UNIVERSIDAD DE GRANADA

TESIS DOCTORAL

ESTRUCTURA, ^{13}C RMN, BIOTRANSFORMACION Y REACCIONES DE REAGRUPAMIENTO Y CICLACION DE DITERPENOS DE SIDERITIS ANDALUZAS

APENDICE

Antonio Martínez Rodríguez

ESTRUCTURA, ^{13}C RMN, BIOTRANSFORMACION Y REACCIONES DE REAGRUPAMIENTO Y CICLACION DE DITERPENOS DE SIDERITIS ANDALUZAS

APENDICE

PARTE I

Espectros ^{1}H RMN

Espectros ^{13}C RMN

PARTE II

Espectros ^{1}H RMN

Espectros ^{13}C RMN

PARTE III

Espectros ^{1}H RMN

Espectros ^{13}C RMN

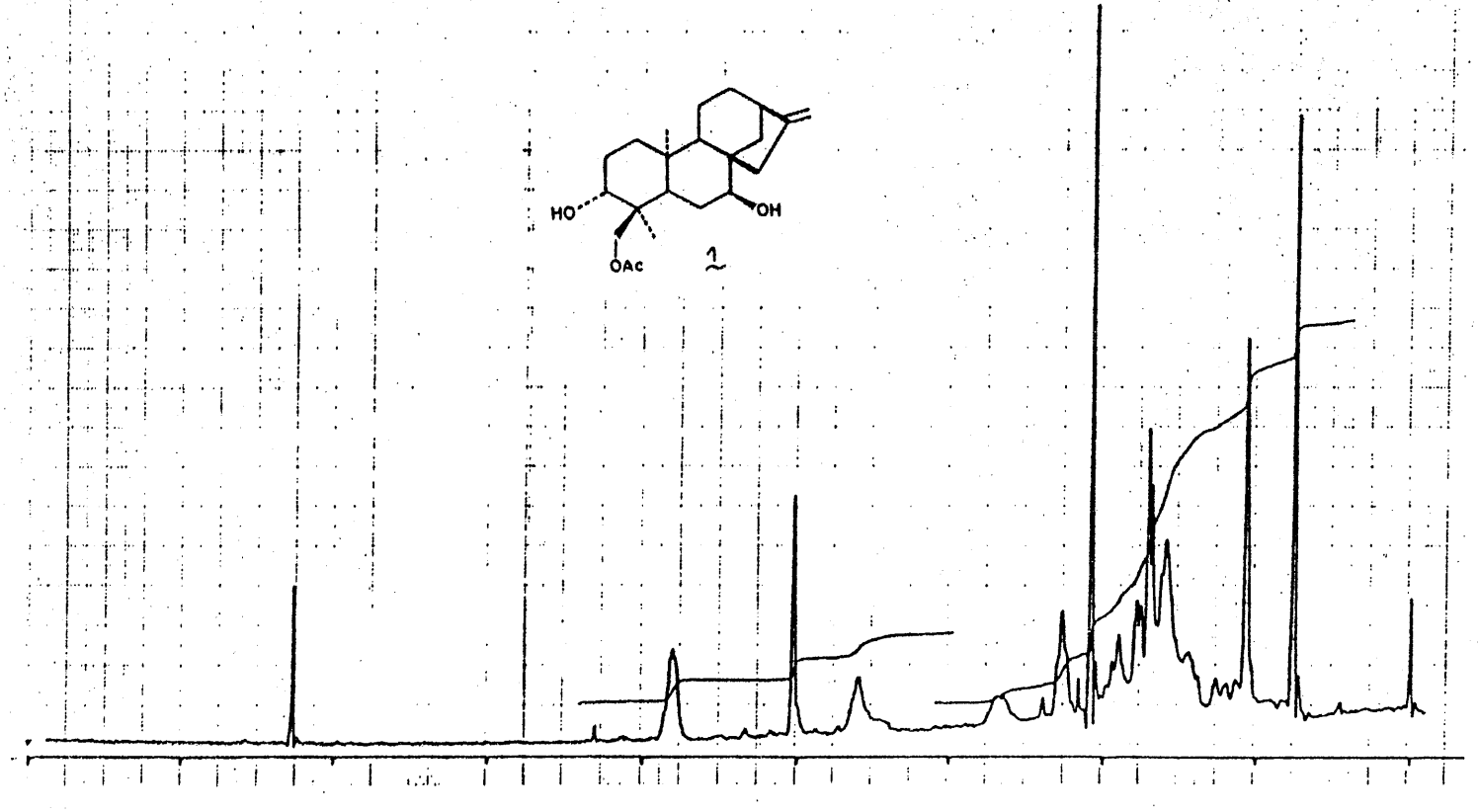
PARTE IV

Espectros ^{1}H RMN

Espectros ^{13}C RMN

P A R T E I

ESPECTROS ^{1}H RMN



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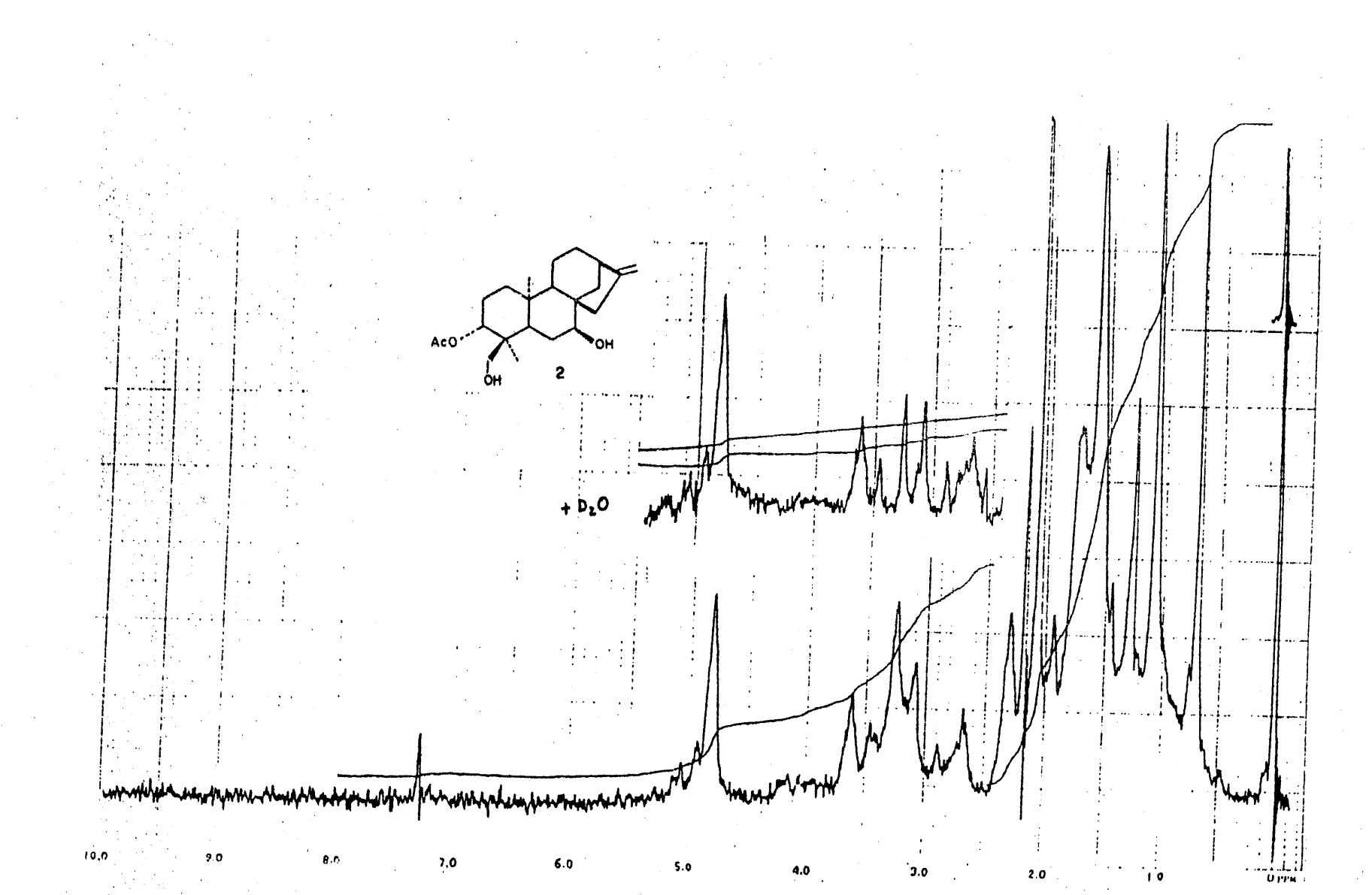
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OH
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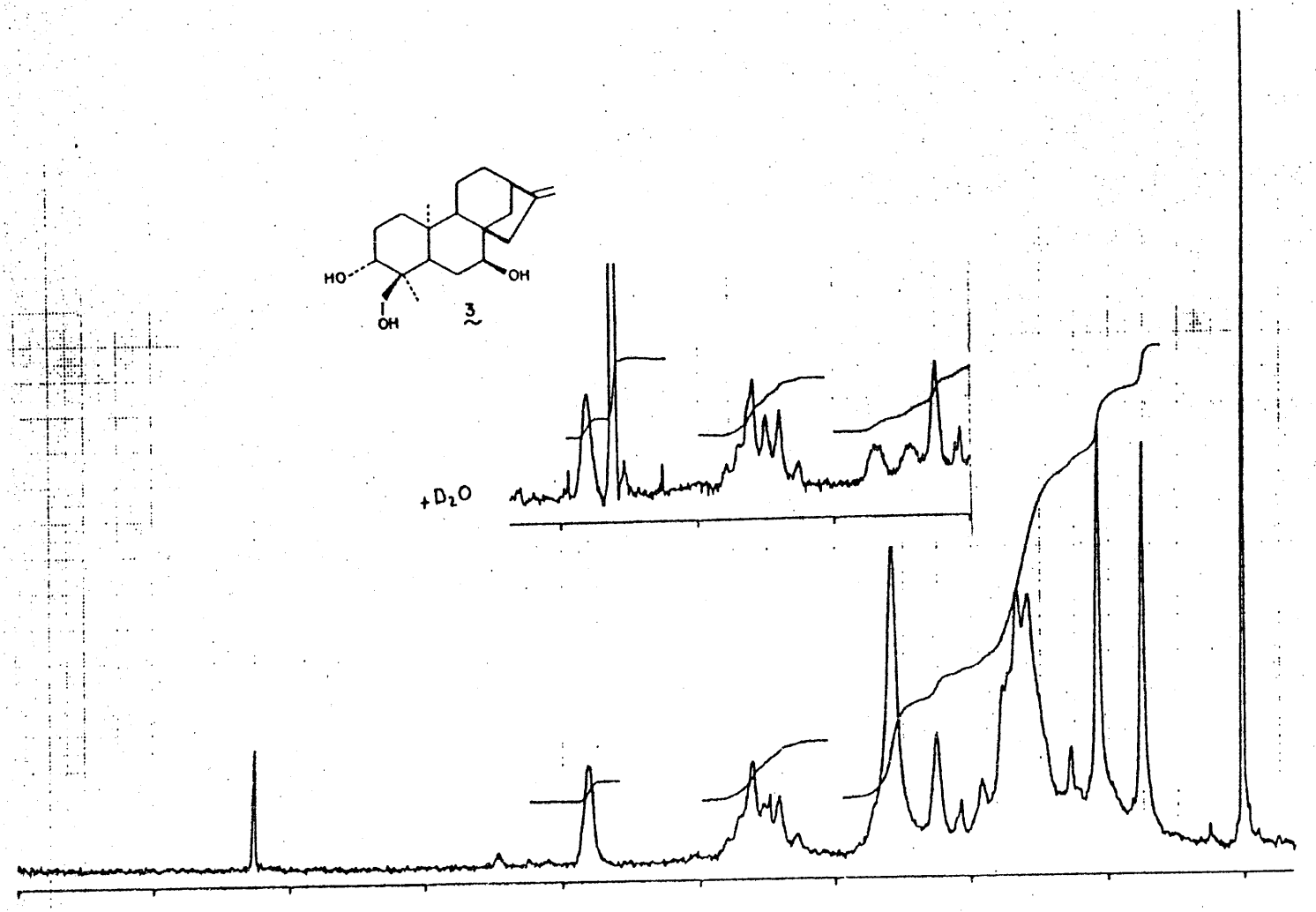
2.0
1.0
0 PPM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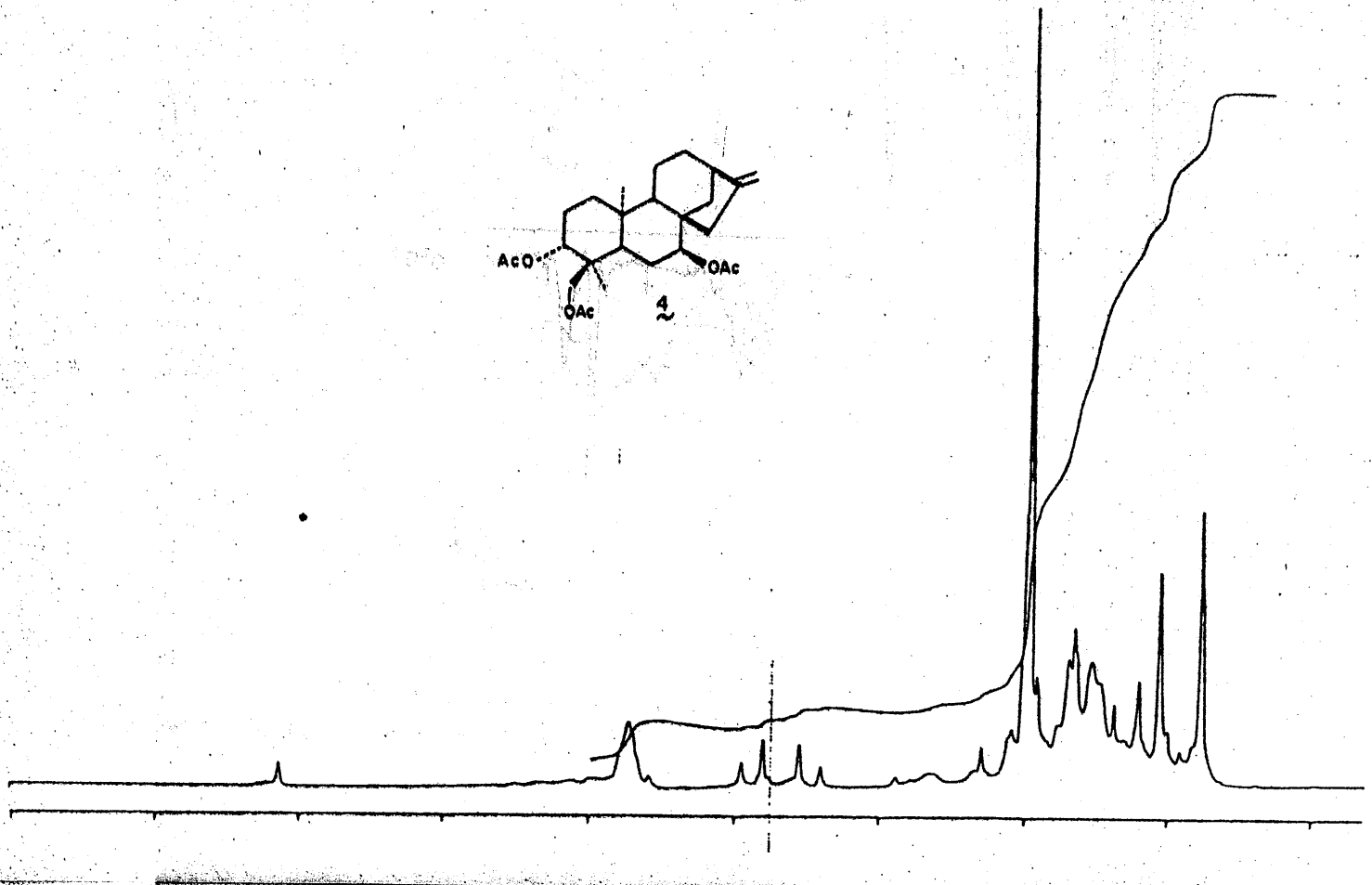
OH
OH
3
+D2O



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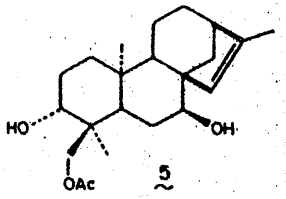

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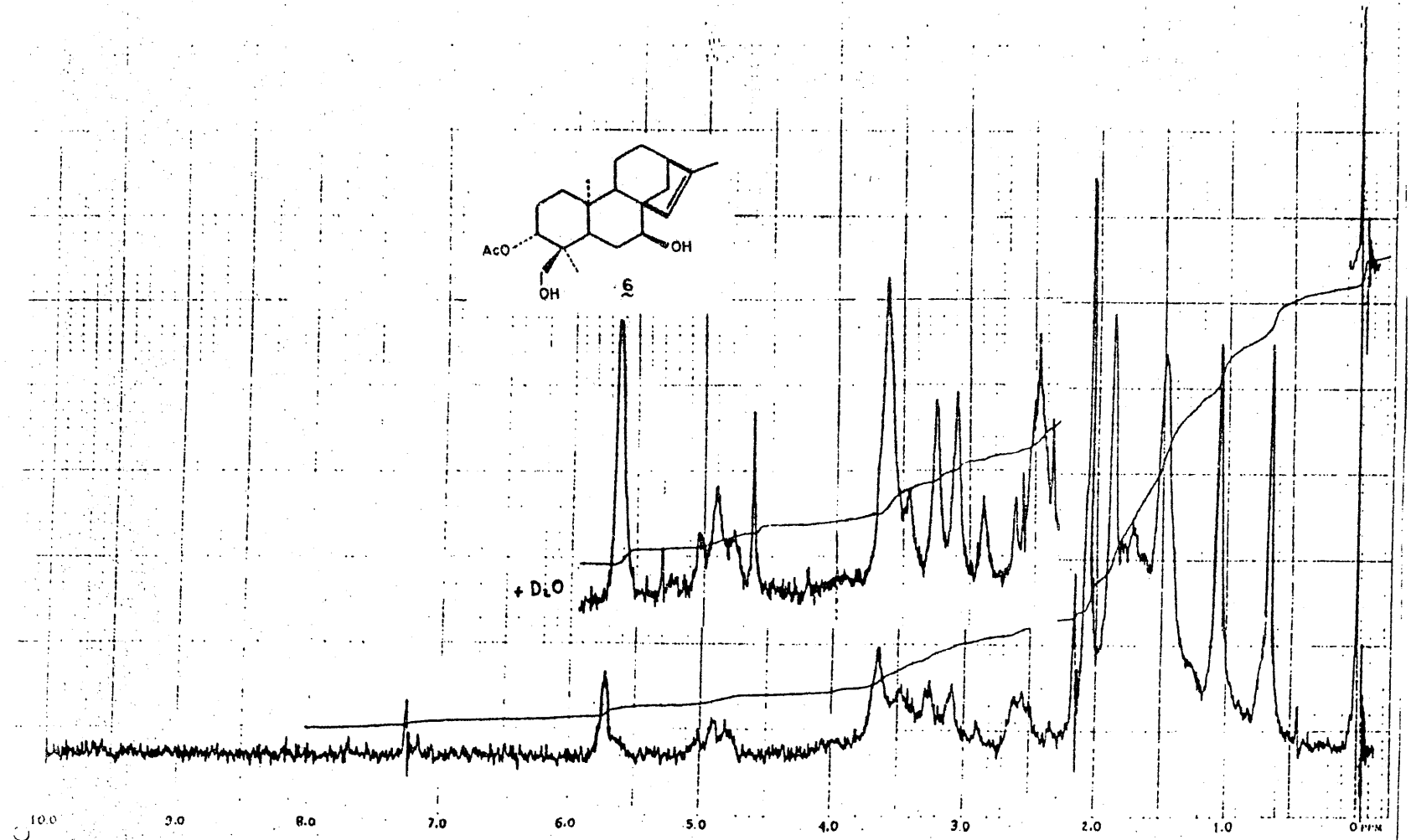
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OH
OH
6
+ D₂O
10.0
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8.0
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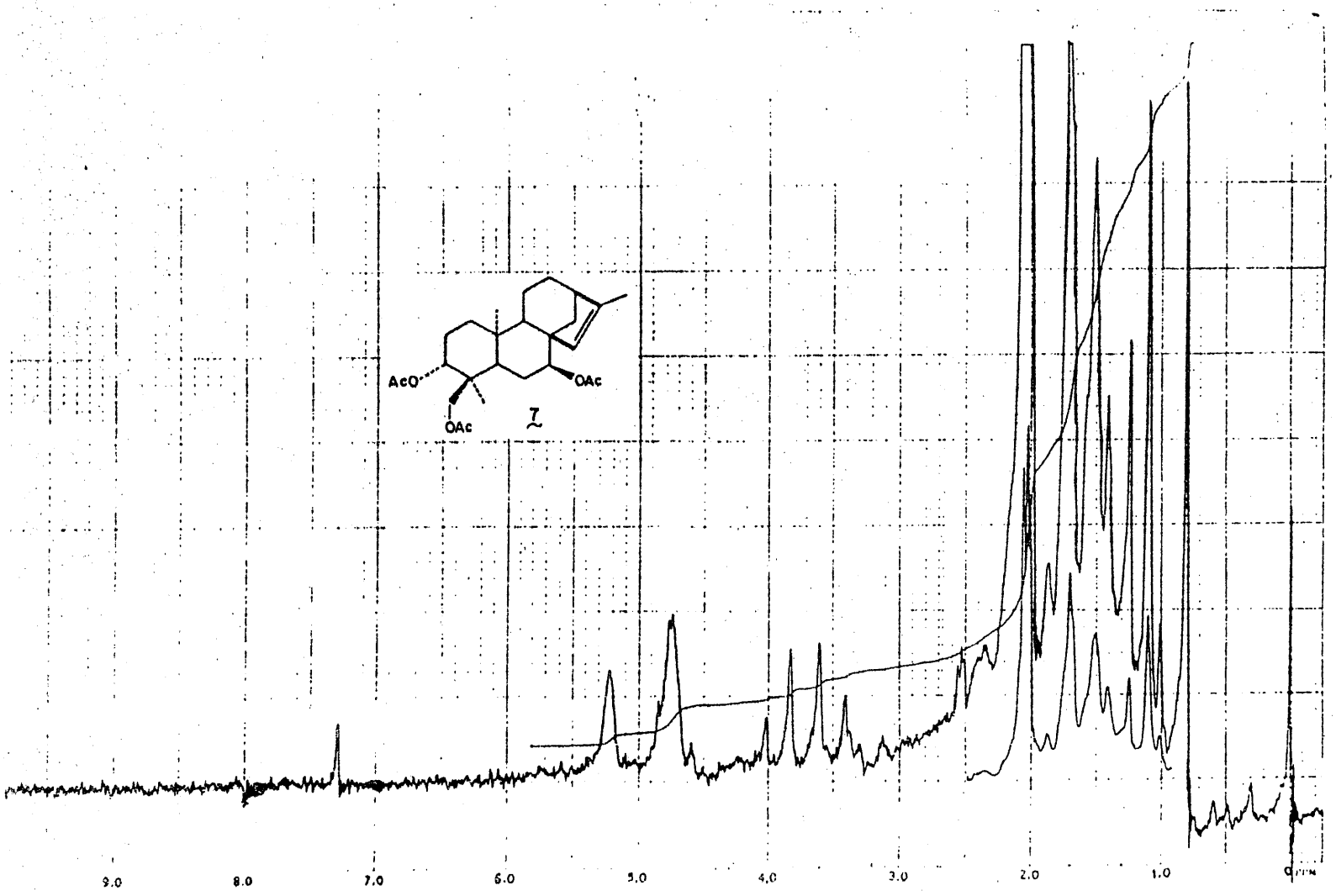
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OAc
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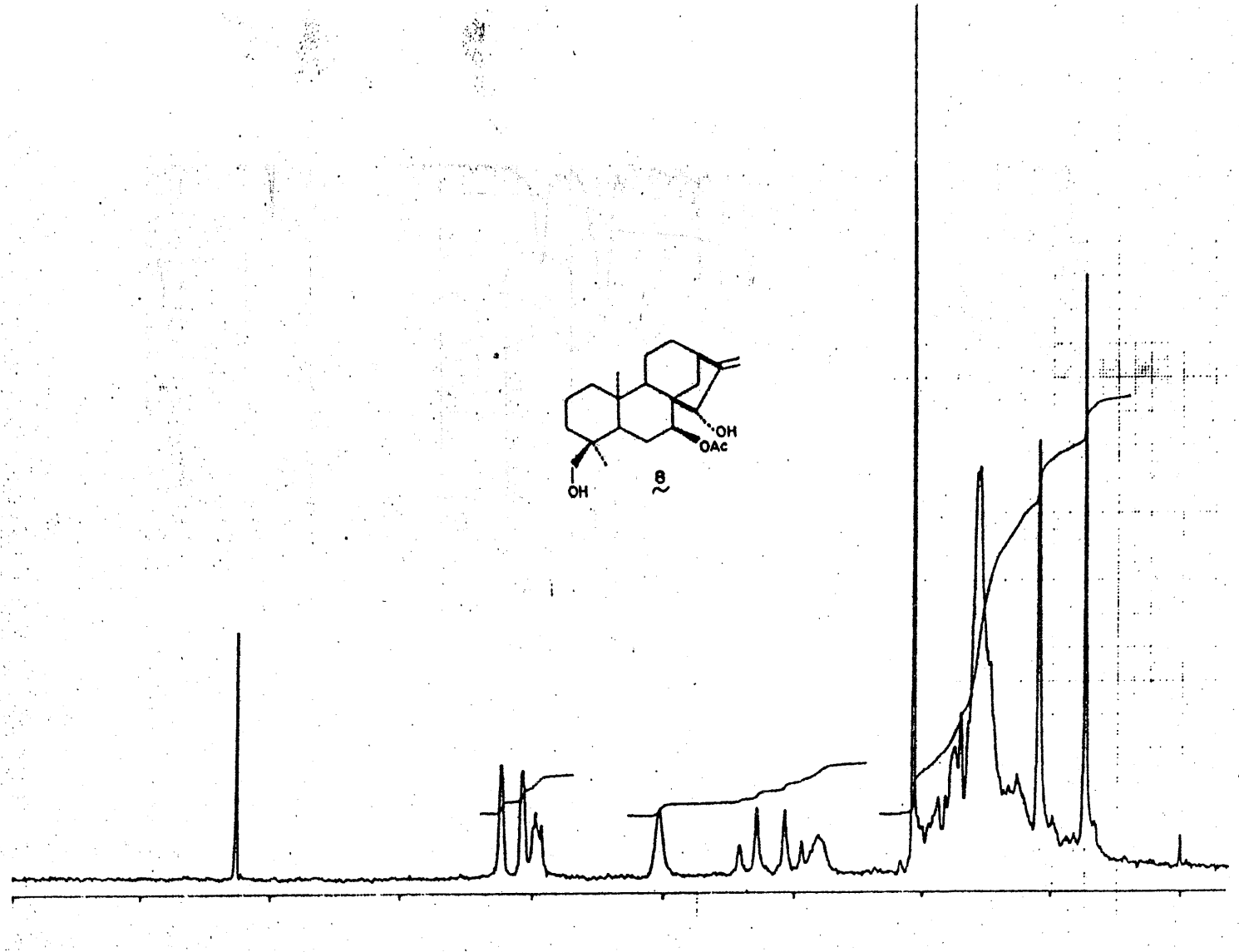

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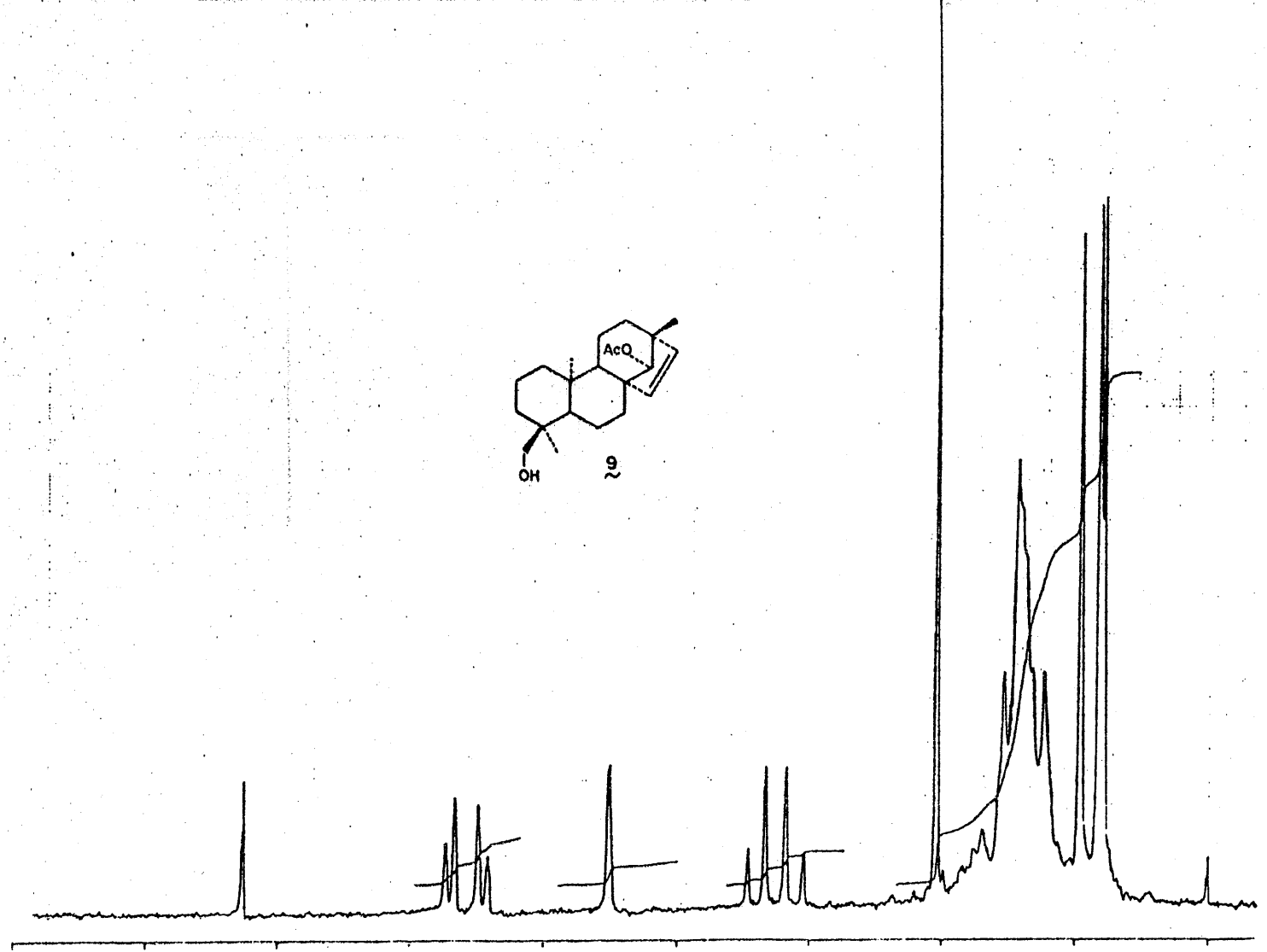

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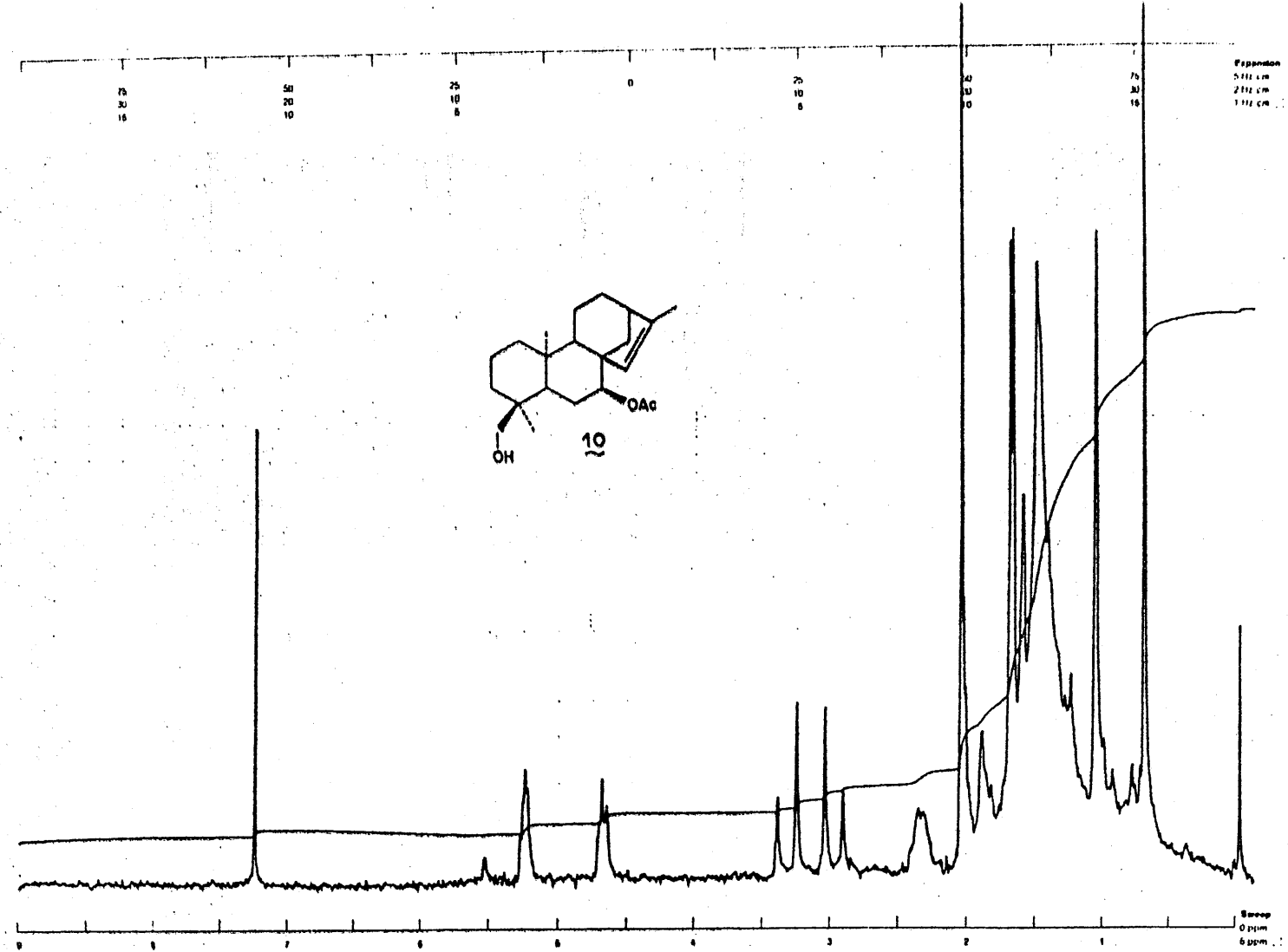
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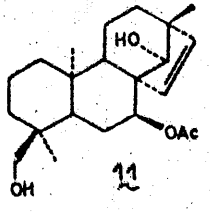
OH
10



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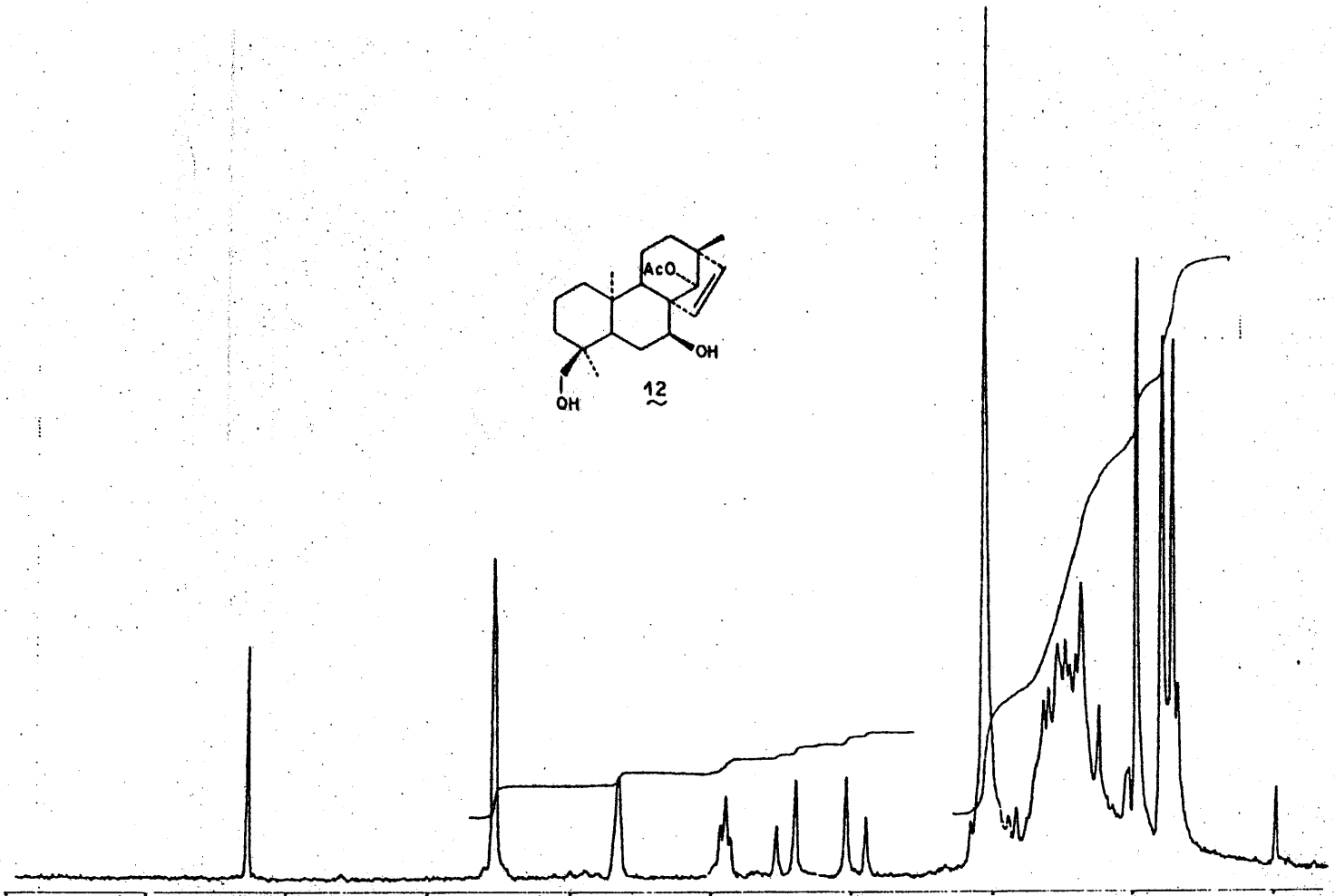

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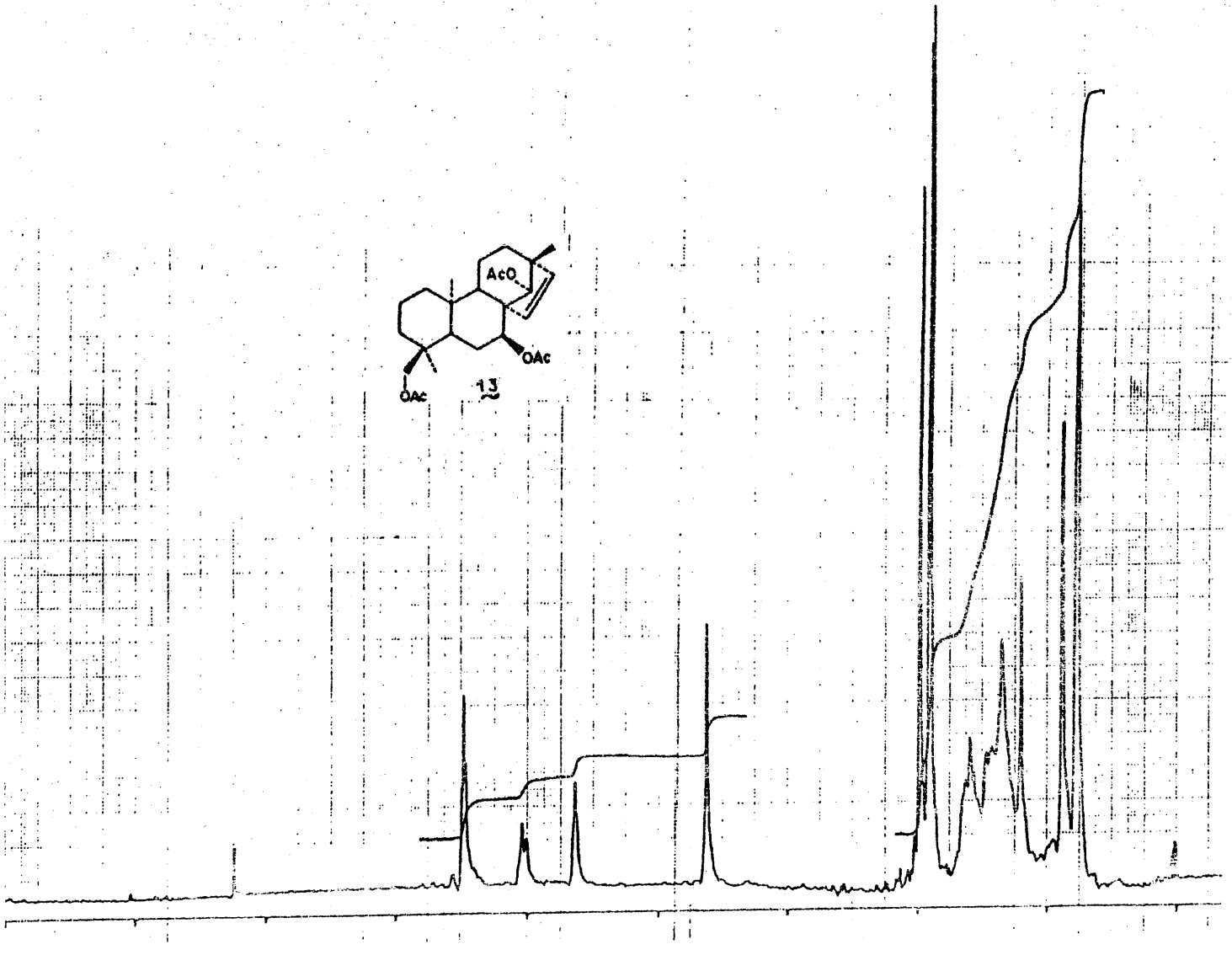

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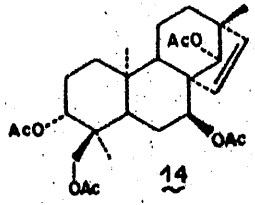

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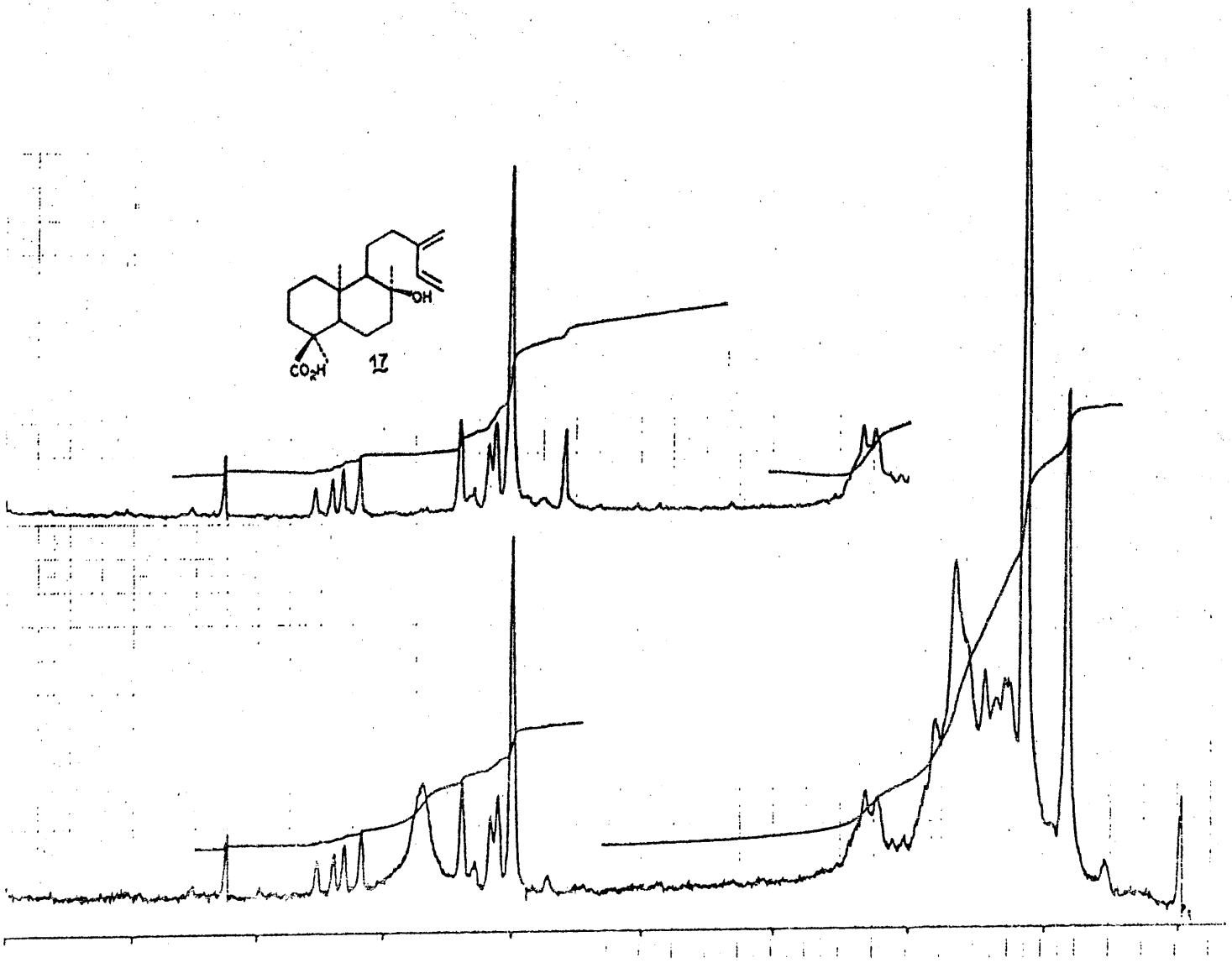

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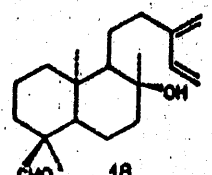

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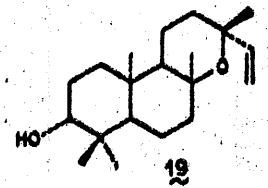

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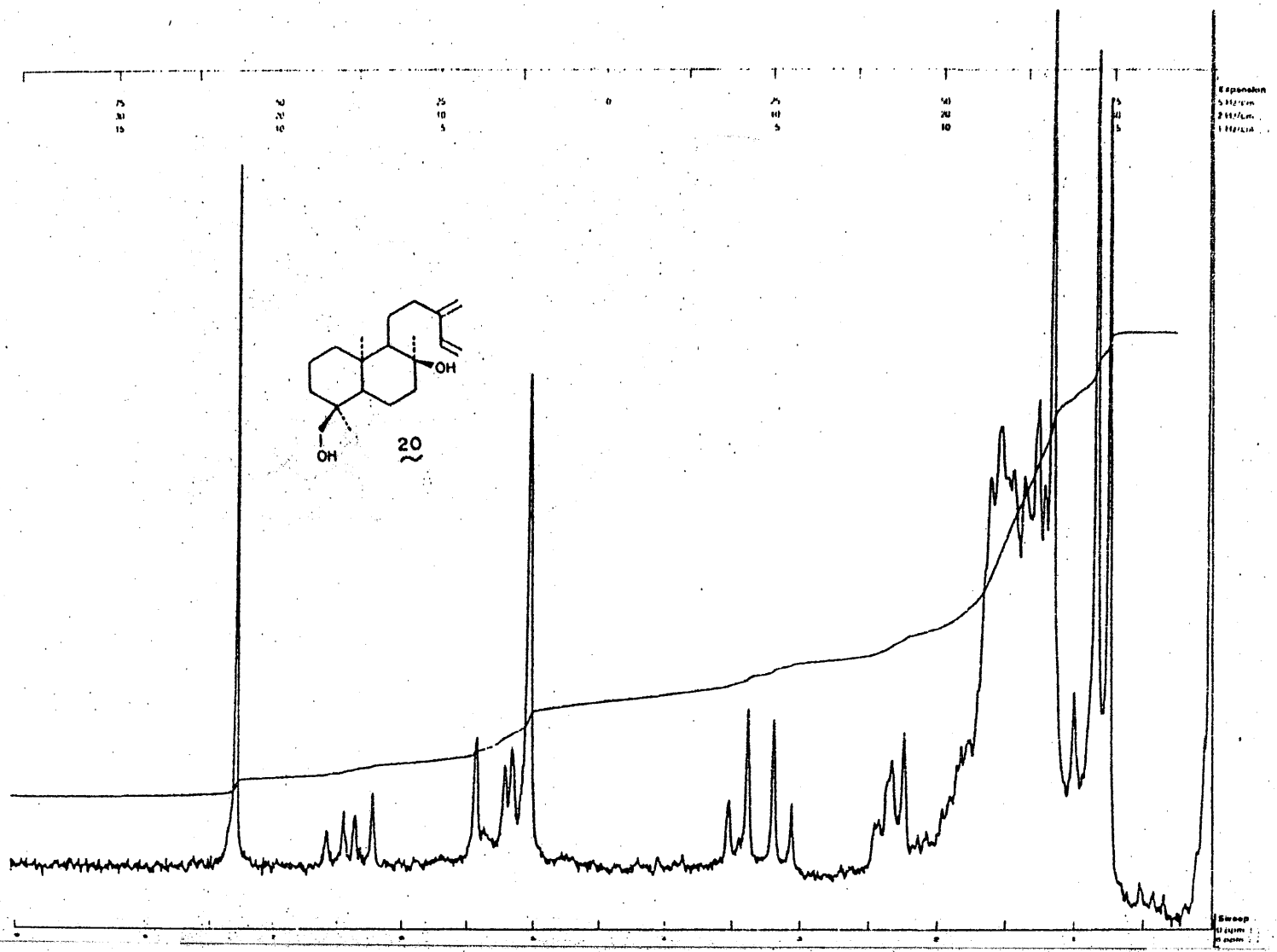
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OH
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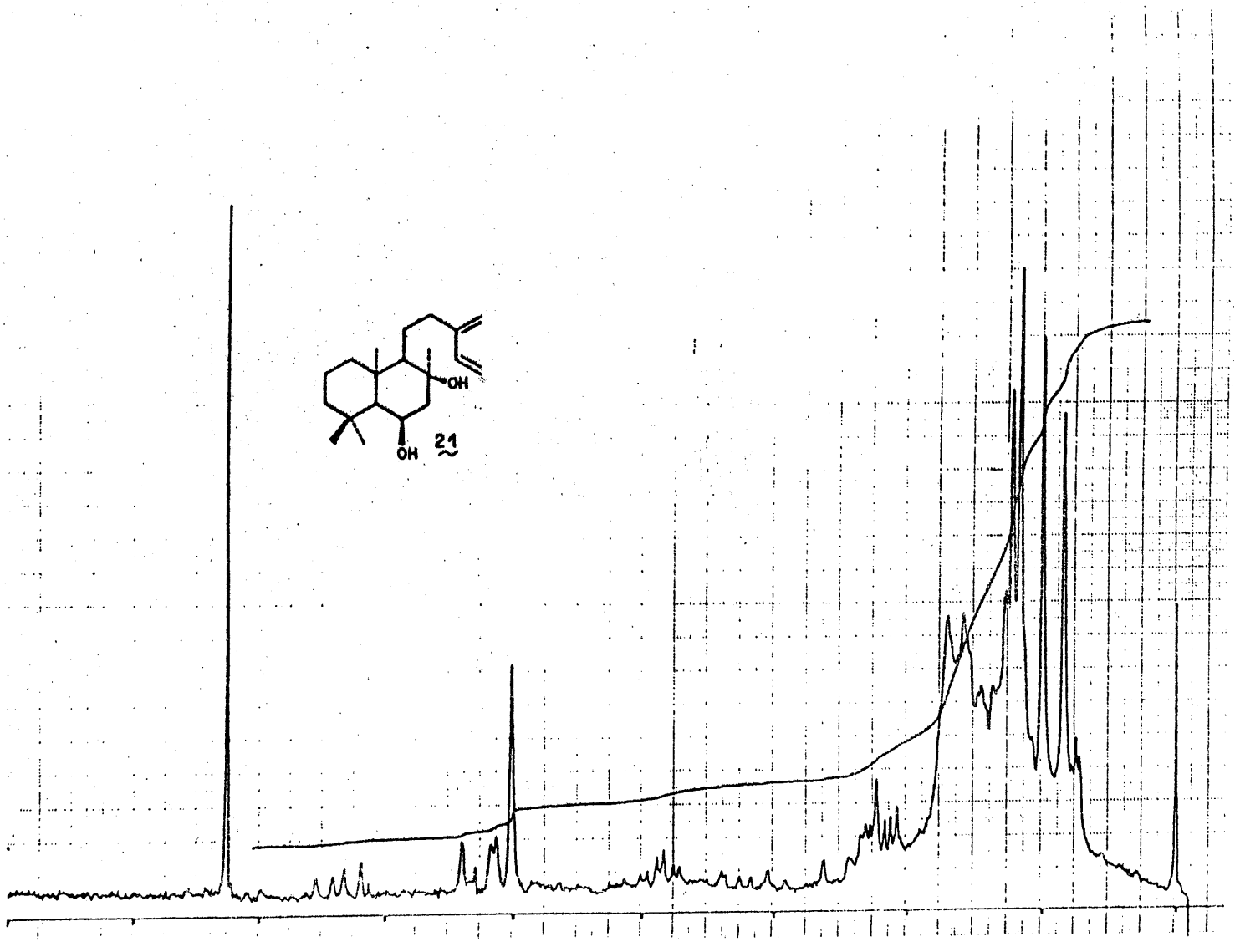

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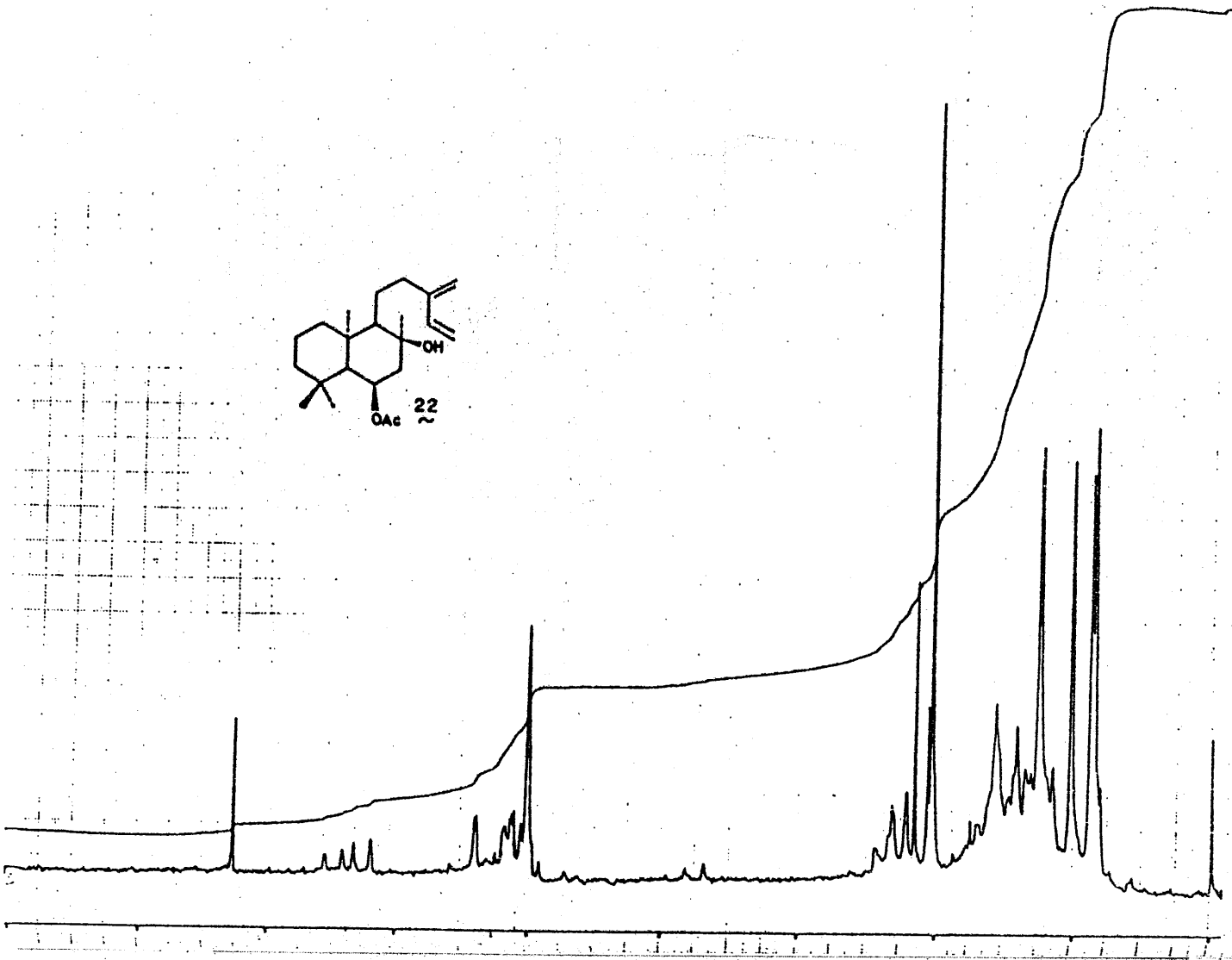

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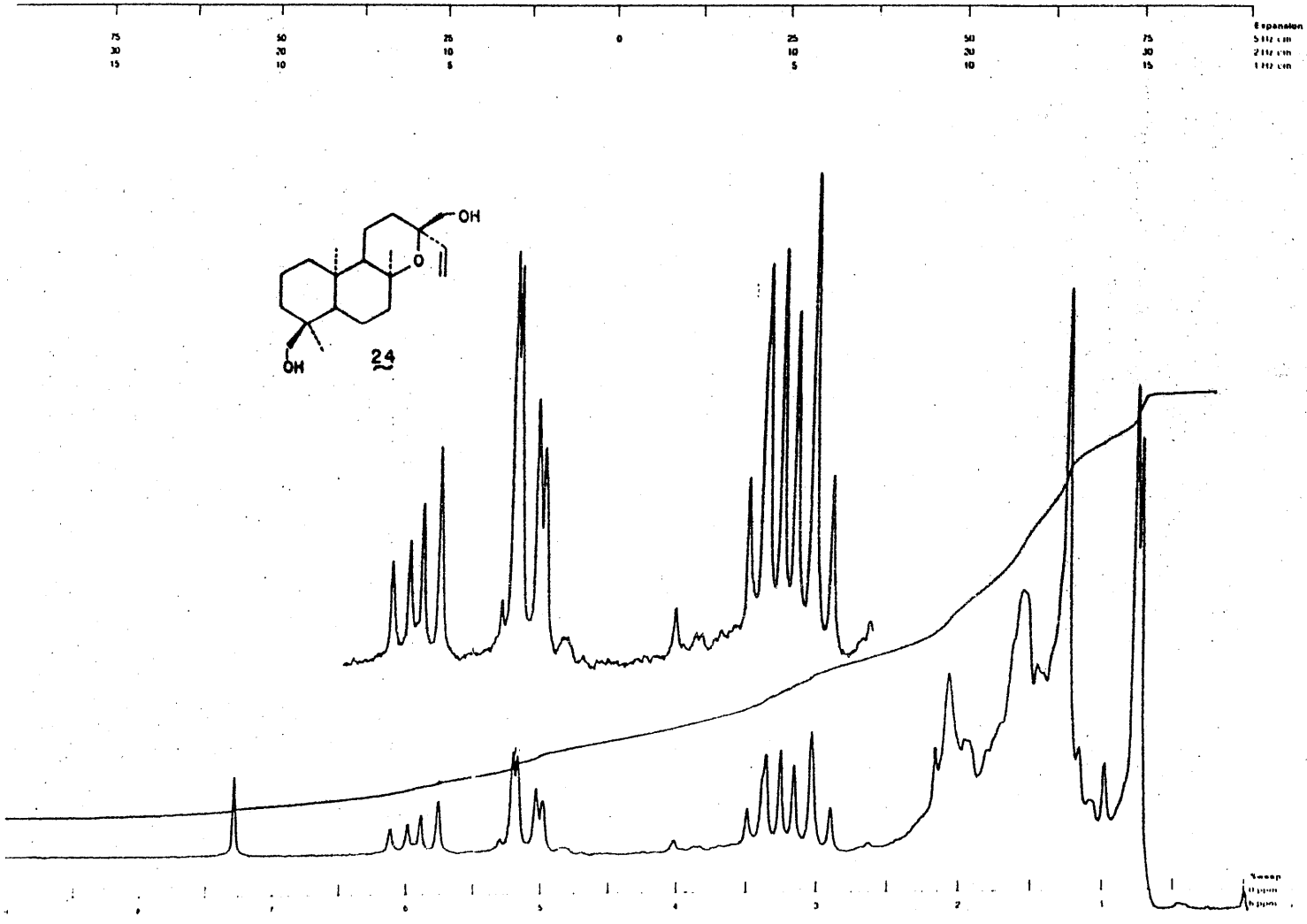
OH
O
OH
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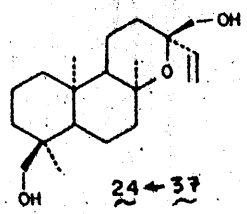

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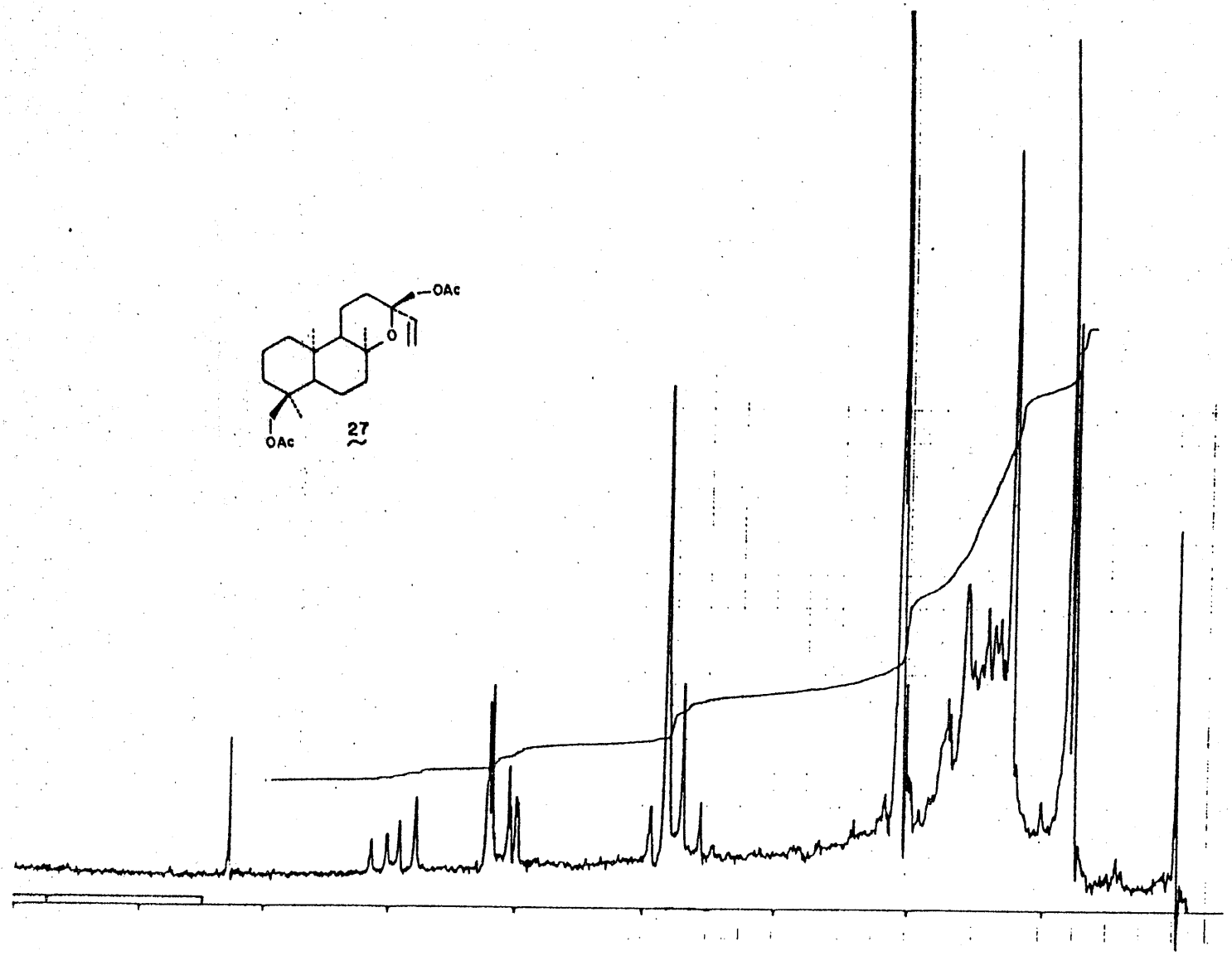

