



Curtis & Tompkins, Ltd., Analytical Laboratories. Since 1878

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18 June 1993

Mr Chris Jennings  
Treadwell & Rollo, Inc.  
353 Sacramento Street  
Suite 800  
San Francisco, CA 94111

**RE: Project# 1107.05/22990 Clawitter Road**

Dear Chris:

Curtis & Tompkins, Ltd. (C&T) recently completed analysis of soil and water samples in support of the above-referenced project. Soil samples were collected 5/17/93 and reported under C&T Laboratory Numbers 110927 and 111053. Water samples were collected 5/21/93 and reported under C&T Laboratory Number 110987. This letter summarizes our comments on the nature of the hydrocarbons detected in one area of this site.

The soil samples were analyzed for both purgeable and extractable hydrocarbons by the California LUFT methods. Of the soils analyzed, only the sample identified by Treadwell & Rollo as MW-1-21' showed detectable hydrocarbons by either analysis. This sample contains hydrocarbons in the approximate range of n-C6 to n-C13. These compounds are indicative of relatively low-boiling hydrocarbon mixtures that are detectable by both purge-and-trap (TVH analysis) and solvent extraction (TEH analysis). Samples analyzed by TEH are generally quantitated as kerosene or diesel. However, although the chromatographic pattern of this sample covered some of the kerosene range, it did not at all match the kerosene standard and was instead quantitated as JP-4 (jet fuel), which was the closest standard in range and pattern. Samples analyzed by TVH are generally quantitated as gasoline. Similarly to TEH however, the chromatographic pattern for this sample was not a good fit to the gasoline standard. Additionally, the predominant gasoline components benzene, toluene, ethyl benzene and xylenes (BTXE) were not detected. The JP-4 standard analyzed by TVH proved to be a closer match; the sample in question was thus quantitated as JP-4. We feel, however, that this sample is best characterized as containing an unknown hydrocarbon mixture in C6-C13 range (overlapping both gasoline and kerosene carbon ranges but not matching either) with a concentration below 50 mg/Kg.

Essentially the same comments can be made regarding the analysis of the water sample identified by Treadwell & Rollo as MW-1. The chromatographic patterns of this sample were nearly identical to the patterns for the soil sample MW-1-21', with slight variations most likely due to differing compound solubilities in water vs soil. Also similarly, none of the gasoline marker compounds BTXE were detected in this sample.

C. Jennings  
6/18/93  
p.2

I have included copies of the TEH and TVH chromatograms for these two samples, as well as those of JP-4, gasoline and kerosene. If you have any further questions, please feel free to contact me.

