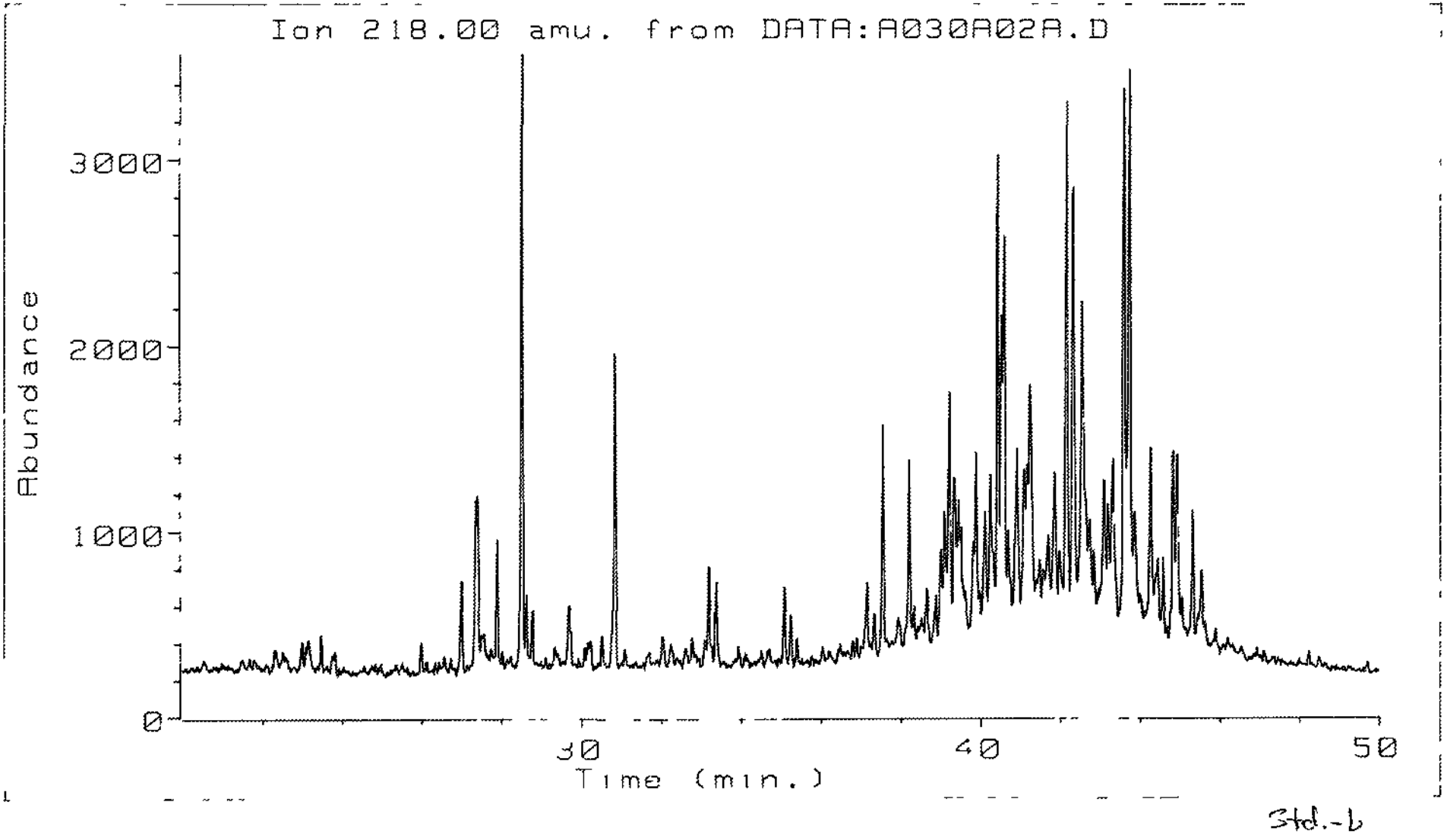
Std.-a


Ion 191.00 amu. from DATA:A030A02A.D
Abundance
2.5E4
2.0E4
1.5E4
10000
5000
0
30
40
50
Time (min.)

SM-6


Ion 217.00 amu. from DATA:A030A02A.D
Abundance
4000
3000
2000
1000
0
30
40
50
Time (min.)

