

Figures must be re-run

STATISTICS
Special Study 70-22
Job No. 8908116

ANALYSIS OF BIODEGRADATION DATA

Data collected in the biodegradation test program prior to November 16, 1970 were submitted for statistical analysis. The numbers used in the analysis represented the amount of test compound degraded in a 21 hour period. Six materials representing varying degrees of molecular complexity were tested. The conditions for biodegradation were similar for all, except that smaller quantities of the less degradable materials were used.

Student's t Test was used to check for significant evidence of biodegradation. Control charts were plotted on the amount of the test compound present at the beginning and the end of the 21 hour period.

CONCLUSIONS

1. Significant evidence of biodegradability was found for MIPB, ~~HB 40~~ and MCS 1043. Significance level used - 95%.
2. MCS 1016 and MCS 1242 showed some evidence of biodegradation, but neither was significant at 95%.
3. Aroclor 1254 showed no evidence of biodegradation.
4. The compounds studied ranked from the most to the least degradable were: MIPB, ~~HB 40~~, MCS 1043, MCS 1242, MCS 1016, Aroclor 1254. (See Table I)
5. In order to detect biodegradability at the 95% level of significance in 20 observations, approximately one-half of the amount of test material added must be degraded. For MCS 1016 this would require about one week; for Aroclor 1242, about 2 days.
6. The day to day variation in amount of test compound found both before and after the 21 hour degradation period is shown in Figures 1 thru 6.

DISCUSSION

This was a preliminary analysis of existing data. This will be followed by a designed experiment to investigate several variations in experimental technique. The designed experiment is intended to lead to experimental conditions which will provide more consistent results.

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TABLE I
COMPARISON OF TEST MATERIALS
DIFFERENCE BETWEEN FEED SAMPLE + 21 HOUR SAMPLE

<u>Material</u>	<u>Ave. Diff. (mg)</u>	<u>Std. Dev. of Diff.</u>	<u>S/D</u>	<u>Significance</u>
MIPB	-8.7	1.95	0.22	***
HB-40	-7.0	8.80	1.26	*
MCS 1016	0.11	ca 1.0	10	NS
Aroclor 1242	0.30	1.07	3.56	NS
Aroclor 1254	-0.04	ca 1.0	25.0	NS
MCS 1043	0.55	0.95	1.73	*

* = 95% Significance

~~***~~ = 99.9% Significance

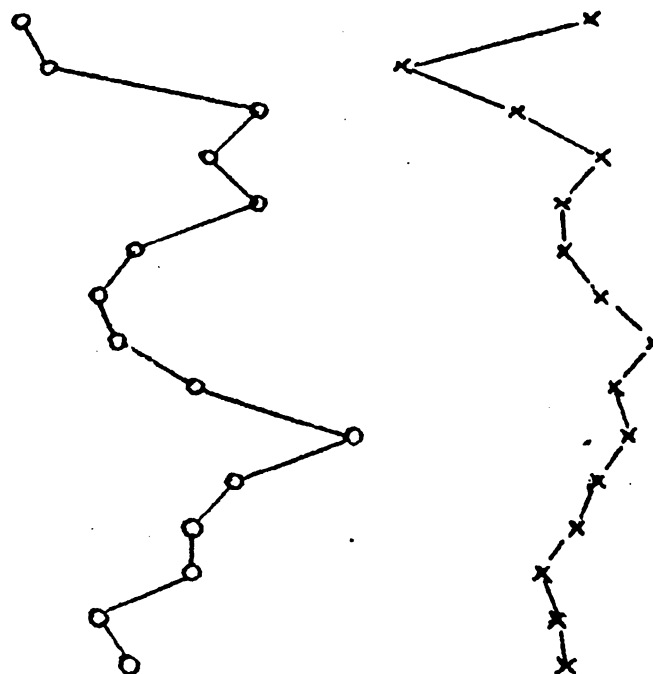
NOTE: 10 mg of MIPB and HB-40 were added every 24 hours.
For the other compounds, the addition rate was
1 mg every 24 hours.

