

Ans: $2 \text{MnO}_4^- + 6\text{H}^+ + 5 \text{H}_2\text{C}_2\text{O}_4 \rightarrow 2 \text{Mn}^{2+} + 8 \text{H}_2\text{O} + 10 \text{CO}_2$

9. This reaction is an example for _____ reaction.

Ans: Autocatalytic reaction.

10. What is Oxidizing agent?

Ans: An oxidizing agent undergoes reduction and oxidizes the other species.

11. What is Reducing agent?

Ans: A reducing agent undergoes oxidation and reduces the other species.

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EXPERIMENT – 3 (DETERMINATION OF Zn(II))

1. Write the chemical reaction between Zn (II) and potassium ferro cyanide solution.

Ans: $3 \text{Zn}^{2+} + 2 \text{K}_4[\text{Fe}(\text{CN})_6] \rightarrow \text{K}_2\text{Zn}_3[\text{Fe}(\text{CN})_6] + 6 \text{K}^+$

2. The indicator used in the reaction is _____

Ans: Di Phenyl Amine(DPA)

3. The color change in the reaction is _____

Ans: Colorless to blue to greenish white precipitate

4. The greenish white precipitate is due to the formation of _____

Ans: Due to the formation of sparingly soluble potassium zinc ferro cyanide complex.

5. What is the function of ammonium sulphate in the reaction?

Ans: it acts as a catalyst.

6. What is DPA?

Ans: DPA is di phenyl amine. It is a redox indicator.

7. This reaction is an example for _____ reactions.

Ans: Redox reactions.

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EXPERIMENT – 4 (DETERMINATION OF Cu (II) USING EDTA)

1. What are the indicators used in this experiment?

Ans: Erio Chrome Black – T and Fast Sulphon Black – F.

2. What is the color change in this experiment?

Ans: When EBT is used, color change is from wine red to blue.

When FSBF is used, color change is from magenta to green.

3. What is the color of Metal EDTA complex in presence of FSBF indicator in alkaline medium?

Ans: Intense red colored complex.

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EXPERIMENT – 5 (ESTIMATION OF TOTAL HARDNESS)

1. Hardness is _____

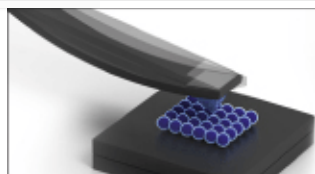
Ans: It is the characteristic property of water of not giving lather with soap.

2. Hardness is due to _____

Ans: It is due to the dissolved bi-carbonates, chlorides and sulphates of calcium and magnesium in water.

3. How many types of Hardness are there?

Ans: There are two types of hardness. Temporary hardness and Permanent Hardness.



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Ans: Dissolved bicarbonates of Calcium and Magnesium.

6. Permanent Hardness is also called as _____.

Ans: Non – Carbonate Hardness, Irremovable Hardness

7. Permanent Hardness is due to_____.

Ans: Dissolved chlorides and sulphates of Calcium and Magnesium.

8. The Principle involved in the estimation of total hardness in water sample is _____.

Ans: Complexometric Titrations.

9. The complexing agent used in this experiment is _____.

Ans: EDTA (Ethylene di amine tetra acetic acid)

10. What is the indicator used in this experiment?

Ans: EBT (Erio Chrome Balck – T)

11. The indicators used in the complexometric titrations are also called as_____.

Ans: Complexometric Indicators or Metal – Ion indicators

14. What are the chemicals used in this experiment?

Ans:EDTA, EBT indicator, pH = 10 buffer.

15. Which type of ligand is EDTA?

Ans:EDTA is a hexa dentate ligand.

16. What is the name of the buffer solution used in EDTA titration?

Ans:Ammonium chloride and Ammonia solution buffer.

17. Why only pH = 10 buffer has to be used?

Ans:At pH = 10, all protons in EDTA molecules are completely dissociated and complete complexation with metal ions in water takes place.

18. What are the units of Hardness?

Ans:ppm or parts per million.

19. Why hardness is expressed in equivalents of calcium carbonate?

Ans:Calcium carbonate is most insoluble salt and its molecular weight and equivalent weights are 100 and 50 respectively.

20. What is hard water?

Ans:The water which will not give lather with soap immediately is called hard water.

21. What is soft water?

Ans:The water which will give later with soap immediately is called soft water.

22. Why disodium salt of EDTA is much preferred than EDTA?

Ans:EDTA di sodium salt is more soluble in water when compared to pure EDTA.

24. How permanent hardness in water is removed?

Ans:Permanent hardness in water is removed by Lime soda method, zeolite method or Ionexchange method.

23. How temporary hardness in water is removed?

Ans:By simple boiling, bicarbonates of calcium and magnesium are precipitated out as carbonates of calcium and magnesium.

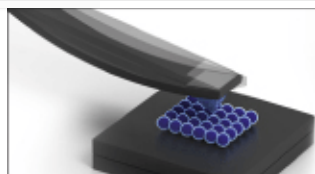
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EXPERIMENT – 6 (DETERMINATION OF pH)

1. What is pH?

Ans: pH is the negative logarithm of hydrogen ion concentration

$pH = -\log [H^+]$



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