Std -b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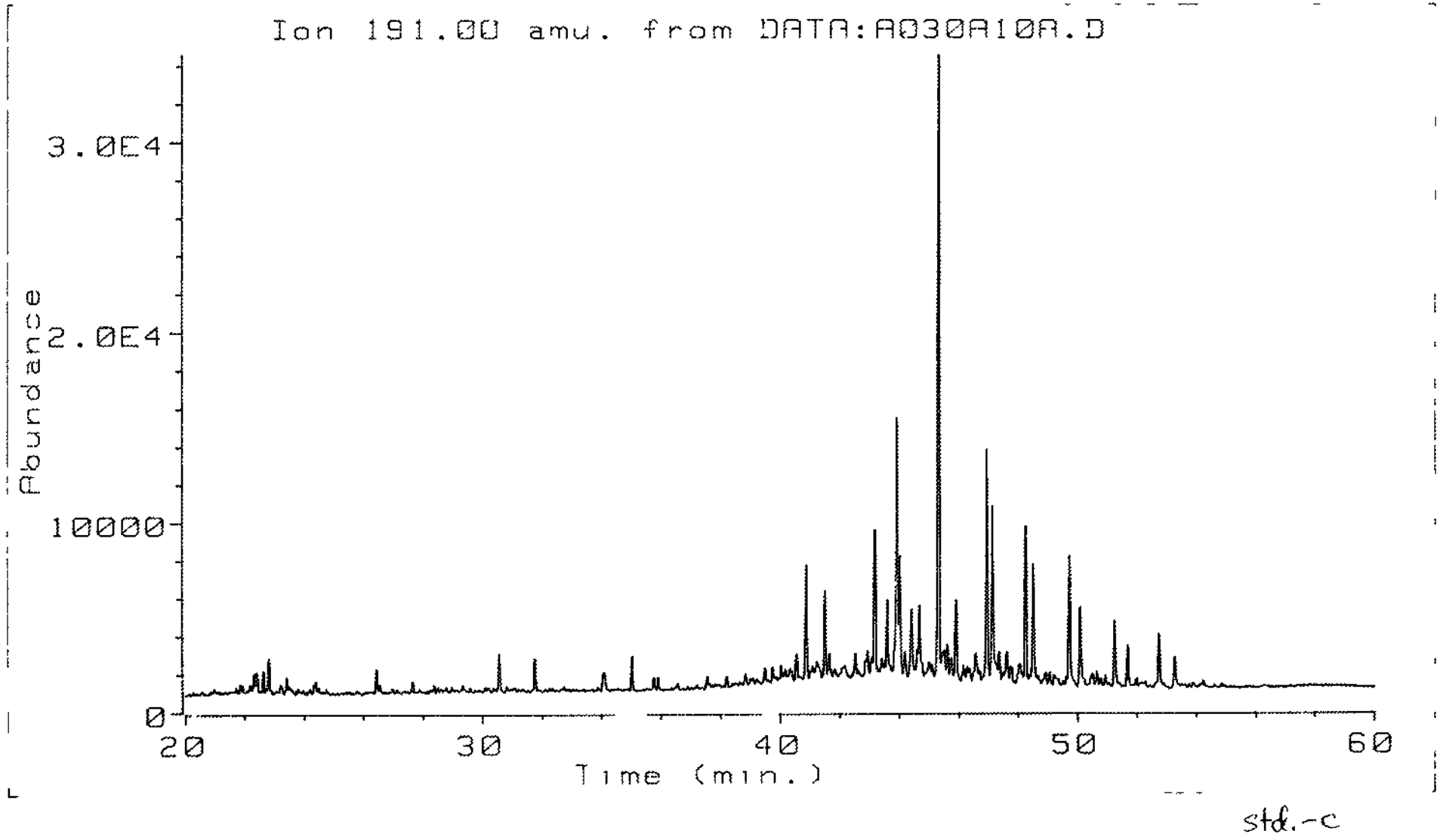
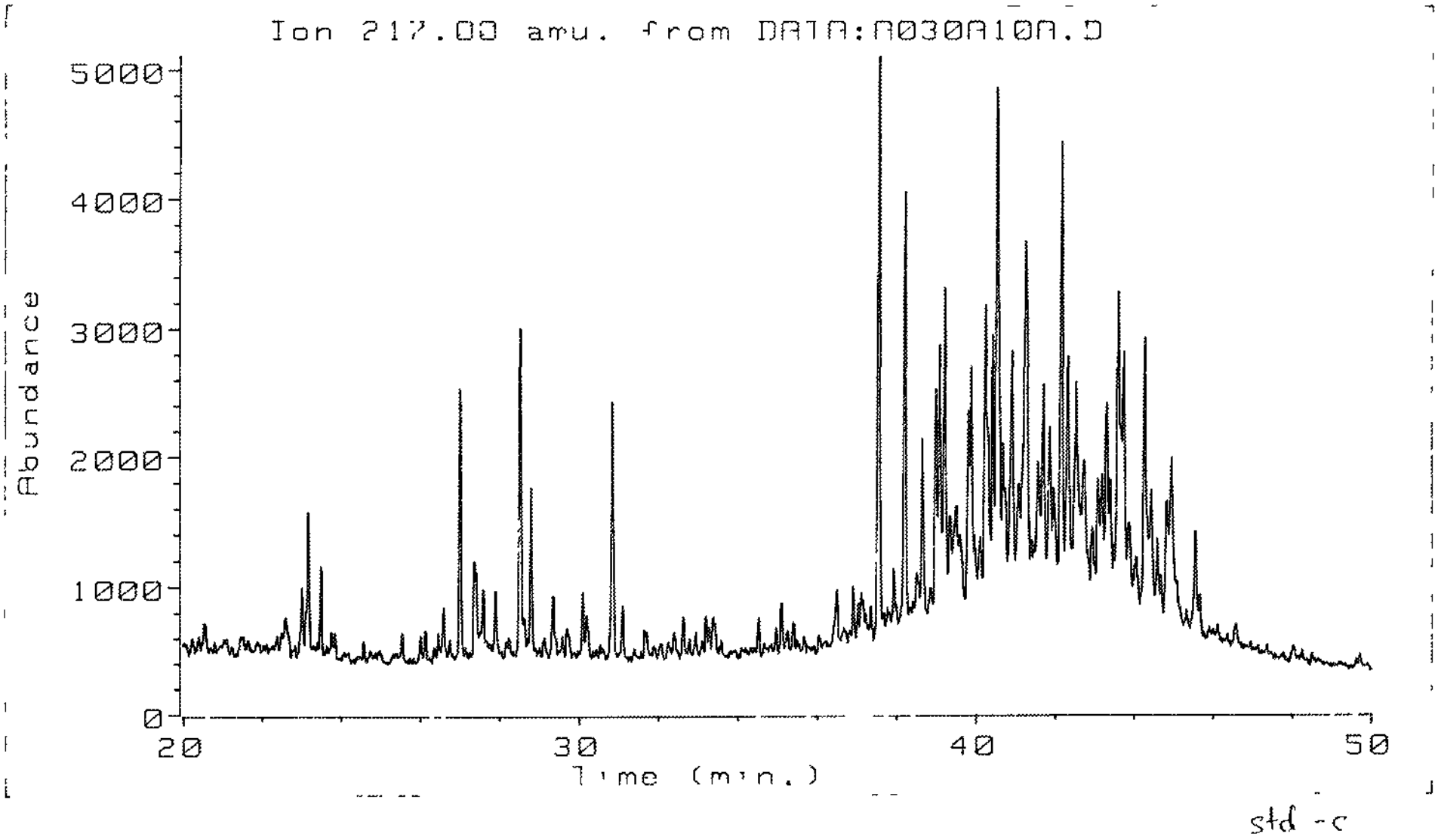
Abundance
3000
2000
1000
0
30
40
50
Time (min.)

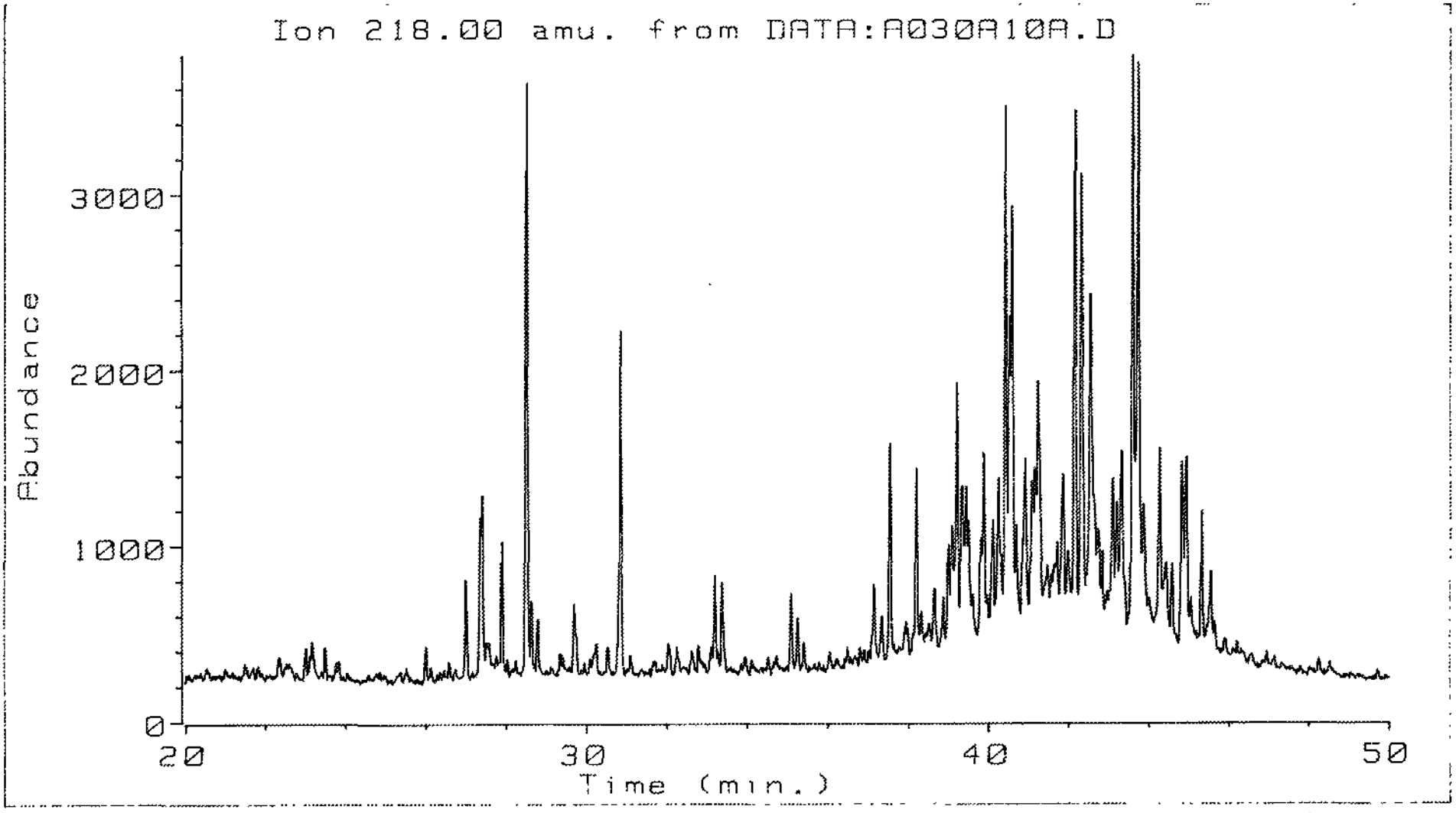
Std.-b


Ion 191.00 amu. from DATA:A030A10A.D
Abundance
3.0E4
2.0E4
10000
0
20
30
40
50
60
Time (min.)