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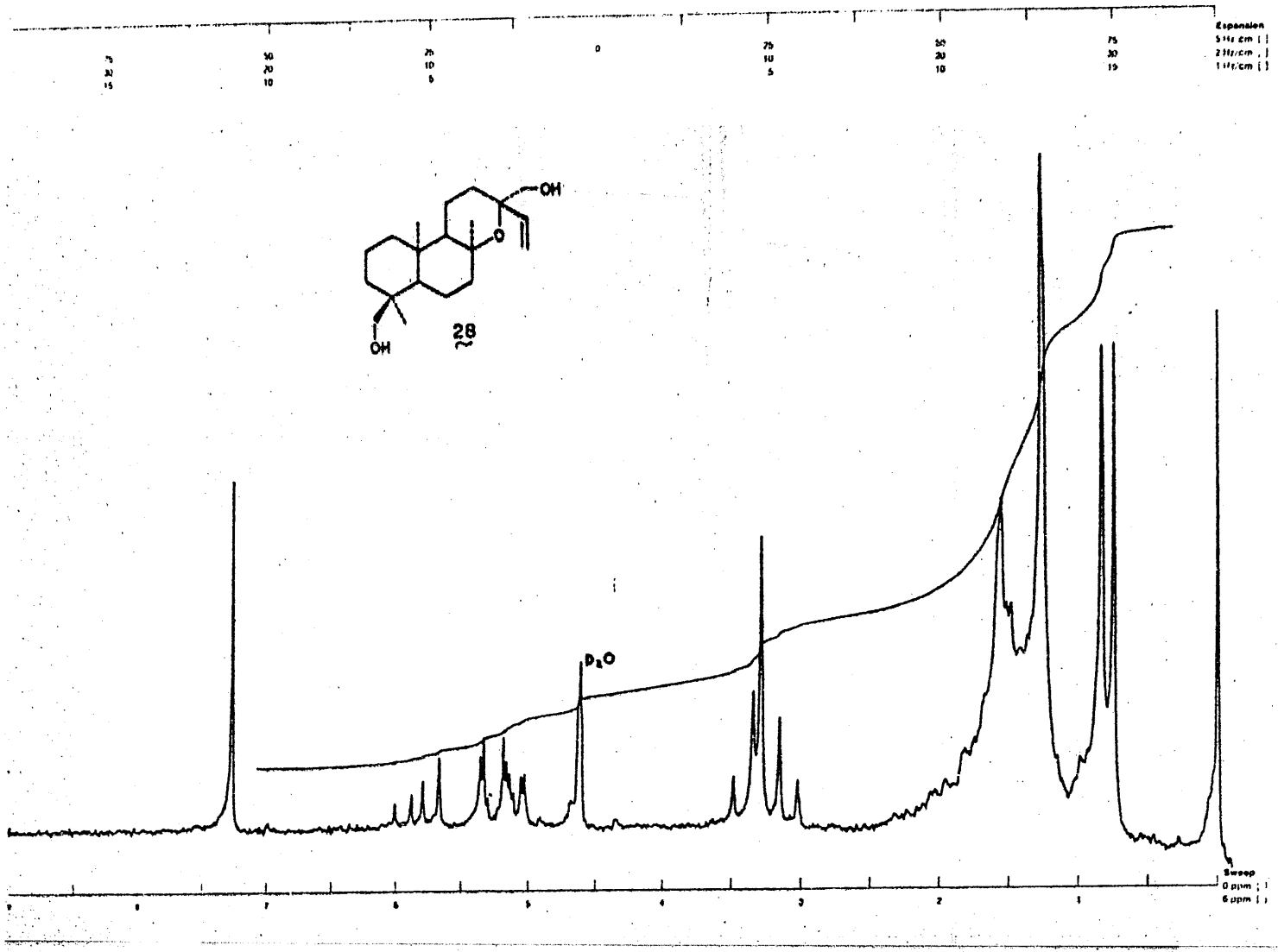
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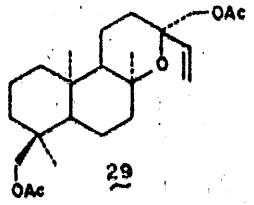
OH
O
28
D2O
Sweep
0 ppm
6 ppm



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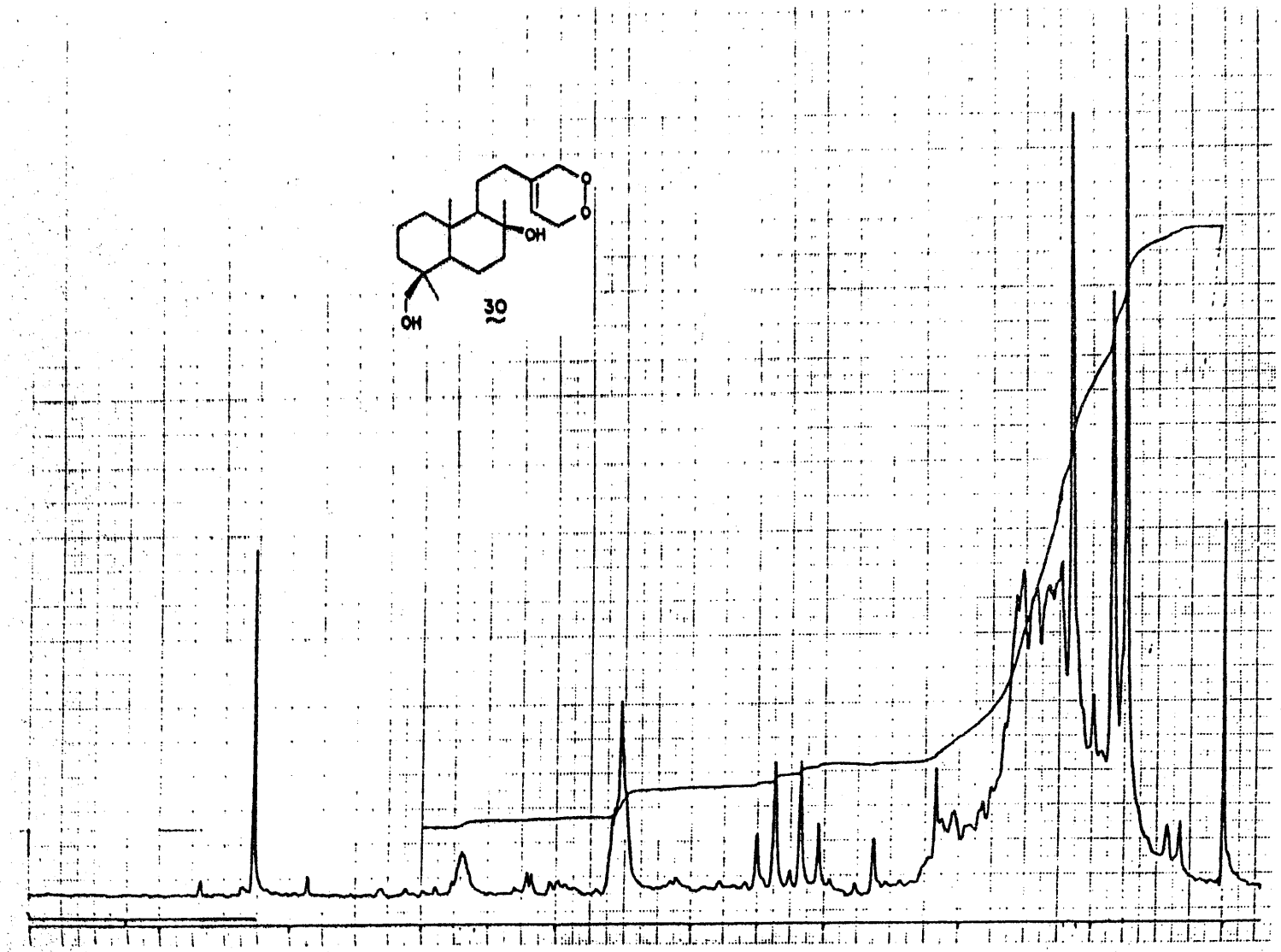

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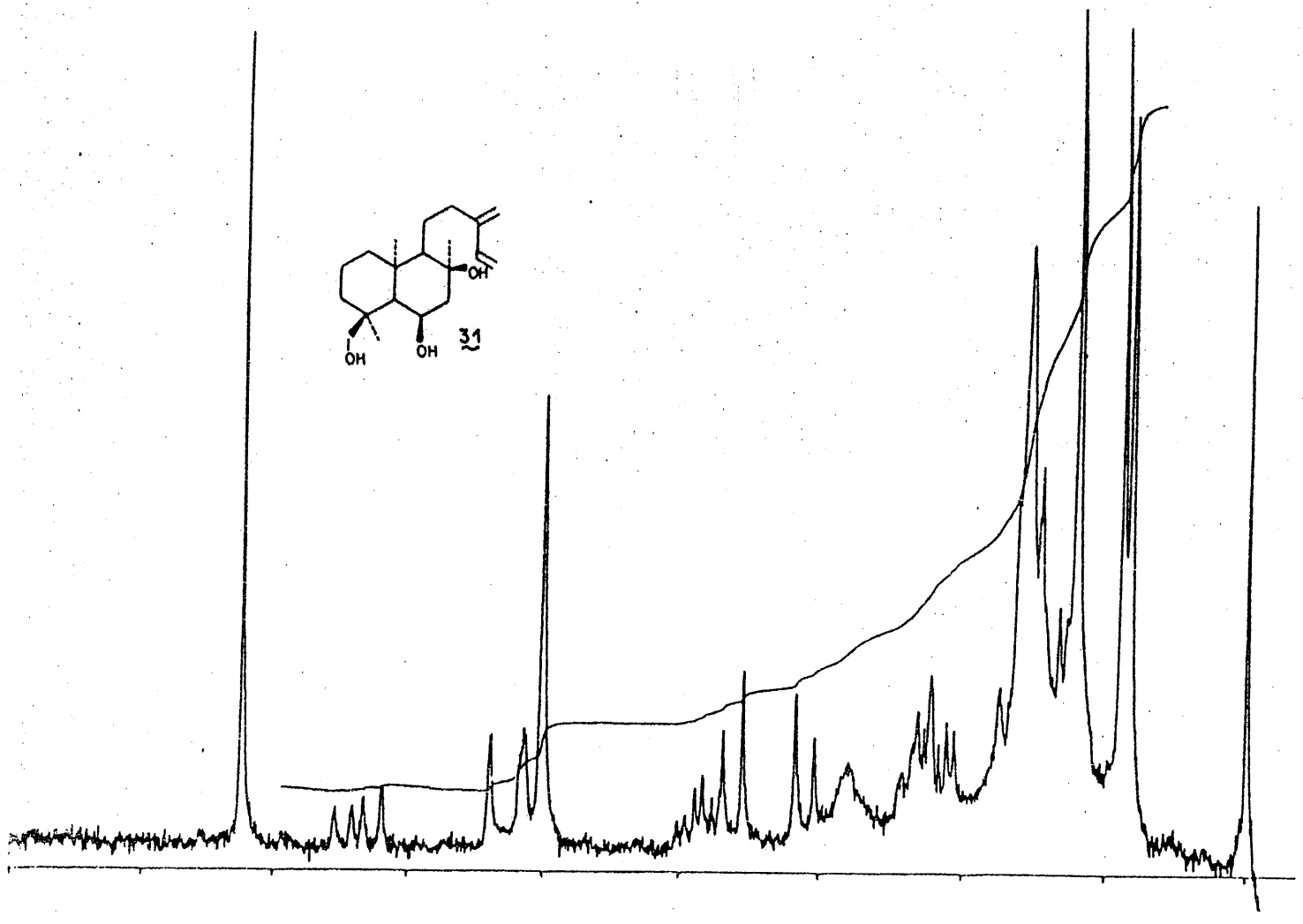

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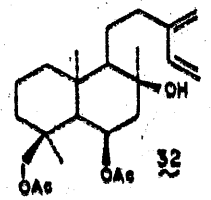

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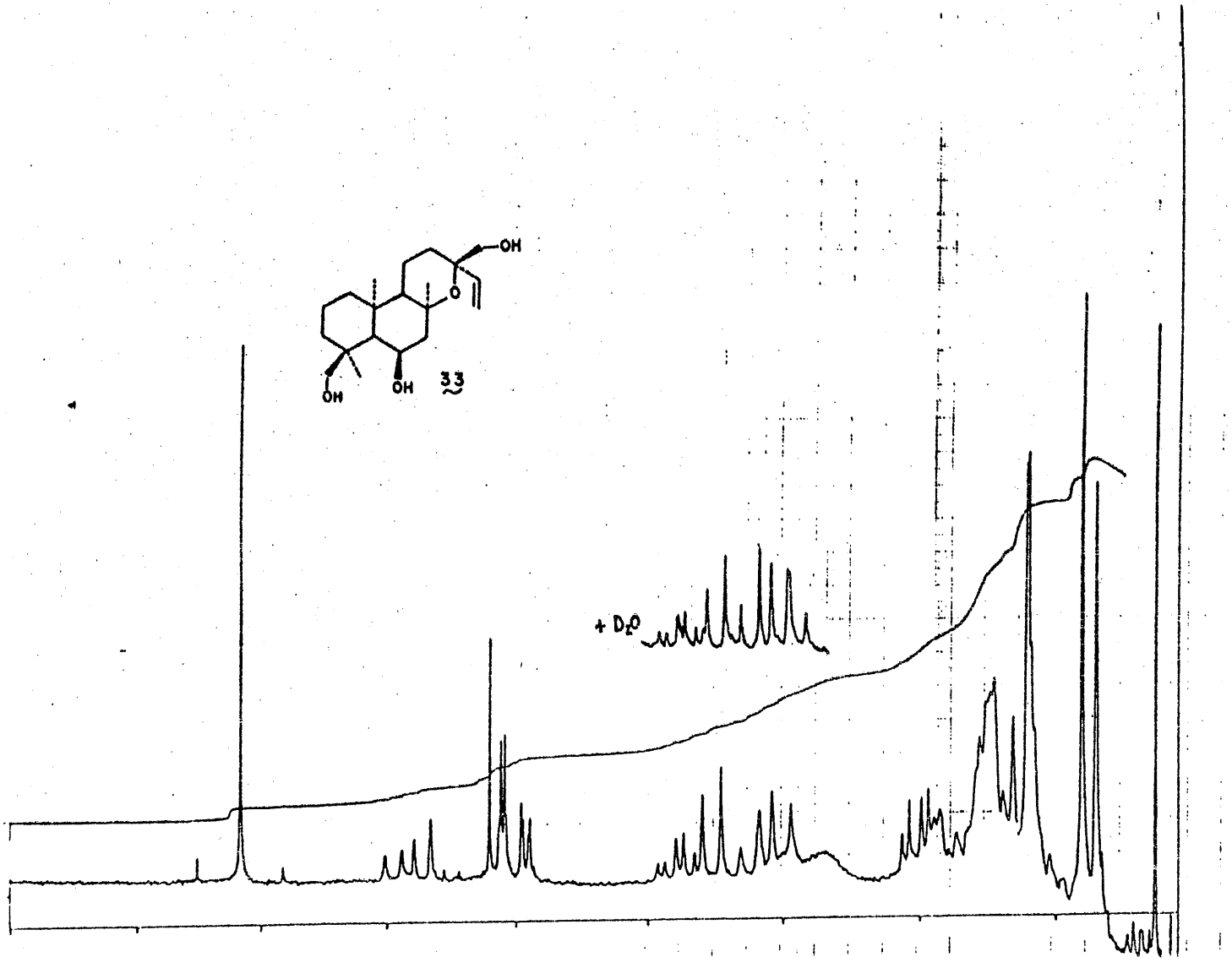
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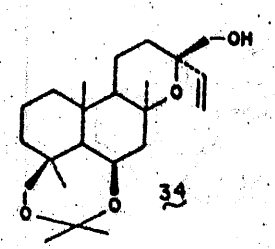
O
OH
OH
33
+ D2O



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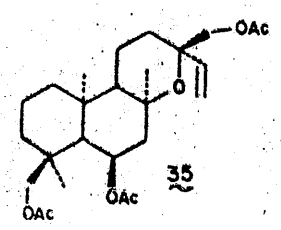

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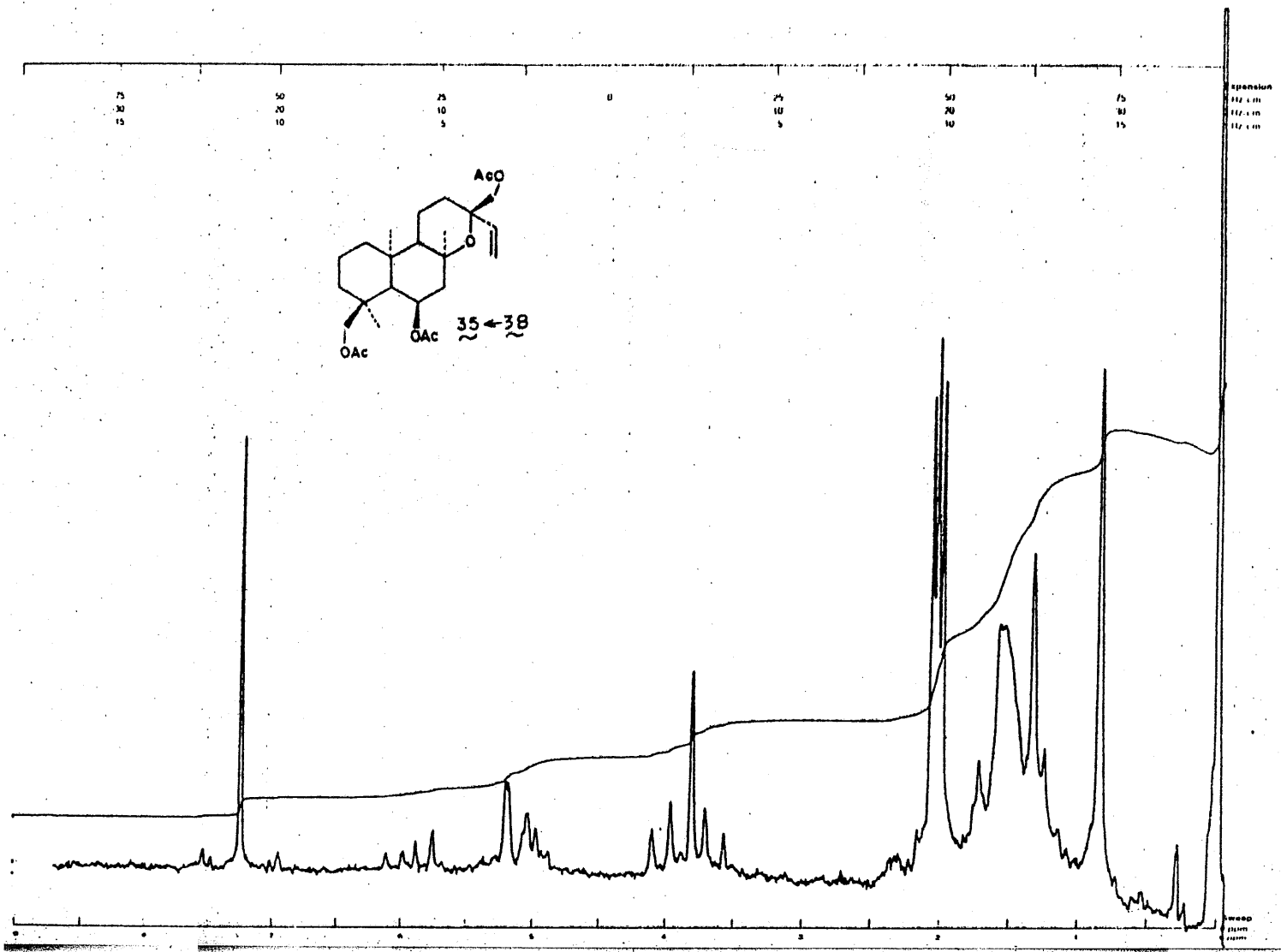
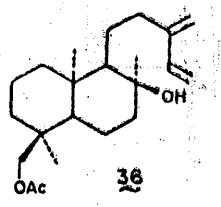

AcO
OAc
OAc
35 ← 38



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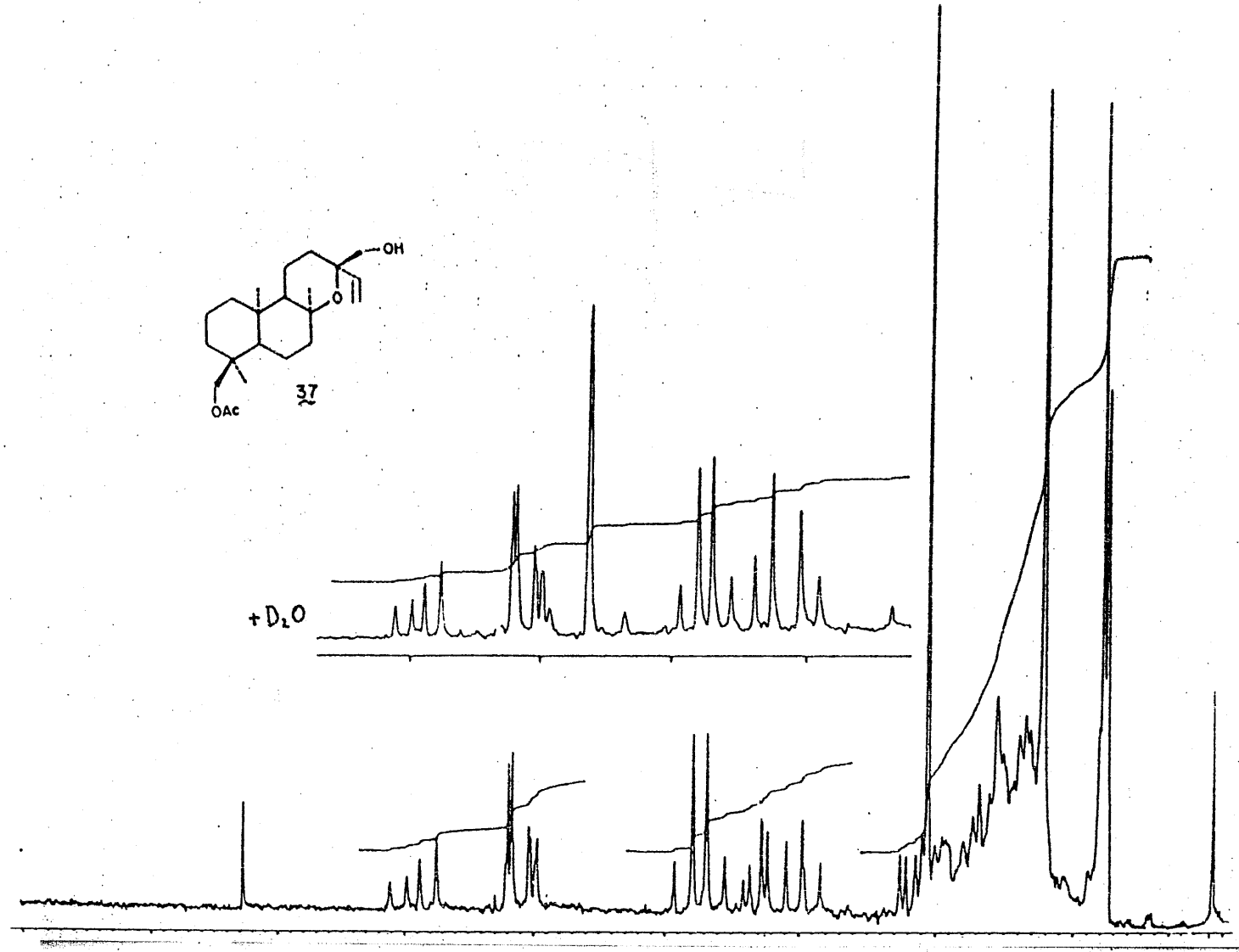
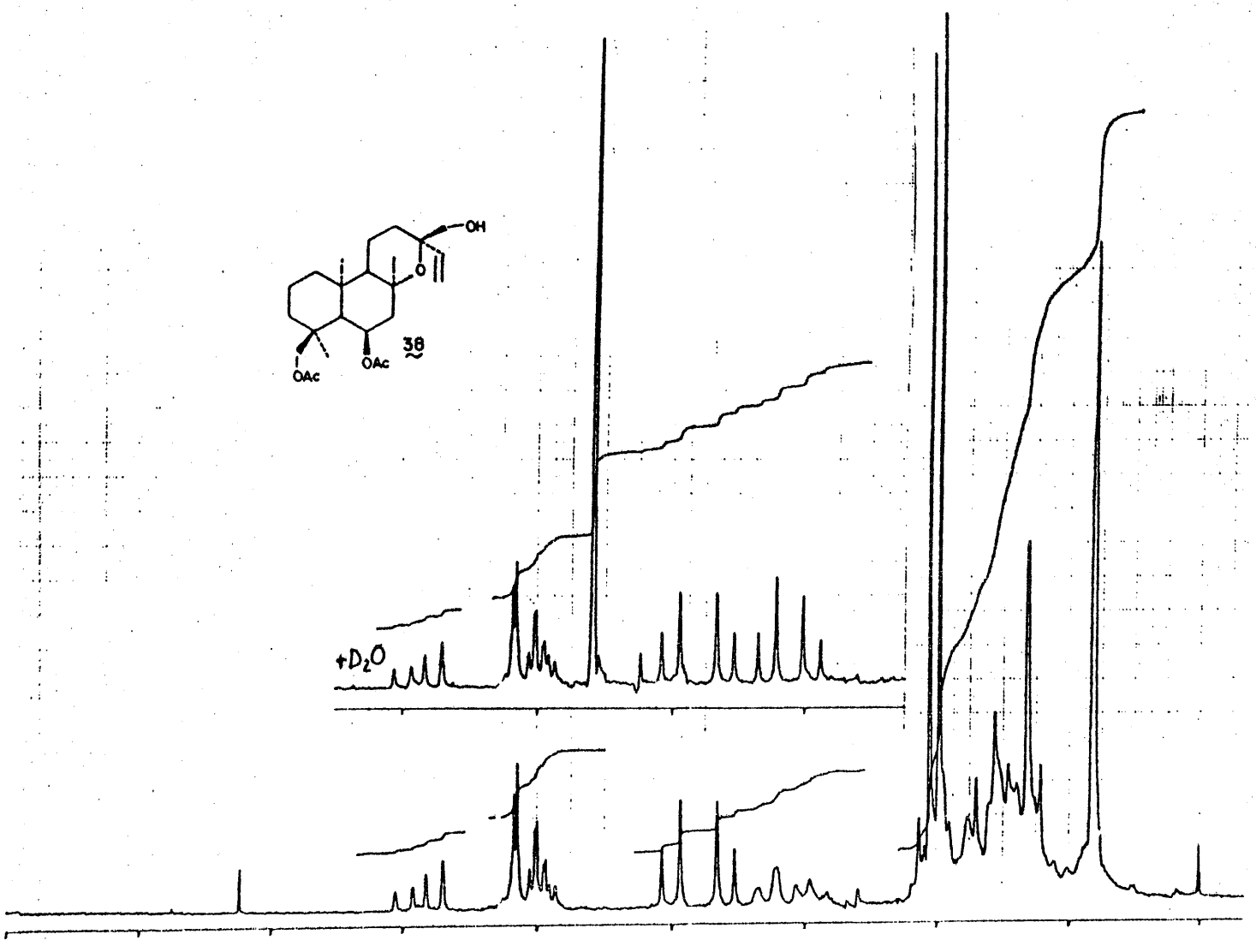
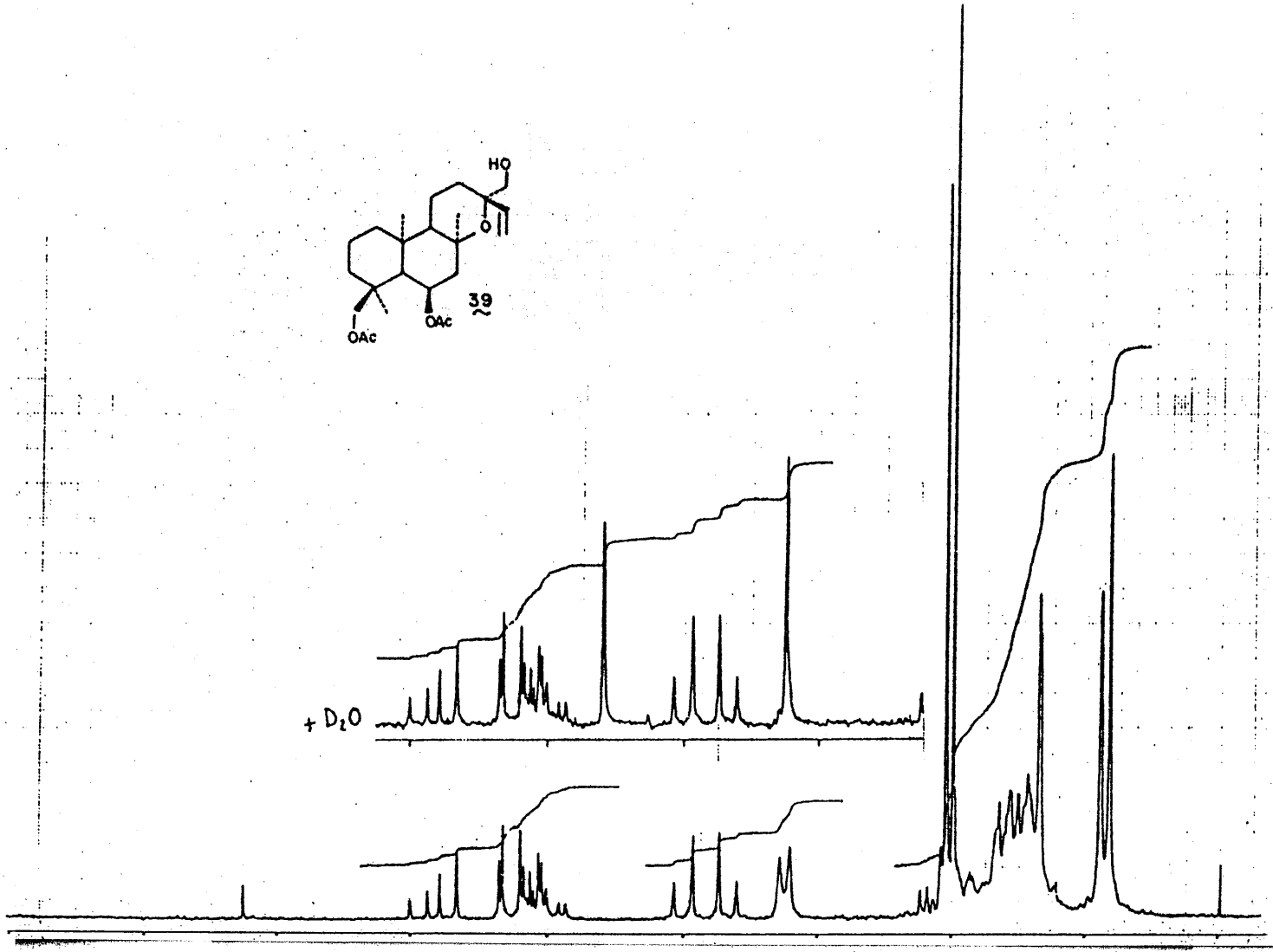

OH
OAc
37
+ D₂O


OH
O
OAc
OAc
38
+D2O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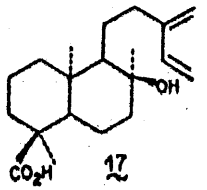
O
OAc
OAc
39
+ D2O

ESPECTROS ^{13}C RMN



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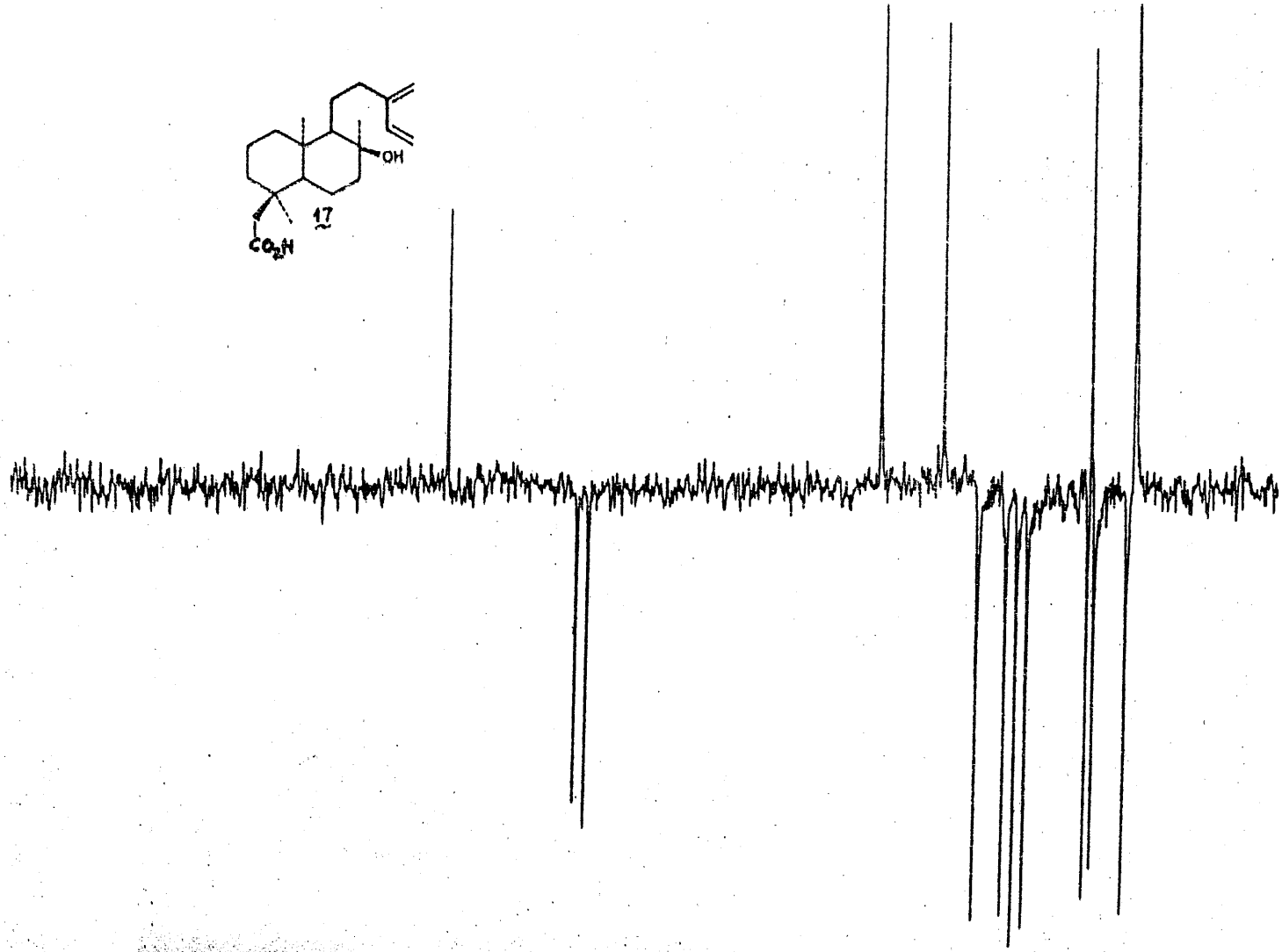

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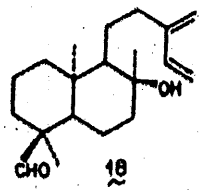

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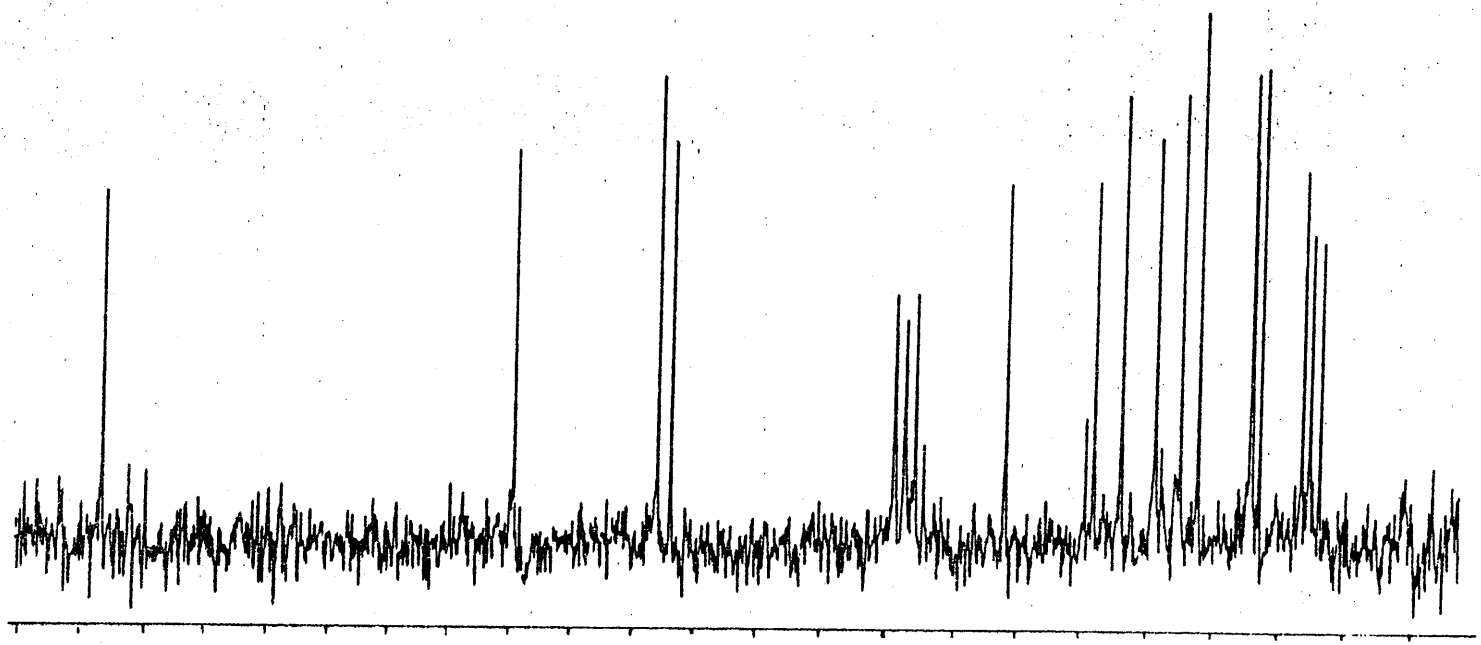

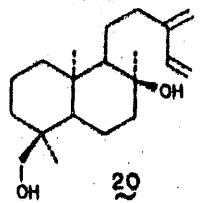

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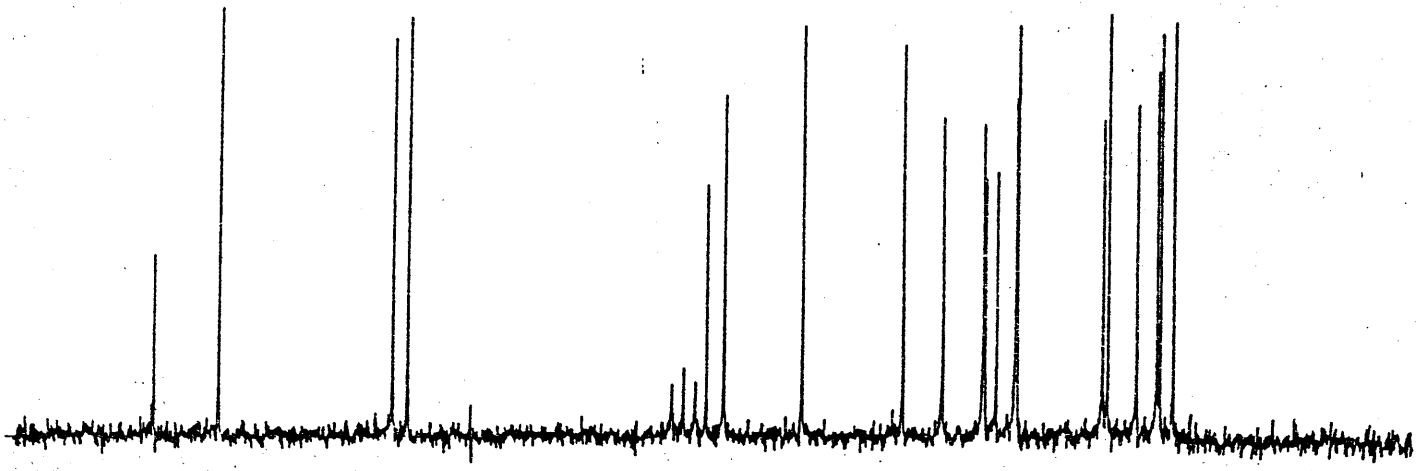

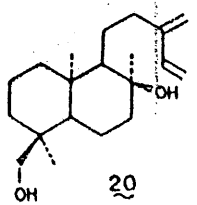

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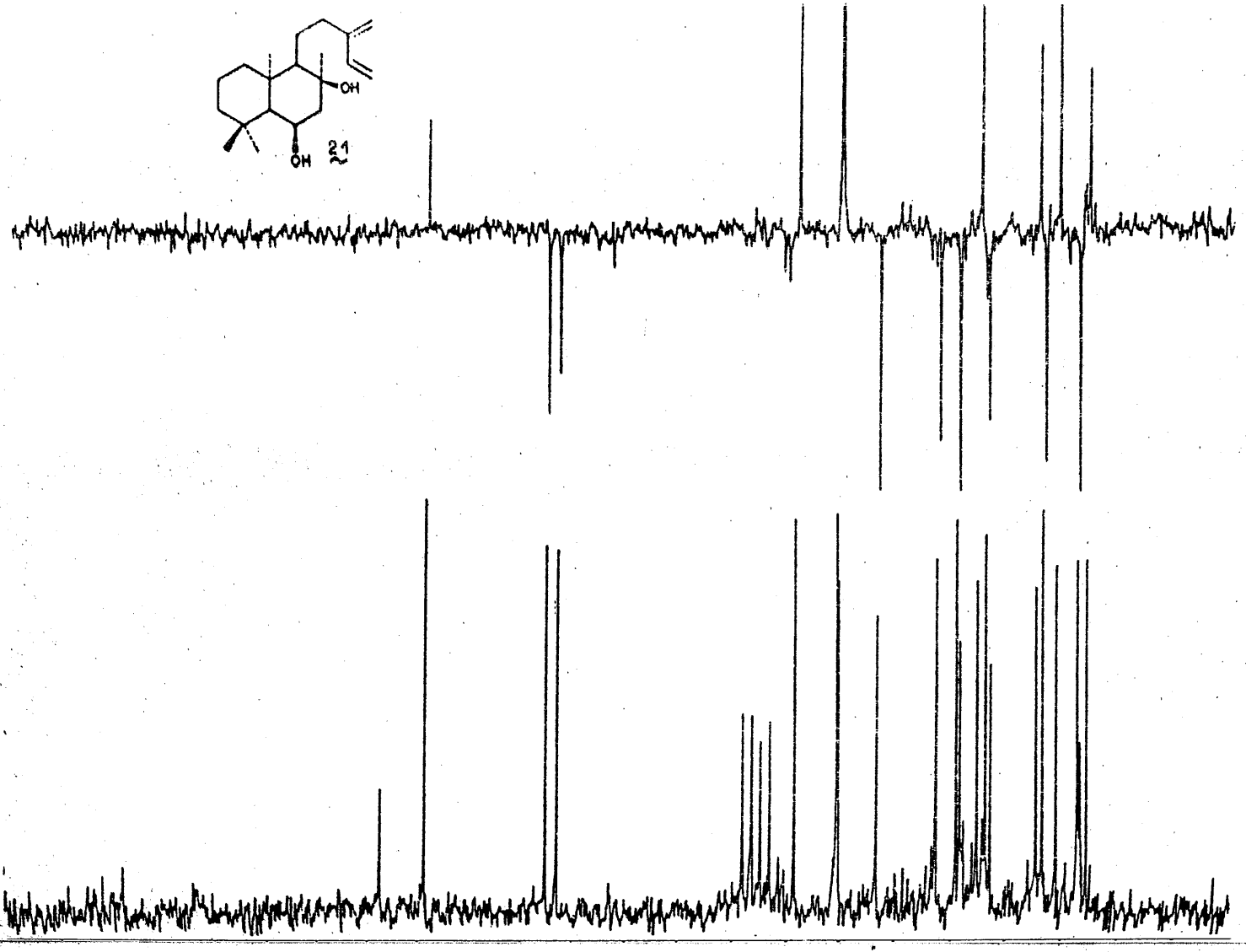

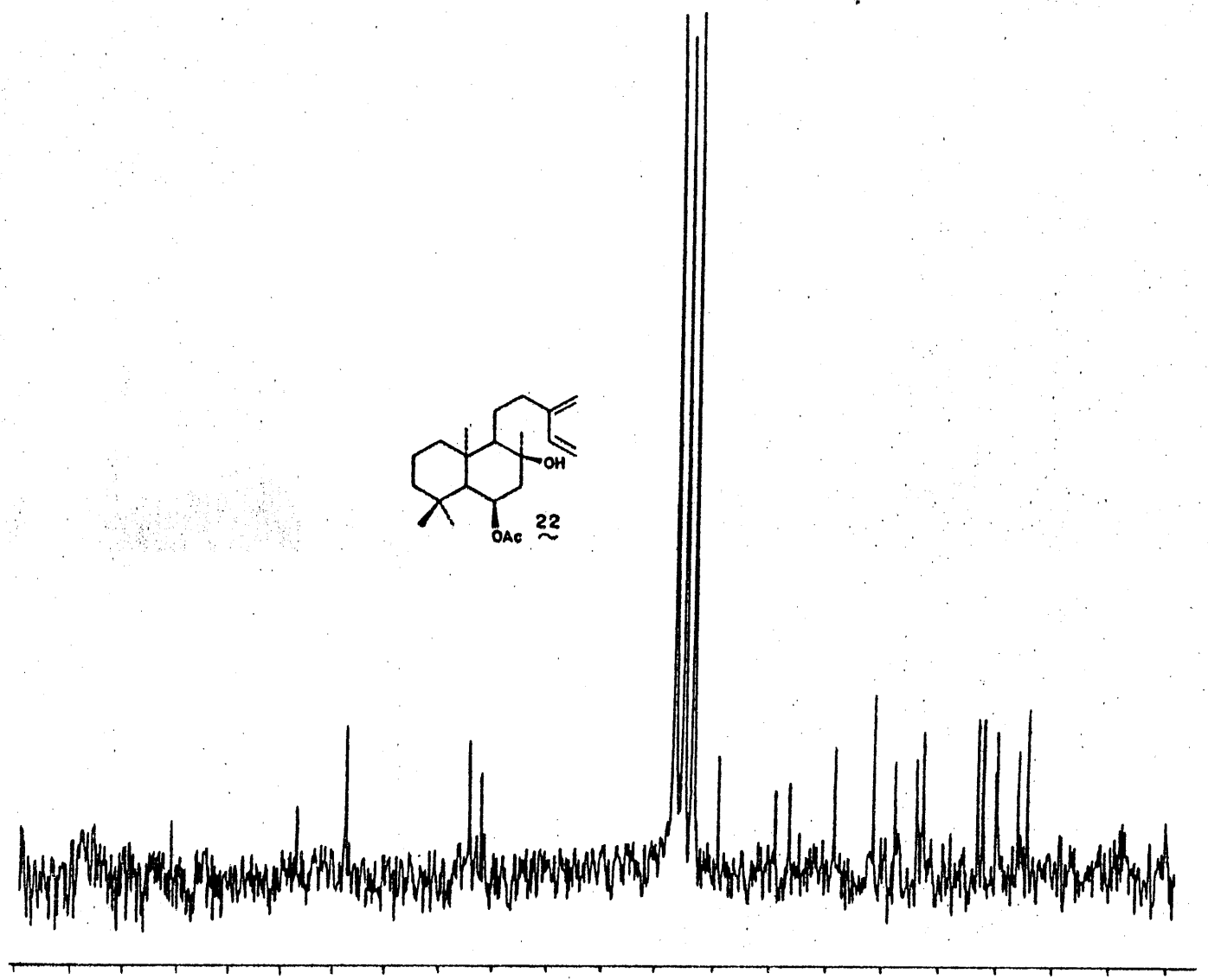

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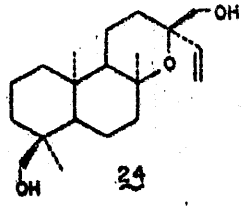

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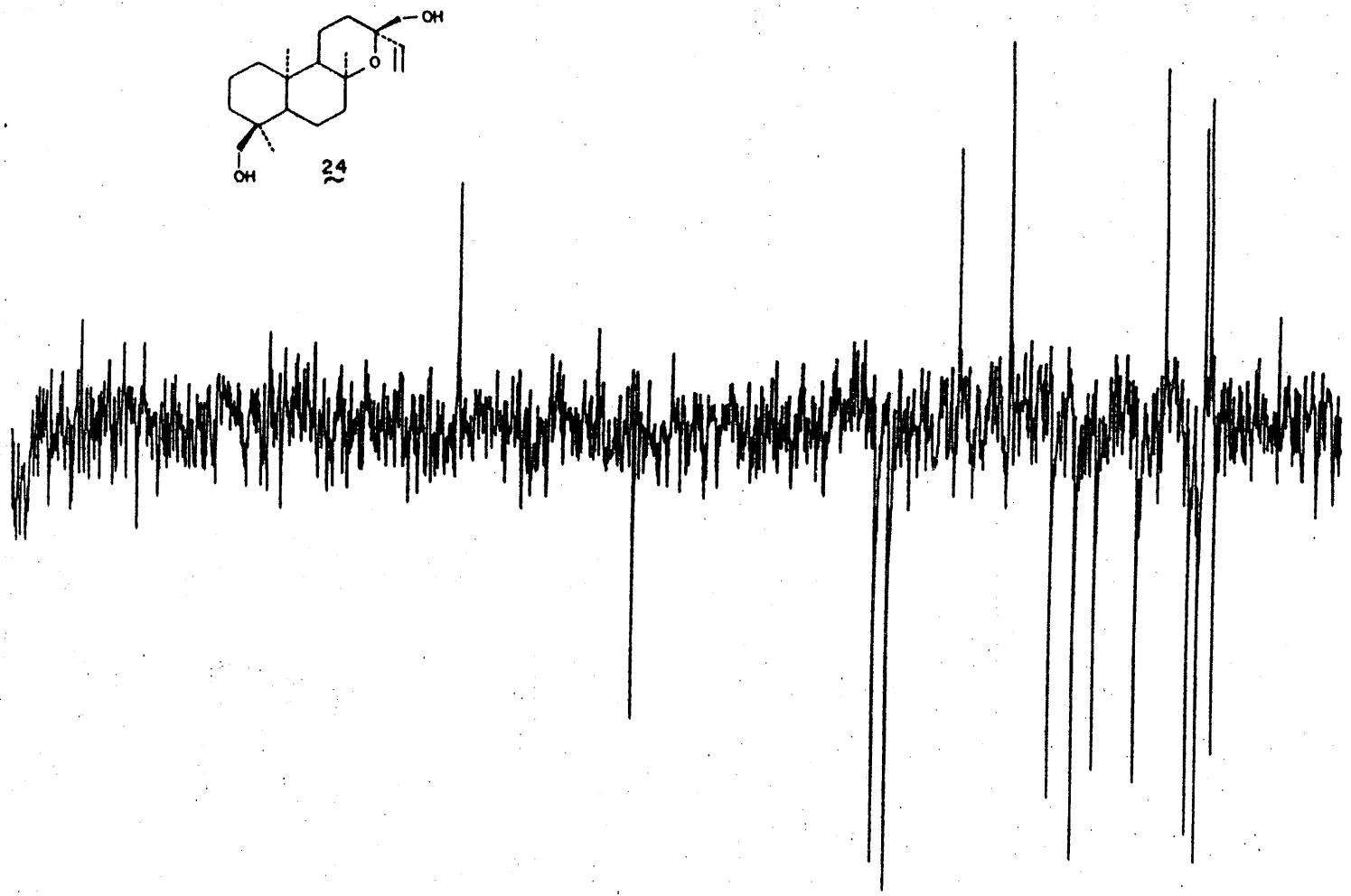

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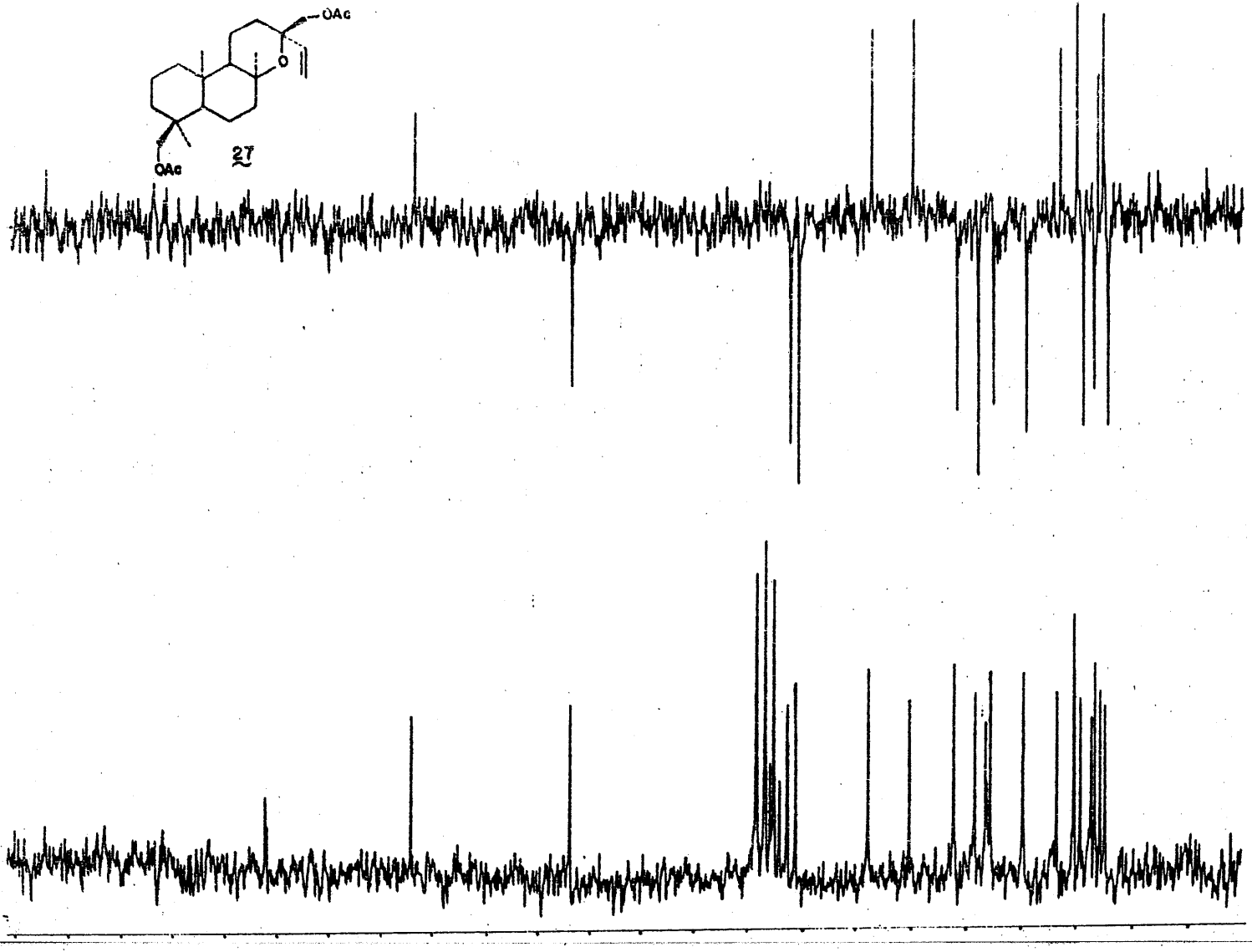

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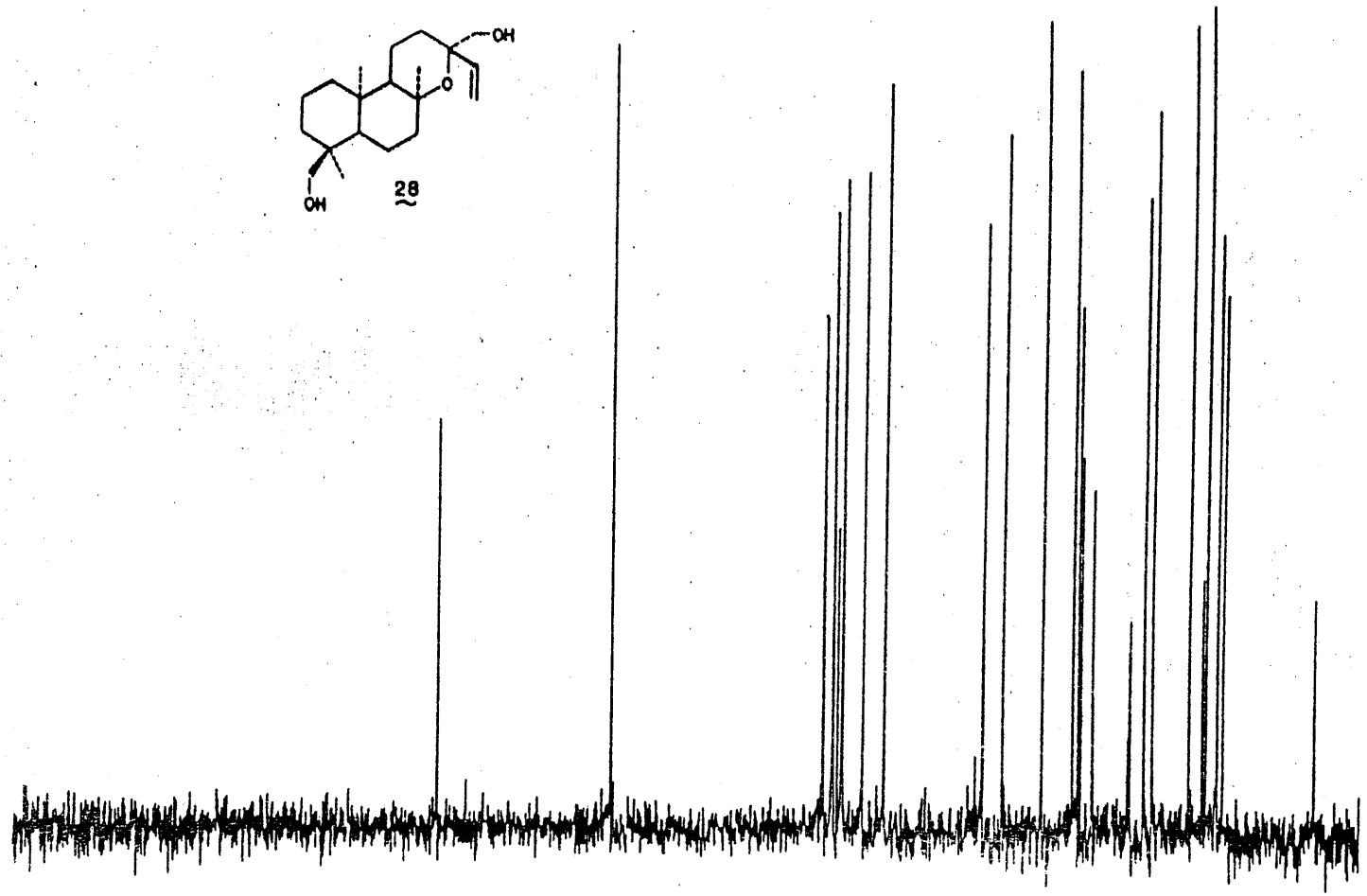

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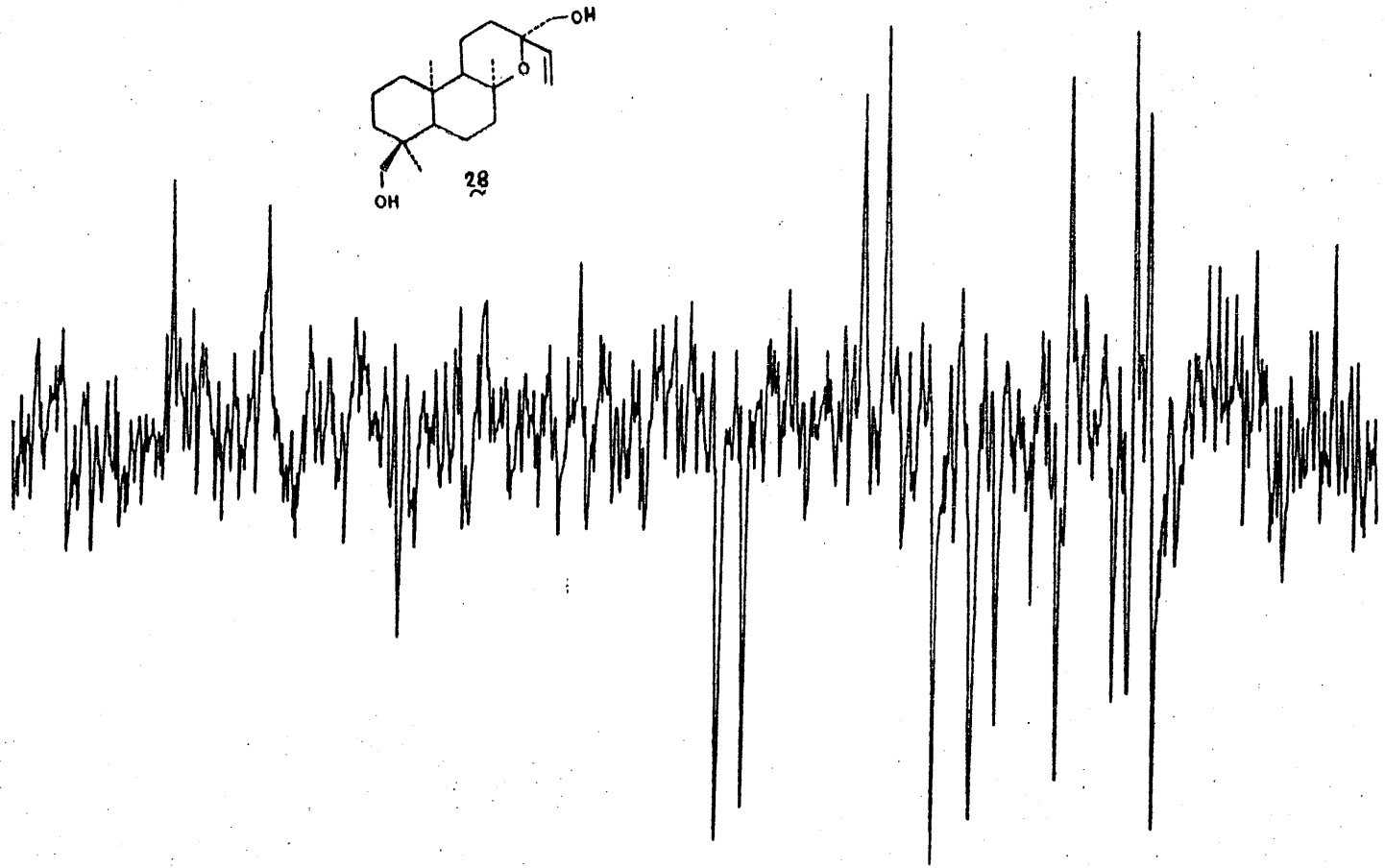

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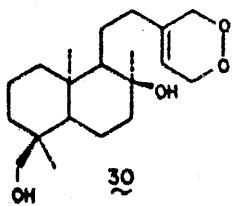

