



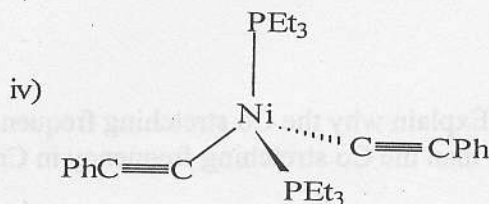
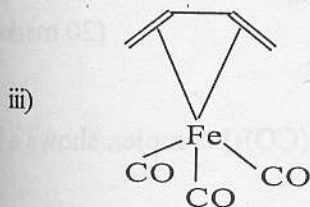
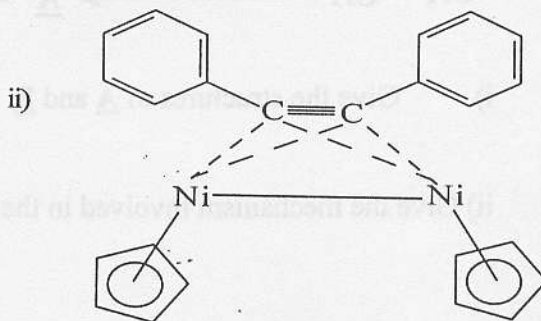
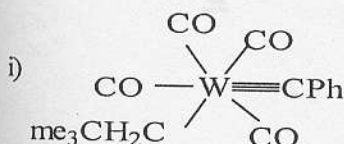
EASTERN UNIVERSITY, SRI LANKA  
THIRD EXAMINATION IN SCIENCE – 2003/2004 (Repeat)  
SECOND SEMESTER  
(June/July-2005)

CH 305 ORGANOMETALLIC AND NON-AQUEOUS SOLVENTS

Answer all questions

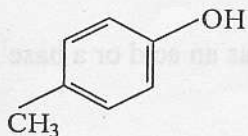
Time: One hour

1) a) Indicate the monohapto, dihapto, trihapto, tetrahapto and pentahapto ligands present in the following organometallic compounds.

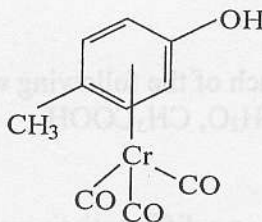


(20 marks)

b) pKa value of A is 11.25 where as that of B is 7.35. Explain this observation.



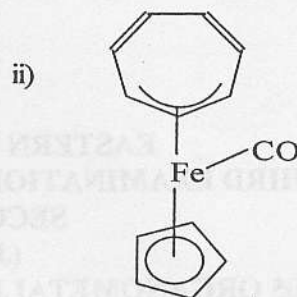
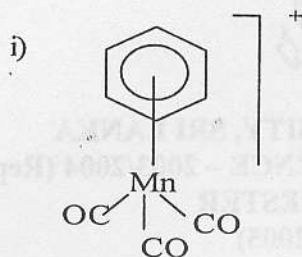
A



B

(15 marks)

c) Give the systematic names of the following organometallic compounds.



(15 marks)

d)



i) Give the structures of A and B.

(10 marks)

ii) Give the mechanism involved in the conversion of A to B.

(20 marks)

e) Explain the bonding in transition metal  $\pi$ -allyl complexes.

(20 marks)

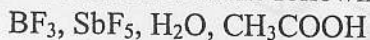
2) a) Explain why the Co stretching frequency in  $[\text{Cr}(\text{dien})(\text{CO})_3]$  complex shows a lower value than the Co stretching frequency in  $\text{Cr}(\text{CO})_6$ .

(20 marks)

b) Using  $^1\text{H}$  NMR spectroscopy, explain how you would differentiate  $\sigma$ -bonded and  $\pi$ -bonded cyclopentadienyl ligand.

(15 marks)

c) State whether each of the following would act as an acid or a base in liquid HF.



(20 marks)

d) Acetic acid acts as a differentiating solvent for strong acids whereas water acts as a leveling solvent for strong acids. Explain this statement.

(20 marks)

- d) Give one example for each of the following types of reaction.
- i) Solvolysis reaction in liq.  $\text{NH}_3$ .
  - ii) Self-ionization of a protic solvent.
  - iii) Amphoteric reaction in liq.  $\text{NH}_3$ .

(15 marks)

- e) Give reasons for selecting liquid  $\text{NH}_3$  as a non aqueous solvent.

(10 marks)

Answer on the following:

- a) Legs of *Apis mellifera*.
- b) Mechanoreceptors.

Write an account of the diversity of insect feeding habits taking three types to illustrate your answer.

Describe the advantage of integrated pest management over chemical control of pests.

Describe the different methods of biological control used against insect pests.