# CHEMICAL TECHNOLOGY

**Course Code :15CH1108**

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## Course Outcomes:

On successful completion of the course, the student should be able to

**CO 1** Explain the manufacturing process of Soda ash, Chlorine and Glass.

**CO 2** Recognize the basic concepts and improvement of quality and quantity of fertilizers

**CO 3** Describe the manufacture of various polymers.

**CO 4** Explain manufacture of soaps and detergents.

**CO 5** Identify and explain the different manufacturing processes of paper and pulp.

## UNIT-I (11 Lectures)

### BASICS OF ELECTRO CHEMISTRY:

Electrode potential, Nernst equation, EMF of electrochemical cell, Reference electrodes-Standard hydrogen electrode, calomel electrode. Electrochemical series.

Manufacturing of Soda ash, caustic soda and chlorine, Glass: manufacture of special glasses.

### INDUSTRIAL GASES:

Carbon dioxide, hydrogen and oxygen – products of water gas,

producer gas. Nitrogen industries: synthetic ammonia, urea, nitric acid, ammonium nitrate, ammonium chloride, ammonium phosphate and complex fertilizers.

## UNIT-II (8 Lectures)

Sulphur and sulphuric acid, manufacture of sulphuric acids,

hydrochloric acid and other chemicals like –Aluminum sulphate and alum, Cement manufacture, Magnesium compounds.

## UNIT-III (11 Lectures)

Polymerization, classification, degree of polymerization, functionality of Polymers, Types Polymerization: addition and condensation polymerization, Preparation, properties and uses of polythene, PVC, Teflon, nylon-6, Bakelite and Silicones.

Manufacture of phenols, formaldehyde, vinyl chloride and vinyl, acetate, manufacture of phenol- formaldehyde resin and polyvinyl chloride polymer, SBR.

## UNIT-IV (10 Lectures)

Oils: Definition, constitution, extraction of vegetable oils, refining and hydrogenation of oils.

Soaps and detergents: Definitions, continuous process for the production of fatty acids, glycerin and soap, production of detergents.

Lubricants, lubrication, functions of lubrication, mechanism of lubrication-thick film, thin film and extreme pressure lubrication, types of lubricants- solid, semisolid and liquid lubricants- their properties

## UNIT-V (10 Lectures)

Pulp and paper industry: methods of pulping, production of sulphate and sulphite pulp, production of paper –wet process

### FUELS:

Classification, characteristics of fuel, calorific value – determination of calorific value by Bomb calorimeter, Analysis of coal - Proximate and ultimate analysis of coal, Petroleum: classification based on sources of petroleum, Refining of petroleum, Knocking, octane value, cetane value, Cracking-thermal cracking and catalytic cracking-fixed bed & moving bed catalytic cracking, reforming

## TEXT BOOKS:

1. Austin. G.T., *"Shreve's Chemical Process Industries"*, McGraw-Hill, 5th Edition,1985.

2. Gopal Rao M. and Sittig M., "*Dryden's Outlines of Chemical Technology*", 3rd Edition, East–West Press Pvt Ltd., New Delhi, 2000.

**REFERENCE:**

1. Davis K.H., Berner F.S., and Bhatia S.C., "*Hand book of Industrial Chemistry Vol 1and II*", CBS publishers, India, 2004.