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## Spectral Data

Spectral [$^{13}$C **NMR** (50 MHz, $CDCl_3$) and $^{1}$H **NMR** (200, MHz $CDCl_3$)] and other characterization data for the compounds 1b, 2b 3b, 4b, 5b, 1c, 1d, 2d, 1a, 2a, 3a, 4a, 5a, 6a, 7a, 8a, 9a, 10a and 11a are summarised here.

**1b. M.P**: 171.5°C (Lit.[31] M.P: 172-173); **IR** (KBr): 1678 $cm^{-1}$; $^{1}$**H NMR**: δ ppm 7.1-7.4 (m, 10H), 7.9 (s, 1H); ; $^{13}$**C NMR**: δ ppm 128.1, 128.3, 128.7, 129.5, 129.8, 130.9, 131.7, 134.4, 135.4, 142.6, 173.5; **MS**(EI): m/z: 224 (M), 179 (B). Analysis calcd for $C_{15}H_{12}O_2$; Calcd C% 80.30, H% 5.35; Found :C% 80.04; H% 5.80

**2b**; Yield: 41% (0.219g); **IR** (neat): 1687 cm-1; $^{1}$**H NMR:** δ ppm 0.19 (s, 9H), 0.89 (t, J=6.7 Hz, 3H), 1.27-1.6 (m, 6H), 2.3 (t, J=6.85 Hz, 2H), 7.0 (s, 1H); $^{13}$**C NMR**: δ ppm -0.49, 13.9, 22.4, 29.8, 31.8, 32.1, 143.6, 147.3, 172.8.

**3b**; Yield: 37% (0.237 g); **IR** (neat): 1687 $cm^{-1}$; $^{1}$**H NMR**: δ ppm 0.17 (s, 9H), 0.87 (t, J= 6.8 Hz, 3H), 1.27 (m, 12H), 2.29 (t, J= 6.85 Hz, 3H), 6.97 (s, 1H); $^{13}$**C NMR**: δ ppm -0.45, 14.1, 22.6, 29.2, 29.4, 29.9, 30.1, 31.8, 143.6, 147.2, 172.7

**4b**; Yield: 50% (0.165 g); **IR** (neat): 1697 $cm^{-1}$; $^{1}$**H NMR**: δ ppm 0.89 (t, J= 7.0 Hz, 3H), 1.37 (m, 6H), 2.26 (t, J= 7.4 Hz, 2H), 5.64 (d, J= 1.3 Hz, 1H), 6.28 (d, J= 1.3 Hz, 1H); $^{13}$**C NMR**: δ ppm 13.9, 22.4, 28.1, 31.4, 126.7, 140.4, 172.9.

**5b**; Yield: 42% (0.193 g); **IR** (neat): 1695 $cm^{-1}$; **$^1$H NMR**: δ ppm 0.9 (t, J= 7.0 Hz, 3H), 1.22-1.56 (m, 12H), 2.26 (m, 2H), 5.8 (dt, J= 15.7, 1.6 Hz, 1H), 7.2 (dt, J= 15.6, 7.0 Hz, 1H); **$^{13}$C NMR**: δ ppm 14.0, 22.6, 27.8, 29.1, 29.3, 31.8, 32.3, 120.6, 152.4, 172.1.

**1c; IR** (neat): 1714 $cm^{-1}$; **$^1$H NMR**: δ ppm 3.84 ( s, 3H -$OCH_3$), 6.93-7.98 (m, 11H); **$^{13}$C NMR**: δ ppm 52.4, 127.9, 128.2, 128.7, 129.1. 129.8, 130.6, 131.5, 142.5, 168.3; **MS (EI)**: m/z 238 (M), 178 (B)

**1d**; Yield: 50% (0.35 g); **IR** (neat): 1633 $cm^{-1}$; **$^1$H NMR**: δ ppm 1.09 (t, J= 7.2 Hz, 3H), 3.14 (q, J= 7.0 Hz, 2H), 6.6 (s, 1H), 7.1-7.6 (m, 10H); **$^{13}$C NMR**: δ ppm 13.2, 42.3, 127.5, 127.9, 128.3, 129.2, 129.7, 130.4, 134.8, 135.5, 138.3, 164.9, 171.1.

**2d**; Yield: 35% (0.176 g); **IR** (neat): 1620 $cm^{-1}$; **$^1$H NMR**: δ ppm 0.91 (t, J= 6.9 Hz, 3H), 1.15 (t, J= 7.1 Hz, 6H), 1.20-1.55 (m, 6H), 2.29 (t, J= 7.3 Hz, 2H), 3.41 (m, 4H), 5.02 (d, J= 1.3 Hz, 1H), 5.10 (d, J= 1.3 Hz, 1H); **$^{13}$C NMR**: δ ppm 13.8, 22.3, 26.9, 31.4, 34.3, 112.4, 145.9, 172.0.

**1a; M.P.**: 95-96°C (Lit.[16a] M.P. 97°C); **IR**(KBr); 1780 $cm^{-1}$;**$^1$H NMR**: δ ppm 7.45-7.68 (m, 6H), 8.14 (m, 4H); **$^{13}$C NMR**:δ ppm 128.7, 129.7, 131.2, 134.6, 187.4, 196.1. **MS(EI)**: m/z: 235 (M+1), 179 (B).

**2a**; Yield: 51% (0.29 g); **IR**(neat): 1774 $cm^{-1}$; **$^1$H NMR**: δ ppm 0.35 (s, 9H); 0.92 (t, J= 6.9 Hz, 3H); 1.17-1.67 (m, 6H); 2.87(t, J= 7.3 Hz, 2H); **$^{13}$C NMR**:δ ppm -2.1, 13.7, 22.2, 26.5, 29.0, 31.8, 200.1, 201.4, 207.7, 211.3;

**MS(EI)**: m/z: 224 (M), 154 (B). **HRMS**: m/z calcd. 224.123258, found: 224.123138.

**3a**; Yield: 53% (0.355 g); **IR**(neat): 1774 $cm^{-1}$; **$^1$H NMR**: δ ppm 0.35 (s, 9H); 0.87 (t, J= 6.9 Hz, 3H); 1.20-1.67 (m, 12H); 2.79 (t, J= 7.1 Hz, 2H); **$^{13}$C NMR**: δ ppm -2.1, 14.0, 22.5, 26.8, 29.0, 29.6, 31.5, 31.7, 200.0, 207.6, 211.2

**4a;** Yield: 60%, (0.29 g); **IR** (neat): 1768, 1631 $cm^{-1}$ **$^1$H NMR**: δ ppm 0.91 (t, J= 7.1 Hz, 3H); 1.25-1.80 (m, 6H); 2.05 (d, J= 6.9 Hz, 2H); 2.75 (t, J= 7.7 Hz, 2H); 6.49 (dd, J= 7.7, 1.8 Hz, 1H), 7.36 (m, 1H); **$^{13}$C NMR**: δ ppm 13.7, 19.9, 22.1, 25.8, 26.4, 31.7, 119.4, 146.6, 190.5, 195.7,197.8, 198.3; **MS (EI)**: m/z: 192 (M), 121 (B).

**5a**; Yield: 61% (0.405 g); **IR** (neat): 3450, 1788 $cm^{-1}$; **$^1$H NMR**: δ ppm 0.88 (t, J= 6.8 Hz, 3H); 0.90 (t, J= 6.9 Hz, 3H); 1.28-1.37 (m, 14H); 2.89 (t, J= 7.2 Hz, 2H); 4.98 (t, J= 6.0 Hz, 3H); **$^{13}$C NMR**:13.8, 13.9, 22.2, 22.4, 24.9, 26.0, 26.9, 28.9, 31.5, 31.8, 35.0, 68.6, 197.3, 198.4, 201.8, 202.7; **MS(EI)**: m/z: 266 (M+1), 195 (B).

**6a**; Yield: 63% (0.428 g); **IR** (neat): 3476, 1786 $cm^{-1}$; **$^1$H NMR**: δ ppm 0.86 (t, J= 6.9 Hz, 3H), 1.25-1.78 (m, 6H), 1.99 (s, 3H), 2.3 (s, 1H), 2.8 (t, J= 7.3 Hz, 2H), 7.26-7.65 (m, 5H); **$^{13}$C NMR**: δ ppm 13.7, 22.1, 26.9, 28.4, 29.3, 31.8, 74.9, 124.9, 125.3, 128.3, 128.8, 196.4, 198.5, 201.2, 202.9; **MS (EI)**: m/z 272 (M), 121(B). **HRMS** m/z ($M^+$) calcd. 272.141245, found 272.141843.

**7a**; Yield: 56% (0.21%); **IR** (neat): 1778$cm^{-1}$; **$^1$H NMR**:δ ppm 0.82 (t, J=7.3, 3H), 1.27-1.40 (m, 4H), 1.70-1.83 (m, 2H), 2.81 (t, J=7.3 Hz, 2H), 9.20 (s,

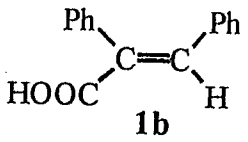
1H); **$^{13}$C NMR** :δ ppm 13.7, 22.1, 25.6, 27.1, 31.2, 184.8, 196.6, 199.9, 208.3.; **MS (EI)**: m/z: 152 (M), 81 (B).

**8a**: Yield: 69% (0.285 g); **IR** (neat): 1786 cm$^{-1}$; **$^{1}$H NMR**: δ ppm 0.89 (t, J=7.3 Hz, 3H),1.2-2.7 (m, 8H) 2.81 (t, J=7.2 Hz, 2H), 9.1 (s, 1H); **$^{13}$C NMR**:δ ppm 13.9, 25.9, 26.8, 28.9, 29.6, 31.8, 184.9, 196.7, 199.9, 208.3.

**9a**: Yield: 70% (0.320 g); **IR** (neat) :1788 cm$^{-1}$; **$^{1}$H NMR**: δ ppm 0.88 (t, J=7.3 Hz, 3H), 1.2-2.5 (m, 12H) 2.85 (t, J=7.3 Hz, 2H), 9.2 (s, 1H); **$^{13}$C NMR:** δ ppm 14.0, 22.6, 26.0, 27.5, 29.3, 29.7, 31.7, 31.9, 184.8, 196.6, 199.7, 208.4.

