

# Herbal Soaps & Detergents Handbook

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The use of herbs for medicinal and cosmetic purpose goes back to the ancient times. The emphasis at the present hour has been laid on the spectacular growth of the herbal and ayurvedic products. The demand in past is found to have increased with increase in number of middle class population. People are now a days very much aware of the ingredients in cosmetic products, the benefits of plant products and the harmful effects of chemical ingredients. The presence of artificial and chemical ingredients in cosmetic products has made people to rethink about suitable alternatives to suit their personal care regime. The herbal products have finally made their appearance in packaged form in the domestic markets, as cosmetics and personal care preparation such as soaps, shampoos, detergent bars, liquid soaps, liquid detergents, etc. These products play a vital role in our sense of well being and quality of life. The herbal soaps and detergents directly influence our emotions and can trigger moods. These creations not only protect the skin from harmful sun radiations but also leave behind a pleasant fragrance. Due to the increasing awareness and importance of cleanliness and healthiness, the use of herbal products is also increasing. Future demand for herbal products depends upon the per capita rate of consumption and segment of population using these products.

This handbook provides detailed information on the manufacturing process of herbal soaps and detergents. This book contains numerous formulae, manufacturing process of different type of soaps and detergents which are used in day to day life. The book is an unique compilation and will be very helpful to all its readers, new entrepreneurs, professionals, beauty care product manufacturers, existing units, technical institutions, etc.

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Filler  
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Foaming Agents Used in Soap  
Solvents  
Medicaments/Deodorants/Bacteriostatic agents  
Clarifiers  
Colouring Matters  
Preparation of Colours  
Water Soluble  
Oil Soluble  
Alcohol Soluble  
Milled Soaps  
For a batch of 100 kg. soap colour required is  
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The oil soluble colours recommended are  
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Medicated Soaps  
Perfumes  
(Comprehensive Details)  
Essential Oils  
Isolates  
Synthetic Chemicals  
Fixatives (Listed in Table 4)  
Important Essentials, Isolates, Synthetic Odourous  
Chemicals and Fixatives  
Isolates  
Synthetic Odourous Chemicals  
Fixatives

Raw Materials : Herbal Products  
Acacia arabica  
A. indica Benth  
Parts Used : Bark, gum, leaves, seeds, pods.  
Acalypha Indica  
(N.O. - Euphorbiaceae)  
ANDROPOGON MURICATUS. Retz. or A. Squarrosus  
Angelica (Angelica archangelica)  
Anise (Pimpinella anisum)  
Associated Oil  
AZADIRACHTA INDICA  
Basil (Ocimum basilicum)  
BALSAMODENDRON MUKUL, HOOK. or B. agollocha  
Parts Used - Gum  
BALSAMODENDRON MYRRHA  
(N.O. Burseraceae)  
Parts Used : Gum from the bark of the tree  
Bay (Laurus nobilis)  
Associated Oils

Benzoin (*Styrax benzoin*)  
 Associated Oils  
 Bergamot (*Citrus bergamia*)  
 Birch (*Betula lenta*)  
 Associated Oils  
 Calendula (*Calendula Officinalis*)  
 Associated Oil  
 Caraway (*Carum carvi*)  
 Cardamom (*Elettaria cardamomum*)  
 CITRUS MEDICA, Linn  
 (N.O.—Rutaceae)  
 Carrot Seed (*Daucus carota*)  
 Caulophyllum Inophyllum  
 Cedarwood (*Cedrus species*)  
 Cinnamon (*Cinnamomum zeylanicum*)  
 Associated Oils  
 Clary Sage (*Salvia sclarea*)  
 Associated Oils  
 Celery (*Apium graveolens*)  
 Chamomile, German  
 (*Matricaria recutita*, formerly *M. chamomilla*)  
 Associated Oils  
 Coriander (*Coriandrum sativum*)  
 Curculigo orchioides Gaertn  
 (N.O.—Amaryllidaceae)  
 Ayurvedic Properties  
 CURCUMA LONGA, Linn  
 (N.O.—Scitamineae)  
 Associated Oil  
 Cypress (*Cupressus sempervirens*)  
 Eucalyptus (*Eucalyptus globulus*)  
 Associated Oils  
 Fennel (*Foeniculum vulgare*)  
 Associated Oil  
 Fir (*Abies alba* and other species)  
 Associated Oils  
 Associated Oils  
 FICUS RELIGIOSA LINN  
 (N.O. Moraceae)  
 Parts Used : Bark, Fruit, Root  
 Ayurvedic Properties  
 Galbanum (*Ferula galbaniflua*)  
 Associated Oils  
 Geranium (*Pelargonium graveolens*)  
 Associated Oil  
 Ginger (*Zingiber officinale*)  
 Associated Oil  
 Helichrysum (*Helichrysum angustifolium*)  
 Hyssop (*Hyssopus officinalis*)  
 Associated Oil  
 Inula, Sweet (*Inula graveolens*, or *I. odorata*)  
 Associated Oil  
 HEMIDESMUS INDICUS, R. BR.,

