

## WORKSHOP 6

ENOLS, ENOLATES AND CARBONYL CONDENSATION

FEBRUARY 26, 2007

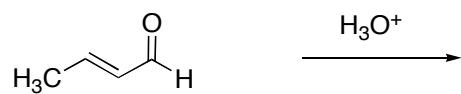
1. a. Draw mechanisms for the acid- and base-catalyzed conversions of acetone into the corresponding enol.

b. Draw the mechanisms for the thermal (1) acid and (2) base catalyzed carbonyl condensation of acetaldehyde ( $\text{CH}_3\text{CHO}$ ). Use  $\text{H}_3\text{O}^+$  and  $\text{NaOH}/\text{H}_2\text{O}$ .

Identify 3) the “aldol” ( $\beta$ -hydroxyketone) intermediate

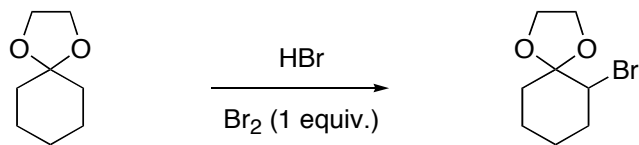
4) the  $\alpha,\beta$ -unsaturated ketone (the product of the dehydration step).

**2. a.** Give the products expected from the following reaction, and a mechanism for the transformation.

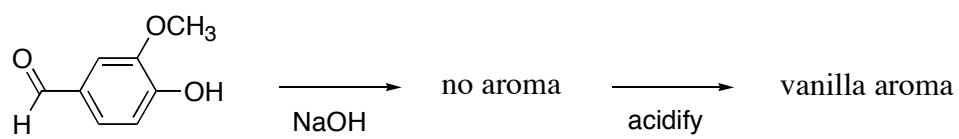


**b.** You may have noticed that this is the reaction in question 1, in reverse. Which way does the equilibrium lie? Explain.

3. Provide a plausible mechanism the transformation below.



4. Explain the following observation:



VANILLIN

vanilla aroma

5. Give reasonable mechanistic pathways that account for the formation of two products under different reaction conditions. Explain why each is the preferred product under the reaction conditions specified.

