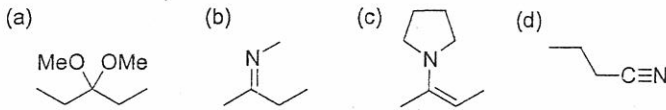




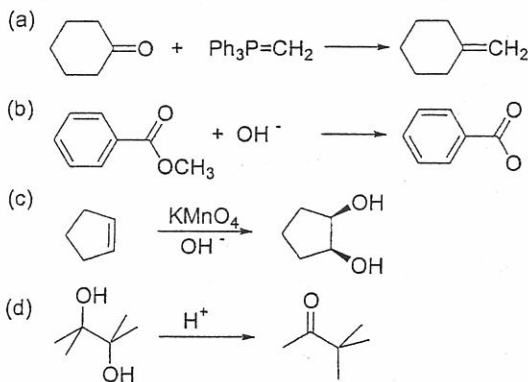


(二) 問答題(共 20 分，請於『非選擇題作答區』內作答。)

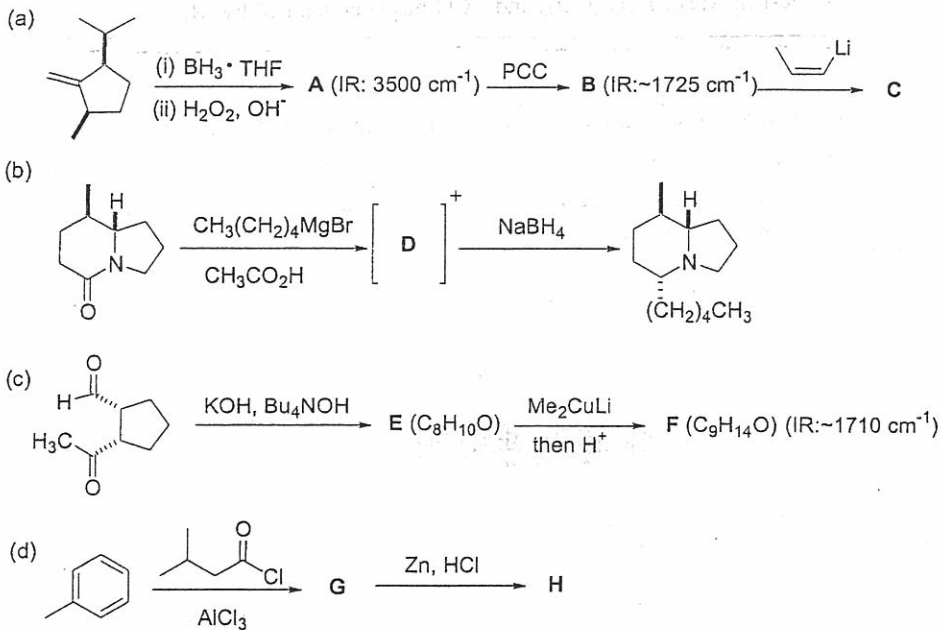
(16) Name the functional group (每一小題 1 分，共 4 分)



(17) Propose the mechanisms for the following reactions. (每一小題 2 分，共 8 分)



(18) Give the structures of intermediates or products A through H for each of the following reactions:  
 (每一結構 1 分，共 8 分)



見背面

無機化學共 50 分

- 1 In the reaction of ethylene hydrogenation with  $\text{RhH}_2\text{Cl}(\text{PPh}_3)_3$ , a rate law as below is obtained.
- $$-d[\text{RhH}_2\text{Cl}(\text{PPh}_3)_3]/dt = k_{\text{obsd}}[\text{RhH}_2\text{Cl}(\text{PPh}_3)_3]$$
- $$k_{\text{obsd}}^{-1} = A([\text{PPh}_3]/[\text{C}_2\text{H}_4]) + B$$
- (a) Propose a mechanism that can explain the rate law. (8 分)
- (b) What results you would expect if  $\text{RhH}_2\text{Cl}(\text{PPh}_3)_3$  and  $\text{RhD}_2\text{Cl}(\text{PPh}_3)_3$  in 1:1 ratio were used for the reaction. Explain. (8 分)
- 2  $\text{CH}_4$  is insoluble in water;  $\text{H}_2\text{S}$  however, is acidic in water; whereas  $\text{NaH}$  reacts with water vigorously by evolving  $\text{H}_2$ .
- (a) Characterize the hydrogen in each of these three compounds. (8 分)
- (b) Why does the H element behave so differently in these three compounds? (8 分)
- 3 The reaction of  $\text{fac-Mn}(\text{Me})(\text{PPh}_3)_2(\text{CO})_3$  and  $^{13}\text{CO}$  has been studied by IR.
- (a) Draw the structure for the organometallic reactant and product(s). Assign their point groups. Give their IUPAC names. (8分)
- (b) Each product of this reaction has a new, rather strong IR band that is distinctly different energy from any band in the reactant. Account for this band with their symmetry and bonding characters, and predict its approximate location in  $\text{cm}^{-1}$  in the IR spectrum. (10分)

試題隨卷繳回