

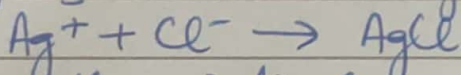
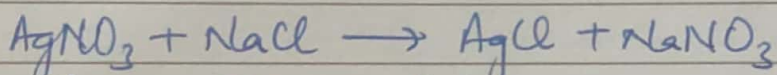
ESTIMATION OF AMOUNT OF CHLORINE IN A WATER SAMPLE

★ AIM:

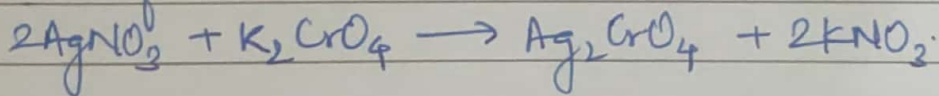
→ To estimate the amount of chlorine in a water sample by Mohr's method.

★ PRINCIPLE:

→ It is an example of precipitation reaction. The reaction between chloride and silver nitrate is direct and simple.



→ K_2CrO_4 is the indicator. Reaction with K_2CrO_4 with AgNO_3 is as follows:



★ PROCEDURE:

(1) Titration 1 - Standardisation of AgNO_3 solution.

→ 20 ml of standard NaCl solution (N/20) is pipetted out into a clean conical flask.

→ 1 ml of 2% K_2CrO_4 indicator is added to it. The sol. turns yellow in colour.

→ It is titrated against AgNO_3 solution taken in the burette.

→ During each addition of AgNO_3 , the content in the conical flask is shaken well.

→ At the end point, the yellow colour changes to brownish red colour. The titration is repeated for concordant values.

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(2) Titration 2: Estimation of Chloride

- The given chloride solution is made upto 100 ml in a standard flask.
- Exactly 20 ml of this solution is pipetted out into a clean conical flask.
- To this solution 1 ml of 2% K_2CrO_4 indicator is added.
- It is titrated against standardised $AgNO_3$ solution from the burette. The titration is repeated for concordance.
- From the volume of $AgNO_3$ consumed, the strength of chloride and hence its amount is calculated.

★ OBSERVATIONS:(1) TABLE 1: (Standardization of $AgNO_3$)

S.No.	Volume of NaCl solution (ml)	Burette Reading (ml)		Concordant value (ml)	Indicator
		Initial	Final		
1	10	0	9.1	} 9.1	K_2CrO_4
2	10	0	9.1		K_2CrO_4
3	10	0	9.1		K_2CrO_4

(2) TABLE 2: (Estimation of Chloride)

S.No.	Volume of Chloride solution (ml)	Burette Reading (ml)		Concordant Value (ml)	Indicator
		Initial	Final		
1	10	0	8.6	} 8.6	K_2CrO_4
2	10	0	8.6		K_2CrO_4
3	10	0	8.6		K_2CrO_4

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★ CALCULATIONS:(1) FOR TABLE 1:Normality of NaCl solution = $N_1 = 0.02 \text{ N}$ Volume of NaCl solution = $10 \text{ ml (} V_1 \text{)}$ Volume of AgNO_3 solution = V_2 (end point) = 9.1 ml Normality of AgNO_3 solution = $N_2 = ?$

$$\therefore N_2 = \frac{V_1 \times N_1}{V_2} = \frac{10 \times 0.02}{9.1} = 0.02197 \text{ N}$$

(2) FOR TABLE 2:Volume of chloride solution = $10 \text{ ml (} V_1 \text{)}$ Normality of chloride solution = $N_1 = ?$ Volume of AgNO_3 solution = V_2 (end point) = 8.6 ml Normality of AgNO_3 solution = $N_2 = 0.02197 \text{ N}$

$$\therefore N_1 = \frac{V_2 \times N_2}{V_1} = \frac{8.6 \times 0.02197}{10} = 0.0188 \text{ N}$$

Thus, the amount of chloride present in the whole of the given solution = $N_1 \times \frac{35.46}{10}$

$$= 0.0188 \times \frac{35.46}{10} \Rightarrow 0.0666 \text{ g/100ml}$$

★ RESULT:

→ Amount of chloride present in whole solution is 0.0666 g/100ml

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