

# Chemistry Practical Class 12 Volumetric Analysis Viva Questions With Answers

## Viva Questions with answers

**Question.1.What is a standard solution ?**

**Answer.** A solution whose strength is known is called a standard solution.

**Question.2.What is a normal solution ?**

**Answer.** A solution containing one gram-equivalent mass of the solute per litre of the solution is called a normal solution.

**Question.3.What is the equivalent mass of  $\text{KMnO}_4$  when it acts as oxidizing agent in acidic medium ?**

**Answer.**  $\text{KMnO}_4$  loses 5 electrons per molecule, when it acts as oxidizing agent in the presence of acids. Therefore, its equivalent mass is one-fifth of its molecular mass.

$$\text{Eq. mass} = \frac{\text{Mol. mass}}{5} = \frac{158}{5} = 31.6.$$

**Question.4.Is sodium hydroxide a primary standard ?**

**Answer.** No.

**Question.5.Are 'molality' and "molarity" same ?**

**Answer.** No, molality of a solution is defined as the number of moles of solute present in 1000 grams of the solution whereas molarity tells us about the number of moles of the solute present per litre of the solution.

**Question.6.What would be the normality of 0.10M  $\text{KMnO}_4$  ?**

**Answer.** It will be  $0.1 \times 5 = 0.5 \text{ N}$ .

**Question.7.What volume of 10M HCl must be diluted with water to get 1L of 1M HCl ?**

**Answer.** 0.1L.

**Question.8.What is the basicity of  $\text{H}_2\text{SO}_4$  ?**

**Answer.** 2.

**Question.9.What is the relationship between normality (N), molarity (M), molecular mass and equivalent mass ?**

**Answer.** Normality x Eq. Mass = Molarity x Mol. Mass.

**Question.10.Why front door of the balance is closed during weighing ?**

**Answer.** Opening the front door causes vibrations in the pan due to operator's breath which leads to inaccurate results.

**Question.11.What is the maximum weight that can be weighed in a chemical balance ?**

**Answer.** 100 grams.

**Question.12.What is the weight of a rider ?**

**Answer.** 10 mg.

**Question.13.What is the use of a rider ?**

**Answer.** A rider is used for weights less than 10 mg.

**Question.14. What is the principle of volumetric analysis?**

**Answer.** In volumetric analysis, the concentration of a solution is determined by allowing a known volume of the solution to react, quantitatively with another solution of known concentration.

**Question.15. What is titration ?**

**Answer.** The process of adding one solution from the burette to another in the conical flask in order to complete the chemical reaction involved, is known as titration.

**Question.16. What is indicator ?**

**Answer.** Indicator is a chemical substance which changes colour at the end point.

**Question.17. What is end point ?**

**Answer.** The stage during titration at which the reaction is just complete is known as the end point of titration.

**Question.18. Why a titration flask should not be rinsed ?**

**Answer.** This is because during rinsing-some liquid will remain sticking to the titration flask therefore the pipetted volume taken in the titration flask will increase.

**Question.19. What are primary and secondary standard substances?**

**Answer.** A substance is known as primary standard if it is available in high degree of purity, if it is stable and unaffected by air, if it does not gain or lose moisture in air, if it is readily soluble and its solution in water remains as such for long time.

On the other hand, a substance which does not possess the above characteristics is called a secondary standard substance. Primary standards are crystalline oxalic acid, anhydrous  $\text{Na}_2\text{CO}_3$ , Mohr's salt, etc.

**Question.20. Burette and pipette must be rinsed with the solution with which they are filled, why ?**

**Answer.** The burette and pipette are rinsed with the solution with which they are filled in order to remove any water sticking to their sides, which otherwise would decrease the concentration of the solutions to be taken in them.

**Question.21. It is customary to read lower meniscus in case of colourless and transparent solutions and upper meniscus in case of highly coloured solutions, why ?**

**Answer.** Because it is easy to read the lower meniscus in case of colourless solutions, while the upper meniscus in case of coloured solutions. In case of coloured solutions lower meniscus is not visible clearly.

**Question.22. What is a molar solution ?**

**Answer.** A molar solution is a solution, a litre of which contains one gm-mole of the substance. This is symbolised as 1M.

**Question.23. Why the last drop of solution must not be blown out of a pipette?**

**Answer.** Since the drops left in the jet end is extra of the volume measured by the pipette.

**Question.24. Pipette should never be held from its bulb, why ?**

**Answer.** The body temperature may expand the glass and introduce an error in the measurement volume.

**Question.25. What is acidimetry and alkalimetry ?**

**Answer.** It is the branch of volumetric analysis involving chemical reaction between an acid and a base.

**Question.26. What is permanganometry ?**

**Answer.** Redox titrations involving  $\text{KMnO}_4$  as the oxidising agent are called permanganometric titrations.

**Question.27. Which is an oxidising agent and a reducing agent in the reaction between  $\text{KMnO}_4$  and  $\text{FeSO}_4$ ?**

**Answer.**  $\text{KMnO}_4$  acts as oxidising agent and  $\text{FeSO}_4$  acts as reducing agent.

**Question.28. What is the indicator used in  $\text{KMnO}_4$  titration ?**

**Answer.** No indicator is used because  $\text{KMnO}_4$  acts as a self-indicator.

**Question.29. Why does  $\text{KMnO}_4$  act itself as an indicator ?**

**Answer.** In the presence of dilute sulphuric acid,  $\text{KMnO}_4$  reacts with reducing agent (oxalic acid or ferrous sulphate). When all the reducing agent has been oxidised, the excess of  $\text{KMnO}_4$  is not decomposed and imparts pink colour to the solution.

**Question.30. What is the end point in  $\text{KMnO}_4$  titrations ?**

**Answer.** From colourless to permanent light pink.

**Question.31. Why is Mohr's salt preferred as a primary standard over ferrous sulphate in volumetric analysis ?**

**Answer.** This is because of the fact that Mohr's salt is stable and is not readily oxidised by air. Ferrous sulphate gets oxidised to ferric sulphate.

**Question.32. Why are a few drops of dilute sulphuric acid added while preparing a standard solution of Mohr's salt ?**

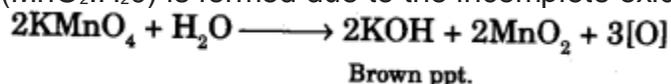
**Answer.** Few drops of  $\text{H}_2\text{SO}_4$  are added to prevent the hydrolysis of ferrous sulphate.

**Question.33. Why a burette with rubber pinch cock should not be used in  $\text{KMnO}_4$  titrations ?**

**Answer.** Because  $\text{KMnO}_4$  attacks rubber.

**Question.34. Sometimes a brown ppt. is observed in  $\text{KMnO}_4$  titrations. Why ?**

**Answer.** It is due to insufficient quantity of dil. sulphuric acid. Brown coloured ppt. ( $\text{MnO}_2 \cdot \text{H}_2\text{O}$ ) is formed due to the incomplete oxidation of  $\text{KMnO}_4$ .



**Question.35. Why should you heat the oxalic acid solution to about 60-70°C before titrating with  $\text{KMnO}_4$  solution ?**

**Answer.** In cold, the reaction is very slow due to the slow formation of  $\text{Mn}^{2+}$  ions. Oxalic acid is heated to speed up the liberation of  $\text{Mn}^{2+}$  ions which then autocatalysis the reaction and thus the reaction proceeds rapidly. This also serves the purpose of expelling the carbon dioxide evolved during the reaction which otherwise does not allow the reaction to go to completion.