Respectfully,

**CURTIS & TOMPKINS, LTD.**



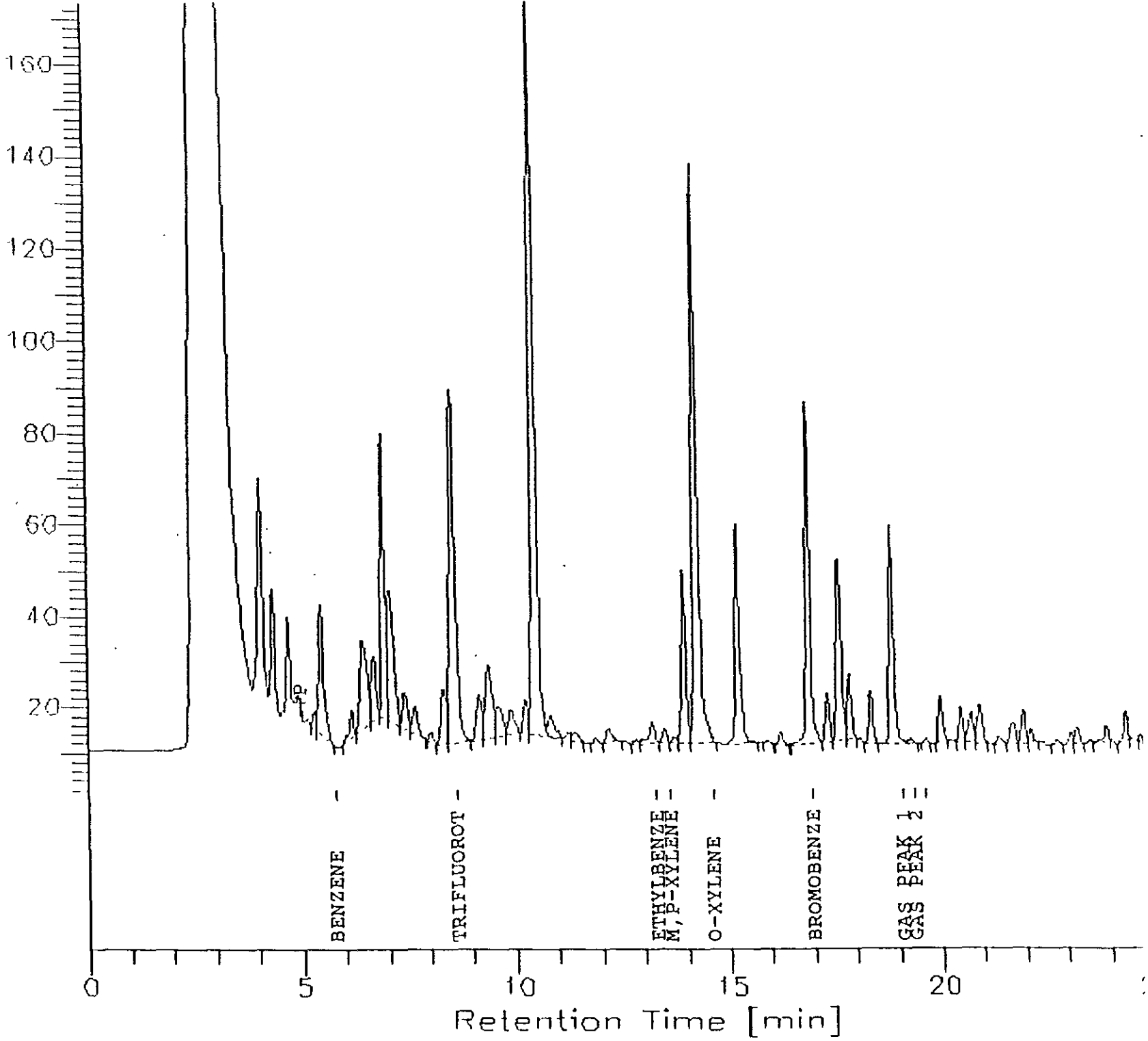
John Goyette  
Operations Manager

enclosures

Filename : G:\GC\1\155A010.raw  
Start Time : 9.00 min  
Scale Factor: -1  
Date : 6/4/93 11:32 PM  
End Time : 26.00 min  
Plot Offset: 2 mV  
Page 1 of 1  
High Point : 176.94 mV  
Low Point : 1.94 mV  
Plot Scale: 175 mV

GAS STD.

Response [mV]

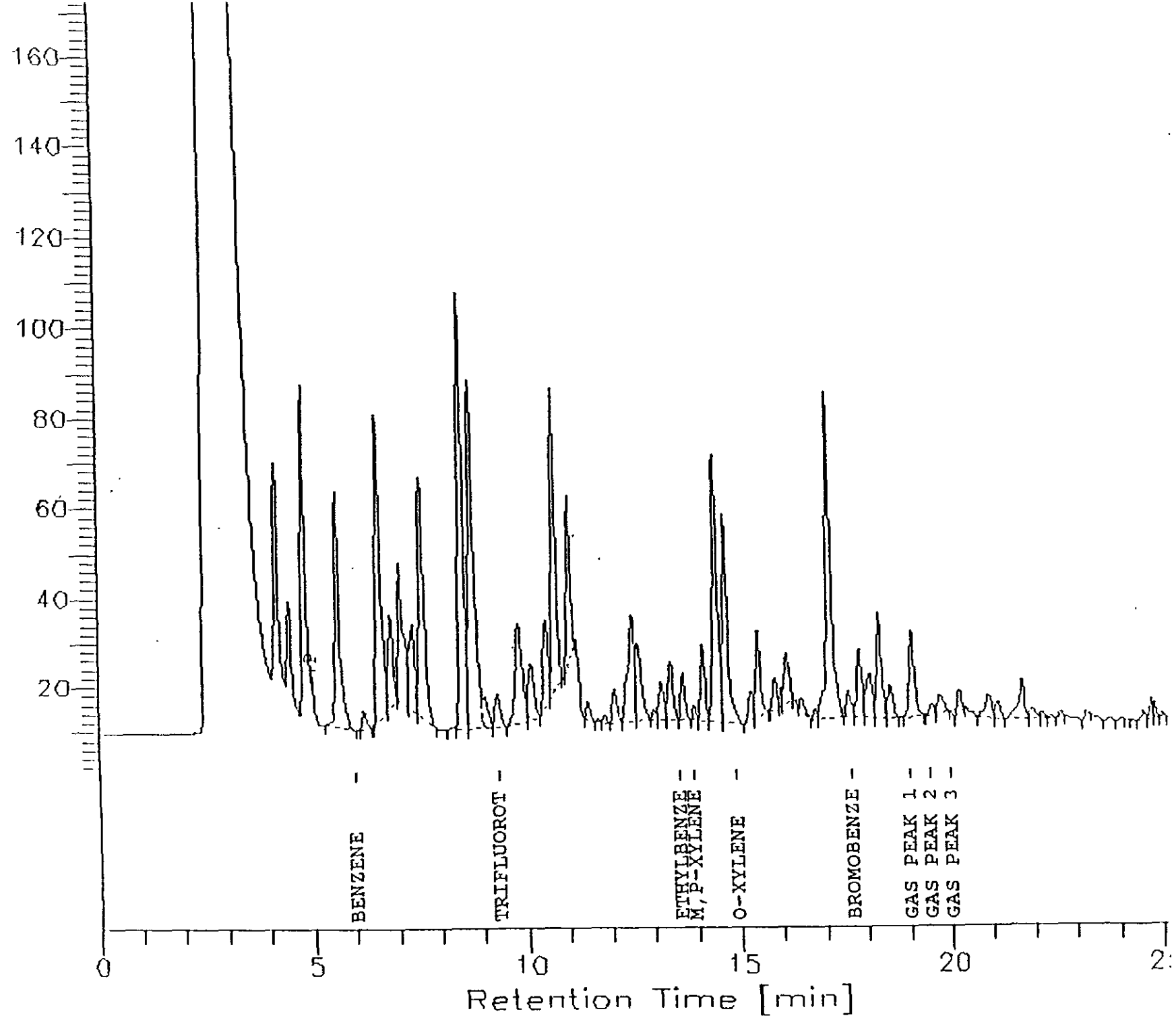


fileName : G:\GC10\152A003.raw  
Start Time : 0.00 min  
Scale factor: 1  
Date : 6/1/93 4:52 PM  
End Time : 26.00 min  
High Point : 176.15 mV  
Low Point : 1.15 mV  
Plot Scale: 175 mV

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df-4 standard

Response [mV]



Retention Time [min]

