Preparation Of Inorganic Compounds Viva Questions With Answers

Question.1. Define the term 'crystallisation'.
Answer. The substances when present in well-defined geometrical shapes are called crystals. These are formed when a hot saturated solution of the salt is allowed to cool slowly and undisturbed. The process of obtaining crystals is termed as crystallisation.

Question.2. What is meant by equimolar proportions?
Answer. Proportion of the substances in the ratio of their molecular masses, i.e. 1: 1 mole ratio.

Question.3. Why is the hot saturated solution not cooled suddenly?
Answer. If the solution is cooled suddenly, crystals of smaller size are formed. By allowing saturated solution to cool slowly, crystals grow in size.

Question.4. What is the term 'seeding"?
Answer. Sometimes on cooling the saturated solution, crystallisation does not occur. A crystal of same substance is placed in the saturated solution which induces crystallisation. This process is known as seeding. It helps in quick separation of crystals from saturated solution.

Question.5. Does lithium sulphate combine with aluminium sulphate to form alum?
Answer. No, lithium ion being very small in size does not form alums.

Question.6. What is green vitriol?
Answer. It is hydrated ferrous sulphate ($FeSO_4.7H_20$).

Question.7. What is mother liquor?
Answer. The liquid left behind after the separation of crystals from a saturated solution is known as mother liquor. It contains soluble impurities.

Question.8. What are alums?
Answer. Alums are double sulphates having general formula $X_2SO_4.M_2(SO_4)_3.24H_20$, where X = monovalent cation such as Na^+, K^+ etc. and M = trivalent cation such as Al^{+3}, Cr^{+3}, etc.

Question.9. In the preparation of Mohr's salt can concentrated H_2SO_4 be used in place of dilute H_2SO_4?
Answer. No, because it would oxidize ferrous ions to ferric ions.

Question.10. What is the action of heat on potash alum?
Answer. It loses water of crystalization and becomes light and fluffy.

Question.11. Give the names of some alums where cations are other than Al^{3+}.
Answer. Ferric alum, $(NH_4)_2SO_4$. $Fe_2(SO_4)_3.24H_20$; Chrome alum, K_2So_4 . $Cr_2(S0_4)_3.24H_20$.

Question.12. What are isomorphous substances ?
Answer. The substances having similar crystal structure are known as isomorphous.

Question.13. Why is dilute sulphuric acid added to the solution during the preparation of Mohr's salt crystals ?
Answer. It prevents hydrolysis of ferrous sulphate.

Question.14. What are the uses of potash alum ?
Answer. It is used for purification of impure water. It is also used to stop bleeding from a wound and in dyeing industry.

Question.15. Why is water, used for the preparation of Mohr's salt solution, boiled for 5 minutes ?
Answer. To expel dissolved oxygen from the water which otherwise will oxidize ferrous salt to ferric salt.

Question.16. What happens when potash alum is heated ?
Answer. It first melts and then swells up and is known as burnt alum. At this point it loses its water of crystallisation.

Question.17. Why dilute sulphuric acid is added during the preparation of aluminium sulphate solution ?
Answer. To prevent the hydrolysis of aluminium sulphate.

Question.18. How does potash alum help in purification of water ?
Answer. When potash alum is added to impure water, it causes the coagulation of colloidal impurities present in water. The precipitated impurities can be removed by filtration or decantation.

Question.19. How does potash alum help in stopping bleeding ?
Answer. Blood is a negatively charged sol, in the presence of potash alum it gets coagulated.

Question.20. Is aqueous solution of potash alum acidic or basic ?
Answer. It is acidic, it turns blue litmus paper red. The solution is acidic due to hydrolysis of the salt.

Question.21. What is the geometry of the complex $K_3[Fe(C_2O_4)_3]. 3H_20$?
Answer. Octahedral.

Question.22. Why is the complex $K_3[Fe(C_20_4)_3]. 3H_20$ paramagnetic ?
Answer. It is paramagnetic due to the presence of five unpaired electrons in 3d-orbitals of Fe atom.

Question.23. What is the IUPAC name of the complex $K_3[Fe(C_2O_4)_3]. 3H_20$?
Answer. Potassium trioxalatoferrate (III)-3-water.

Question.24. What is meant by high spin and low spin complexes ?
Answer. When the unpaired electrons pair up prior to complex formation, the complex is known as low spin complex and if prior to complex formation no electron pairing takes place, the complex is known as high spin complex.

Question.25. What is the difference between a complex and a double salt ?
Answer. In complex salt, the properties of all individual ions of the constituent salts may not be exhibited. Whereas in double salts properties of the ions of the constituent salts are exhibited in solution.

Question.26. What is the difference between iron compounds given below ? $K_4[Fe(CN)_6]$ and $FeSo_4 .(NH_4)_2 So_4.6H_20$.
Answer. $K_4[Fe(CN)_6]$ is a coordination complex whereas $FeSo_4.(NH_4)_2 So_4.6H_20$ is a double salt.

Question.27. What is the coordination number of iron is potassium trioxalatoferrate (III)?
Answer. Six

Question.28. List two examples of bidentate ligands other than oxalate ion.
Answer. (i) Ethylene diamine (en), $H_2N\text{-}CH_2\text{-}CH_2\text{-}NH_2$ (ii) Glycinate, $H_2N\text{-}CH_2\text{-}COO^-$.

Question.29. Why does the compound, potassium trioxaloferrate (III), not give tests for ferric ions ?
Answer. Because it contains Fe(III) as complex ion, $[Fe(C_20_4)_6]^{3-}$ and not as Fe^{3+} ions.

Question.30. What are chelates ?
Answer. Multidentate ligands are known as chelates.