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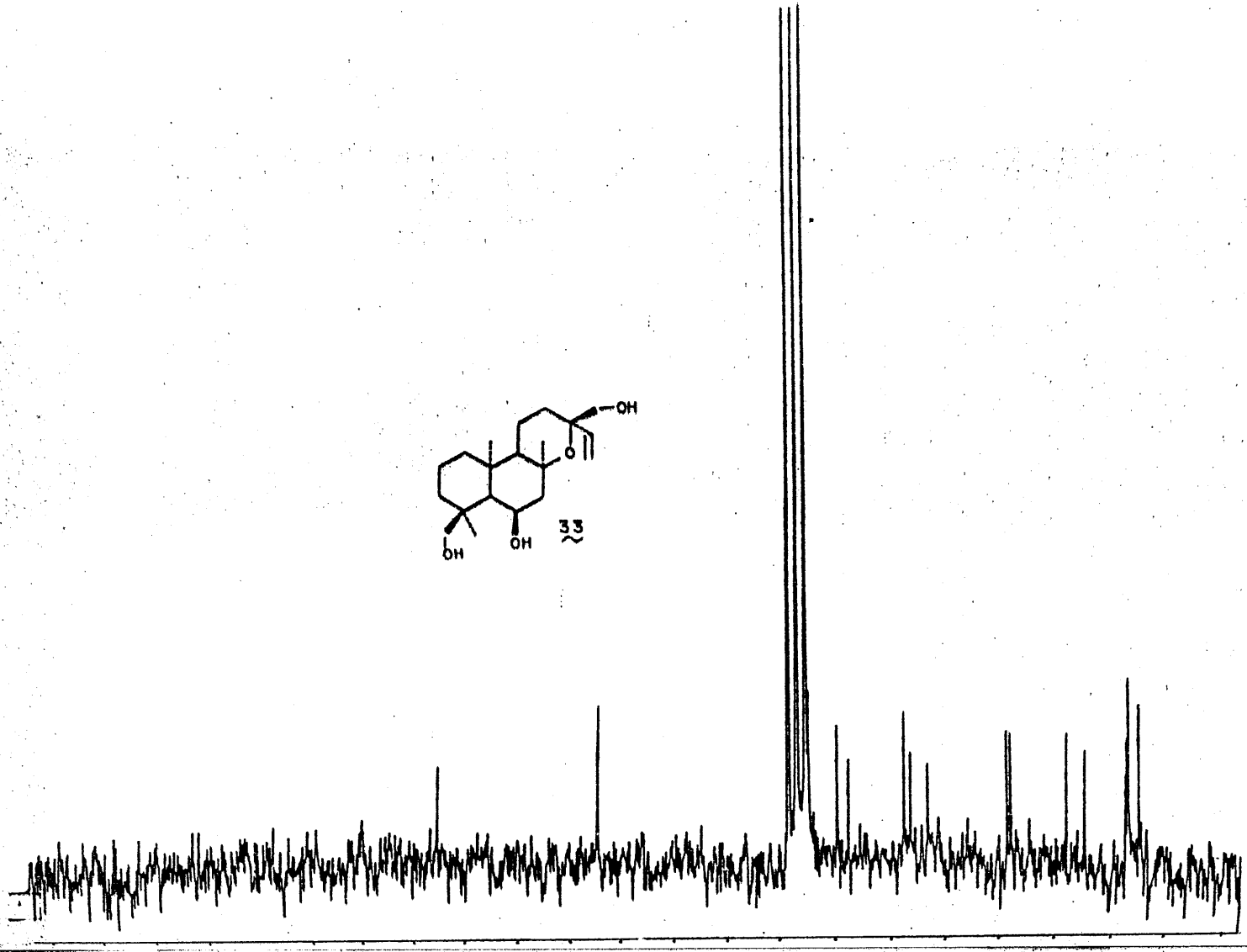

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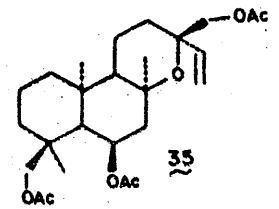

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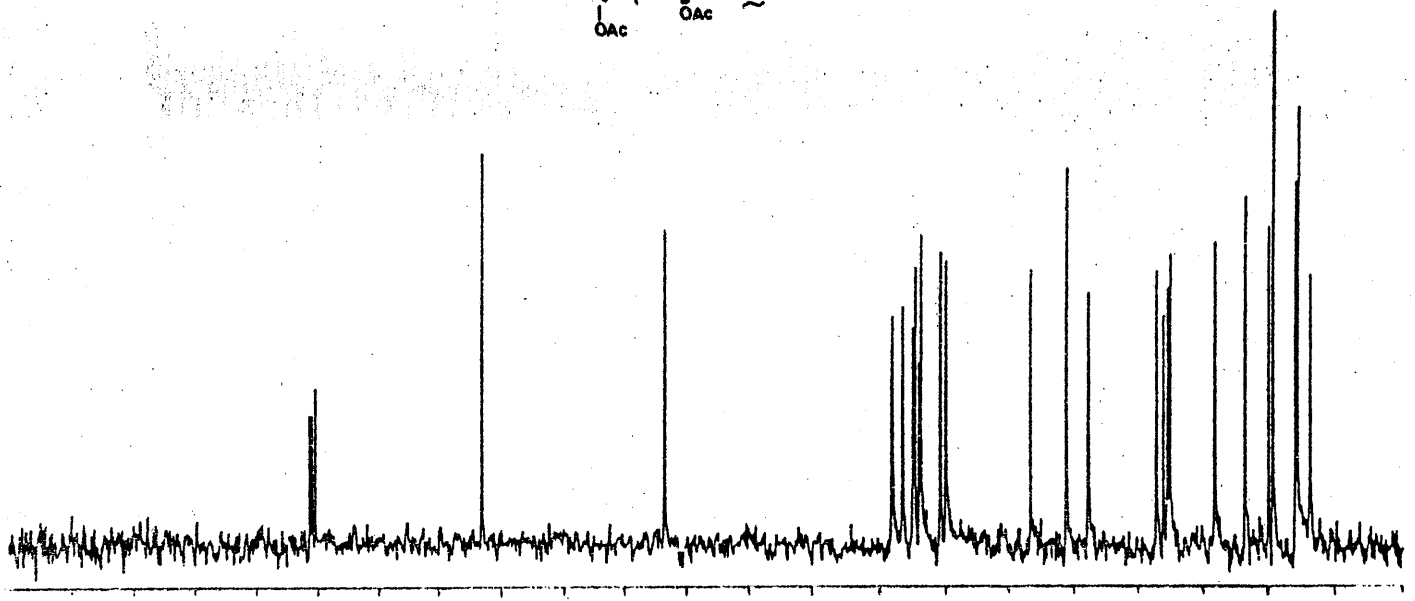

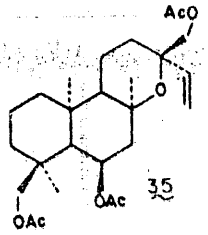

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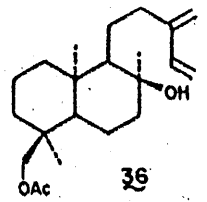

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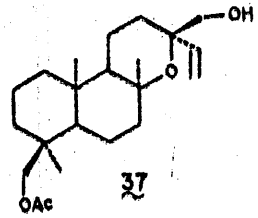

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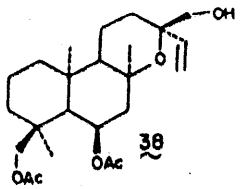

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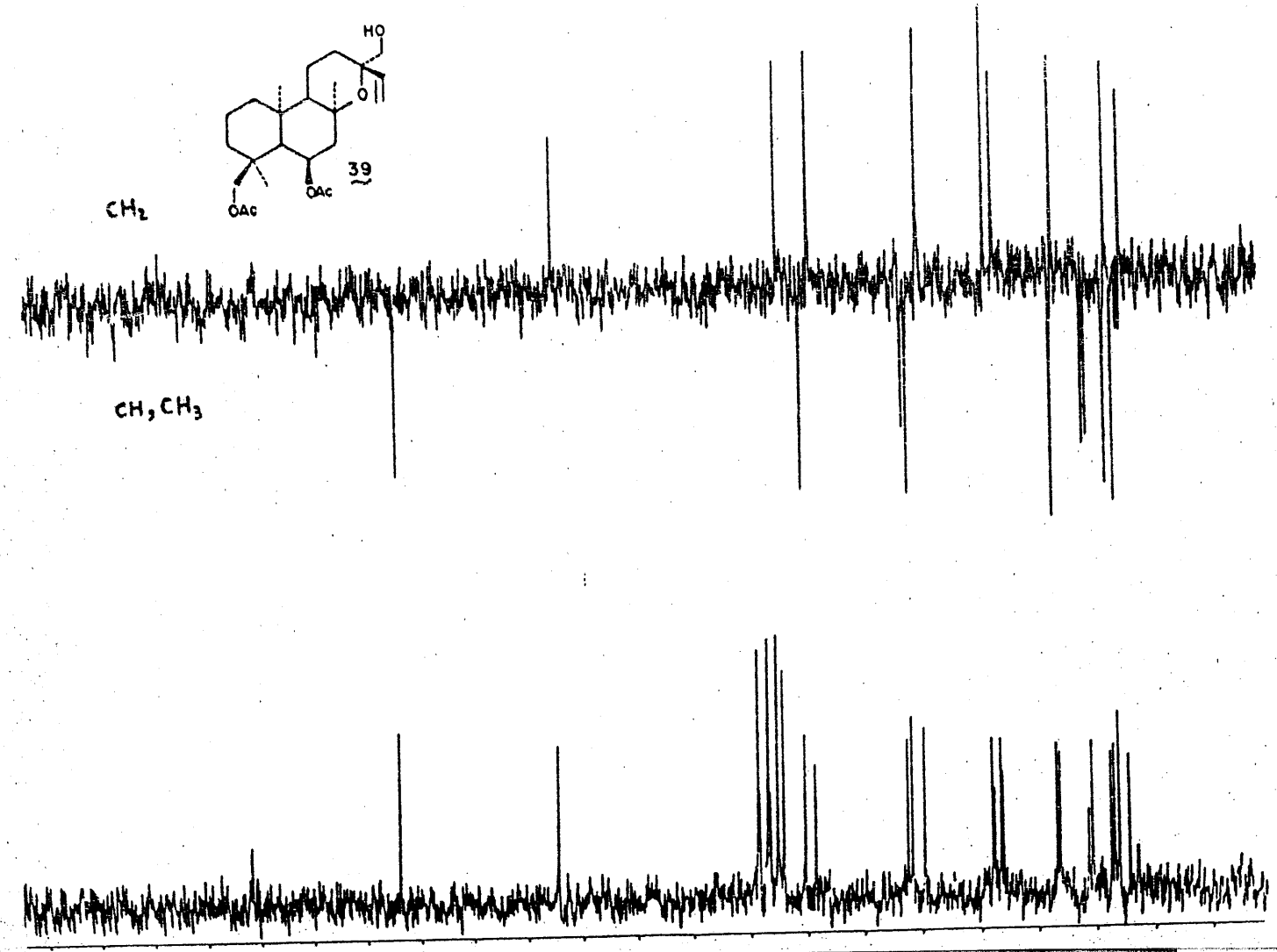
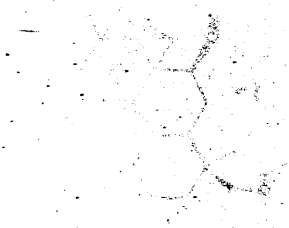
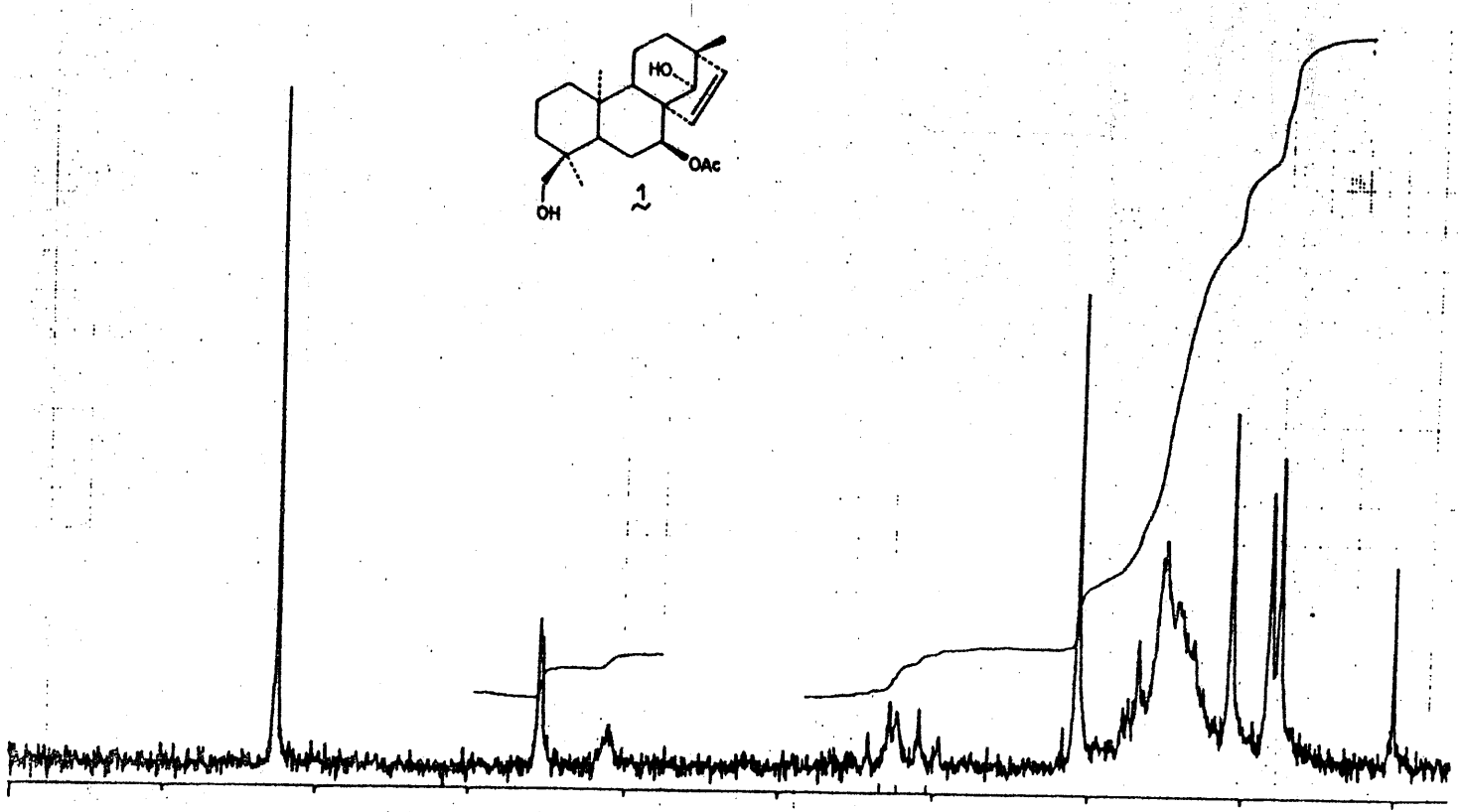

HO
O
OAc
OAc
39
CH₂
CH, CH₃

P A R T E I I

ESPECTROS ^{1}H RMN





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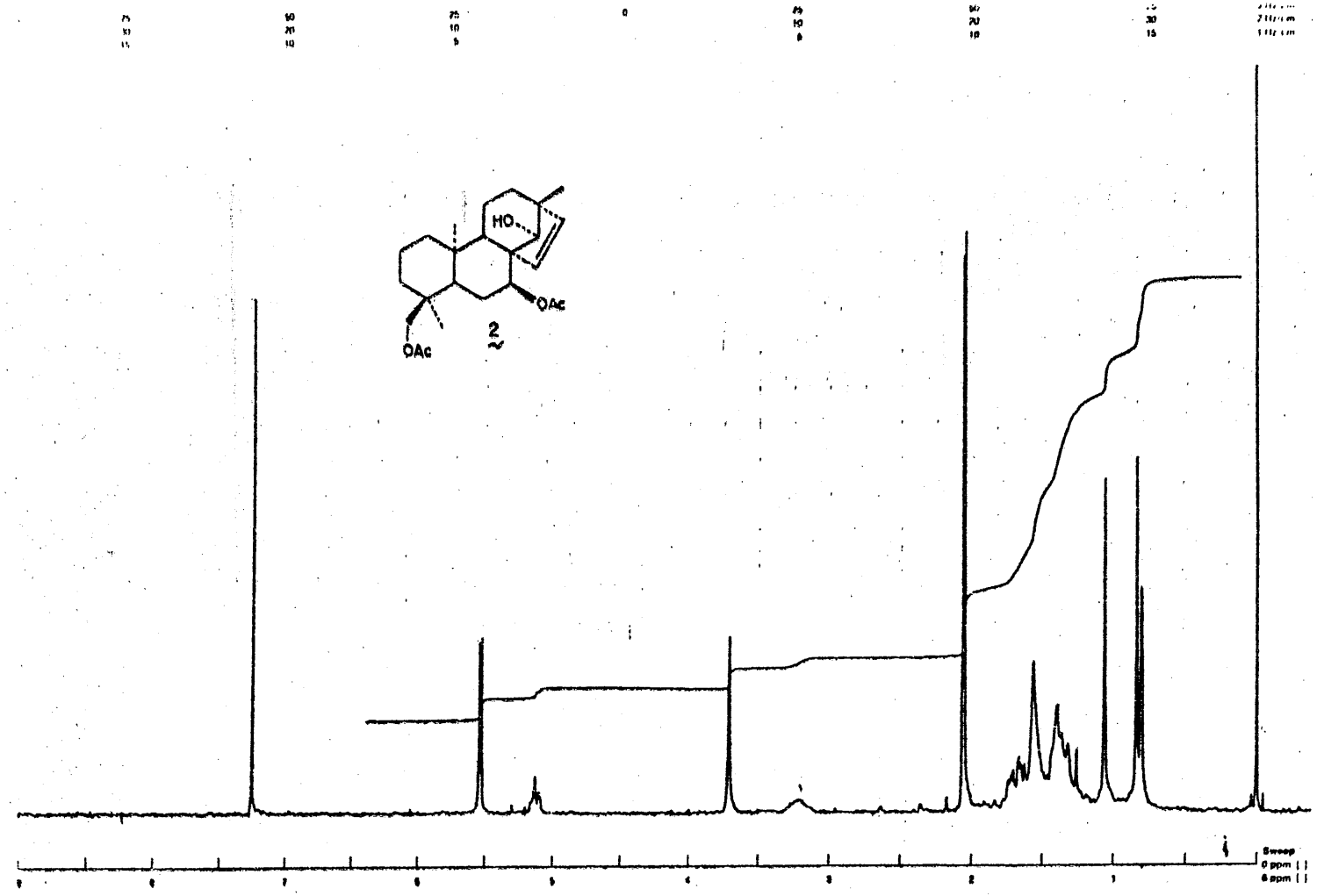
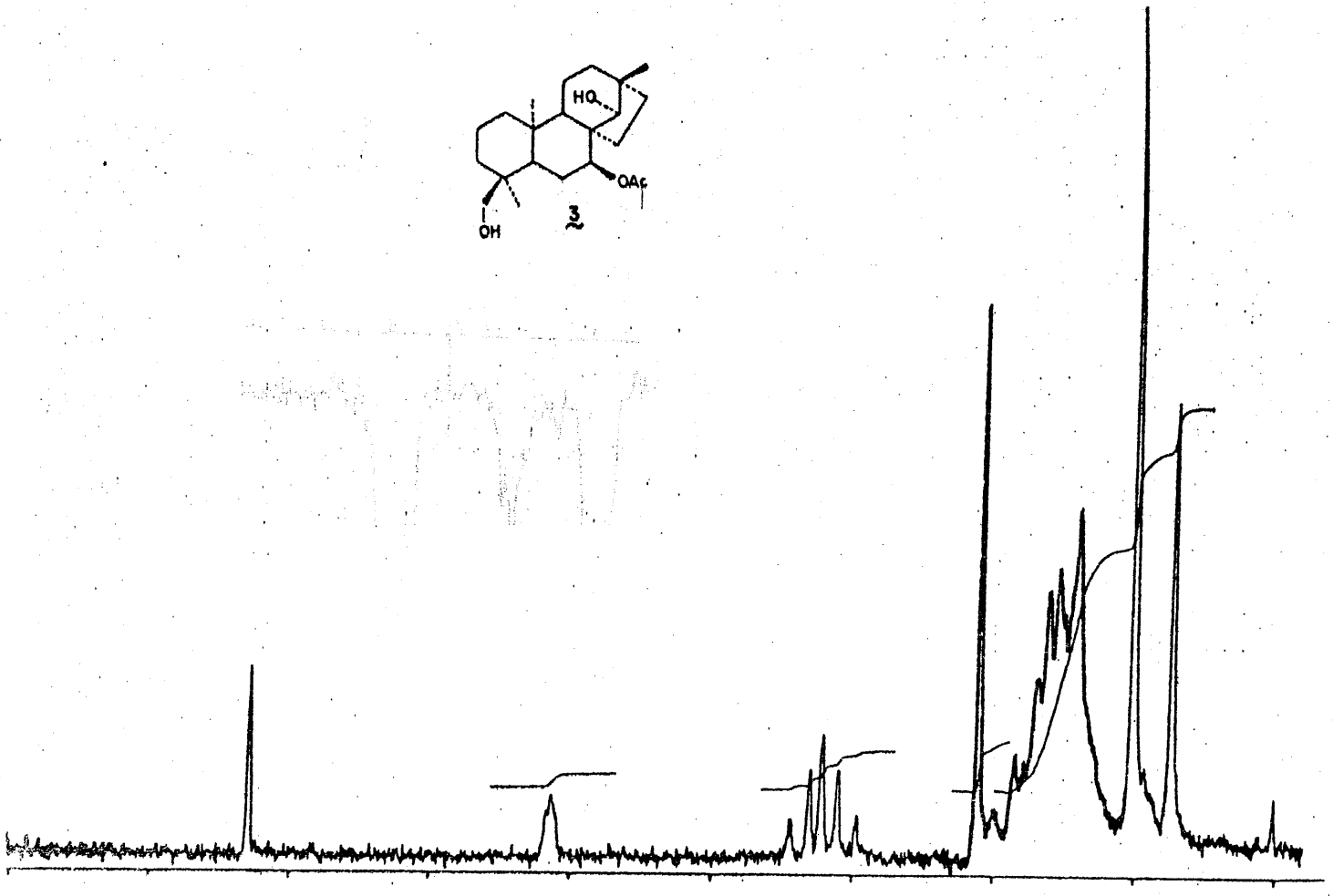

HO
OAc
OAc
2
Sweep
0 ppm
6 ppm



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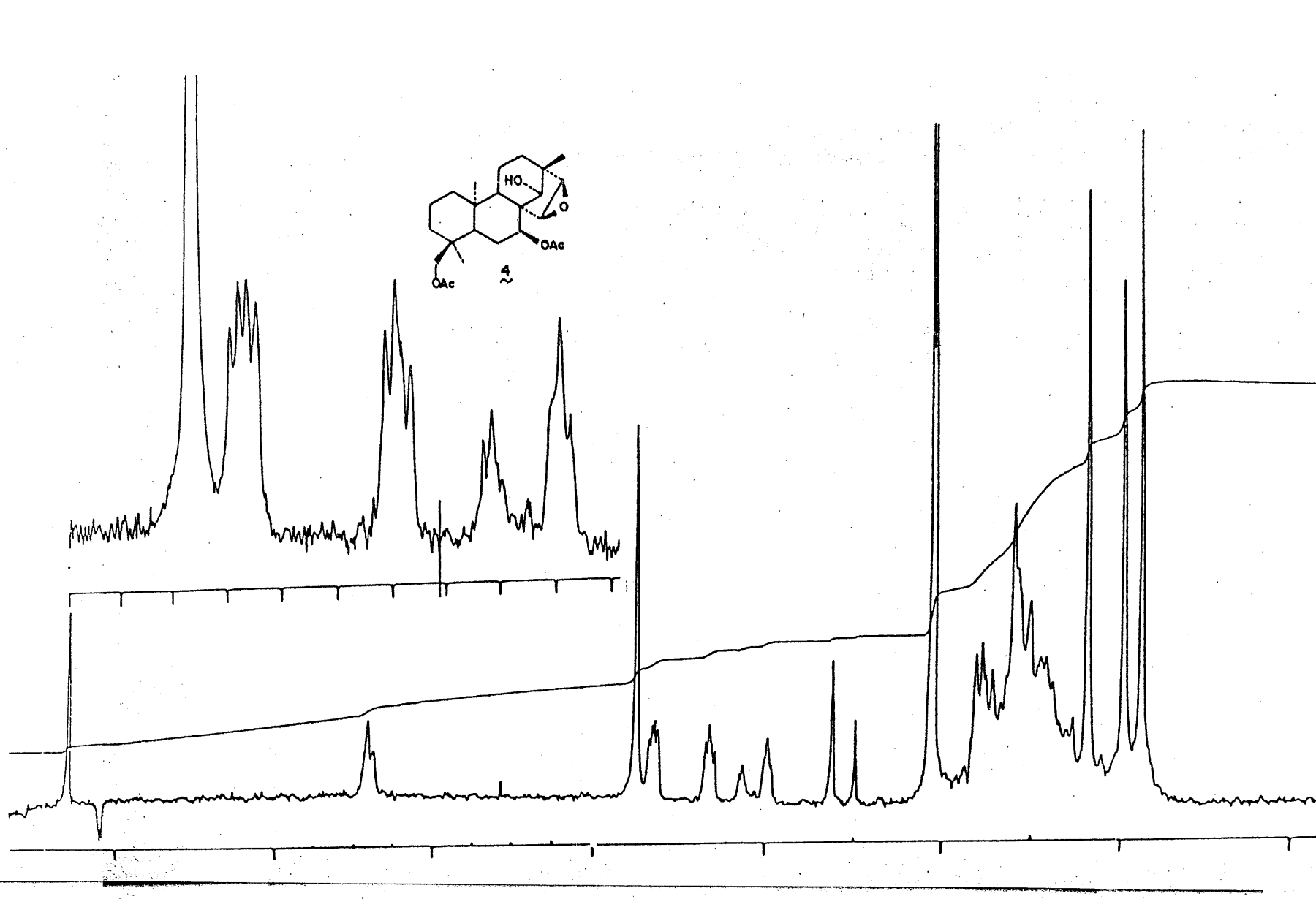

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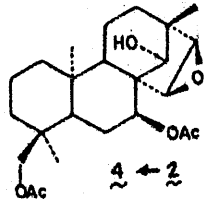
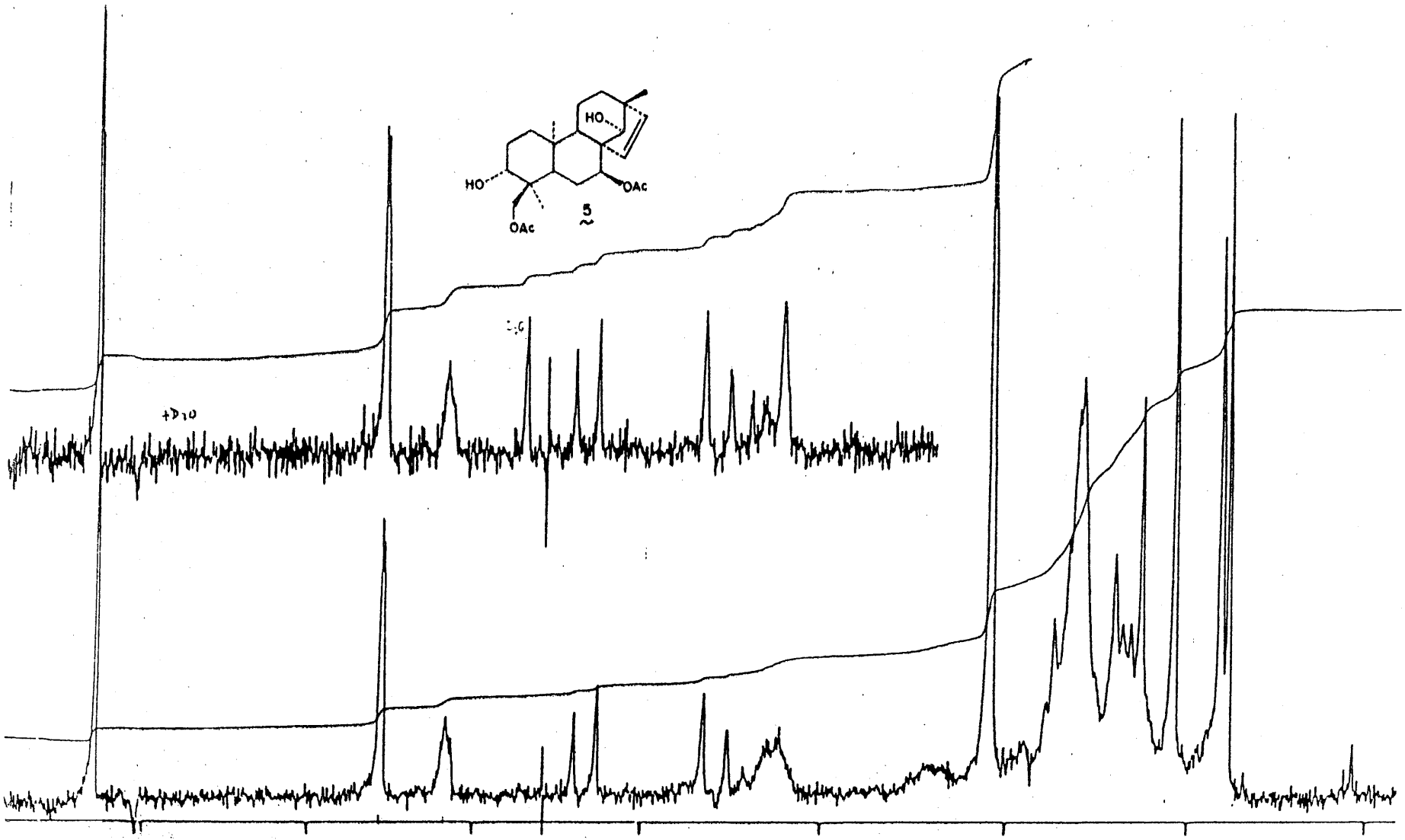
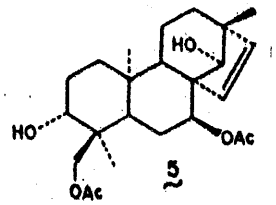


4 ← 2


HO
HO
OAc
OAc
5
+D2O



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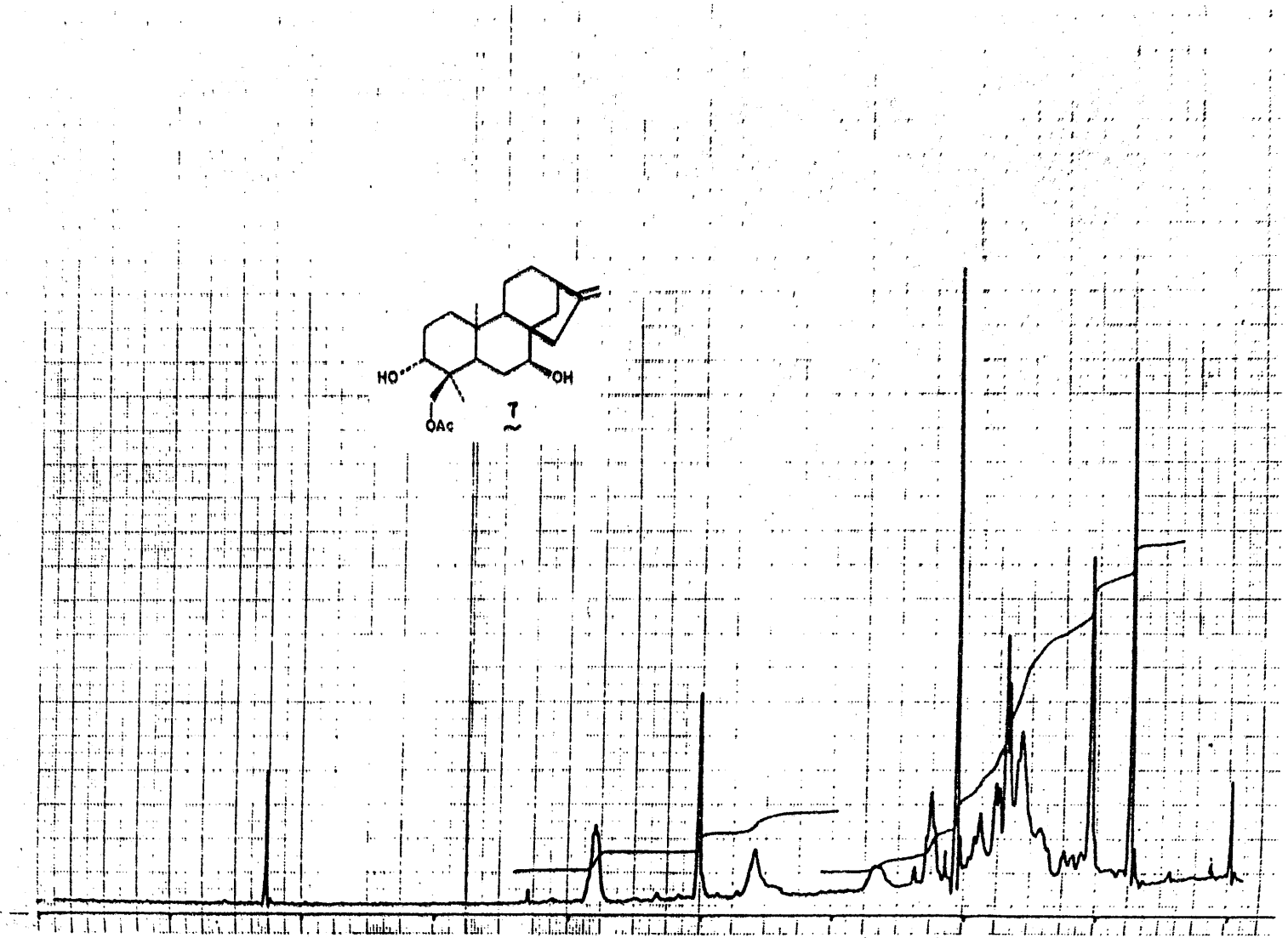

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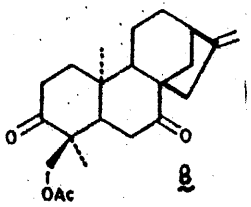

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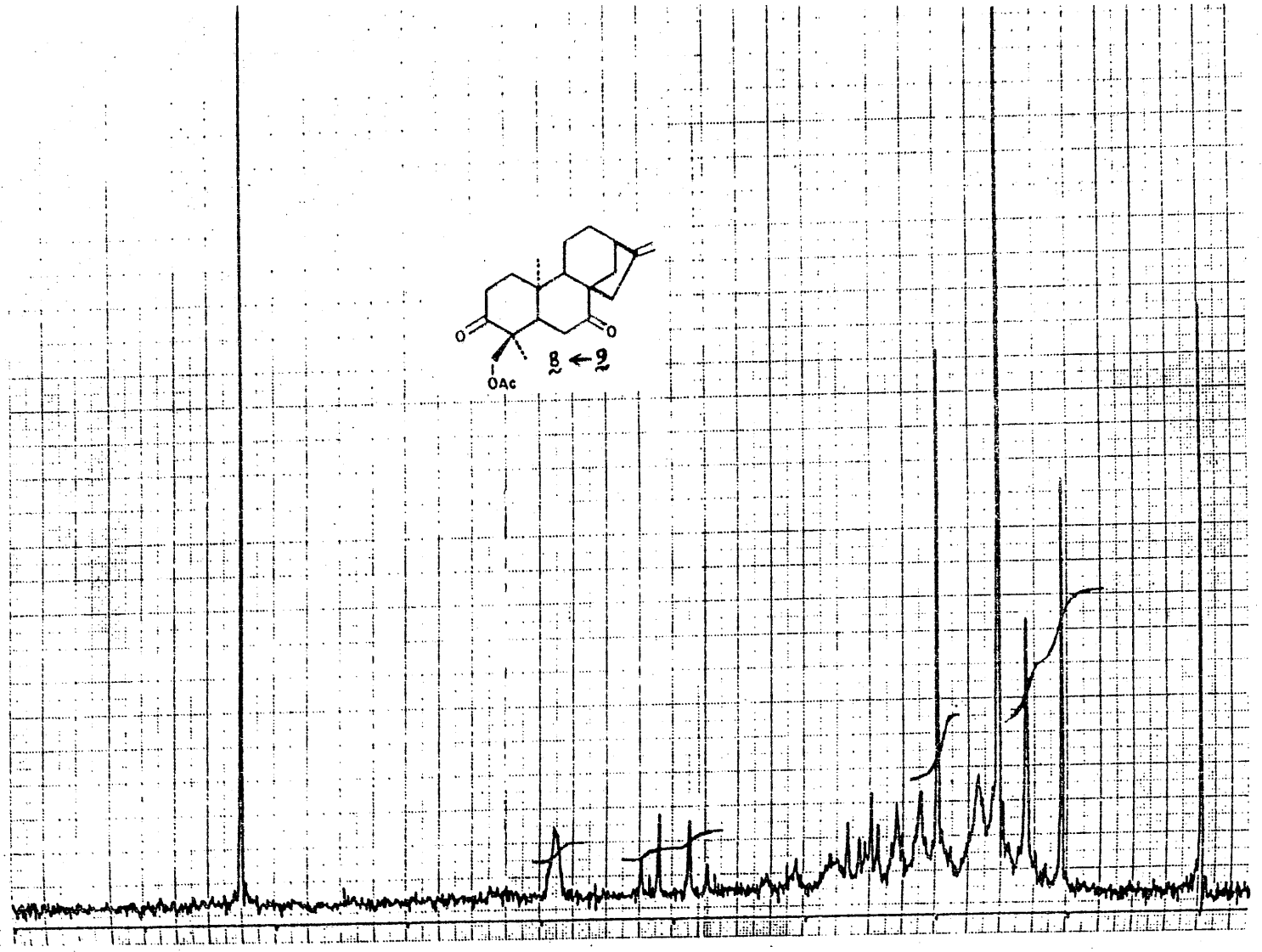
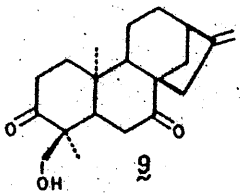

OAc
8 ← 9



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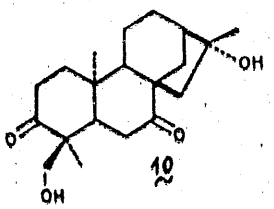

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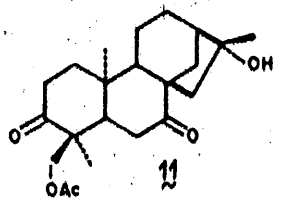

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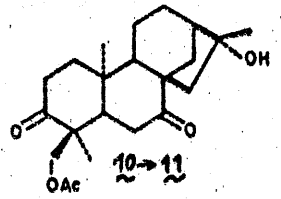

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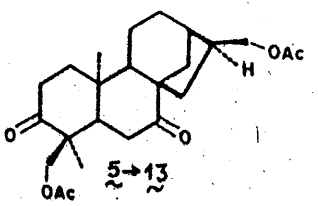
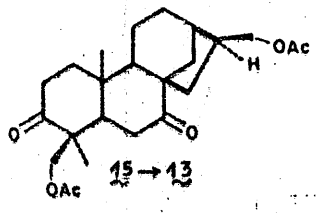
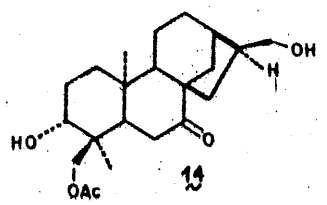


5→13



15 → 13



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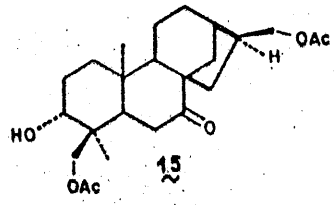

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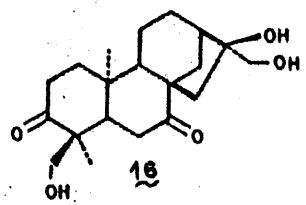

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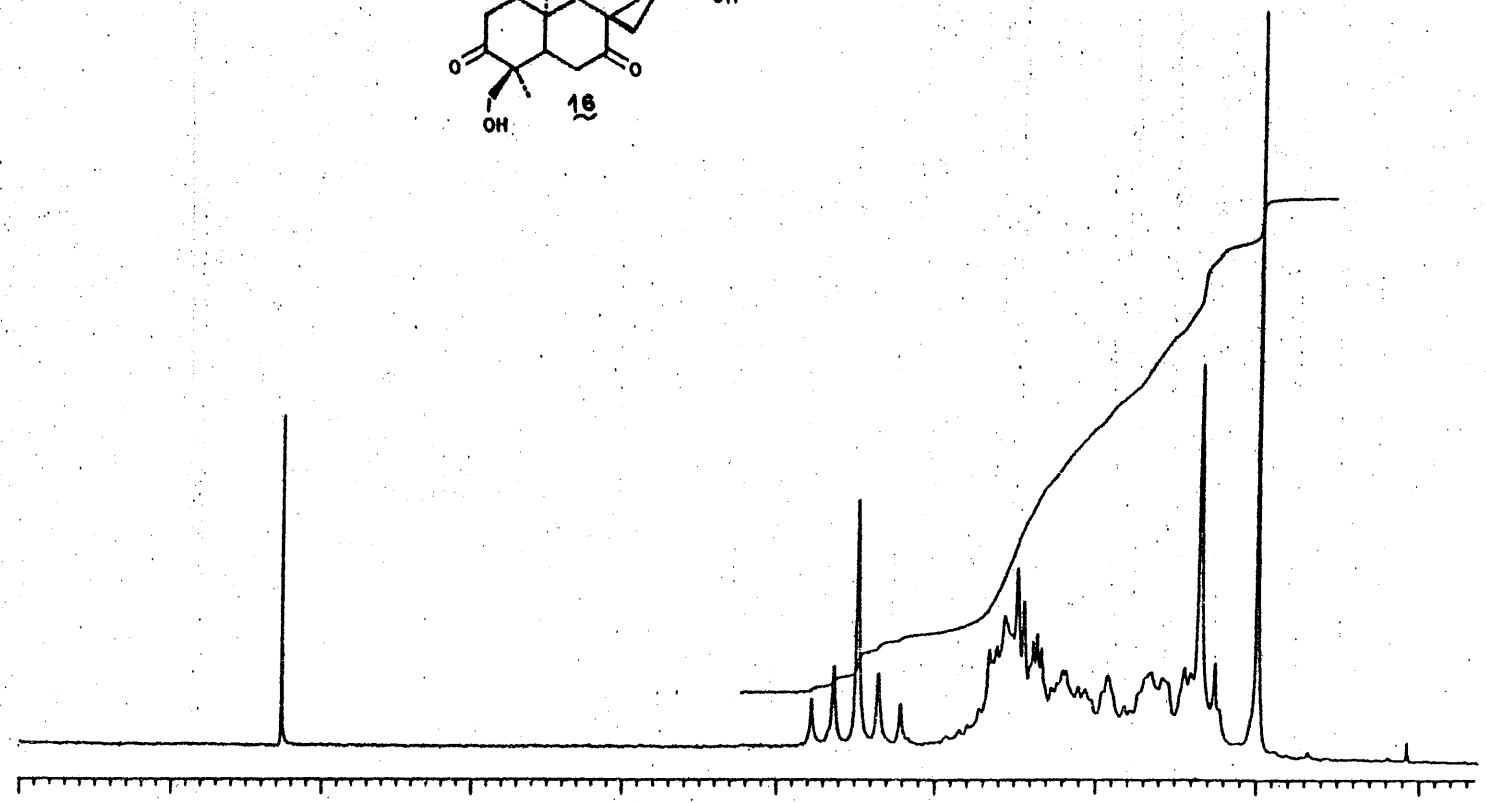

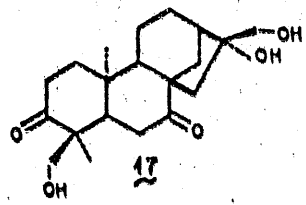

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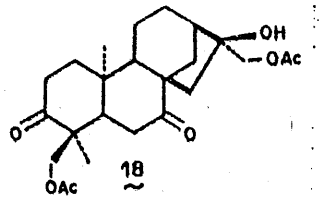

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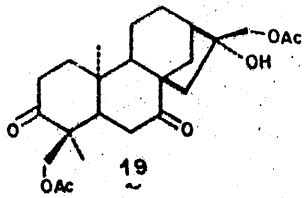

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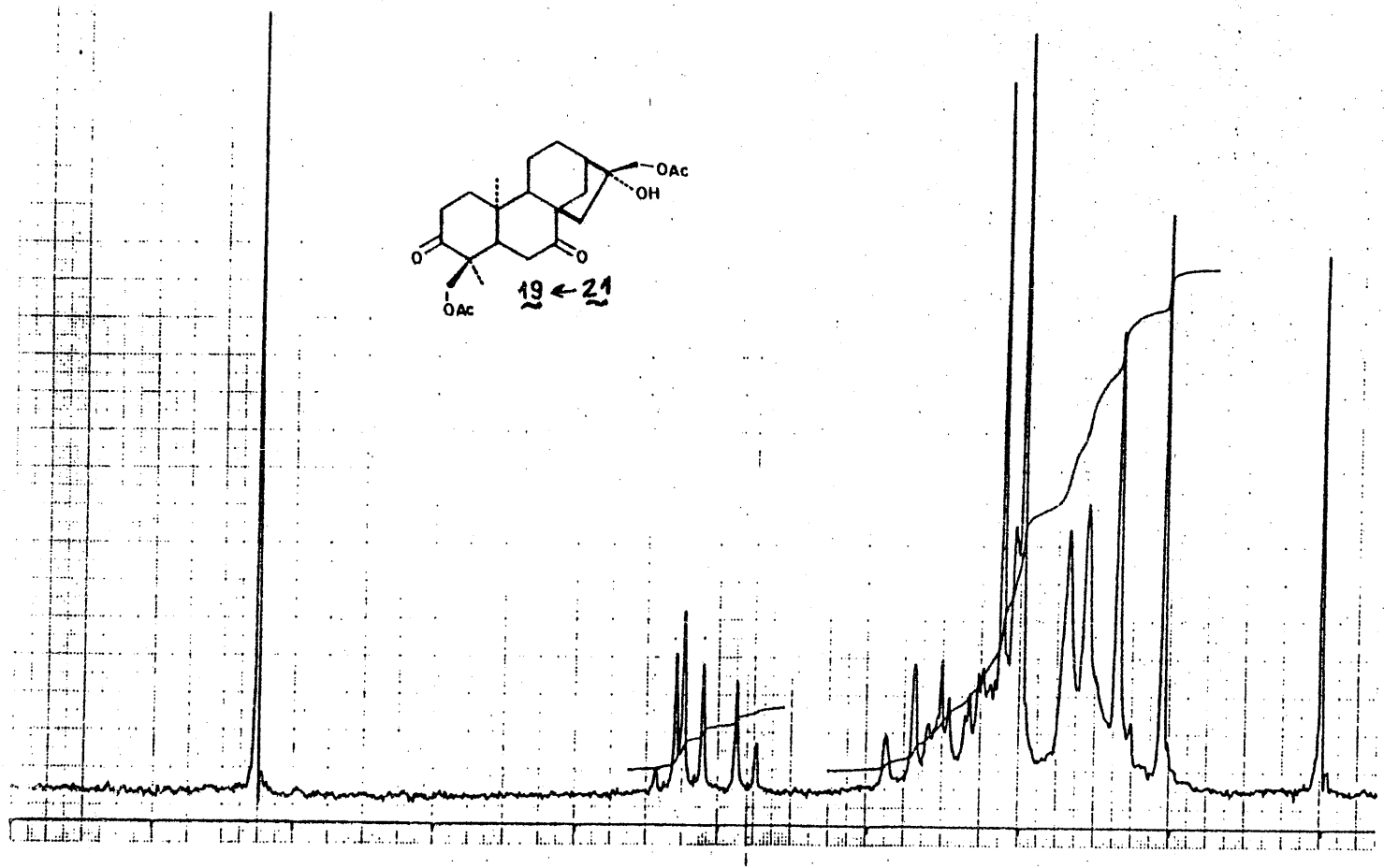
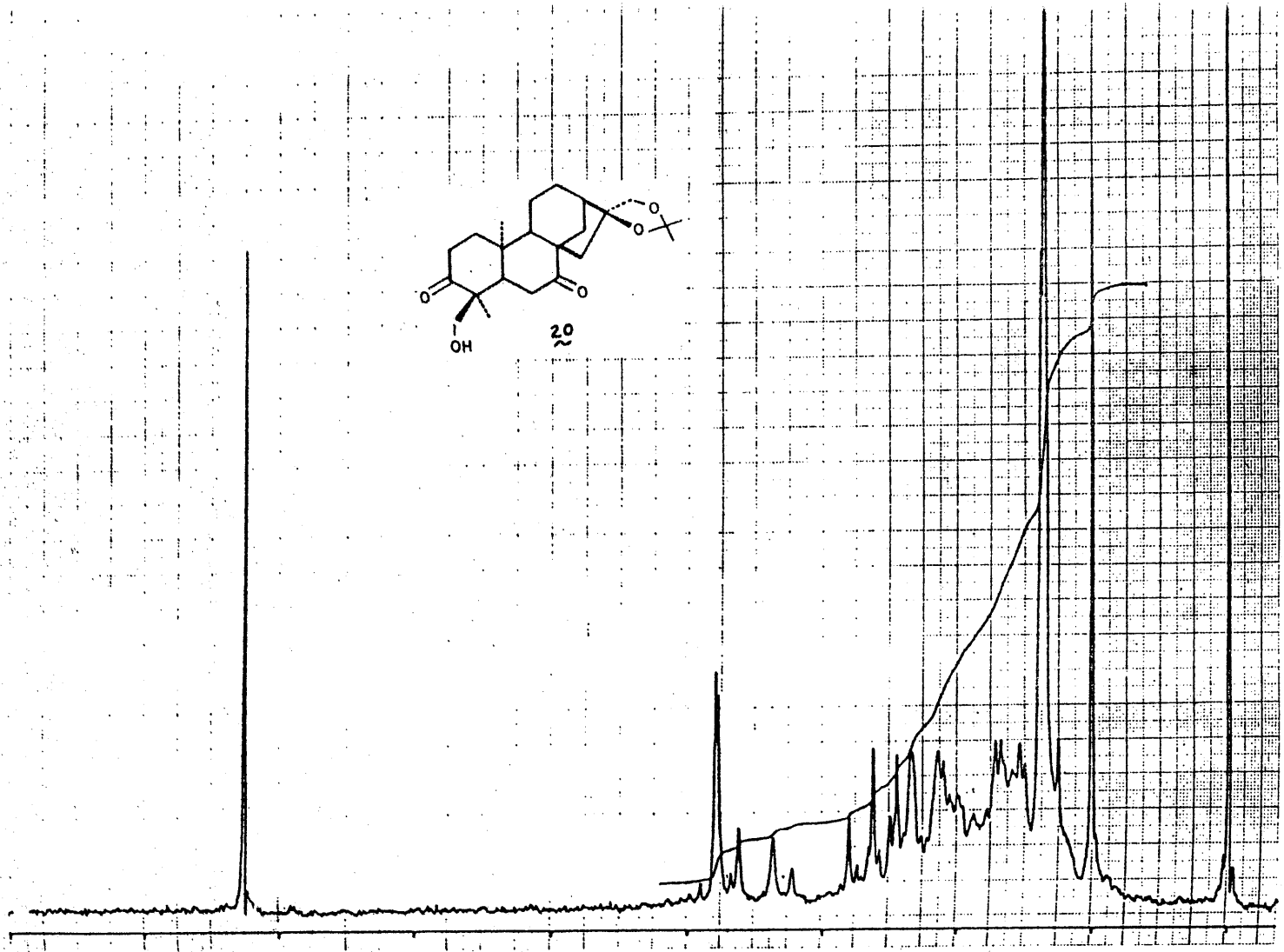

OAc
OH
O
O
OAc
19 ← 21



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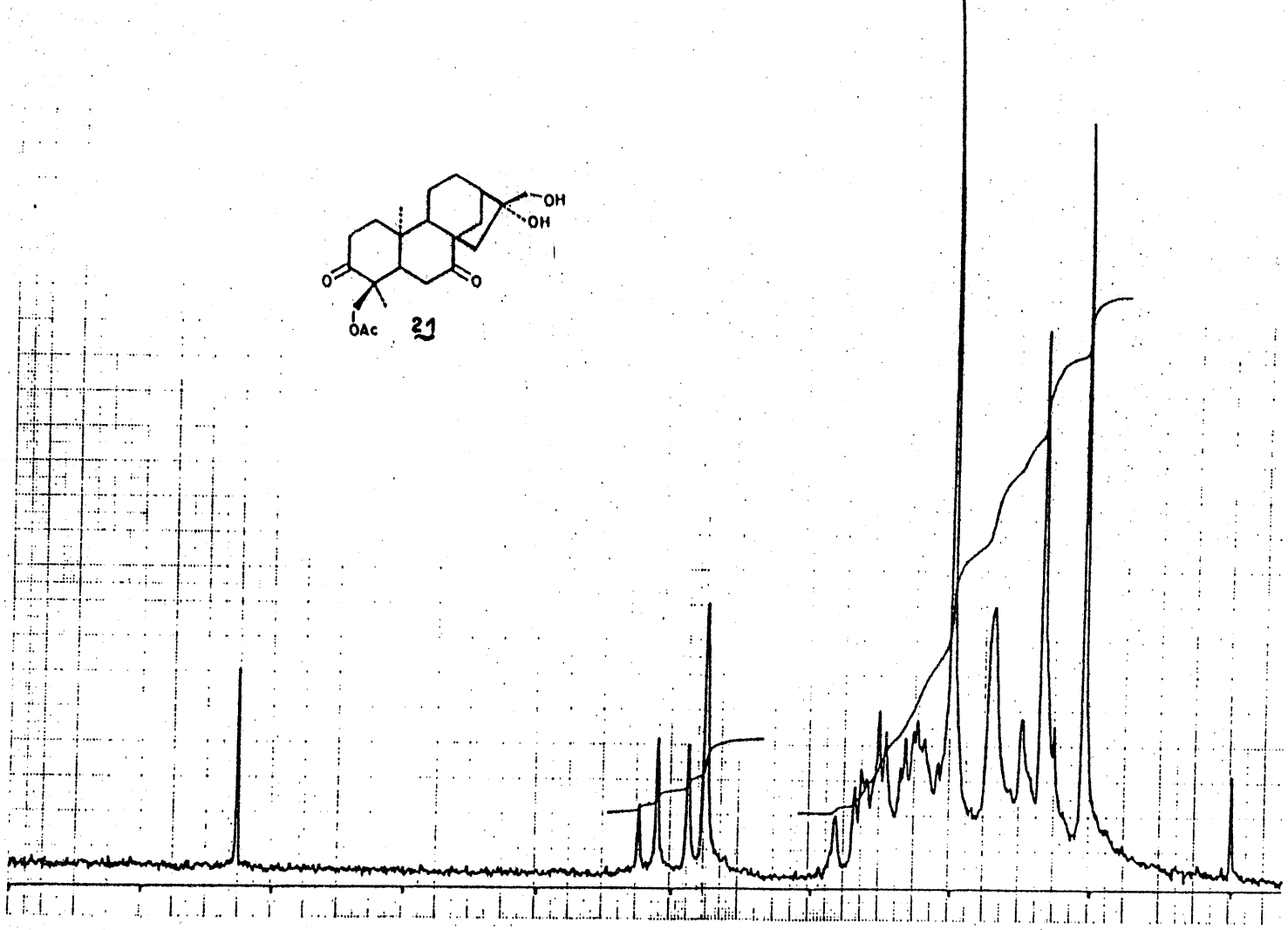

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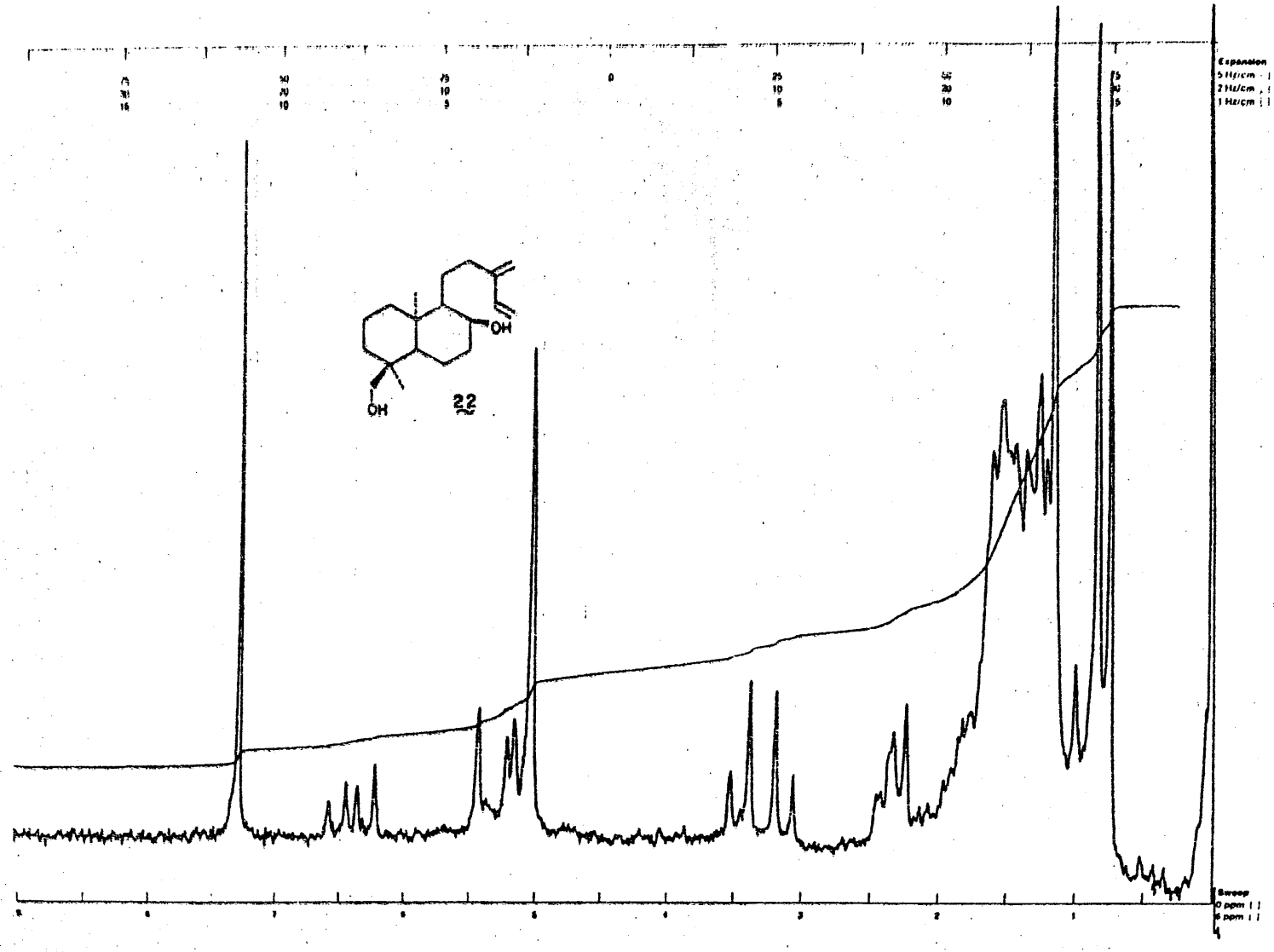
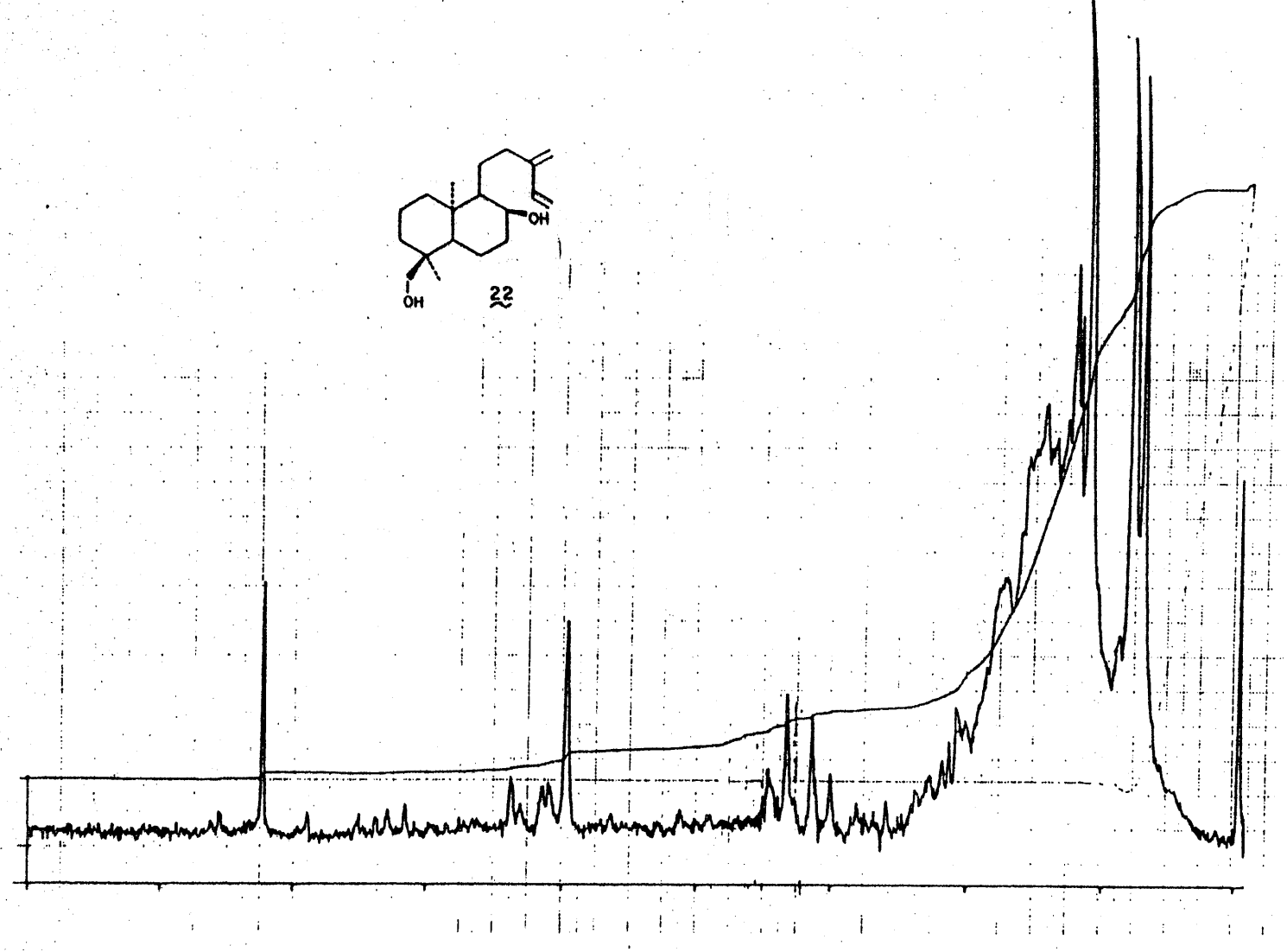

OH
OH
22
Expansion
5 Hz/cm
2 Hz/cm
1 Hz/cm
Sweep
0 ppm
6 ppm



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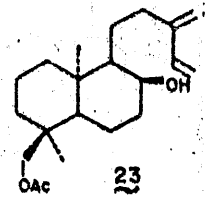

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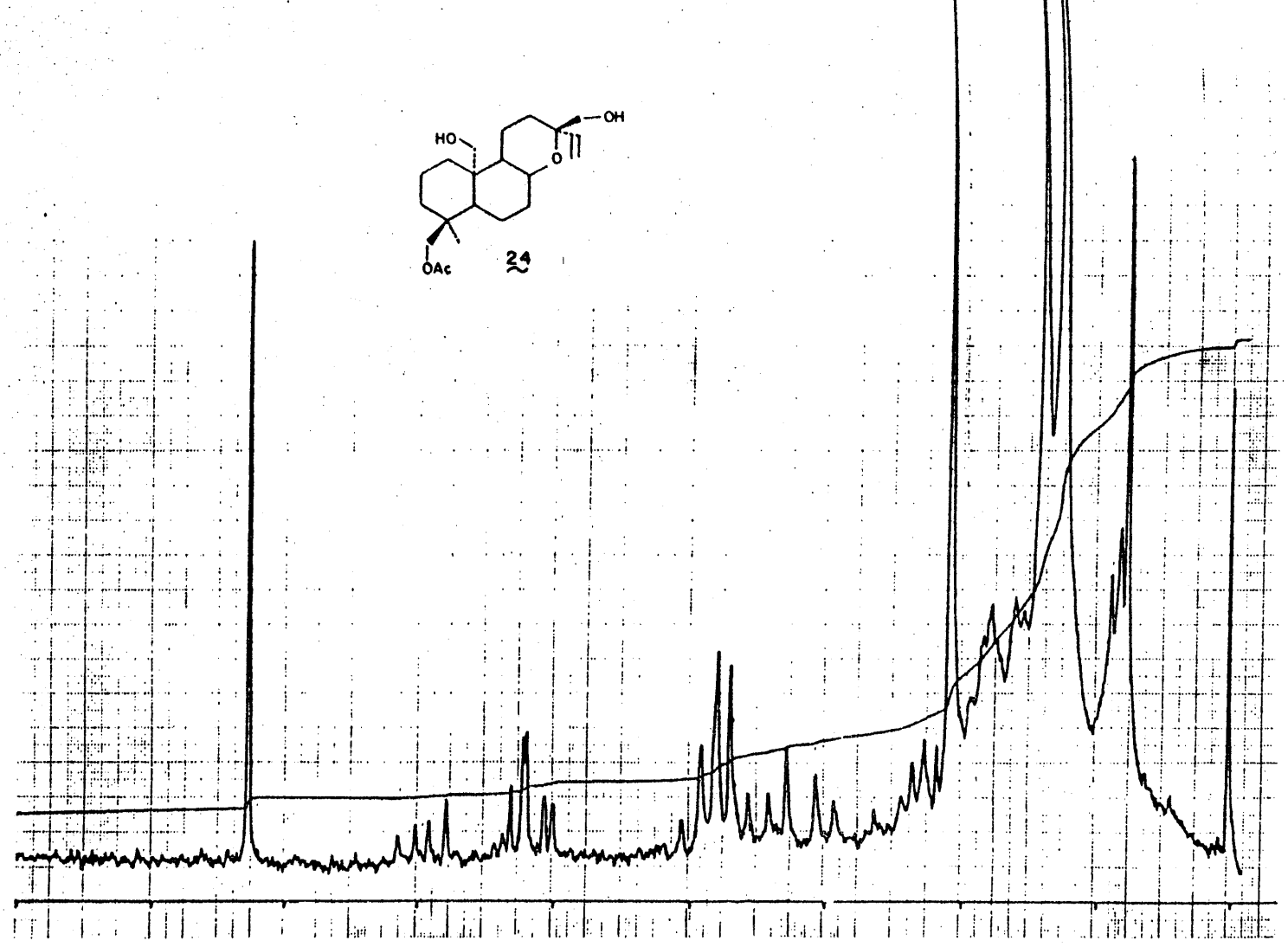

