

Preparation and Some Properties of Sodium Thiosulfate

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Abstract:

Sodium thioantimonate is also called Schlippe's salt. This salt is a thio compound formed by antimony (V) sulfide with sodium. One of the starting materials for the preparation of the salt, antimony (III) sulfide, was obtained from the Daridag antimony ore. Thermogravimetric and chemical analyses of the composition of the Daridag antimony ore were carried out. As a result of the study, it was found that the compound is soluble in sodium hydroxide. The particle size of the sample varies between 0.12 and 0.105 mm, the ratio of antimony (II) sulfide to sodium hydroxide in the ore is 1:1.4. The process at a temperature of 343 to 362 K with a solid-liquid phase ratio of 1:6-8. The process duration is 20-25 minutes, and the yield of antimony (III) sulfide is 97.50%. Thus, after the antimony (III) sulfide layer obtained from the sublimation of the ore was dissolved in hydrochloric acid, antimony (III) chloride was distilled and the sulfide was released. At this time, the color of the solution turned orange. It was purified from the resulting impurities. Hydrogen antimony (III) sulfide was filtered from the antimony (III) chloride solution at room temperature through filter, paper, washed until chloride and sulfide ions were removed. The precipitate was finally washed with 50 ml of ethyl alcohol and dried at 333 K until constant mass was obtained, and prepared for the production of sodium thioantimonate. Other components were chemically pure sodium hydroxide and elemental sulfur.

The reaction equation for the production of sodium thioantimonate is formulated as follows:



The substances taken in stoichiometric proportions according to the reaction equation were mixed and heated to boiling. Heating was continued by adding water to the mixture from time to time. After dissolution, the solution was filtered, the filtrate was evaporated slightly and then allowed to crystallize. The obtained crystals were filtered through a Buchner funnel and dried in vacuum at room temperature. The crystals were obtained in a grayish white color. In order to study the physicochemical properties of the sample, its thermogravimetric analysis are given in the figure below.