Asclepias pseudosarsa, var. latifolia  
 (N.O. Asclepiadaceae)  
 Jasmine  
 (Jasminum officinale and J. grandiflorum)  
 Associated Oil  
 Juniper (Juniperus communis)  
 Associated Oils  
 Labdanum (Cistus labdaniferus)  
 Associated Oils  
 Lavender (Lavandula angustifolia, previously L. vera and L. Officinale)  
 Associated Oils  
 Lemon (Citrus limon)  
 Associated Oil  
 Associated Oils  
 Lemongrass Cochin (C. flexuosus)  
 Grown in India primarily for isolation of citral  
 Lovage (Levisticum officinale)  
 Marjoram  
 (Origanum marjorana or Marjorana hortensis)  
 Associated Oils  
 Melissa (Melissa Officinalis)  
 Associated Oil  
 Mimosa (Acacia decurrens var. dealbata)  
 Associated Oil  
 Myrrh (Commiphora myrrha)  
 Associated Oils  
 Myrtle (Myrtus communis)  
 Oakmoss (Evernia prunastri)  
 Associated Oil  
 Orange (Citrus sinensis)  
 Associated Oils  
 Orange Blossom (Neroli)  
 (Citrus aurantium var. amara)  
 Associated Oils  
 Patchouli (Pogostemon cablin)  
 Pepper, Black (Piper nigrum)  
 Associated Oils  
 Cubeb (Piper cubeba)—A litsea substitute  
 Peppermint (Mentha piperita)  
 Associated Oils  
**PSORALEA CORYLIFOLIA LINN.**  
 (N.O. Papilionaceae, Fabaceae)  
 Parts Used : Roots, leaves, fruits, seeds  
 Ayurvedic Properties  
 Ravensare (Ravensara aromatica)  
 Rose (Rosa damascena, R. gallica, and others)  
 Associated Oils  
 Rosemary (Rosmarinus officinalis)  
 Associated Oils  
 Rosewood (Aniba rosaeodora)  
 Sage (Salvia officinalis)  
 Sandalwood (Santalum album)

Associated Oil  
Spikenard (*Nardostachys jatamansi*)  
Associated Oils  
SMILAX CHINA  
(N.O. - Liliaceae)  
TERMINALIA CHEBULA RETZ.  
(N.O. Combretaceae)  
Parts Used : Fruit  
Ayurvedic Properties  
TERMINALIA BELERICA ROXB  
(N.O. Combretaceae)  
Parts Used : Fruit (unripe and ripe)  
Ayurvedic Properties  
Healing Power and Curative Properties  
Cough  
Stomach Disorders  
Sore Throat  
Chronic Constipation  
Intestinal Worms  
Eye Disorders  
Other Diseases  
Tea Tree (*Melaleuca alternifolia*)  
Associated Oils  
Thyme (*Thymus vulgaris*)  
Associated Oils  
Thymus vulgaris has many chemotypes  
Tuberose (*Polianthes tuberosa*)  
Vanilla (*Vanilla planifolia*)  
Vetiver (*Vetiveria zizanoides*)  
Violet (*Viola odorata*)  
Associated Oil  
Yarrow (*Achillea millefolium*)  
Ylang-Ylang (*Cananga odorata*)  
Associated Oils

Preparation and Properties of Surface Active Agents from Castor Oil  
Manufacture of Turkey Red Oil  
Preparation of Esters by Alcoholysis  
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Hexane Extraction of the Sulphated Product  
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Cottonseed Oil for Soapstock  
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## Development and Application of New Herbal Functional Surfactants

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Narrow distribution ethoxylate ('Peaked' ethoxylates)  
and its derivatives  
Biodegradable surfactants  
Surfactants arising from natural materials  
Reactive Surfactants  
Effect of TREM LF-40 concentration (2.03 mM initiator)  
on the particle size of poly (vinyl acetate) latex particles