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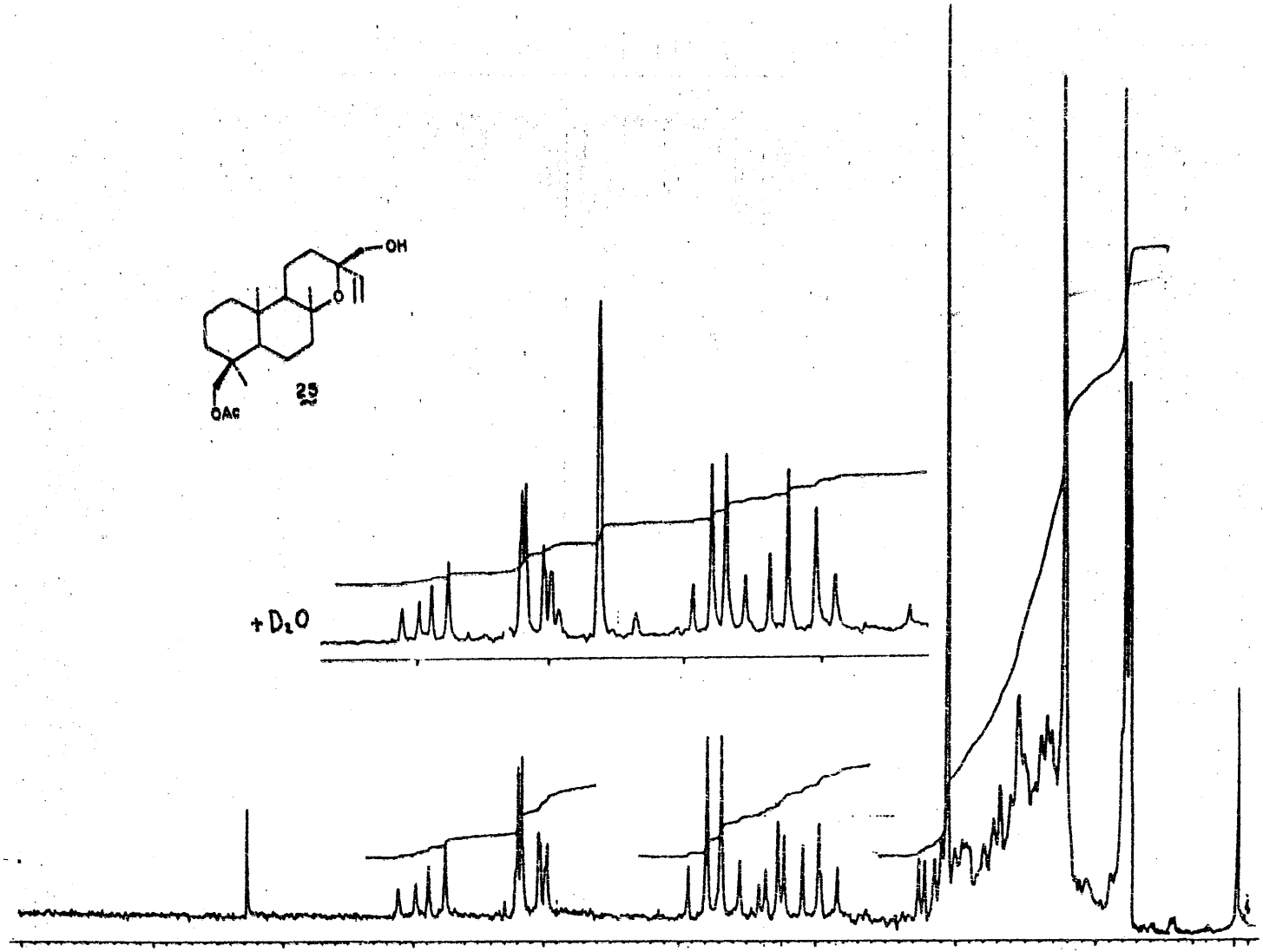
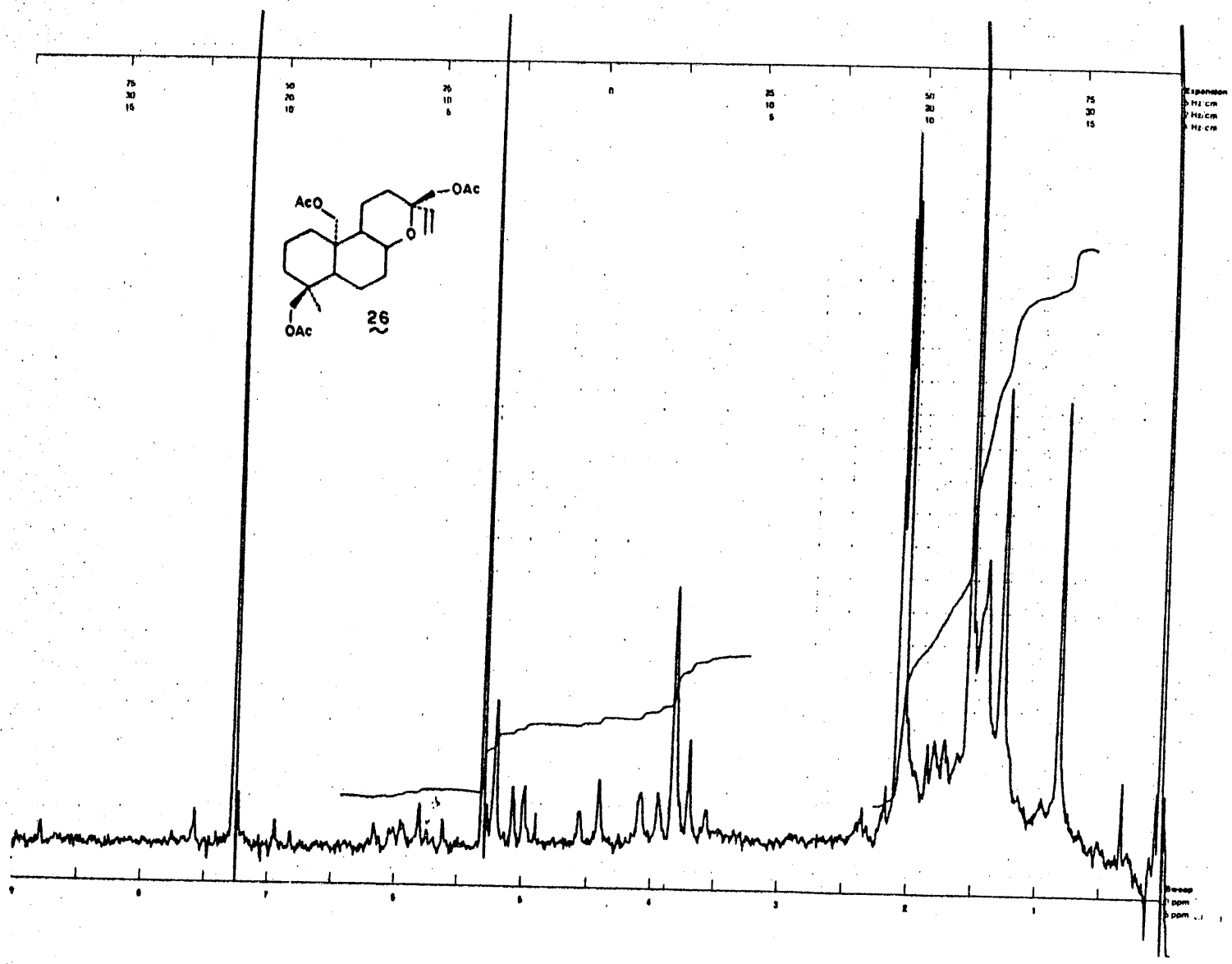
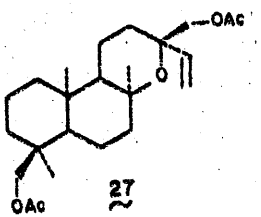

OH
OAc
25
+ D₂O


AcO
OAc
O
OAc
26



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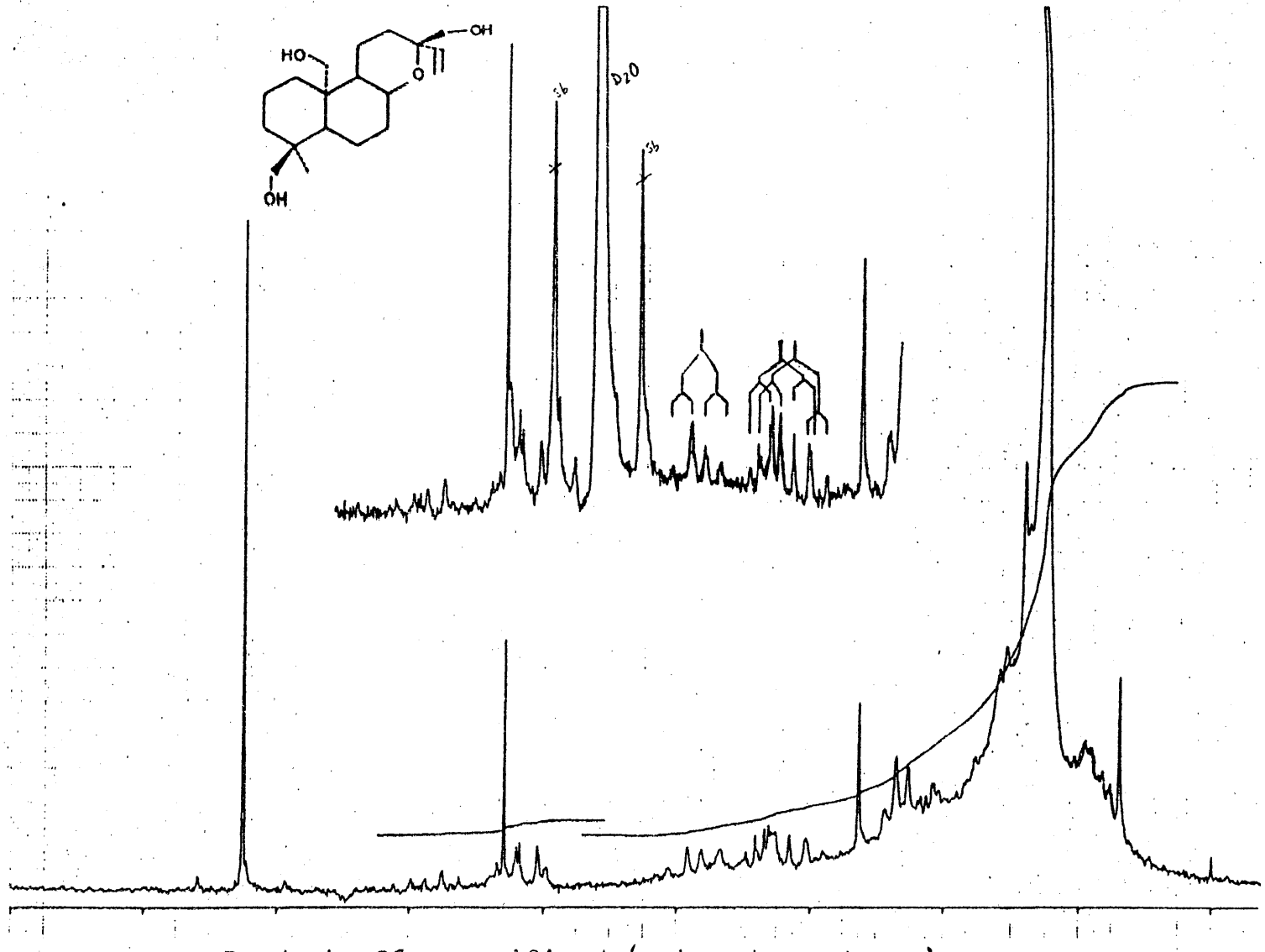
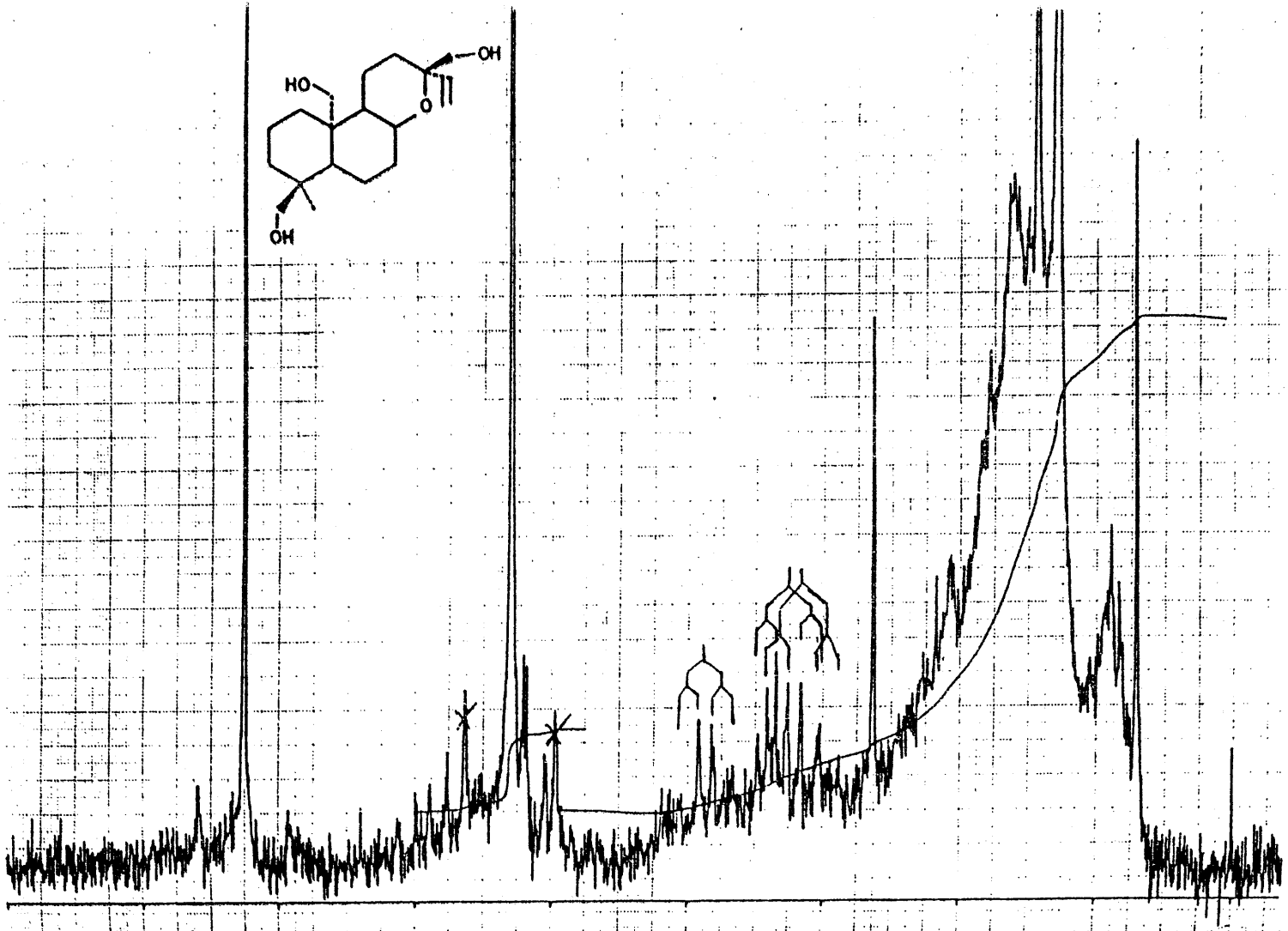
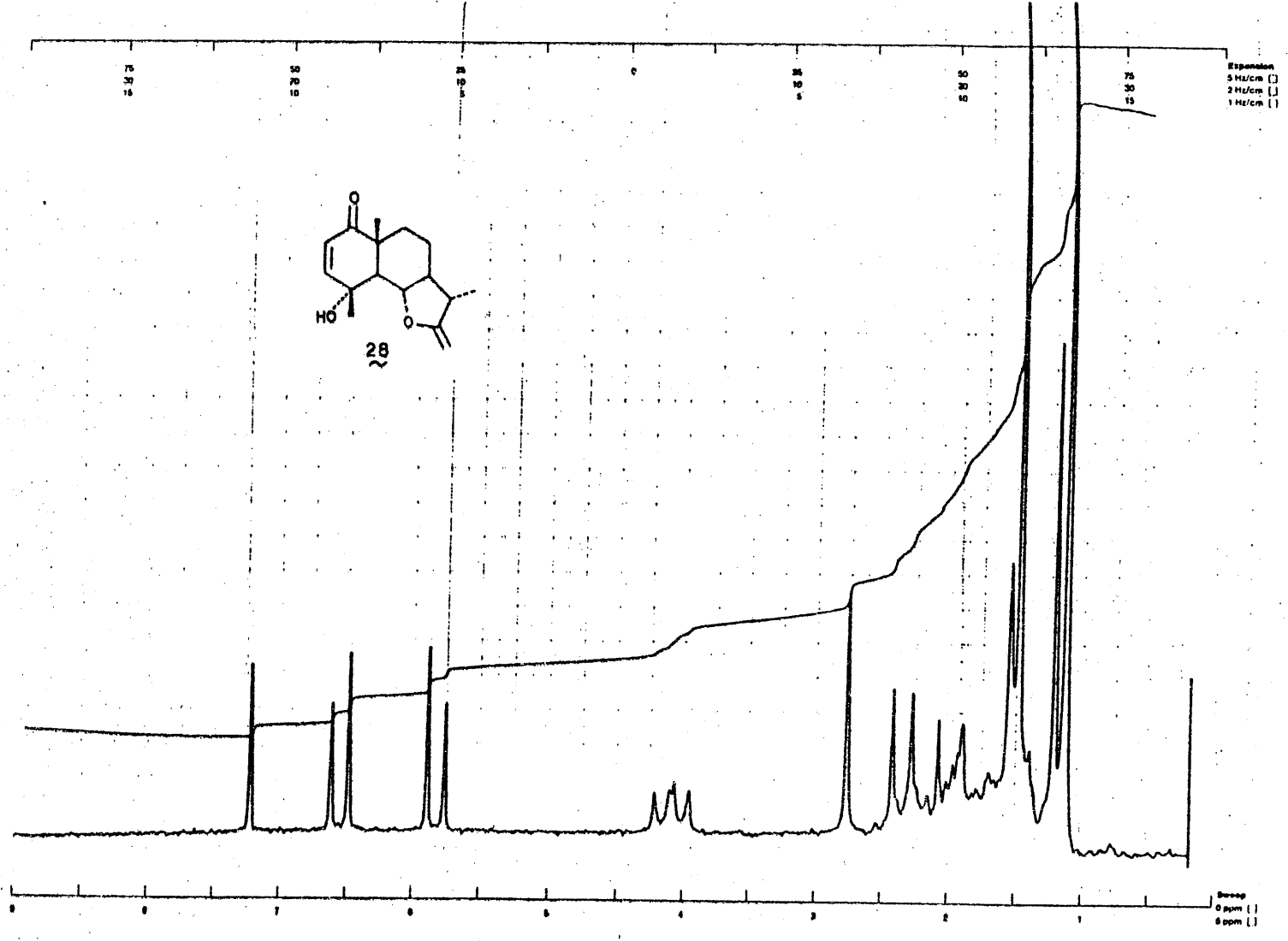
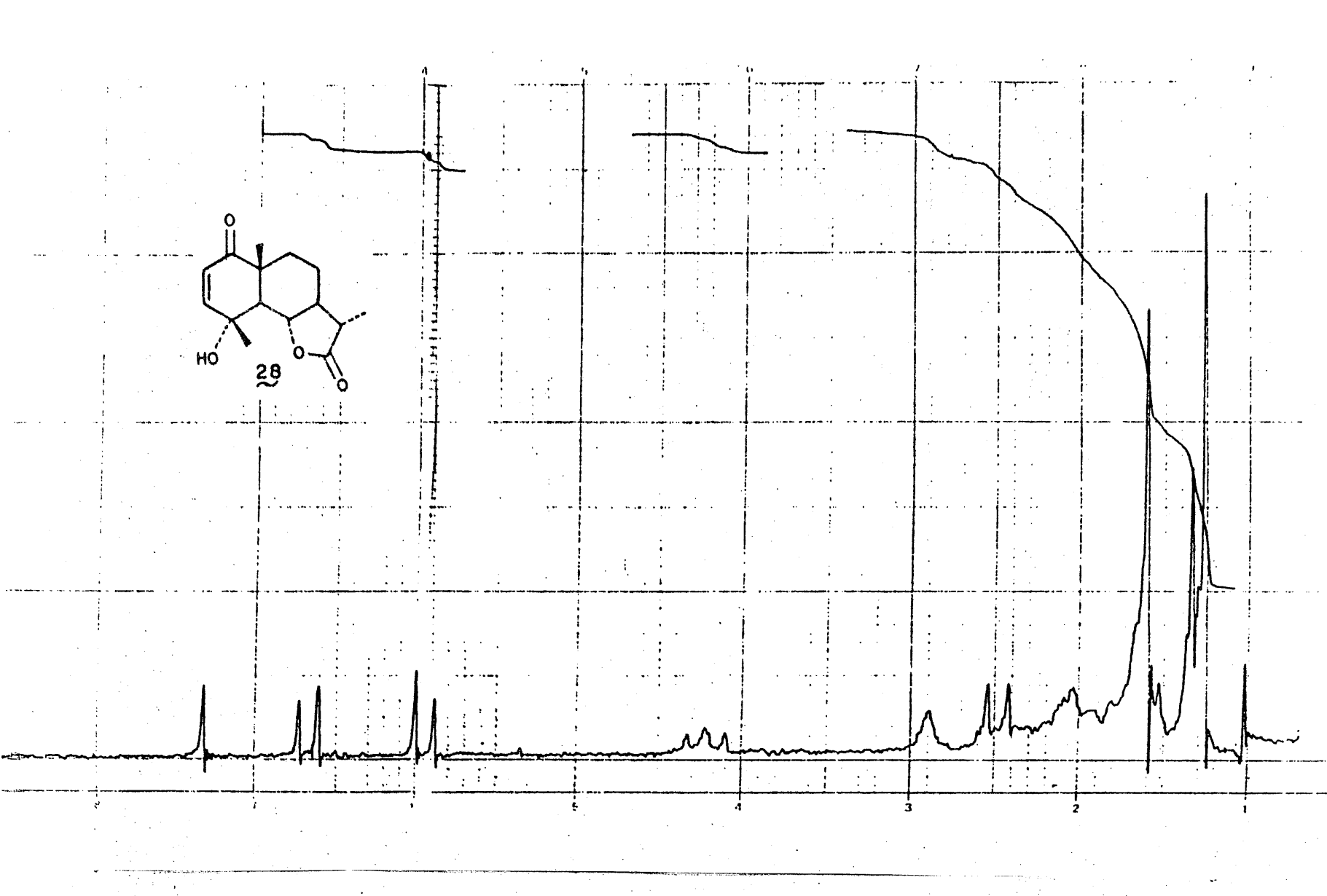


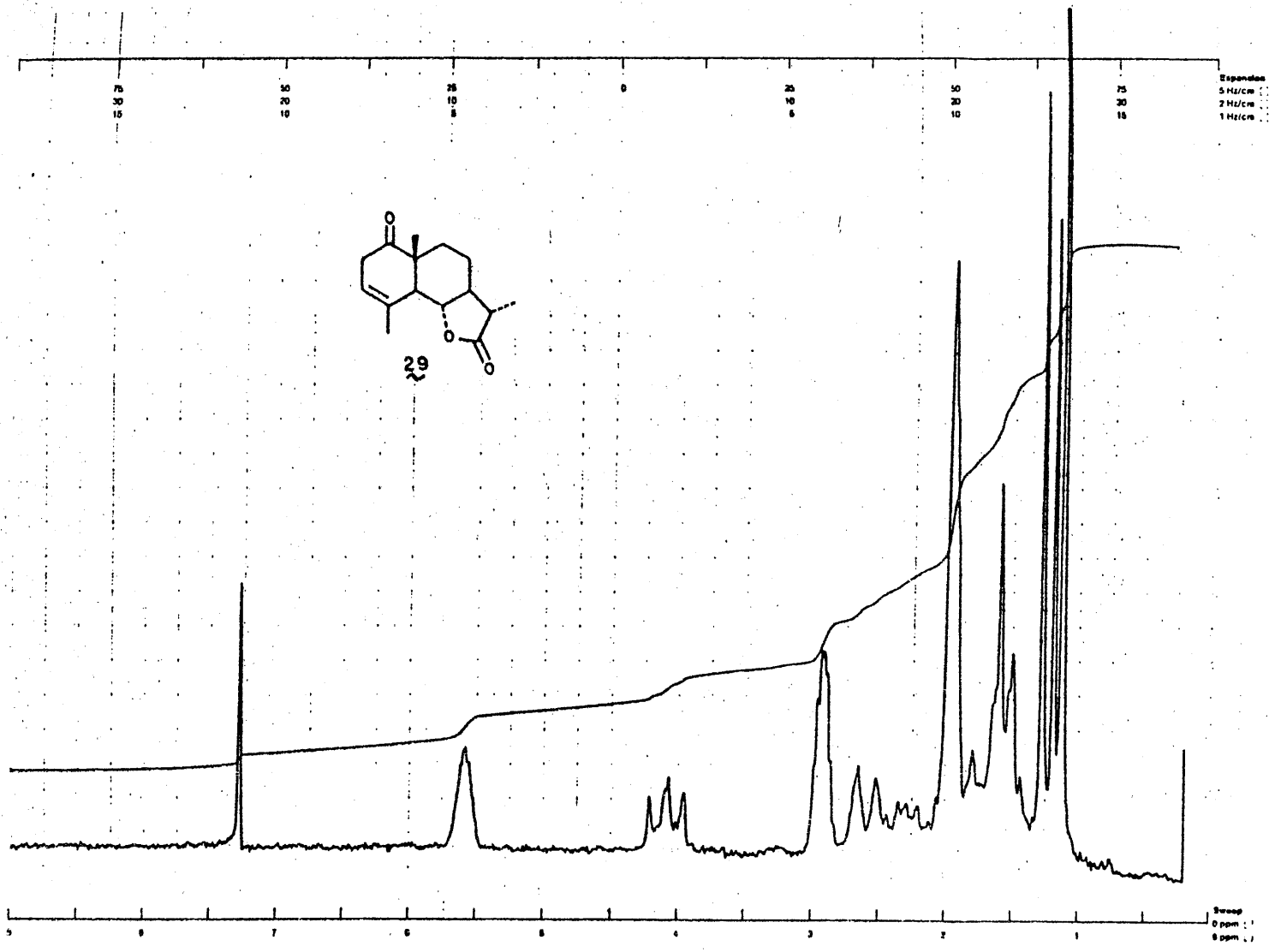
Producto 26 saponificado(antes de acetonar)



Producto 26 saponificado(después de acetonar)


Expansion
5 Hz/cm [ ]
2 Hz/cm [ ]
1 Hz/cm [ ]
HO
O
O
28
Decoup
0 ppm [ ]
6 ppm [ ]


O
HO
O
O
28
3
2
1



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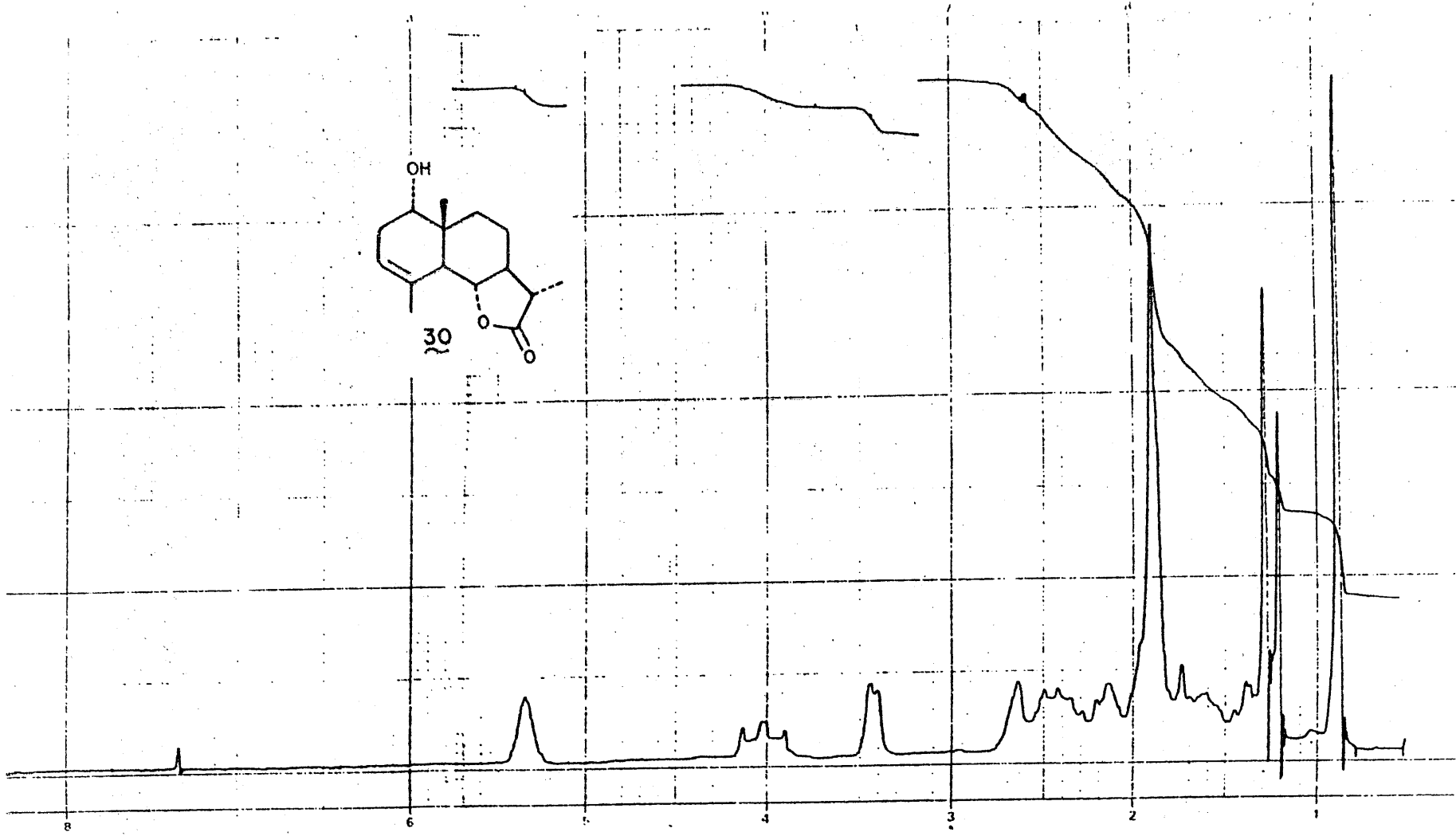
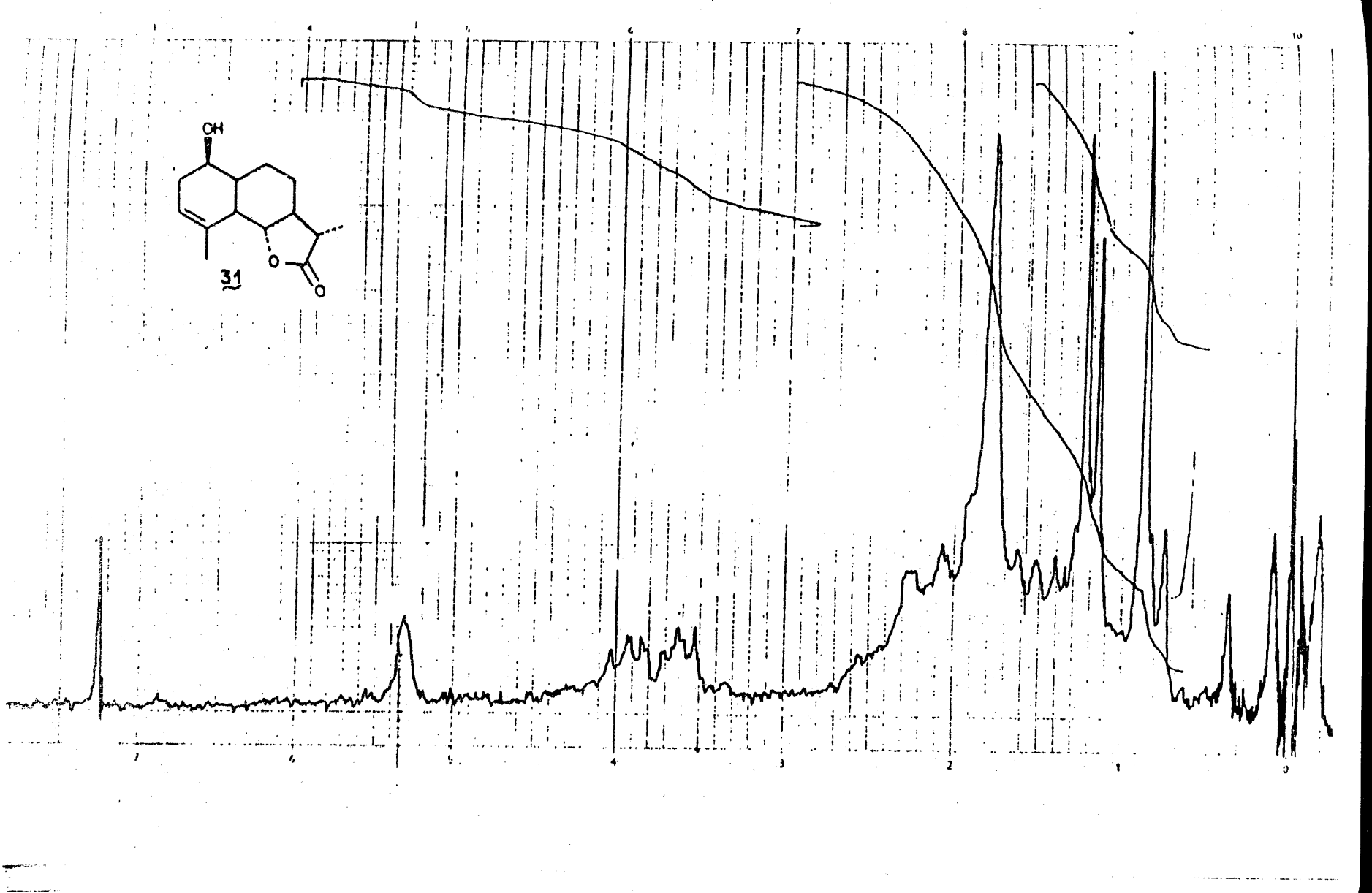
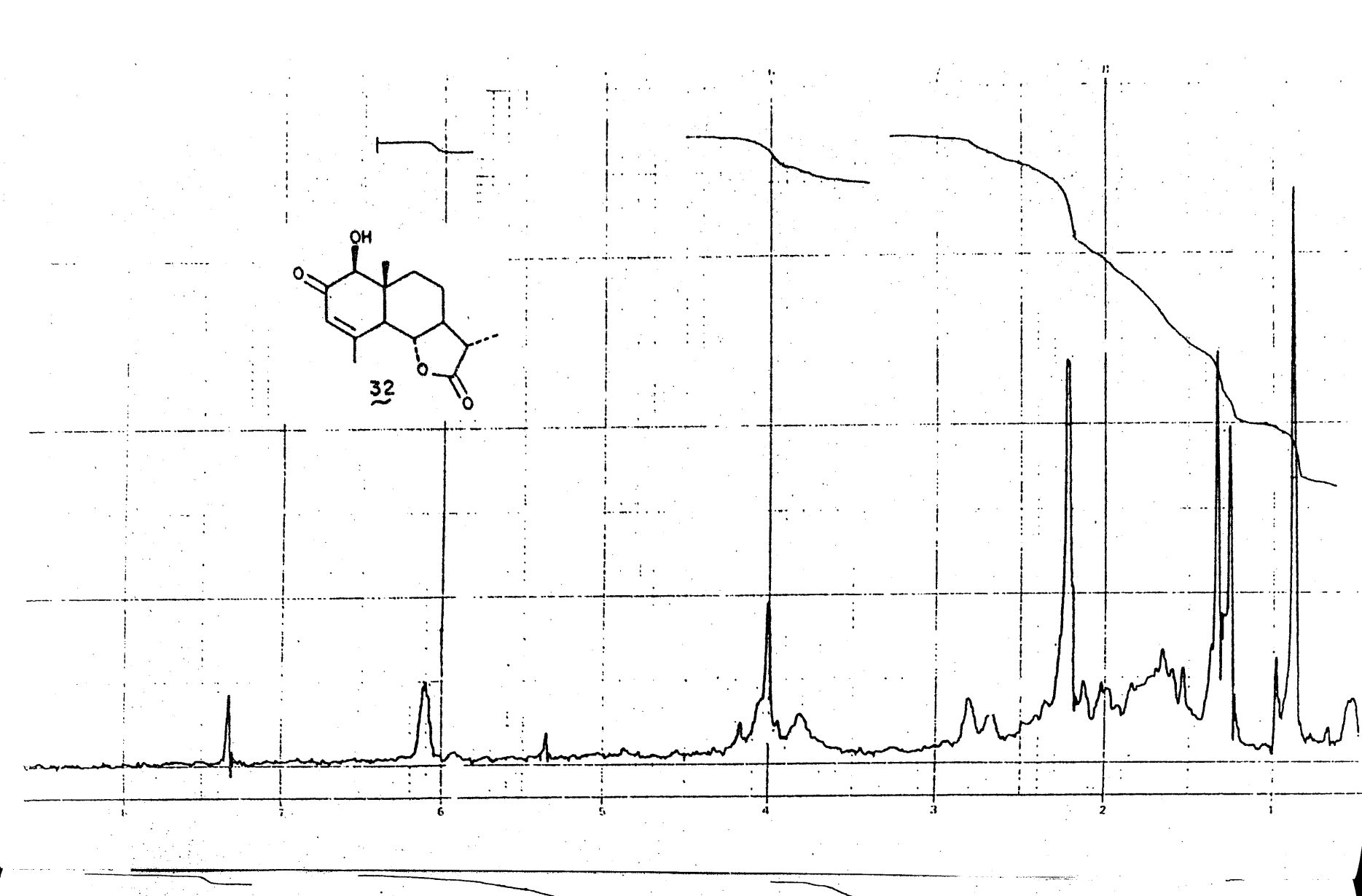
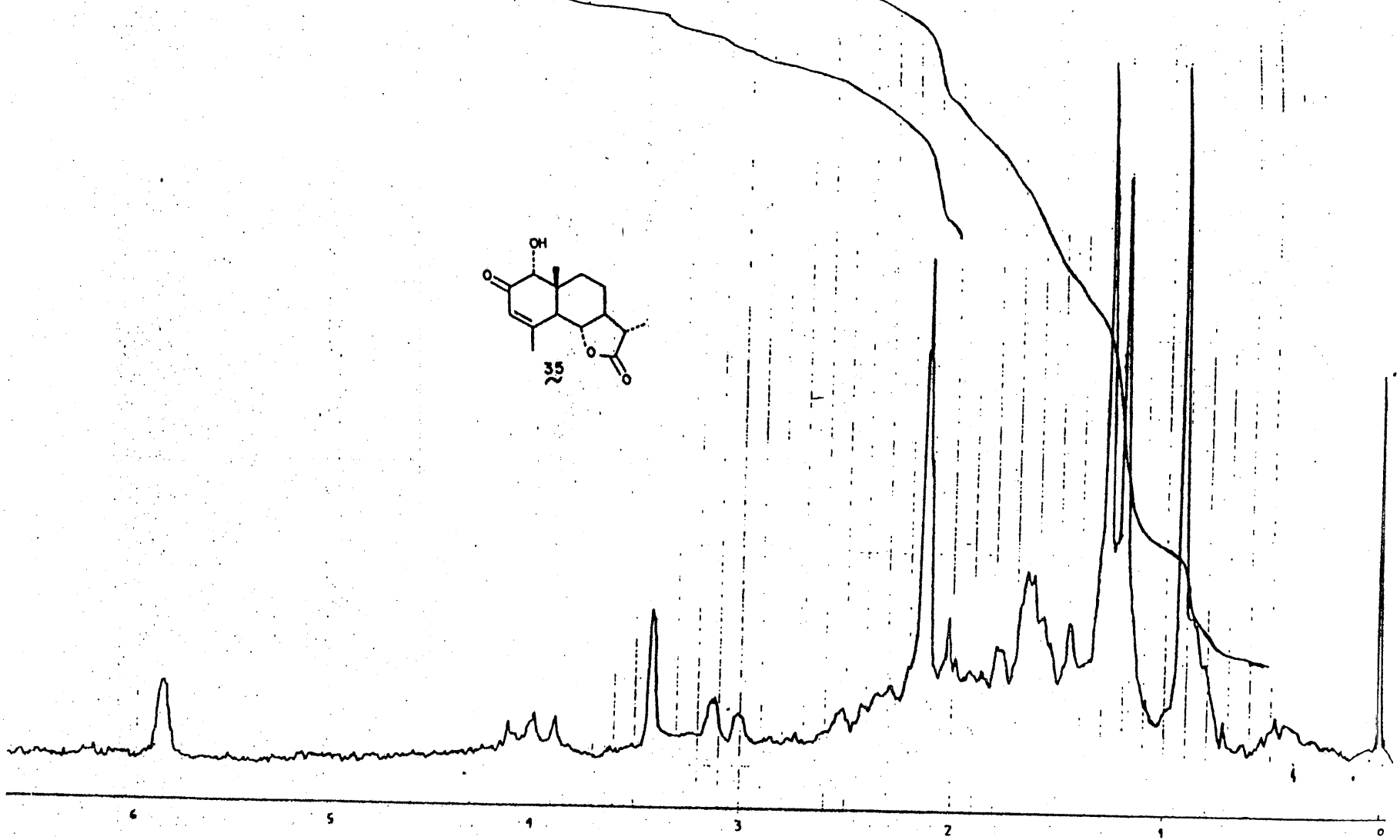
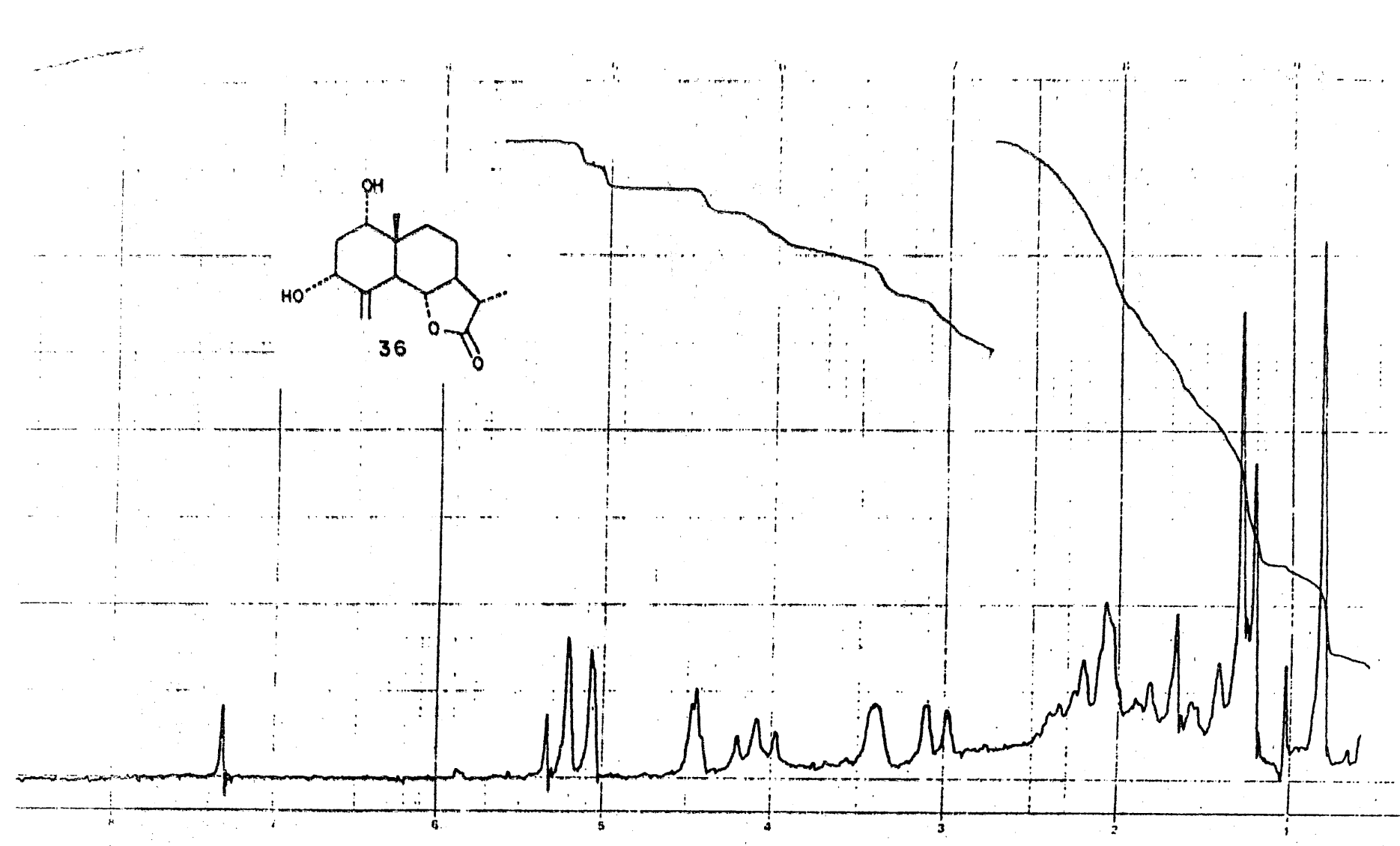

OH
O
O
30
8
6
4
3
2
1


OH
O
O
31

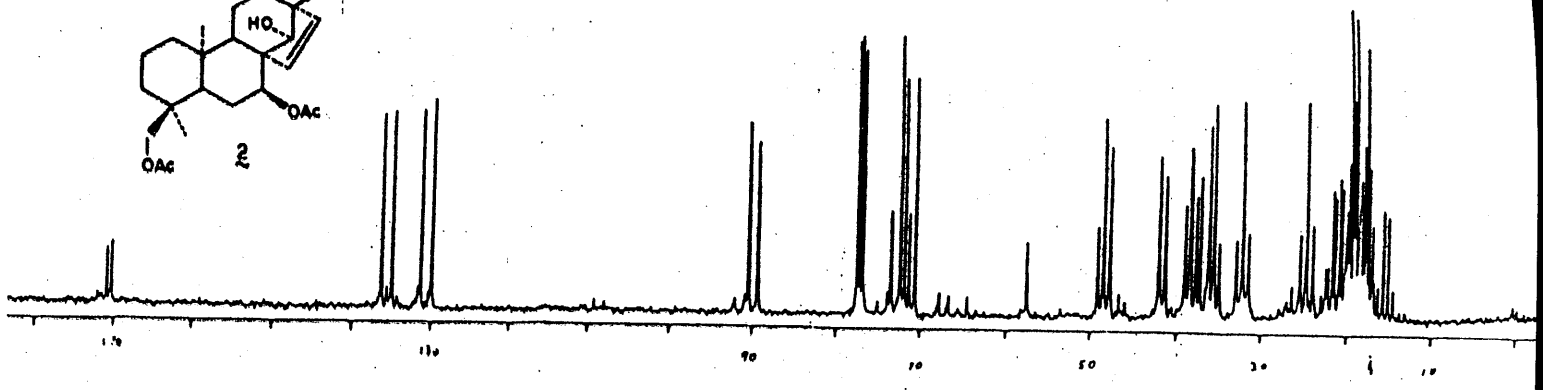

OH
O
O
O
O
32
1
7
6
5
4
3
2
1

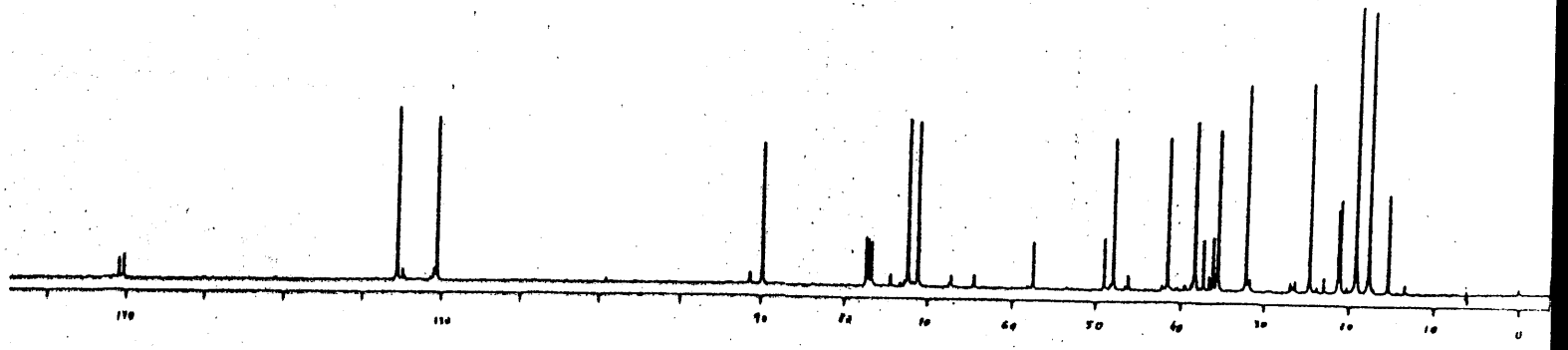

OH
O
O
O
O
35
6
5
4
3
2
1
0

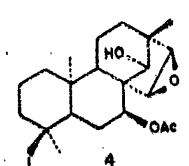

OH
HO
O
O
36
6
5
4
3
2
1

ESPECTROS ^{13}C RMN

2







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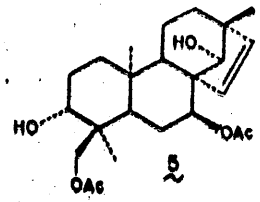

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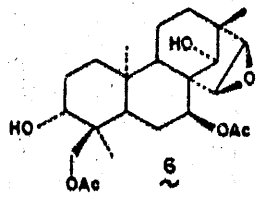

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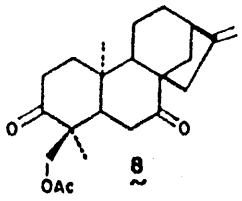

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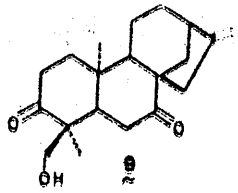
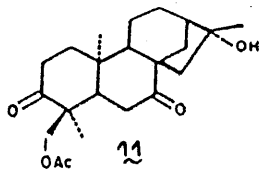


9

CH_2

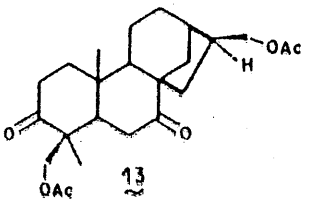
CH_3, CH



11

CH_2

CH_3 , CH



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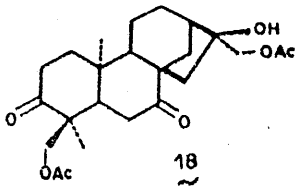

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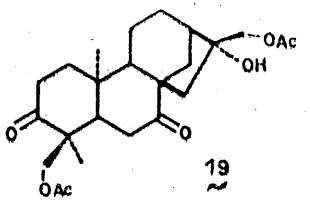

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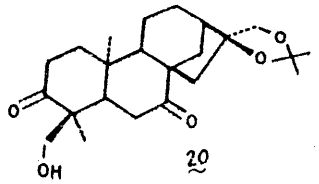
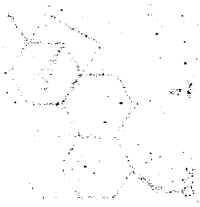
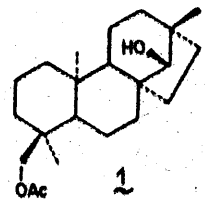


20

P A R T E III

ESPECTROS ^{1}H RMN





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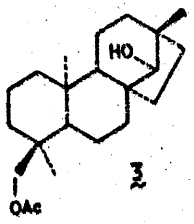
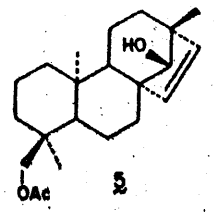


3



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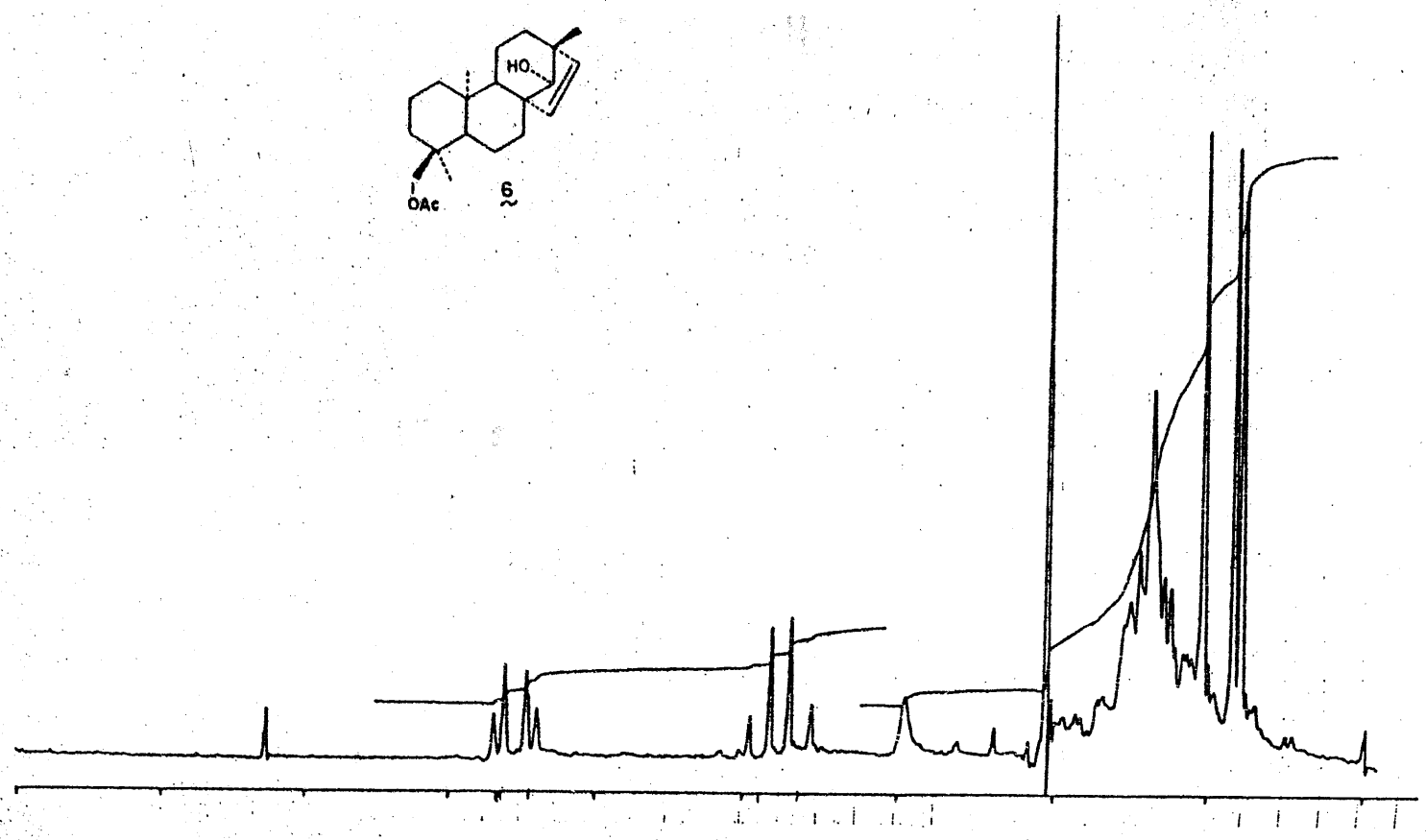

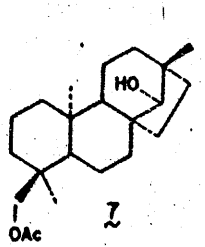

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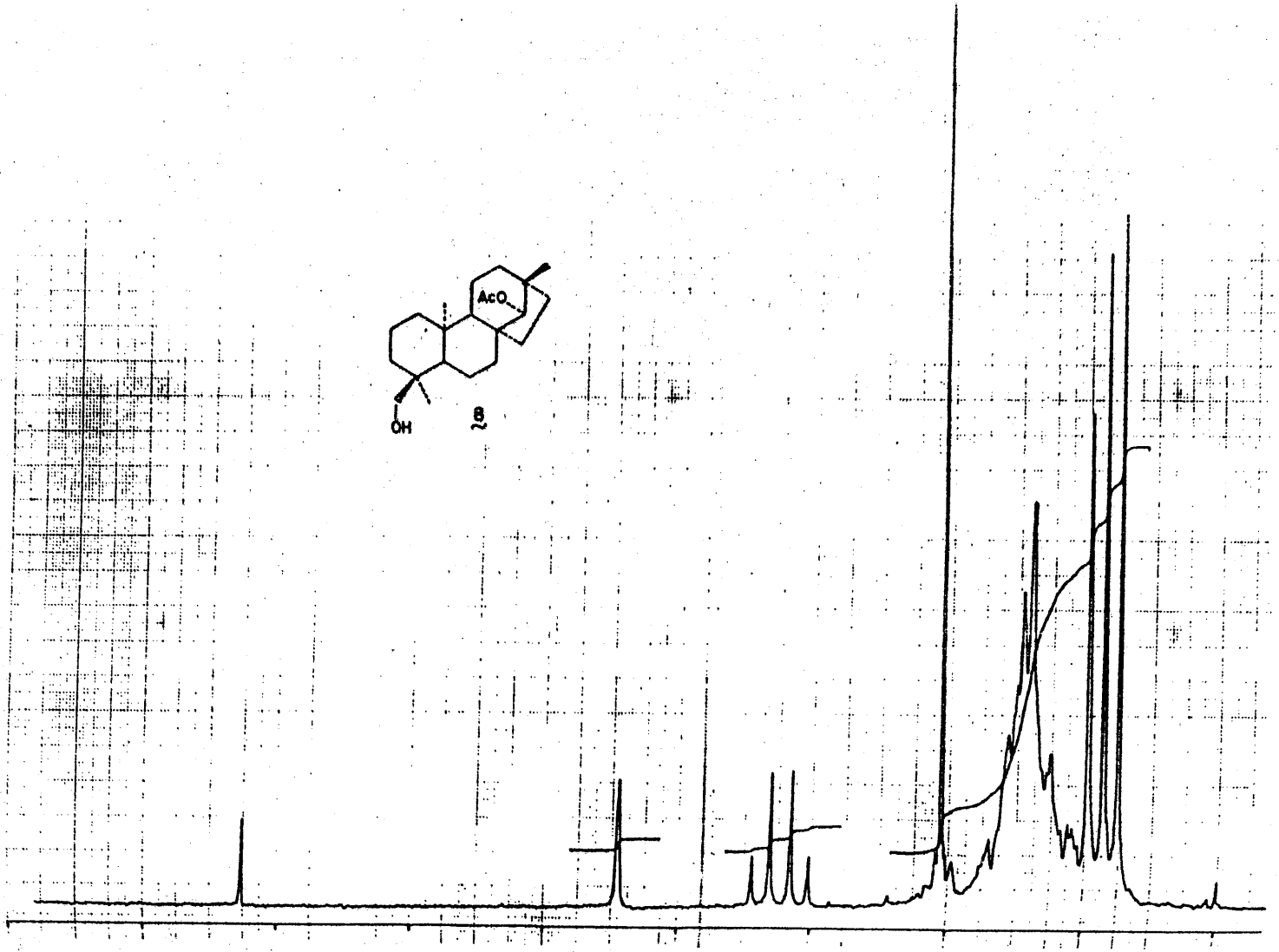

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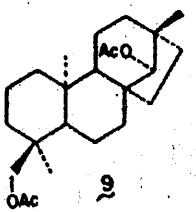

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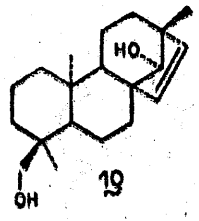

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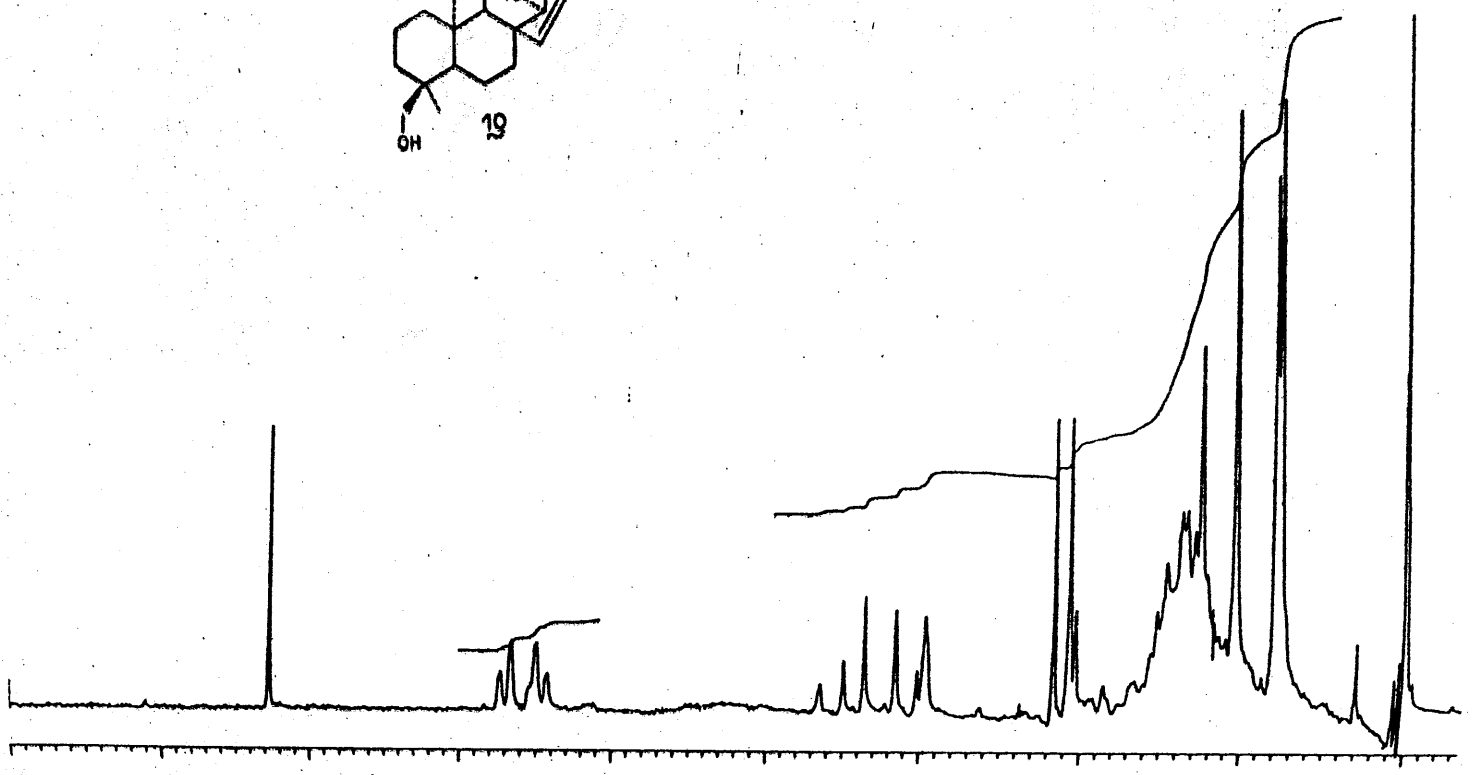

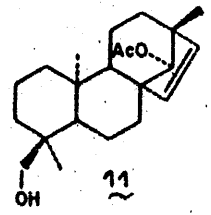

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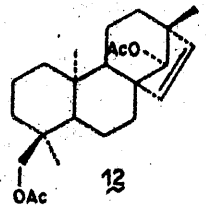

