

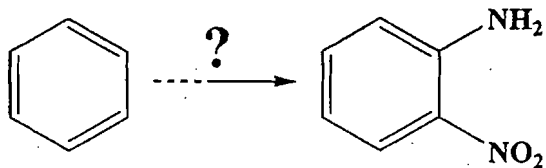
一、(I) Define the following terms: (10 %) (5 points each)

(a) Organic Chemistry

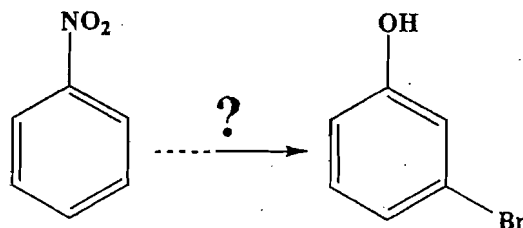
(b) Aliphatic Compounds and Aromatic Compounds

(II) (10 %) (5 points each)

(a)

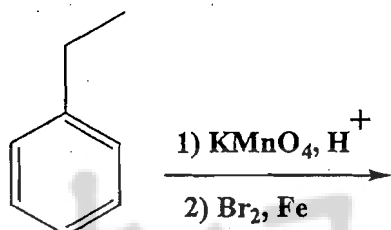


(b)

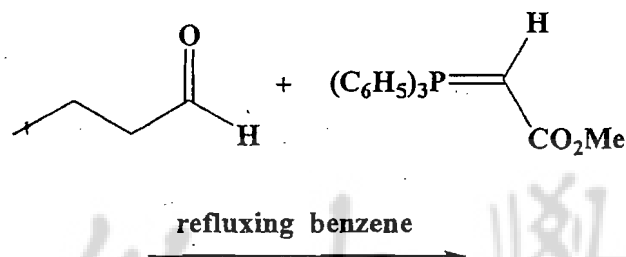


(III) Give the structures of the major organic products of the following reactions: 3 points each

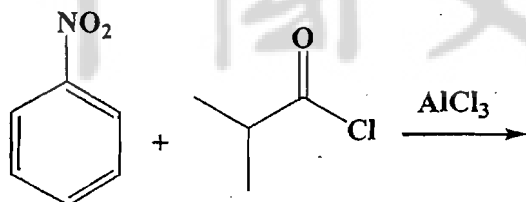
(1)



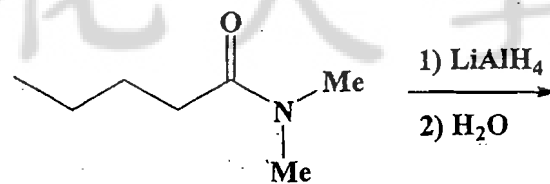
(2)



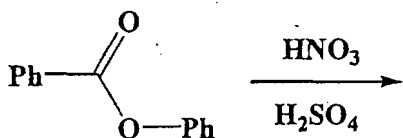
(3)



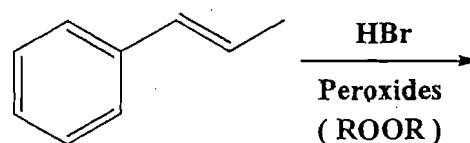
(4)



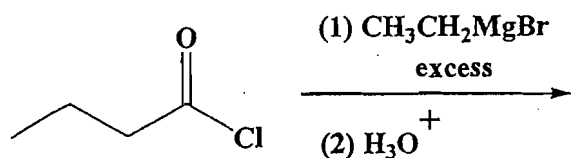
(5)



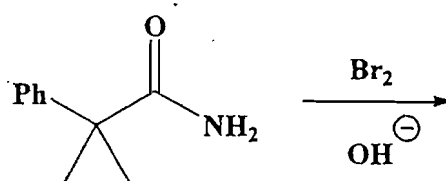
(6)



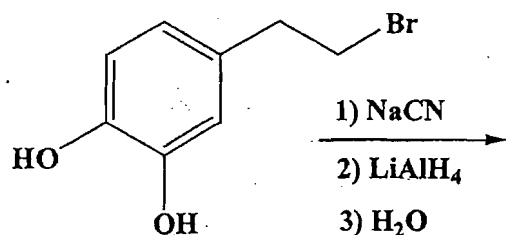
(7)



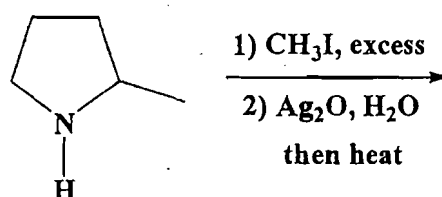
(8)



(9)



(10)



二、分析化學部分

1. (10%) The density of a solution containing 292.0 g of $\text{Mg}(\text{NO}_3)_2$ (molecular weight 148.3 g/mole) in 880 g of H_2O is 1.108 g/ml. The molarity of the solution is _____ M.
2. (8%) Filling in the missing information in the following table:

	<u>PH</u>	<u>POH</u>	<u>[H⁺]</u>	<u>[OH⁻]</u>	<u>acid base or neutral</u>
Solution	5.64	_____	_____	_____	_____

3. (10%) The K_{sp} for lead iodide (PbI_2) is 1.4×10^{-8} . Calculate the solubility of lead iodide in each of the following. (a). water. (b). 0.01 M $\text{Pb}(\text{NO}_3)_2$.
4. (10%) The measured voltage of the cell:



is 1.02 V at 25°C. Given E°_{cell} is 0.80 V,
calculate the $[\text{H}^+]$ of the solution and its pH.

5. (12%) 當你決定再進修前,你熟知的化學分析儀器有那些?請列述其名稱和功用;若你進入研究所後,你的興趣領域是什麼?將會用到那些化學分析儀器,請列述其名稱和功用.