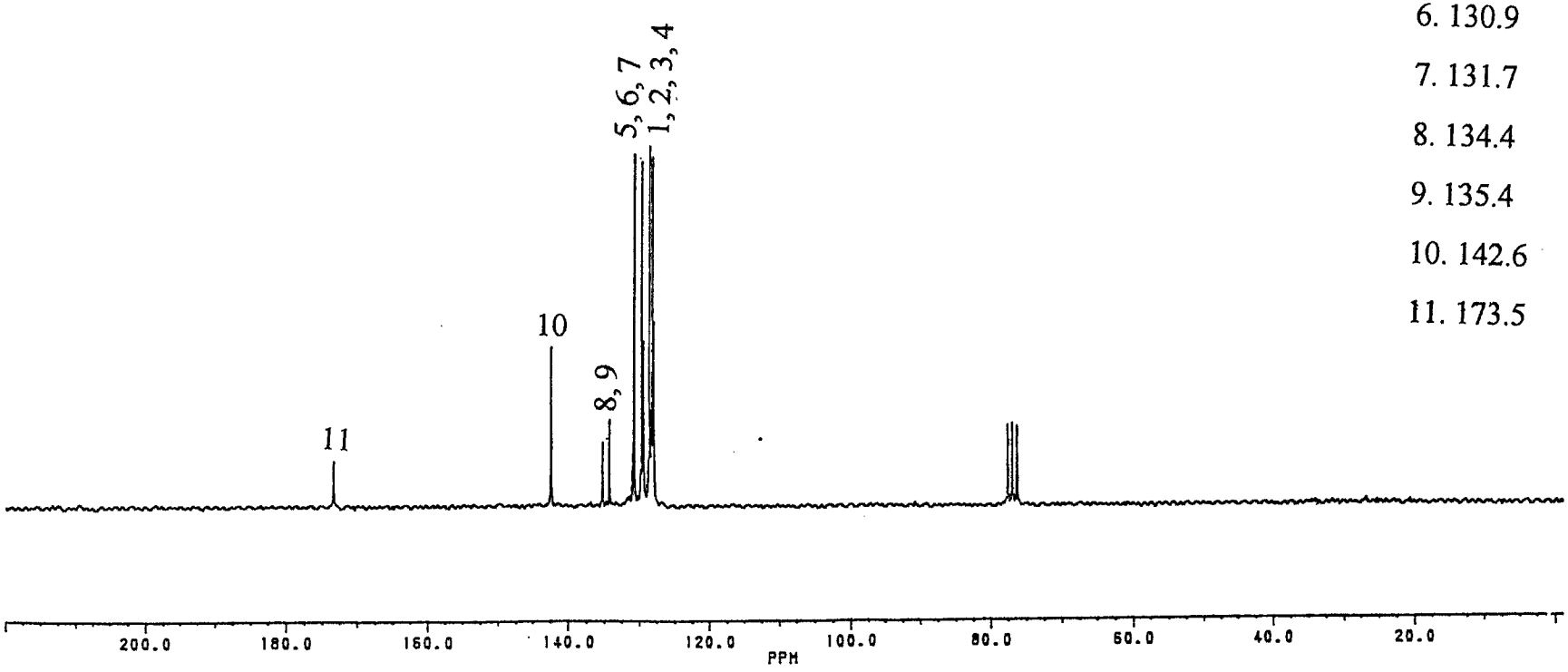
**10a**; Yield: 68% (0.375 g); **IR** (neat): 1774 cm$^{-1}$; **$^{1}$H NMR**:δ ppm 0.81 (t, J=7.2 Hz, 3H), 1.23-2.42 (m, 16H), 2.75 (t, J=7.4 Hz, 2H), 9.21 (s, 1H); **$^{13}$C NMR** :δ ppm 13.9, 22.6, 25.9, 26.3, 29.1, 29.2, 29.5, 29.6, 31.8, 31.9, 198.7, 199.1, 199.4, 203.4; **MS (EI)**: m/z 222 (M), 81 (B).

**11a:** Yield: 65% (0.240 g); **MP:** 152-153$^{o}$ C (Lit.[16a] 152-153$^{o}$C); **IR** (KBr)**:** 1768 cm$^{-1}$; **$^{1}$H NMR:** δ ppm 7.3-8.0 (m, 5H), 9.5 (s, 1H); **$^{13}$C NMR:** δ ppm 128.6, 129.4, 129.5, 134.6, 178.3, 195.5, 196.0, 197.7.




**1b**

1. 128.1
2. 128.3
3. 128.7
4. 129.5
5. 129.8
6. 130.9
7. 131.7
8. 134.4
9. 135.4
10. 142.6
11. 173.5



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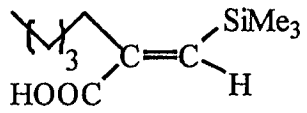


**2b**

1.-0.49

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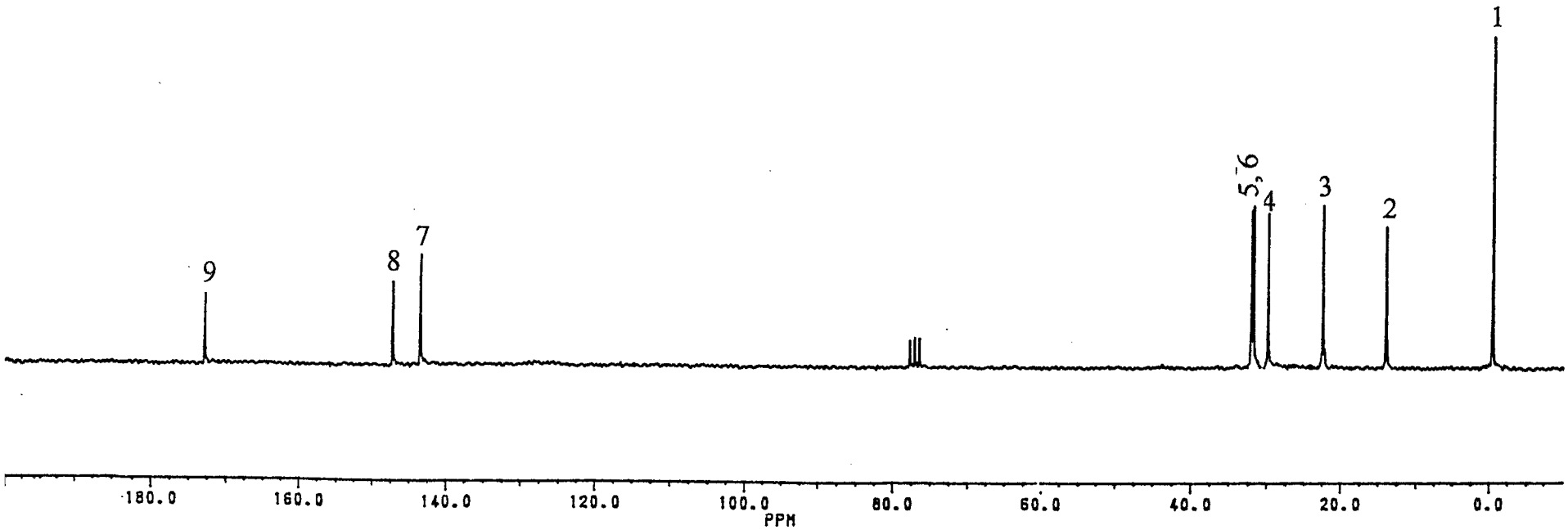
5. 31.8

6. 32.1

7. 143.6

8. 147.3

9. 172.8



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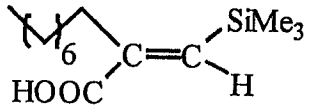
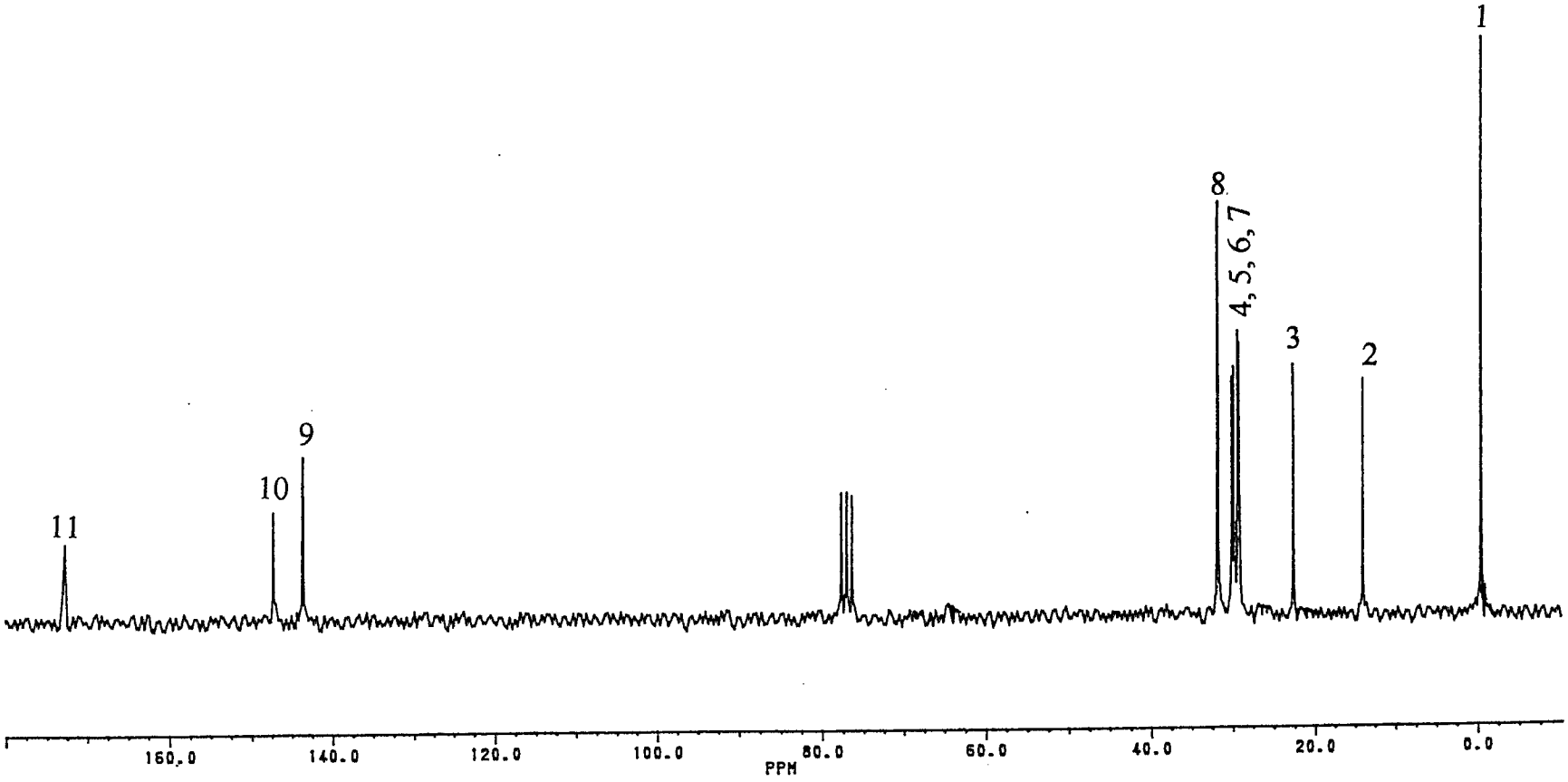