std.-c


Ion 217.00 amu. from DATA:A030A10A.D
Abundance
5000
4000
3000
2000
1000
0
20
30
40
50
Time (min.)

std -c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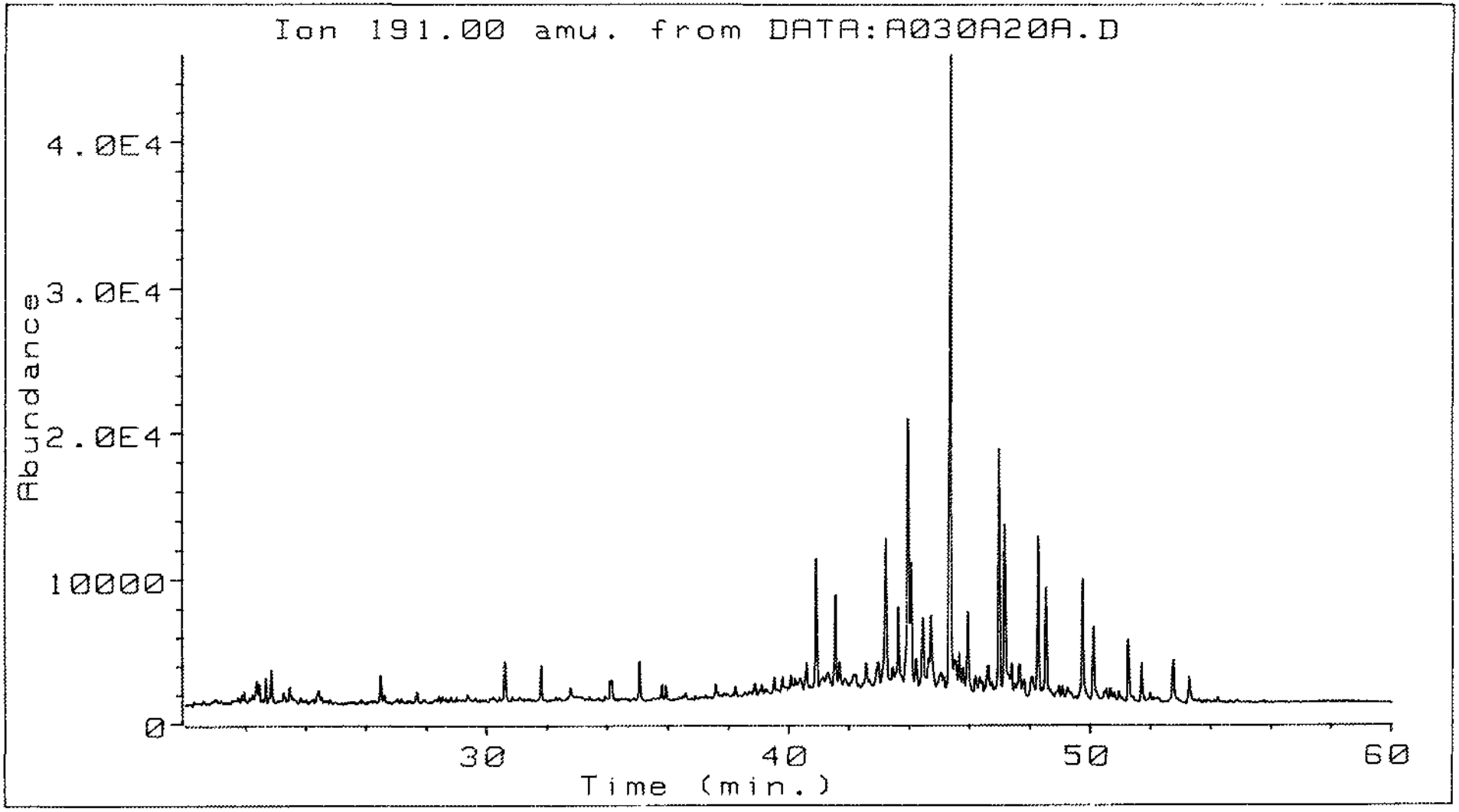
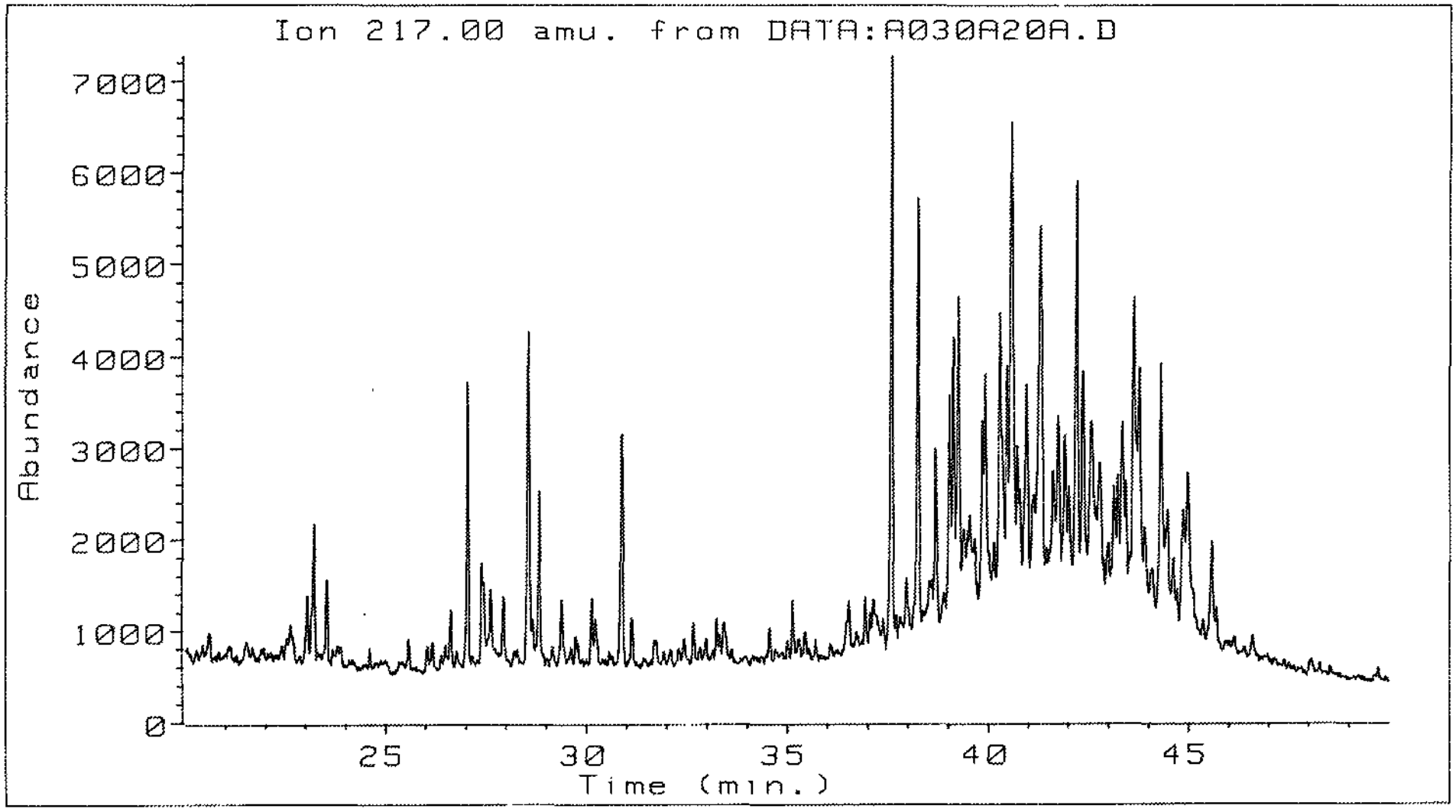
Abundance
3000
2000
1000
0
20
30
40
50
Time (min.)