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Mgs. Compound Found

16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1



DELETE

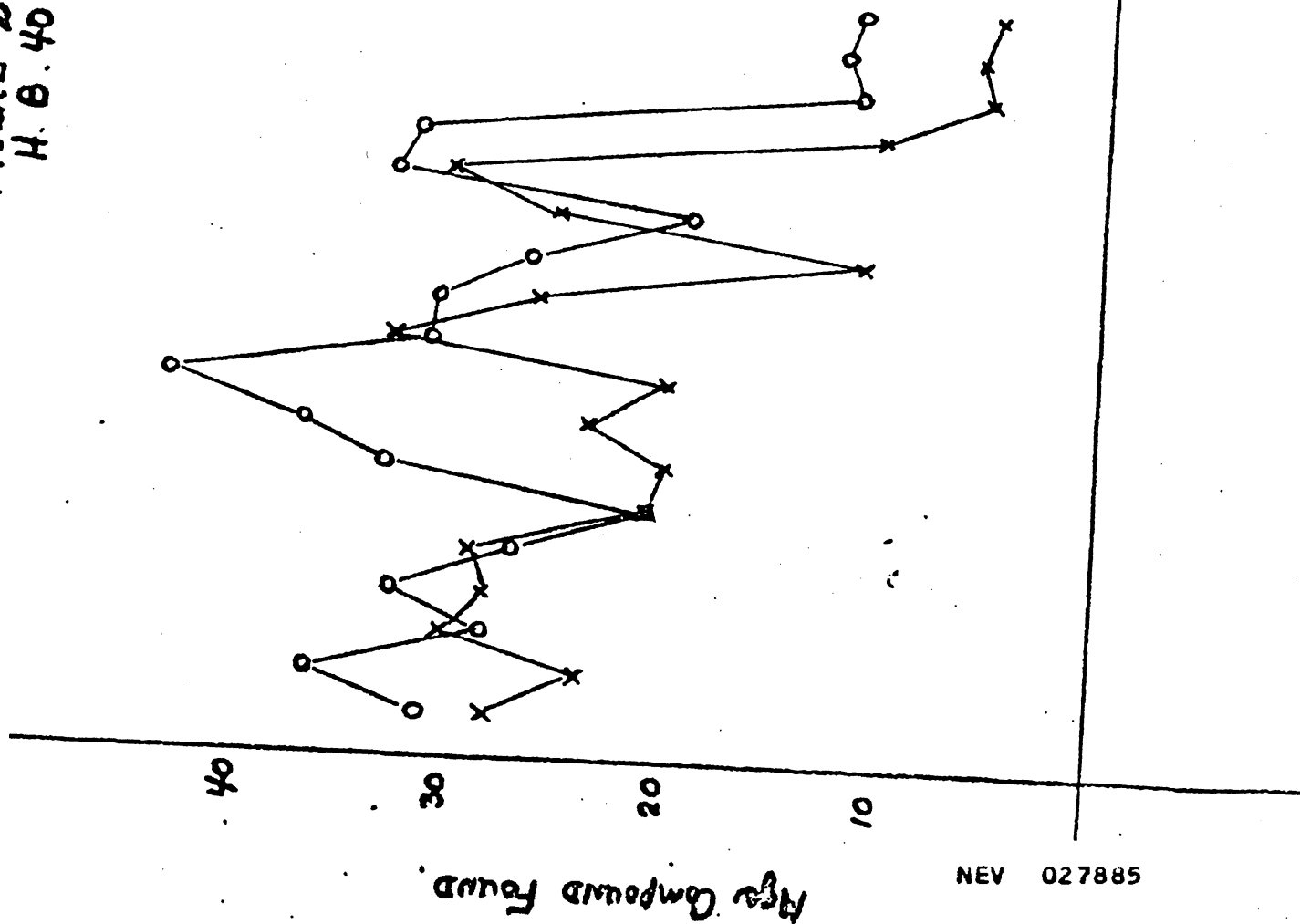
