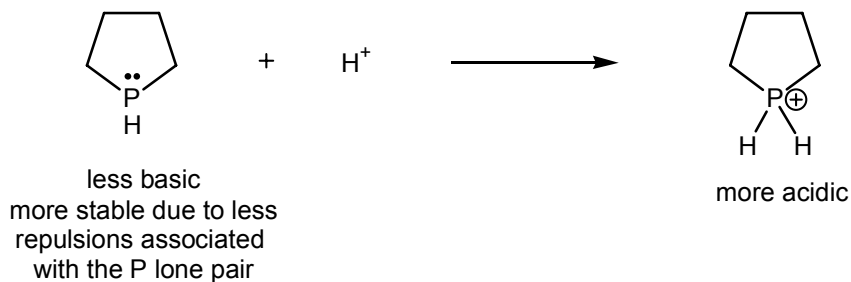
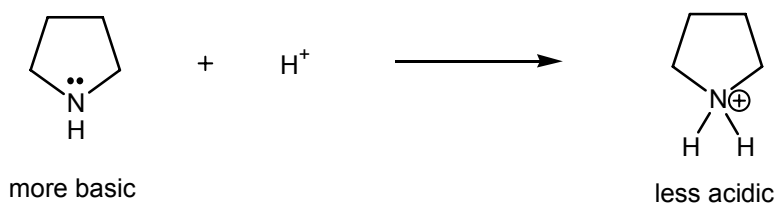
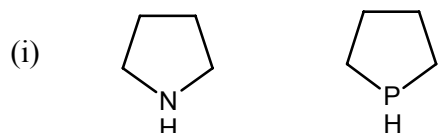


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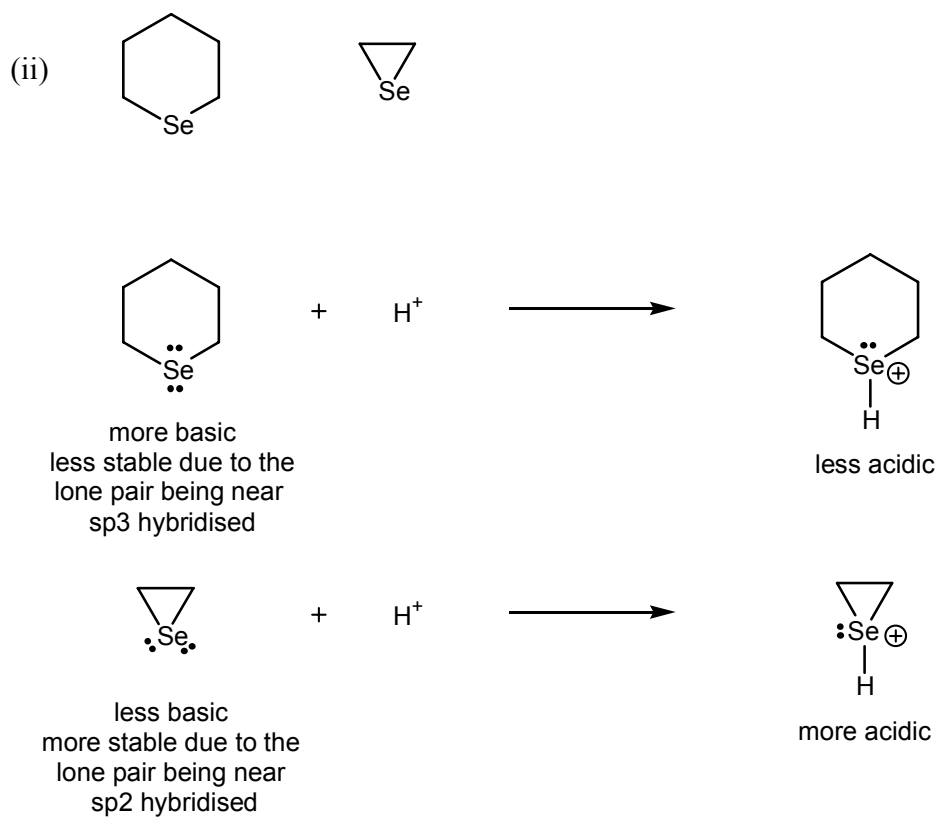
**Year 2 Seminars, 06524, Semester 2, 2007**  
**Bifunctional and Heterocyclic Chemistry Test**

1. Answer *all* parts

(a) For each of the following pairs of molecules, predict and explain which is the more basic.



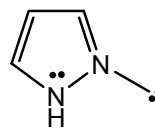
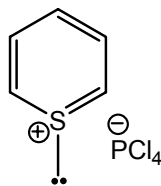
YOUR STUDENT NUMBER:



(b) Which of the following molecules are aromatic, anti-aromatic or simply conjugated?