**3b**




1. -0.4
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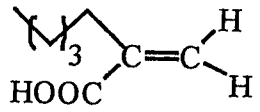
3. 22.6
4. 29.2
5. 29.4
6. 29.9
7. 30.1
8. 31.8
9. 143.
10. 14
11. 17

4




**4b**

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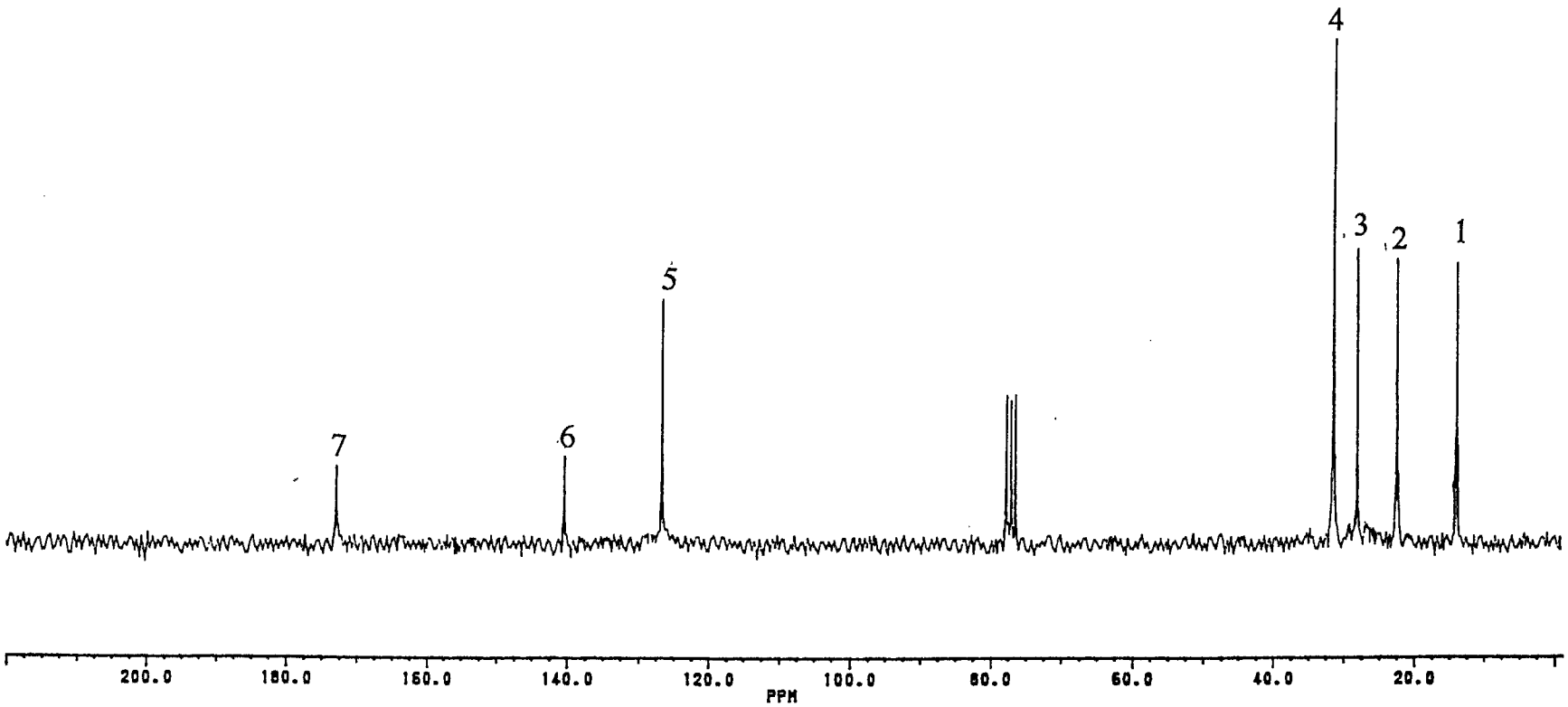
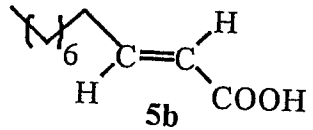
5. 126.7
6. 140.4
7. 172.9






**5b**

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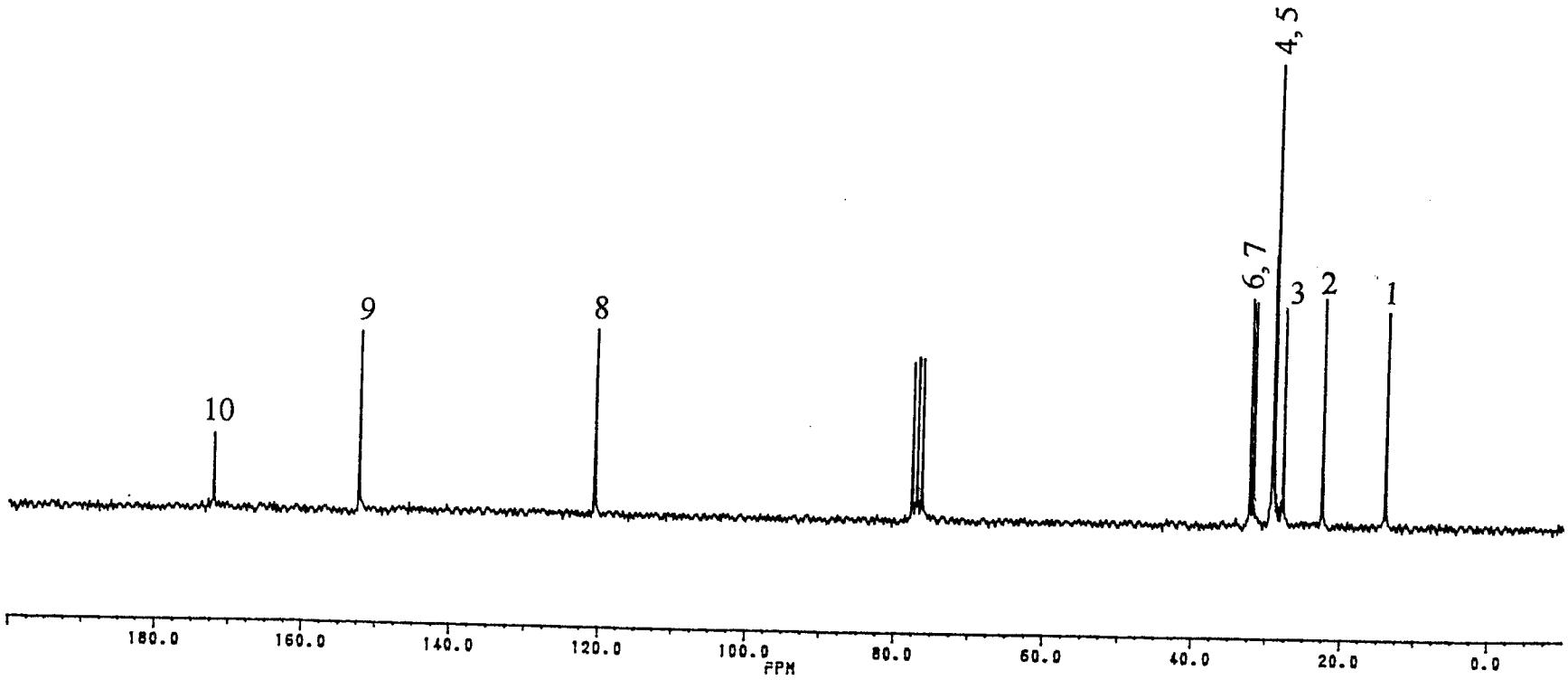
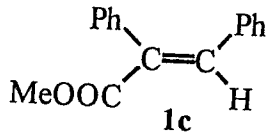
10. 172.1