std.-c


Ion 191.00 amu. from DATA:A030A20A.D
4.0E4
3.0E4
2.0E4
10000
0
Abundance
30
40
50
60
Time (min.)

Std. - d


Ion 217.00 amu. from DATA:A030A20A.D
Abundance
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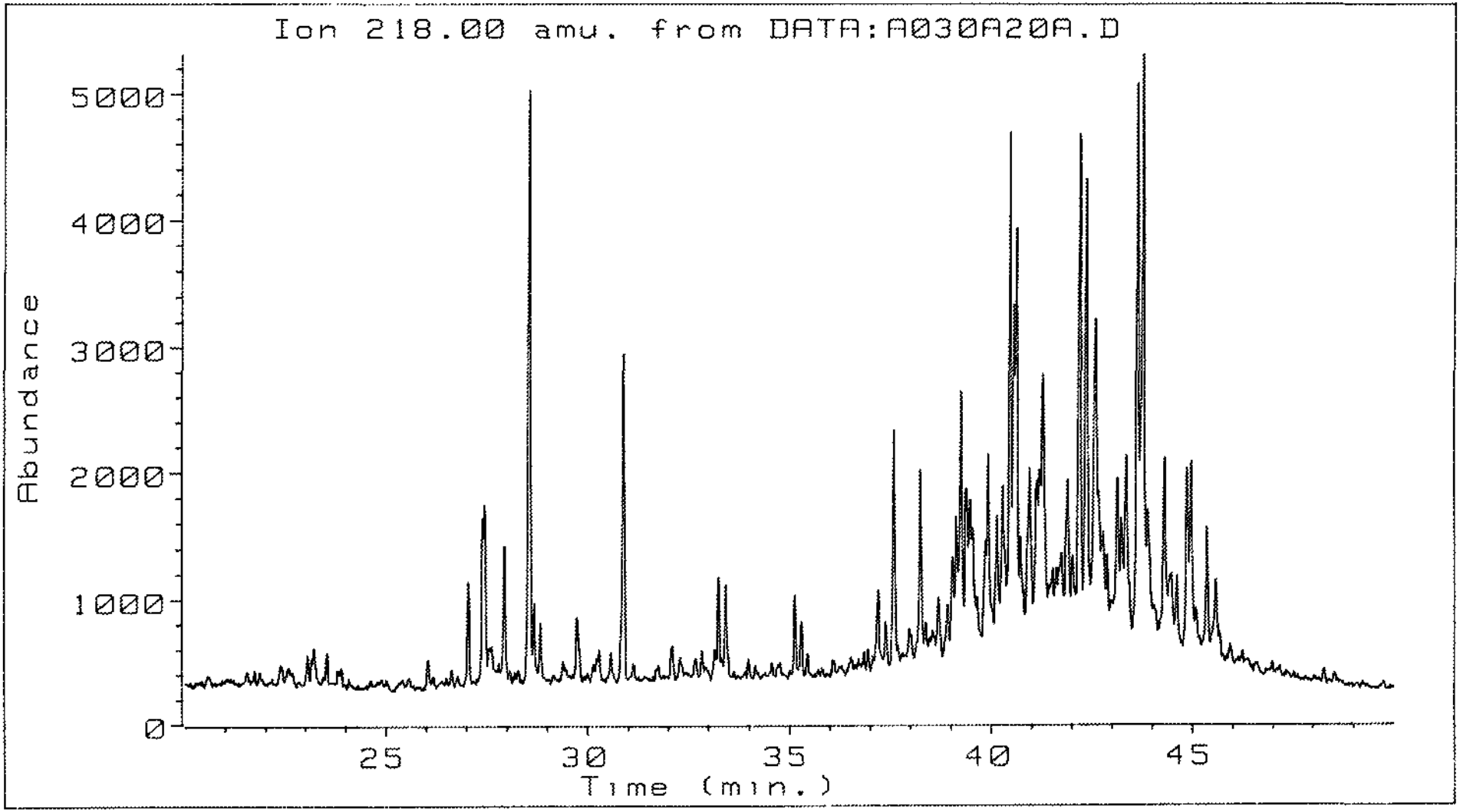
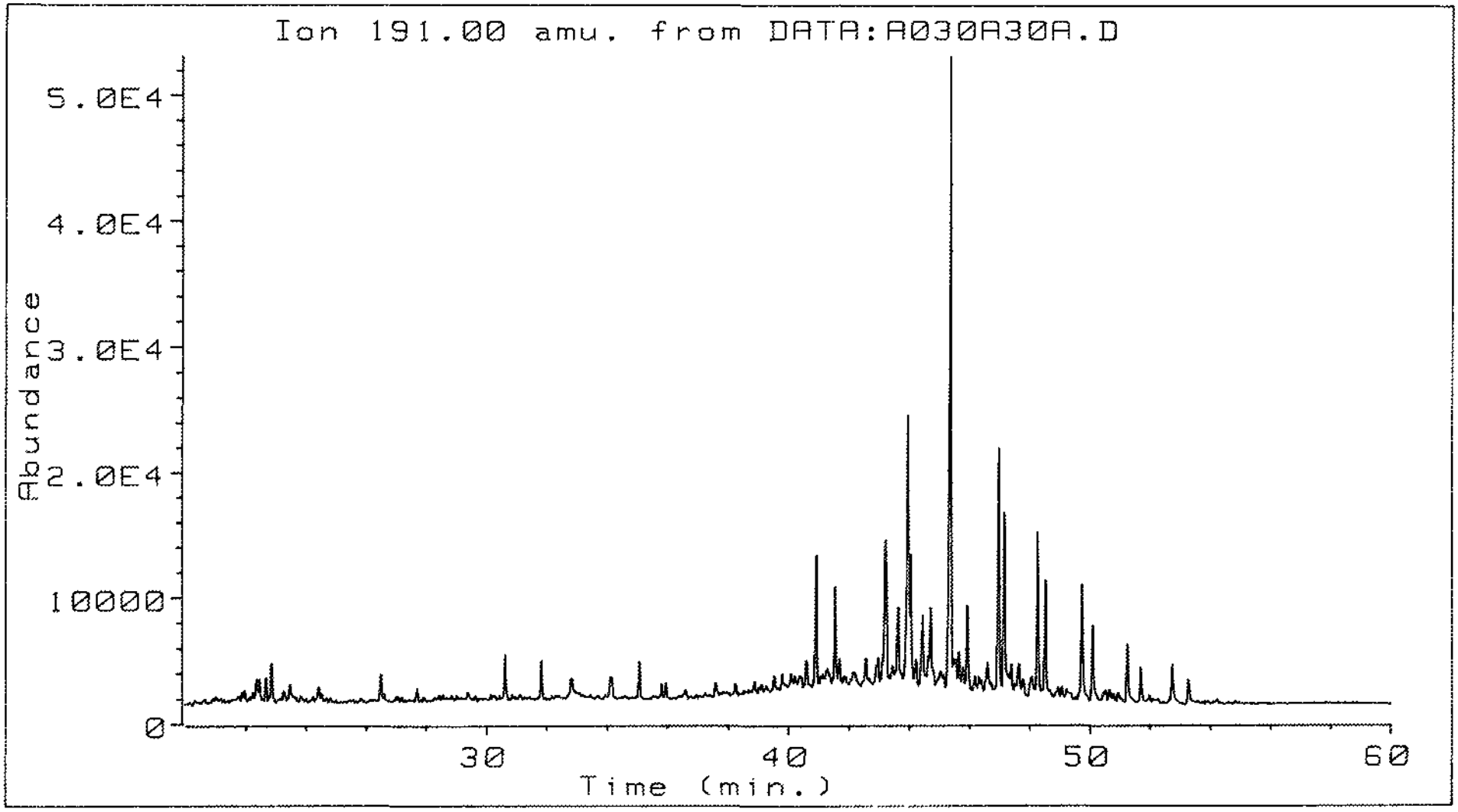
5000
4000
3000
2000
1000
0
25
30
35
40
45
Time (min.)