O = FEED SAMPLE
X = 21 Hr Sample

FIGURE I
MIPB

FIGURE 2
H. B. 40

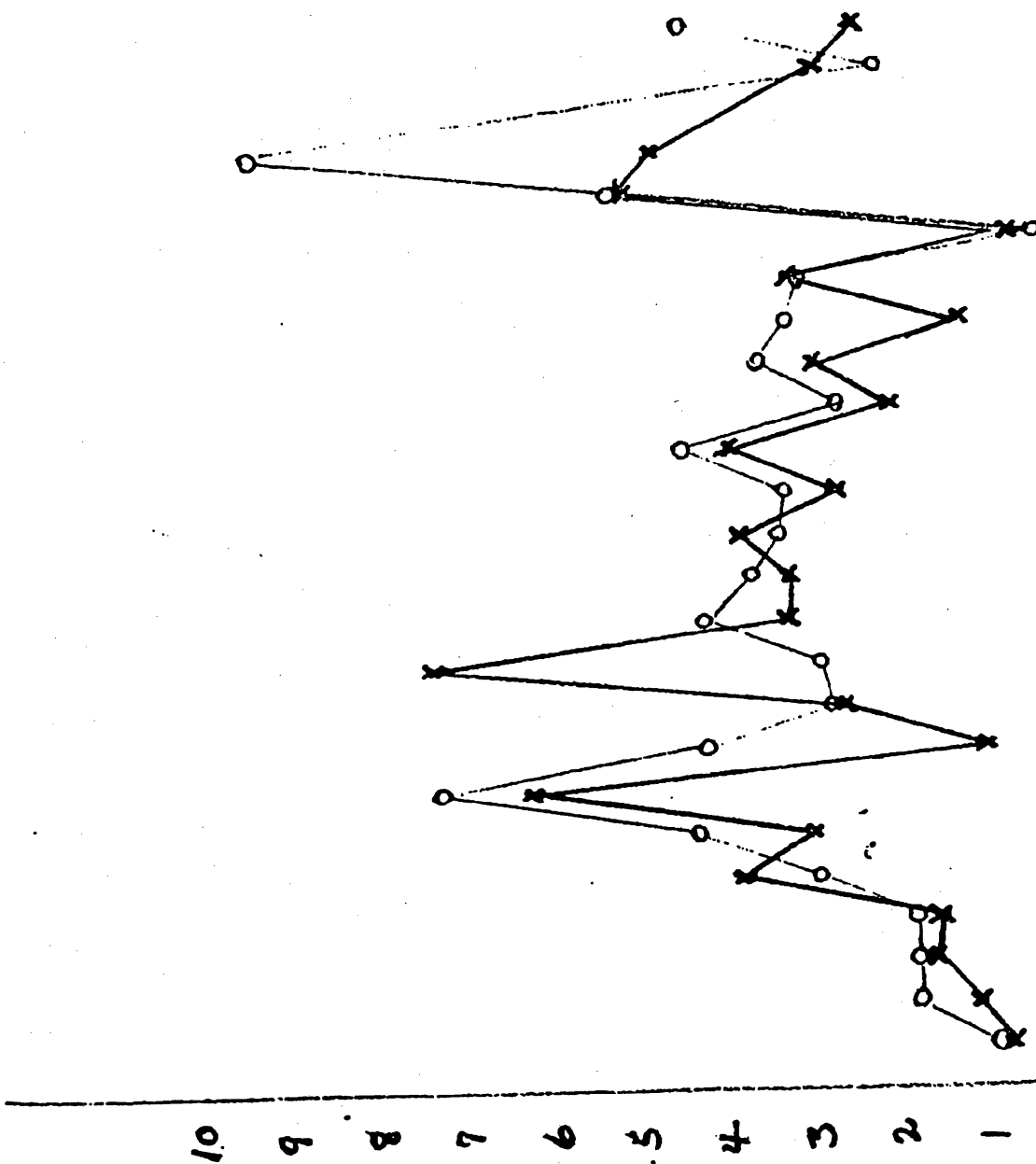
O = FEED SAMPLE
X = 21 Hr SAMPLE

DELETE



