(c) Describe the bonding mechanism of M-CO and M-olefin complexes. 4

(d) Construct the character table of C_{3V} point group using the Great Orthogonality Theorem. 4

(e) What is the difference between Fischer carbene and Schrock carbene? 4

(f) What are interstitial compounds? Why are such compounds well-known for transition metals? 4

3. Answer any ***two*** questions 2×8 = 16

(a) (i) Explain the *closo*, *nido*, *hypo* structures in the form of electronic term. What should be the structures of $[Os_4(CO)_{16}]$ and $C_2B_9H_{13}$

(ii) WriteashortnoteonCreutz-Taubecomplex. 4+4

(b) (i) Write two reactions for metal alkyl complex formation

(ii) Complete the following reaction

$WMe_6 + 4O \longrightarrow$?

$[Fe(CO)_4(CH_3)]^-Na^+ + PhCOCl \longrightarrow$?

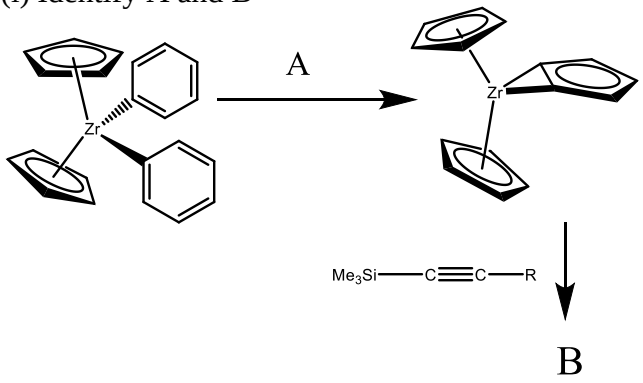
(iii) Write a reaction where metallocycle is formed. (2+4+2)

(c) (i) Write a short note on agostic interaction.

(ii) Why do ruthenium complexes act as catalysts?

(iii) Which metal in the first series of transition metals exhibits +1 oxidation state most frequently and why? 3+2+3

(d) (i) Identify A and B



(ii) Which one is more stable and why: Ti^{4+} or Ti^{3+}?

(iii) Write a short note on polyoxometalate. (4+2+2)

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Internal Assessment-10

2023

M.Sc.

2nd Semester Examination

CHEMISTRY

PAPER – CEM-203

Full Marks: 50

Time : 2 Hours

(CEM 203-Inorganic Chemistry-II)

1. Answer any ***four*** bits: 2×4 = 8

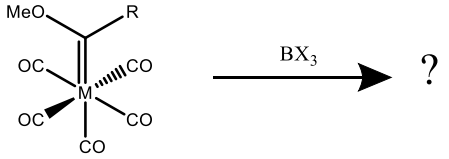
(a) Write down the Wade's rule with examples.

(b) Draw the structures of $[B_6H_6]^{2-}$ and $[Fe_3(CO)_9]$.

(c) Most transition elements can act as good catalyst. Explain

(d) Calculate the coordination number and oxidation state of the complex, $[FeCp(CO)_2]^-$

(e) What will be the product in the following reaction

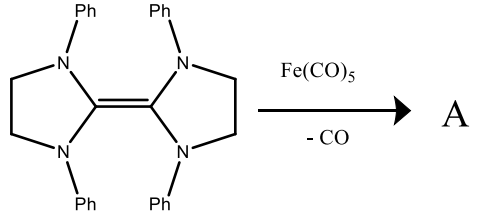


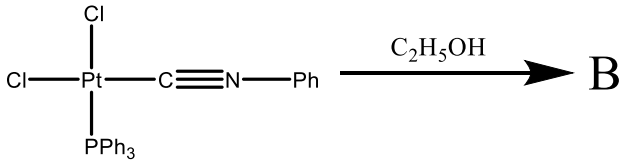
(f) Find out the point group of NH_3 with proper justification.

2. Answer any ***four*** bits: 4×4 = 16

(a) Explain the term 'BNCT'. Indicate its use in medical purposes. 4

(b) Identify A and B. 4





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