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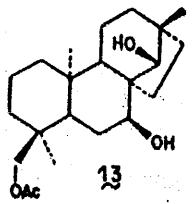

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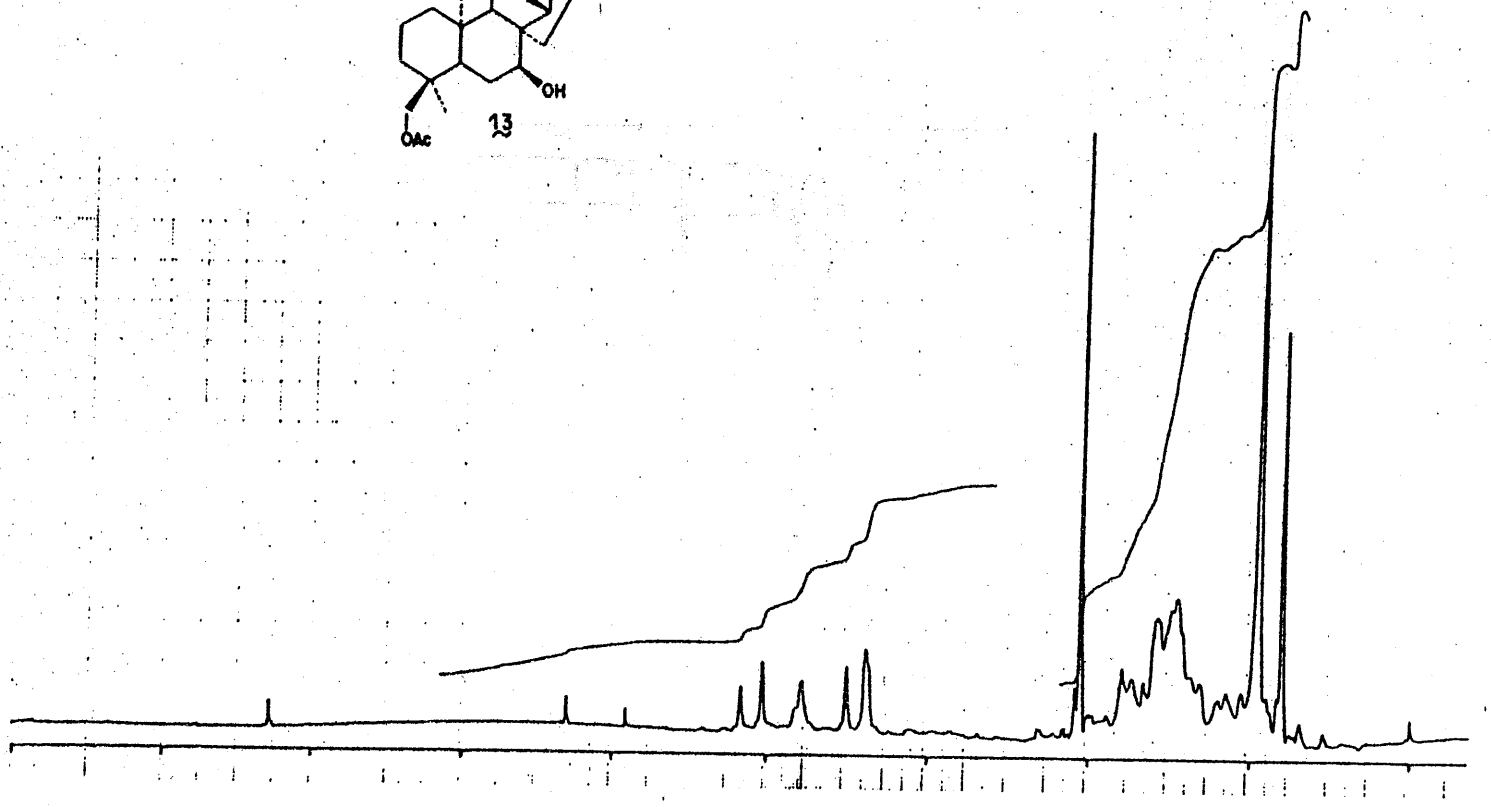

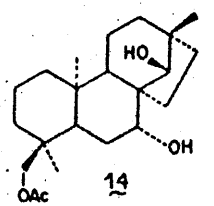

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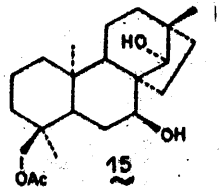

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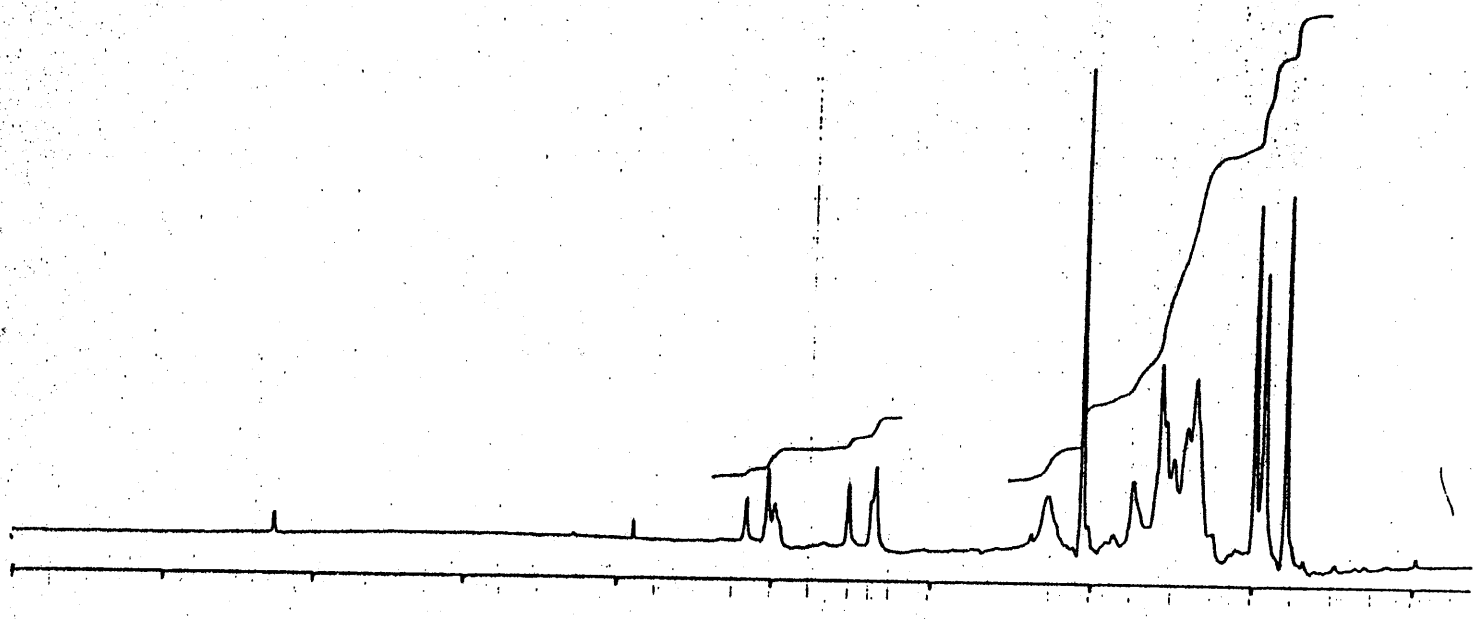

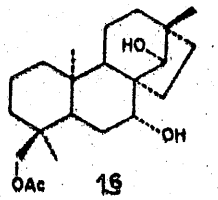

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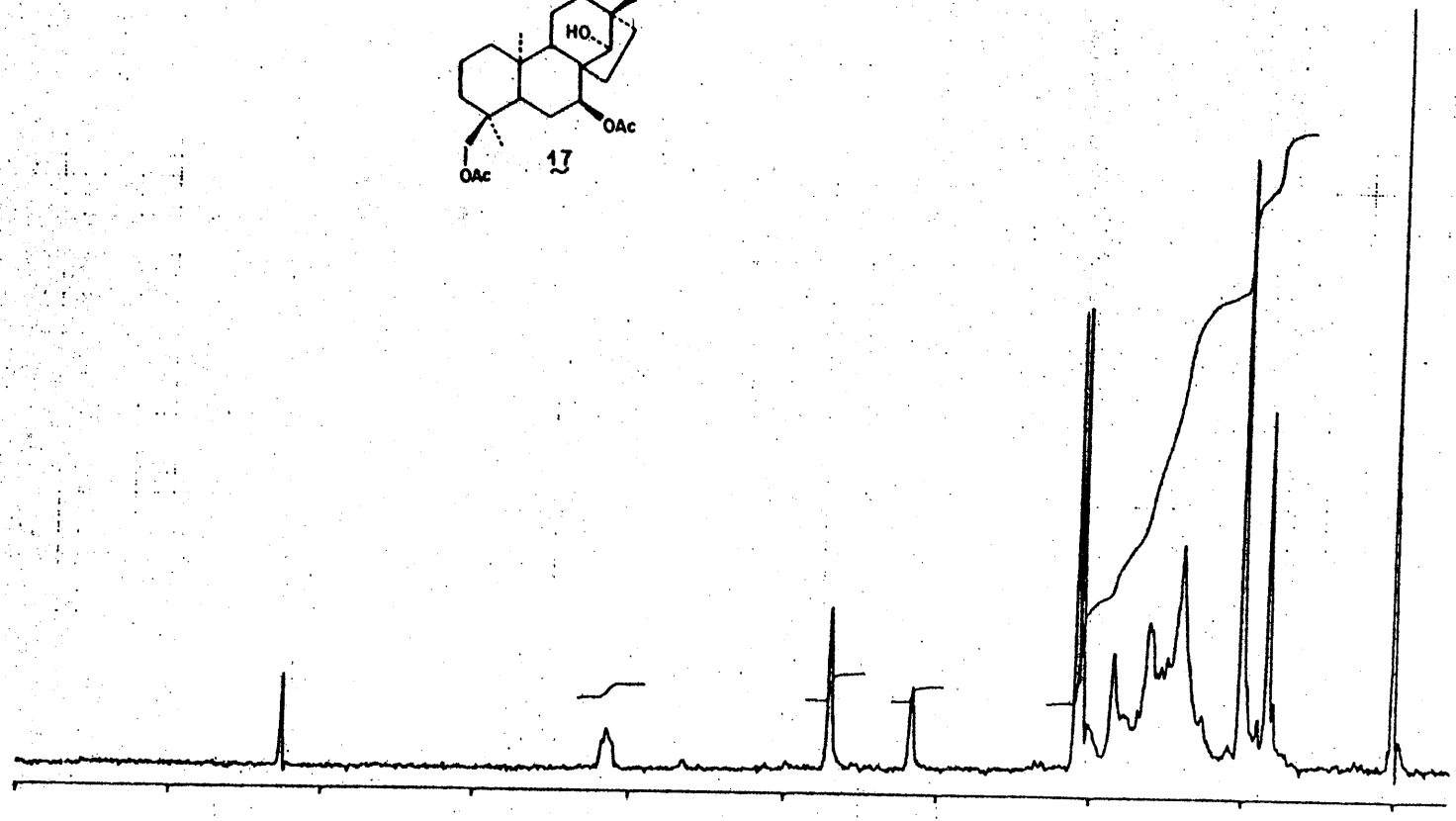

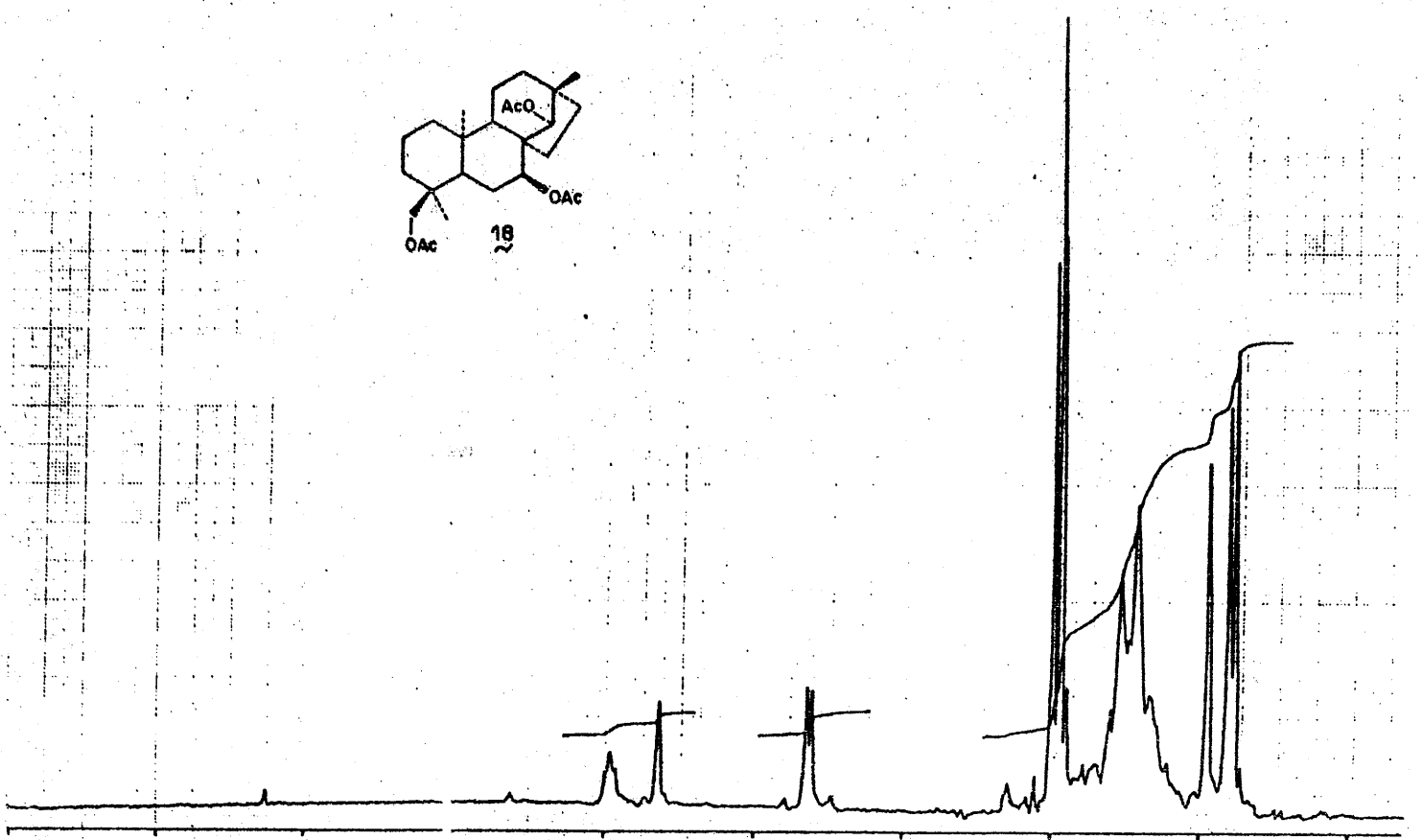

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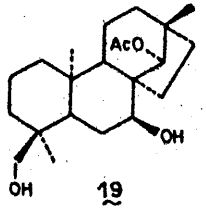

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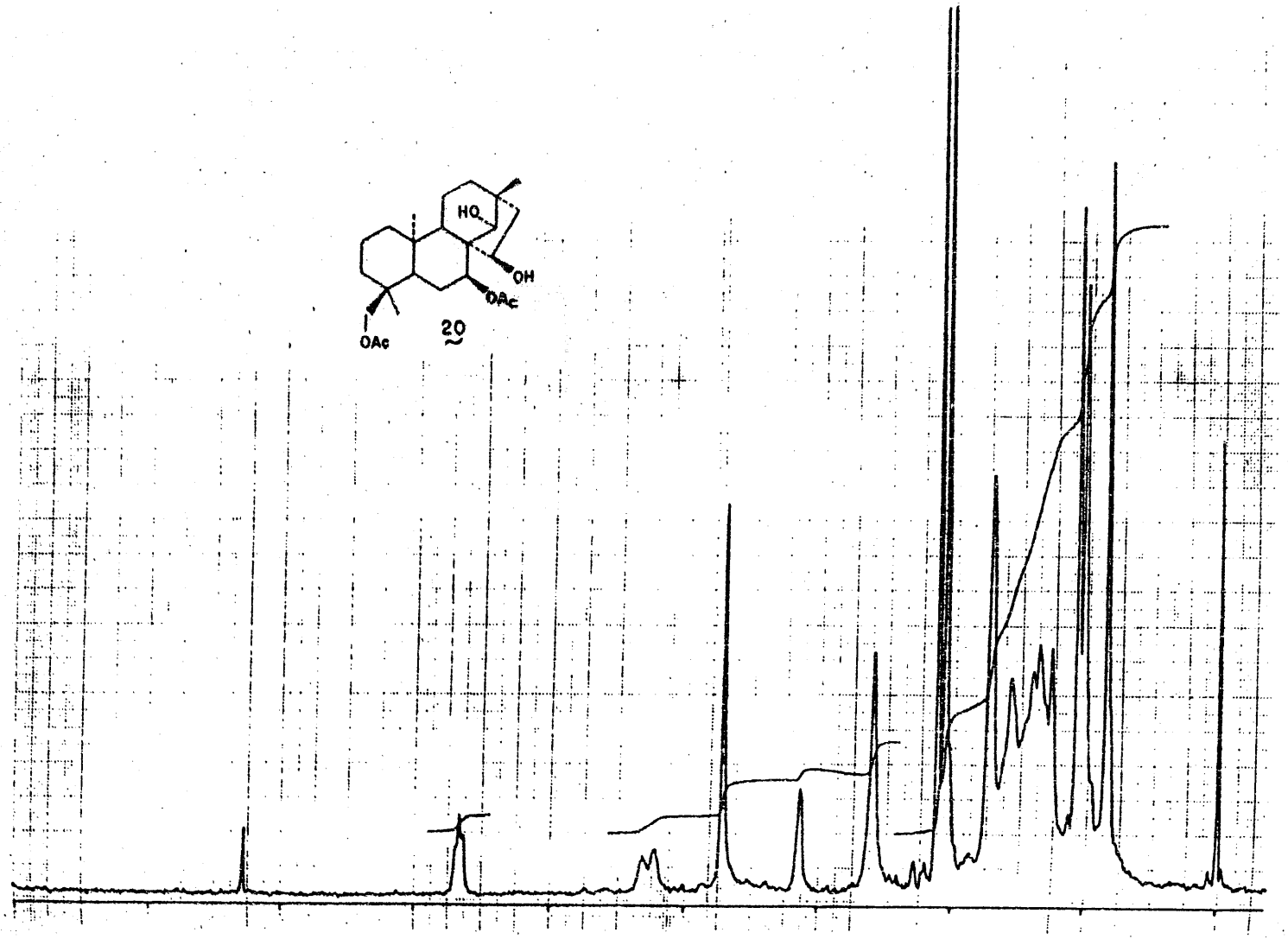

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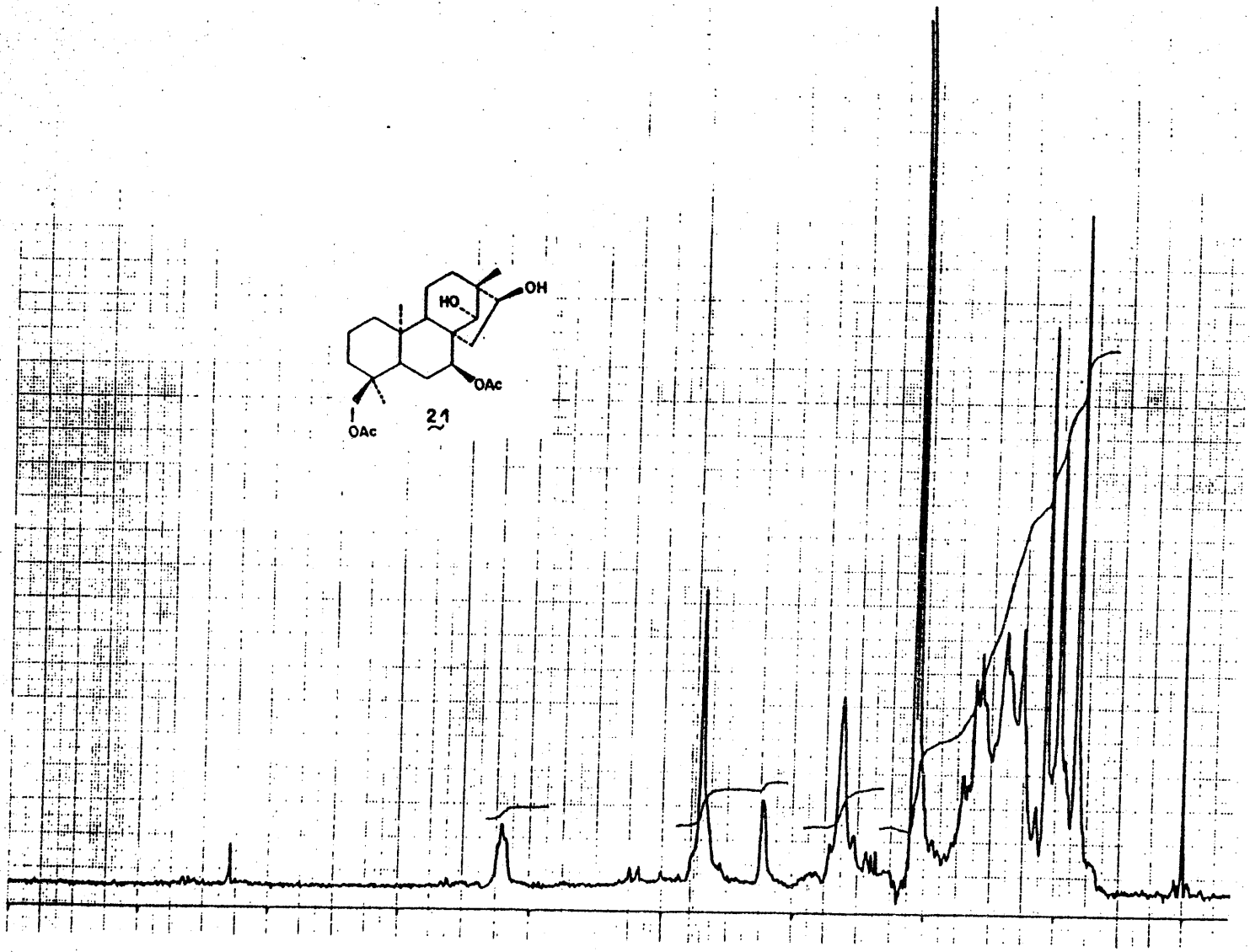

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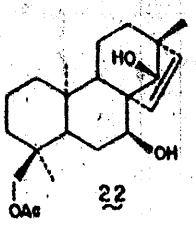

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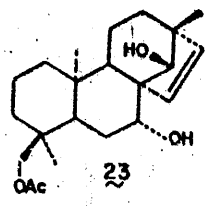

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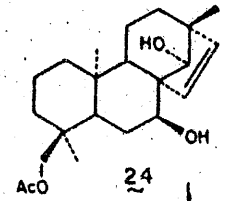

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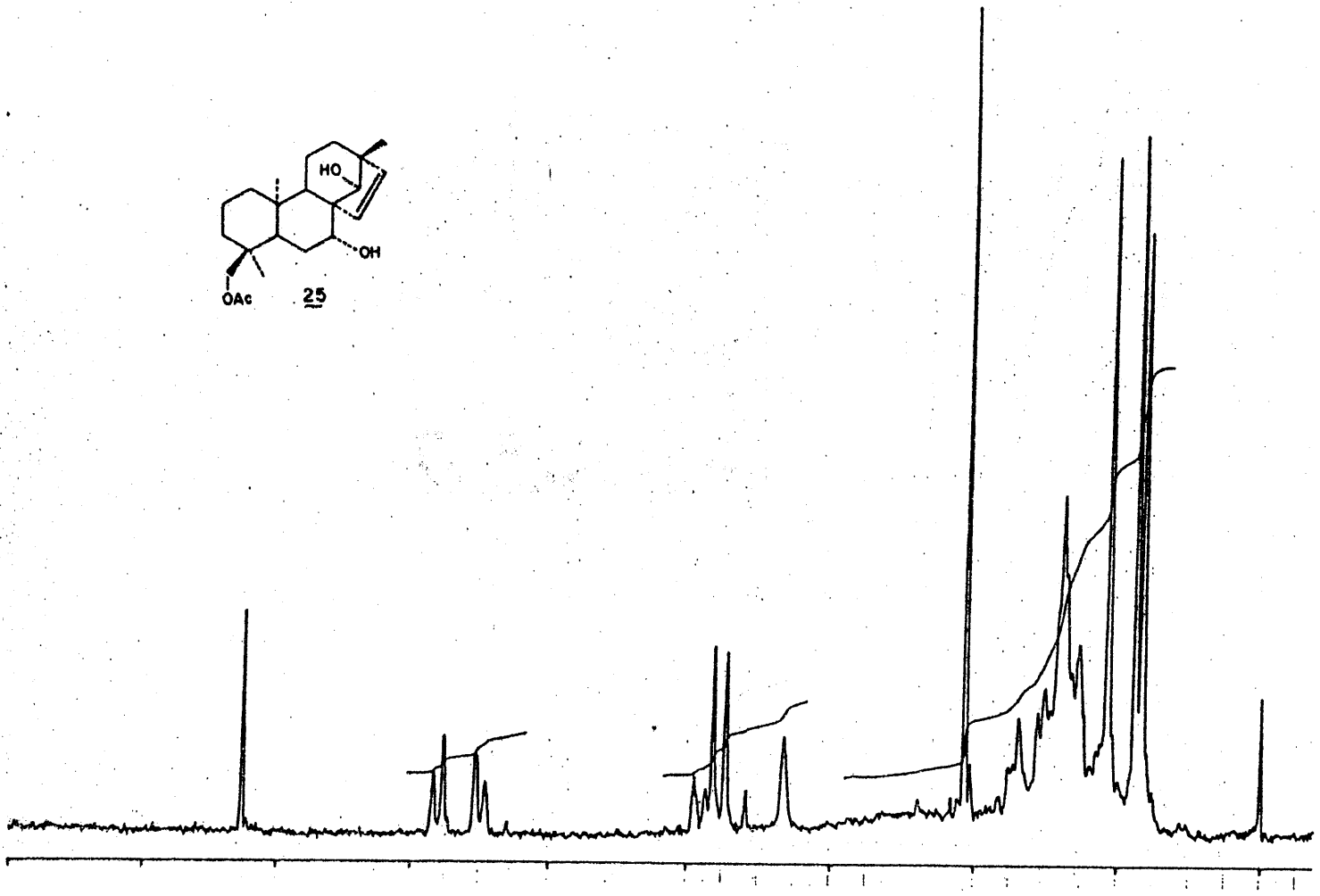

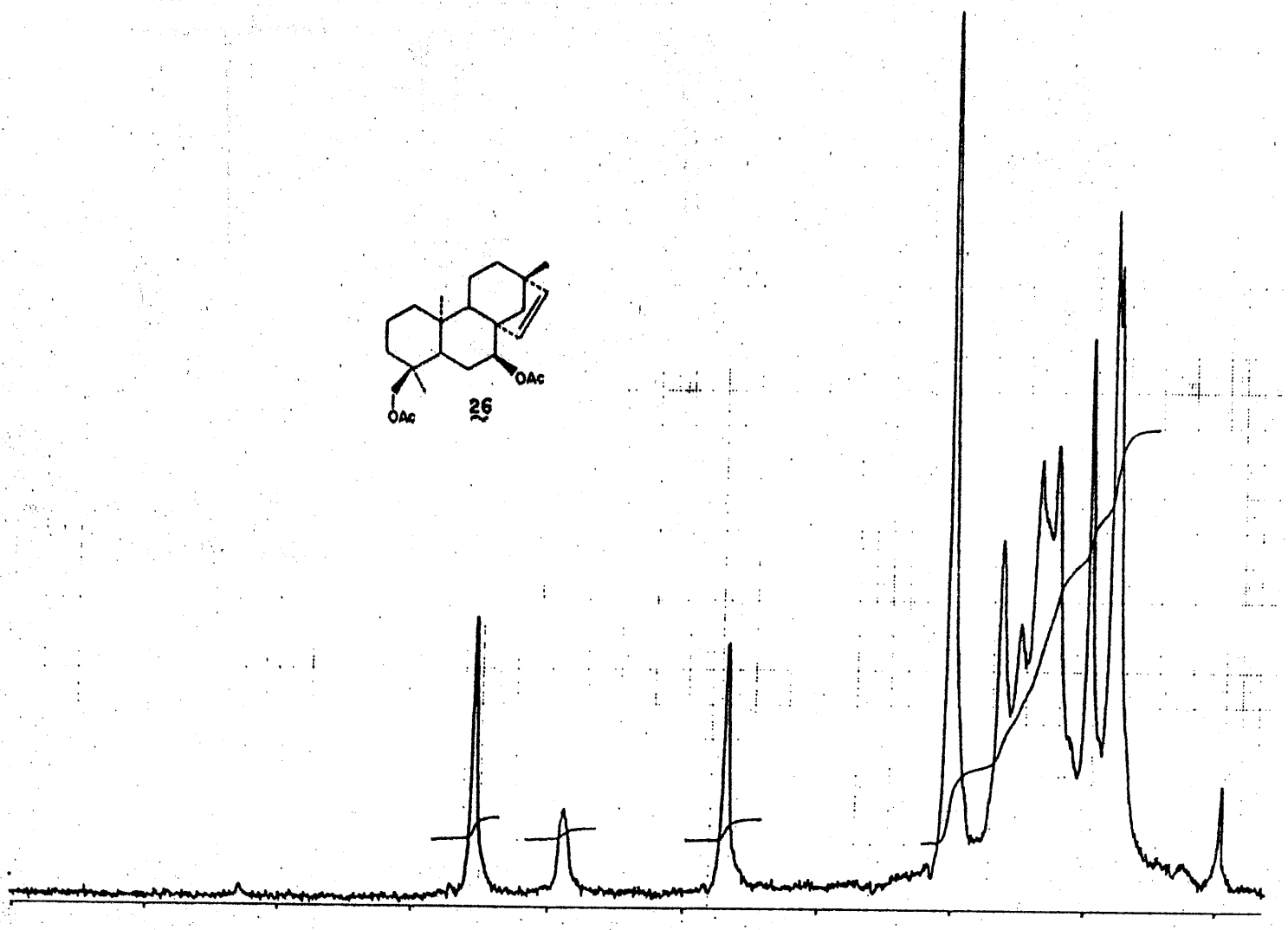

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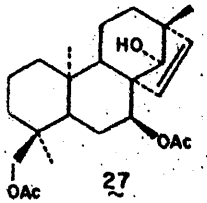

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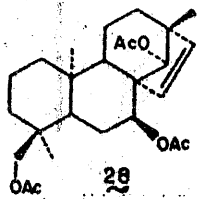

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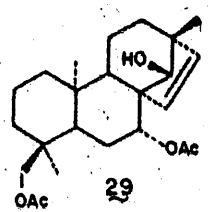

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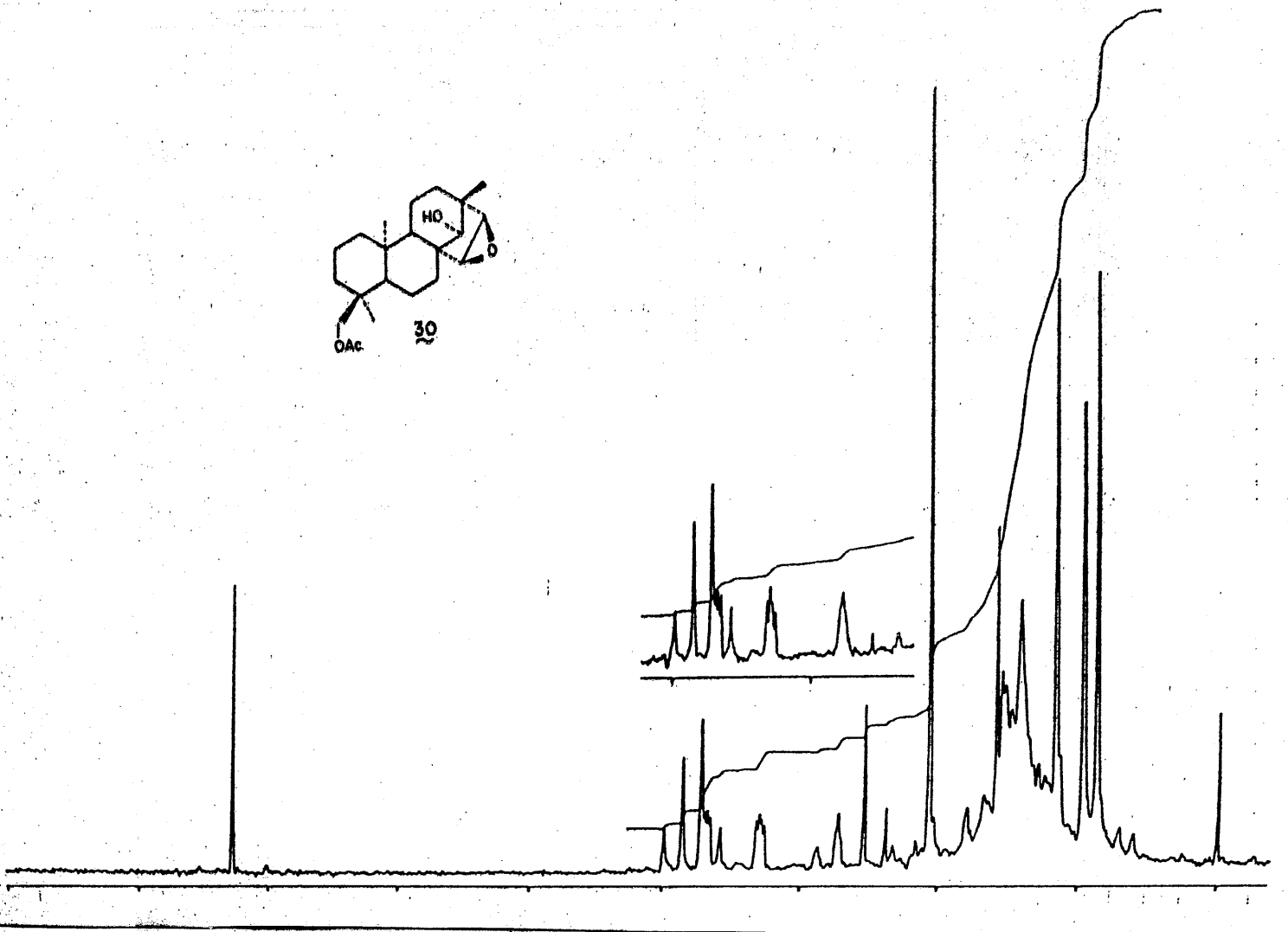

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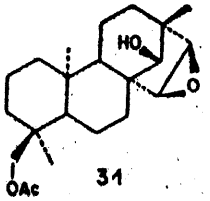

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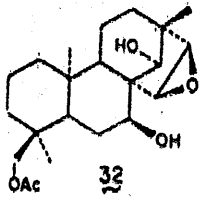

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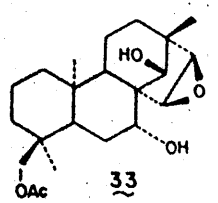

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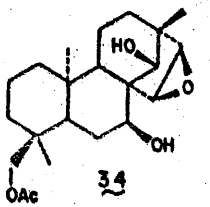

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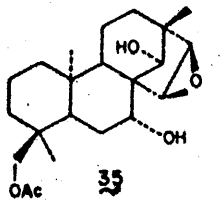

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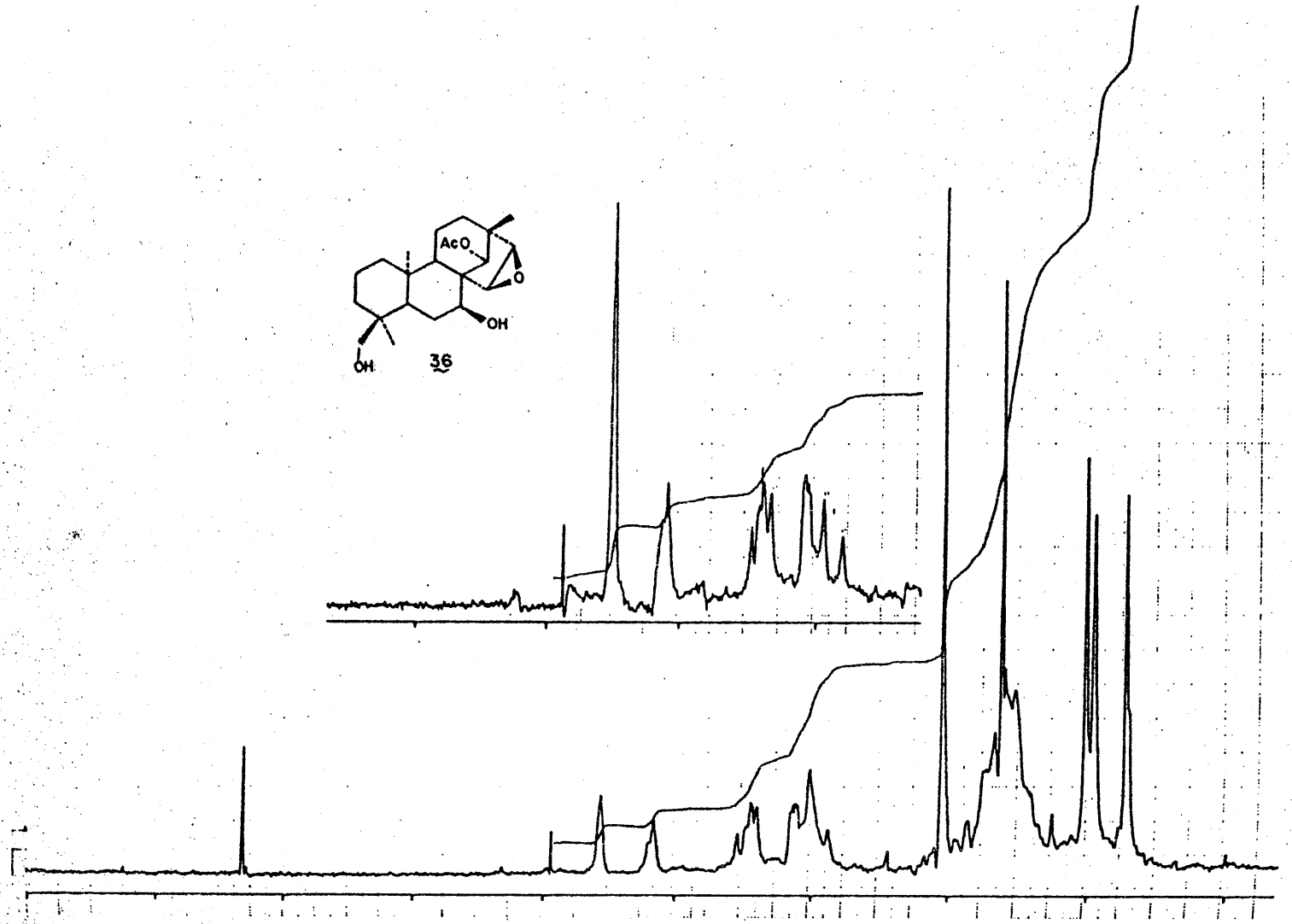

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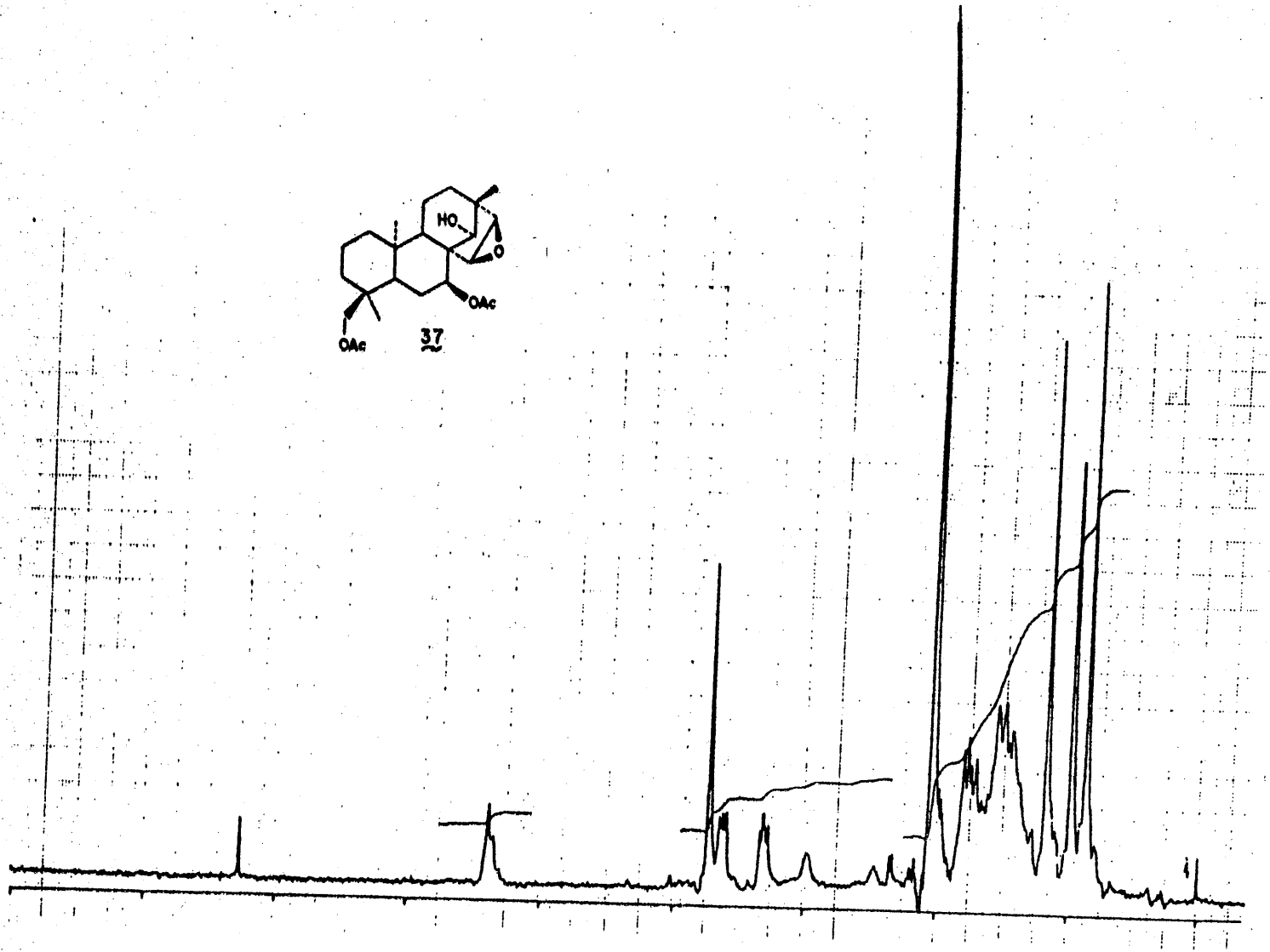

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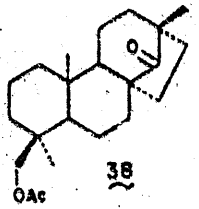

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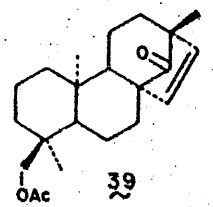

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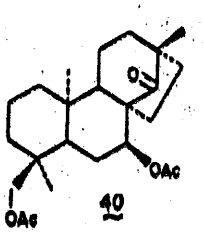

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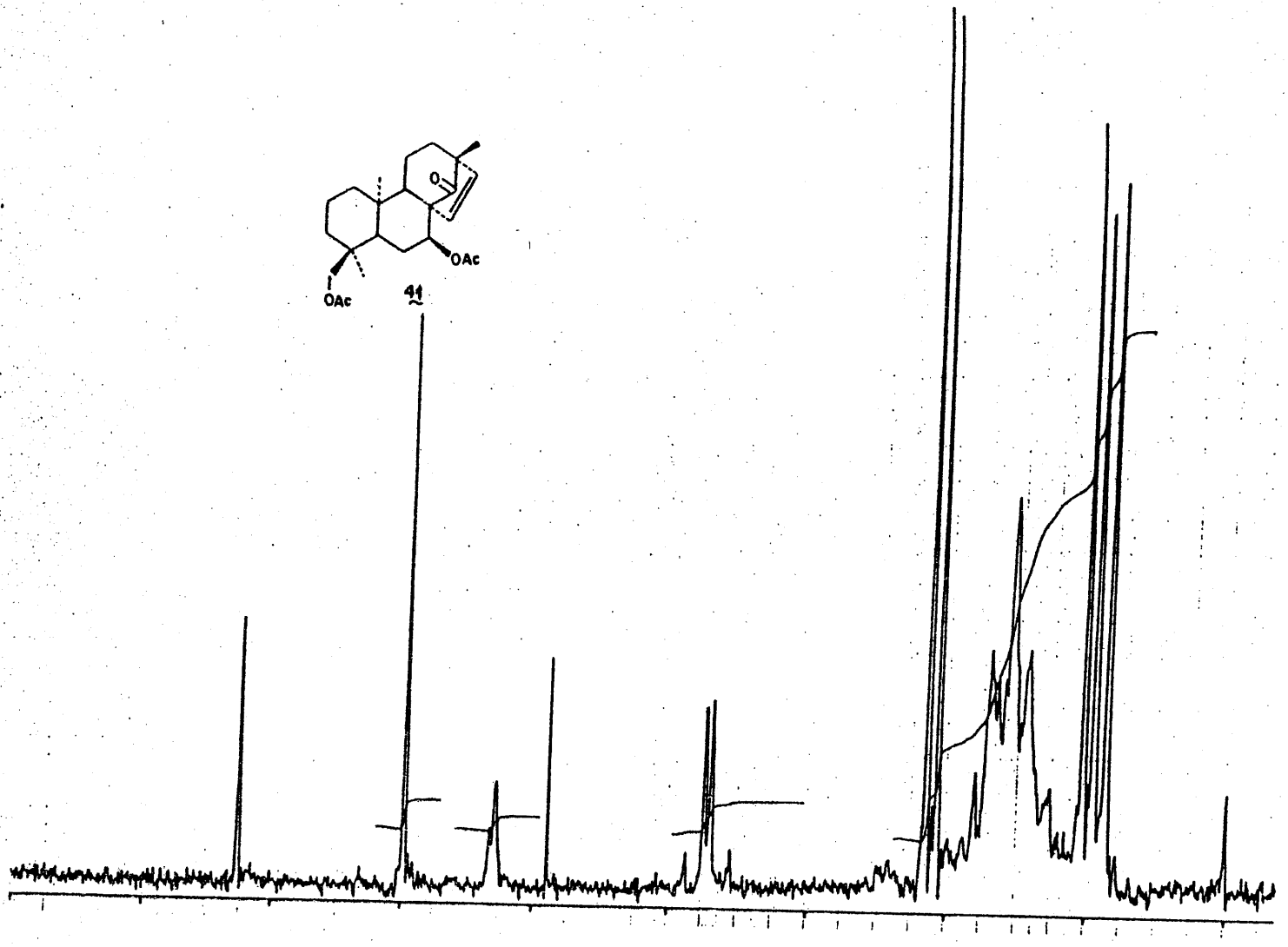

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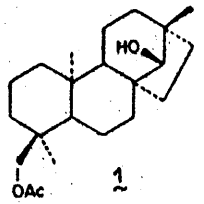

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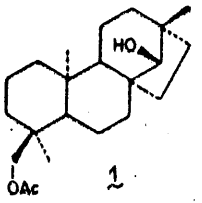

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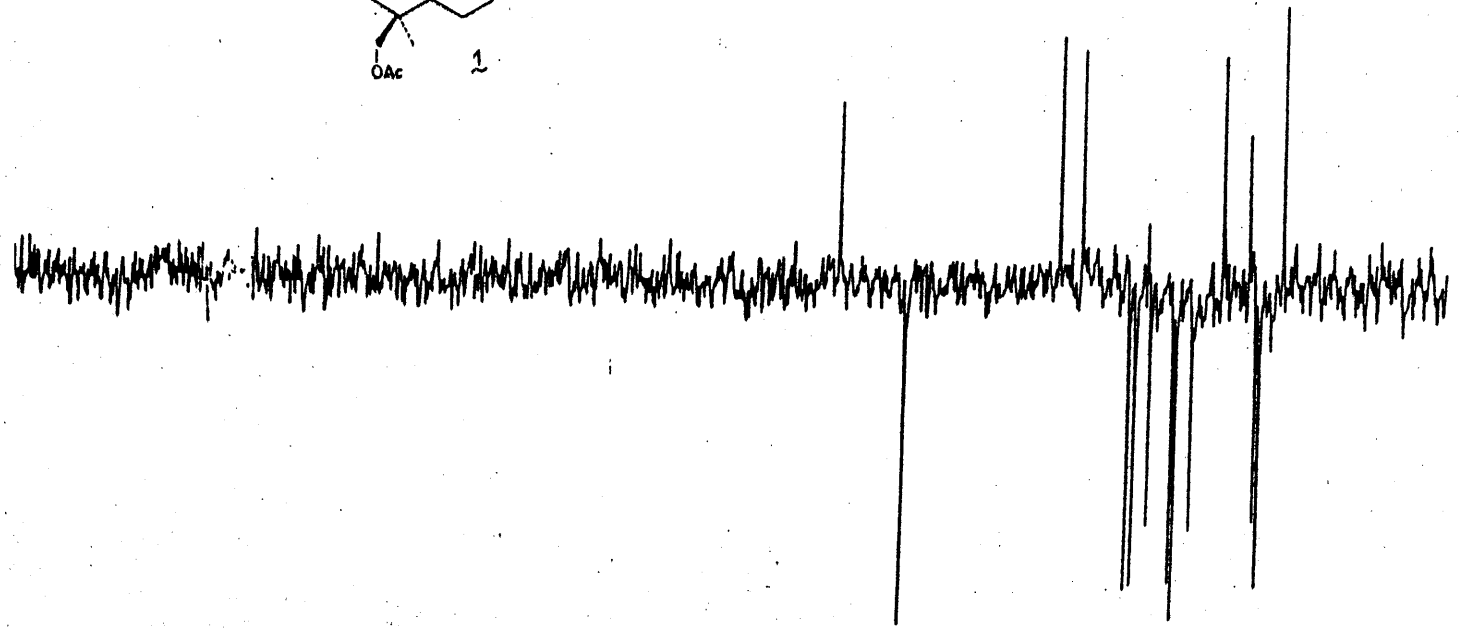

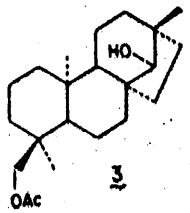

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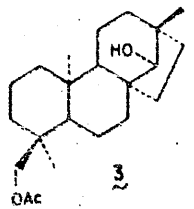

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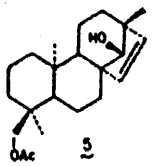

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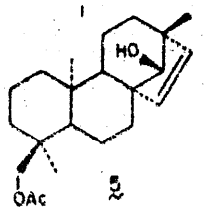

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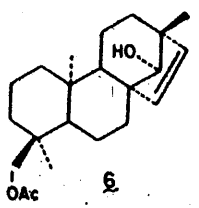

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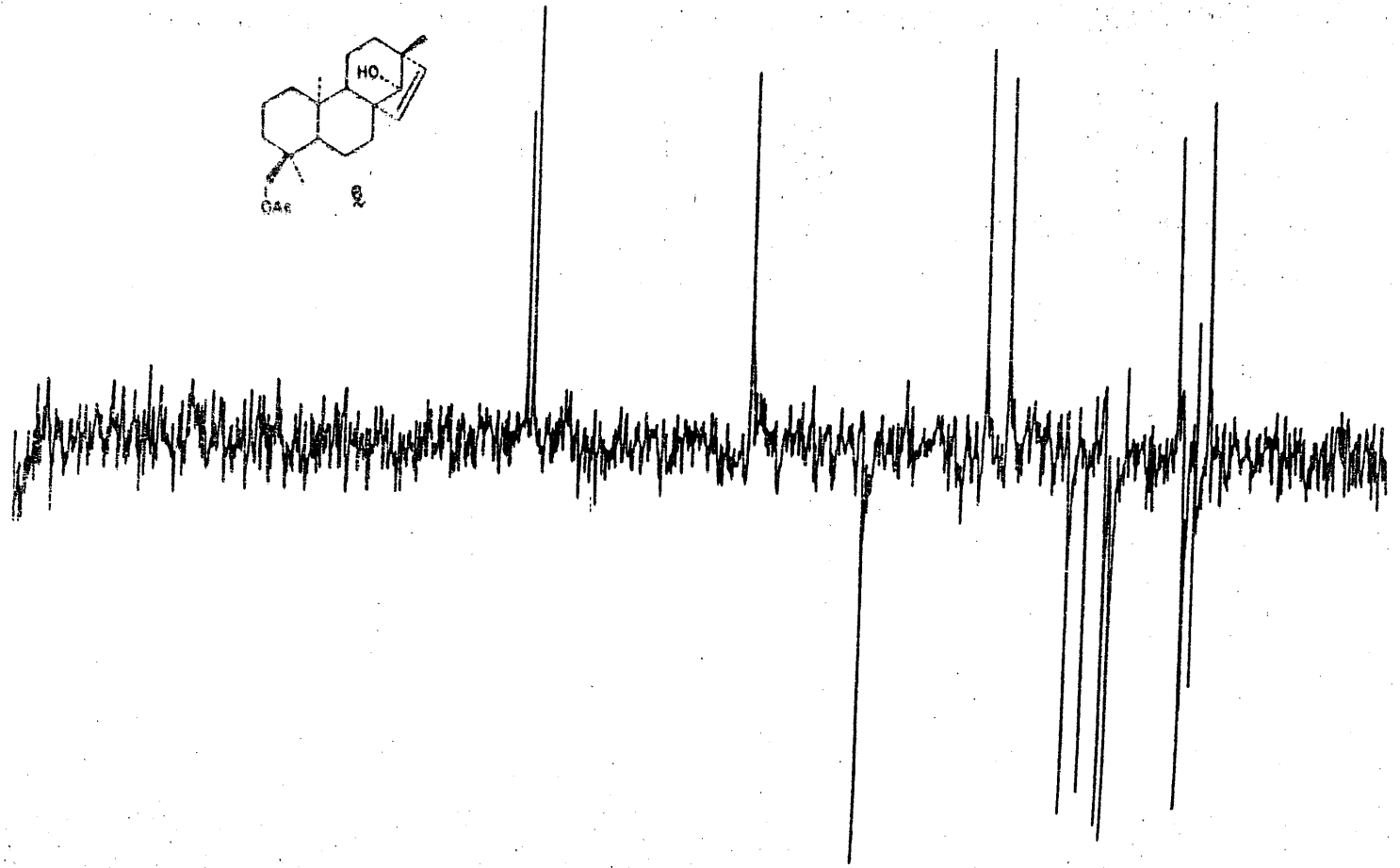
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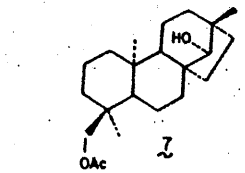

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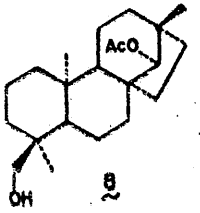

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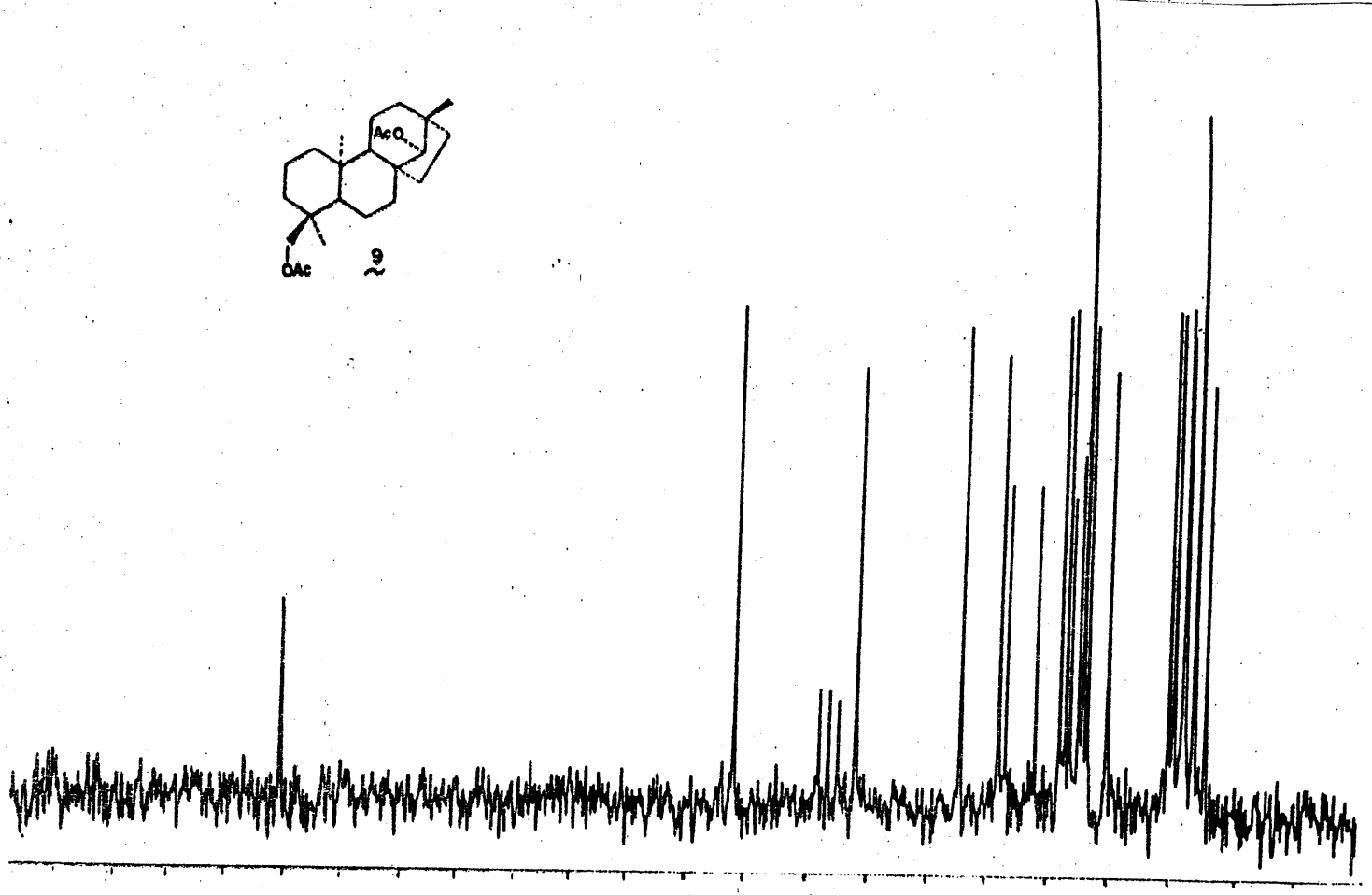

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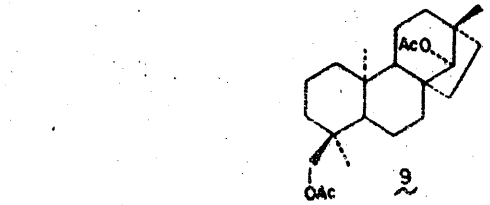

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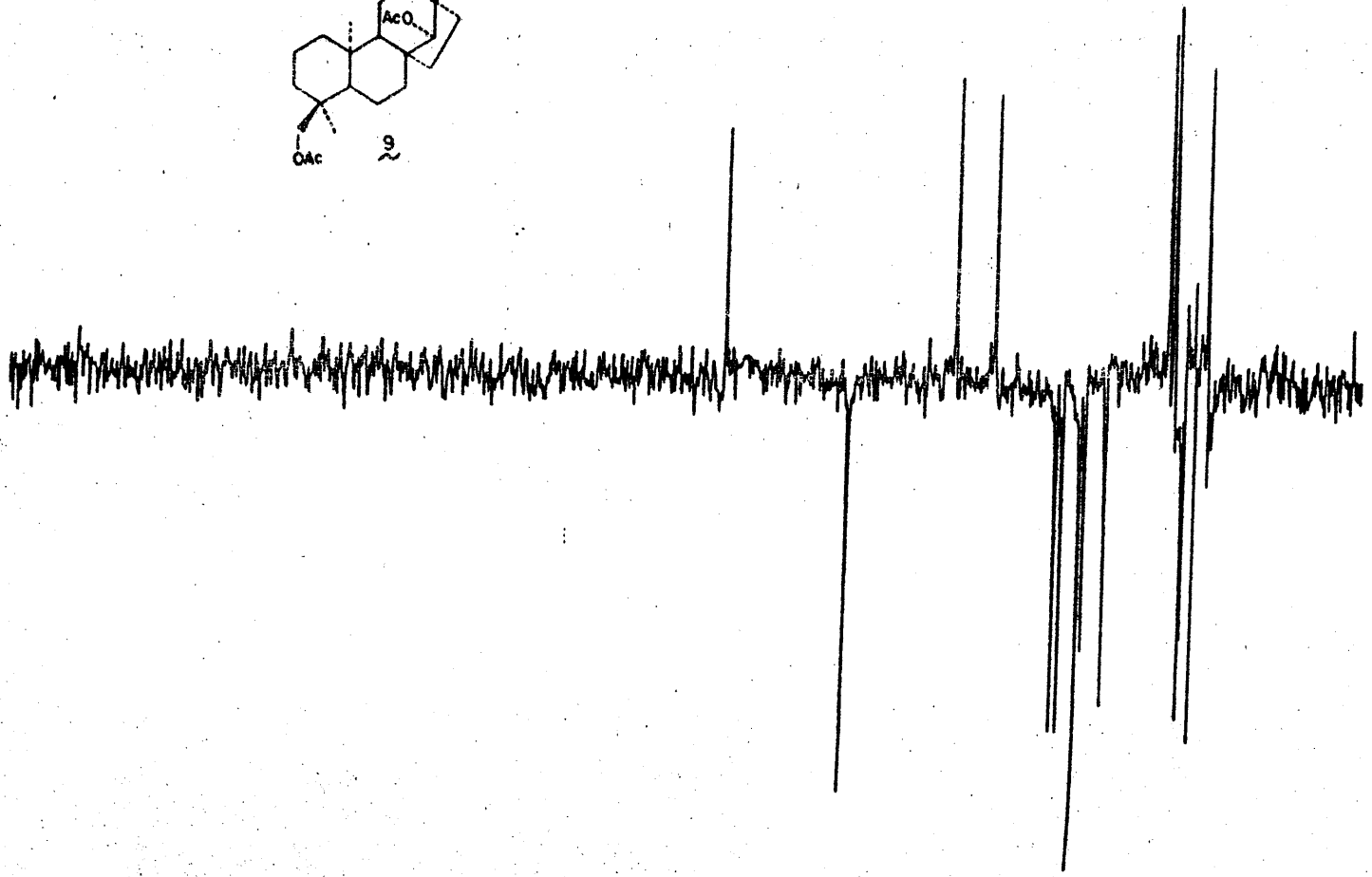

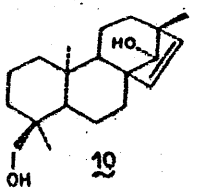

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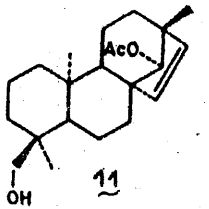

