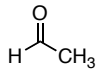
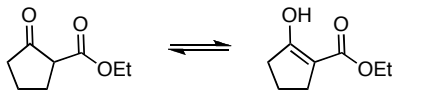
Practice Problems for Midterm 1
(*This is not an inclusive list of the concepts!)*

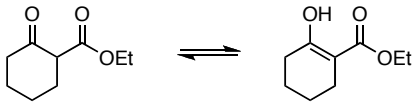
1. Predict the most stable conformation of acetaldehyde. Please use FMO arguments to support your prediction.



2. Please explain why ring size affects the position of the equilibria shown below (Brown et al. *JACS* **1954**, *76*, 467).

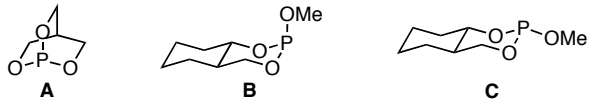


95.5 : 4.5



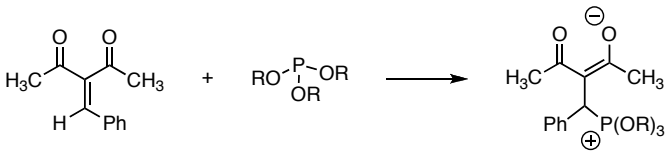
24 : 76

3. Explain the relative reactivity of the following phosphites in the reaction with 3-benzylidene-2,4-pentanedione (Gorenstein *J. Am. Chem. Soc.* **1984**, *106*, 7831).

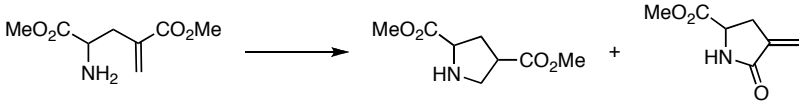


A **B** **C**

k_{rel} 1 125 750



4. Propose arrow-pushing mechanisms for both of the two possible products shown (Baldwin *J. Chem. Soc., Chem. Commun.* **1976**, 736).



1 **2**

Only one of the two possible products is formed. Predict which product is formed and explain your reasoning.

5. Please propose an arrow-pushing mechanism for the following transformation (Pirrung *J. Am. Chem. Soc.* **1979**, *101*, 7130).