Soaps and detergents are used frequently in our daily life. We use them to wash our hands and clean our clothes without ever really paying attention to how they work. Beneath the plain white surface of a bar of soap lies an intriguing history and a powerful chemistry. It has been said that amount of soap and detergent consumed in a country is a reliable measure of its civilizations. There was a time when these products were luxury; now it is a necessity. A disinfectant or agent that frees from infection is ordinarily a chemical agent which kills disease germs or other harmful microorganisms and is applied to inanimate objects. The specific way in which a disinfectant agent is used is dependent on both the desired objective and the infectious agent present. The term detergent by itself refers specifically to laundry detergent or dish detergent, as opposed to hand soap or other types of cleaning agents. Detergents are commonly available as powders or concentrated solutions. Detergents work because they are amphiphilic partly hydrophilic (polar) and partly hydrophobic (non polar). Their dual nature facilitates the mixture of hydrophobic compounds (like oil and grease) with water. Because air is not hydrophillic, detergents are also foaming agents to varying degrees. Completely non polar solvents known as degreasers can also remove hydrophobic contaminants but may not dissolve in water because of a lack of polar elements. Soaps are mainly used as surfactants for washing, bathing, and cleaning, but they are also used in textile spinning and are important components of lubricants. Soap is a mixture of sodium salts of various naturally occurring fatty acids. Soaps and detergents are very similar in their chemical properties. However, there is a significant difference between them; soaps are produced from natural products, and detergents are synthetic, or manmade. The market is expected to grow at rates ranging from under 4% to around 4.5%. These are very modest rates considering that the lifestyles not only of urbanites, but even of well off rural folks are changing at a very high pace. The analysts are expecting the industry to continue to grow in both the industrialized as well as developing nations.

Some of the fundamentals of the book are technology of soap making, washing of saponified soap, plant for total soap making operation, construction materials for soap making plants, earth bleaching of oils, chemical bleaching, fatty acids, manufacture of framed soaps, manufacture of chips and flakes, manufacture of milled bars, the mazzoni process, floating soap bars, mixing of soap, chemicals used in soaps & detergents, alkylolamides, alkylolamides in shampoo formulations, chemistry of the alkylolamides, mono alkylolamides, di alkylolamides, pure dialkylolamides, phosphoxylated alkylolamides, sulphated alkylolamides, disinfectants and antiseptics, dry cleaning agents, etc.
The present book contains formulae, processes of different types of soaps, detergents and disinfectants. These products have good demand in domestic as well as in International market. So there is a very good scope for new entrepreneurs to venture into this field. This book is an invaluable resource for entrepreneurs, technocrats and for those who want to diversify in to this field.