Std. - d


Ion 218.00 amu. from DATA:A030A20A.D
Abundance
5000
4000
3000
2000
1000
0
25
30
35
40
45
Time (min.)

Std. - d


Ion 191.00 amu. from DATA:A030A30A.D
Abundance
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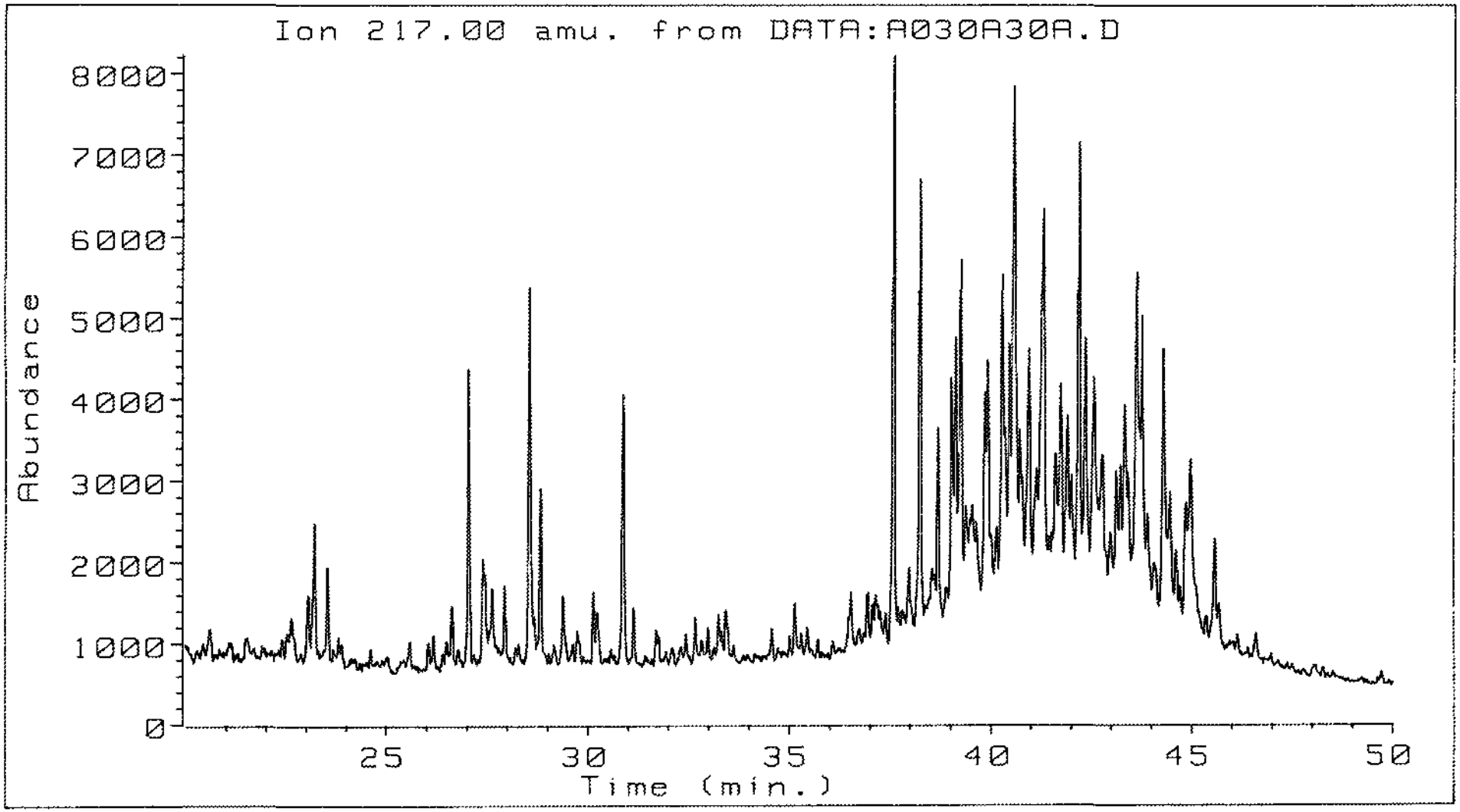
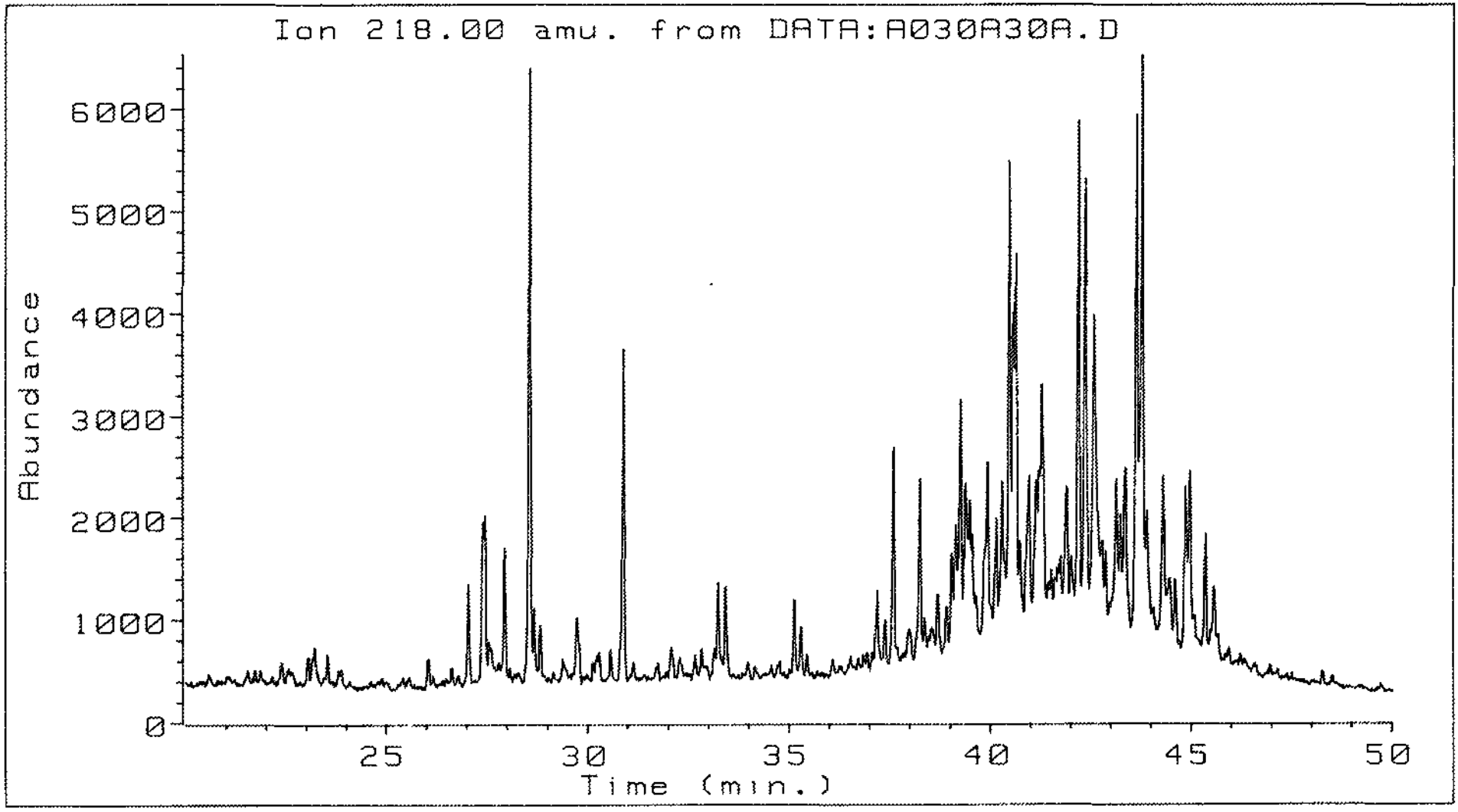
3.0E4
2.0E4
10000
0
30
40
50
60
Time (min.)