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FIGURE 3
MCS 1043

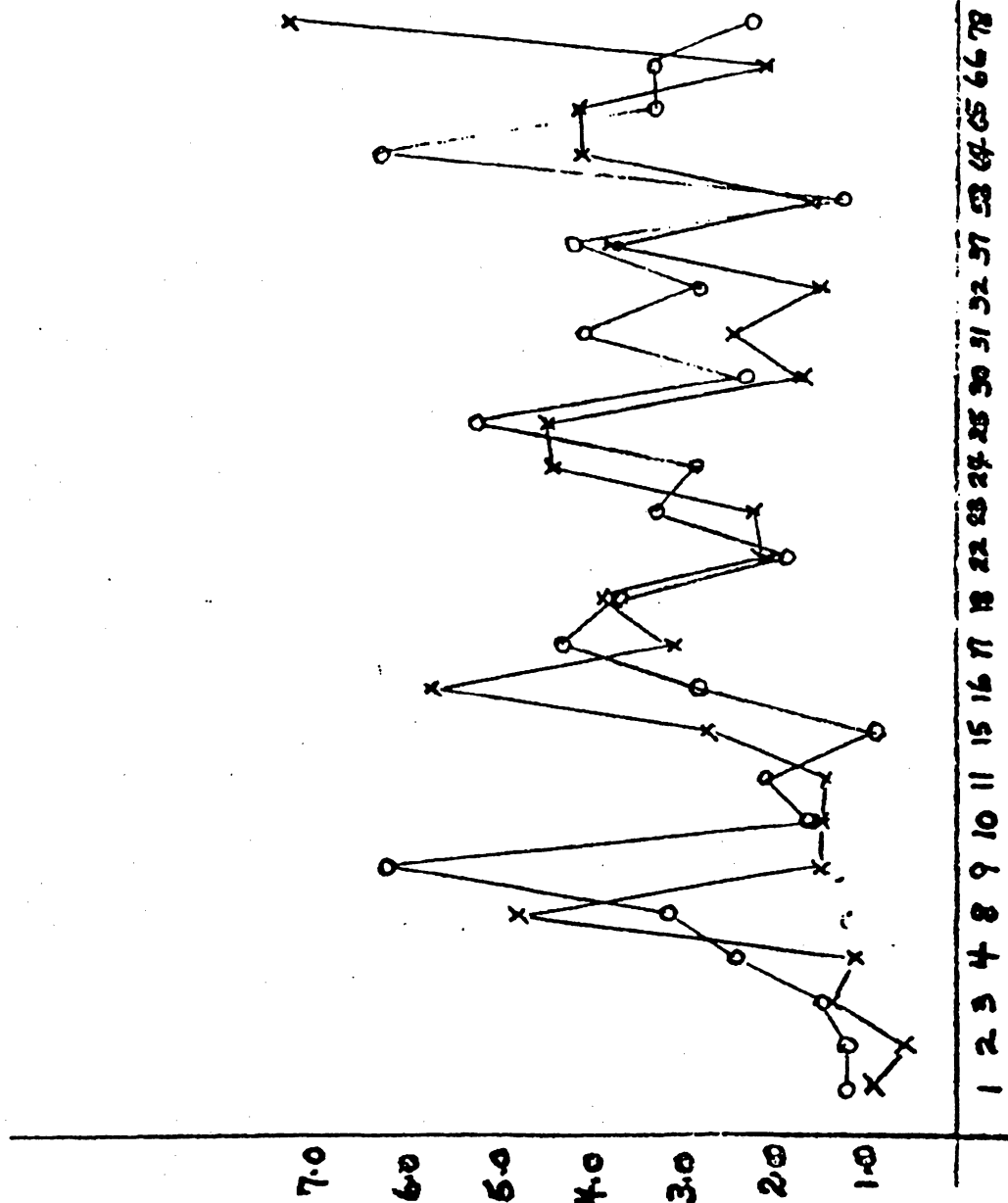


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FIGURE 4
ACCLOR 1242
AMOUNT FOUND

