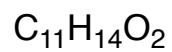


Chem 333 Organic Lab Lecture
Fall 2011
Exam #4
December 5, 2011

Name _____

This is an open-book, open-notes exam. Please indicate your answer clearly.

1. (20 points)



^{13}C NMR

203.1, s

163.3, s

130.5, s

129.2, d (2)

113.7, d (2)

55.4, q

34.9, d

19.3, q (2)

^1H NMR

1.21, d, $J = 6.9$ Hz, 6H

3.52, heptuplet, $J = 6.9$ Hz, 1H

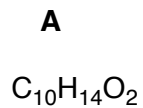
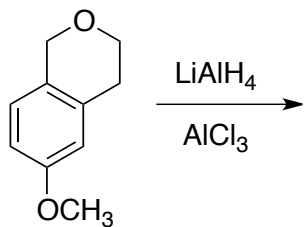
3.87, s, 3H

6.94, d, $J = 9.5$ Hz, 2H

7.95, d, $J = 9.5$ Hz, 2H

2. (40 points) Deduce the structure of **A**.

IR: 3610, 3590, 1250, 1045, 1030, 810, 797 cm^{-1}



¹³C NMR

157.8, s

137.7, s

131.2, d

128.5, s

115.5, d

111.5, d

62.6, t

55.3, q

36.7, t

18.6, q

¹H NMR

7.20, d, J = 8.0 Hz, 1H

6.75, d, J = 2.5 Hz, 1H

6.68, dd, J = 2.5, 8.0 Hz, 1H

3.80, t, J = 7.1 Hz, 2H

3.75, s, 3H

2.90, t, J = 7.1 Hz, 2H

2.50, bs, 1H (exchanges)

2.22, s, 3H

3. (40 points) $C_{14}H_{20}O_2$ IR: 3075, 2975, 2926, 2872, 1600, 1588, 1497, 1245, 1172, 1110, 1080, 1044, 912, 752, 691 cm^{-1}

MS (m/z, relative intensity): 220 (25),
174 (5), 119 (35), 113 (100)

^{13}C NMR
158.8, s
138.3, d
129.3, d (2)
120.7, d
114.7, t
114.5, d (2)
77.0, d
70.1, t
69.6, t
31.3, t
29.5, t
15.6, q

1H NMR
7.20, m, 2H
6.85, m, 3H
5.77, ddt, J = 15.9, 11.6, 7.3 Hz, 1H
5.00, m, 2H
4.12, dd, J=16.2, 7.6 Hz, 1H
3.99, dd, J=16.2, 6.7 Hz, 1H
3.54, ddt, J=7.6, 6.7, 7.4 Hz, 1H
3.44, q, J = 7.0 Hz, 2H
2.14, m, 2H,
1.63, m, 2H,
1.14, t, J = 7.0 Hz, 3H