V12C

Virudhunagar District
Common Second Mid Term Test - 2024

Standard 12
CHEMISTRY
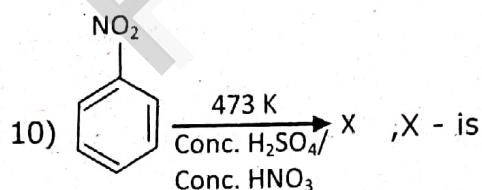**Part - A**

Time: 1.30 Hours

Marks: 50

10×1=10

I. Choose the correct answer:

1) Which one of the following complexes is not expected to exhibit isomerism?
   a) $[Ni(NH_3)_4(H_2O)_2]^{2+}$
   b) $[Pt(NH_3)_2Cl_2]$
   c) $[FeCl_6]^{3-}$
   d) $[Co(NH_3)_5SO_4]Cl$

2) Choose the formula for the compound Pentaamminenitrido - k.N-Cobalt (III) ion
   a) $[Co(NO_2)_2(NH_3)_4]$
   b) $[Co(NO_2)(NH_3)_5]^{2+}$
   c) $[Cr(NH_3)_3(NO_2)_3]$
   d) $[Co(ONO)(NH_3)_5]^{2+}$

3) Crsystal field stabilization energy for high spin d^5 octahedral complex is
   a) $-0.6\Delta_o$
   b) 0
   c) $2(P-\Delta_o)$
   d) $2(P+\Delta_o)$

4) Assertion: pure iron when heated in dry air is converted with a layer of rust.
   Reason: Rust has the composition of Fe_3O_4
   a) If both assertion and reason are true and reason is the correct explanation of assertion
   b) If both assertion and reason are true but reason is not the correct explanation of assertion.
   c) assertion is true but reason is false
   d) both assertion and reason are false

5) The number of electrons that have a total charge of 9650 coulombs is
   a) 6.22×10^{23}
   b) 6.022×10^{24}
   c) 6.022×10^{22}
   d) 6.022×10^{-34}

6) Which one of the following is correctly matched?
   a) Emulsion - Smoke
   b) Gel - butter
   c) Foam - Mist
   d) Whipped cream - Sol

7) In chemical adsorption with rise in temperature x/m value
   a) decreases
   b) increases
   c) no change
   d) first increases and then decreases

8) Argyrol is
   a) Colloidal gold
   b) milk of magnesia
   c) silver sol
   d) Calcium sol

9) $C_6H_5NO_2 \xrightarrow{Fe/HCl} A \xrightarrow[273K]{NaNO_2/HCl} B \xrightarrow[283K]{H_2O} C$, C is
   a) C_6H_5OH
   b) $C_6H_5CH_2OH$
   c) C_6H_5CHO
   d) $C_6H_5NH_2$

10) $\xrightarrow[\text{Conc. } H_2SO_4/\text{Conc. } HNO_3]{473\ K}$ X , X - is
   a) 1, 2 - dinitro benzene
   b) 1,3 - dinitro benzene
   c) 1, 4 - dinitrobenzene
   d) 1, 3, 5 - trinitro benzene

Part - B

II. Answer any five questions: Q.No. 17 is compulsory.

5×2=10

11) What are the limitations of VB theory
12) What are homoleptic, heteroleptic complexs, give example.
13) State Kohlrausch law
14) Write a note on electro osmosis

15) Write a note on catalytic poison Give example
16) Write Sandmeyer reaction.
17) Calculate the standard emf of the cell:
   cd/cd^{2+} || Cu^{2+} / cu and determine the cell reaction. The standard reduction potentials of Cu^{2+}/cu and cd^{2+}/cd are 0.34 V and –0.40 volts respectively

Part - C

III. Answer any five questions: Q.No. 24 is compulsory.   5×3=15

18) In a tetrahedral crysal field, draw the figure to show splitting of d-orbitals
19) Write the IUPAC names of the following compounds
   i) [Fe(CO)$_5$]   ii) [Ag(CN)$_2$]$^-$ iii) K4[Fe(CN)$_6$]
20) Write notes on Standard Hydrogen Electrode (SHE)
21) Write any three characteristics of catalysts.
22) Explain a method of detecting charge on the Sol particles
23) Write the following reactions.
   i) Carbylamine reaction   ii) Hoff man bromide reaction

24)
$$CH3Br \xrightarrow{NaN_3} A \xrightarrow{LiAlH4} B + N_2$$
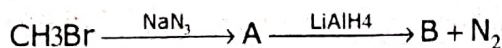
Pyridine ↓ CH$_3$COCl   Identify A, B, C

C

Part - D

IV. Answer all the questions: 3×5=15

25) a) Write the IUPAC name, Co-ordination number, nature of ligand, magnetic property and electronic configuration in octahedral crystal field for the complex K$_4$[Mn(CN)$_6$]

(OR)

b) Write the postulates of valence Bond Theory

26) a) Write notes on
   i)   Helmholtz double layer
   ii) Brownian movement
   iii) Tyndall effect.

(OR)

b) Explain the adsorption theory of catalysis

27) a) Explain the function of H$_2$–O$_2$ fuel cell

(OR)

b) Write short notes on
   i)   Diazotization reaction
   ii) Gomberg reaction
   iii) Gabriel Phthalimide Synthesis

- - - - - -