**1c**

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3. 128.2
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7. 130.6
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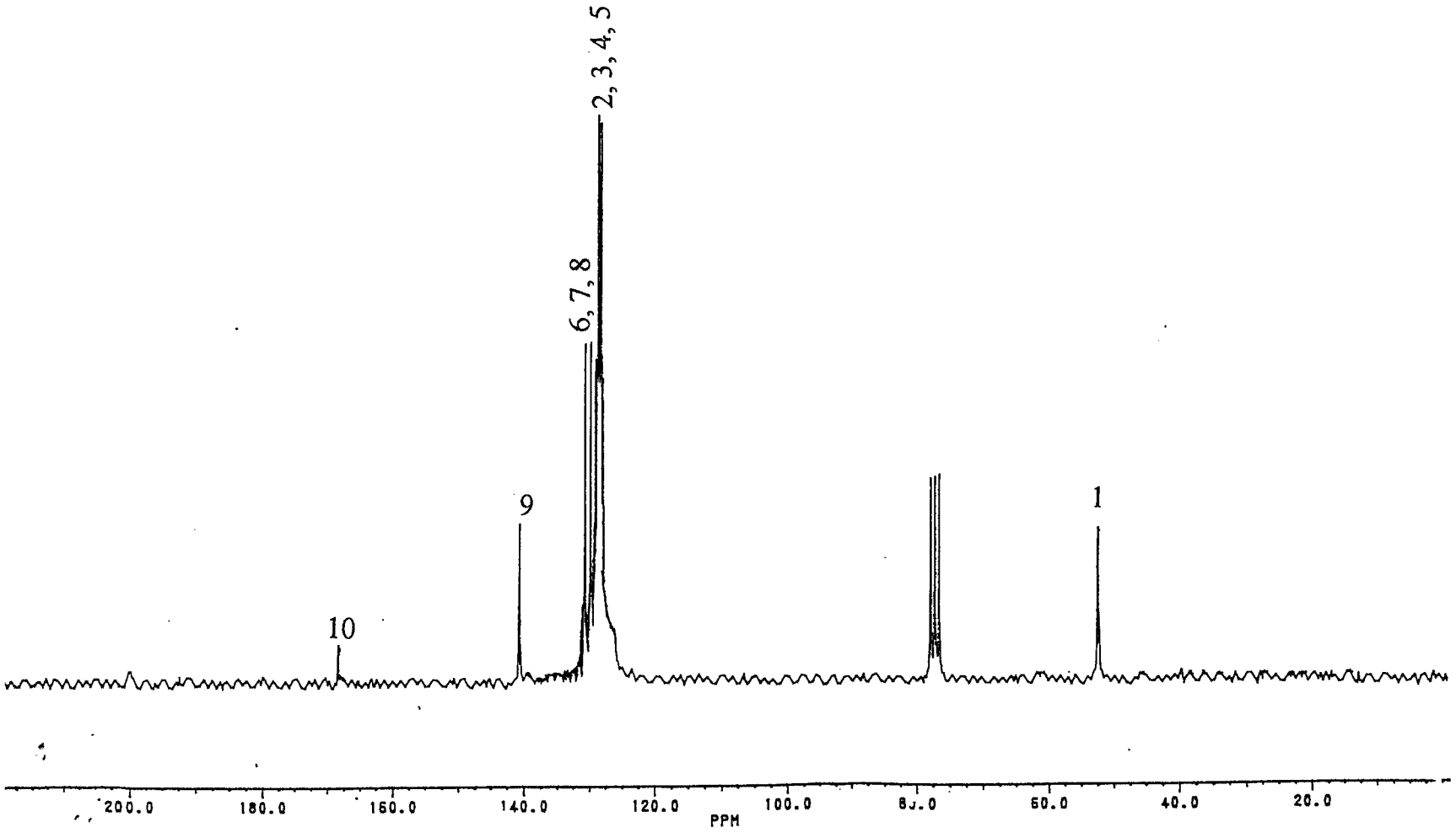
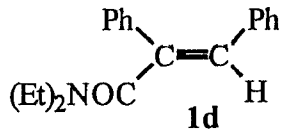
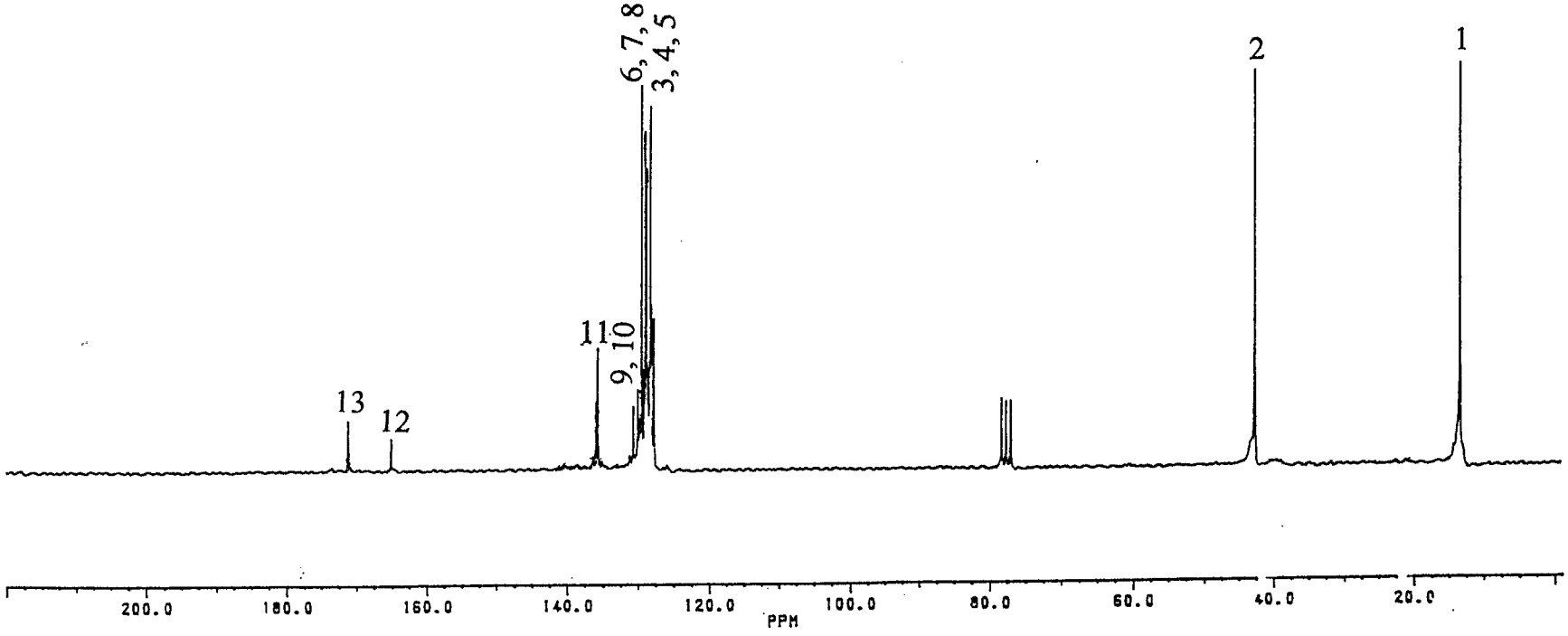
9. 142.5
10. 168.3






**1d**

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4. 127.9
5. 128.3
6. 129.2
7. 129.7
8. 130.4
9. 134.8
10. 135.5
11. 138.3
12. 164.9
13. 171.1

1. 13.8
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4. 31.4
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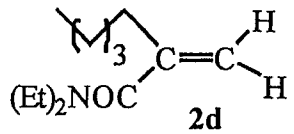
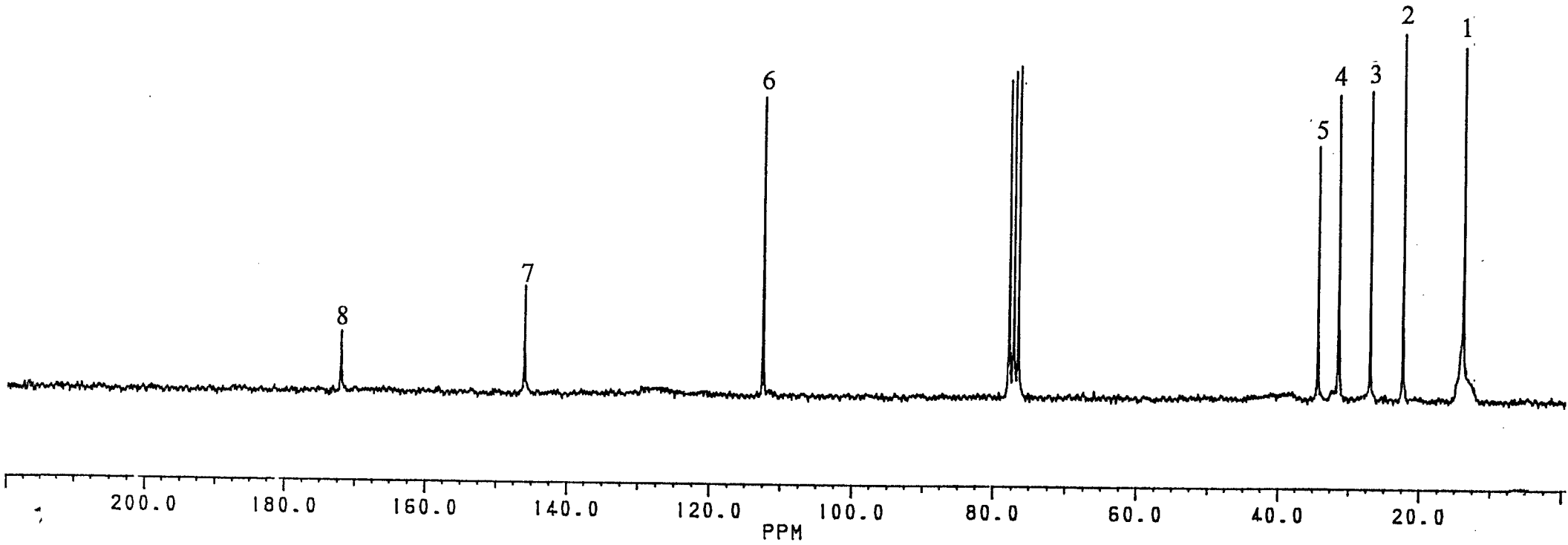
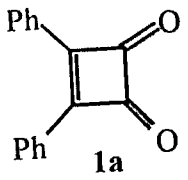
8. 172.0




**2d**






**1a**

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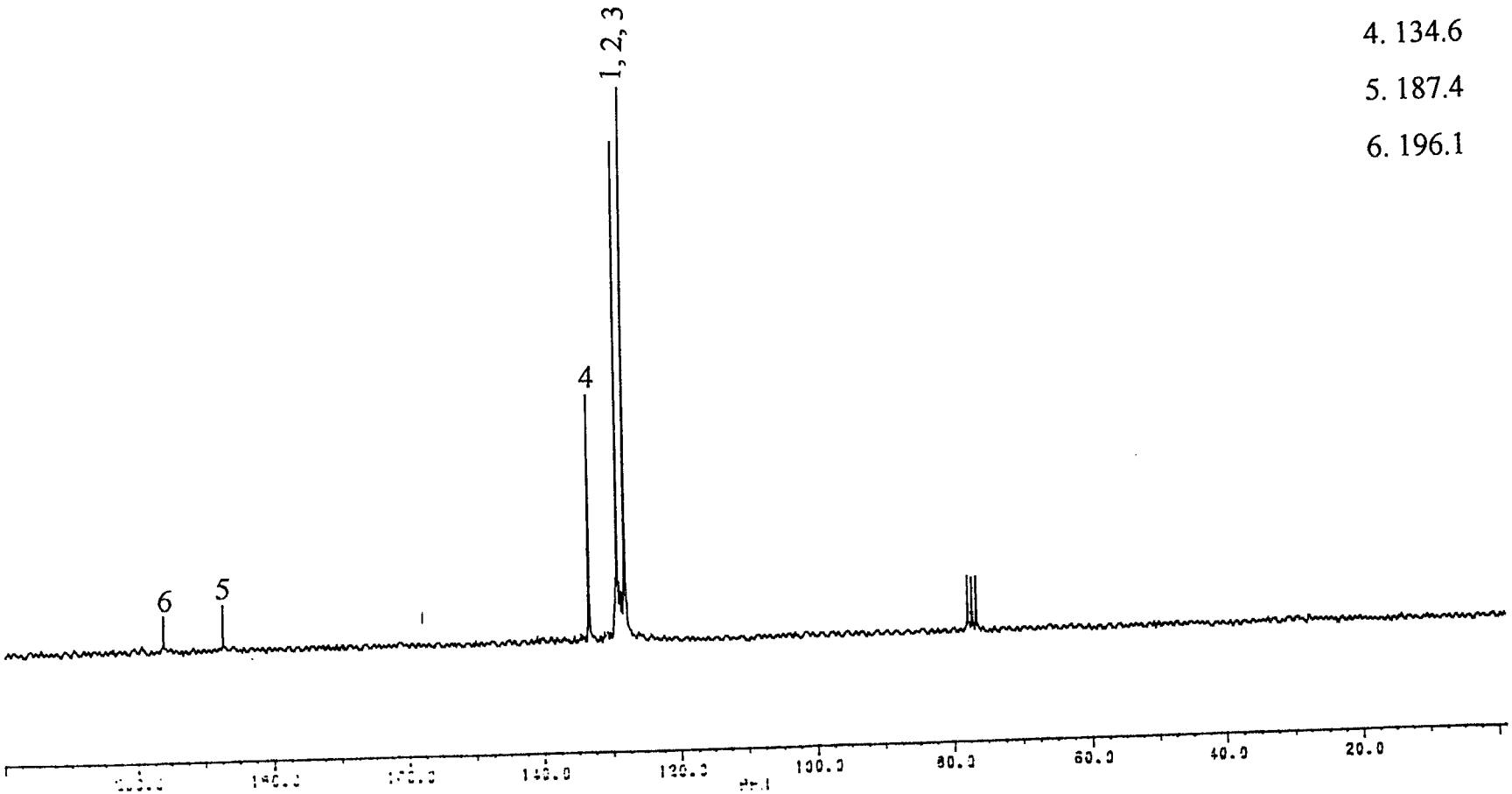
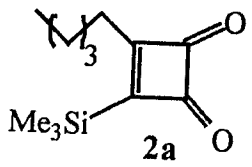
6. 196.1






