

Exam #3

This is an open-book, open notes exam. Show your work, so you can receive credit for correct parts of the final molecule.

1. (20 points)  $C_9H_{11}NO_2$

**$^{13}C$  NMR**

166.8, s

150.9, s

131.5, d (2)

120.0, s

113.7, d (2)

60.3, t

14.4, q

**$^1H$  NMR**

7.86, d, J = 8.8 Hz, 2H

6.64, d, J = 8.8 Hz, 2H

4.32, q, J = 7.2 Hz, 2H

4.08, bs, 2H, exchanges

1.37, t, J = 7.2 Hz, 3H

2. (40 points)  $C_{11}H_{16}O_2$

**$^{13}C$  NMR**

20.4, t

24.7, t

26.4, t

29.9, q (2)

35.4, d

74.5, d

126.9, d

129.7, d

203.5, s (2)

**$^1H$  NMR**

1.19-1.22, m, 1H

1.57-1.59, m, 1H

1.68-1.74, m, 2H

1.98-2.00, m, 2H

2.18, s, 6H

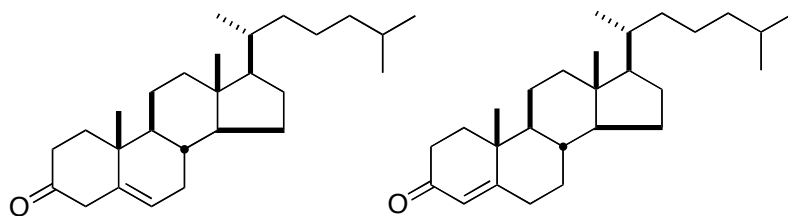
3.00-3.04, m, 1H

3.61, d, J = 10.6 Hz, 1H

5.38, dd, J = 10.2 Hz, 2.4 Hz, 1H

5.75-5.80, m, 1H

3. (40 points) You have isolated 5-cholestenone **1**. It is crystalline and gives a reasonable melting point, but you are concerned that it might contain a little bit of the more stable isomer **2**. For a 5.0 mg sample in 50 mL of ethanol, you measure  $A = 0.240$  at 280 nm. What % **2** is in the sample?



**1**

**2**

$\epsilon_{280}$

800

11,200

