

Experiment 7

Aim of the experiment : To determine the Chloride ion (Cl^-) present in a given sample by argentometric method by using **N/100 AgNO_3** solution

Apparatus required:

1. Burette
2. Pipette
3. Conical Flask
4. Beaker

Chemical Required:

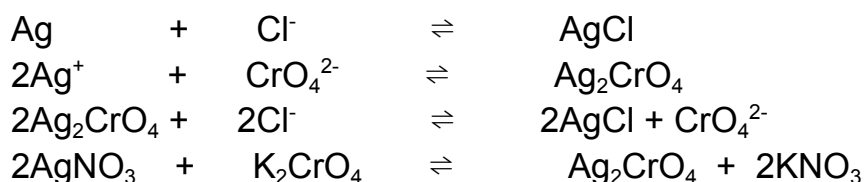
1. Standard AgNO_3 solution
2. K_2CrO_4 solution
3. Water Sample

Principle:

Chlorides are present in water as NaCl , Mg_2Cl and CaCl_2 . Although chlorides are not harmful, their concentration above 200 ppm imparts a peculiar taste to water , thus rendering the water unacceptable for drinking purposes.

When AgNO_3 solution is released from the burette to the water sample containing Cl^- , first Ag^+ reacts with Cl^- and forms a yellowish white precipitate of AgCl . After completing reaction with Cl^- , with the addition of one extra drop of AgNO_3 imparts a red color to the solution due to formation of Ag_2CrO_4

Chemical Reaction:



Observation Table:

No . of Observa tion	Volume of water sample in ml.	Burette Reading (ml)			Remarks
		Initial	Final	Difference	
1	25	0	5	5	Rough
2	25	5	9.9	4.9	Concordant
3	25	9.9	14.8	4.9	Concordant
4	25	14.8	19.7	4.9	Concordant

Calculation:

N_1 = Normality of water sample due to Cl^- = ?

V_1 = Volume of water taken for titration = 25ml

N_2 = Normality of AgNO_3 solution. = 0.01 N

V_2 = Volume of AgNO_3 solution required for the equivalence point. = 4.9 ml

$$N_1 = \frac{N_2 V_2}{V_1} = \frac{0.01 \times 4.9}{25} = \frac{0.049}{25} = \mathbf{0.00196 \text{ N}}$$

$$\begin{aligned} \text{Strength of } \text{Cl}^- \text{ ion} &= N_1 \times 35.5 \text{ g/l} = 0.00196 \times 35.5 \text{ g/l} = \mathbf{0.06958 \text{ g/l}} \\ &= N_1 \times 35.5 \times 1000 \text{ ppm} = 0.00196 \times 35.5 \times 1000 \text{ ppm} \\ &= \mathbf{69.58 \text{ ppm}} \end{aligned}$$

Conclusion:

The Chloride ion present in a given sample by argentometric method by using **N/100 AgNO_3** solution is **69.58 ppm**.