



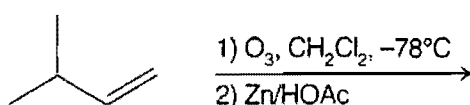
1. Arrange the following compounds in order of decreasing acidity: (8%)

Pentane, 1-Pentene, 1-Pentyne, 1-Pentanol

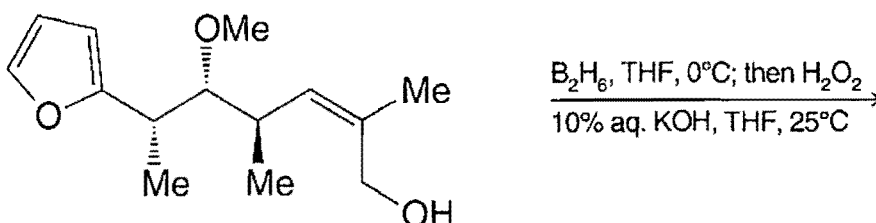
2. Write structures for the major organic products from the following reactions.

Show stereoisomers where applicable. (10%)

(a)



(b)



3. Which reagent in each pair listed here would be the more reactive nucleophile in a polar aprotic solvent? (12%)

(a) CH_3NH^- or CH_3NH_2

(b) CH_3O^- or CH_3CO_2^- ($^- \text{OAc}$)

(c) $(\text{C}_6\text{H}_5)_3\text{N}$ or $(\text{C}_6\text{H}_5)_3\text{P}$

(d) CH_3SH or CH_3OH



4. Write formulas for all of the isomers of each of the following. Designate pairs of enantiomers and achiral compounds where they exist. (10%)

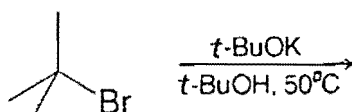
(a) 1-Bromo-2-chlorocyclohexane

(b) 1-Bromo-4-chlorocyclohexane

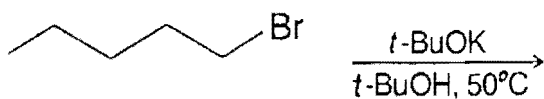
5. Which product (or products) would you expect to obtain from each of the following reactions? In each part give the mechanism (S_N1 , S_N2 , E1 or E2) by which each product is formed and predict the relative amount of each product (i.e., would the product be the only product, the major product, a minor product, etc.?).

(10%)

(a)



(b)





6. 請列出下列常用原料的化學結構式(10%)
- (a). N,N-dimethyl formamide (b).urea (c).styrene
(d).caprolactame (e). bis- phenol -A
7. 請列出下列反應式的產物: (12%)
- (a). cyclohexene +Cl₂ +H₂O → A
(b). ethylchloride +sodium ethoxide → B
(c). (CH₃)CCH₂CH₂CH₂Br +NH₃ (excess) → C
(d). 1-methylcyclohexene + CH₃COOOH → D
8. 請列出丙醛在鹼催化下,經由 Aldol condensation 而生成的 Aldol 產物的化學式(8%)
9. 丙酮是重要的化工原料,請列出化學式?以說明如何由丙烯與苯製造丙酮與酚過程中的中間產物及反應. (10%)
- 10.請說明為何我們日常生活中所用的聚乙烯醇(PVA)膠水,不能由乙烯醇聚合製造?請以化學式說明其真實的原料單體為何?並經由那些反應及中間體而製得. (10%)