

# The Complete Technology Book on Detergents (2nd Revised Edition)

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**Format:** paperback

**Code:** NI92

**Pages:** 542

**Price:** Rs.1100US\$ 125

**Publisher:** NIIR PROJECT CONSULTANCY SERVICES

Usually ships within 5 days

The Indian detergent industry is about three decades old. An interesting and unique feature of detergent industry in India is the existence of non power operated units which do not use any electrical power for the production of detergent powder. But the production technology of detergents have been changed involving high technique in process control, more skilled personnel and requiring large input. There are various forms of detergents; liquid detergents, paste detergents, solid detergents etc. Whether in liquid or in powdered forms, present detergent products are complex mixtures of several ingredients including performance additives such as bleaches, bleach activators etc. The scope and spectrum of methods and techniques applied in detergent analysis have changed significantly during the last decade..

The book outlines features and experimental parameters for many essential procedures, and emphasizes the latest techniques and methods. This book emphasizes practical aspects of detergent production with latest development and other special products based on synthetic surfactants. This book basically deals with the builders, additives and components of detergents, recent developments in surfactant, manufacture of active Ingredients for detergents, manufacture of finished detergents, application and formulation of detergents, packaging of detergents, analysis of detergents, machinery photographs with their suppliers, directory of raw material suppliers etc.. This is an attempt to fill the need of those desirous of starting detergent industry in small scale sector and necessarily contains analytical methods for testing and evaluation of raw as well as final products.

## 1. Introduction

Definition

Biodegradability

Synthetic Detergents

Introduction

Surfactant Hydrophile-Hydrophobe Balance

Anionic Surfactants

Alkylaryl Sulfonates

Sulfonation

Sulfation

Neutralization

Nonionic Surfactants

Ethoxylation

Amphoteric Surfactants

Alkylolamides  
Cationic Surfactants

## 2. Builders, Additives and components of detergents

Phosphates

Silicates

Soluble glass

Water glass

Soluble powders

Contribution by the alkaline radical

( $\text{Na}_2\text{O}$  or  $\text{K}_2\text{O}$ )

Contribution by the  $\text{SiO}_2$  radical

Zeolites

Carbonates

Sodium Carbonate or Soda Ash- $\text{Na}_2\text{CO}_3$

Sodium Bicarbonate- $\text{NaHCO}_3$

Sodium Sesquicarbonate, or Modified Soda

Potassium Carbonate

Oxygen-releasing Compounds

Sundry Inorganic Builders

Borax

Sodium Chloride

Magnesium Sulphate

Insoluble Inorganic Fillers

Caustic Alkalis

Ammonia

Colloidal Silica

Sodium Hypochlorite

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Sulphation of glycerine

Nonionic surfactants

Amphoteric surfactants

Anionic surfactants

Nonionic surfactants

Cationic surfactants

Amphoteric surfactants

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Surfactant synthesis

Toxicological studies

Effluent decolorisation

Synthesis of Surfactants and their Toxicity-IV

Diastereoisomers

Fructose  $\text{C}_6\text{H}_{12}\text{O}_6$

Saccharose or sucrose or table sugar

$\text{C}_{12}\text{H}_{22}\text{O}_{11}$

D-Mannose

D-Galactose

$\beta$ -Glucosamine

Anionic surfactants

Cationic surfactants

Nonionic surfactants  
Sugar-based surfactants  
Toxicity of surfactants

#### 4. Manufacture of Active Ingredients for Detergents

Sulphonation Process

Manufacture of Alkyl benzene sulphonic acid (Acid Slurry)

Alkyl benzene

Process to obtain straight chain normal paraffins of desired chain length

Major technologies using molecular sieves for separation of n-paraffins

Process for alkylation of benzene by narrow cut (C10-C14) n-paraffin

Review of technologies for production of LAB from n-paraffins

UOP technology to manufacture lab from kerosene

Prefractionation unit

Feed preparation (hydrotreater) unit-hydrobon n-Paraffin Extraction Unit (MOLEX)

Catalytic partial dehydrogenation unit-PACOL HF alkylation unit

Advance in technology in production of LAB  
Improvements in dehydrogenation catalysts and process

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Introduction of a solid catalyst in place of liquid HF catalyst-UPO-Detal Process

Other raw materials for sulphonation

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Liquid SO<sub>3</sub>

Sulphur

Sulphonation with sulphuric acid and oleum

Batch sulphonation

Manufacturing process

Sulphonation with 98% sulphuric acid

Sulphonation with oleum

Continuous sulphonation with oleum

Chemithon Process

Bellestra sulfan process

Proctor & Gamble Process

Rifenberick process

Sulphonation with SO<sub>3</sub>

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Stabilised liquid sulphur trioxide

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Sat, 17 May 2025 08:04:41 +0000