Contents

1. SOAPS
   TECHNOLOGY OF SOAP MAKING
   HISTORICAL
   SOAP BOILING
   Equipment for Soap Boiling
   Selection of Fat Charge
   The Saponification Reaction
   Physical Chemistry of the Soap Kettle
   Graining Out and Washing
   Strong Change
   Finishing or Fitting Operation
   Countercurrent Washing
   Soap from Fatty Acids
   Miscellaneous
   SEMIBOILED AND COLD PROCESSES
   Semiboiled Soaps
   Cold-Made Soaps
   CONTINUOUS SAPONIFICATION
   Mills Process
   Sharples Process
   The De Laval Process
   The Monsavon Process
   Lye Absorption
   Saponification Loop
   Saponification of Distilled Fatty Acids
   Alfa Laval Continuous Saponification
   WASHING OF SAPONIFIED SOAP
   PLANT FOR TOTAL SOAPMAKING OPERATION
   CONSTRUCTION MATERIALS FOR SOAPMAKING PLANTS
   Earth Bleaching of oils
   Chemical Bleaching
   Fatty Acids
   Lye Treatment
   Storage of Raw Lye
   OUTPUT OF SOAP AND GLYCERINE
   Analysis of Oils
   Ester Value of Oils
   FATTY ACIDS
   Manufacture from Glycerides
   SOAP-MAKING WITH FATTY ACIDS
   Tall Oil
   Whole Tall Oil
   Tall Oil Refining
Tall Oil Soaps
GLYCERIN
Crude Glycerin
Purification
Synthetic Glycerin
CLASSIFICATION OF SOAP PRODUCTS
Spray Drying
MANUFACTURE OF FRAMED SOAPS
MANUFACTURE OF CHIPS AND FLAKES
MANUFACTURE OF MILLED BARS
THE MAZZONI PROCESS
FLOATING SOAP BARS
Mixing of Soap
Preservatives
Perfumes
Colours
Opacifiers
Optical Brighteners
Superfatting Agent
Structurants
Bactericides and Germicides
Miscellaneous Additives
Soapmaking
Fat Charge Control
Colour of Soap Base
Free Alkali and Chloride
Unsaponified Fat
Glycerol in Soap
METHODS OF ANALYSIS
Sampling
Procedures
Separation
Identification
DETERMINATION OF SOAP COMPOSITION
DETERMINATION OF INORGANIC FILLERS AND SOAP BUILDERS
DETERMINATION OF OTHER ADDITIVES
DETERMINATION OF IMPURITIES
OTHER QUALITY CONTROL TESTS
ANALYSIS OF SOAPS CONTAINING SYNTHETIC DETERGENTS
ANALYSIS OF METALLIC SOAPS
SOAP AND OTHER SURFACE-ACTIVE AGENTS
Theory of Surface Action
Quantitative Relationships
Defoaming
Emulsification
Wetting of Solids
Miscellaneous Effects of Adsorption on Solid Surfaces
Detergency
PHYSICAL CHEMISTRY OF SOAPS AND RELATED MATERIALS
Phase Behaviour of Aqueous Systems
Phase Behaviour of Solid Soaps
Nature of Dilute Solutions
Structure of Micelles and Solubilization
Surface and Interfacial Tensions
COMMERCIAL SOAP PRODUCTS
Raw Materials
Production and Consumption
Characteristics of Soaps Saponified by Different Methods
Effect of Different Factors on Physical Characteristics of Bar Soaps
Types of Commercial Soap
SURFACE-ACTIVE AGENTS OTHER THAN SOAP
Classification of Surfactants
List of Surfactants
Production and Consumption
Ampholytic Surfactants
Detergents
Wetting Agents
Emulsifying Agents

2. DETERGENTS
PRODUCTION OF DETERGENT ACTIVE
Introduction
Choice of Alkylate
Sulphonation
CHOICE OF SULPHONATION PLANT
SIDE REACTIONS DURING SULPHONATION
SUISIONATION PRACTICE
SULPHONATION OF ALPHA OLEFIN
NEUTRALISATION/HYDROLYSIS
CHEMITHON TECHNOLOGY
Storage and Handling
DERIVATION OF FATTY ALCOHOLS
General Outline
PROCESS BASED ON NATURAL FATS
PROCESS BASED ON ETHYLENE SOURCE
SULPHATION OF FATTY ALCOHOLS
CONTINUOUS PROCESS FOR FATTY ALCOHOL SULPHATES
PREPARATION OF DETERGENT GRANULES AS FINISHED PRODUCT
PROCEDURE
Acid Slurry
Alkali Solution
ADDITIVES TO DETERGENT ACTIVES
Inorganic Additives
Phosphates
Zeolites
Silicates
Carbonates
Bleaches
Other inorganic builders and fillers
Organic Additives
Anti-redeposition agents
Optical brighteners (OB)
Foam boosters
Enzymes
Chelating agents
Hydrotopes
Bacteriostats
MANUFACTURE OF SYNTHETIC DETERGENT POWDER
BY SPRAY DRYING
Outline of the Spray Drying Process
Slurry Preparation
Kinetics of Hydration of STPP
Dosing of Ingredients
Slurry Handling
Spray Drying
PRODUCTION OF DETERGENT POWDER BY DRY MIXING
Dry-Mixing Process
Machine-Mixing
Formulations
Compact Detergents
METHODS OF ANALYSIS
Sampling
Separation
Procedure
IDENTIFICATION OF COMPONENTS
DETERMINATION OF SURFACTANTS
Total Organic Active Ingredient
Anionic Detergents
Cationic Detergents
Nonionic Detergents
DETERMINATION OF COMPONENTS OTHER THAN SURFACTANTS
Abrasives
Ammonia
Carbonates
Carboxymethylcellulose
Chlorides and Available Chlorine
Enzymes
Ethanol and Isopropyl Alcohol
Ethylenediaminetetraacetate
Fatty Acids
Glycerine
Hydrotropes
Metallic Impurities
Neutral Oil (Free Oil) and Free Fatty Alcohol
Perborates
Phosphates
Silicates
Steam-Distillable Maller
Sulfates
Water
DETERMINATION OF PROPERTIES
Performance Tests

