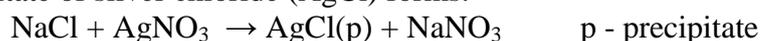


Determination of NaCl by titration with silver nitrate

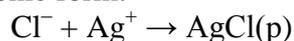
This method determines the chloride ion concentration (NaCl) of a solution by titration with silver nitrate (AgNO₃).

Indicator - potassium chromate (K₂CrO₄)

As the silver nitrate solution is slowly added from the buret to NaCl solution, a white precipitate of silver chloride (AgCl) forms.

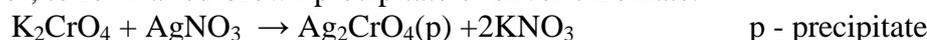


or in ionic form:

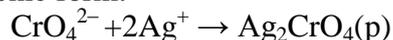


The end point of the titration occurs when all the chloride ions are precipitated.

Then additional silver ions from AgNO₃ react with the chromate ions (CrO₄²⁻) of the indicator, to form a red-brown precipitate of silver chromate.



or in ionic form:



Before titration small amount of potassium chromate (an indicator) is added to the solution, making it slightly yellow in color. During titration, as long as chlorides are present, concentration of Ag⁺ is too low for silver chromate formation. Near equivalence point concentration of silver cations rapidly grows, allowing precipitation of intensively red silver chromate which signals end point.

Manual

1. Dilute obtained from the teacher sample of NaCl in the volumetric flask to 100 ml
2. Mix the content of the flask, and transfer 10 ml of the solution with a pipette to 3 Erlenmeyer flasks.
3. To each flask add 2-3 drops of K₂CrO₄ solution (yellow) and titrate with AgNO₃ solution. Continue titrating until a red precipitate of Ag₂CrO₄ begins to show locally in the solution. At this point, slow down with drop-wise additions. Each successive drop can be added only after the red color caused by the preceding drop has disappeared. Continue until one added drop produces a faint red precipitate which does not disappear. It means that the end point of the titration is reached.
4. Calculate the amount of miligrams of NaCl that you obtained from the teacher (in 100 ml).

The report should contain:

1. Reactions
2. Three values obtained during titration and the calculated mean value.
3. Calculation showing how many mg of NaCl was in the flask obtained from the teacher.

4. The table as below:

Student's number	Mean volume (ml)
	Mass of NaCl in the flask (mg)