TVH - GC-10

S:\GC10\146A013.raw  
Time : 0.00 min  
Factor: -1

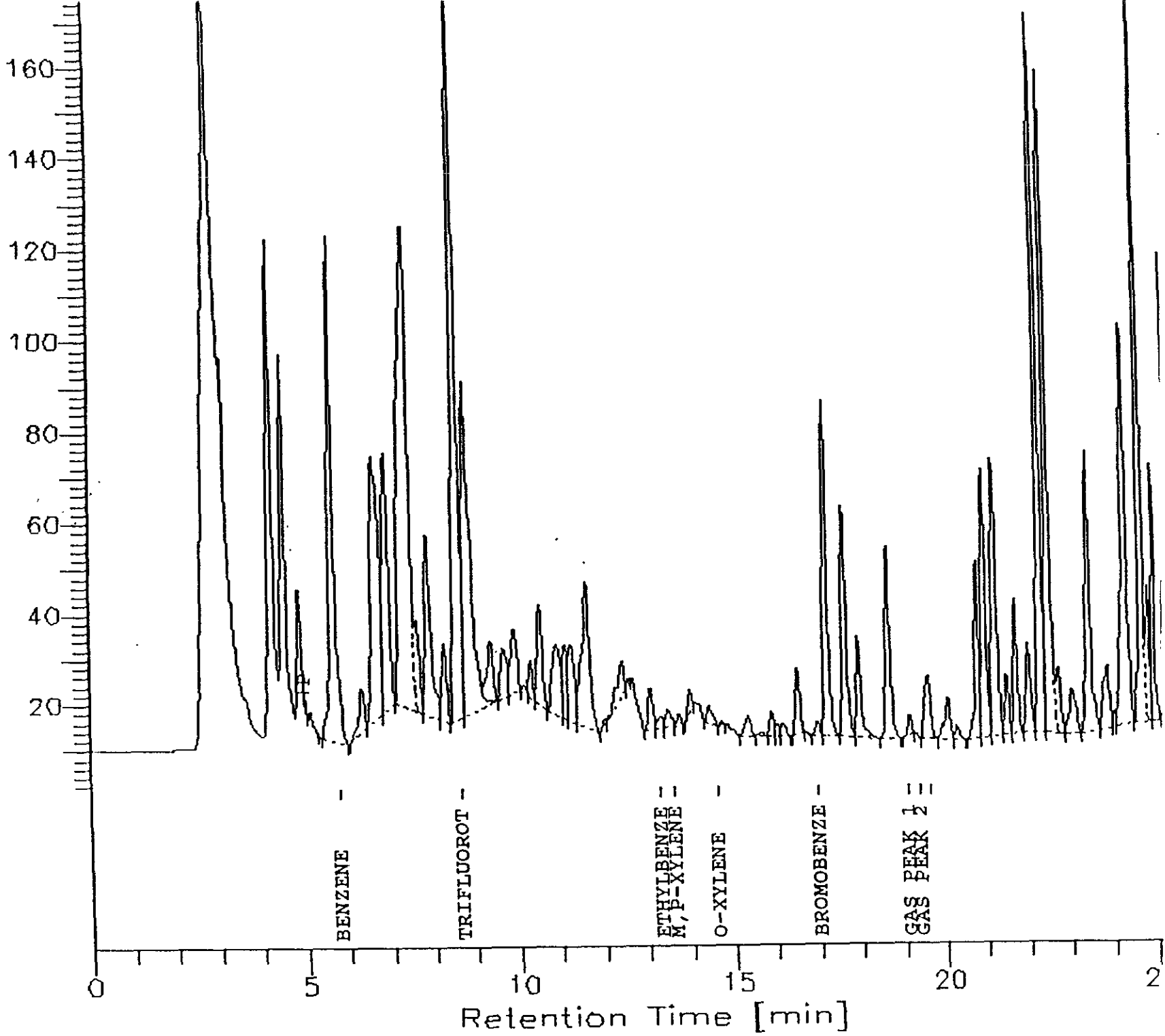
End Time : 26.00 min  
Plot Offset: 2 mV

Date : 5/26/93 11:24 PM  
Low Point : 1.50 mV  
Plot Scale: 175 mV

Page 1 of 1  
High Point : 176.50 mV

MW-1

Response [mV]



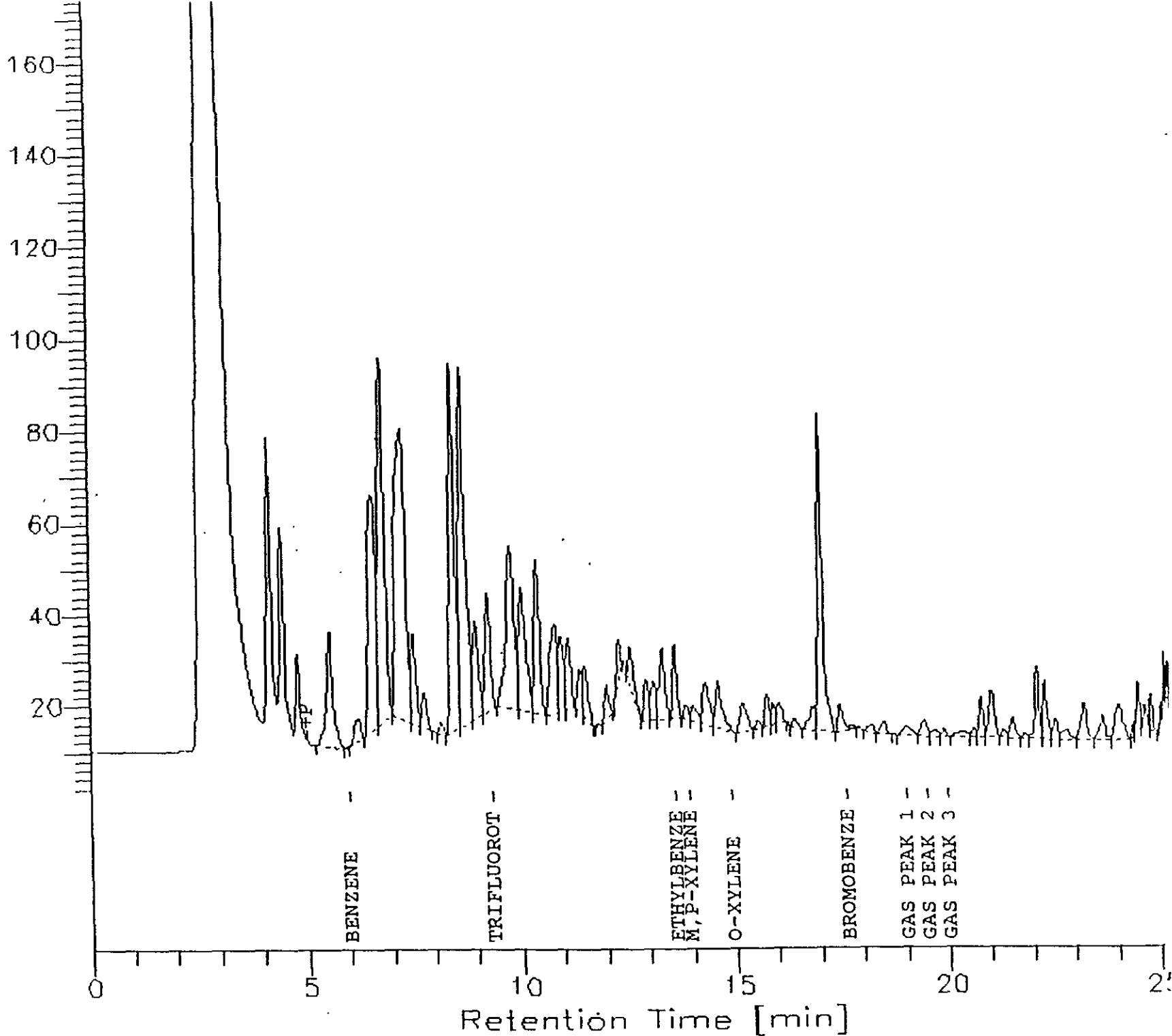
File Name: G:\GC10\152A009.raw  
Start Time: 0.00 min  
Scale factor: -1

