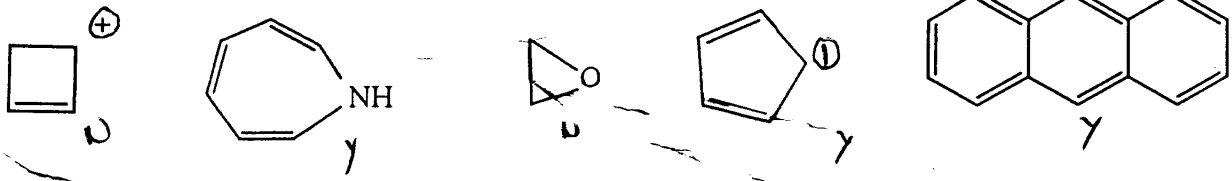
Chem 65.224*,226*,228* **Quiz #** March 21, 2002

Marks

5 1. Indicate which of the following compounds will be aromatic, and which will not.



10 2. Provide the structures for the major organic products in each of the following reactions.

(i) 2,2,2-trifluoroethanal + H_2O

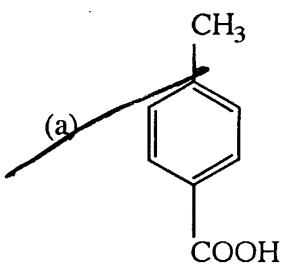
(ii) 2-pentanone + phenylhydrazine

(iii) ethyl butanoate + (a) excess methyl lithium (b) H^+,H_2O

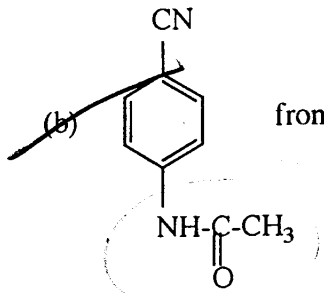
(iv) cyclohexanone + methanol (excess) with an acid catalyst

(v) ethyl methyl amine + (a) excess CH_3I (b) AgOH

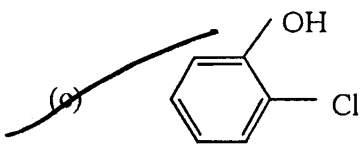
15 3. Provide synthetic schemes (with reagents) for the synthesis of the following target molecules from the indicated starting materials. **Hint**: give your strategy, even if you do not know all the reagents!



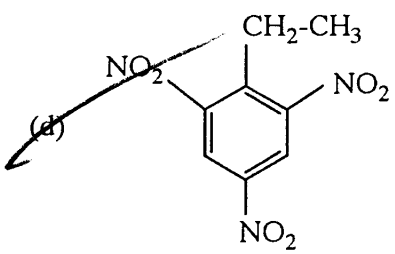
from benzene



from benzene

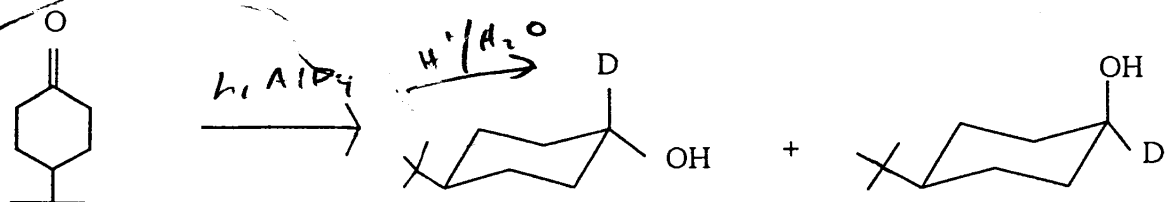


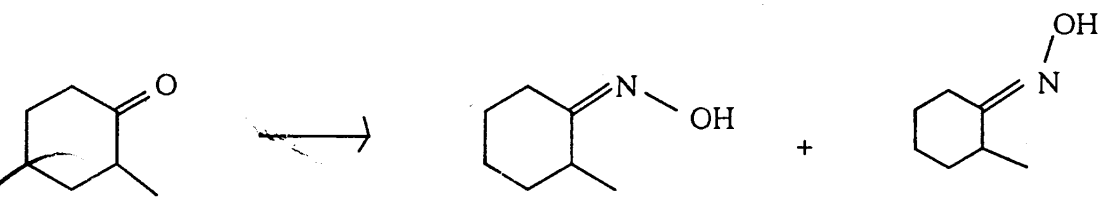
from phenol, with no contamination from para-isomer

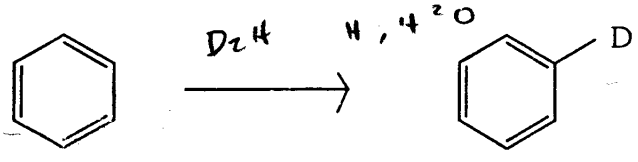


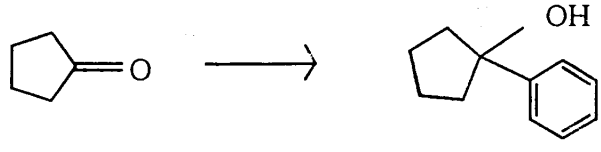
from benzene

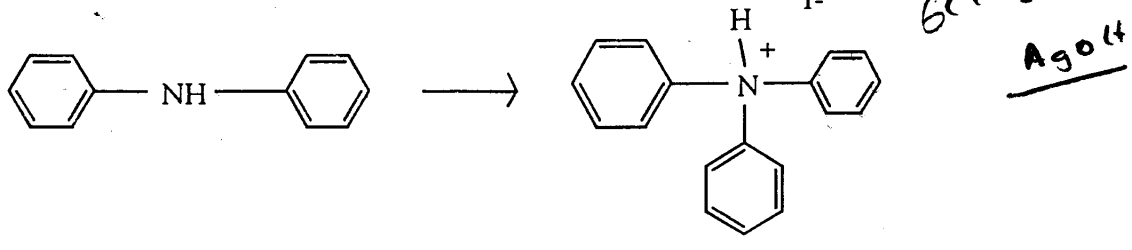
10 4. Indicate the reagents required to carry out the following transformations:

(a) 

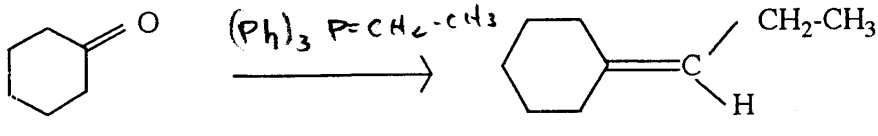
(b) 

(c) 

(d) 

(e) 

5 5. Indicate how the Wittig reaction (Nobel Prize 1979) can be used to carry out the synthetic transformation below. Give all reagents needed and show a detailed mechanism ("arrow pushing").



5 6. Distinguish between the following pairs of terms. Use examples and drawings wherever possible.

(a) Acetal vs. ketal
(b) Hemi-acetal vs. hemi-ketal
(c) Morphine vs. Heroin
(d) primary vs. secondary amine
(e) chiral vs. non-chiral amine (structures!) ($CH_2(CH_3)$ chiral