Std. - e


Ion 217.00 amu. from DATA:A030A30A.D
Abundance
8000
7000
6000
5000
4000
3000
2000
1000
0
25
30
35
40
45
50
Time (min.)

std. -e


Ion 218.00 amu. from DATA:A030A30A.D
Abundance
6000
5000
4000
3000
2000
1000
0
25
30
35
40
45
50
Time (min.)

std. -c

Appendix II

GC/MS-SMIM of saturated biomarkers
in the SAT-fractions.

List of abbreviation codes and
reported biomarkers.
Listed peak data.
Bargraphs on biomarker distributions.

HYDRO

STANDARDIZED IDENTIFICATION/ABBREVIATION
OF SAT-BIOMARKERS.

Triterpanes:

Numbers from 18 to 35 correspond to the carbon number of the molecule, the subsequent capital letter identifies the stereochemistry and/or the number of rings.

A 17α(H)-hopanes (I) 22S
B 17α(H)-hopanes 22R
C 17β(H)-moretanes (II) 22S
D 17β(H)-moretanes 22R
E 17β(H)-hopanes (III)
F Neohopanes (IV)
G Gammacerane (V)
H Hopenes (VI)
I 25-norhopanes (VII)
L Lupane (VIII)
O 18α(H)-oleanane (IX)
X Tetracyclic terpanes (X)
Y Tricyclic terpanes (XI)
N Unidentified

Steranes:

Numbers from 20 to 30 correspond to the carbon number of the molecules, the subsequent small letter identifies the stereochemistry.

a 13β(H),17α(H)-diasteranes 20S (1)
b 13β(H),17α(H)-diasteranes 20R (2)
c 13α(H),17β(H)-diasteranes 20S (3)
d 13α(H),17β(H)-diasteranes 20R (4)
e 5α(H),14α(H),17α(H)-steranes 20S (5)
f 5α(H),14β(H),17β(H)-steranes 20R (6)
g 5α(H),14β(H),17β(H)-steranes 20S (7)
h 5α(H),14α(H),17α(H)-steranes 20R (8)
i 5β(H),14α(H),17α(H)-steranes (9)
k 4-methylsteranes (10)
n unidentified

Examples: 31B corresponds to 17α(H)-homohopane 22R
29e corresponds to ααα-ethylcholestane 20S

The detected SAT-biomarkers are abbreviated accordingly:

Terpanes:

26Y:	C-26 Tri-cyclic terpanes
26YY:	C-26 Tri-cyclic terpanes
25Y:	C-25 Tri-cyclic terpanes
24Y:	C-24 Tri-cyclic terpanes
24X:	C-24 Tetra-cyclic terpanes
23Y:	C-23 Tri-cyclic terpanes
22Y:	C-22 Tri-cyclic terpanes
21Y:	C-21 Tri-cyclic terpanes
20Y:	C-20 Tri-cyclic terpanes

Low molecular weight steranes:

23a:	C-23 Sterane
23k:	C-23 Sterane
22a:	C-22 Sterane
22k:	C-22 Sterane
21a:	C-21 Sterane
21k:	C-21 Sterane

Triterpanes:

35A:	C-33 17α(H),21β(H)-pentakishomohopane-22S
35B:	C-33 17α(H),21β(H)-pentakishomohopane-22R
34A:	C-33 17α(H),21β(H)-tetrakishomohopane-22S
34B:	C-33 17α(H),21β(H)-tetrakishomohopane-22R
33A:	C-33 17α(H),21β(H)-trishomohopane-22S
33B:	C-33 17α(H),21β(H)-trishomohopane-22R
32A:	C-32 17α(H),21β(H)-bishomohopane-22S
32B:	C-32 17α(H),21β(H)-bishomohopane-22R
31A:	C-31 17α(H),21β(H)-homohopane-22S
31B:	C-31 17α(H),21β(H)-homohopane-22R
31C:	C-31 17β(H),21β(H)-homohopane-22S
31D:	C-31 17β(H),21β(H)-homohopane-22R
30F:	C-30 ?-hopane
30O:	C-30 18α(H)-oleanane
30A:	C-30 17α(H),21β(H)-hopane
30H:	C-30 ?-hopene
30C:	C-30 17β(H),21α(H)-moretane
30G:	C-30 gammacerane
30E:	C-30 17β(H),21β(H)-hopane
29N:	C-29 ?-30-norhopane
29A:	C-29 17α(H),21β(H)-30-norhopane
29F:	C-29 ?-30-norhopane
29C:	C-29 17β(H),21α(H)-30-normoretane
28A:	C-28 17α(H),21β(H)-28,30-bisnorhopane + βα-bisnormoretane
28N:	C-28 ?-17β(H),21β(H)-28,30-bisnorhopane
27F:	C-27 18α(H)-22,29,30-trisnorneohopane (Ts)
27A:	C-27 17α(H)-22,29,30-trisnorhopane (Tm)
27E:	C-27 17β(H)-22,29,30-trisnorhopane

HYDRO

Steranes:

30a:	C-30	13β(H),17α(H)-diasterane-20S
b:	C-30	13β(H),17α(H)-diasterane-20R
c:	C-30	13α(H),17β(H)-diasterane-20S
d:	C-30	13α(H),17β(H)-diasterane-20R
e:	C-30	5α(H),14α(H),17α-sterane-20S
f:	C-30	5α(H),14β(H),17β-sterane-20R
g:	C-30	5α(H),14β(H),17β-sterane-20S
h:	C-30	5α(H),14α(H),17α-sterane-20R
29a:	C-29	13β(H),17α(H)-diasterane-20S
b:	C-29	13β(H),17α(H)-diasterane-20R
c:	C-29	13α(H),17β(H)-diasterane-20S
d:	C-29	13α(H),17β(H)-diasterane-20R
e:	C-29	5α(H),14α(H),17α-sterane-20S
f:	C-29	5α(H),14β(H),17β-sterane-20R
g:	C-29	5α(H),14β(H),17β-sterane-20S
h:	C-29	5α(H),14α(H),17α-sterane-20R
28a:	C-28	13β(H),17α(H)-diasterane-20S
28aa:	C-28	?-diasterane-20S
b:	C-28	13β(H),17α(H)-diasterane-20R
28bb:	C-28	?-diasterane-20R
c:	C-28	13α(H),17β(H)-diasterane-20S
d:	C-28	13α(H),17β(H)-diasterane-20R
e:	C-28	5α(H),14α(H),17α-sterane-20S
f:	C-28	5α(H),14β(H),17β-sterane-20R
g:	C-28	5α(H),14β(H),17β-sterane-20S
h:	C-28	5α(H),14α(H),17α-sterane-20R
27a:	C-27	13β(H),17α(H)-diasterane-20S
b:	C-27	13β(H),17α(H)-diasterane-20R
c:	C-27	13α(H),17β(H)-diasterane-20S
d:	C-27	13α(H),17β(H)-diasterane-20R
e:	C-27	5α(H),14α(H),17α-sterane-20S
f:	C-27	5α(H),14β(H),17β-sterane-20R
g:	C-27	5α(H),14β(H),17β-sterane-20S
h:	C-27	5α(H),14α(H),17α-sterane-20R

0 Depth start int	1 Depth end int.	2 Sample type	3 Lith.	4 Well	5 Geochem job #	6 MS-file	7 26Y 360-191/2	8 26YY 360-191/2	9 25Y 346-191	10 24Y 332-191/1
106 PRODEFOA					ROBERTSON	AS25061	0.01	0.01	0.77	4.33
107 PROCAP					ROBERTSON	AS25061	0.01	0.01	0.17	0.21
108 ST25061B						AS28061	1.69	1.63	2.65	5.89

0 Depth start int	11 24X 330-191	12 23Y 318-191	13 22Y 304-191	14 21Y 290-191	15 20Y 276-191	16 23a 316-217/1	17 23k 316-217/2	18 22a 302-217/1	19 22k 302-217/2
106 PRODEFOA	0.95	8.31	1.81	8.86	12.54	6.62	1.28	28.48	10.24
107 PROCAP	0.37	0.50	0.10	0.25	0.20	0.01	0.01	0.01	0.01
108 ST25061B	7.67	7.99	0.89	5.88	7.01	7.71	1.85	21.13	14.19

0 Depth start int	20 21a 288-217/1	21 21k 288-217/2	22 35A 482-191/1	23 35B 482-191/2	24 34A 468-191/1	25 34B 468-191/2	26 33A 454-191/1	27 33B 454-191/2
106 PRODEFOA	38.76	39.47	0.01	0.01	0.01	0.01	0.01	0.01
107 PROCAP	0.01	0.01	0.59	0.35	0.61	0.35	1.48	0.89
108 ST25061B	28.59	30.35	5.98	3.13	9.33	5.08	21.53	12.93

0 Depth start int	28 32A 440-191/1	29 32B 440-191/2	30 31A 426-191/1	31 31B 426-191/2	32 31C 426-191/3	33 31D 426-191/4	34 30F 412-191	35 30O 412-191	36 30A 412-191
106 PRODEFOA	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
107 PROCAP	3.36	1.75	6.63	4.63	0.44	0.40	0.01	0.01	10.85
108 ST25061B	31.84	21.25	51.04	34.04	1.93	3.18	11.15	0.01	152.32

0 Depth start int	37 30H 412-191	38 30C 412-191	39 30G 412-191	40 30E 412-191	41 29N 398-191	42 29A 398-191	43 29F 398-191	44 29C 398-191	45 28A 384-191	46 28N 384-191
106 PRODEFOA	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
107 PROCAP	0.20	0.24	0.28	0.01	0.01	11.42	1.81	0.01	0.01	0.01
108 ST25061B	5.53	7.88	1.84	0.01	12.14	64.39	28.20	10.03	44.38	3.78

0 Depth start int	47 27F 370-191	48 27A 370-191	49 27E 370-191	50 30a 414-217	51 30b 414-217	52 30c 414-217	53 30d 414-217	54 30e 414-217	55 30f 414-217	56 30g 414-217
106 PRODEFOA	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
107 PROCAP	1.47	1.55	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
108 ST25061B	34.13	23.34	0.01	5.41	4.03	1.75	1.26	2.40	3.22	5.01

0 Depth start int	57 30h 414-217	58 29a 400-217	59 29b 400-217	60 29c 400-217	61 29d 400-217	62 29e 400-217	63 29f 400-217	64 29g 400-217	65 29h 400-217	66 28a 386-217
106 PRODEFOA	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
107 PROCAP	0.01	0.53	0.40	0.16	0.17	0.23	0.25	0.24	0.46	0.01
108 ST25061B	2.87	48.47	36.98	14.98	9.51	10.45	19.13	17.63	15.24	24.98

0	Depth start int	67 28aa 386-217	68 28b 386-217	69 28bb 386-217	70 28c 386-217	71 28d 386-217	72 28e 386-217	73 28f 386-217	74 28g 386-217	75 28h 386-217	76 27a 372-217
106	PRODEFOA	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	4.80
107	PROCAP	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
108	ST25061B	26.63	15.98	19.32	7.08	7.53	5.13	16.45	12.88	5.79	62.62