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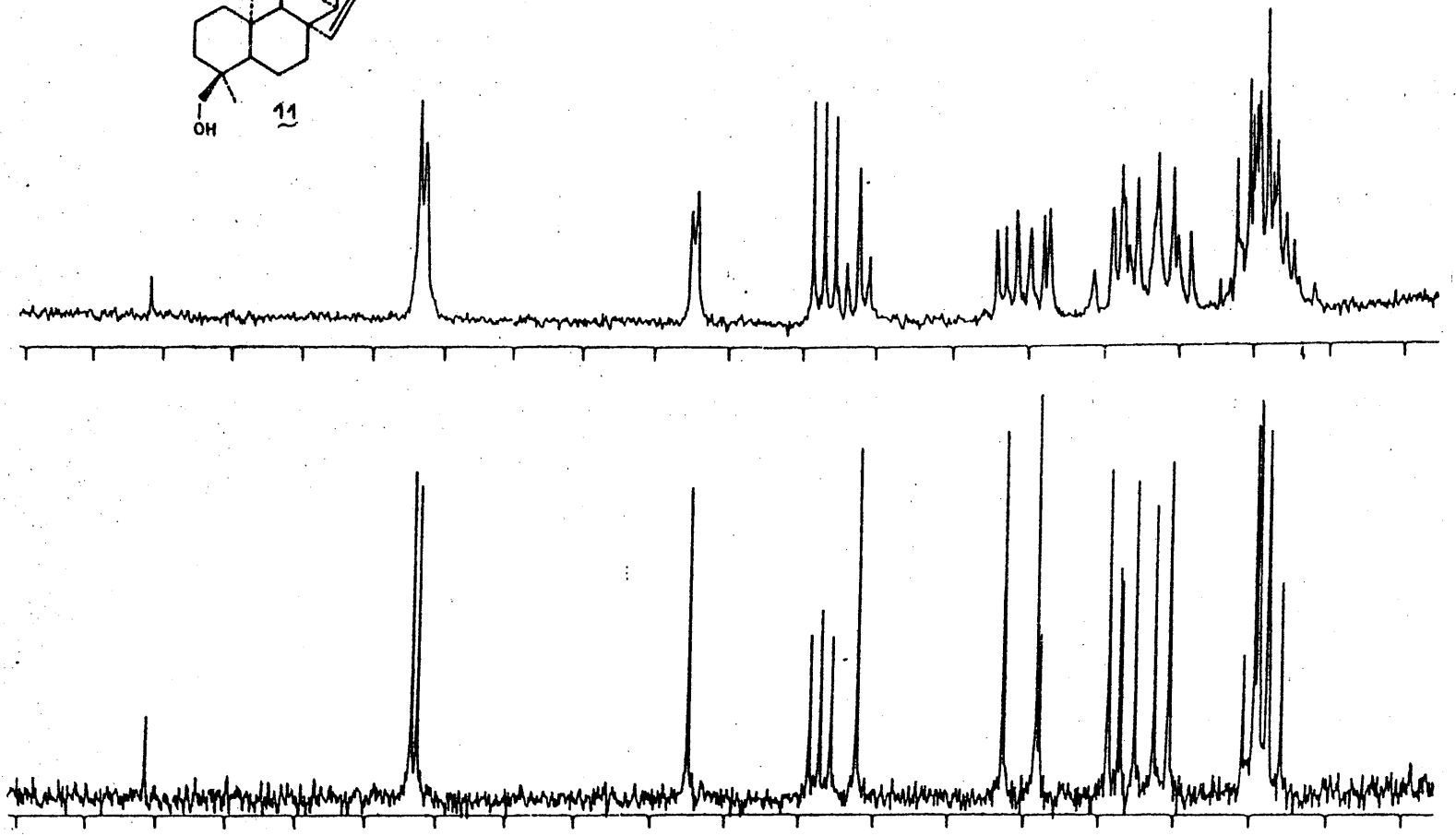

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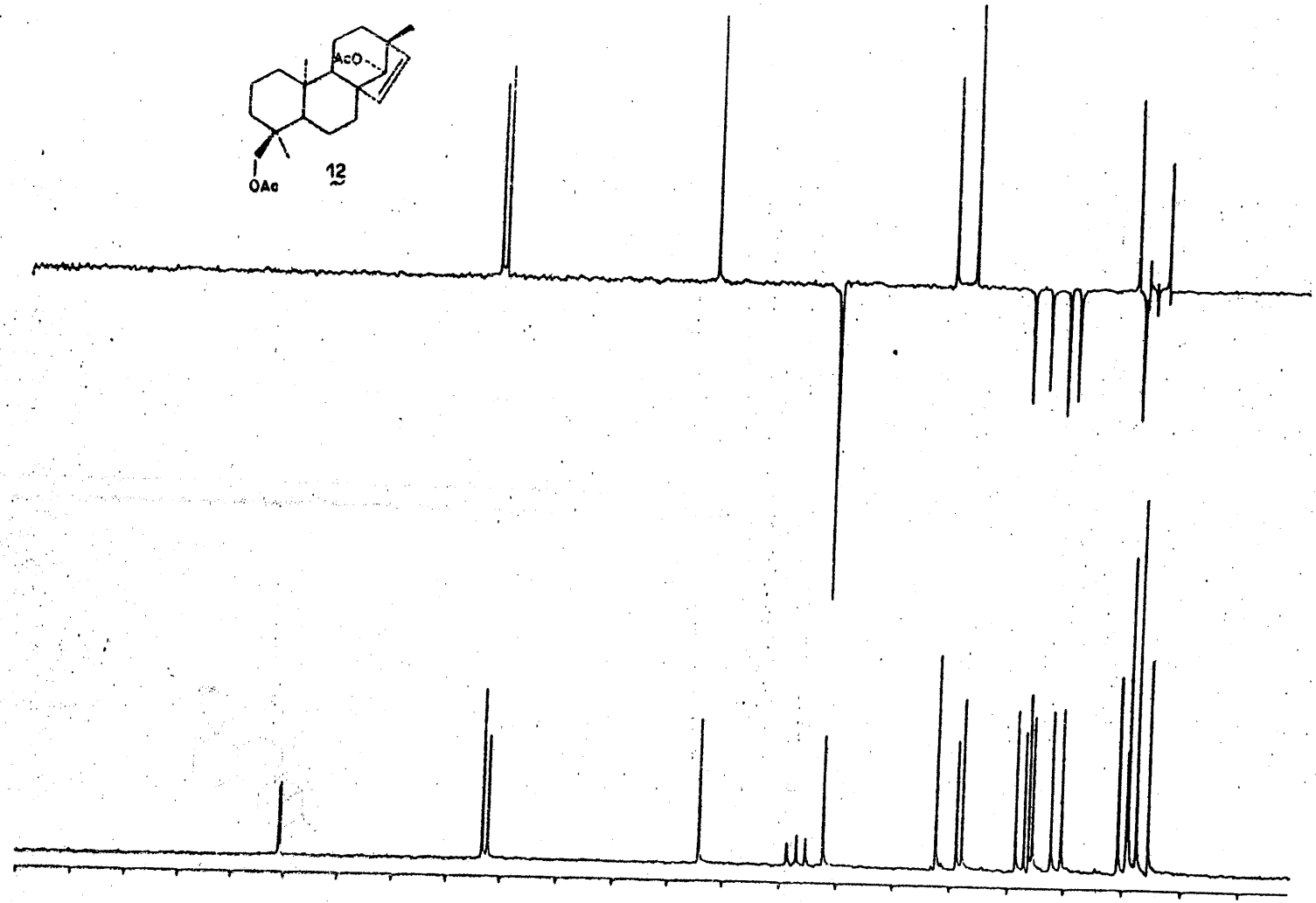

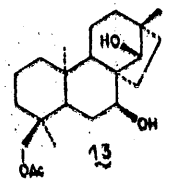

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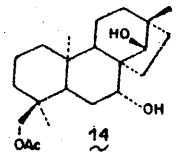

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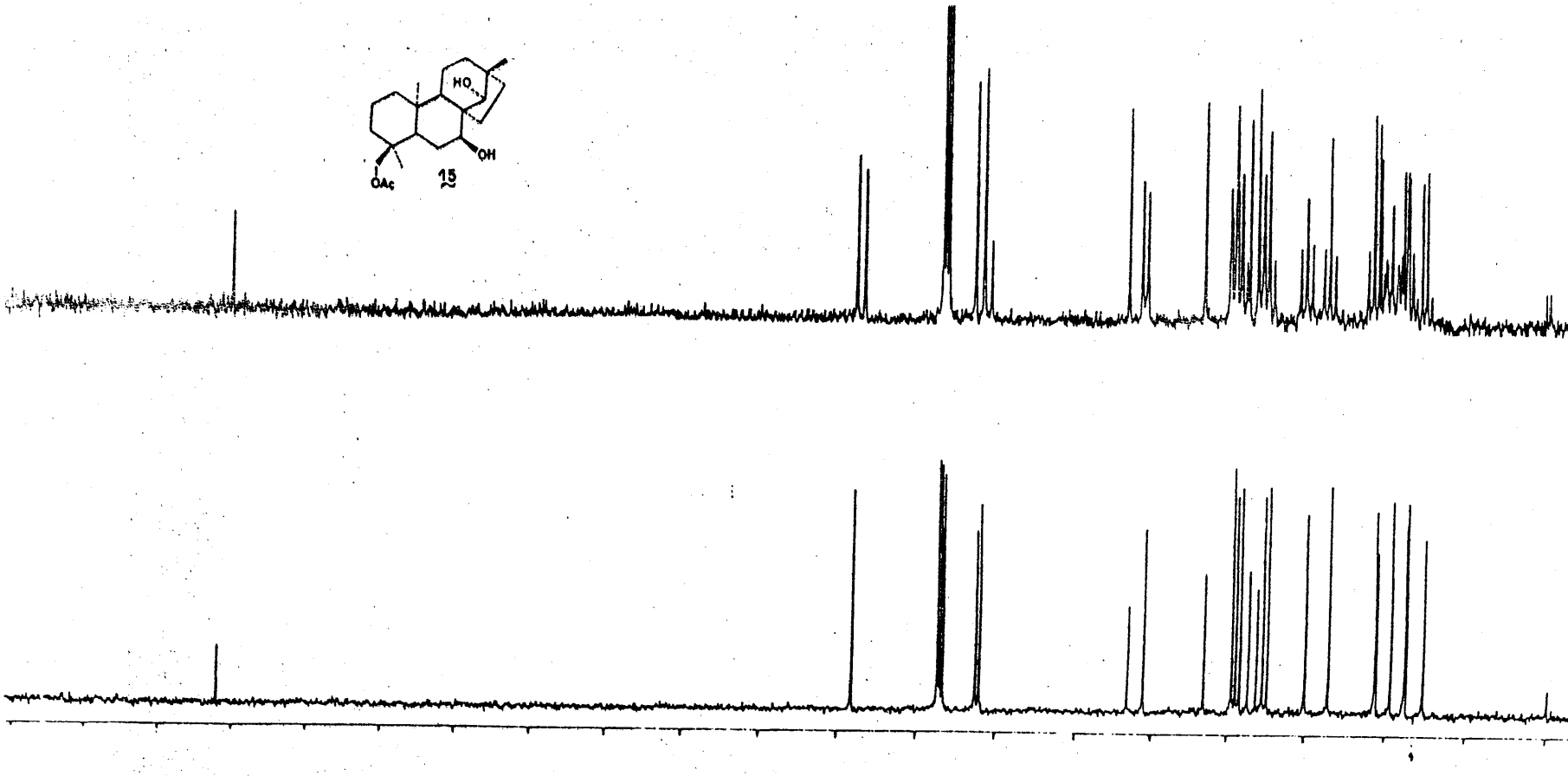

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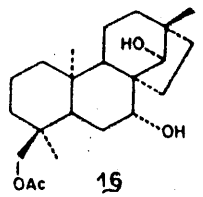

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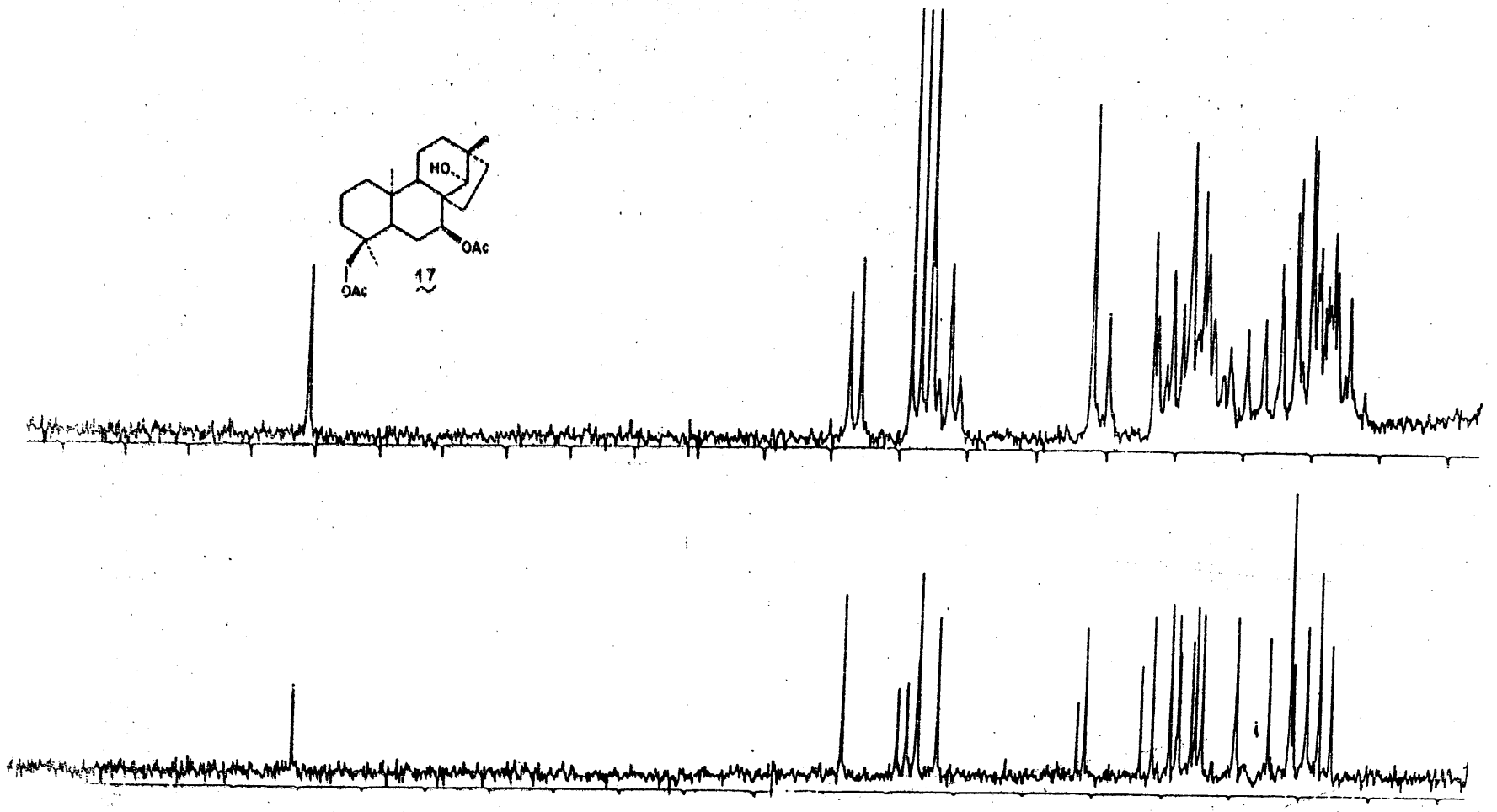

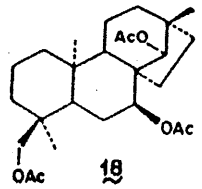

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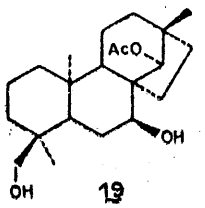

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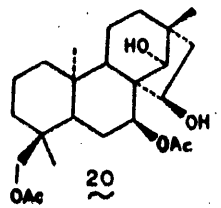

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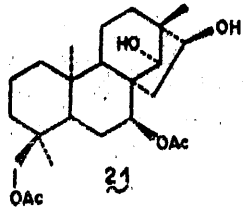

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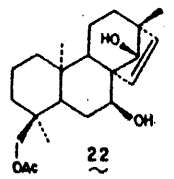

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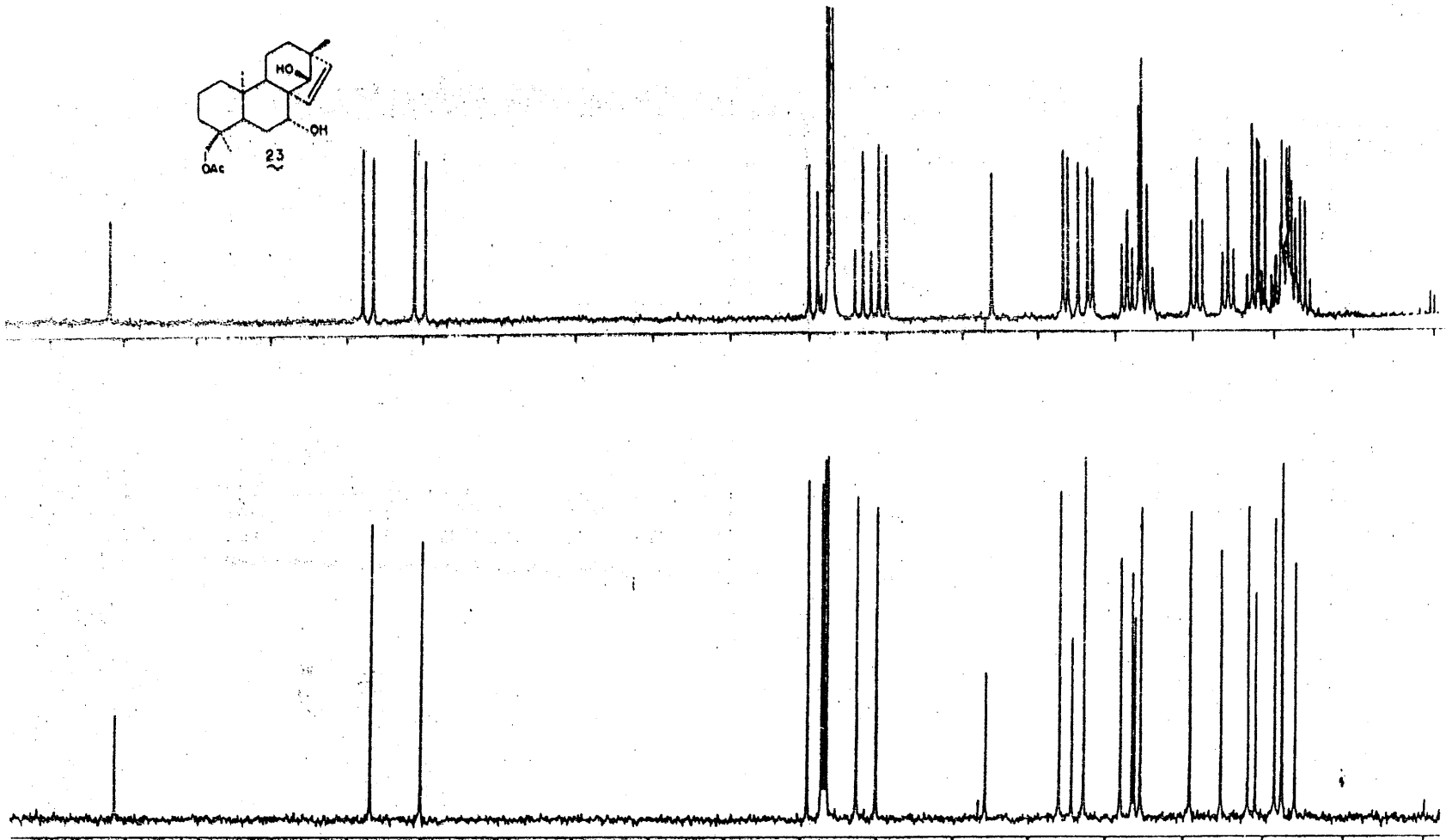
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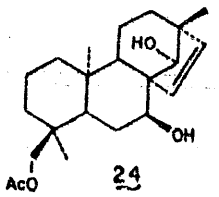

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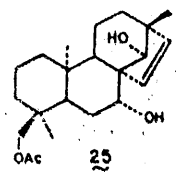

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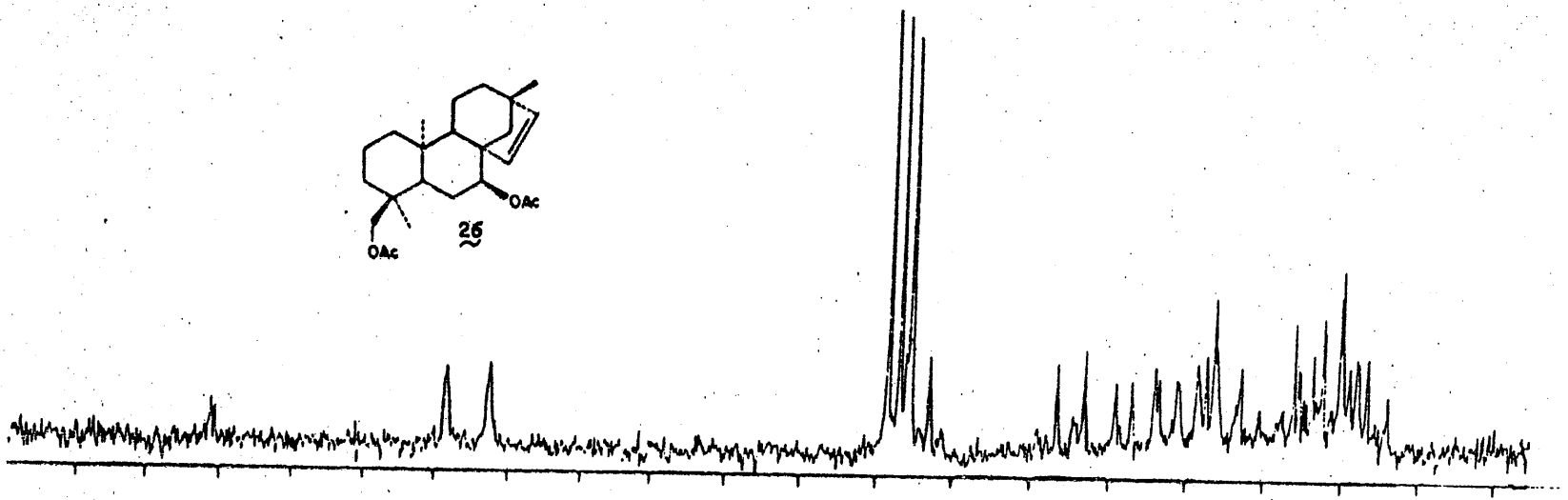

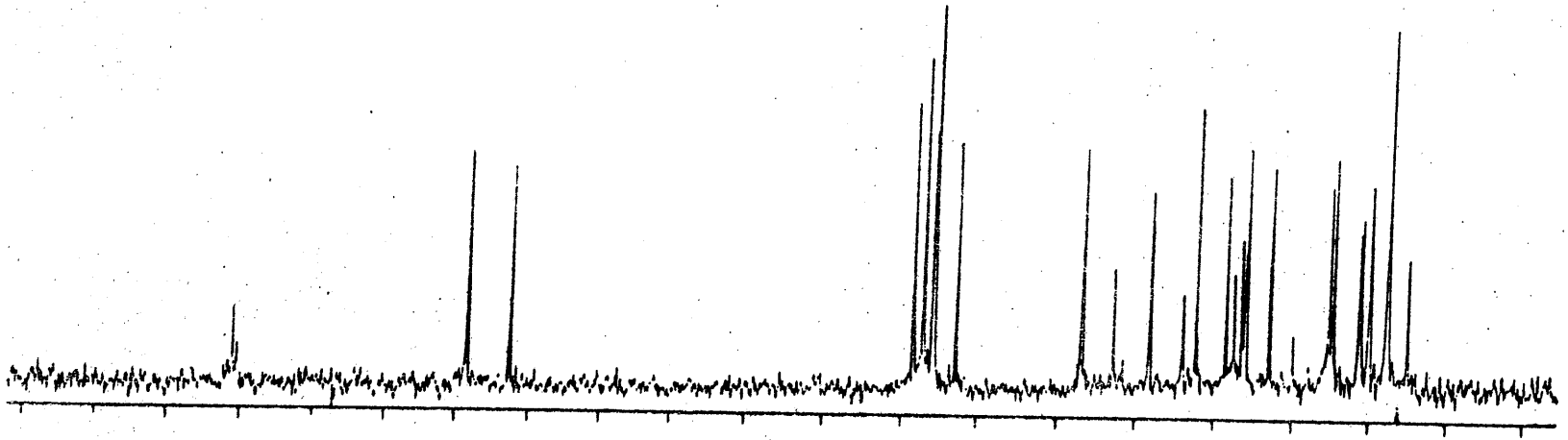

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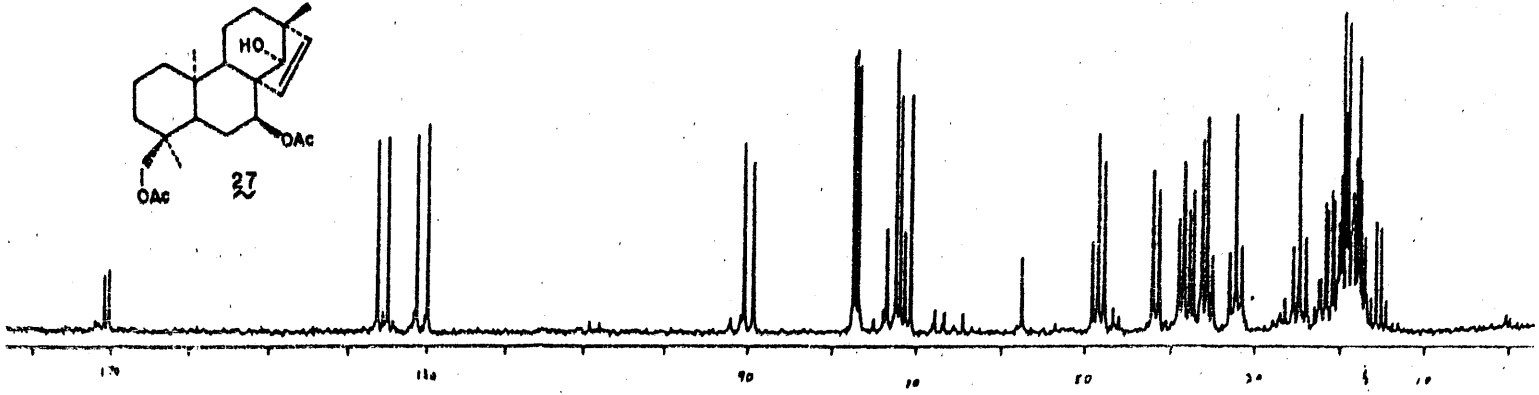

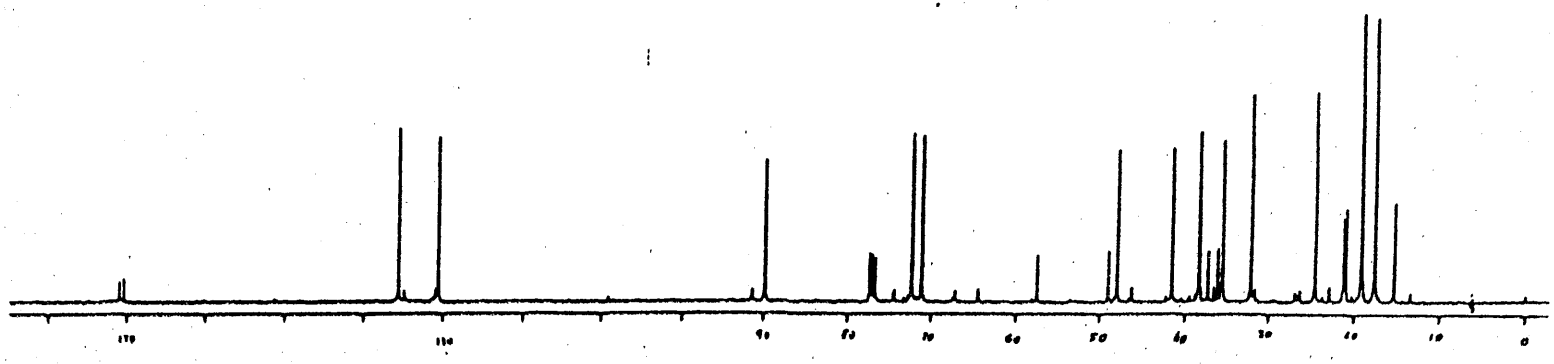

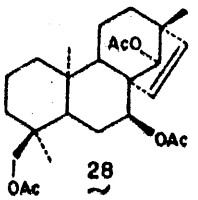

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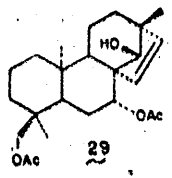

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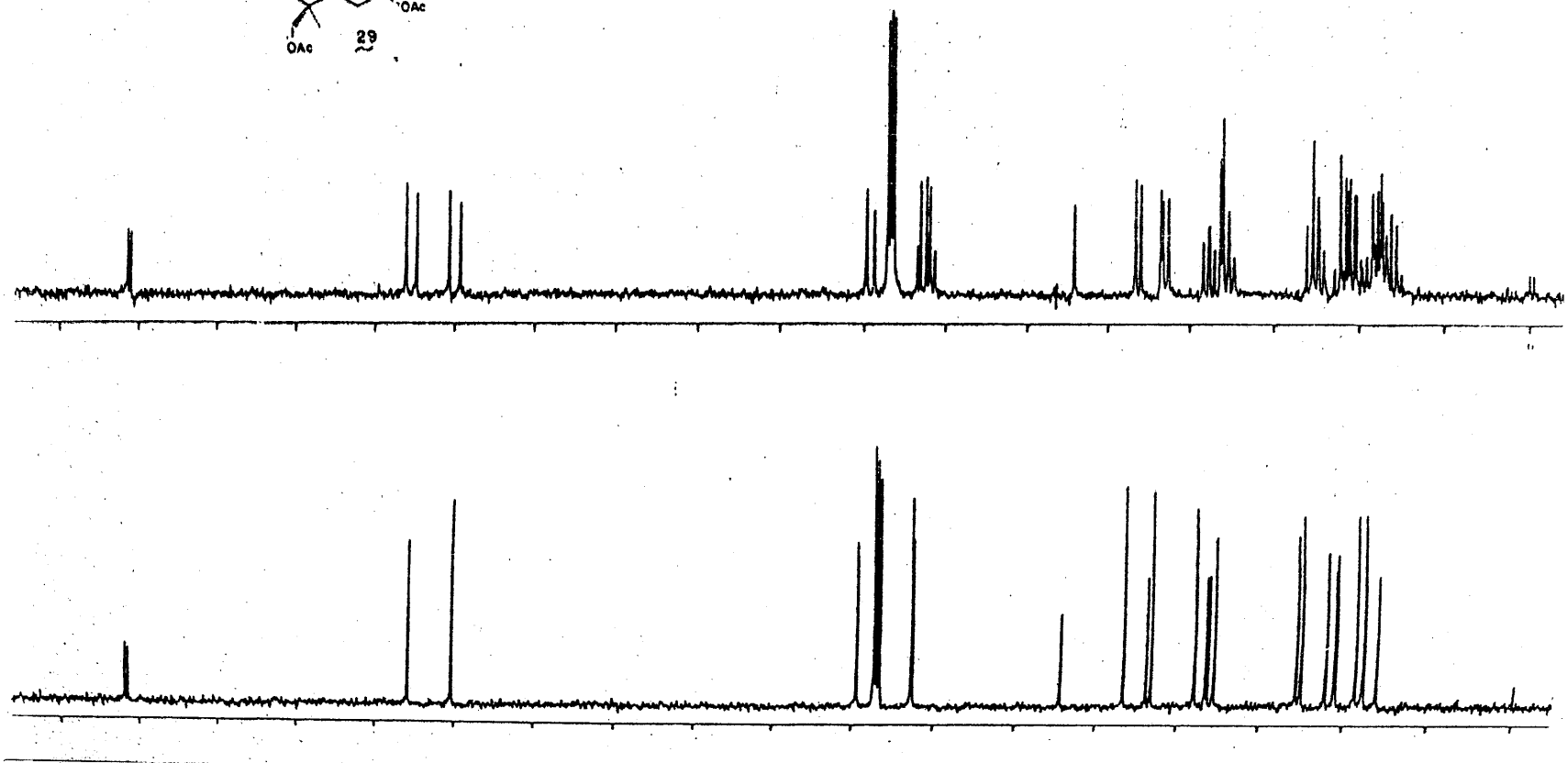

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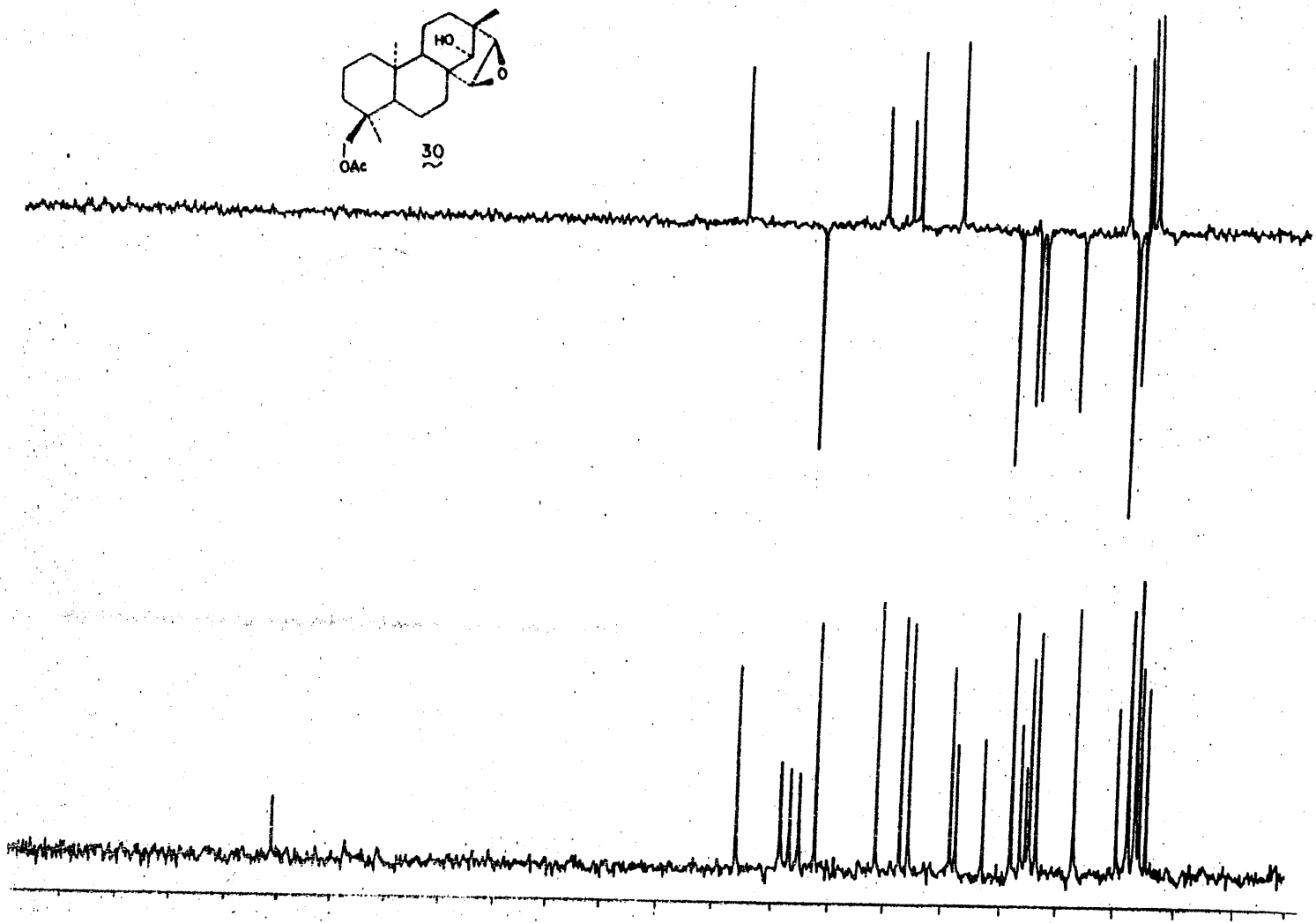

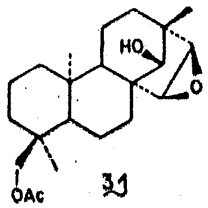

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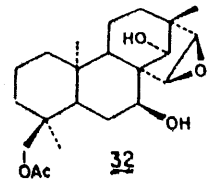

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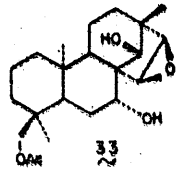

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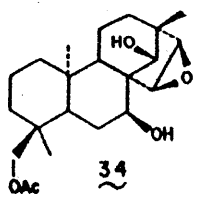

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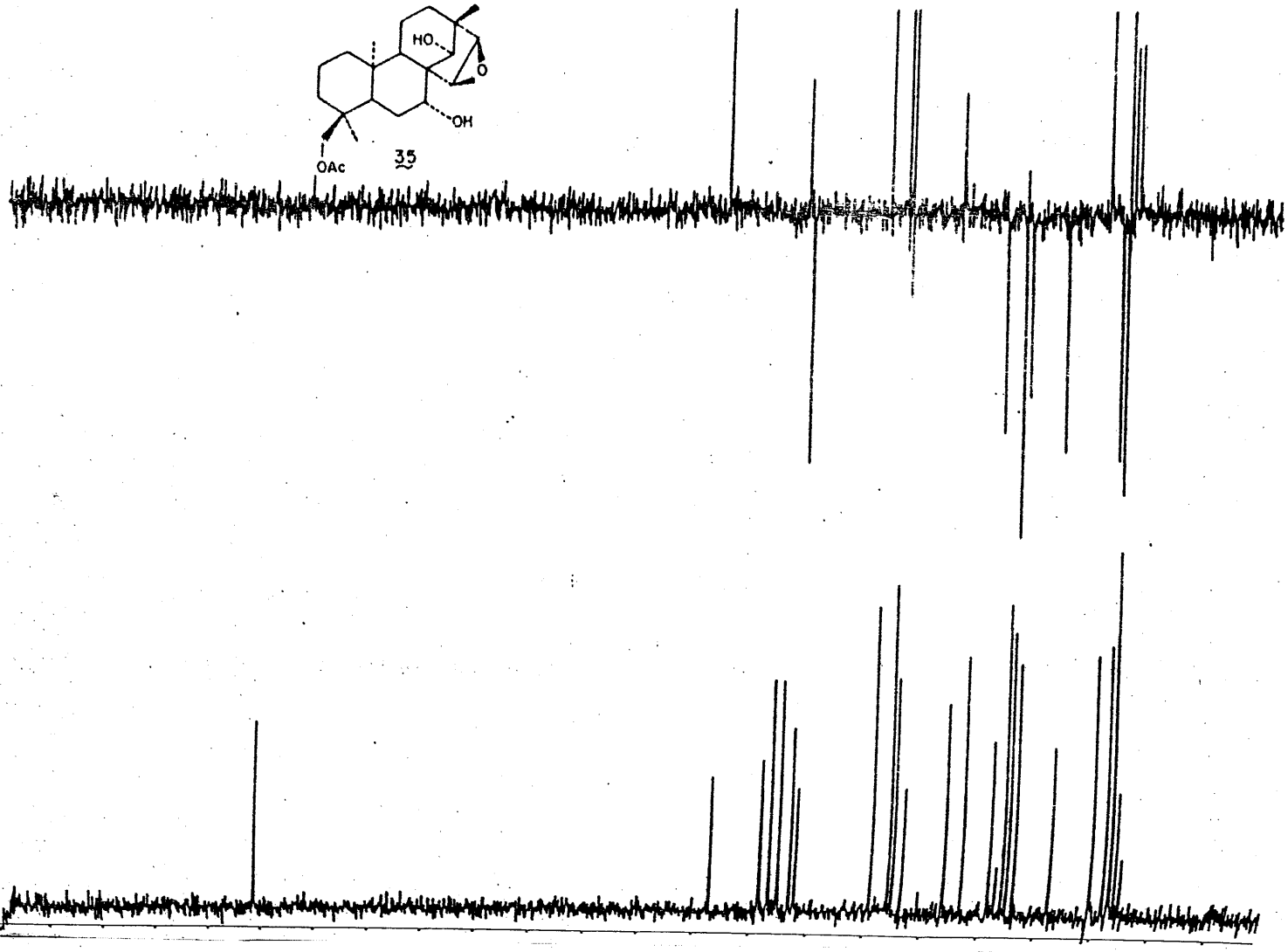

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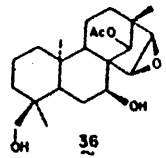

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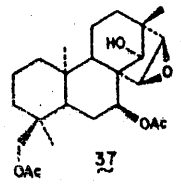

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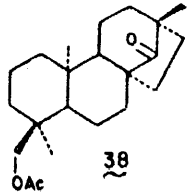

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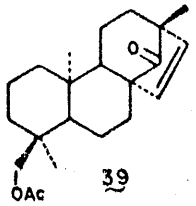

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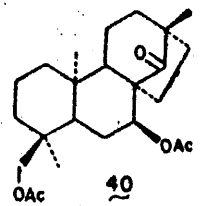

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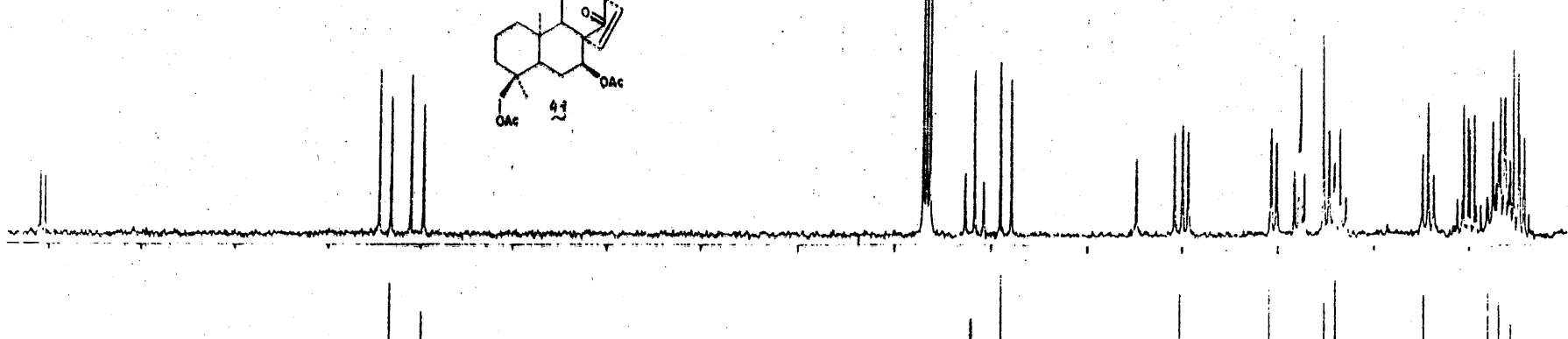

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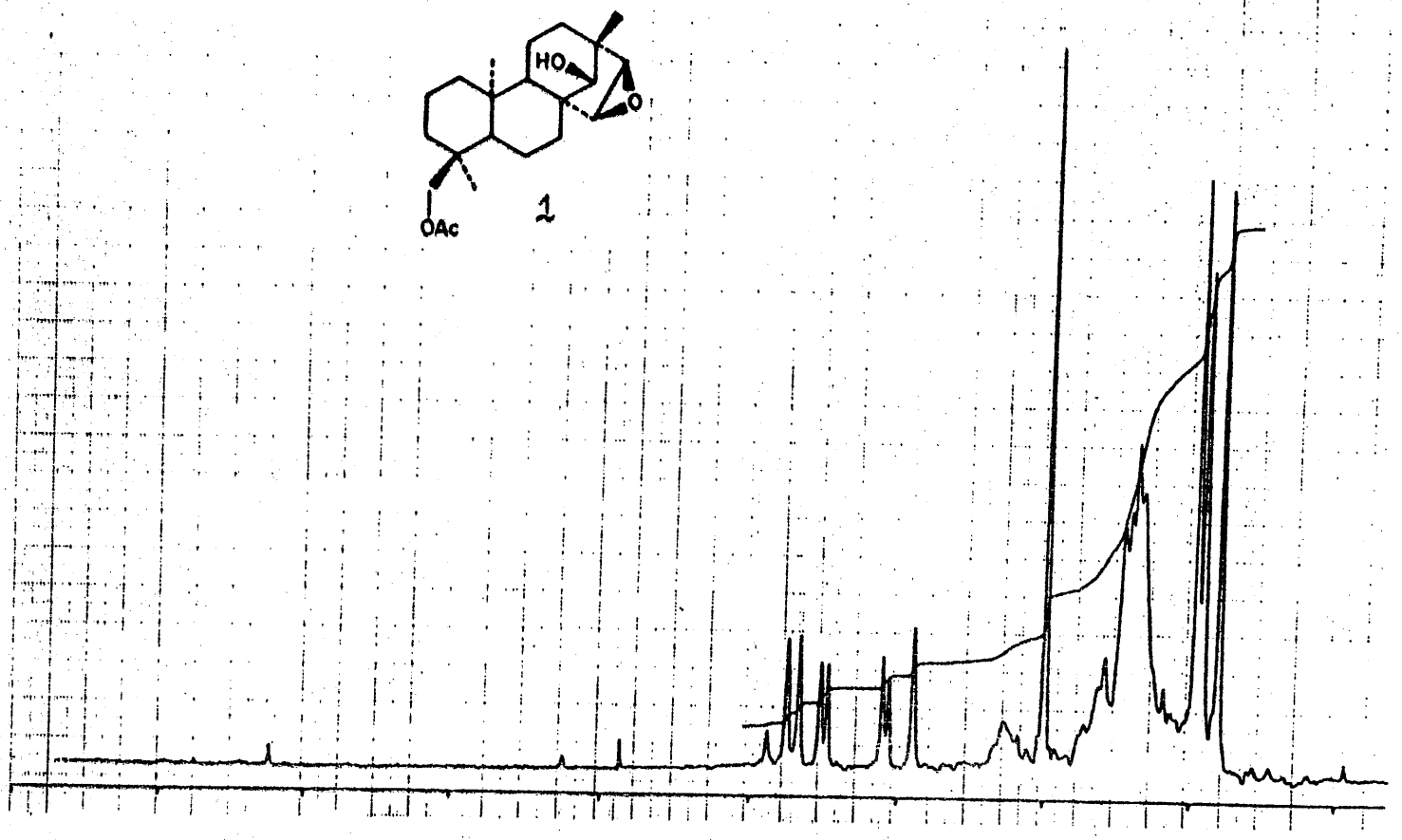

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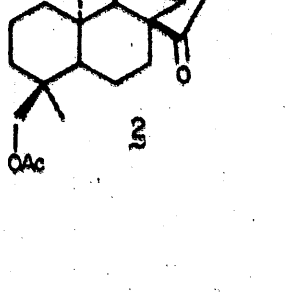

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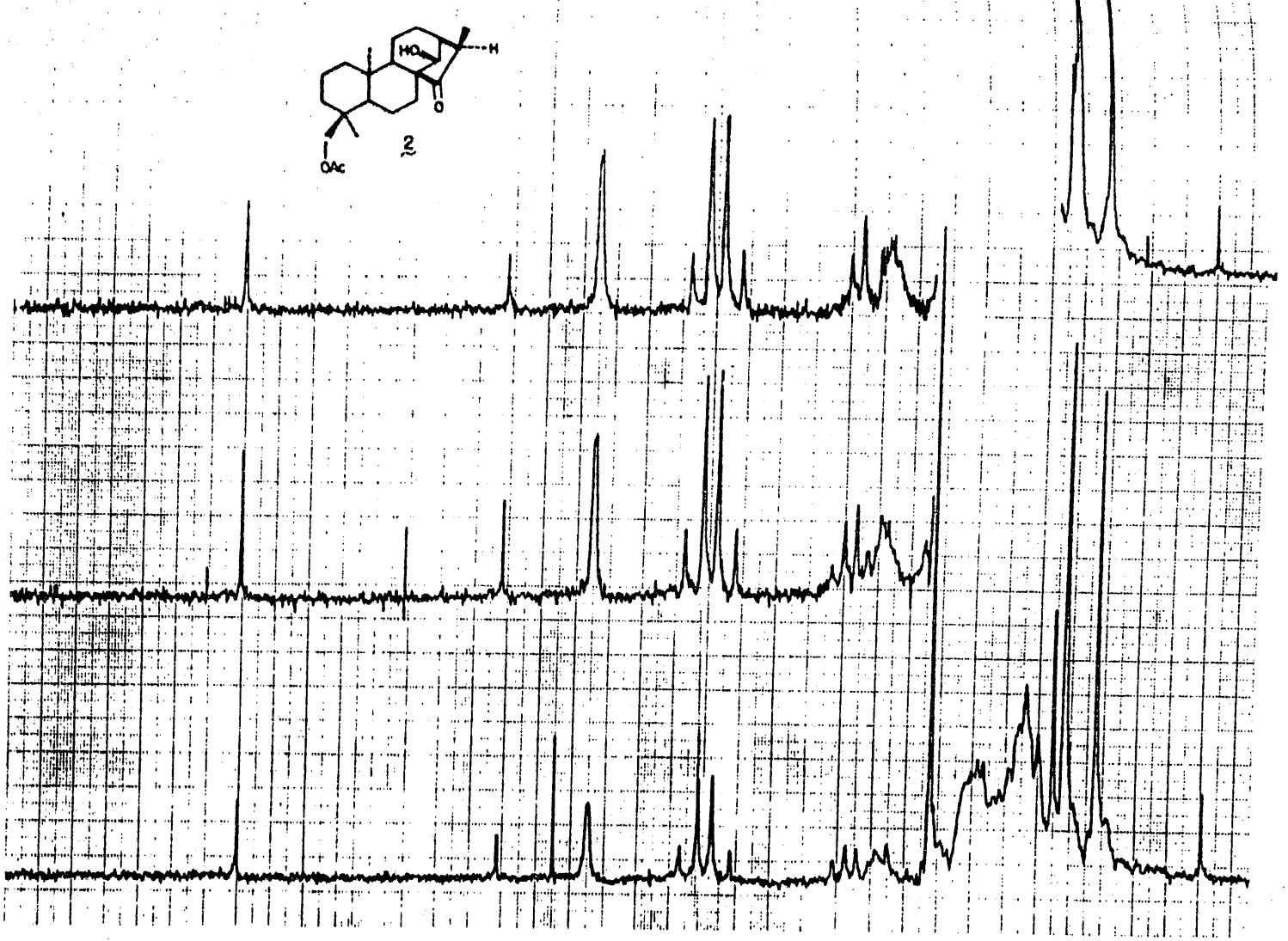

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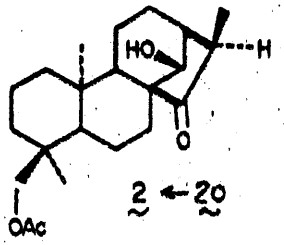

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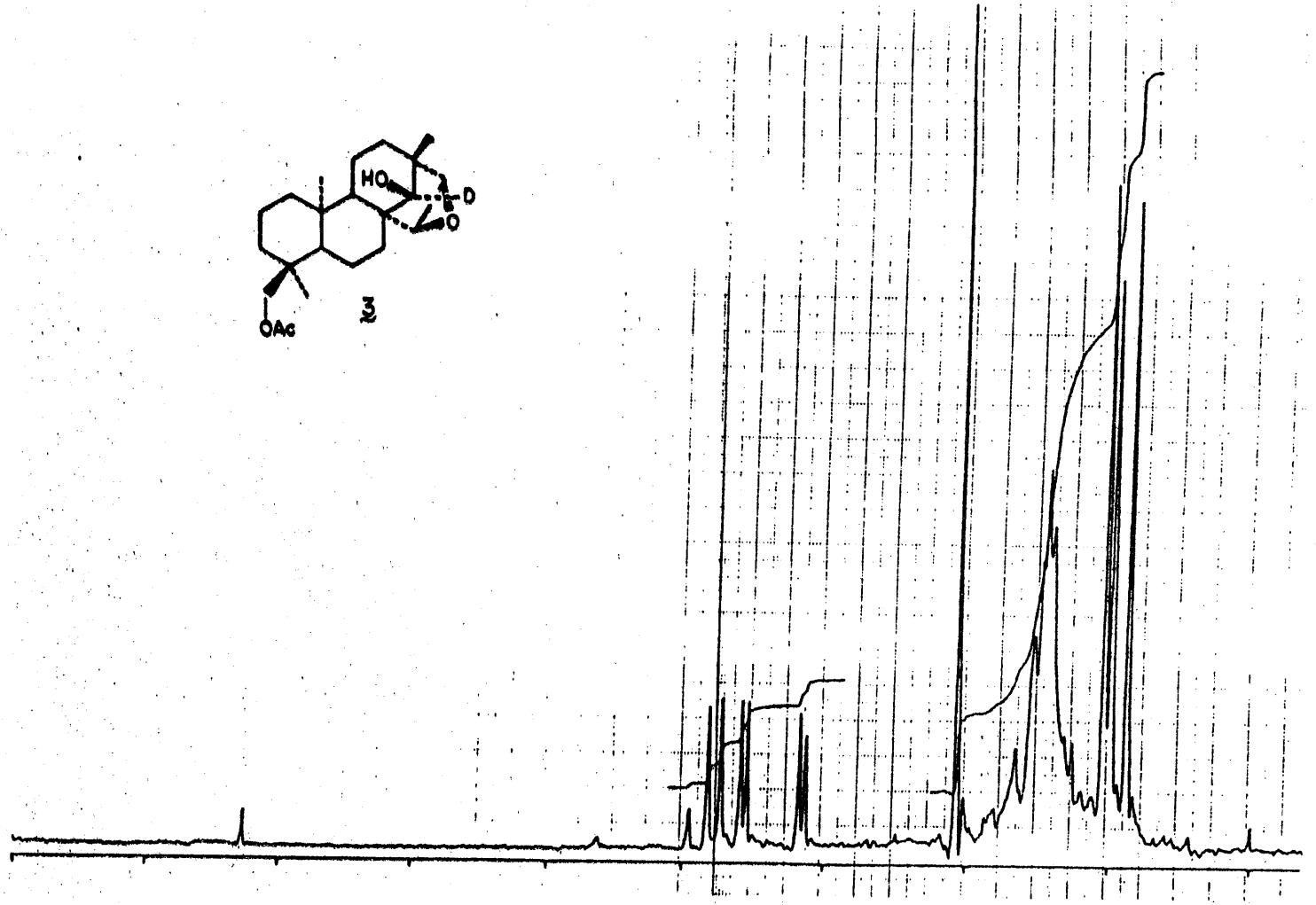

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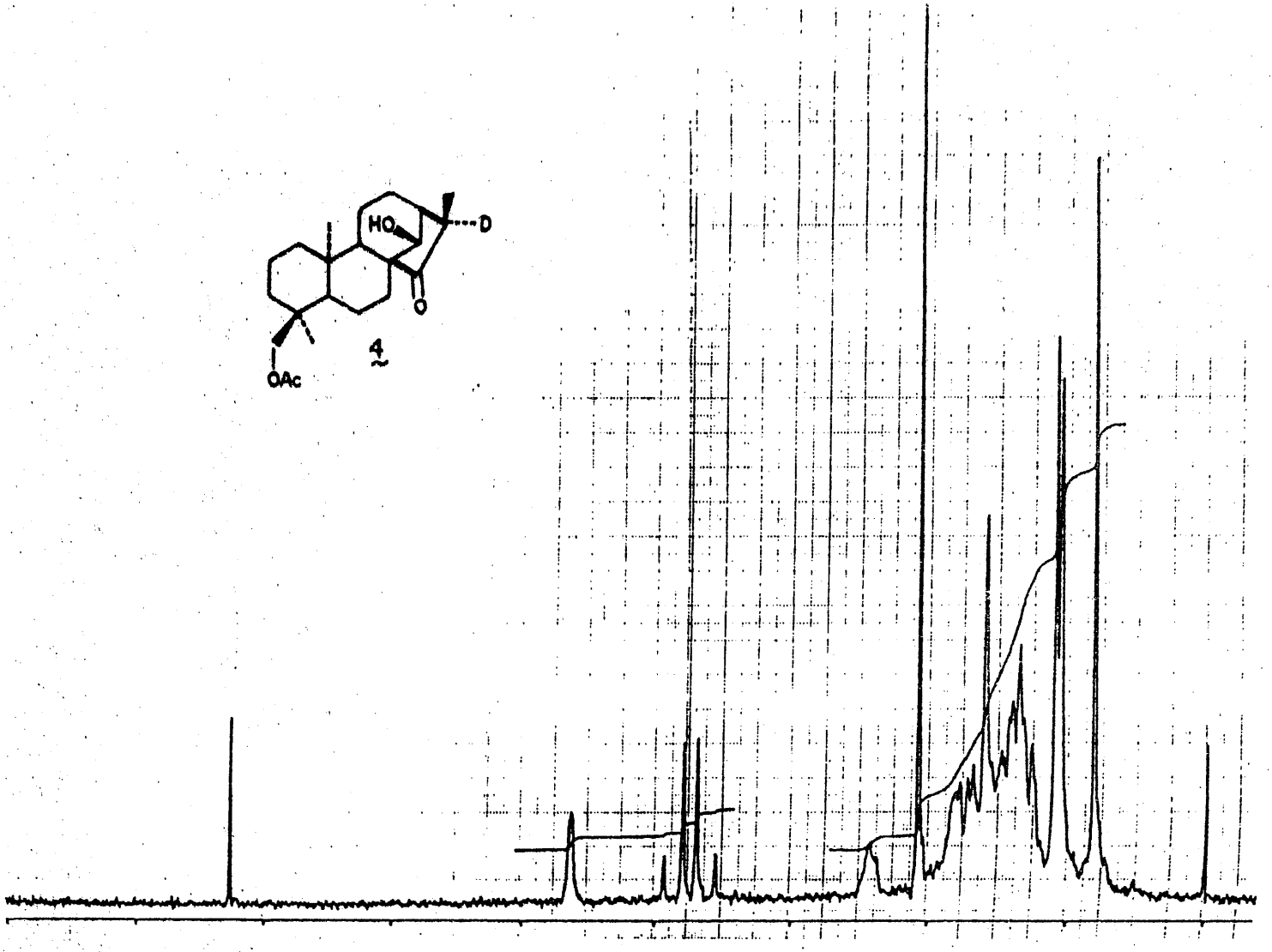

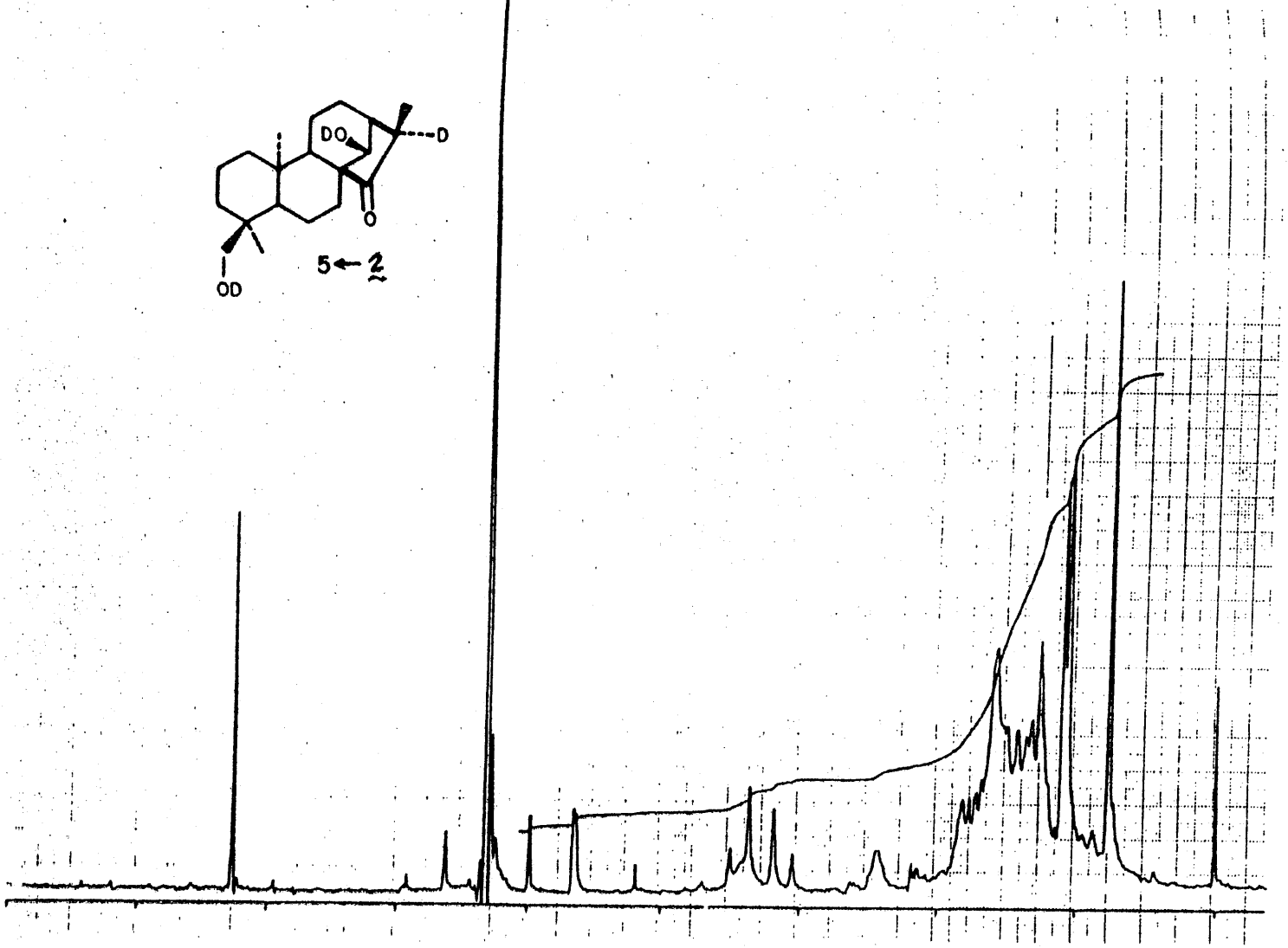
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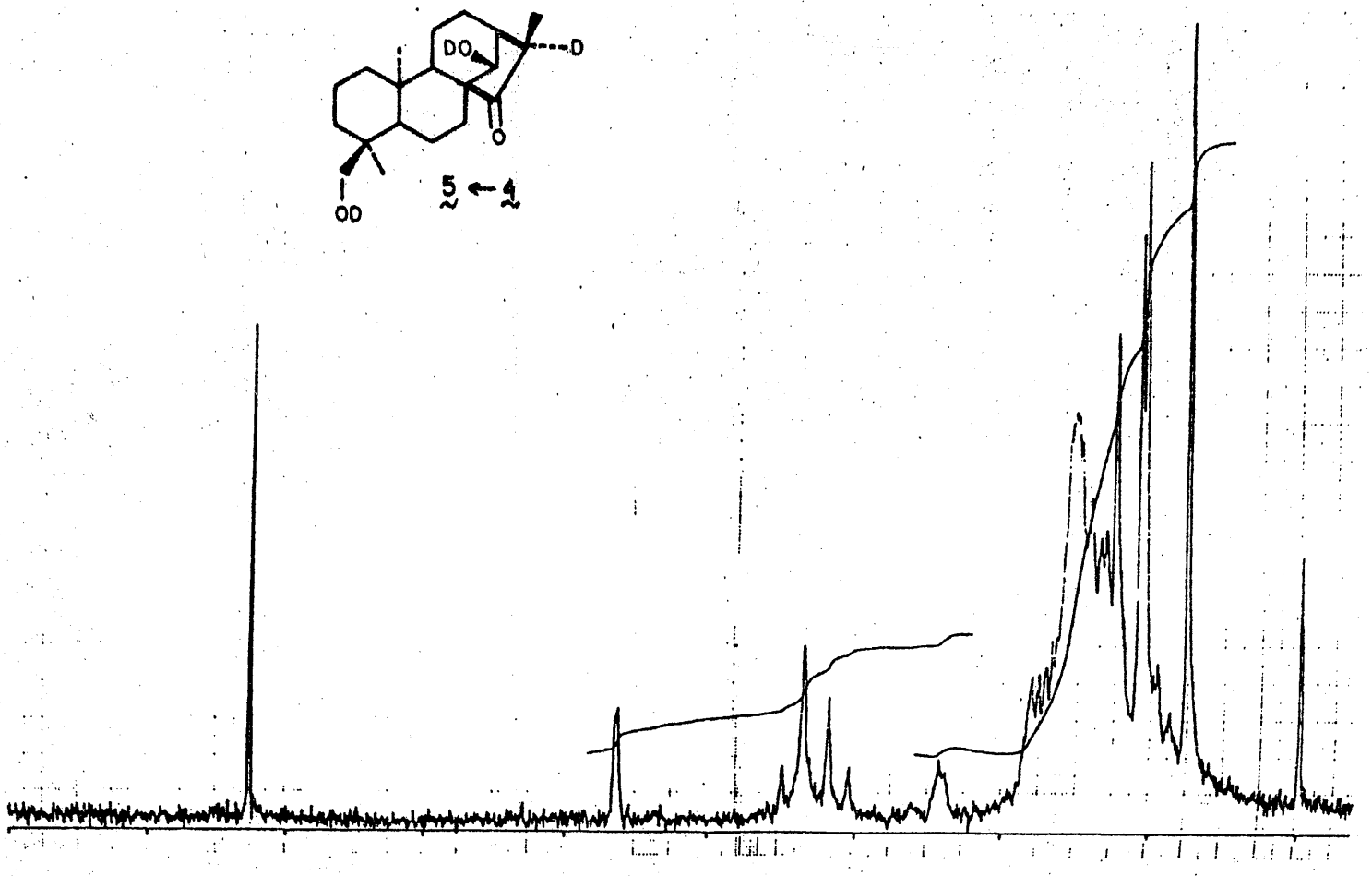

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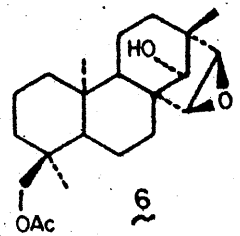

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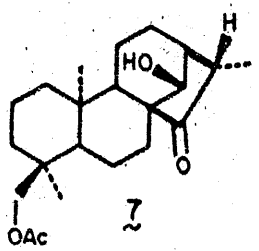