Date: 6/1/93 8:40 PM  
End Time: 26.00 min  
Plot Offset: 2 mV

Page 1 of 1  
High Point: 176.64 mV  
Low Point: 1.64 mV  
Plot Scale: 175 mV

Response [mV]

MW-1-21'



BENZENE

TRIFLUOROT

ETHYLBENZENE  
M, P-XYLENE

O-XYLENE

BROMOBENZENE

GAS PEAK 1

GAS PEAK 2

GAS PEAK 3

Sample Name : jp-4 224.4 mg/L  
Filename : g:\gc13\cna\139a011.raw  
Method : FER\_CHA.ins  
Start Time : 0.00 min  
Scale Factor : -1

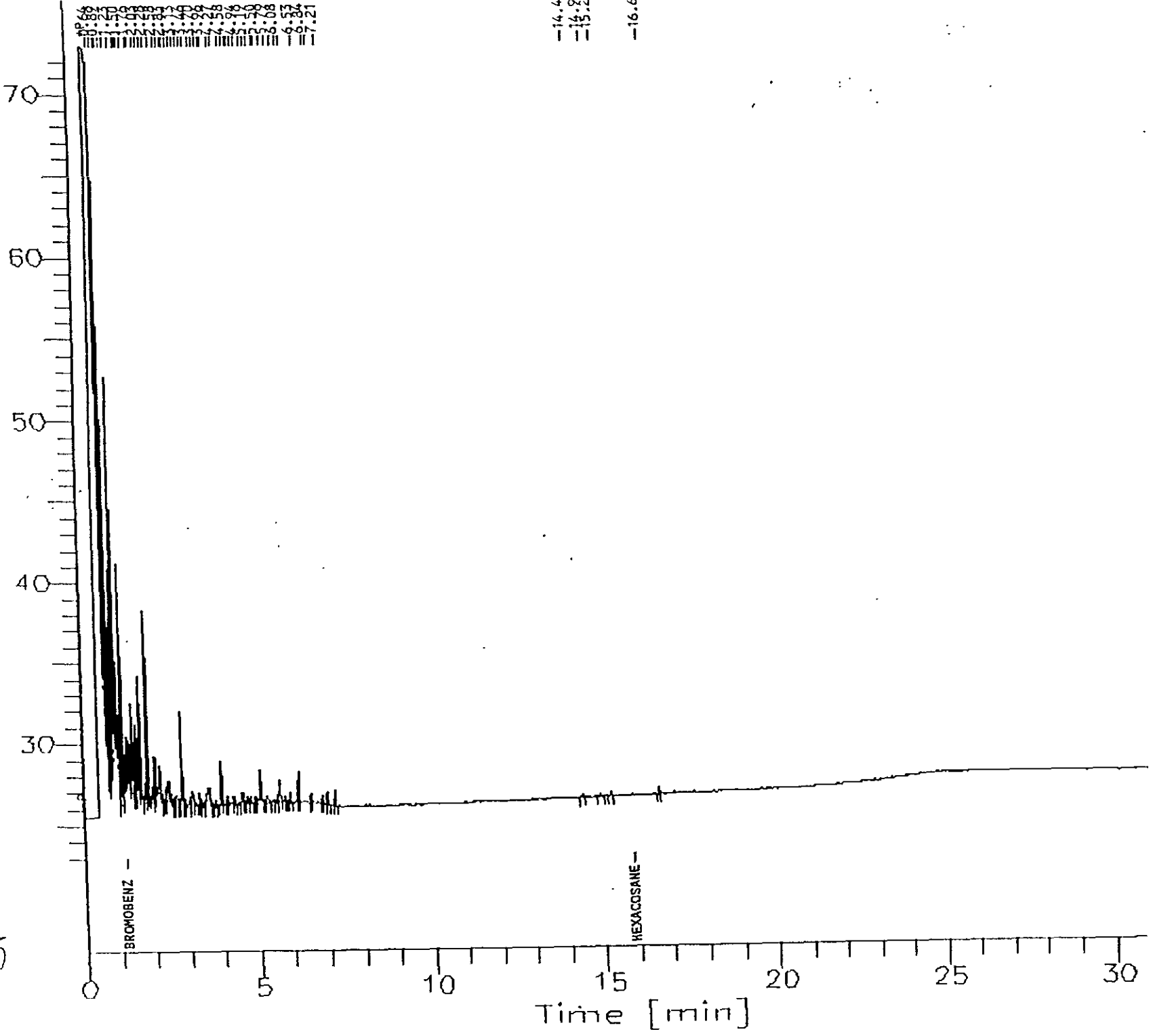
Sample #: 93us4568  
Date : 5/19/93 5:47 PM  
Time of Injection: 5/19/93 5:14 PM  
Low Point : 22.99 mV  
Plot Scale: 50 mV