O = FEED
X = 27 HR



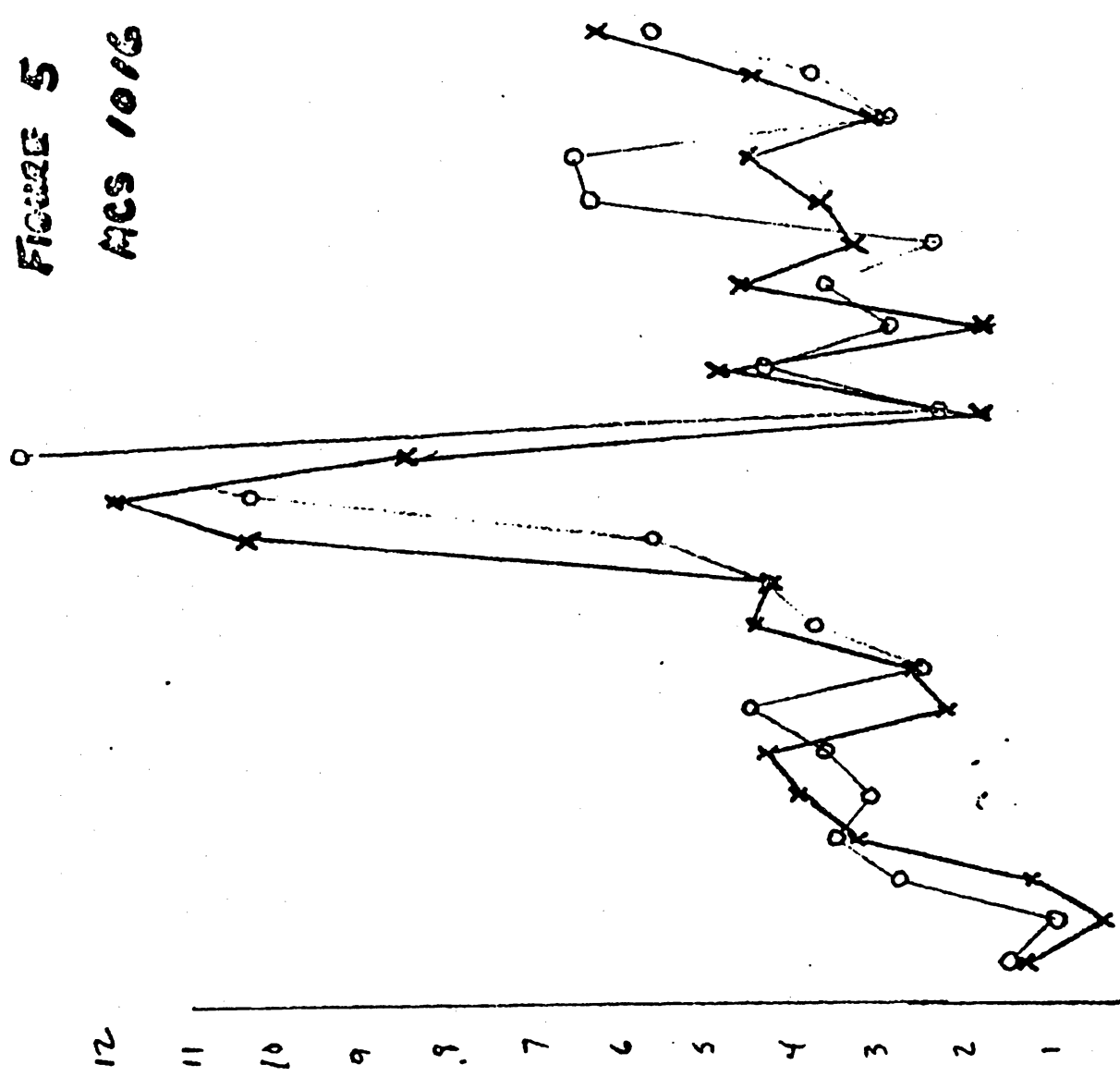
TIME →

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FIGURE 5

MCS 1016



Time →