3. CHEMICALS USED IN SOAPS & DETERGENTS
ALKYLOLAMIDES
Introduction
Alkylolamides in Shampoo Formulations
CHEMISTRY OF THE ALKYLOLAMIDES
Mono-alkylolamides
Di-alkylolamides
Pure Di-alkylolamides
Phosphorylated Alkylolamides
Sulphated Alkylolamides
FOAM STABILIZATION
MANUFACTURE OF ALKYLOLAMIDES
Coconut Fatty Acid Diethanolamide
Lauric Acid Diethanolamide
Oleic Acid Monoethanolamide
Stearic Acid Monoethanolamide
FORMULATION OF SHAMPOOS
N-ACYL-N-ALKYLTaurATES
Introduction
Applications of Igepon T Products
Future of Igepons
MANUFACTURE OF IGEPON T
Raw Materials
Oleic Acid Chloride
Igepon T Gel
Igepon T Powder
Chemical Control
Utilities
Materials of Construction
ALKYL SULFATES
Introduction
Manufacture of Alcohols
PROPERTIES AND PERFORMANCE CHARACTERISTICS OF ALKYL SULFATES
Krafft Point
Critical Micelle Concentration
Surface and Interfacial Tensions
Wetting Time
Foam Height
Detergency
Dishwashing Test
Emulsion Stability
MANUFACTURE OF ALKYL SULFATES
Sulfation with Chlorosulfonic Acid
Sulfation with Sulfuric Acid
Sulfation with Sulfur Trioxide
Manufacture of Alkyl Sulfated on Large Scale
FORMULATED PRODUCTS FROM ALKYL SULFATES
OLEFIN SULFATE & SULFONATES
Introduction
OLEFIN SULFATES
Introduction
RAW MATERIALS AND PRODUCT COMPOSITION
Olefin Sulfates from Shale Oil
OLEFIN SULFATE FROM WAX-CRACKED DISTILLATES
Sulfation
Neutralization and Hydrolysis
Evaporation
Finishing
Solvent Recovery
OLEFIN SULFONATES
Introduction
Products of Sulfonation
MANUFACTURE OF OLEFIN SULFONATES
Introduction
Batch Sulfonation
Continuous Sulfonation
Sulfonation with Dioxane-SO₃
CHARACTERISTICS & SURFACE ACTIVE PROPERTIES OF OLEFIN SULFONATES
FORMULATION OF HEAVY-DUTY DETERGENTS WITH OLEFIN SULFONATES
ETHOXYLATION PROCESSES
Introduction
ETHOXYLATED ALKYL PHENOLS
Laboratory Method of Preparation
Batch Ethoxylation Unit
Properties of Ethoxylated Alkyl Phenols
ETHOXYLATED FATTY ALCOHOLS
Introduction
Laboratory Method of Preparation
Continuous Ethoxylation Unit
Properties of Ethoxylated Fatty Alcohols
Solubility
Cloud point
Surface and interfacial tension
Detergency
Wetting properties
Foaming properties
Emulsifying properties
ETHOXYLATED FATTY ACIDS
Introduction
Manufacture
Properties of Fatty Acid Ethoxylates
ETHOXYLATED FATTY AMINES
FORMULATIONS
ALKYL PHENOL ETHER SULFATES
Introduction
Sulfation and Sulfonation
MANUFACTURE OF ALKYL PHENOL ETHER SULFATES
Sulfamation
Nonylphenol 4-ethoxy Sulfate
Di-(isohexyl/isodecyl) Phenol Ether Sulfate
Dodecylphenol Ether Sulfate
Sulfation with Sulfur Trioxide
Comparison of Sulfation with Sulfur Trioxide and Sulfamic Acid
PROPERTIES-AND PERFORMANCE CHARACTERISTICS OF ALKYL PHENOL ETHER SULFATES
ALKYL ETHER SULFATES
Introduction
PROPERTIES & PERFORMANCE CHARACTERISTICS OF ALKYL ETHER SULFATES
Individual Alkyl Ether Sulfates
Tallow Alcohol Ether Sulfates
MANUFACTURE OF ALKYL ETHER SULFATES
Process Development
MANUFACTURE OF ALCOHOL ETHER SULFATES
FORMULATED PRODUCTS FROM ALKYL ETHER SULFATES
FATTY AMINE OXIDES
Introduction
MANUFACTURE OF FATTY AMINE OXIDES
Routes to Fatty Amines
Amine Oxidation
Commercial Synthesis
PROPERTIES AND ANALYSIS OF FATTY AMINE OXIDES
Amine Oxide Properties
Analytical Methods
FORMULATIONS AND USE OF FATTY AMINE OXIDES
Light-duty Liquids
Heavyduty Formulations
BISQUATERNERY AND OTHER CATIONIC SOFTENERS
Introduction
PREPARATION OF BISQUATERNERIES
PERFORMANCE EVALUATION OF SOFTENERS
Multiwash Softeners Evaluation
Softness Evaluation
Rewettability Measurements
PERFORMANCE CHARACTERISTICS OF BISQUATERNERIES AND OTHER CATIONICS AS SOFTENERS
Softener Concentration
Fabric Rewettability Measurements
OTHER MISCELLANEOUS SURFACTANTS
Alkyl Naphthalene Sulfonates
Introduction
General Method of Manufacture
Nekal BXG
Nekal BX Extra Strong
Dibutyl Naphthalene Sulfonate
Diamyl Naphthalene Sulfonate
SULFATED ALKYLOLAMIDES
Introduction
Igepon B Paste
Igepon C Paste
SODIUM B-SULFOETHYL ESTERS OF FATTY ACIDS
Introduction
Manufacture of Igepon A
POLYETHYLENE GLYCOL FATTY ACID ESTERS
Introduction
Manufacturing Process
Fatty Acid Esters of Sucrose
N-ACYLSARCOSINATES
Introduction
Manufacture of Sodium N-oleylsarcosinate
SULFATED MONOGLYCERIDES
Introduction
Manufacture
4. BLEACHING AGENTS
History
Mechanism of Bleaching
Bleaching Strength
Methods of Analysis
Identification
ASSAY METHODS
Chlorine-Containing Bleaches
Procedure
Oxygen-Containing Bleaches
DETERMINATION OF IMPURITIES
Methods of Evaluation
BLEACHED TEXTILE PRODUCTS
BLEACHED PULP AND PAPER
Handsheets for Testing of Pulp
Physical Testing of Pulp Handsheets
Brightness of Pulp
Brightness Reversion
Disperse Viscosity of Pulp
Physical Testing of Paper and Paperboard