End Time : 31.92 min  
Plot Offset: 23 mV

High Point : 72.99 mV

*JP-4 Standard*

Response [mV]



10:60  
11:00  
12:00  
13:00  
14:00  
15:00  
16:00  
17:00  
18:00  
19:00  
20:00  
21:00  
22:00  
23:00  
24:00  
25:00  
26:00  
27:00  
28:00  
29:00  
30:00

-14.4  
-15.2  
-16.6

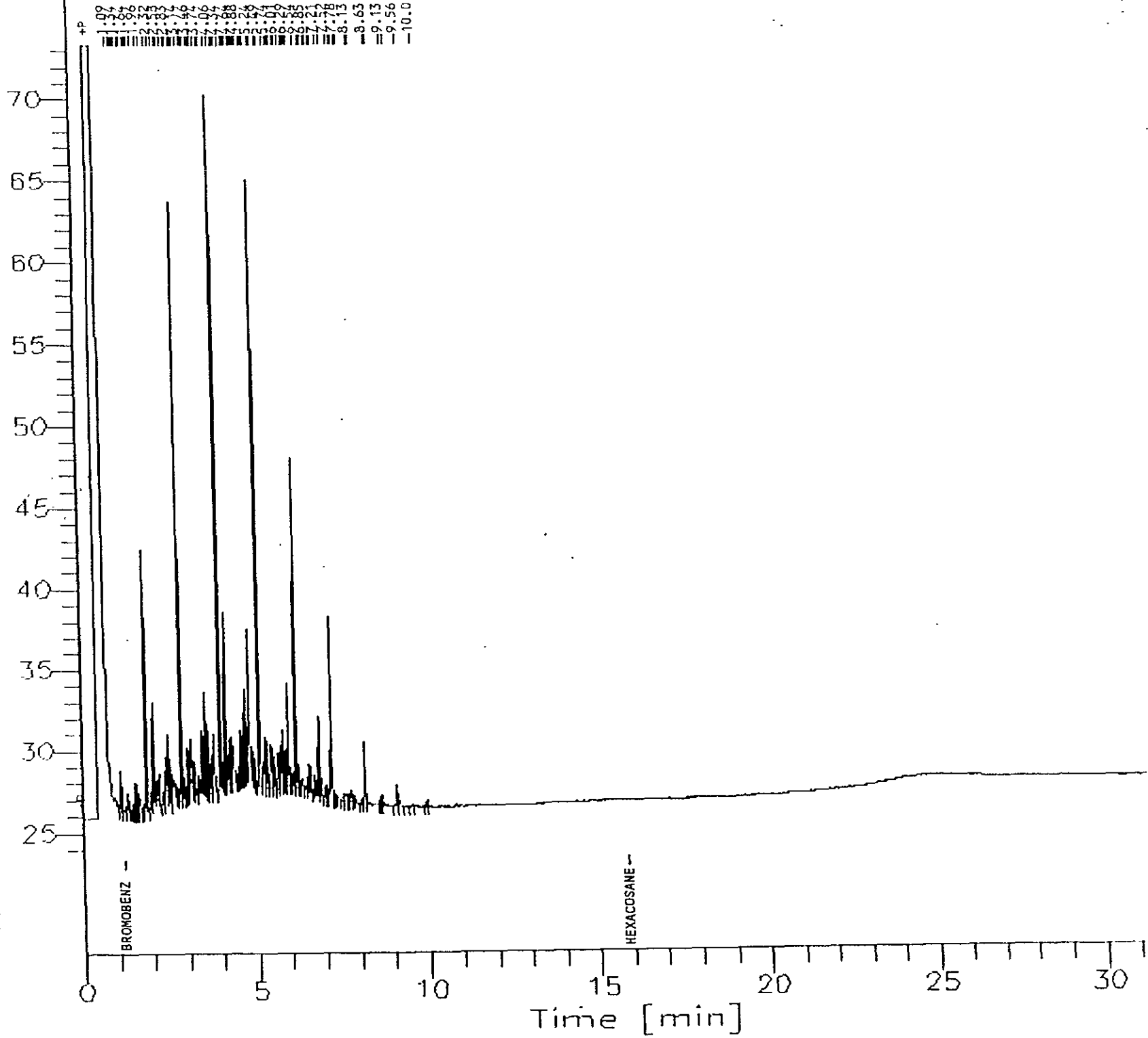
Sample Name : kerosene 235 mg/L  
 fileName : 3:\gc13\cha\138a002.raw  
 Method : TEH\_CHA.ins  
 Start Time : 0.00 min  
 Scale Factor: .1

Sample #: 93ws4929  
 Date : 5/18/93 12:59 PM  
 Time of Injection: 5/18/93 12:25 PM  
 Low Point : 23.37 mV  
 Plot Scale: 50 mV

End Time : 31.92 min  
 Plot Offset: 23 mV

High Point : 73.37 mV

*Kerosene Standard*



1.5  
2.0  
2.5  
3.0  
3.5  
4.0  
4.5  
5.0  
5.5  
6.0  
6.5  
7.0  
7.5  
8.0  
8.5  
9.0  
9.5  
10.0

