

Ministry of Higher Education and Scientific Research

Mustansiriyah University

College of Science / Department of Chemistry



Practical Analytical Chemistry

For First Year Students Biology Department

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Determination of chloride ion by Precipitation Titration

(Mohr's Method)

- ❖ **Purpose:** Determine the exact normality of chloride ion.
- ❖ **Theory:** In this experiment, the titration of sodium chloride (NaCl) sample with standard silver nitrate solution (AgNO₃) using potassium chromate (K₂CrO₄) as indicator.
- ❖ **Reaction:** One mole of NaCl reacts with exactly one mole of AgNO₃.



Equipment

Materials

- Burette

Sodium chloride (NaCl) unknown

- Beaker

Silver nitrate solution (AgNO₃) 0.05N

- Pipette

Potassium chromate indicator

- Pipette filler

Distilled water

- Conical flask

- Dropper bottle

- Funnel

- Stand

- Clamp

- Filter paper

Procedures

1. Wash the burette, pipette and conical flask with distilled water.
2. Using a funnel, fill the burette with silver nitrate solution (AgNO_3) 0.05N.
3. Using a pipette, transfer a 5.00 mL volume of the sodium chloride (NaCl) to a conical flask.
4. Add a few drops of potassium chromate (K_2CrO_4) indicator to the conical flask.

Note the color of the solution.(solution I).

5. Add silver nitrate solution (AgNO_3) 0.05N slowly from the burette in about 1.00 mL portions to the sodium chloride (NaCl) in a conical flask (solution I), swirling the conical flask after each addition, silver chloride that forms are a white precipitate. The end-point of the titration is identified as the first appearance of a red-brown color of silver chromate.

Procedures

6. Note the burette reading and calculate how adding silver nitrate solution (AgNO_3) was used.
7. Repeat the titration for a more accurate reading. Repeat the titration until two readings agree within 0.10 mL.
8. **Blank Determination:** Transfer a 5.00 mL of distilled water to a conical flask. Add a few drops of potassium chromate (K_2CrO_4) indicator to the conical flask (Solution II). Added silver nitrate solution (AgNO_3) 0.05N slowly from the burette in about 1.00 mL portion to the distilled water in a conical flask (Solution II), swirling the conical flask after each addition. The end-point of the titration is when the color of the solution in the conical flask changes (red-brown).
9. Note the burette reading and calculate how adding silver nitrate solution (AgNO_3) was used. Calculate the normality of chloride ion.

Calculations

$$N_1 (V_{1Cl} - V_{1dw}) = N_2 \times V_2$$

AgNO_3 NaCl

Questions:

Explain briefly:

1. Why do you have to store the silver nitrate solution in a dark container an amber colored bottle?
2. What are the health effects of chloride in water?
3. What is the effect of temperature on the determination of chloride content in water?