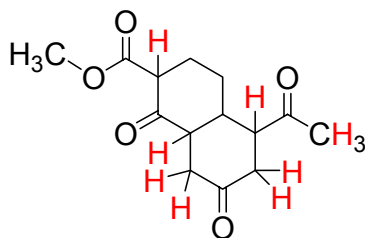
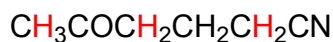
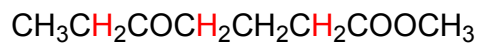
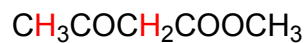
YOUR STUDENT NUMBER:



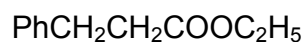
Cyclic	yes	yes	yes
Planar	yes	yes	yes
Continuous conjugation	yes	yes	yes
Number of contributing electrons	4	6	6
	Anti-aromatic	Aromatic	Aromatic

YOUR STUDENT NUMBER:

2. (a) Mark the acidic  $\alpha$ -hydrogen atoms on the following structures.



- (b) Work out the structures of all the products that may be formed when a mixture of compounds **A** and **B** are reacted in the presence of a slight molar excess of sodium ethoxide.

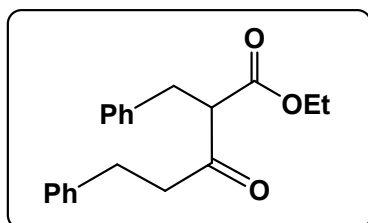
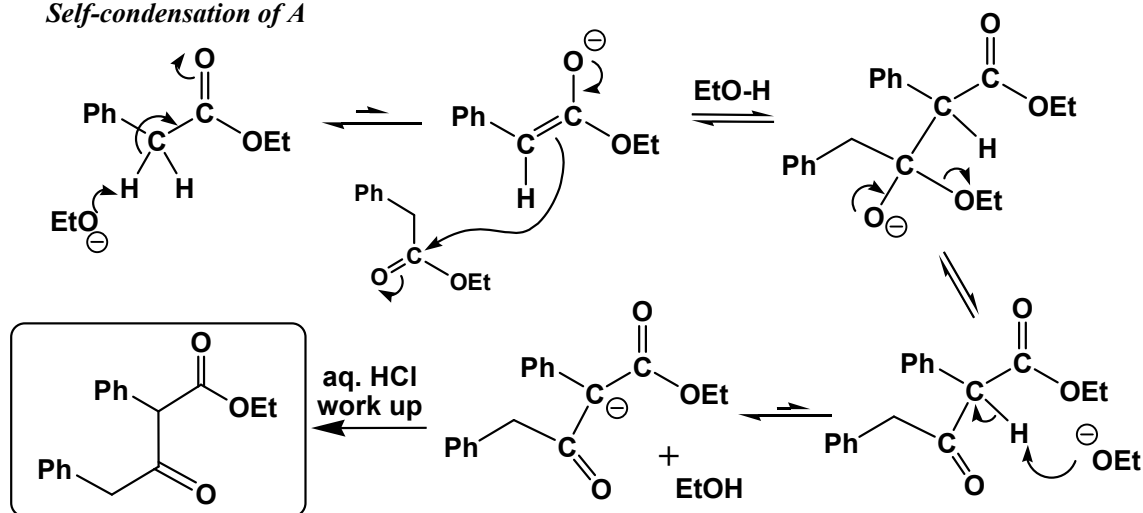


**A**

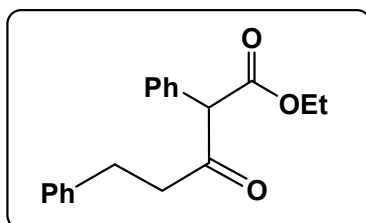
**B**

Four possible products may be formed

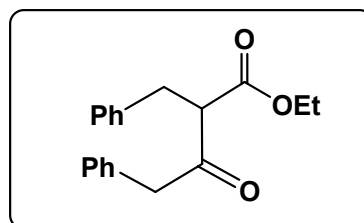
*Self-condensation of A*



*Self-condensation of B*



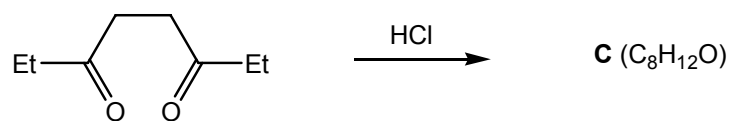
*Enolate of A plus ester B*



*Enolate of B plus ester A*

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3. Complete the following reaction scheme providing brief mechanistic detail.



For a detailed mechanism see your lecture notes on page 50.