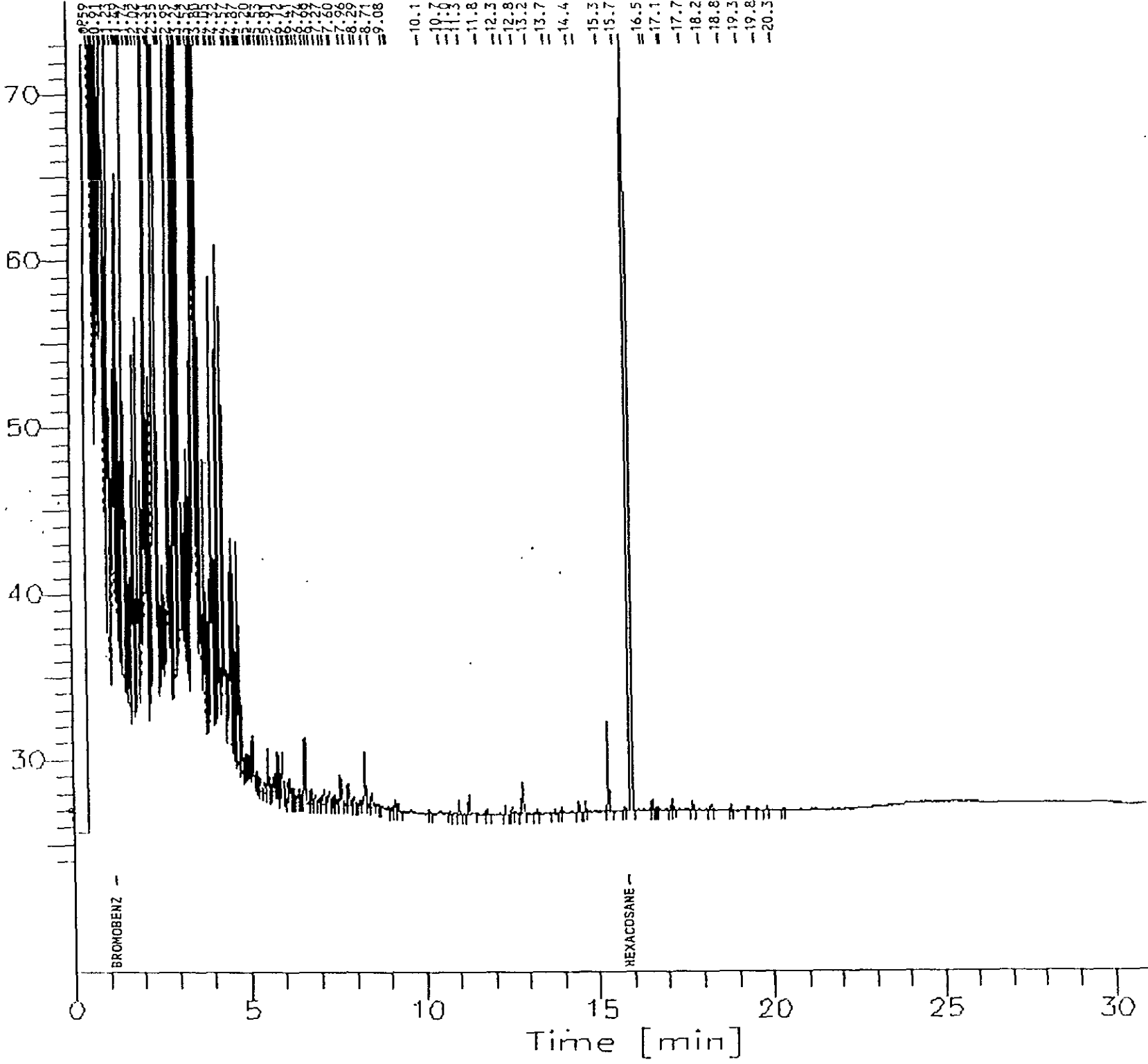


Sample Name : C987-001 960:5  
FileName : g:\gc13\cna\14-a023.raw  
Method : EH.ins  
Start Time : 0.00 min  
Scale Factor : 1

End Time : 31.92 min  
Plot Offset: 23 mV

Sample #: 9325  
Date : 5/25/93 2:55 PM  
Time of Injection: 5/25/93 1:12 PM  
Low Point : 23.17 mV  
High Point : 73.17 mV  
Plot Scale: 50 mV

MW-1 Response [mV]



93.25  
90.14  
88.29  
86.55  
84.92  
83.40  
81.98  
80.66  
79.34  
78.02  
8.71  
9.08  
10.1  
10.7  
11.3  
11.8  
12.3  
12.8  
13.2  
13.7  
14.4  
15.3  
15.7  
16.5  
17.1  
17.7  
18.2  
18.8  
19.3  
19.8  
20.3