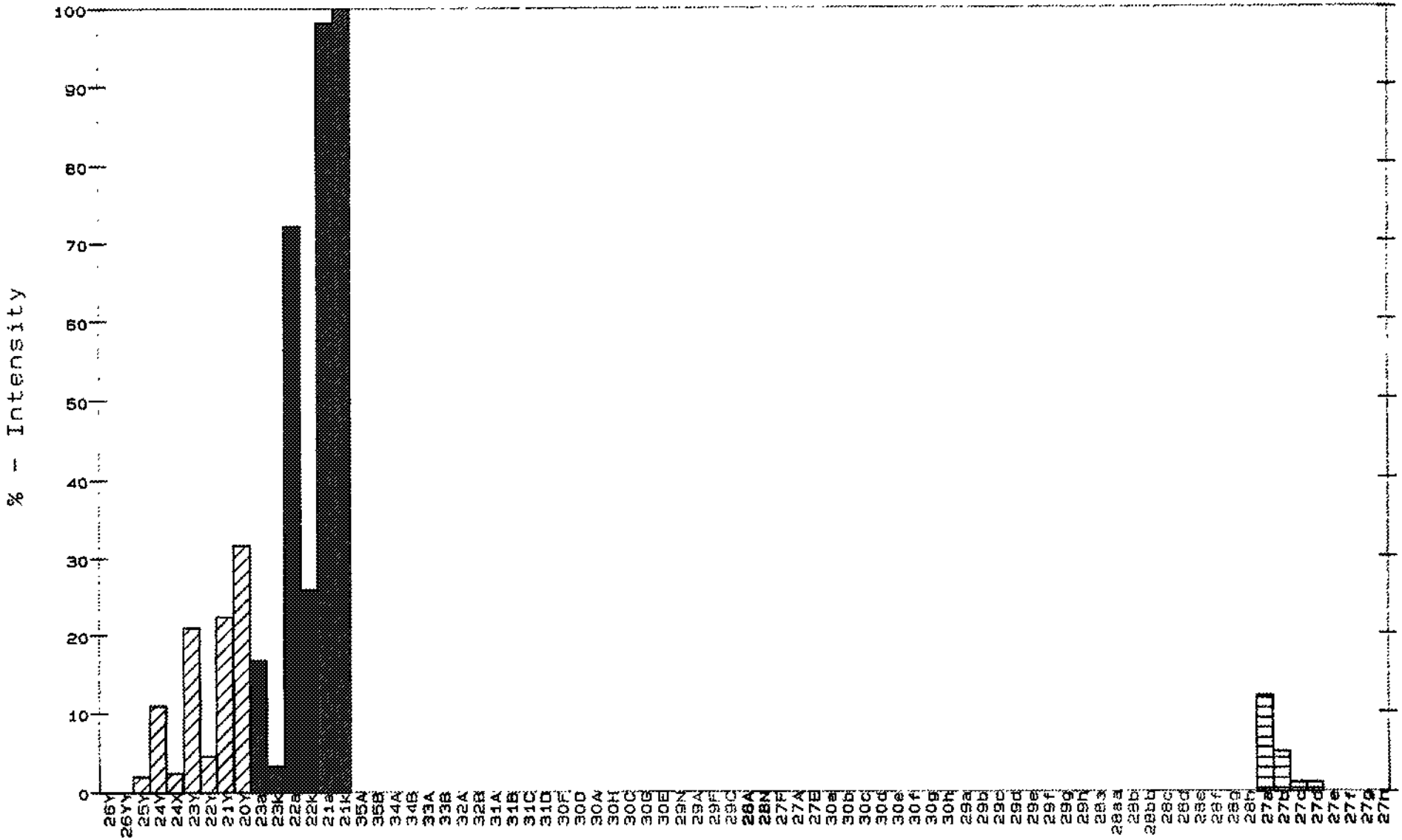
0	Depth start int	77 27b 372-217	78 27c 372-217	79 27d 372-217	80 27e 372-217	81 27f 372-217	82 27g 372-217	83 27h 372-217	84	85 Status	86 D-MIX DATE
106	PRODEFOA	1.97	0.46	0.48	0.01	0.01	0.01	0.01		WEAK	
107	PROCAP	0.01	0.01	0.01	0.01	0.01	0.01	0.01		WEAK	
108	ST25061B	41.94	10.52	15.90	11.40	13.99	12.84	10.50		OK	

0	Depth start int	87 D4-C21 292-221	88 D2-C29 400-193	89 D4-C27 376-221	90	91 %-TRI CYCL.	92 %-L.M. STERAN.	93 %-PENTA CYCLIC	94 %-C27-30 STERANES	95 GROUP SUM	96 %-C29-20S
106	PRODEFOA									170.73	
107	PROCAP									53.96	
108	ST25061B					3	8	47	41	1265.34	41

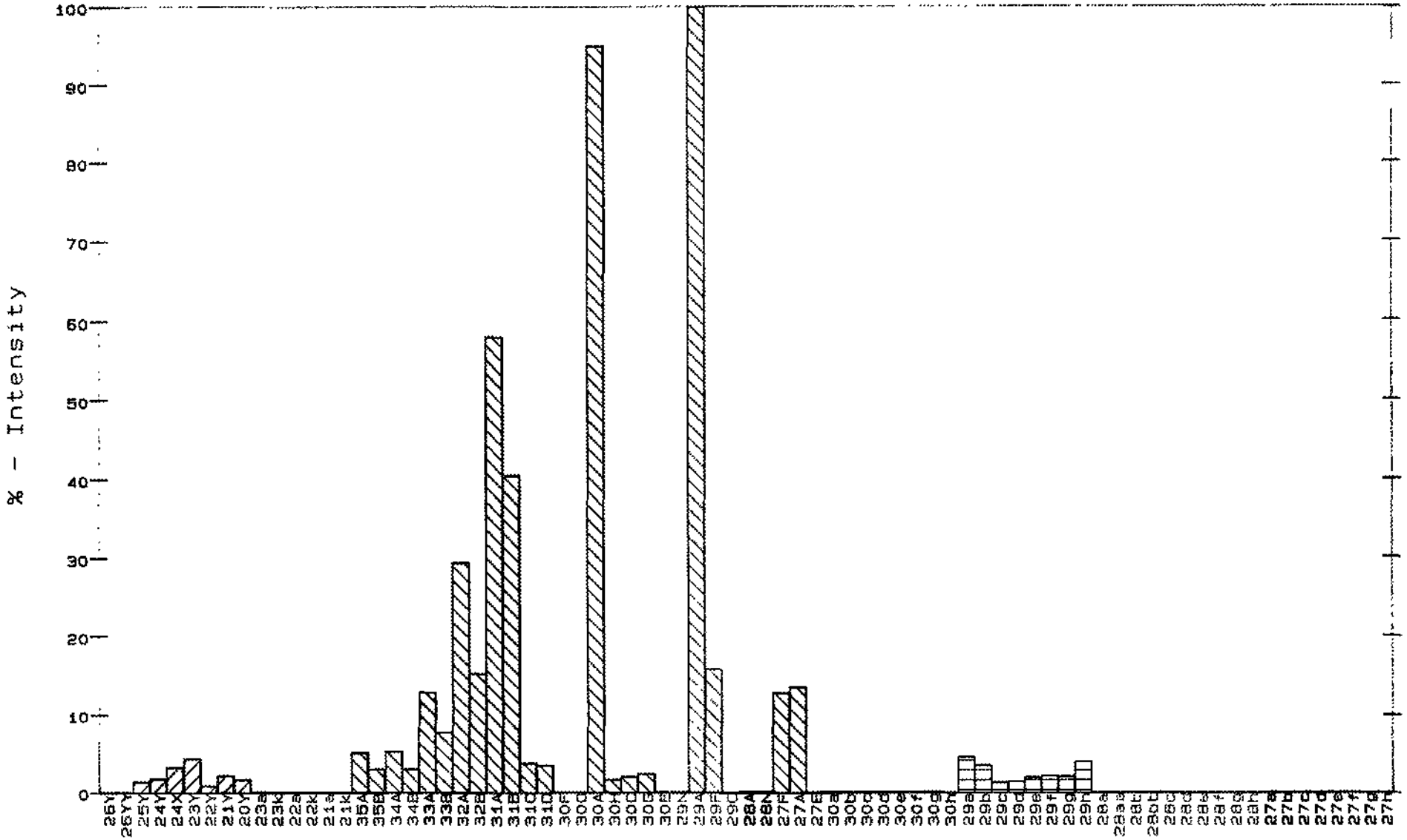
0	Depth start	int	85 Status	91 %-TRI CYCL.	92 %-L.M. STERAN.	93 %-PENTA CYCLIC	94 %-C27-30 STERANES
106	PRODEFOA		WEAK				
107	PROCAP		WEAK				
108	ST25061B		OK	3	8	47	41

0	Depth start	int	96 %-C29-20S
106	PRODEFOA		
107	PROCAP		
108	ST25061B		41

Biomarker pattern, SAT-fraction
PRODUFOAM
ms-file: AS25061, norm. factor: 39.47



Biomarker pattern, SAT-fraction
PROCAP
ms-file: AS25061, norm. factor: 11.42



Biomarker pattern, SAT-fraction
ST250618
ms-file: AS25061, norm. factor: 152.32