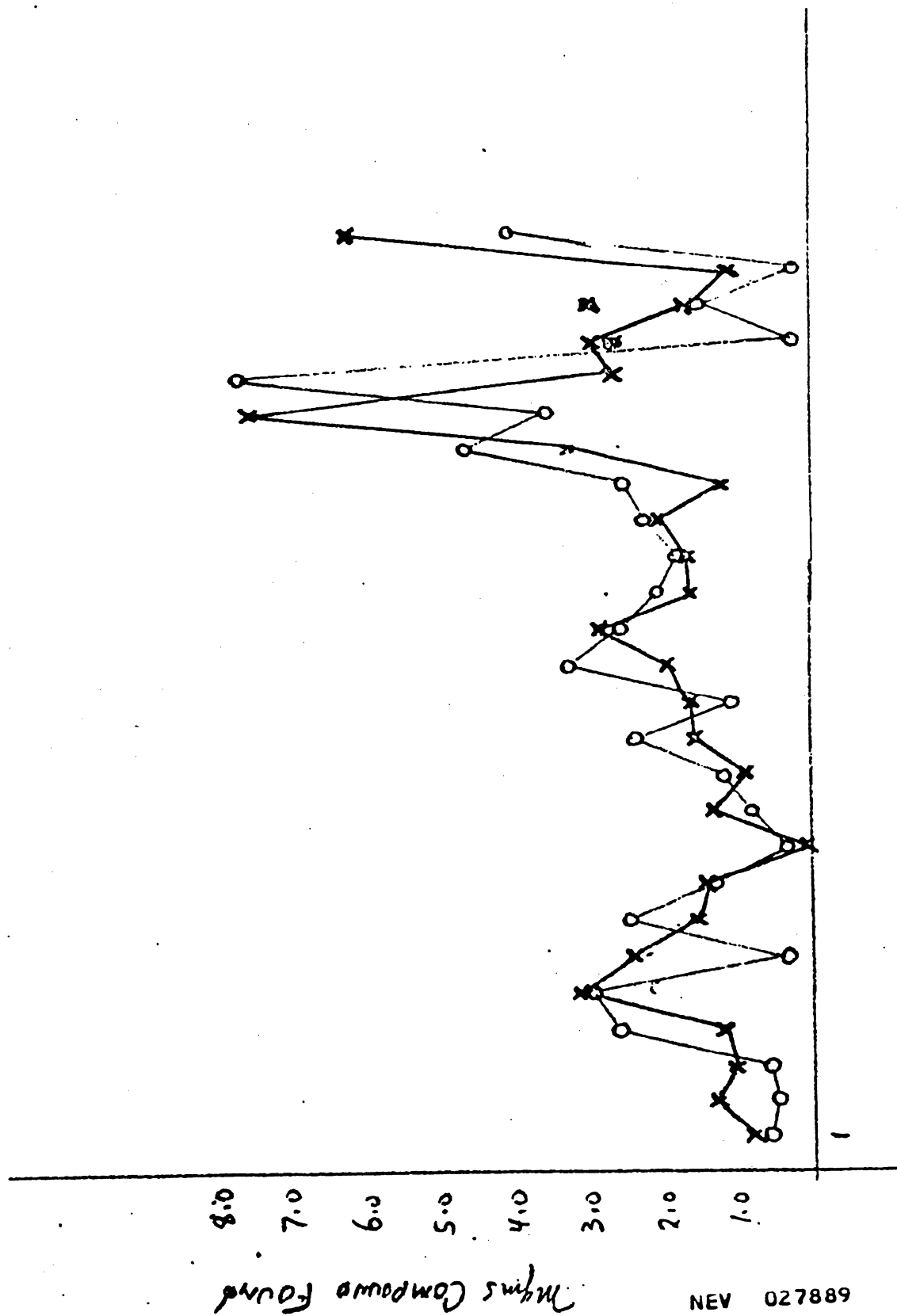
O: PresSonic

X: 21 HRS.

FIGURE 6

ANALON 1254

O = FEED SAMPLE
X = 21 HR SAMPLE



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