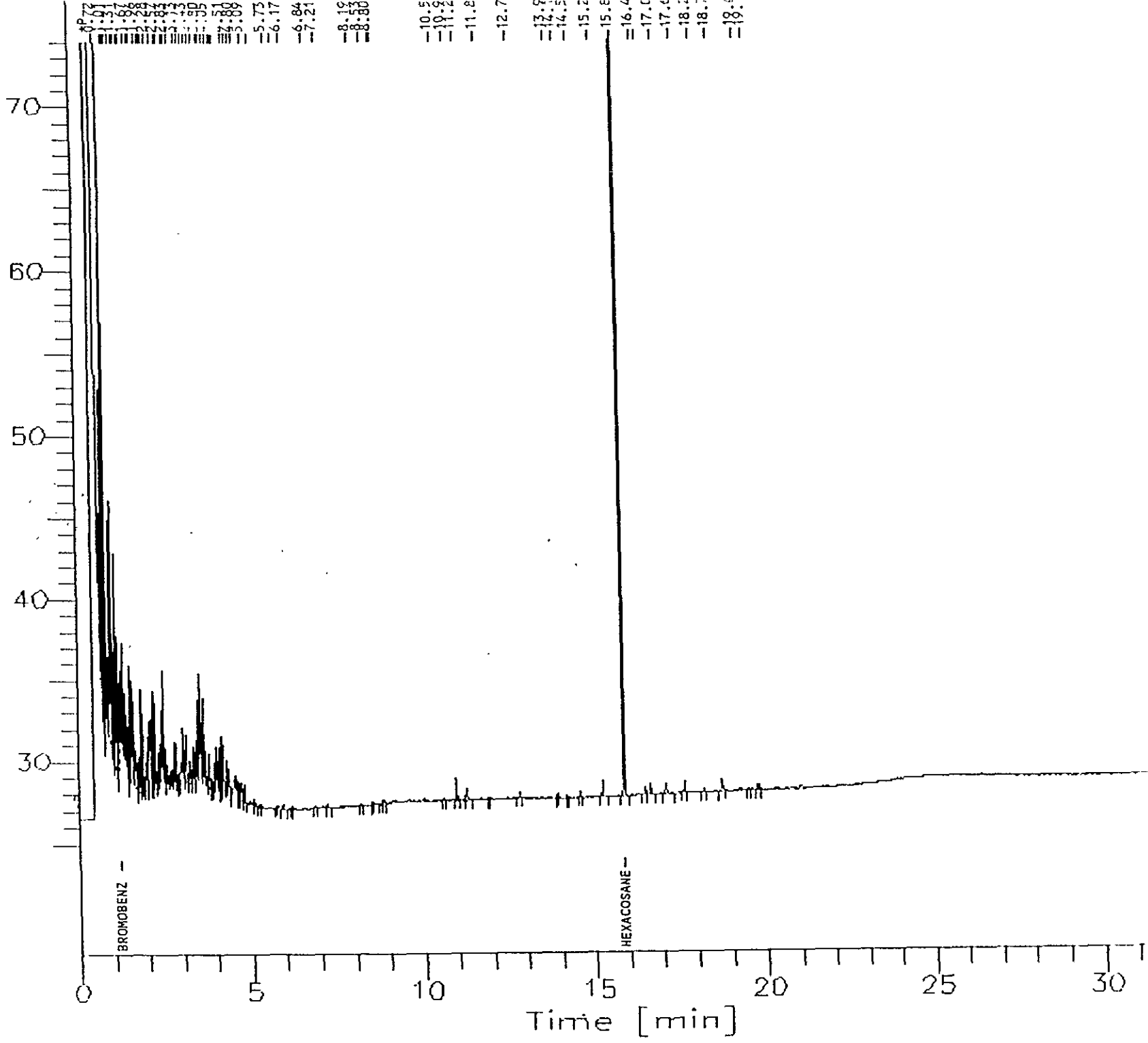
Sample Name : 10927-004 50:5  
FileName : S:\gc3\cna\139a016.raw  
Method : FID\_CHA.ins  
Start Time : 0.00 min  
Scale Factor : -1

End Time : 31.92 min  
Plot Offset: 24 mV

Sample #: 9254  
Date : 5/19/93 9:18 PM  
Time of Injection: 5/19/93 8:45 PM  
Low Point : 24.01 mV  
Plot Scale: 50 mV

Page 1 of 1  
High Point : 74.01 mV

MW-1-21  
Response [mV]



TEH Chromatogram 001001010

Sample Name : 110987-001 960:50  
FileName : 9:\gc13\cha\144a010.raw  
Method : TEH\_CHA.ins  
Start Time : 0.00 min  
Scale Factor : -1

End Time : 31.92 min  
Plot Offset: 24 mV

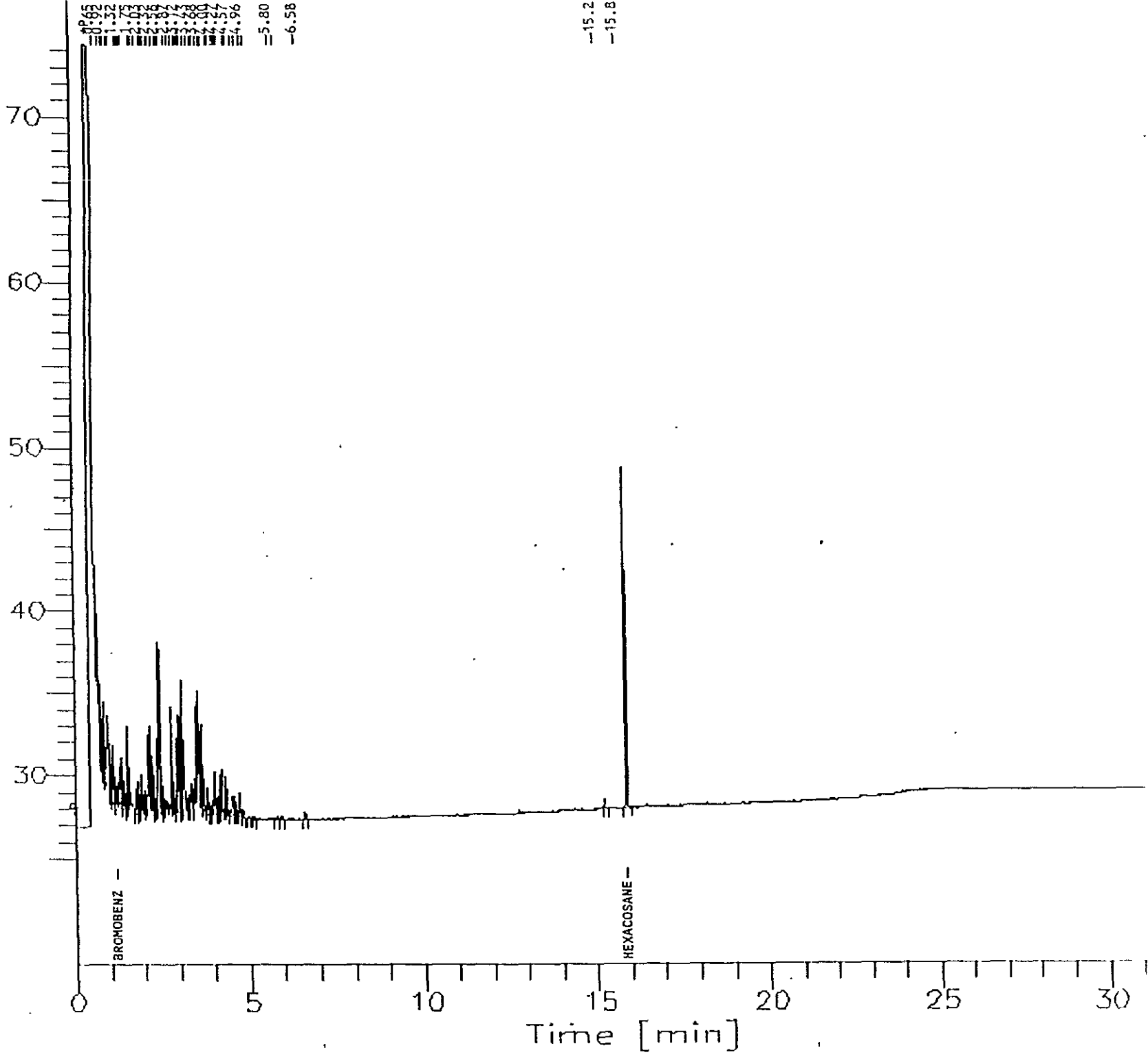
Sample #: 9325  
Date : 5/25/93 3:56 AM  
Time of Injection: 5/25/93 3:23 AM  
Low Point : 24.38 mV  
Plot Scale: 50 mV