5. DRY CLEANING AGENTS
STODDARD SOLVENT
Specification Tests
PERCHLOROETHYLENE
Specification Tests
FLUOROCARBON SOLVENT
DRYCLEANING DETERGENTS
Methods of Analysis
Specification Tests
Procedure
PERFORMANCE TESTS
CHEMICAL FABRIC FINISHES

6. DISINFECTANTS AND ANTISEPTICS
GENERAL EVALUATION METHODS
ALCOHOLS
PHENOLS
Methods of Analysis
Separation and identification
Procedure
DETERMINATION IN MIXTURES
BISPHENOLS
Methods of Analysis
Identification
Specification Tests
DETERMINATION IN MIXTURES
SALICYLANILIDES AND CARBANILIDES
Methods of Analysis
HALOGENS AND HALOGEN DONORS
Methods of Analysis
QUATERNARY AMMONIUM COMPOUNDS
Method of Analysis
Separation and indentification
ASSAY METHODS
DETERMINATION IN MIXTURES
Colorimetric Methods
Gravimetric Methods
Titrimetric Methods
MERCURIALS
Inorganic Mercurials
Organic Mercurials
Methods of Analysis
DETERMINATION IN MIXTURES
ALDEHYDES
Methods of Analysis
DETERMINATION IN MIXTURES
EPOXIDES
Methods of Analysis
DETERMINATION IN MIXTURES
GUANIDINE DERIVATIVES
Method of Analysis

About NIIR

NIIR PROJECT CONSULTANCY SERVICES (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.


NPCS also publishes varies process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.