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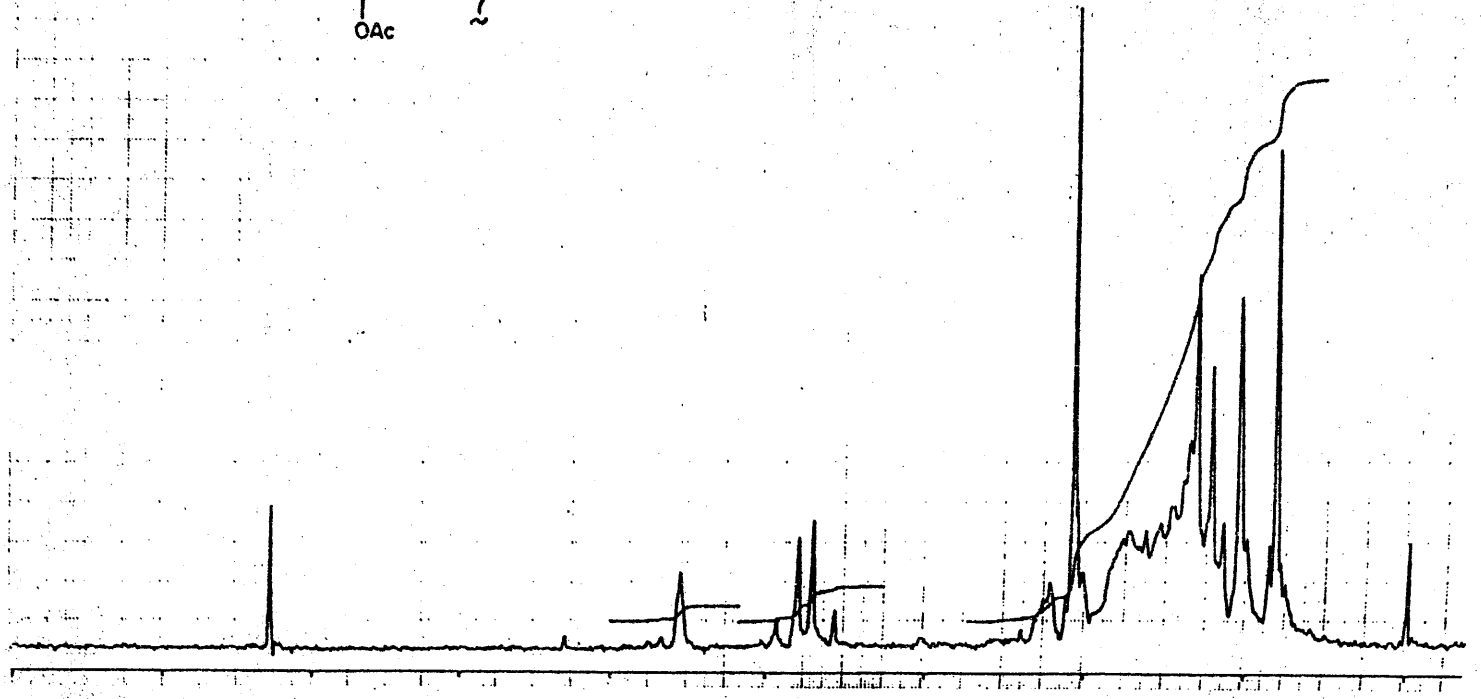

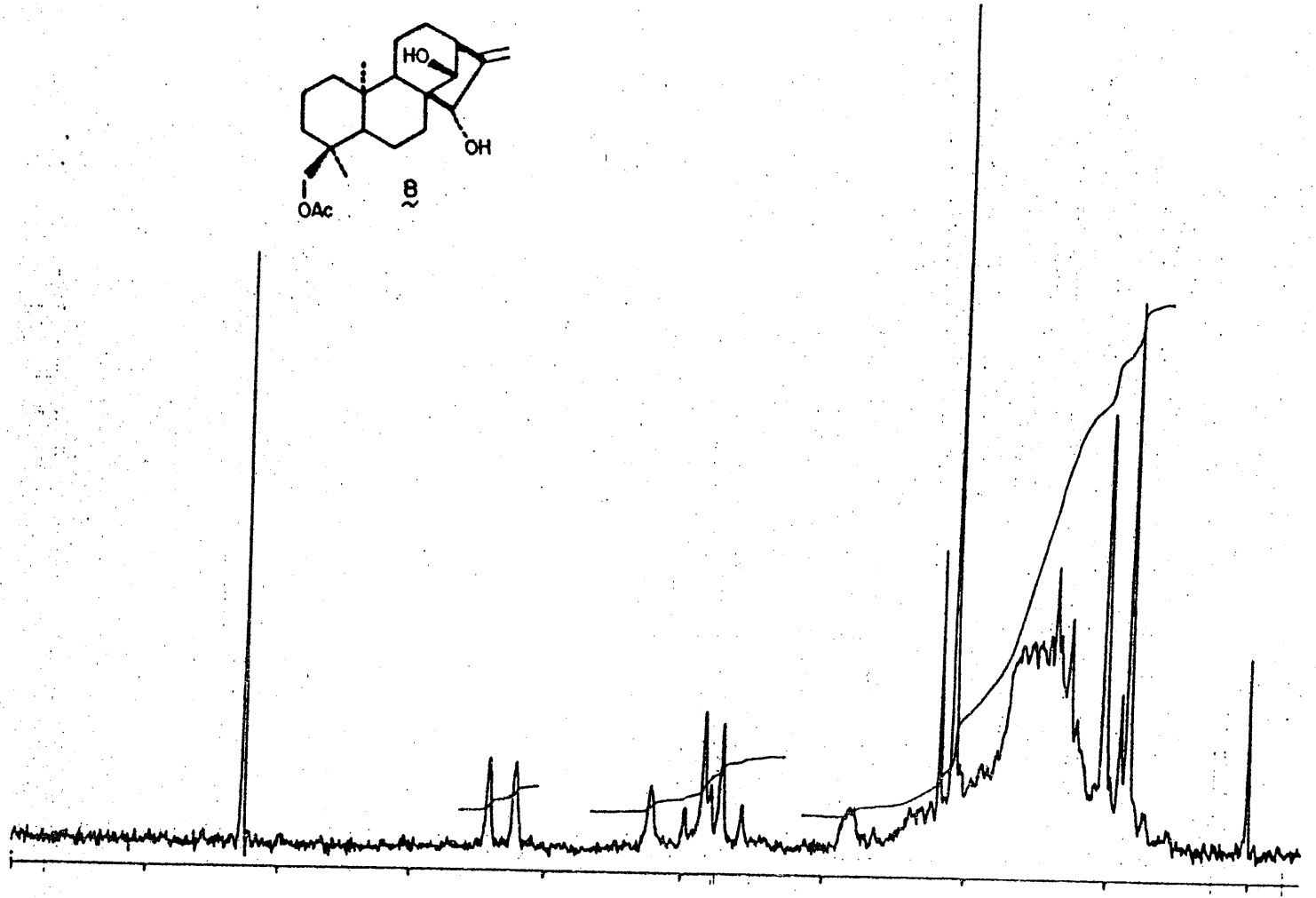

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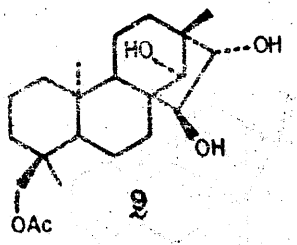

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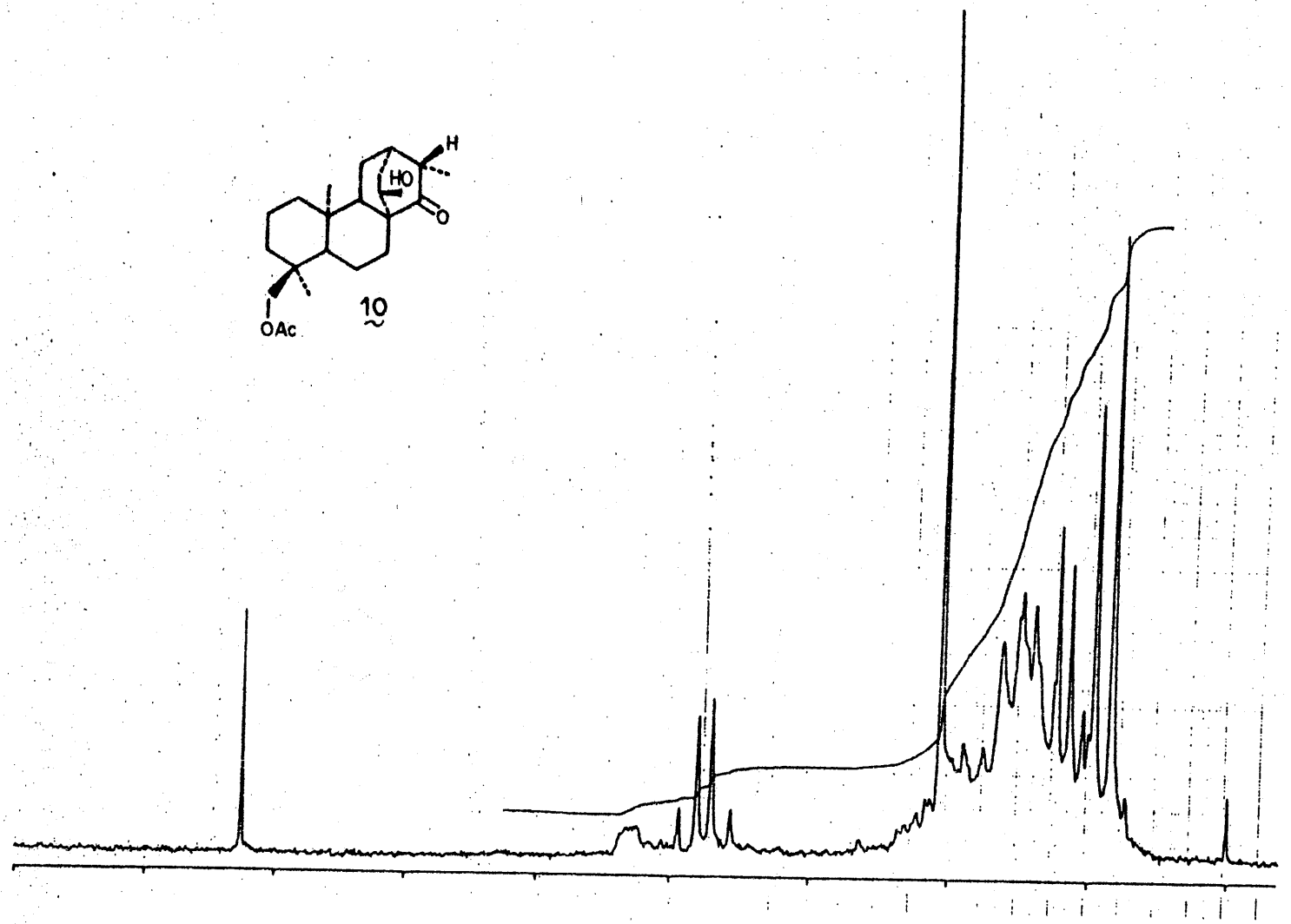

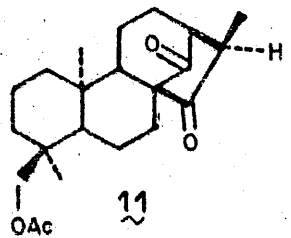

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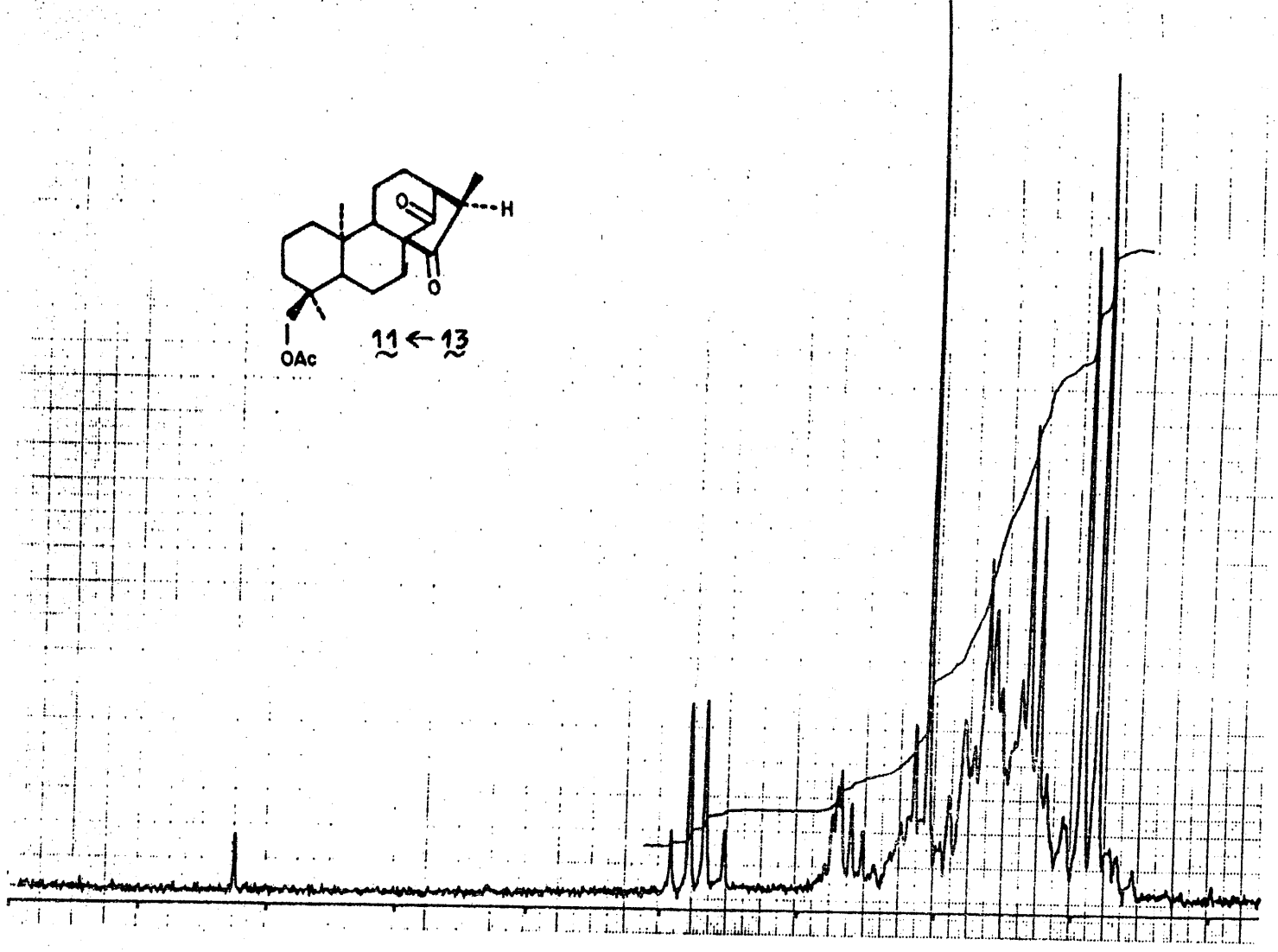
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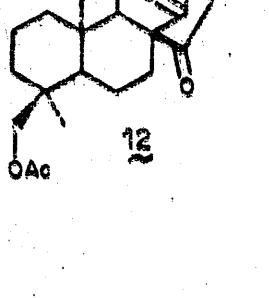

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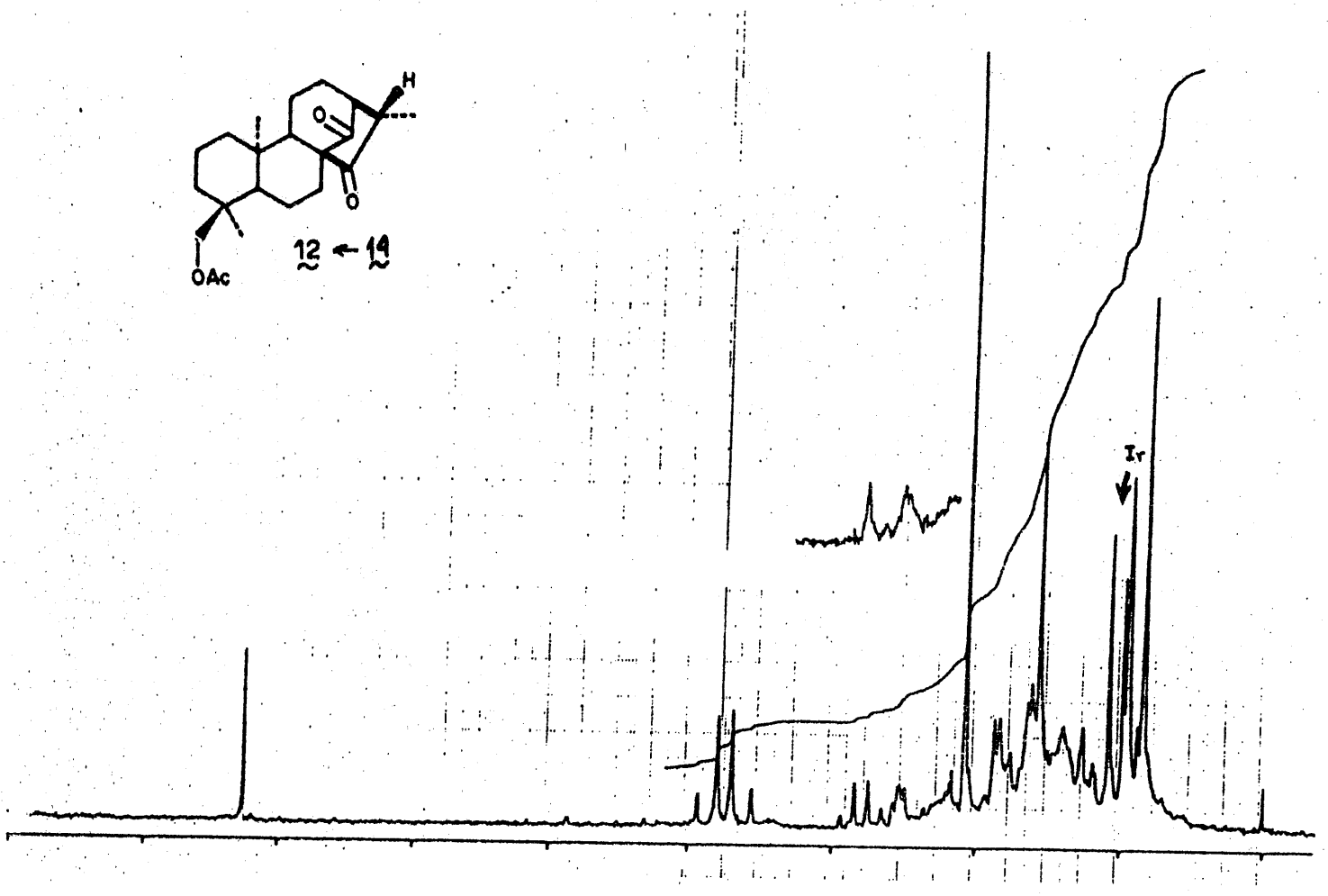

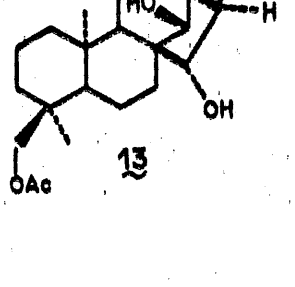

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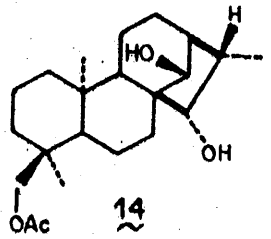

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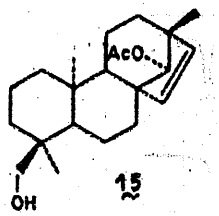

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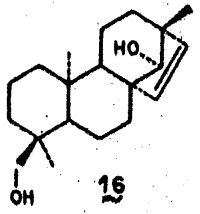

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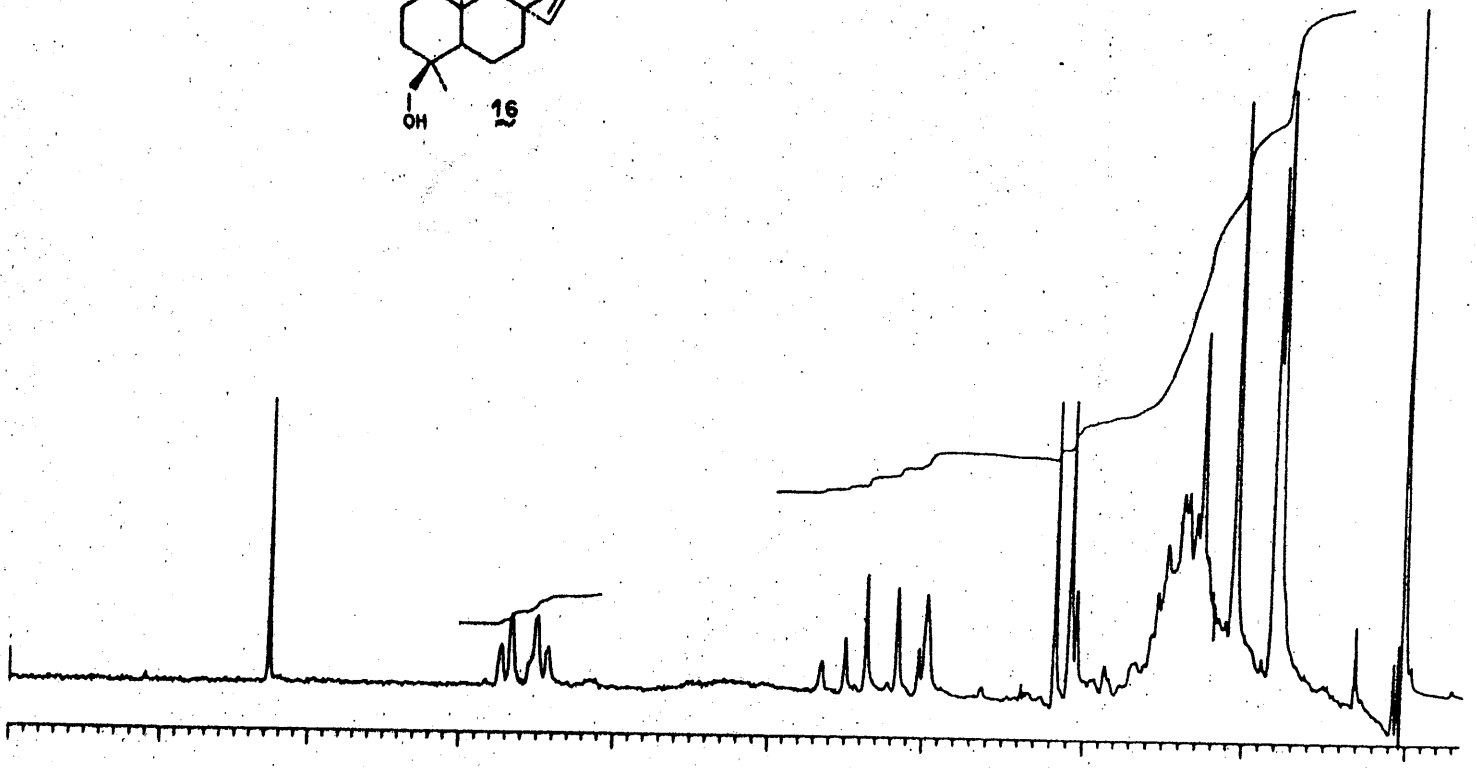

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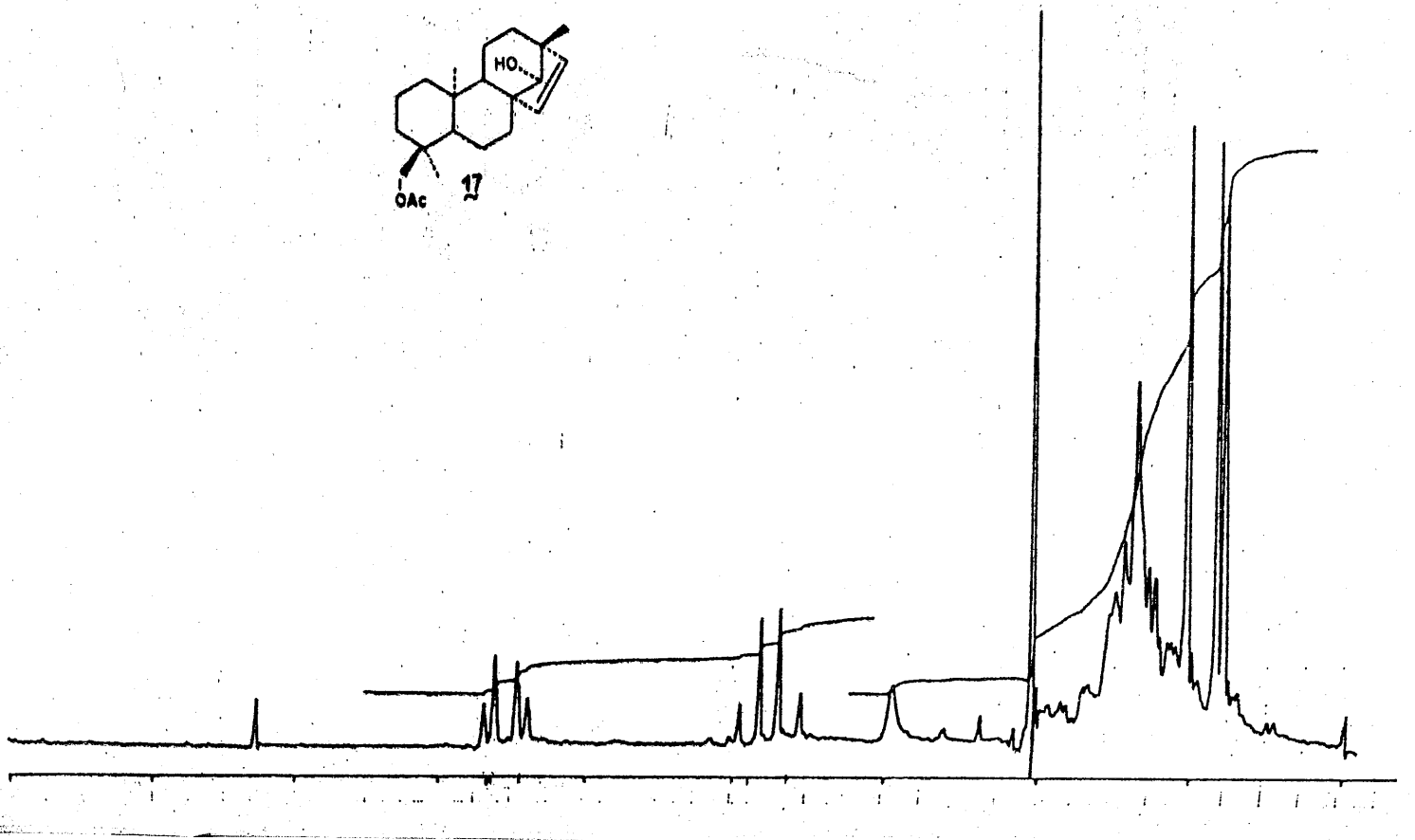

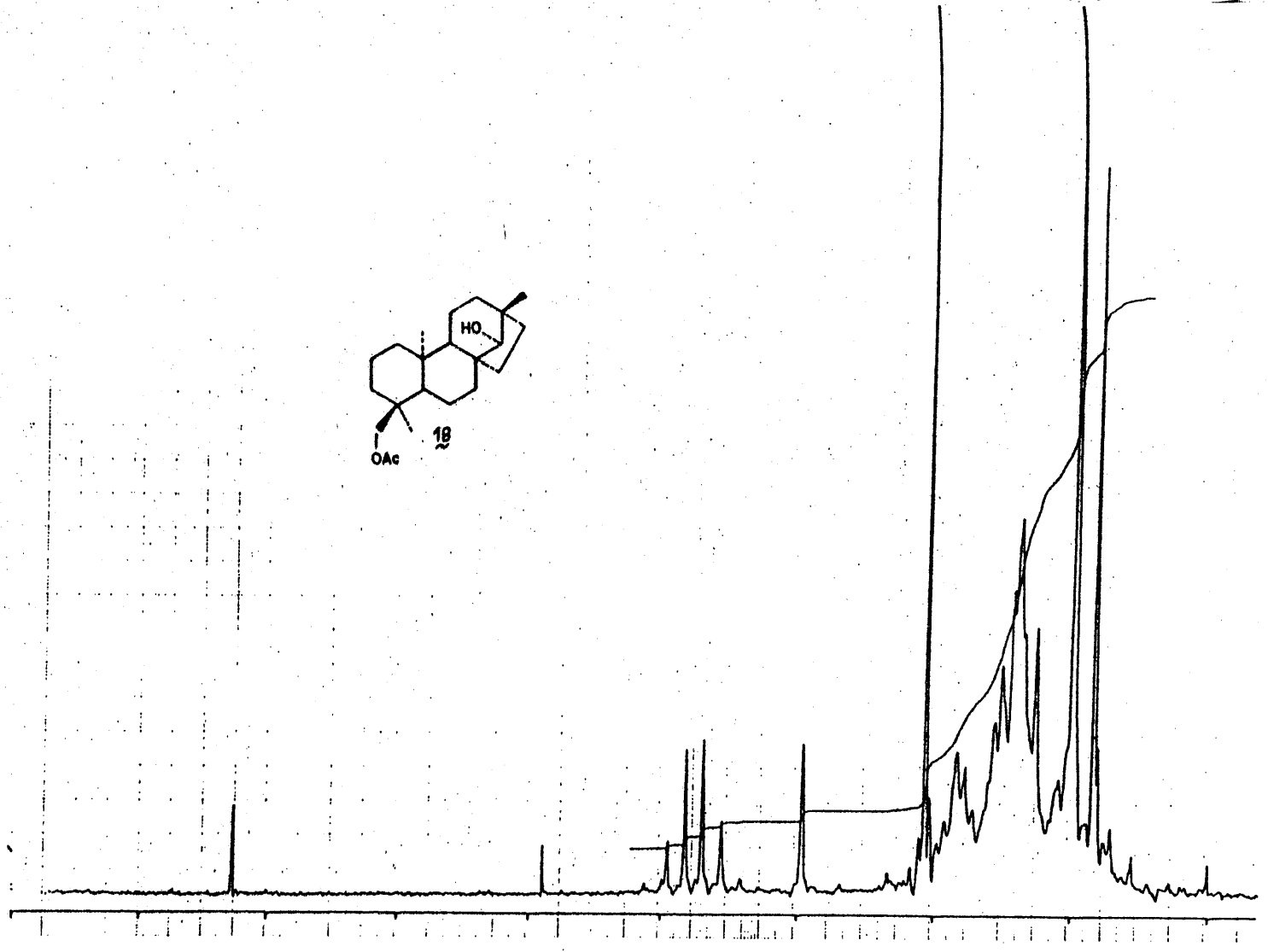

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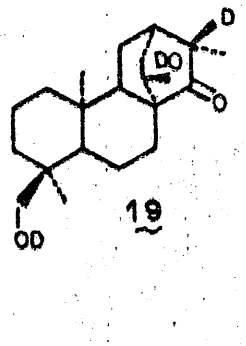

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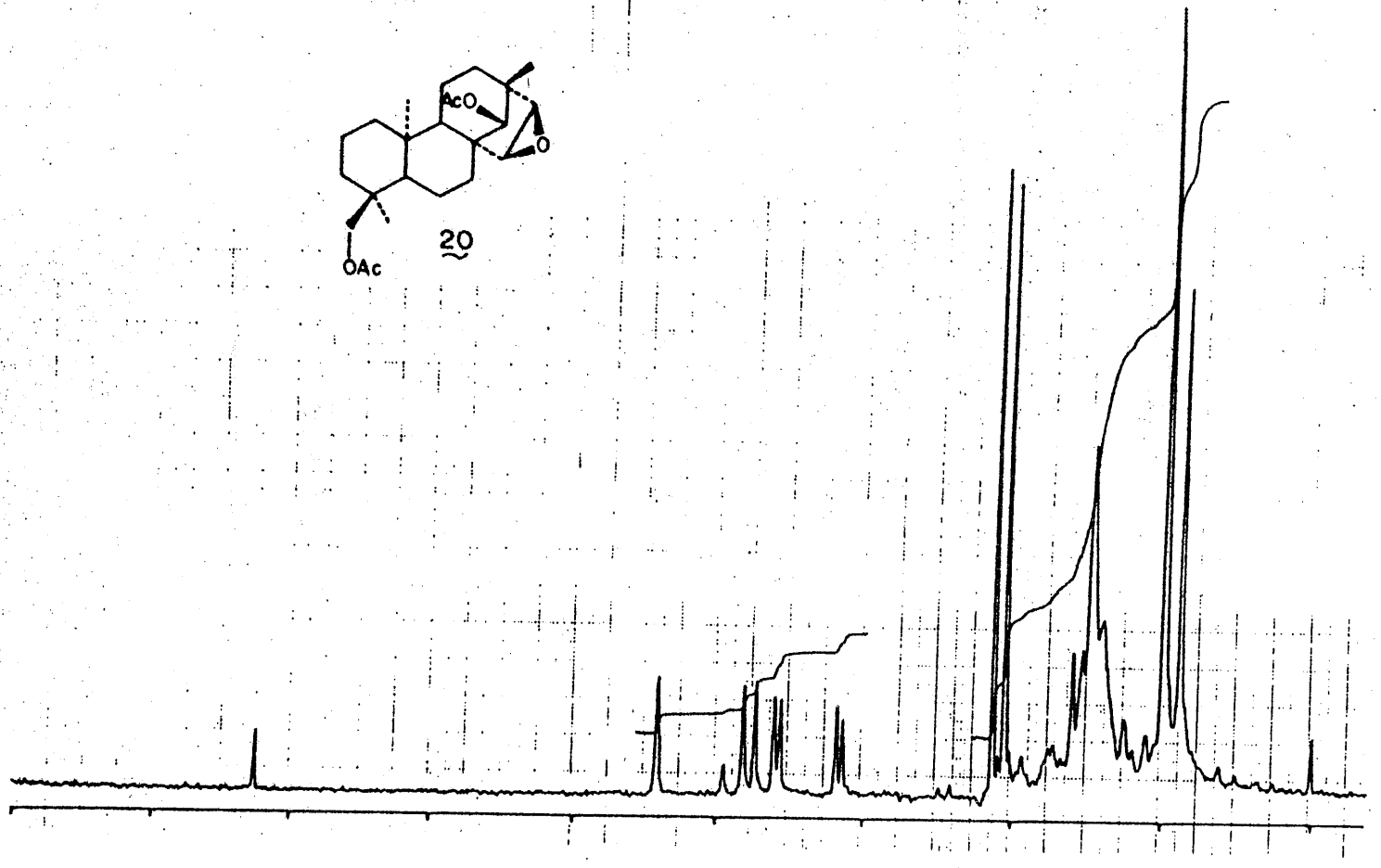

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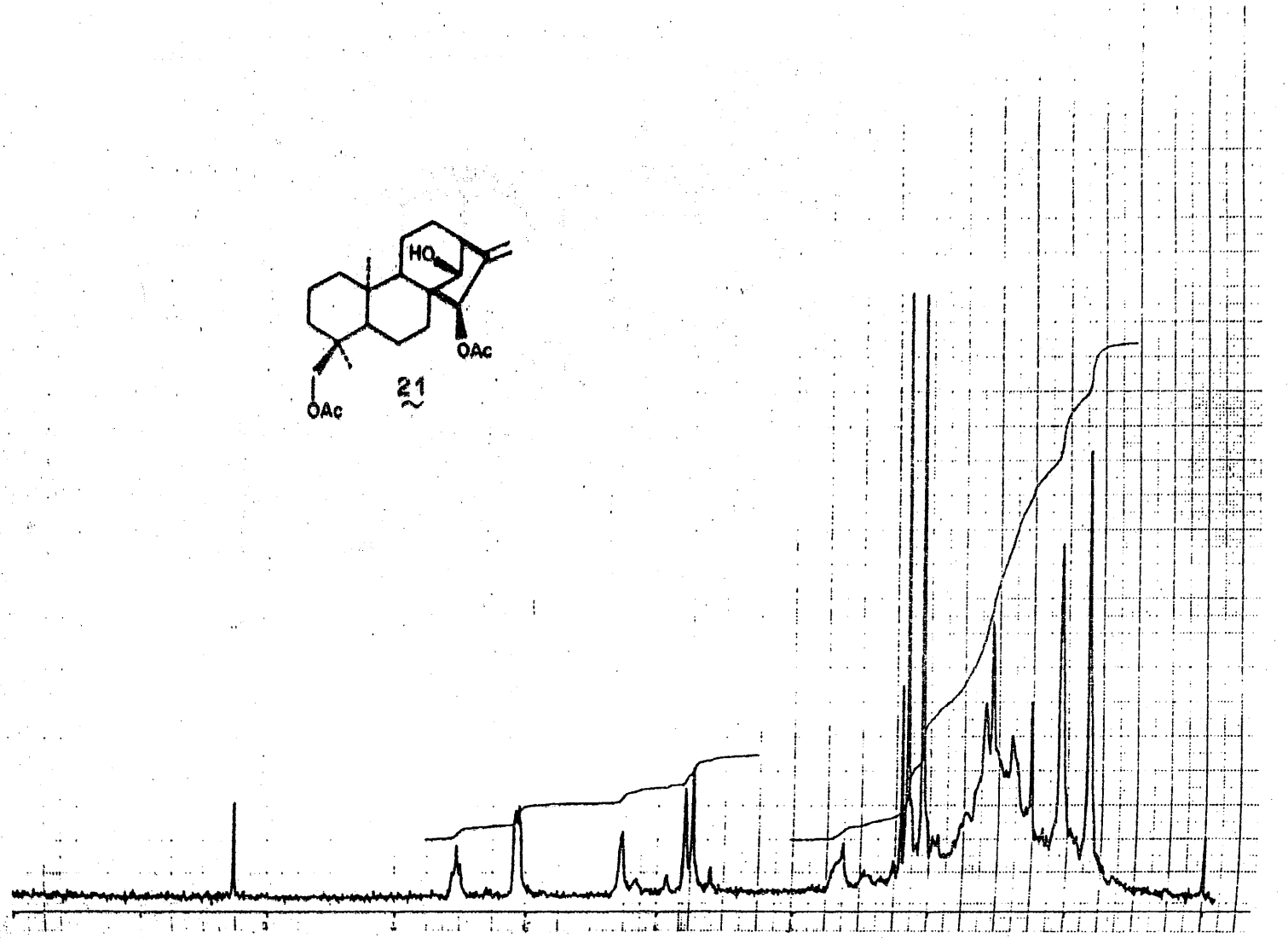

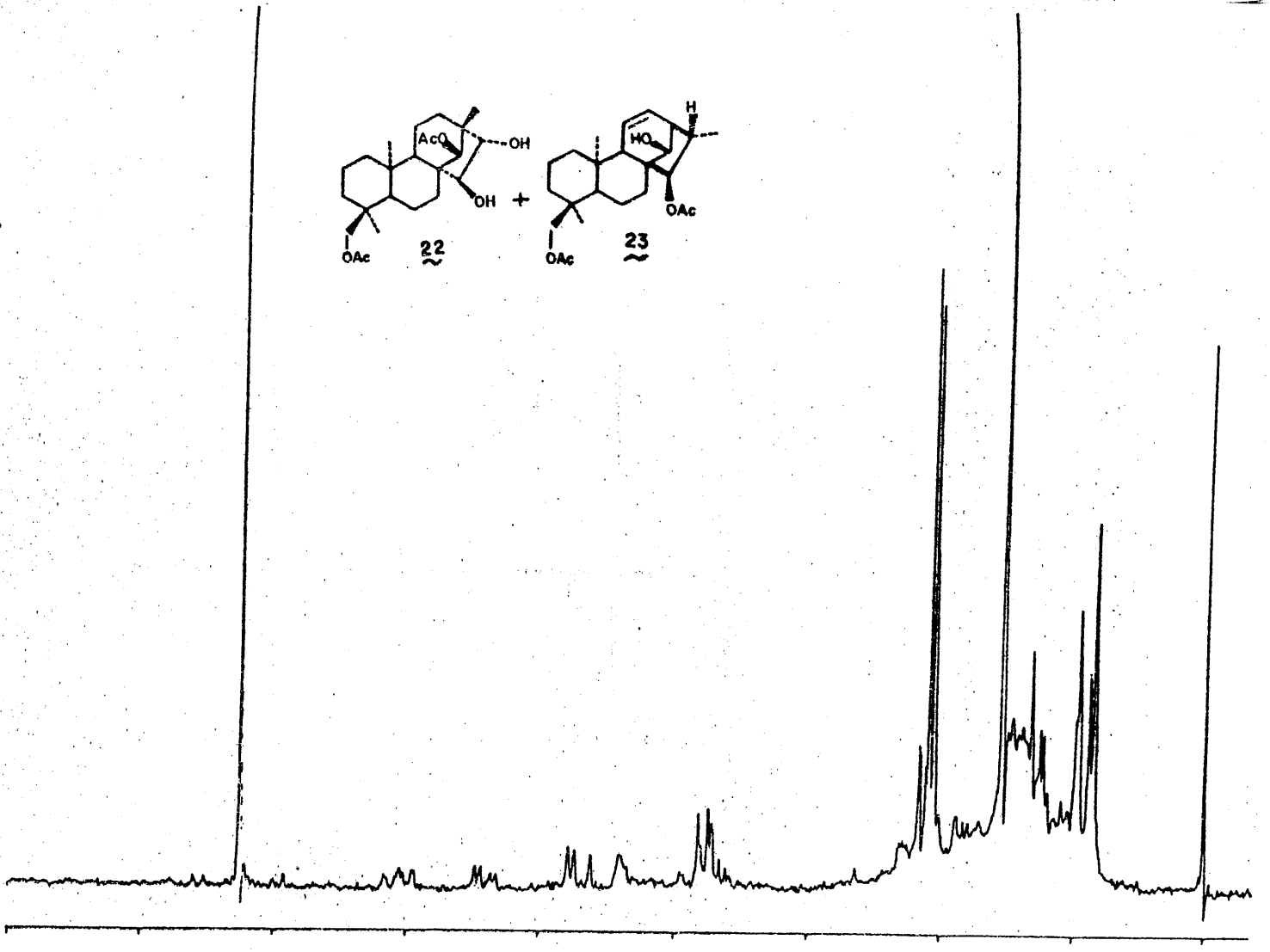
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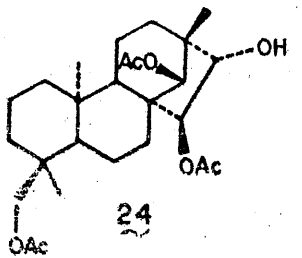

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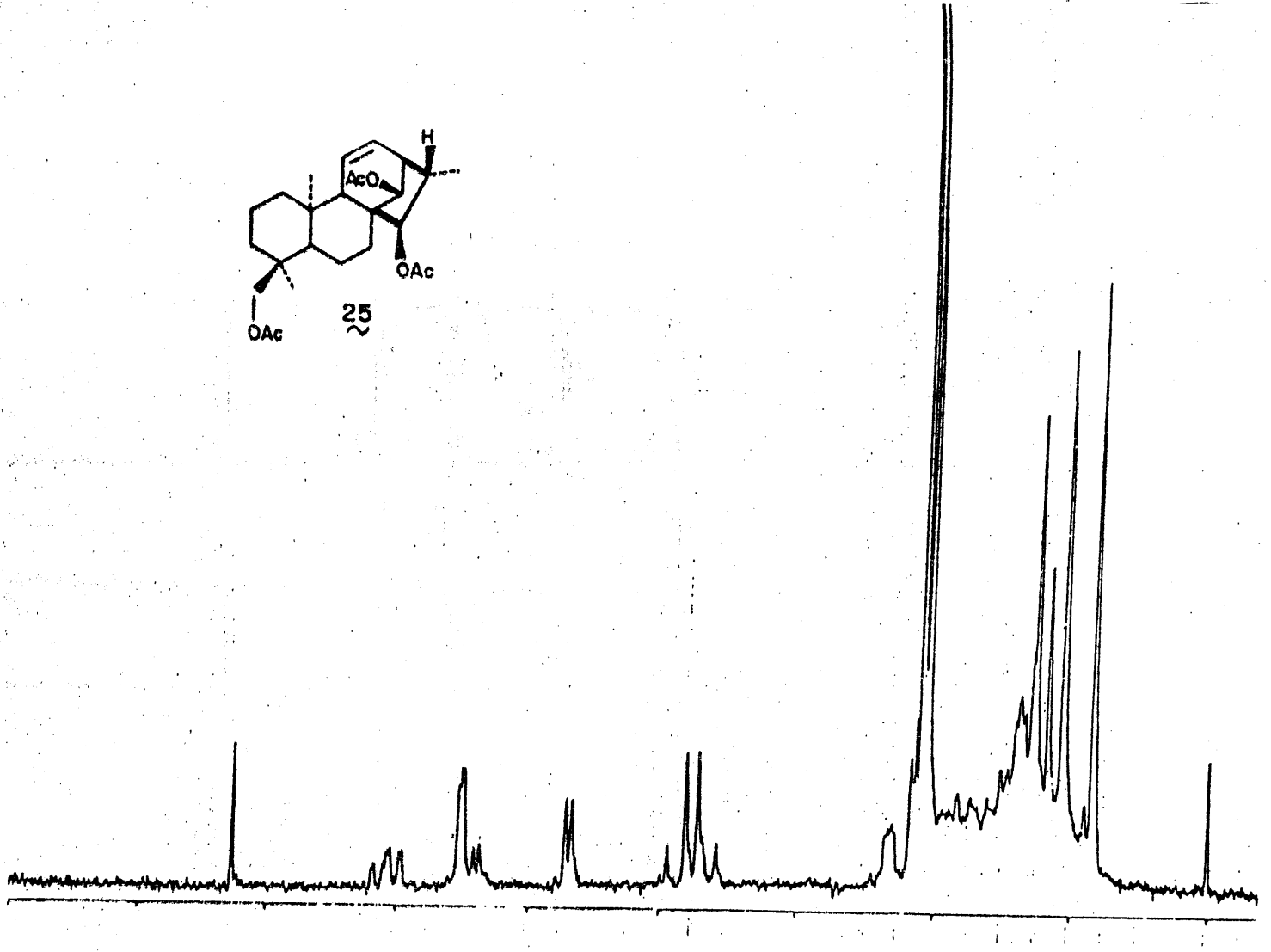

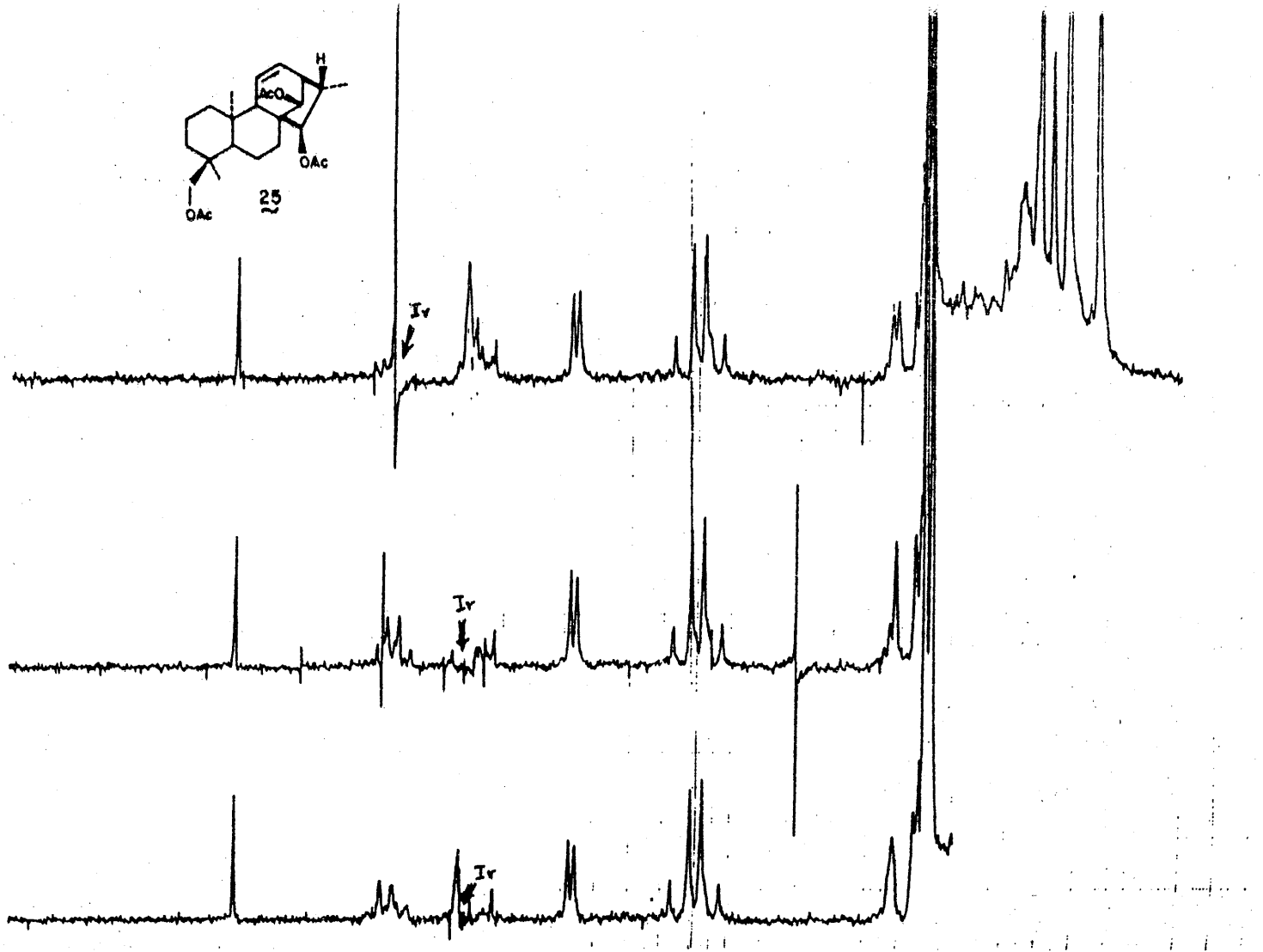
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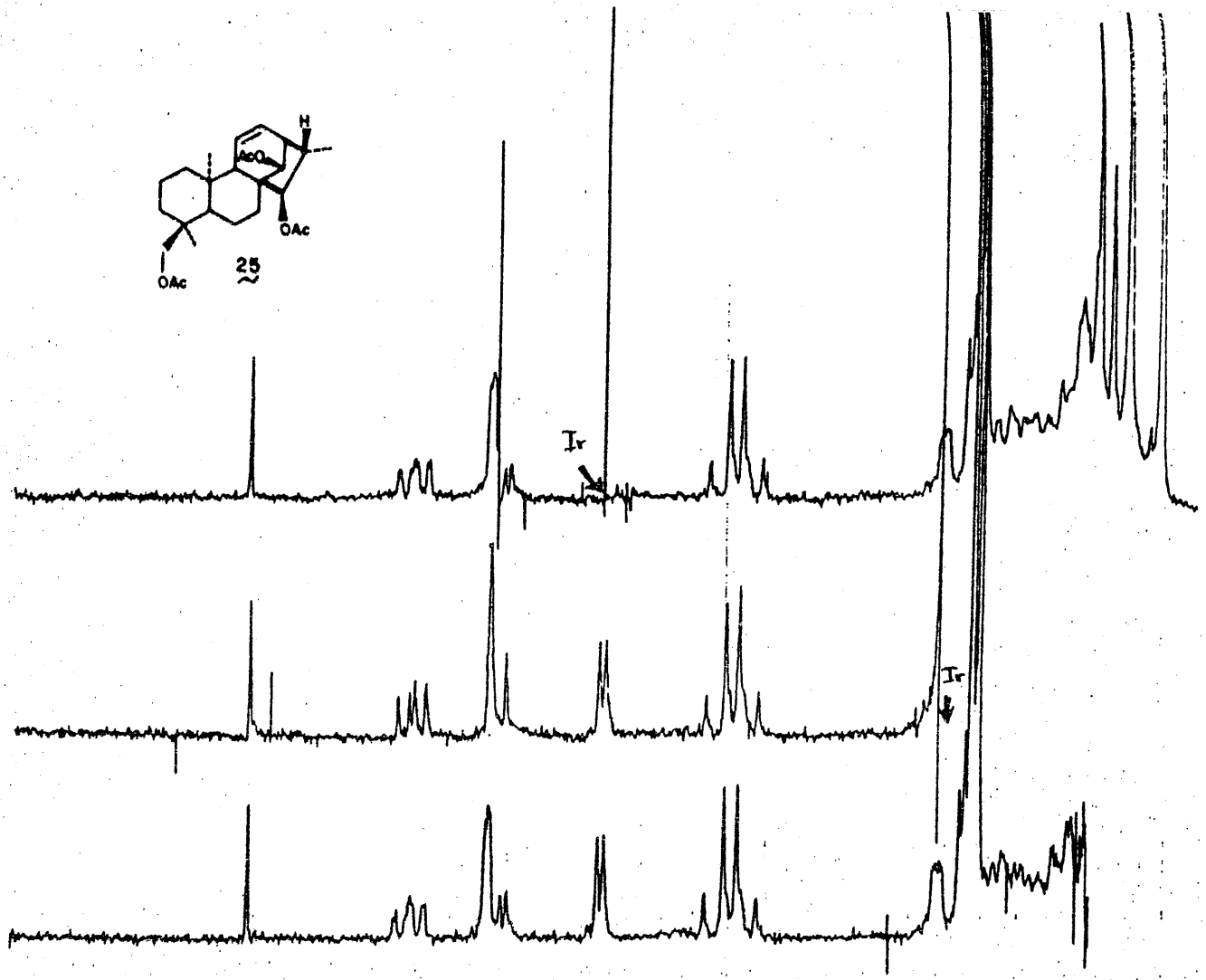

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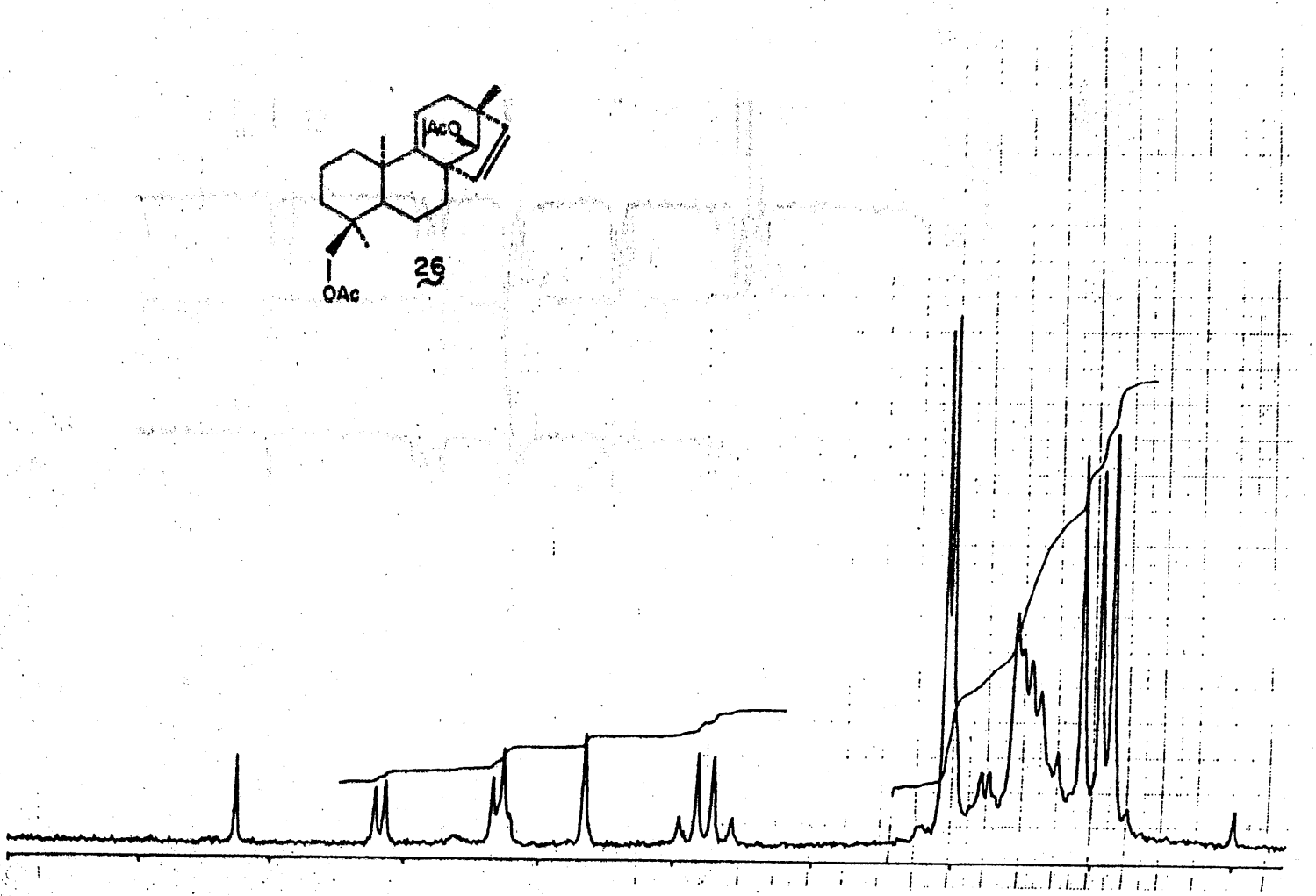

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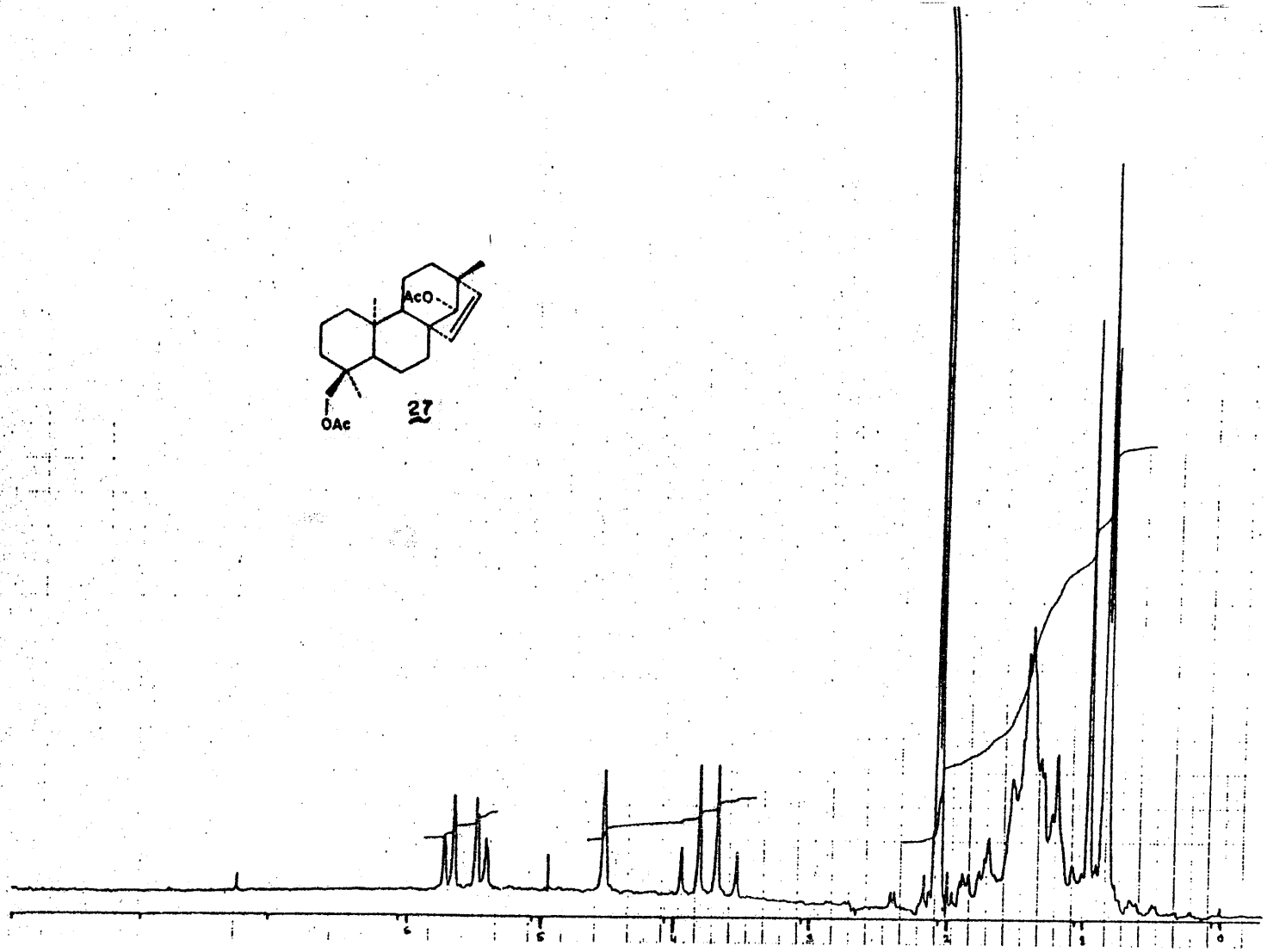

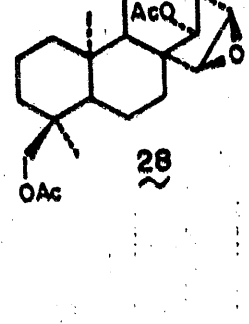

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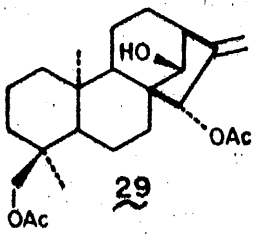

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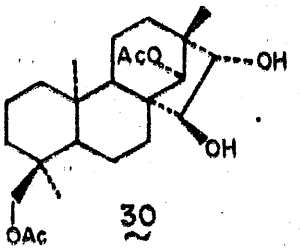

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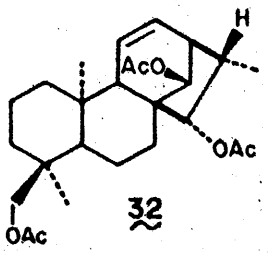

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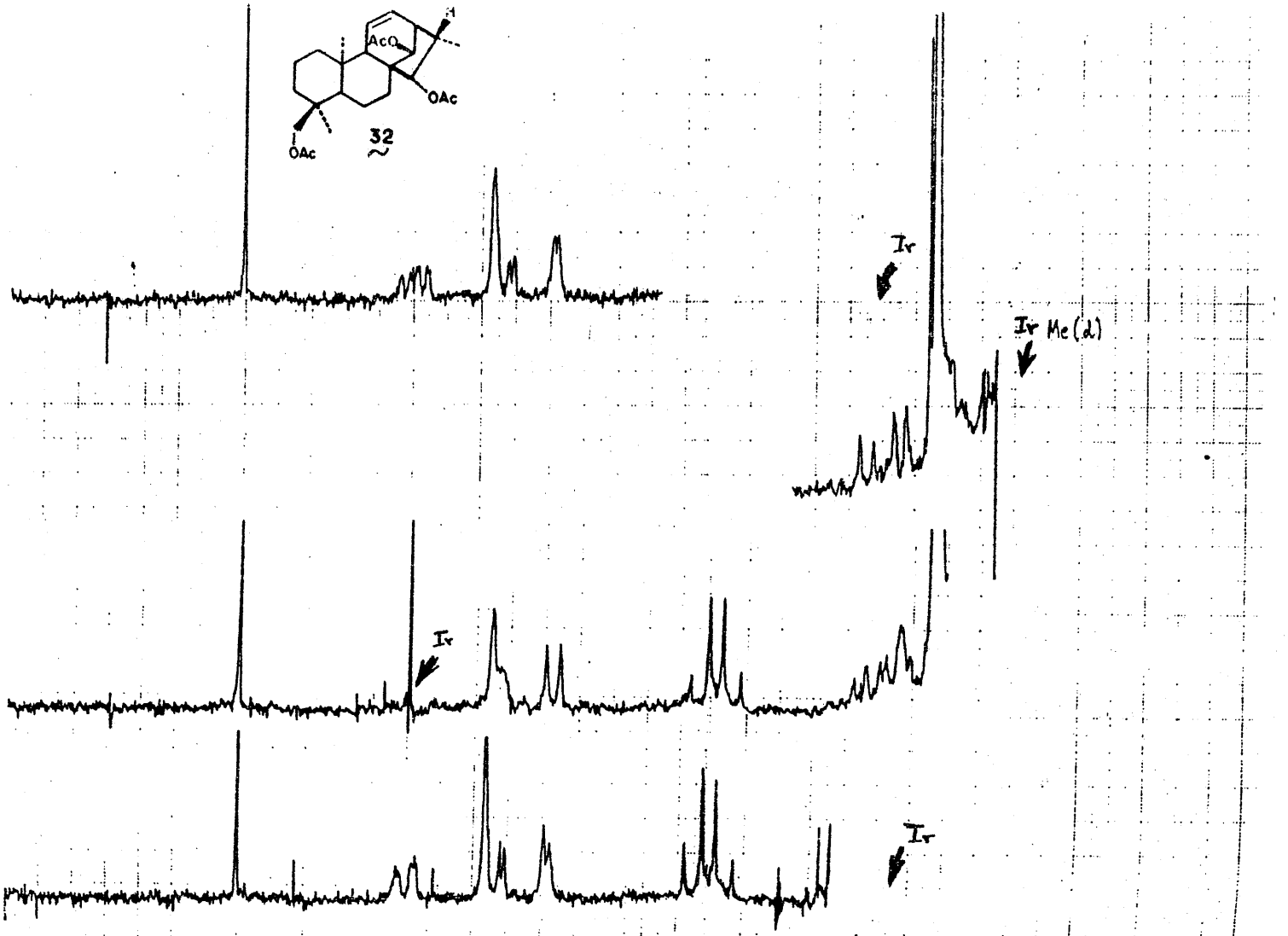
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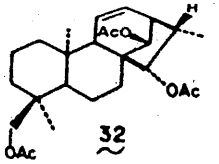
Ir
Ir
Me (d)
Ir
Ir