2a

1. -2.1
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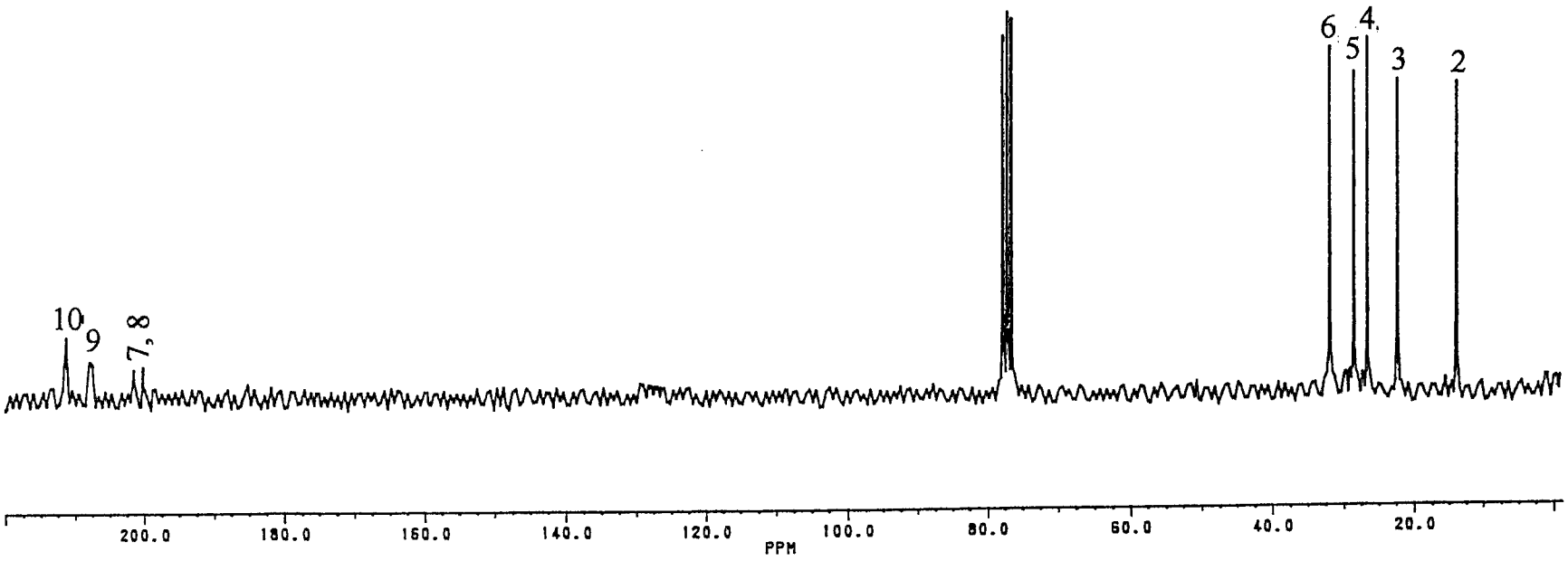
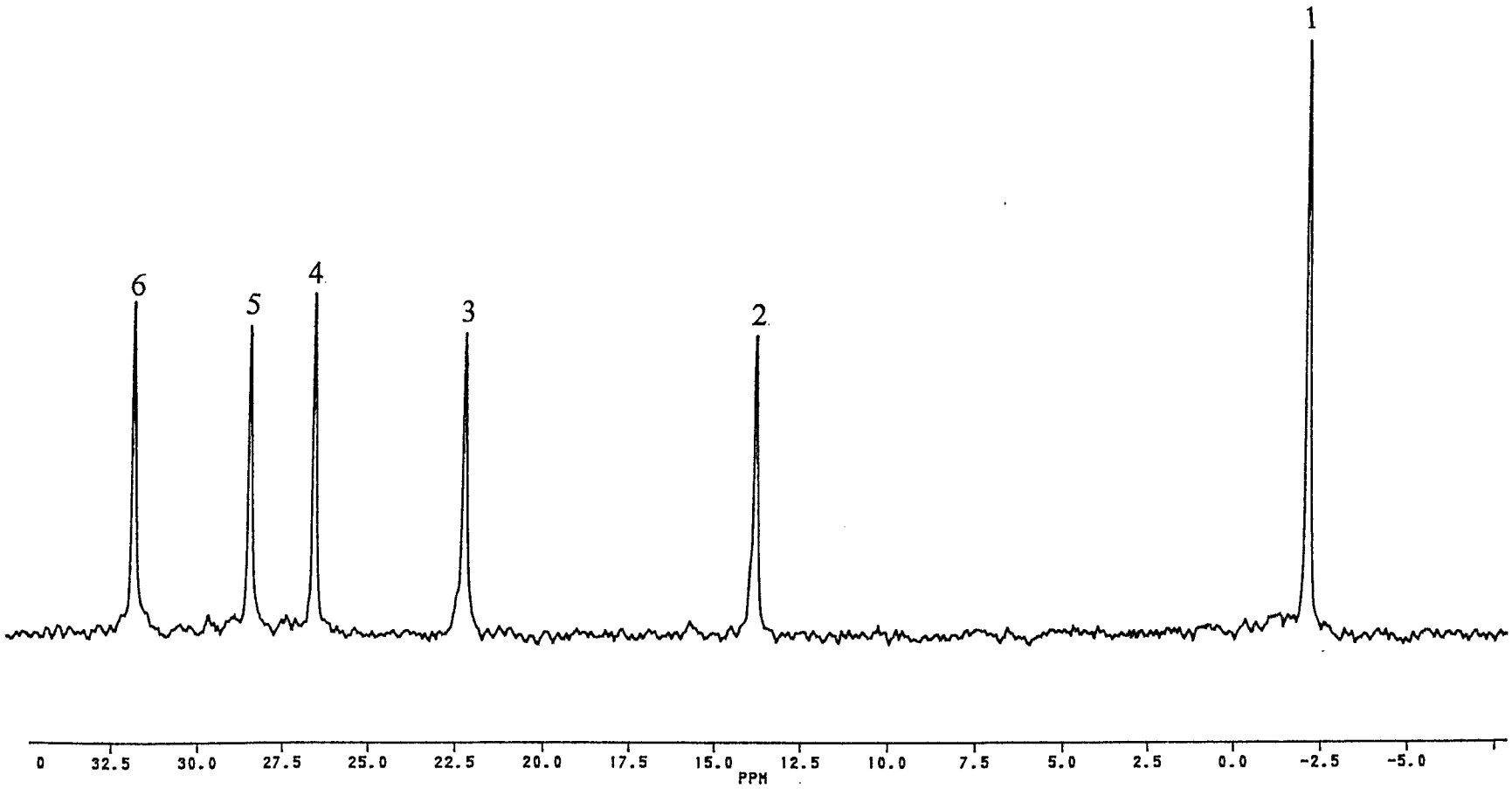
9. 207.7
10. 211.3



**2a**


1
2
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4
5
6
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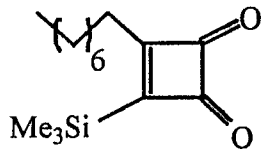


3a

1. -2.
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4. 26.
5. 29.
6. 29.
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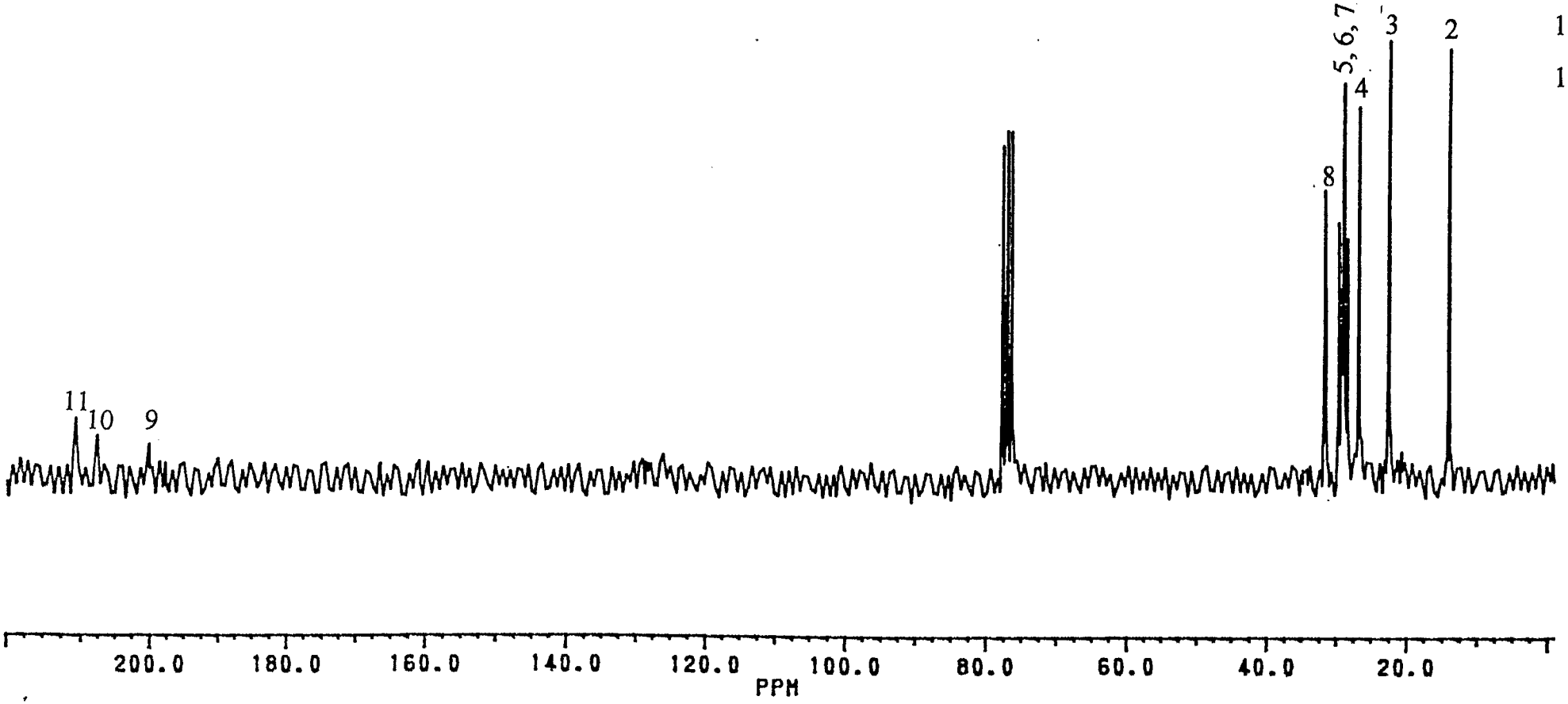
8. 31.
9. 200
10. 20
11. 21



