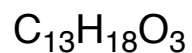


Chem 333 Organic Lab Lecture  
Fall 2011  
Exam #3  
November 14, 2011

Name \_\_\_\_\_

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

1. (40 points)



IR: 3400, 1740, 1601, 1516  $\text{cm}^{-1}$

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

174.0, s

154.9, s

132.4, s

129.8, d (2)

115.8, d (2)

81.5, s

38.0, t

30.7, t

15.5, q (3)

**$^1\text{H}$  NMR**

7.05, bs, 1H (exchanges)

7.01, d,  $J = 8.5$  Hz, 2H

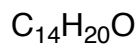
6.74, d,  $J = 8.5$  Hz, 2H

2.82, t,  $J = 7.6$  Hz, 2H

2.51, t,  $J = 7.6$  Hz, 2H

1.41, s, 9H

2. (40 points)



IR: 3302, 2928, 1602, 1492, 1443, 1034, 749, 696  $cm^{-1}$

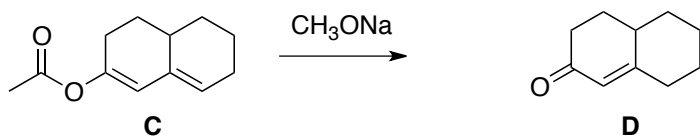
**$^{13}C$  NMR**

139.4, s  
129.5, d (2)  
128.7, d (2)  
126.5, d  
77.0, d  
43.3, d  
40.9, t  
29.5, t (2)  
26.7, t (2)  
26.3, t

**$^1H$  NMR**

7.3, m, 5H  
3.58, ddd,  $J = 9.5, 8.9, 3.6$  Hz, 1H  
2.89, dd,  $J = 13.6, 3.6$  Hz, 1H  
2.60, dd,  $J = 13.6, 9.5$  Hz, 1H  
1.91, bs, 1H (exchanges)  
1.2-1.7, m, 11H

3. (20 points) The diene **C** reacts quantitatively with sodium methoxide to give **D**. After addition of 1.0 mL of sodium methoxide in methanol to a 9.0 mL solution of **C** in methanol, the resulting solution showed  $A = 1.20$  at 254 nm, and  $A = 0.90$  at 280 nm. How much **C** (in milligrams) did the initial solution contain, and what was the molar concentration of the 1.0 mL of sodium methoxide solution that was added?



$$\epsilon_{254} = 900$$

$$1600$$

$$\epsilon_{280} = 1800$$

$$300$$