# Chemistry Practical Class 12 Determination of Concentration/Molarity of $KMnO_4$ Solution by Titrating it against a Standard Solution of Oxalic Acid Viva Questions with Answers

**Q1. How to convert M/10 oxalic acid solution into N/10 oxalic acid solution?**

**Answer.** To make the conversion add an equal volume of water so that the solution converted to N/10.

**Q2. What is the formula and basicity of oxalic acid?**

**Answer.** The formula for oxalic acid is $(COOH)_2.2H_2O$. The basicity of oxalic acid is 2 means it is a dibasic acid.

**Q3. In this titration of $KMnO_4$ vs oxalic acid, what is the indicator used?**

**Answer.** Potassium permanganate itself is purple in colour and acts as a self indicator.

**Q4. What is meant by redox titration?**

**Answer.** In redox titrations, both oxidation and reduction reactions take place simultaneously. During titration, one will get oxidised at the same time the other reactant will get reduced also called a redox reaction

**Q5. What specific name is given to the permanganate titrations?**

**Answer.** Permanganometric titrations are redox titrations that involve potassium permanganate.

**Q6. Which indicator is used in the permanganate titration?**

**Answer.** No indicator is used. This is because $KMnO_4$ acts as a self-indicator.

**Q7. Why isn't an indicator used in permanganometry?**

**Answer.** An indicator is not required for titration of colourless or slightly coloured solutions because 0.01 mL of 0.02M potassium permanganate imparts a pale-pink colour to 100 mL of water.

**Q8. In $KMnO_4$ titrations, what is the endpoint?**

**Answer.** From colourless to a constant light pink.

**Q9. In $KMnO_4$ titrations, a brown ppt. is occasionally observed. Why is this so?**

**Answer.** It is due to a lack of dilution of sulphuric acid. The incomplete oxidation of $KMnO_4$ results in the formation of brown-coloured ppt. ($MnO_2.H_20$).

**Q10. Why is a burette with pinch-cock regulator not used for the permanganate titration?**

**Answer.** This is because KMnO4 corrodes rubber.

**Q11. Why do we heat oxalic acid solution containing sulphuric acid up to 50–60°C in the permanganate titration?**

**Answer.** This is done because the reaction between oxalic acid and potassium permanganate in an acidic medium is extremely slow at normal temperature, heating to 50 – 60°C keeps oxalic acid in a decomposed state to facilitate better interaction between oxalate and potassium permanganate.

**Q12. What happens when $KMnO_4$ reacts with oxalic acid?**

**Answer.** The reaction between oxalic acid and potassium permanganate is a redox reaction that takes place in the presence of sulphuric acid and heat, making it endothermic. Potassium permanganate and sulfuric acid produce oxygen, which reacts with oxalic acid to produce carbon dioxide and water.

**Q13. How does a self indicator work?**

**Answer.** The Self Indication is essentially a chemical product that, in conjunction with self-participation in the reaction, marks the endpoint of titration or other reaction. However, in order to suggest colour change, certain markers, such as litmus, do not modify their own chemical composition.

**Q14. Why in the redox titration of $KMnO_4$ vs oxalic acid do we heat oxalic acid solution before starting the titration?**

**Answer.** We heat oxalic acid solution because it is a slow process without heating because a reaction requires more energy than the activation energy. To increase the energy, the temperature must be raised, which can only be accomplished by heating the oxalic acid solution.

**Q15. What is the molarity of the $KMnO_4$ solution?**

**Answer.** The strength and molarity of the given KMnO4 solution are determined to be 2/y x 31.6 g/l and N/5 moles/litre, respectively.

**Q16. How can the concentration of a $KMnO_4$ solution be determined?**

**Answer.** Moles of solute/volume of solution = Concentration

**Q17. What is titration?**

**Answer.** Titration is the process of adding one solution from the burette to another in the conical flask in order to complete the chemical reaction.

**Q18. What is the endpoint?**

**Answer.** The endpoint of the titration is the point during titration when the reaction is nearly complete. It is also called the equivalence point or stoichiometric point.

**Q19. Why should a titration flask not be rinsed?**

**Answer.** This is due to the fact that some liquid will remain stuck to the titration flask during rinsing, causing the pipetted volume taken in the titration flask to increase.

**Q20. Why must the burette and pipette be rinsed with the solution with which they are filled?**

**Answer.** The burette and pipette are rinsed with the solution with which they are filled to remove any water that has accumulated on their sides, which would otherwise reduce the cone of the solutions to be taken in them.

**Q21. Why is it customary to read the lower meniscus in colourless and transparent solutions and the upper meniscus in highly coloured solutions?**

**Answer.** This is because it is easier to read the lower meniscus in colourless solutions and the upper meniscus in coloured solutions. In the presence of coloured solutions, the lower meniscus is not clearly visible.

**Q22. What are the precautions that should be taken while performing the experiment?**

**Answer.** Some precautions that should be taken while performing the experiment are as follows-

- Clean all the apparatus with distilled water before starting the experiment and then rise with the solution to be taken in them.
- Potassium permanganate is dark in colour, so always read the upper meniscus.
- Use dilute sulfuric acid for acidifying the potassium permanganate.
- Take accurate readings once it reaches the endpoint and don't go with average readings.
- Use antiparallex card or autoparallex card while taking the burette readings.
- Do not use a rubber cork burette as it is can be attacked by $KMnO_4$.
- The strength of the unknown solution should be taken up to two decimal places only.