## Herbal based Soaps & Shampoos

Formulations for Herbal Washing Soaps  
Hard Fats are  
Soft Fats are  
Some Suggested Formulations for Washing Soaps  
Good Quality  
Cheaper Quality  
A Typical Batch for Herbal Based Toilet Soap  
Oriental type  
Perfume mixture as formulated below  
Perfumes as formulated below  
Perfume Mixtur  
Formulation of fancy Soap Type  
Perfume Mixture  
Himalayan Boquet Type  
Perfume Mixture  
Rose Soap Type  
Perfume Mixture  
Transparent Soap – No. 1.  
(glycerine soap of market)  
A suggested formulation  
Transparent Soap-No.2  
(by special milling method)  
Mottled Soap  
Carboli Acid Soap  
Suggested Formulation  
Procedure  
Medicated Soaps  
Castile Soap  
CASTILE SOAP BY BOILING PROCESS  
Process Description  
Some Suggested Formulations for Castile Soap  
Translucent Coconut Oil Soap  
Some Suggested Formulations for Disinfectant

Liquid Antiseptic Soap

Deodorant Soaps

Combination in Soap No. 1.

Combination in Soap No. 2

VARIOUS INDUSTRIAL SOAPS

Textile Soaps

Some of the uses are

Textile Bleaching-Washing Soap Powder

Laundry Soap Formulations

More Formulations

Laundry Washing Aids

More Laundry Wash Mixtures

(Soap and Sodium Metasilicate Solution)

A Fabric Cleaning Compound

Cotton Scouring Soap

Dry Cleaner's Soap

A suggested Formulation of Dry Cleaner's Soap

WATER SOFTNER

(Chemicals which may be used for prevention of soap curds)

JELLY SOAP/ SOFT SOAP

AUTOMOBILE SOAP

WIRE DRAWING SOAP

SCOURING SOAP

PREPARATION OF WASHING SOAP POWDER

Simplified Method

SHAVING SOAPS

Procedure

A Typical Charge

Shaving Cream

A Typical Charge

Other Formulation

Brushless/Latherless Shaving Cream

LIQUID SHAVING CREAM

Basic Combination

Thicker Cream

Aerosol Package

Liquid Soaps/Shampoos

Process of Manufacture

EQUIPMENTS

LIQUID TOILET SOAP CONCENTRATES

Some suggested Formulations

For Office use

For Workshop use

Soap Bubble Liquid

LIQUID WASHING SOAP CONCENTRATE

SHAMPOOS

Classification

Physical States

Characteristics

Various Additives of Shampoos Imparting Special Properties

Solubilizer

Opacifiers

Thickeners for Body or Viscosity



Foam Stabilizers  
Conditioning Agents  
Agents for Resistance of Hard-Water  
Germicidal Agents  
Preservatives  
SOAP SHAMPOOS  
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Modern Methods  
Some Typical Formulations  
SHAMPOOS BASED ON SYNTHETIC HERBAL SURFACTANTS  
GENERAL FORMULATIONS  
Liquid Cream Shampoos and Paste Cream  
A General Formulation  
Foamless oil Shampoos  
A Formulation  
Baby Shampoos  
Medicated Dandruff Shampoos  
Other miscellaneous shampoos  
Aerosol Shampoos (Pressure Dispersed)  
HERBAL TOILET SOAPS  
To Prevent Pimples  
To Fight Dandruff  
To Kill Germs  
To Prevent Prickly Heat  
HERBAL SHAMPOOS  
Lime Shampoo  
Lavender Shampoo  
Methi-Shikakai Shampoo  
Sandalwood Shampoo  
Neem Shampoo  
Hair Rinses  
Apple Hair Rinse  
Barley Hair Rinse  
Chamomile Hair Rinse  
Rosemary-Chamomile Hair Rinse  
Rosemary Hair Rinse  
Hair Setting Preparations for all Hair Types  
Bay-Rum Hair Setting Preparation  
Clove Hair Setting Preparation  
Gum Tragacanth Hair Setting Preparation  
Lime Hair Setting Preparation  
HAIR CONDITIONERS FOR ALL HAIR TYPES  
Avocado Hair Conditioner  
Sunflower Hair Conditioner  
Wheat Hair Conditioner  
Shampooing  
ANTI-DANDRUFF PREPARATIONS FOR ALL HAIR TYPES  
Anti Dandruff Lemon Preparation  
Anti-Dandruff Egg Preparation  
Anti-Dandruff Vinegar Preparation  
Anti-Dandruff Sesame Preparation  
Anti-Dandruff Sesame Preparation  
Anti-Dandruff Rosemary Preparation

Technology of Manufacturing Herbal Synthetic Detergents

Performance Criteria

Washing habits

Quality of water

Soiling

White vs. coloured clothes

Manufacturing facilities

Safety and pleasant 'in-use' qualities

Colour, odour and flow characteristics

Shelf life

Pricing

Formulation Requirements

Alkalinity

Good building and active matter

Approach to Product Formulation

Non Soapy Detergent Powder Formulations

Production Procedure

FORMULATIONS OF SYNTHETIC DETERGENT POWDERS

A TYPICAL BATCH OF FINISHED PRODUCT

(A good quality household detergent granules)

