The work recorded in this thesis deals with some of the common scientific and technical problems of salt or salt based industries.

In the beginning literature on various aspects dealing with the manufacture of salt by solar evaporation has been reviewed briefly. Survey of the quality and production of salt produced in various parts of India has been carried out. The quality of salt required for various uses is described. (Chapter 1)

Common salt contains sulphates and chlorides of calcium and magnesium, along with the insoluble matter as major impurities. Association and distribution of these impurities in sea salt and Kharaghoda salt have been studied. (Chapter 2)

For upgrading the common salt to a quality required by I.S.S. for salt for chemical industries, removal of major impurities has been carried out by washing process on laboratory as well as larger scale. (Chapter 3)

Moisture absorption by sodium chloride containing known amounts of hygroscopic impurities namely magnesium chloride and/or magnesium sulphate at various relative humidities in the range of 50 to 90 per cent has been studied systematically. Quantitative data on moisture desorption and theoretical calculations of the moisture absorption from the known impurity content and relative humidity have been attempted. (Chapter 4)

Systematic laboratory experiments have been carried out to study the effect of moisture level, impurity content, particle size, pressure, relative humidity, temperature and
anticaking agents on the caking of salt and quantitative correlations have been obtained. (Chapter 5)

Comparative study of the dissolution rates of various common salt samples has been carried out. Diffusion rate constants of salt have been determined by using the equations available in literature.

The significant contributions of these investigations are:

Association and distribution of impurities in solar salt samples have been systematically studied for the first time.

A new equipment viz. disperse washing column has been designed and used to obtain high purity washed salt.

Correlations between the impurity (magnesium chloride and magnesium sulphate) content in salt and amount of moisture absorption at various relative humidities have been established by deriving empirical equations.

Quantitative data on the caking of salt have been obtained under controlled conditions assessing the effect of various factors. Correlations between the caking and moisture level as well as caking and particle size have been established by deriving empirical equations.

Diffusion constant rates of solar salt under controlled experimental conditions have been determined.

The entire investigation presented in this thesis is my original contribution except in large scale experiments on washing of salt in which I was partly assisted by others.
The sources on which this work is based have been reviewed throughout the text and clearly indicated under references.

The results, observations and discussions are entirely original and are based on the experimental work carried out by me for the thesis.

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