University of Technology
Chemical Engineering Department
Graduation Project Summary

Supervisors: Dr. Jamal M. Ali

Branch: Chemical Processes Engineering

Academic Year: 2016-2017

Groups No.: P5

Students Name: Aya Maher Hameed and Maysam Mohanad Mahmood

Project Title: PRODUCTION OF SODIUM THIOSULFATE

Specific Objective includes:

1- Definition and chemical formula:

Sodium thiosulfate, $Na_2S_2O_3$ is a colorless crystalline compound which is more familiar as the pentahydrate, $Na_2S_2O_3.5H_2O$, an efflorescent, monoclinic crystalline substance. Sodium thiosulfate is produced industrially from liquid waste products of sodium sulfide or during sulfur dye manufacture. An aqueous solution of sodium sulfite is heated with sulfur or by boiling aqueous sodium hydroxide and sulfur resulting into sodium thiosulfate on laboratory scale.

John Herschel was developed the use of sodium thiosulfate as photographic fixer in 1819. John discovered the sodium thiosulfate to be a solvent for silver halides.

Commercially sodium thiosulfate is produced using air oxidation of sulfides, polysulfides and hydrosulfides. It is also obtained as by-product in manufacturing of sulfur dyes and sulfur black. It is also produced using reaction of sodium sulfide with sulfur dioxide and soda ash or caustic soda. Aqueous solution of sodium thiosulfate is generally neutral. Decomposition of sodium thiosulfate produces sodium sulfite and sulfur at under neutral or at slightly acidic condition. Alkaline solution decomposes to sulfate and sulfide in the presence of air.

2-Other Names:

Sodium thiosulfate also called sodium hyposulfite or "hypo."

3-Goal of project:

The purpose of this project is to produce - Sodium Thiosulfate. The product is considered an important industrial material. Most Sodium Thiosulfate, can be produced from soda ash and sulfur dioxide.

4-Production Methods:

There are Two methods for production:

1. **From soda ash sulfurdioxide.**
2. **From Hydrogen Sulfide gas.**

5-Flow sheet or block diagram for selected production method