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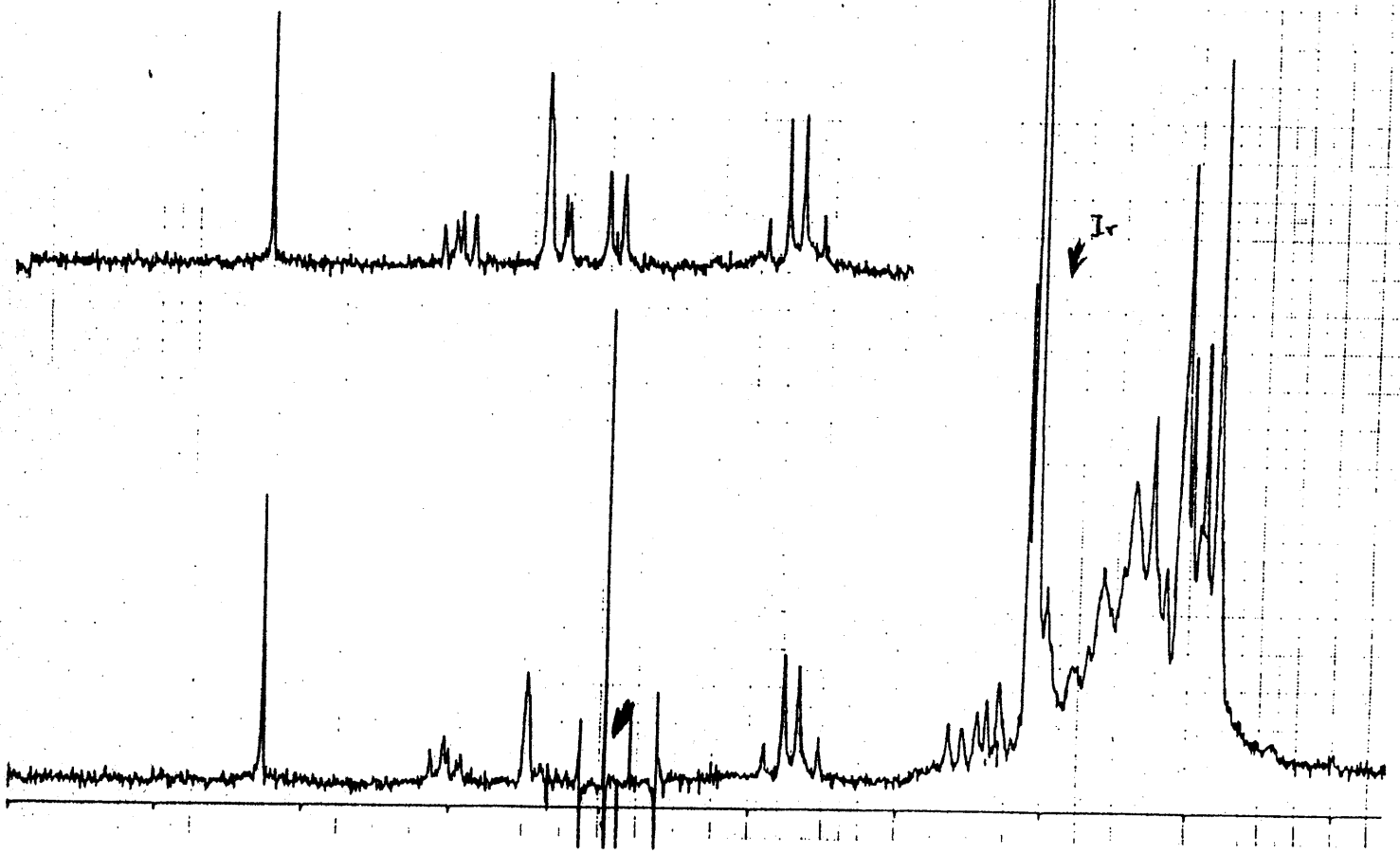

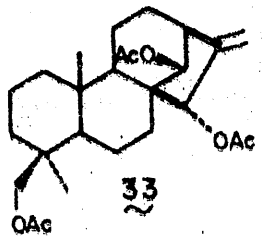

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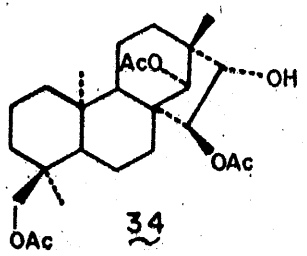

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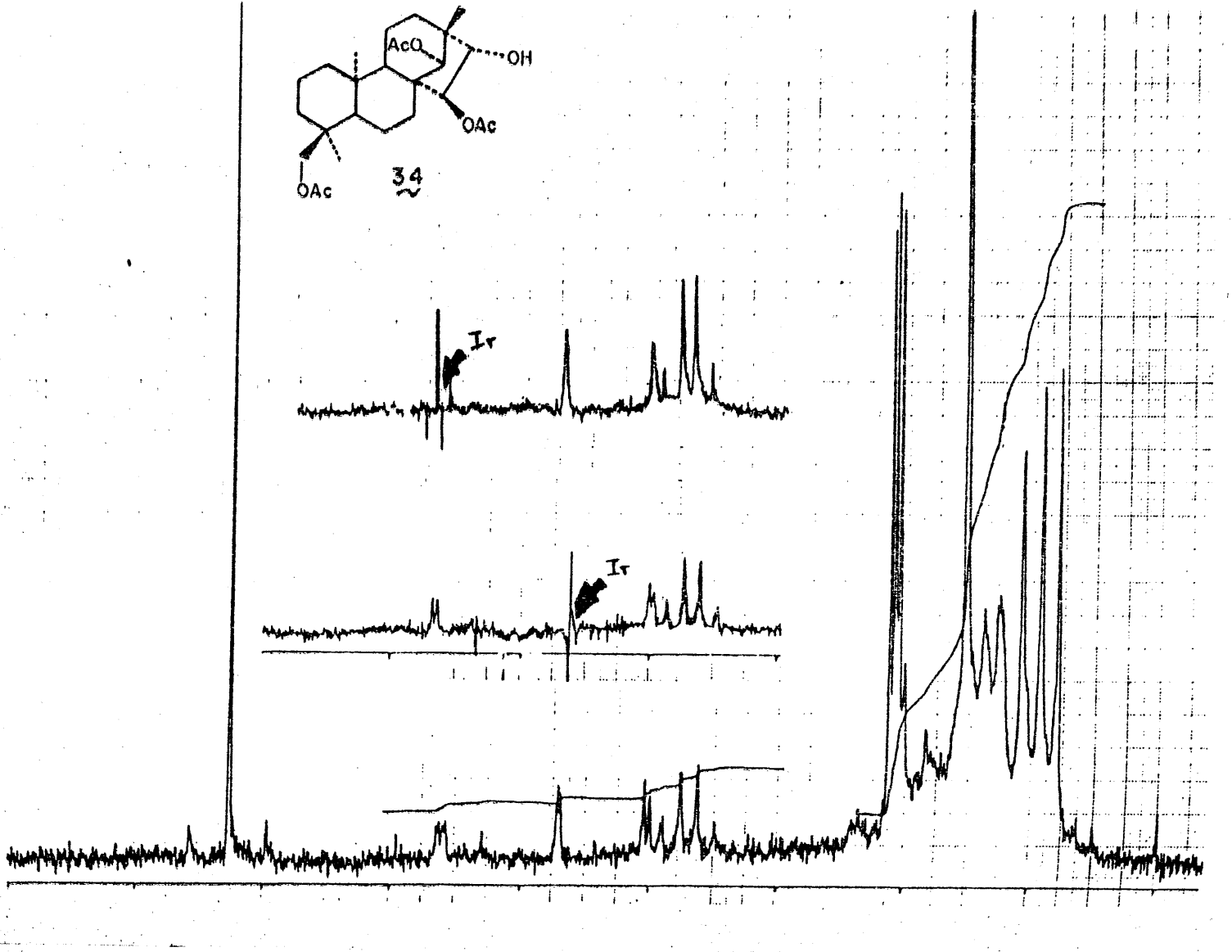
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OAc
34
Ir
Ir

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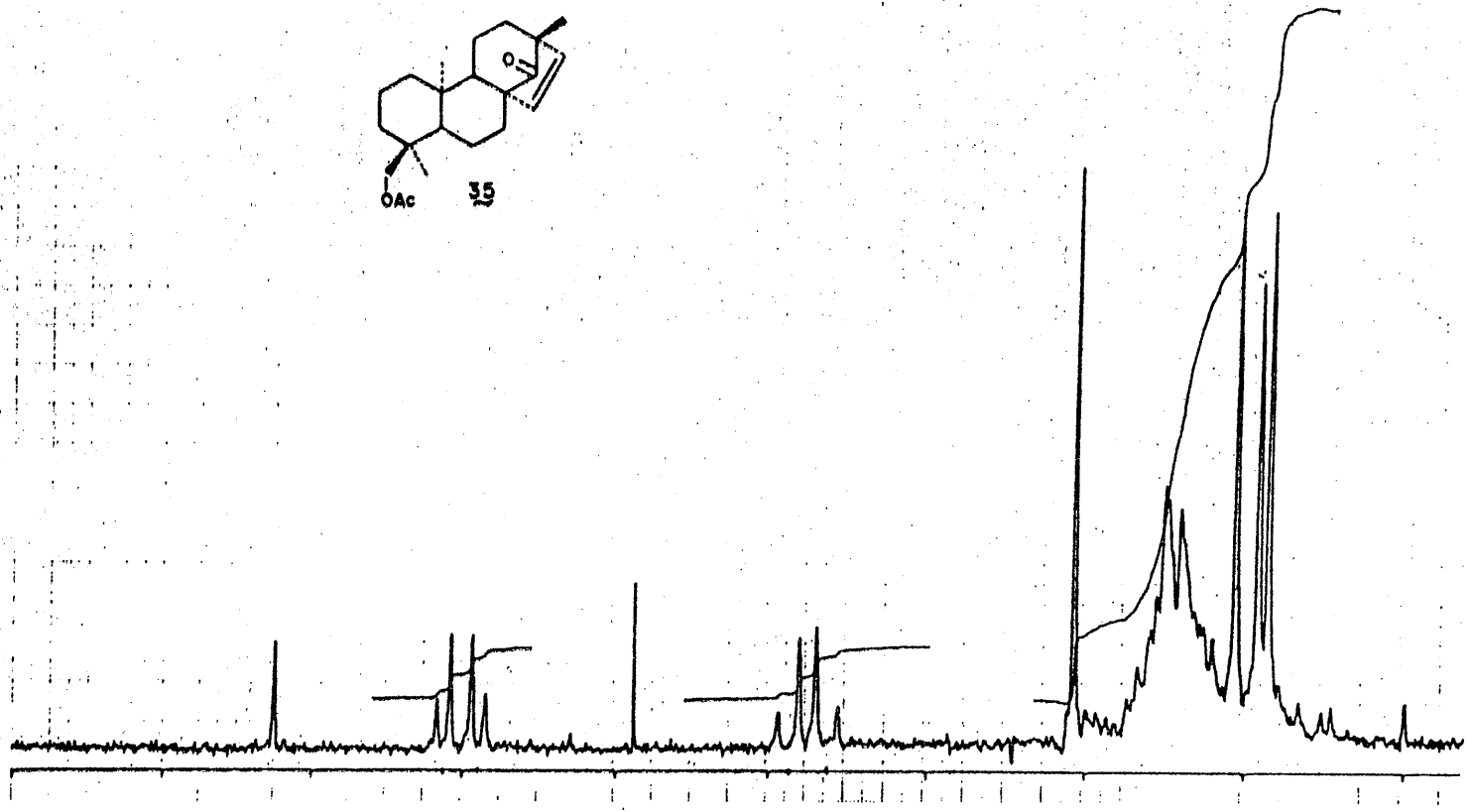

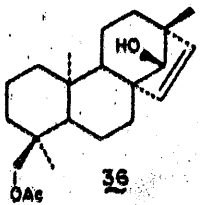

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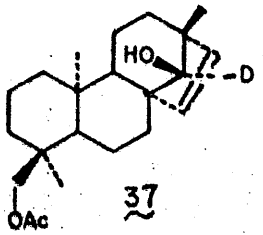

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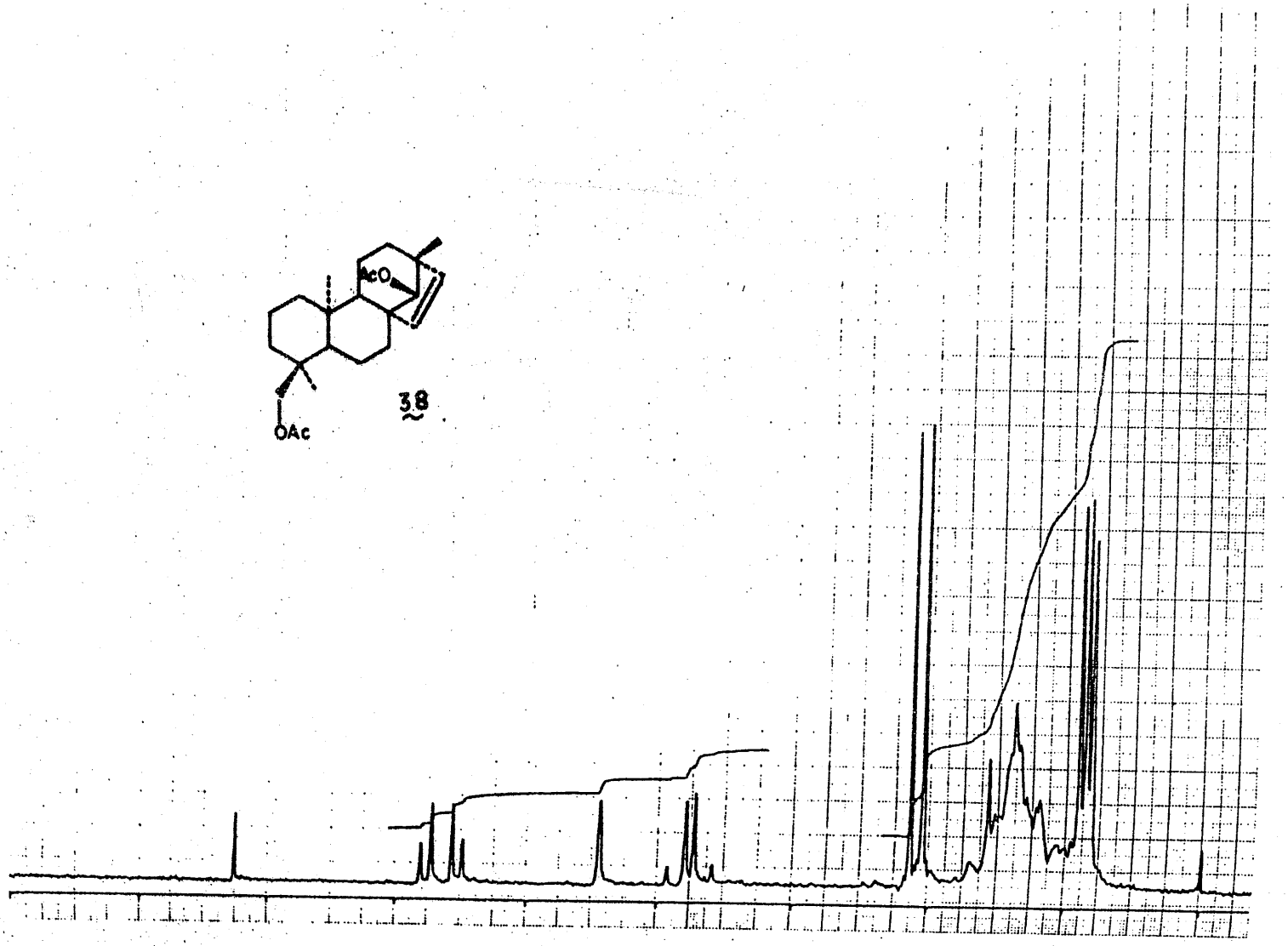
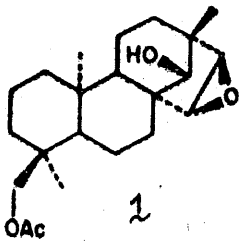


ESPECTROS ^{13}C RMN



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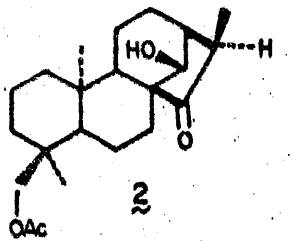

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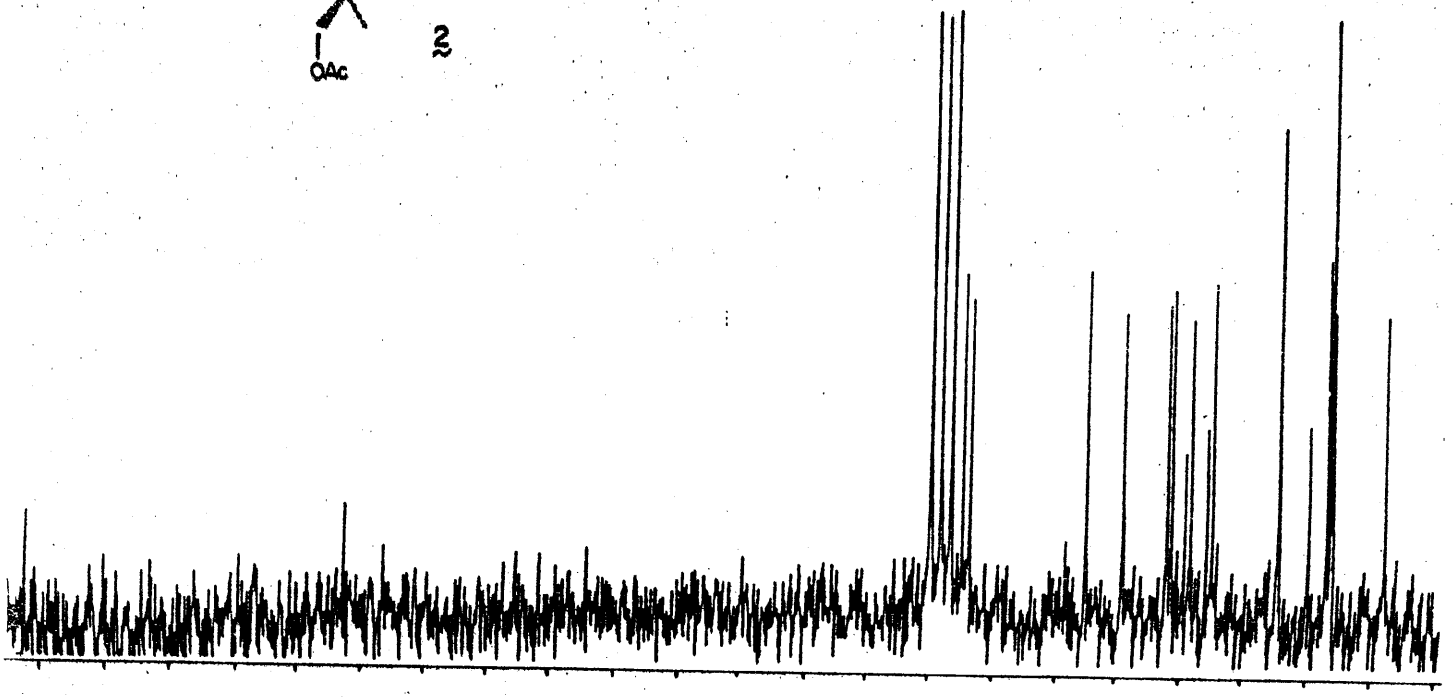

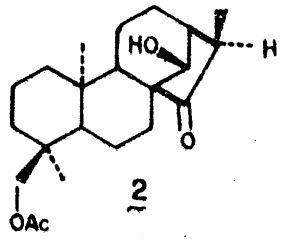

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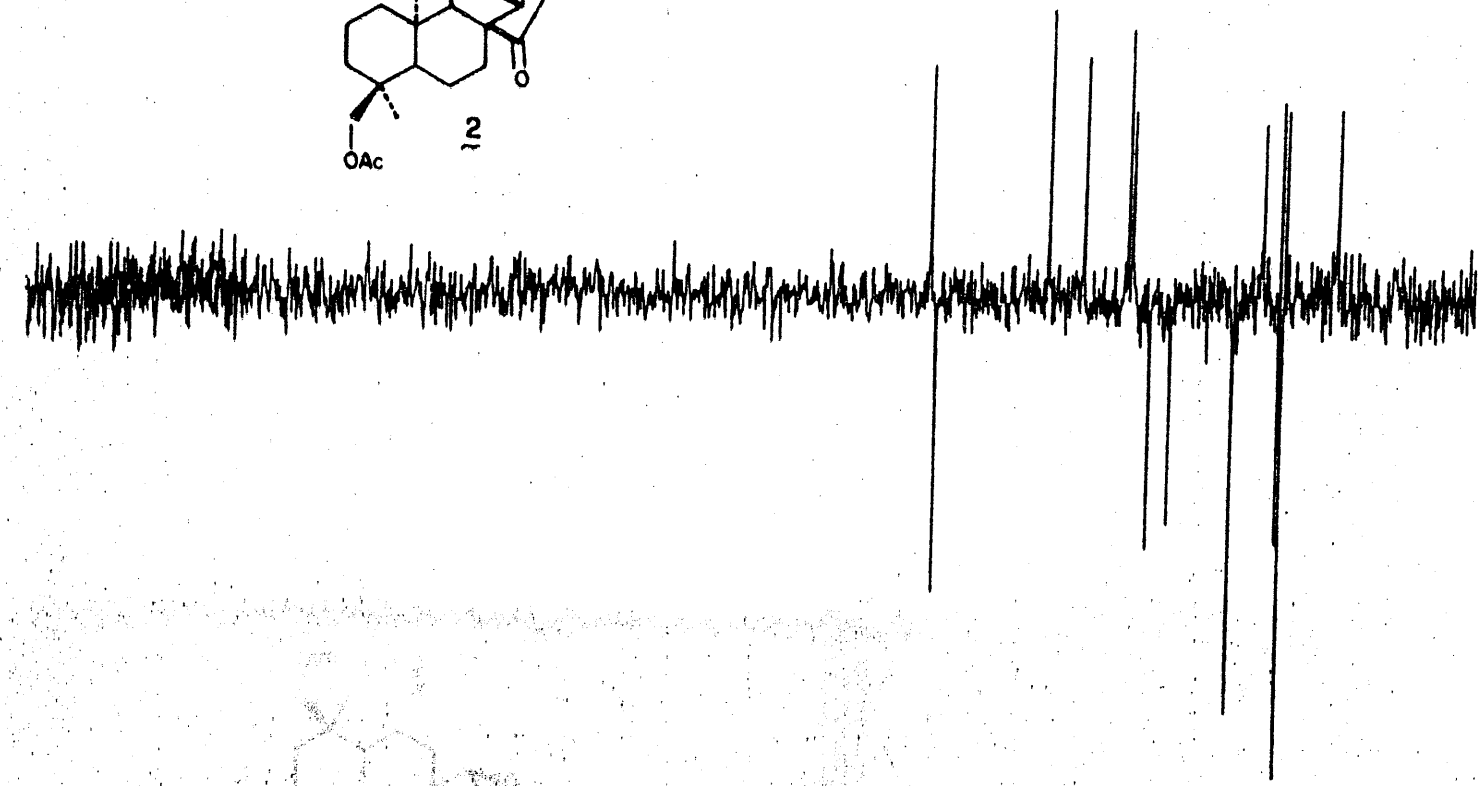

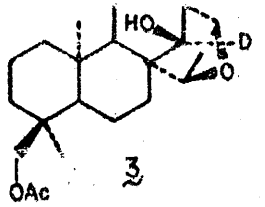

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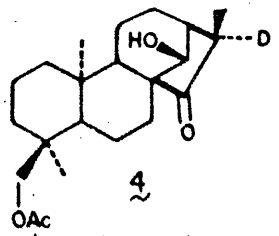

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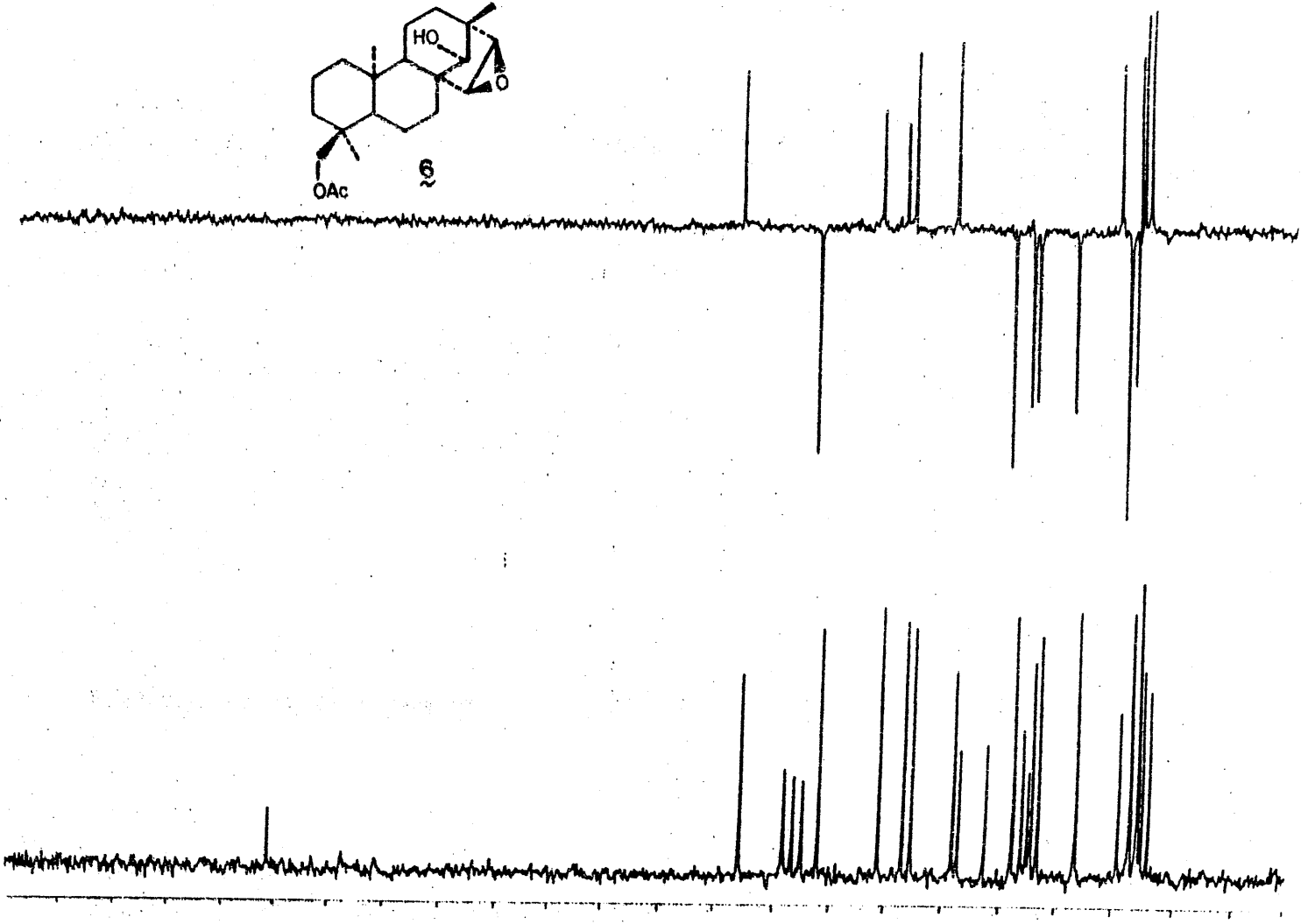

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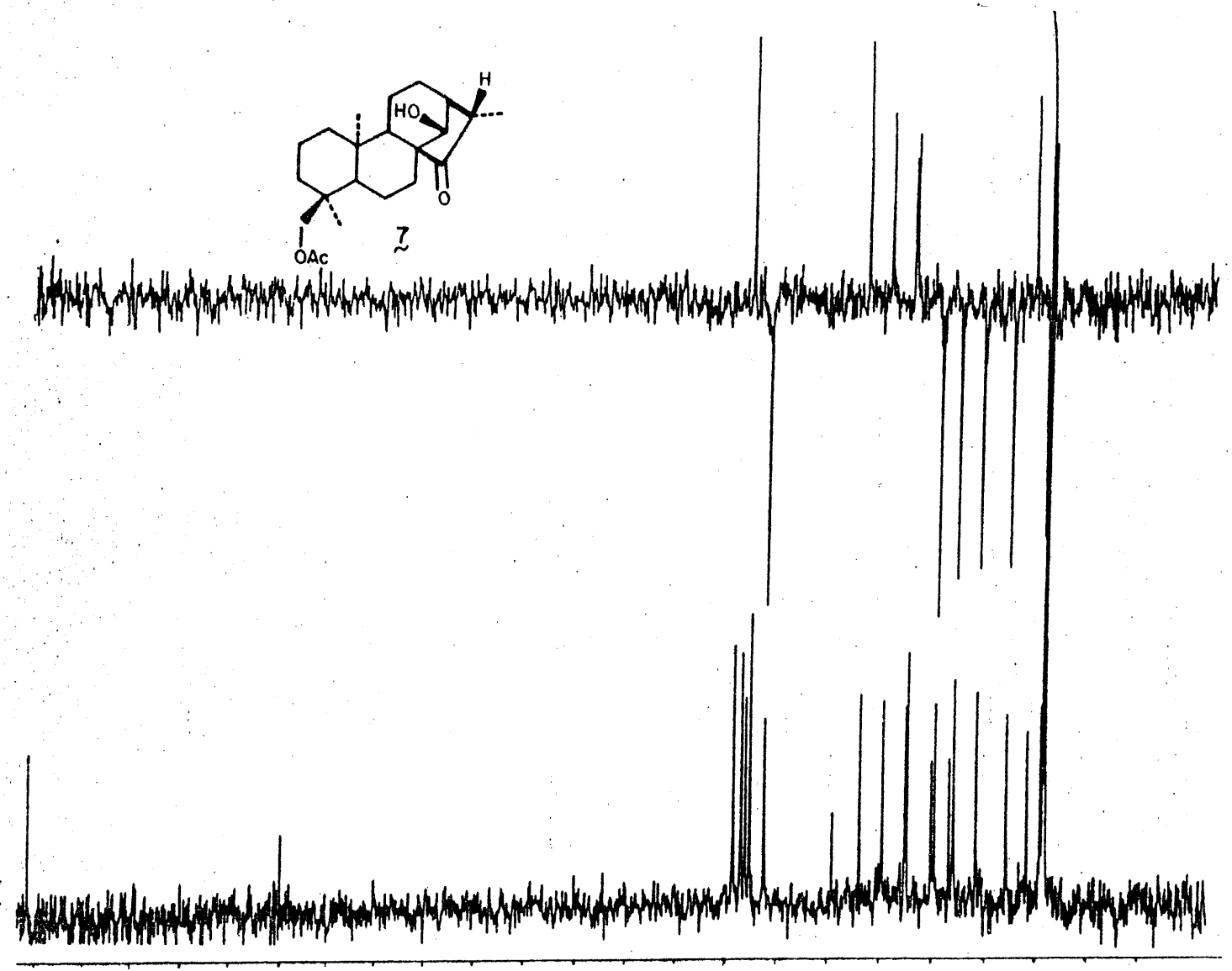

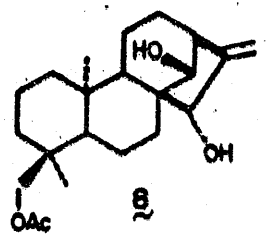

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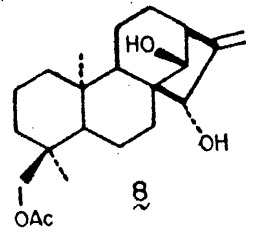

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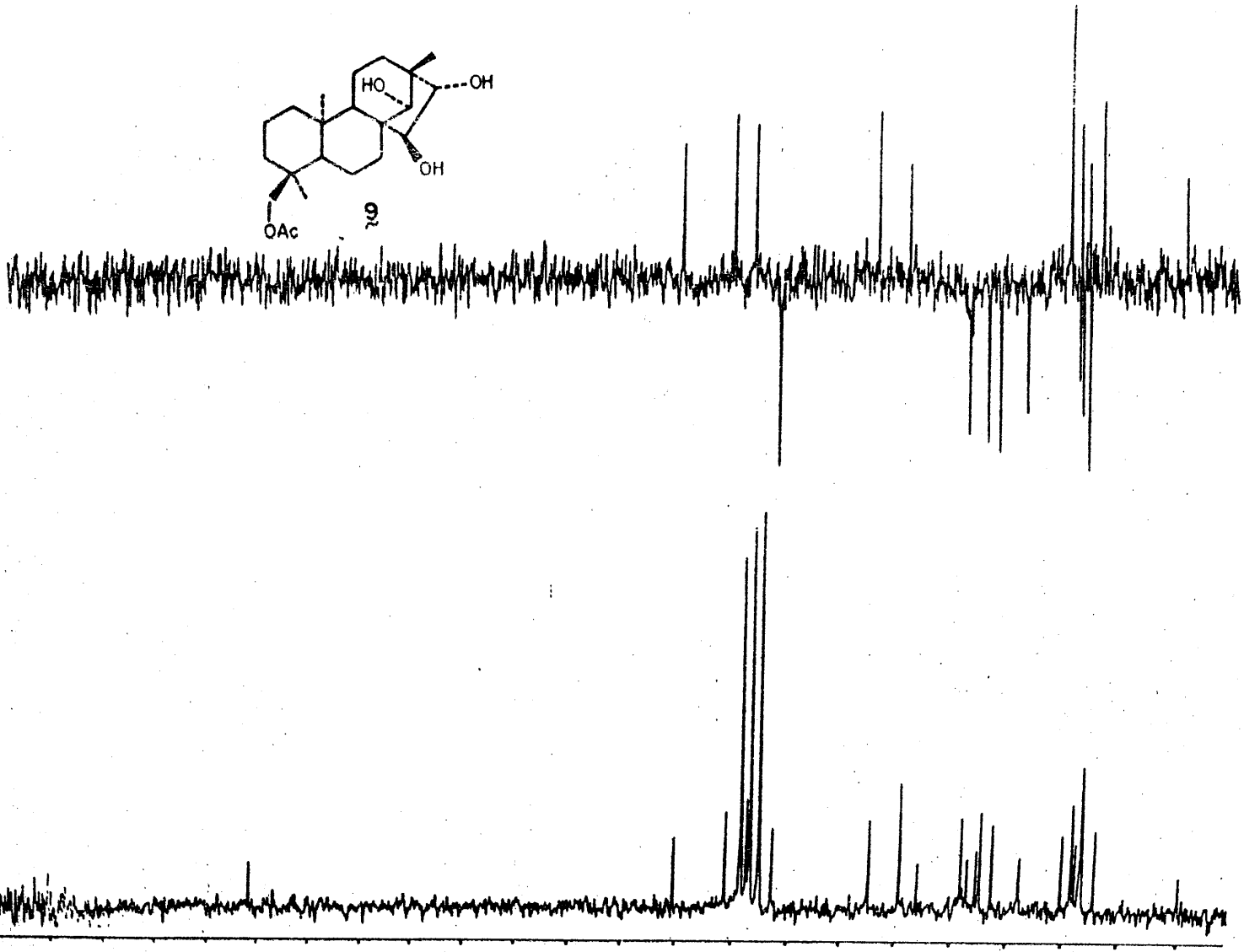
CH_2

CH, CH_3



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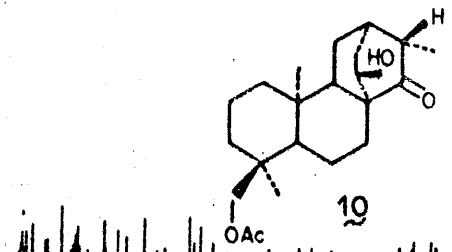

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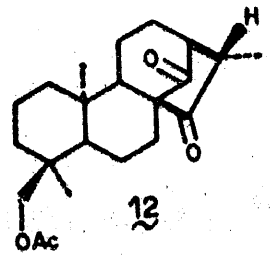

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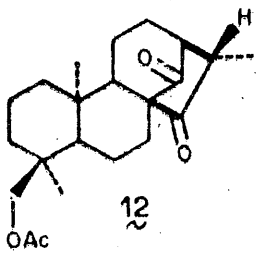

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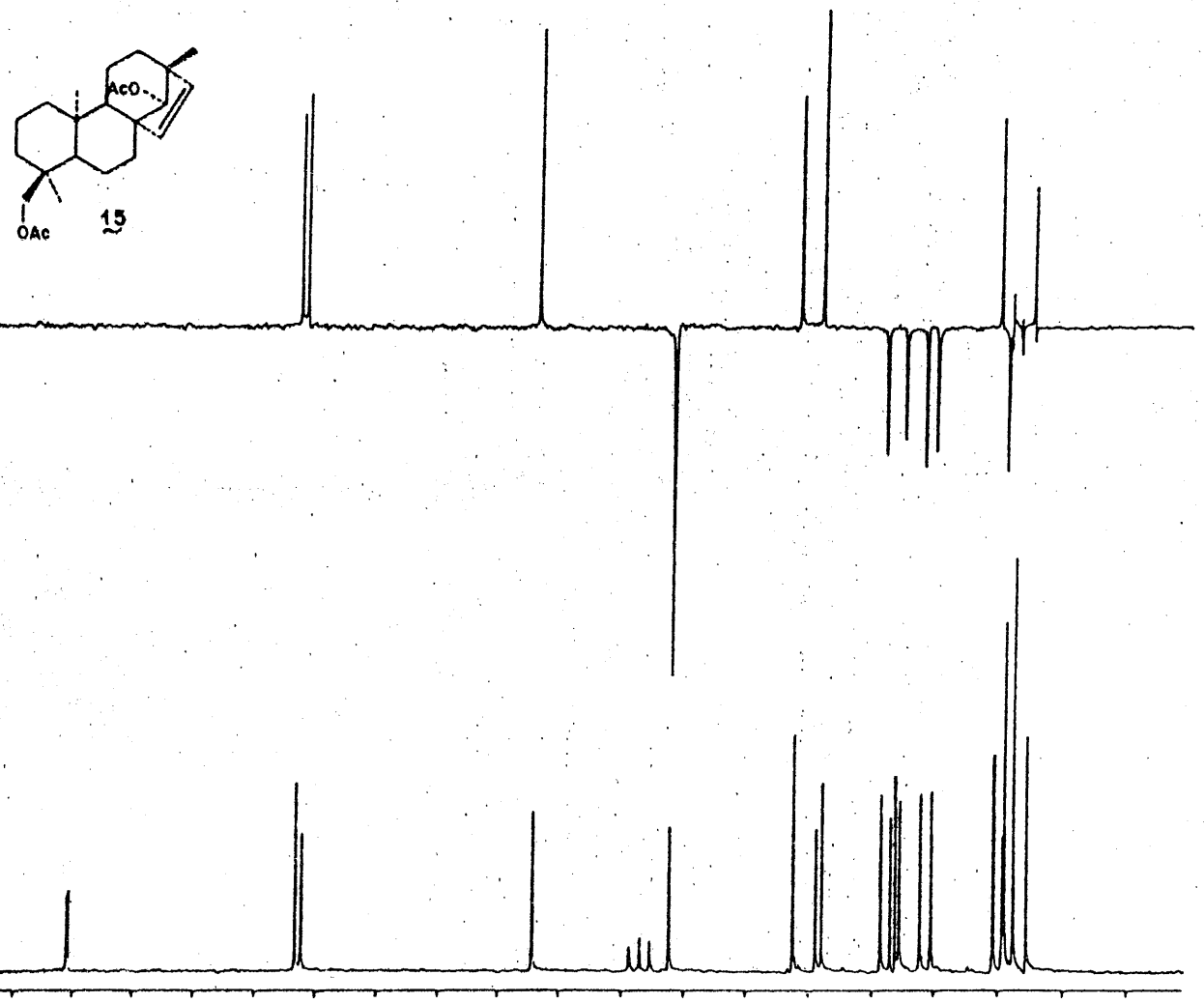

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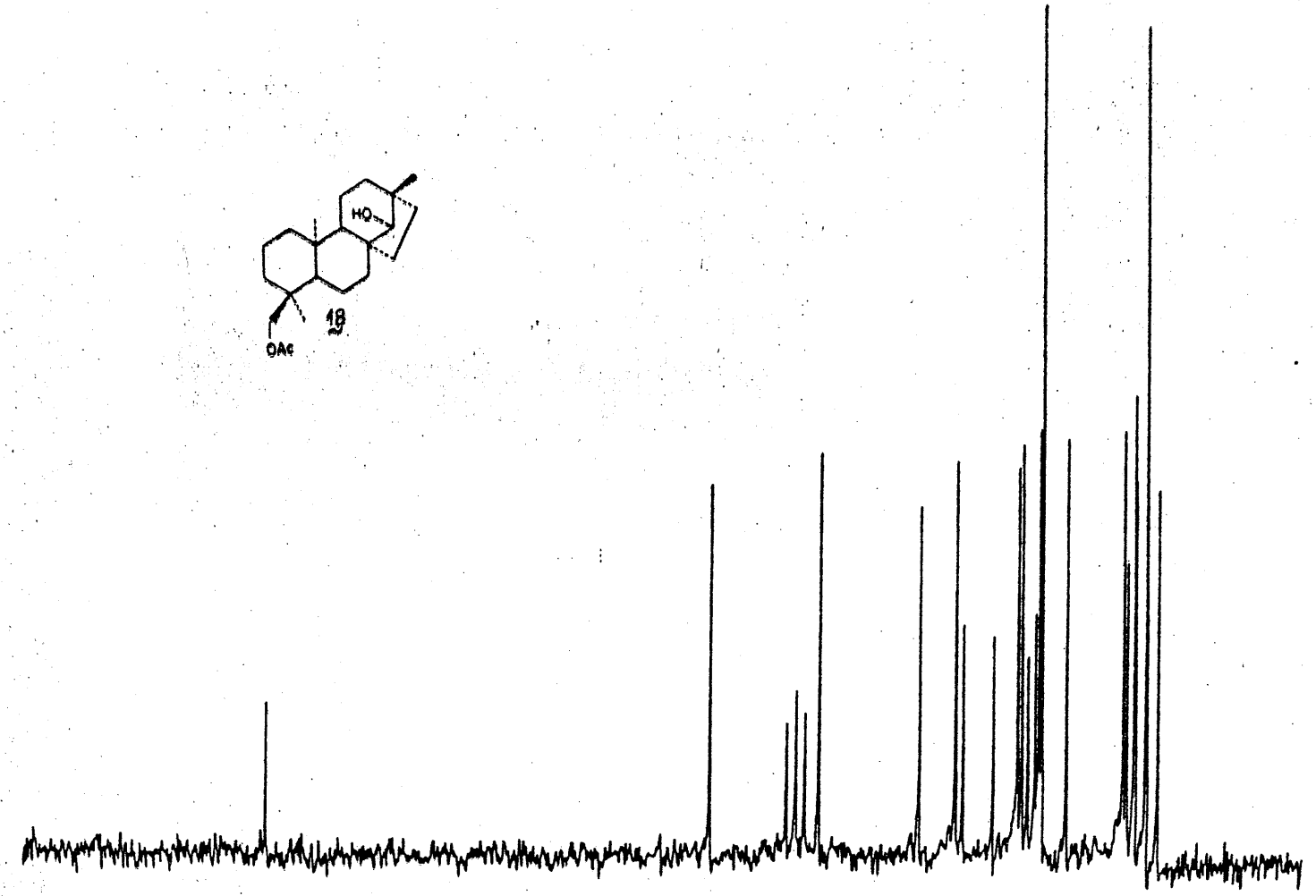
HO
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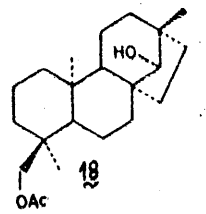
OAc



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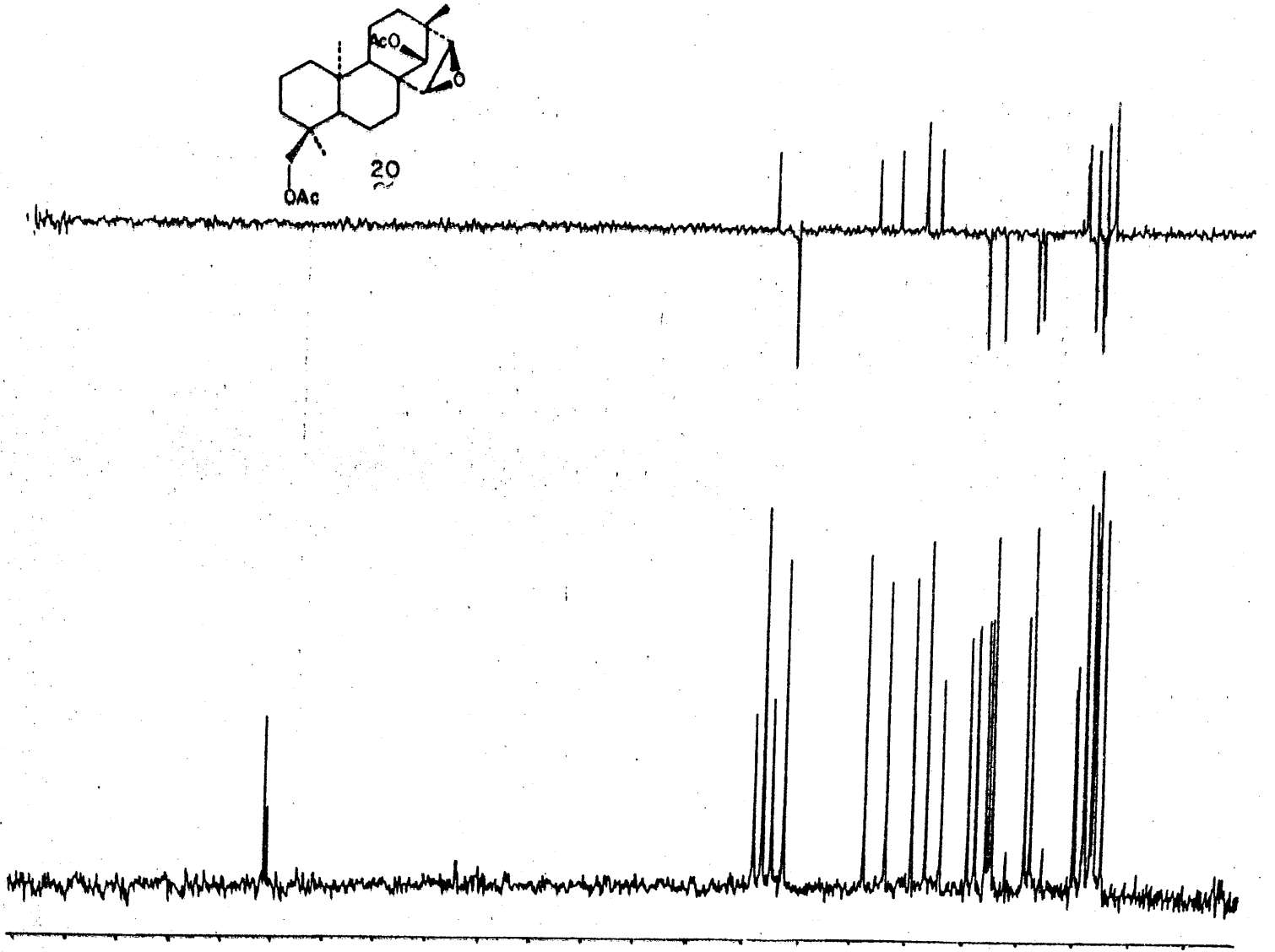

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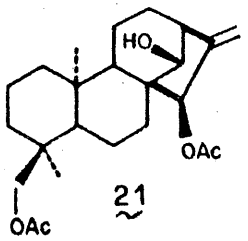

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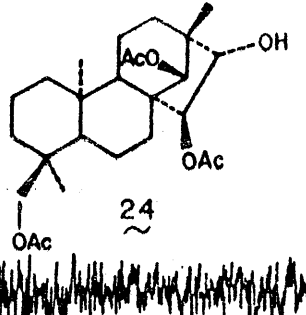

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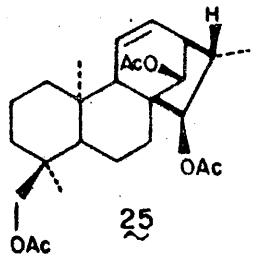

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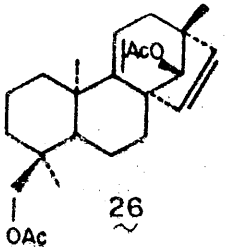

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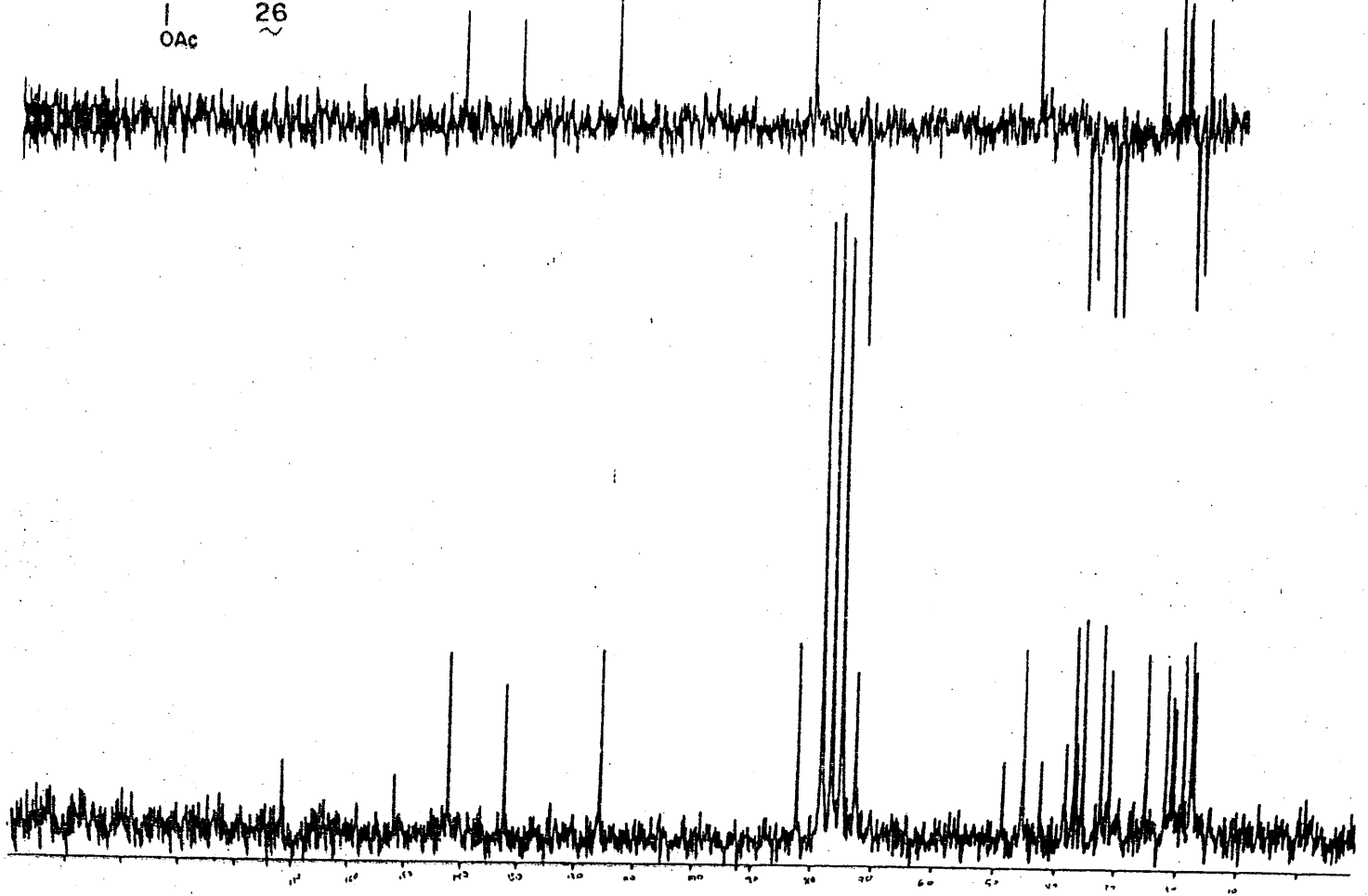

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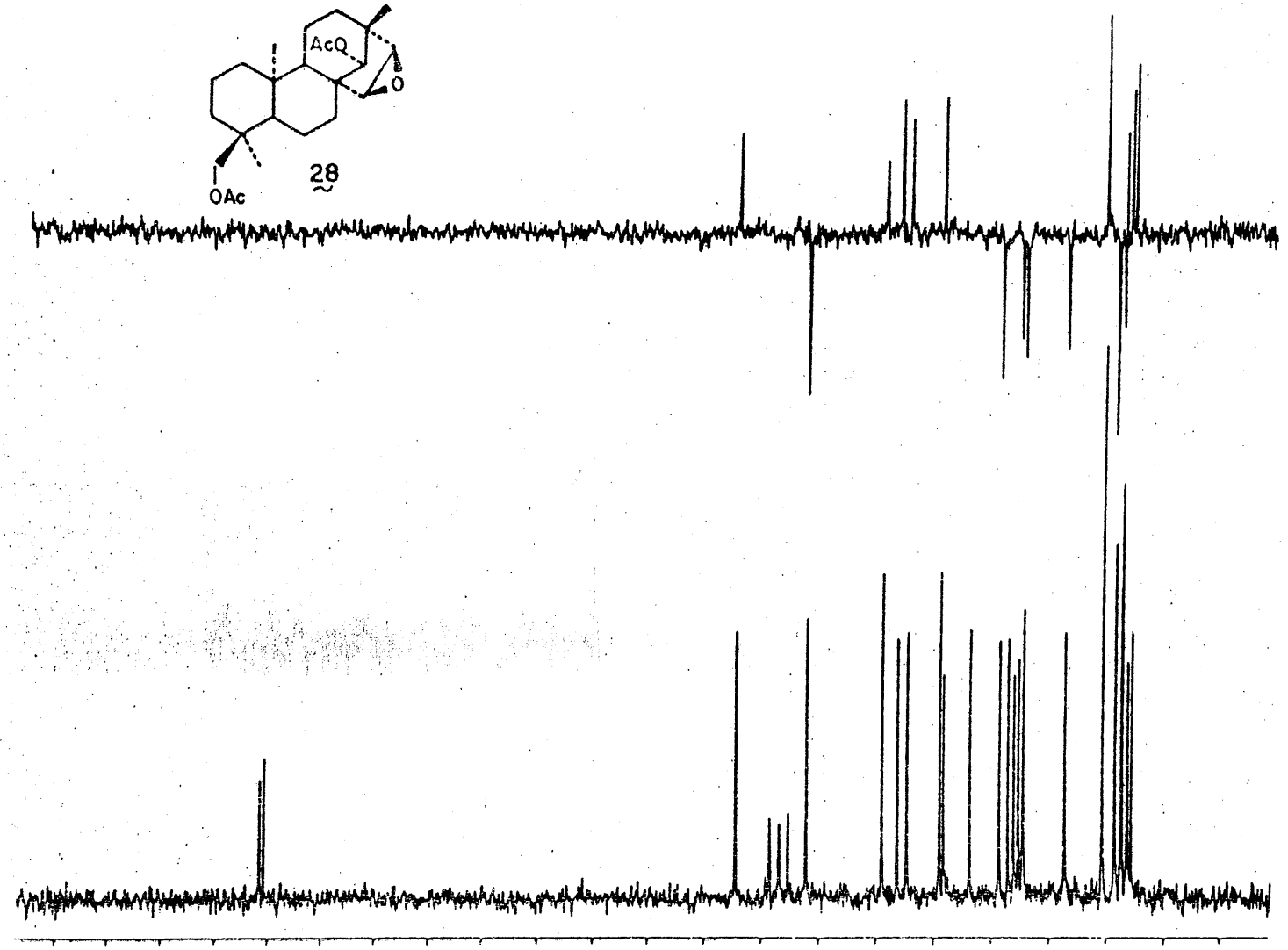

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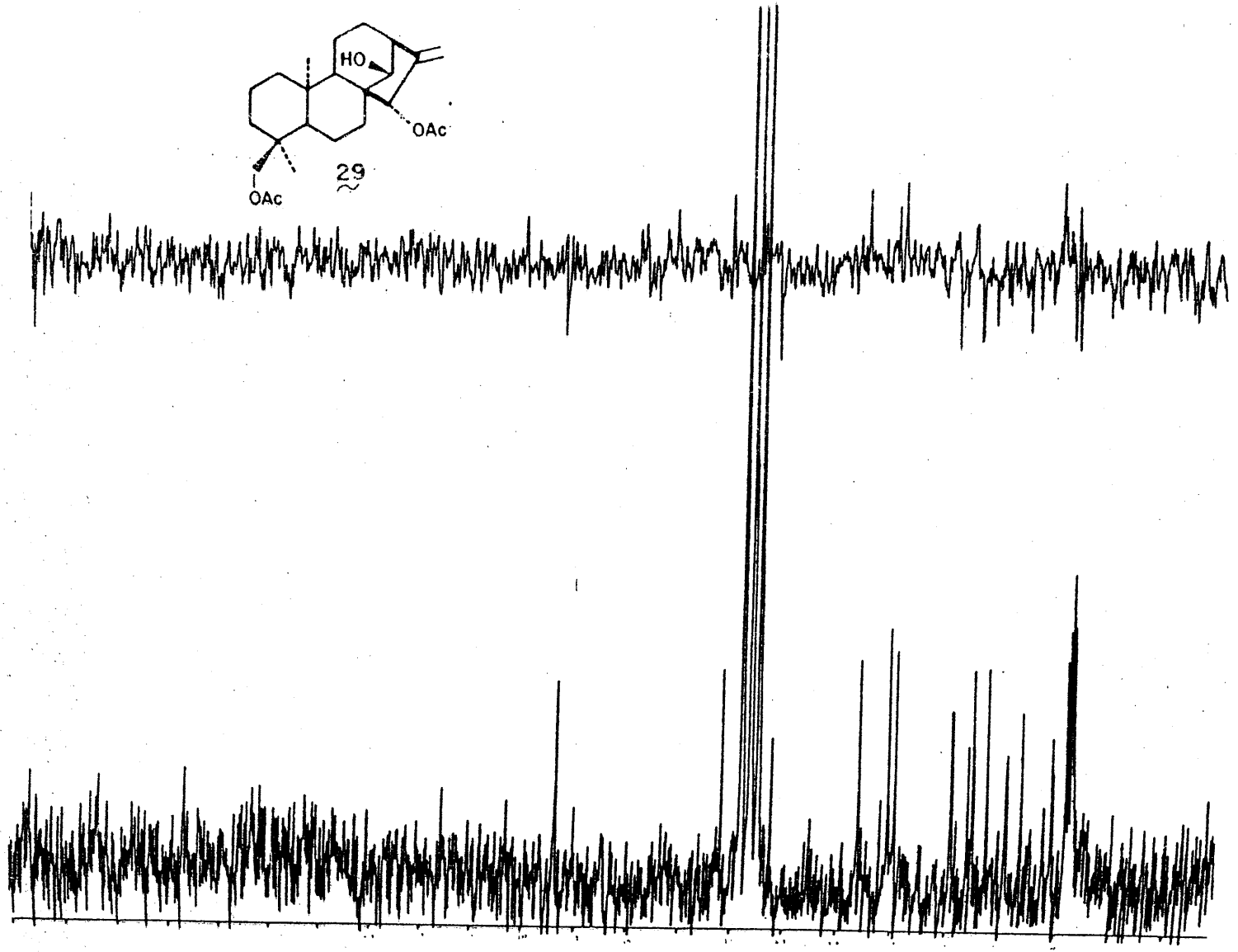

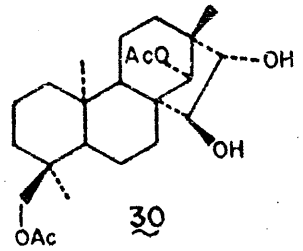

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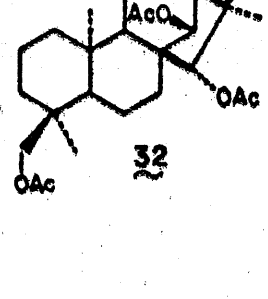

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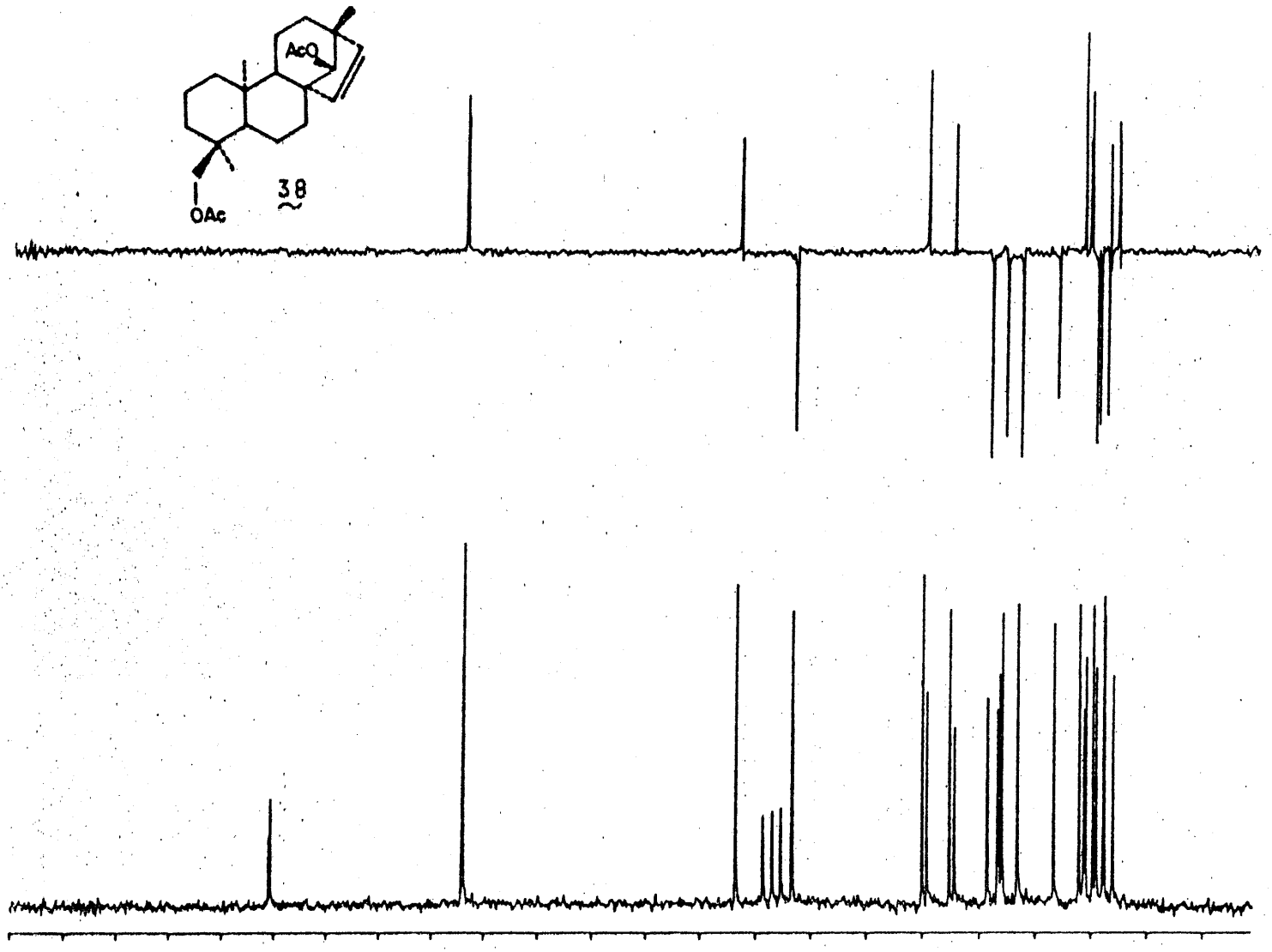
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OAc
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