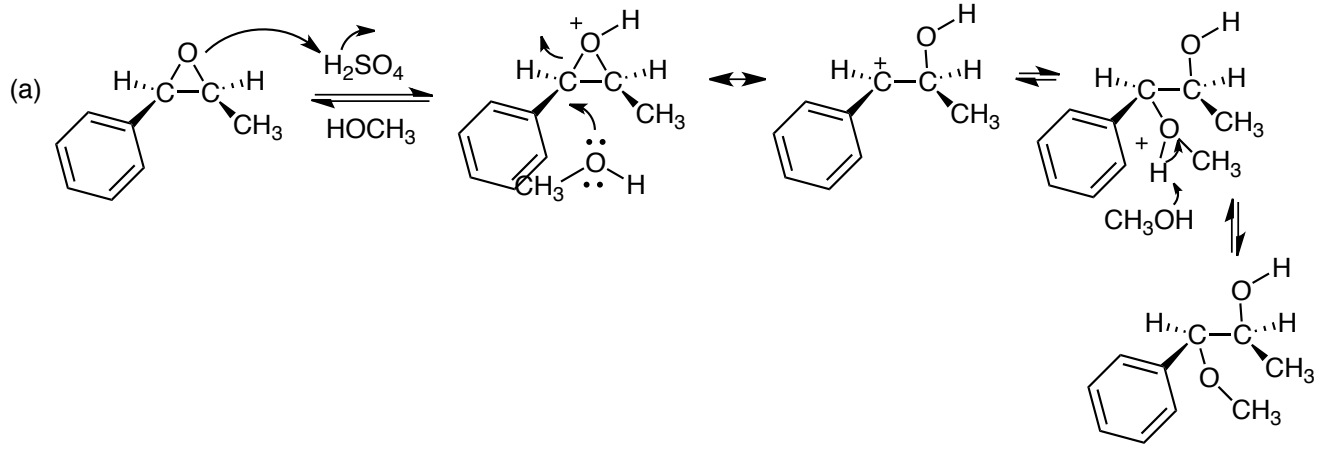
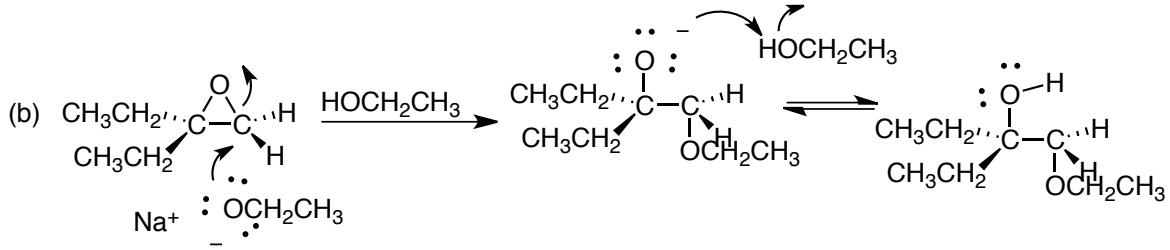
Name .....

L.I.U.

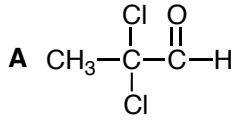
Chem. 122, Sect 007, Quiz 2, 50 pts, Spring, 2012

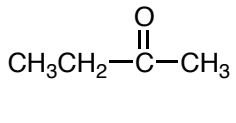
1. Give the product of the following reactions and in each case give the full reaction mechanism, showing all of the steps. (20 pts)



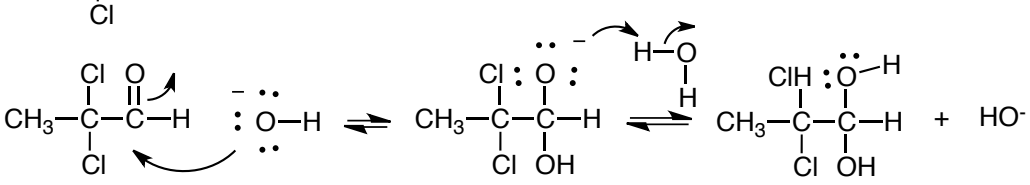


2. Which molecule would have a larger equilibrium for hydration? Explain briefly and show the reaction that would occur for the base ($NaOH/H_2O$) catalyzed hydration reaction. (10 pts)

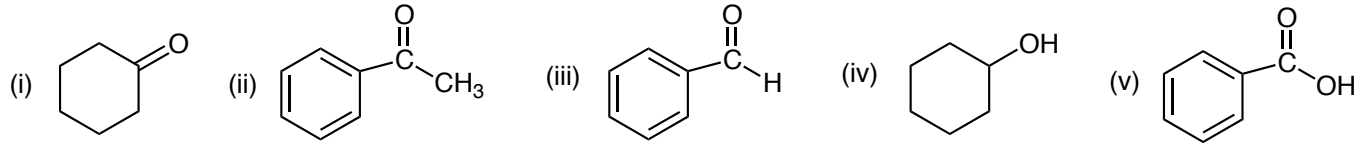




A would form the greater concentration of hydrate since as an aldehyde it is less hindered than the ketone and the Cl's withdraw electron density from the carbonyl carbon, making it more reactive.



3. Which of the molecules shown below would give (a) a positive test with Ag^+? (b) a negative test with 2,4-DNP? (c) a positive test with chromic acid? (15 pts) (There may be more than one correct answer in each case.)



(a) Ag^+ will oxidize aldehydes (iii) to carboxylic acids but does not react with alcohols (iv), ketones (i, ii) or carboxylic acids (v). (b) 2,4-DNP will react with aldehydes and ketones (i, ii, iii) but not with alcohols (iv) or carboxylic acids (v). (c) Chromic acid will oxidize alcohols (iv), aldehydes (iii) but not ketones (i, ii) or carboxylic acids (v).

4. One student isolated a 2,4-DNP derivative for her unknown ketone that had a melting point of 128-136°C. Which is a better match for her unknown, acetone (m.p. 126°C) or cyclopentanone M.P. 142°C)? Explain briefly. The best match is Cyclopentanone since her experimentally determined melting point is generally impure and it will therefore be LOWER (and broader) than the given value.