Sodium Sulfate

\[ \text{Na}_2\text{SO}_4 \cdot n\text{H}_2\text{O} \ (n=10 \text{ or } 0) \]

Mol. Wt. decahydrate 322.20
anhydrous 142.04

sodium sulfate

Definition Sodium Sulfate occurs as two forms: the crystal form (decahydrate) called Sodium Sulfate (crystal) and the anhydrous form called Sodium Sulfate (anhydrous).

Content Sodium Sulfate, when dried, contains not less than 99.0% of sodium sulfate (Na\textsubscript{2}SO\textsubscript{4}).

Description Sodium Sulfate (crystal) occurs as colorless crystals or as a white crystalline powder. Sodium Sulfate (anhydrous) occurs as a white powder.

Identification Sodium Sulfate responds to all tests for Sodium Salt and for Sulfate as described in the Qualitative Tests.

Purity Dry Sodium Sulfate (crystal) before performing the test.

1. Clarity and color of solution Colorless, almost clear (1.0 g, water 10 ml.)
2. Chloride Not more than 0.11% as Cl (0.10 g, Control solution 0.01 mol/l hydrochloric acid 0.30 ml).
3. Heavy metals Not more than 10 \( \mu \text{g/g} \) as Pb (2.0 g, Method 1, Control solution Lead Standard Solution 2.0 ml).
4. Arsenic Not more than 4.0 \( \mu \text{g/g} \) as As\textsubscript{2}O\textsubscript{3} (0.50 g, Method 1, Apparatus B).

Loss on Drying
Crystal: 51.0 - 57.0% (105 \( ^\circ \), 4 hours).
Anhydrous: Not more than 5.0% (105 \( ^\circ \), 4 hours).

Assay Weigh accurately about 0.4 g of Sodium Sulfate, previously dried, dissolve in 200 ml of water, add 1 ml of hydrochloric acid, boil, and add gradually 30 ml of barium chloride solution (1 \( \text{ml} \)). Heat this solution in a water bath for 1 hour, cool, and filter through a filter paper for quantitative analysis (5C). Wash the residue on the filter paper with warm water until the washings do not give positive tests for Chloride. Dry the residue with the filter paper, ignite to constant weight, and weigh accurately as Barium Sulfate (BaSO\textsubscript{4}).

Content of sodium sulfate (Na\textsubscript{2}SO\textsubscript{4})
\[ = \frac{\text{Weight (g) of } \text{BaSO}_4 \times 0.6086}{\text{Weight (g) of the sample}} \times 100(\%) \]