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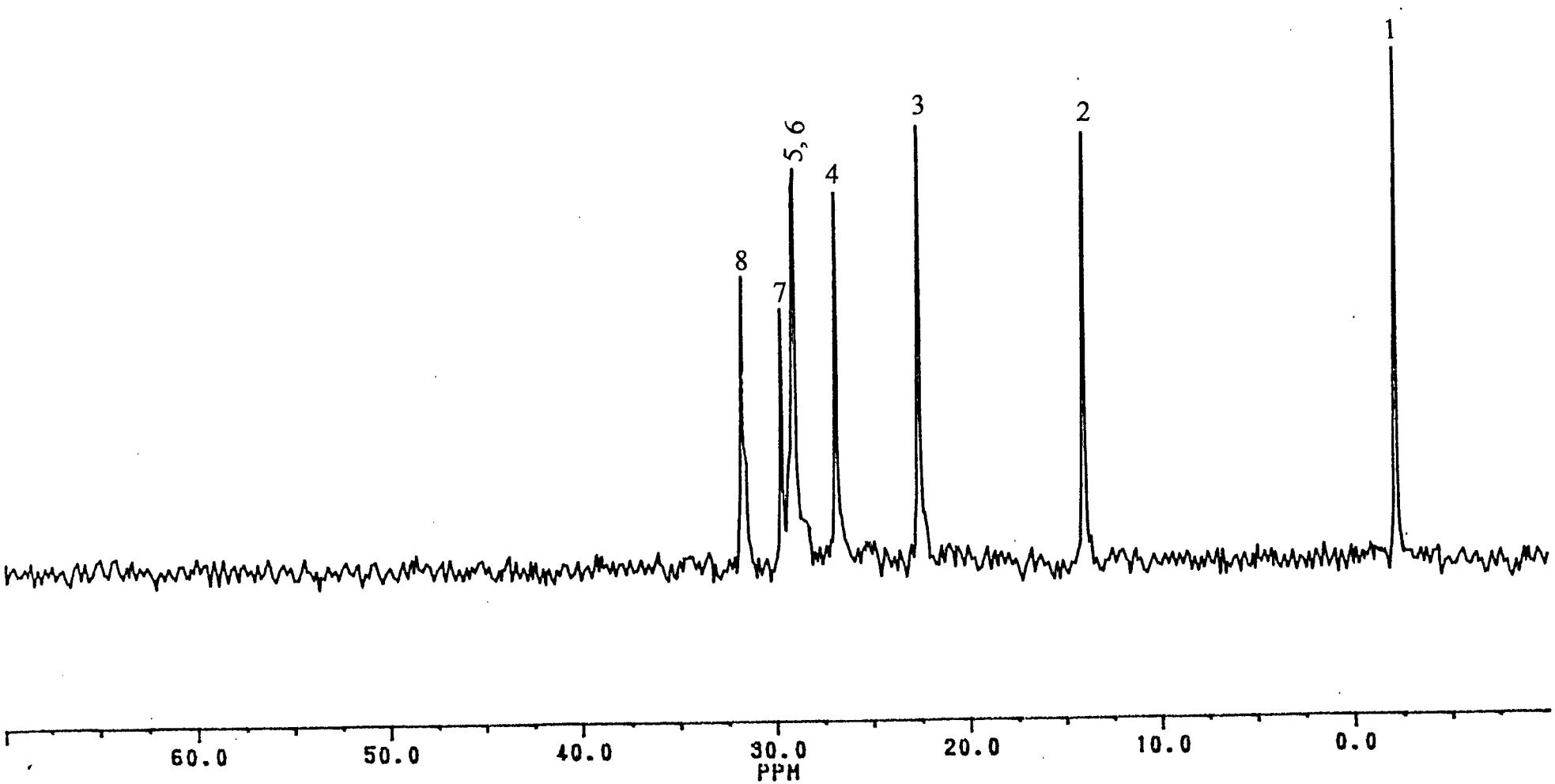
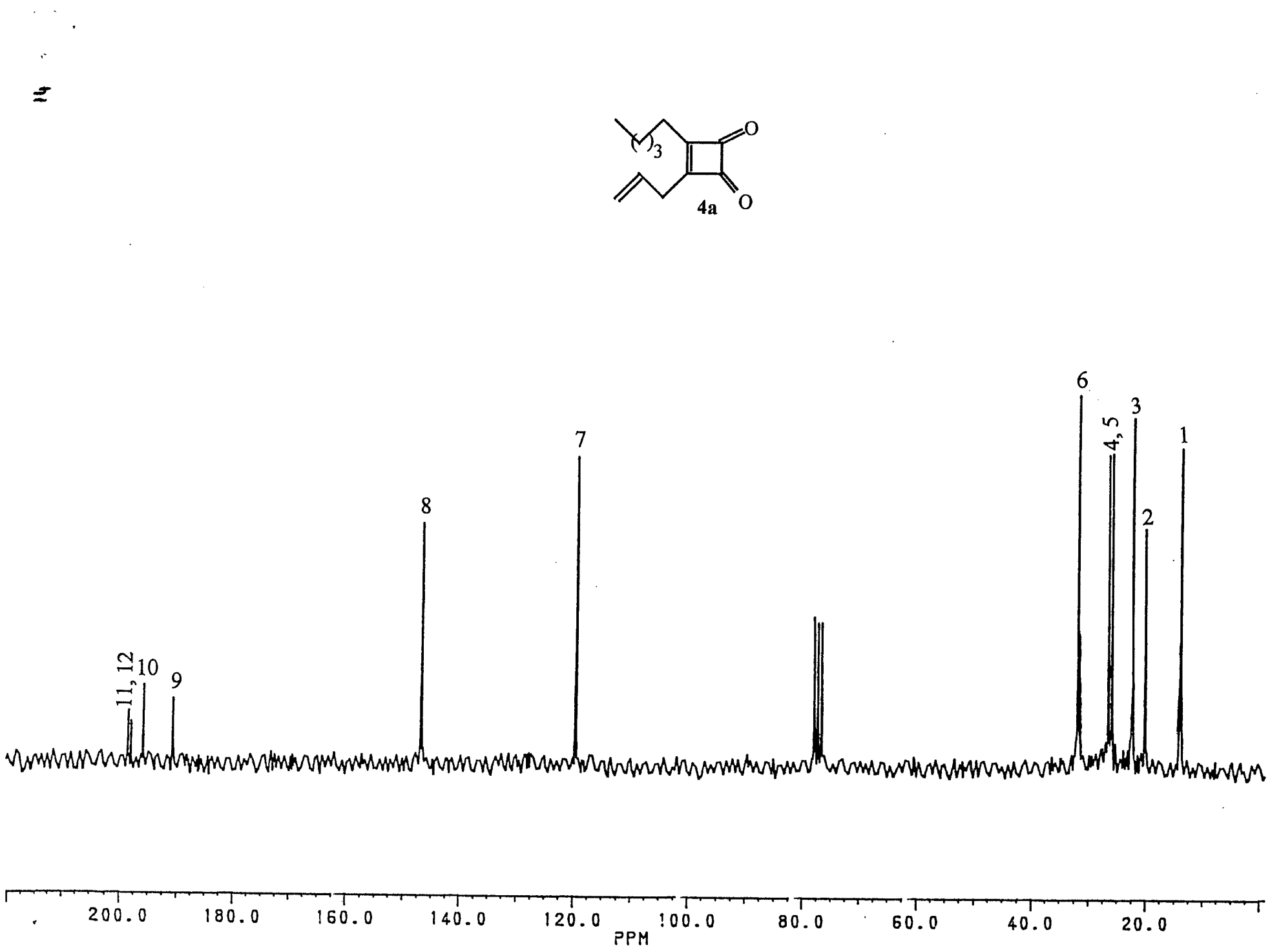
**3a**






1. 13.
2. 19.
3. 22.
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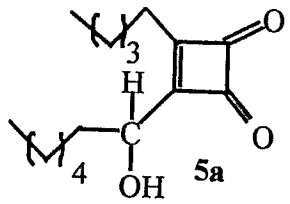
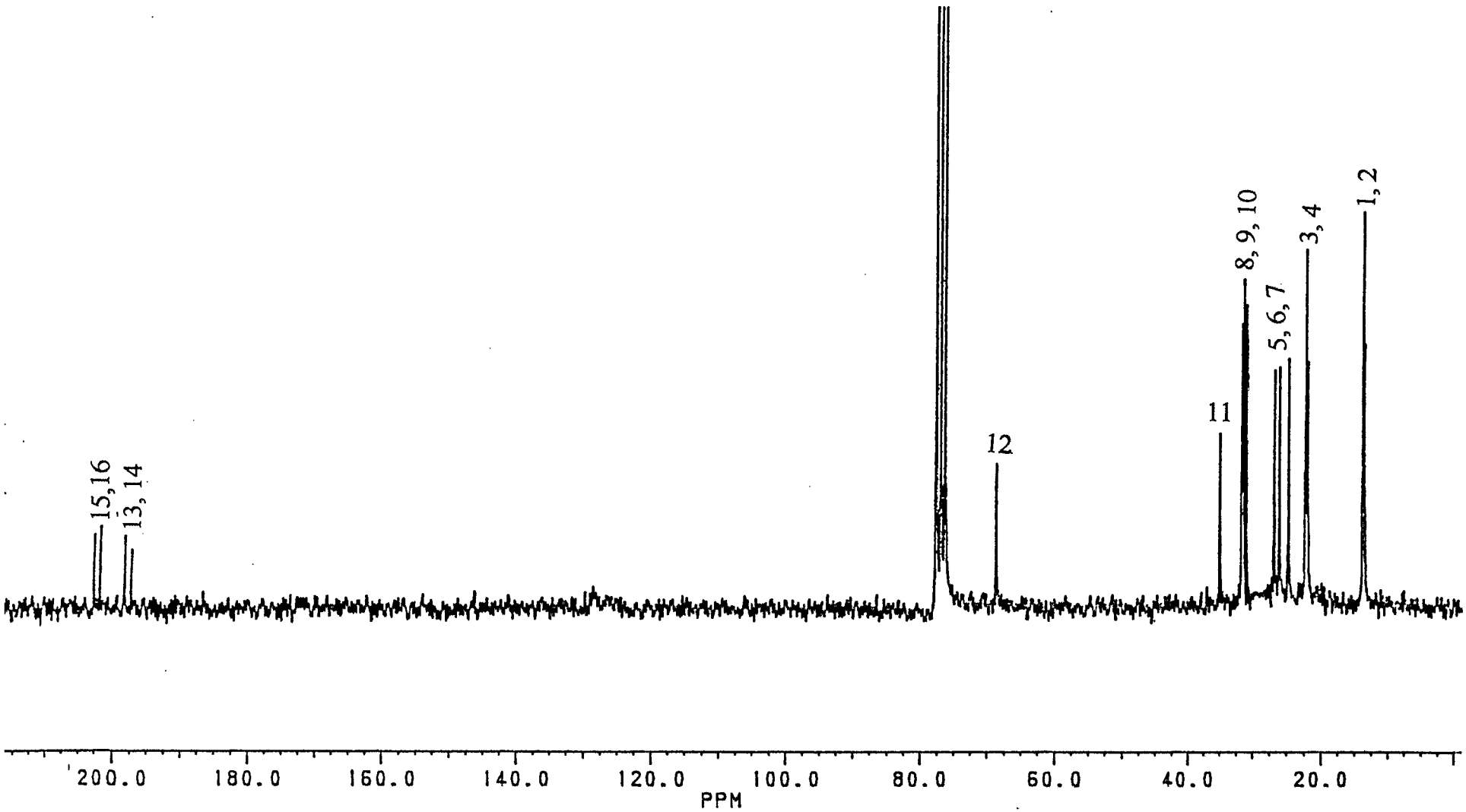
5. 26.
6. 31.
7. 119.
8. 146.
9. 190.
10. 19
11. 19
12. 19