High Point : 74.38 mV

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Response [mV]

MW-1



TEH Chromatogram GC13 CH A

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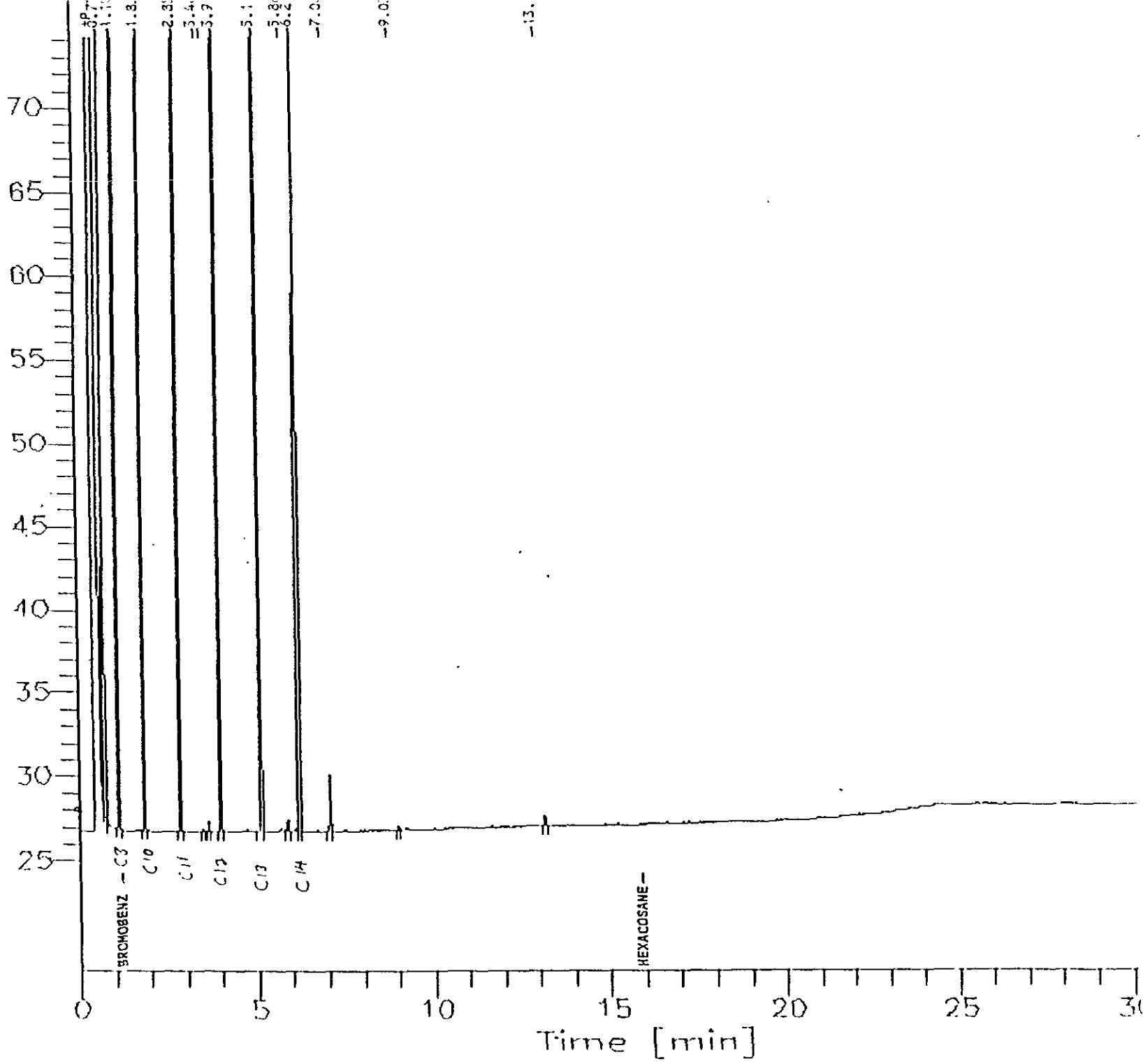
Sample Name : 07-c14 mix  
FileName : E:\gc13\cha\120a002.raw  
Method : TEH.ins  
Start Time : 0.00 min  
Scale Factor : -1

Sample #: 93WS4701  
Date : 4/30/93 12:12 PM  
Time of Injection: 4/30/93 11:50 AM  
Low Point : 24.20 mV  
Plot Scale: 50 mV

End Time : 31.92 min  
Plot Offset: 24 mV

High Point : 74.20 mV

Response [mV]



Time [min]