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QUARTERLY EXAMINATION - 2024

12 - STD

CHEMISTRY

Marks 70 | Time 3.00 Hrs.

PART - I

Choose the correct answer. 15 x 1 = 15

1. Considering Ellingham diagram, which of the following metals can be used to reduce alumina?
   a) Fe b) Cu c) Mg d) Zn
2. In Aluminothermic process which of the following is used as ignition mixture.
   a) $Mg + BaO_2$ b) $Cr_2O_3 + Al$ c) $HgS + O_2$ d) $Mg + Cr_2O_3$
3. The geometry at which carbon atom in diamond are bonded to each other is
   a) Tetrahedral b) hexagonal c) octahedral d) none of these
4. Which one of the following order is correct for the bond dissociation enthalpy of halogen molecules?
   a) $Br_2 > I_2 > F_2 > Cl_2$ b) $F_2 > Cl_2 > Br_2 > I_2$
   c) $I_2 > Br_2 > Cl_2 > F_2$ d) $Cl_2 > Br_2 > F_2 > I_2$
5. The molarity of given orthophosphoric acid solution is 2M. Its normality is
   a) 6N b) 4N c) 2N d) none of these
6. Which of the following lanthanoid ion is diamagnetic?
   a) Eu^{2+} b) Yb^{2+} c) Ce^{2+} d) Sm^{2+}
7. Which of the following is called as Inorganic benzene ?
   a) $B(OC_2H_5)_3$ b) $Na_2B_4O_7$ c) $B_3N_3H_6$ d) B_2H_6
8. The yellow colour in NaCl crystal is due to
   a) excitation of electrons in F centers b) reflection of light from Cl^- ion on the surface
   c) refraction of light from Na^+ ion d) all of the above
9. If 75% of a first order reaction was completed in 60 minutes, 50% of the same reaction under the same conditions would be completed in
   a) 20 minutes b) 30 minutes c) 35 minutes d) 75 minutes
10. Which of these is not likely to act as Lewis base?
    a) BF_3 b) PF_3 c) CO d) F^-
11. The crystal with metal excess defect is
    a) NaCl b) AgBr c) AgCl d) FeO
12. Which one of the following will cause common-ion-effect when added to the following dissociation equilibrium reaction?

$$CH_3COOH_{(aq)} \rightleftharpoons CH_3COO^-_{(aq)} + H^+_{(aq)}$$

    a) CH_3COCl b) AgCl c) CH_3Cl d) HCl
13. Carbolic acid is
    a) Phenol b) Picric acid d) benzoic acid d) Phenylacetic acid
14. Which one of the following reduces Tollens' reagent.
    a) formic acid b) acetic acid c) benzophenone d) none of these
15. Which of the following compound is used as an anti-freeze in automobile radiator?
    a) Methanol b) ethanol c) Neopentyl alcohol d) ethylene glycol

PART - II

6 x 2 = 12

Answer any six questions. Q.No. 24 is compulsory.

16. Give the limitations of Elingham diagram.
17. What is meant y Burnt Alum?
18. What are interhalogen compounds? Give examples.

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19. Which is more stable? Fe^{3+} (or) Fe^{2+} Explain
20. Write Arrhenius equation and explain the terms involved
21. Distinguish tetrahedral and octahedral voids
22. How Malachite green is prepared from Benzaldehyde?
23. Write saponification reaction
24. Calculate the pH of 0.1M CH_3COOH solution. Dissociation constant of acetic acid is 1.8×10^{-5}

PART - III

Answer any six questions. Q.No. 33 is compulsory. 6 x 3 = 18

25. Explain the Mond's process of refining Nickel.
26. Write a note on Fischer tropsch synthesis
27. How will you prepare chlorine by Deacon's process?
28. Write Chromyl Chloride test.
29. Explain pseudo first order reaction with an example?
30. Explain common ion effect with an example.
31. Write Schotten-Baumenn reaction.
32. Write the preparation and the structure of Urotropine.
33. Barium has a body centered cubic unit cell with a length of 590pm along an edge. What is the density of barium in g cm^{-3}?

PART - IV

Answer all the questions. 5 x 5 = 25

34. a) Explain zone refining process with an example.

(OR)

b) i) Describe the structure of diborane (3)
ii) Write Ethyl Borate test. (2)

35. a) State Hume-Rothery rule for i) Alloy formation (3)
ii) Give the equation for the reaction between chlorine with cold NaOH and hot NaOH (2)

(OR)

b) What are the differences between Lanthanoids and actinoids ? (5)

36. a) Explain Schottky and Frenkel defects. (5)

(OR)

b) i) What are the differences between order and molecularity of a reaction? (3)
ii) Give two examples for zero order reaction. (2)

37. a) Derive an expression for Ostwald's Dilution Law. (5)

(OR)

b) i) Define Buffer solution? and give example. (3)
ii) What is conjugate acid-base pairs ? (2)

38. a) Write the Mechanism of aldol condenstation reaction. (5)

(OR)

b) Compound (A) of molecular formula C_6H_6O gives purple colourisation with neut $FeCl_3$. Compound (A) reacts with ammonia to give compound (B) and it also rea with *Zn* dust to give compound (C). Identify the compounds A, B and C and wr down the equations. (5)

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