15




5a




1. 13.8
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3. 22.2
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5. 24.9
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7. 26.9
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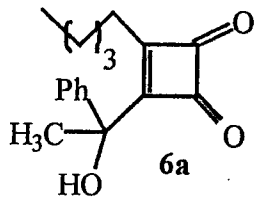
14. 198.4
15. 201.8
16. 202.7




6a

1. 13.
2. 22.
3. 26.
4. 28.
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6. 31.
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8. 12
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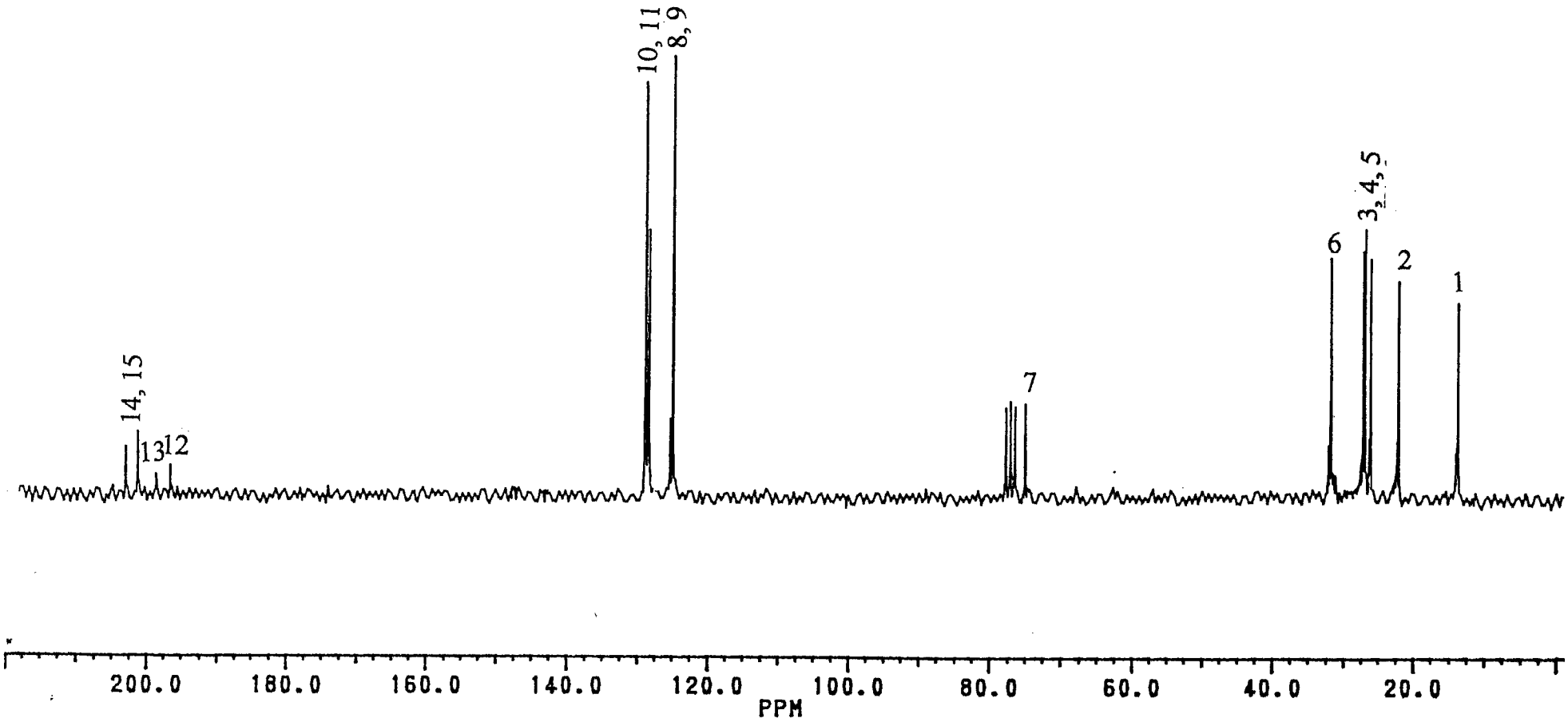
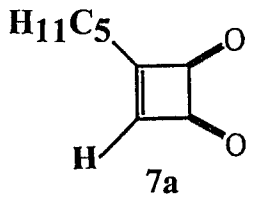
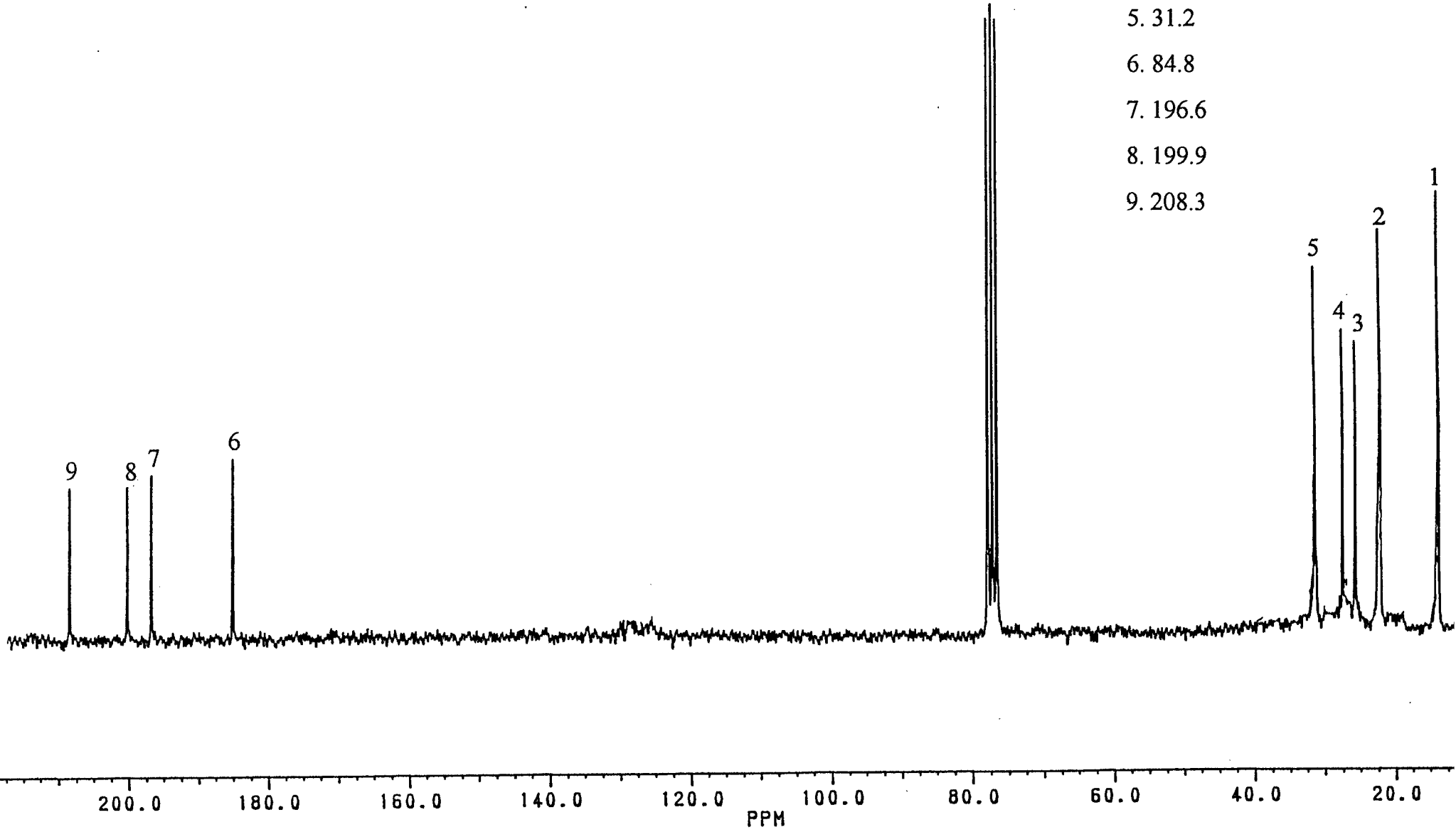
11. 1
12. 1
13. 1
14. 2
15. 2

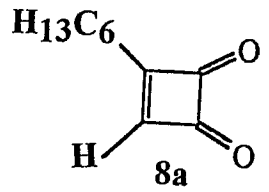





7a

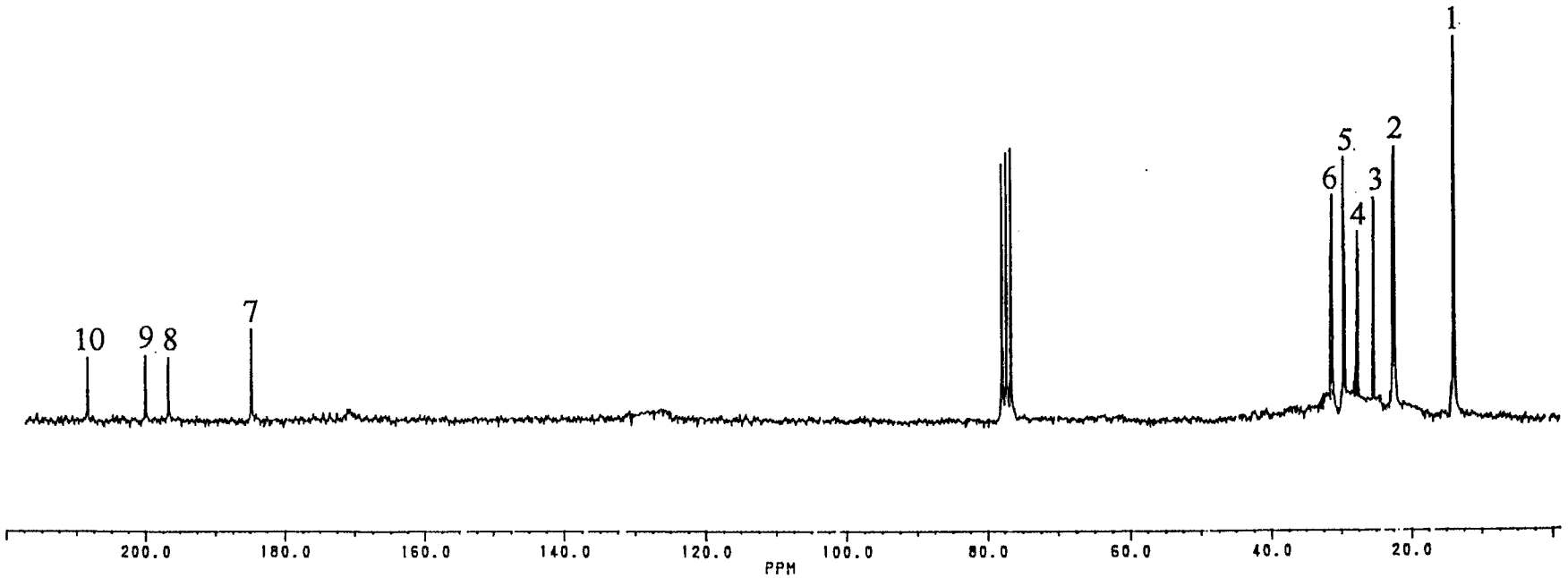
1. 13.7
2. 22.1
3. 25.6
4. 27.1
5. 31.2
6. 84.8
7. 196.6
8. 199.9
9. 208.3

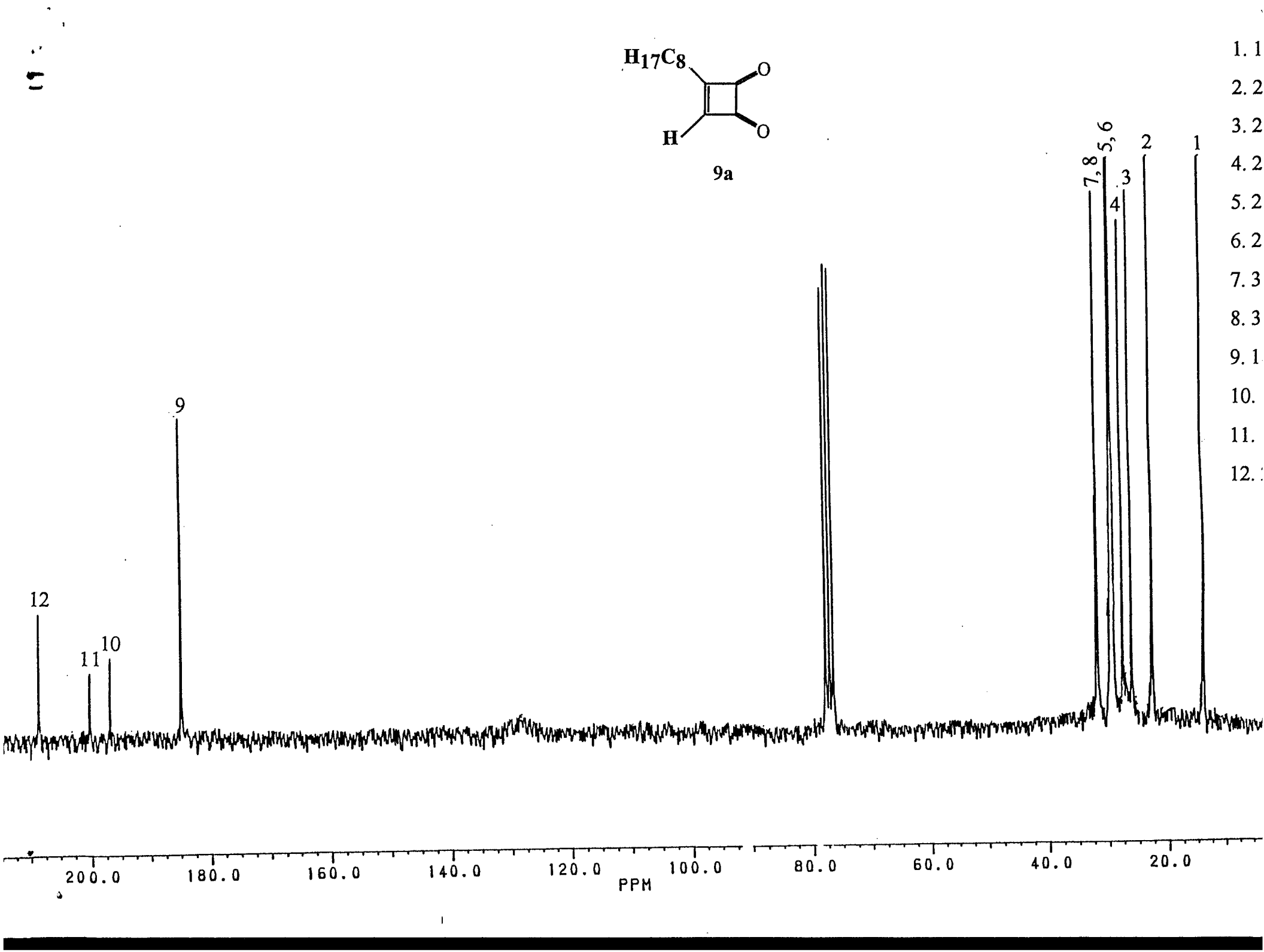





8a

1. 13.9
2. 25.9
3. 26.8
4. 28.9
5. 29.6
6. 31.8
7. 184.
8. 196.
9. 199.9
10. 208




H17C8
O
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9a
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2
3
4
5,6
7,8
9
10
11
12
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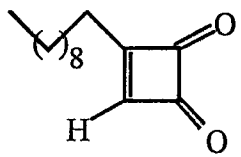
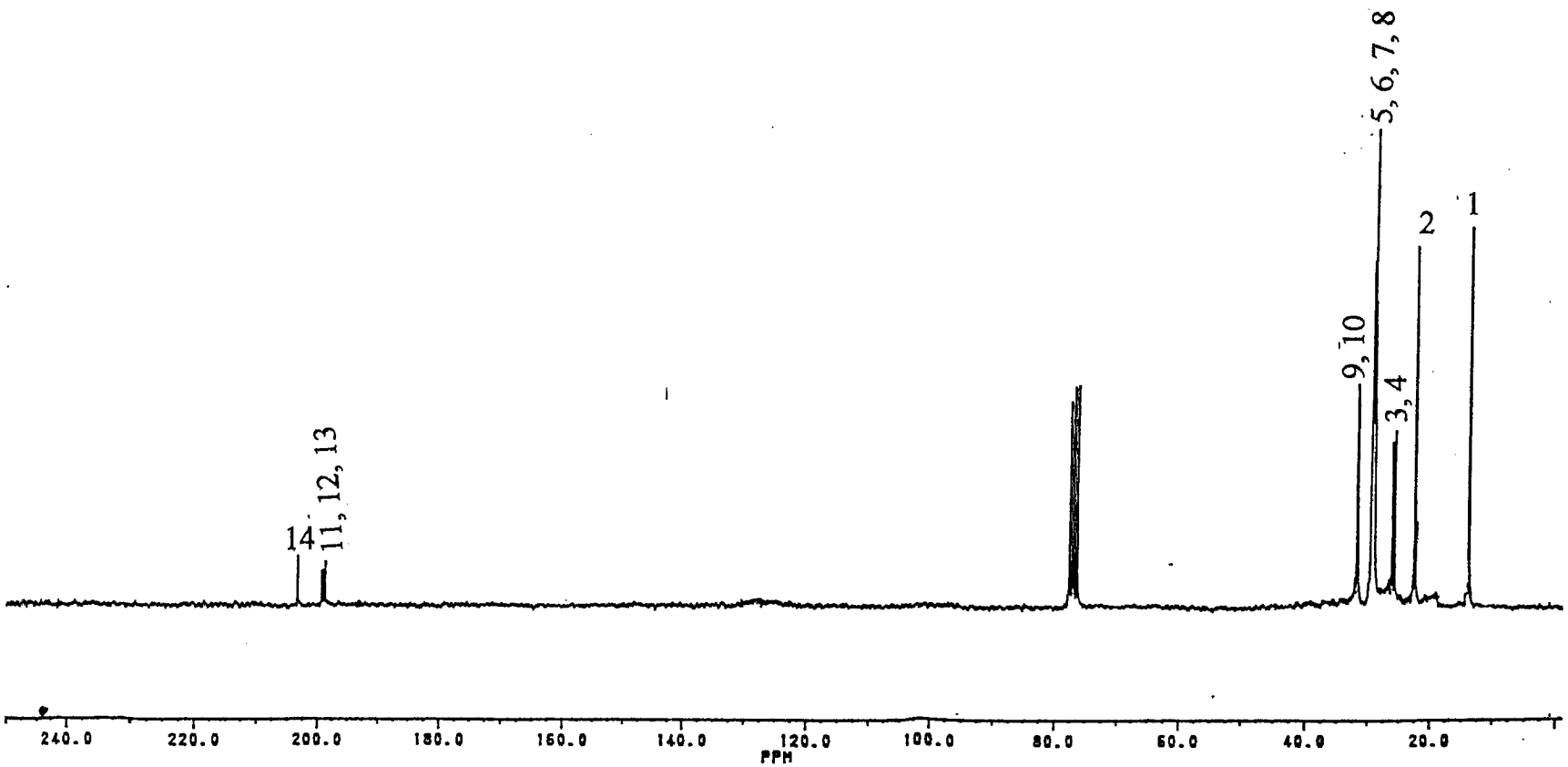
80.0
60.0
40.0
20.0
PPM

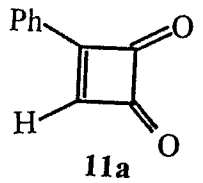
22




**10a**

1. 13.9
2. 22.6
3. 25.9
4. 26.3
5. 29.1
6. 29.2
7. 29.5
8. 29.6
9. 31.8
10. 31.9
11. 198.7
12. 199.1
13. 199.4
14. 203.4






**11a**

1. 128.6
2. 129.4
3. 129.5
4. 134.6
5. 178.3
6. 195.5
7. 196.0
8. 197.7