For 1000 kg. yield

Surfactants

Builders

Additives

A TYPICAL BATCH USING ACID SLURRY OF

UNSEPARATED SPENT ACID

For 1000 kg. of finished detergent

Surfactant

Builders

Additives

Detergent Powder Prepared Without

Using Spray Dryer (High Bulk Density)

A TYPICAL FORMULATION OF HOUSEHOLD

DETERGENT POWDER

For 1000 kg. finished product

Procedure

Foam Regulation

Typical Suds Regulated Surfactant Compounds

General Formulations for Industrial Detergent Powder

Woollen Piece Goods Scouring Preparation

Formulation with anionic and soap as active surfactants

Light Duty

Machine Dish Washing Powder

Scouring Powders Including Kitchen Cleaners

Abrasives

Surfactants

Other Chemicals

Soap Powder

Manufacturing Process

Floor Washing Compound

Heavy-duty Household Washing Powder

White Household Heavy-duty washing Powder

Spray-dried Heavy-duty Household Hand-washing Powder

Household Spray-dried Powder

General-purpose Spray-dried Powder

General Purpose Powder

High-foam Food/Dairy Detergent Cleaner

Heavy-duty Detergent Powder

Light-duty Detergent Powder

General Formula for Detergent Powders

Spray-dried Enzyme Detergent

Medium-foam Detergent Powder

Glass Rinsing Sanitizer

Industrial Sanitary Cleaner

General Cleaning Compound

Dishwashing Compound

Heavy-duty Detergent

Household Laundry Bleach

Low Sudsing Detergent Powder

Hand Laundering Powder

Plastic-ware Destaining Compounds

Magic Dip Bleach

Purex Bleach

All-purpose Metal Cleaning Compound

Standards

Scheme for the Manufacture of Detergent  
powder on small scale

Land and Building

Projecting Cost

Plant and Machinery

Labour & Staff

Monthly Requirements of Raw Materials,  
Utilities and Factory Overheads

Working Capital (3 months basis)

Total Capital Investment

Own Capital Requirements

Factory cost of Production (Monthly Basis)

Profitability

Detergent Bars

Introduction

Requirements of a Detergent Bar

NSD Bar Vs. Soap

Components of Detergent Bars

Active detergent

Sodium tripolyphosphate

Talc

Starch

China clay

Calcite

Soda ash

Sodium sulphate

Sodium silicate

Coconut mono ethanolamide

Soapstock

Dicalcium phosphate  
Rosin  
Titanium dioxide  
Colour  
Fluorescer  
Perfume  
Water  
Processing of NSD Bars  
Handling of Raw Materials  
Processing  
Process Control  
Some Typical Formulations of Detergent Bar  
Formulations for detergent bar manufacture  
Plant & Machinery for Small Scale Detergent  
Cake Manufacture  
Kneader  
Milling Machine  
Plodder  
Bar Cutter or Billet Cutter  
Embossing or Stamping Machine  
Pulverizer  
Formulations of Detergent Cakes  
Soap-Surfactant Combination  
Detergent Bar  
Low-soap Syndet Bar  
Soap-Synthetic All-purpose Bar  
All Syndet Bar  
Alkyl-Sulfate Syndet Bar  
Proctor & Gamble's Soap Syndet Formulation  
Proctor and Gambler's Syndet Laundry Bar  
SCHEME FOR THE MANUFACTURE OF  
DETERGENT CAKES ON SMALL SCALE  
Capacity : 1 tonne per day per shift basis  
Land and Building  
Projecting Cost  
Plant and Machinery  
Monthly requirements of Raw Materials, Utilities and Factory  
Overheads  
Labour and Staff  
Working Capital requirements (3 months basis)  
Total Capital Investment  
Own Capital Requirements  
Cost of Production (Monthly Basis)  
Profitability

Herbal Liquid and Paste Detergents  
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Surfactants most commonly used  
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Viscosity Controllers  
Other Ingredients  
HOUSEHOLD LIQUID DETERGENTS FOR LAUNDERING

Heavy Duty

Manufacture of Paste Detergents

FORMULATIONS OF LIQUID AND PASTE DETERGENTS

Heavy Duty liquid Detergents

A few formulations are listed in Table 2

Light Duty Detergents

Liquid Shampoo

Liquid Shampoo Formulation

TYPICAL FORMULATIONS

Opaque viscous solution

Procedure

Light Duty : (for silk, wool etc.)

TYPICAL FORMULATIONS

Procedure

Shampoos

Rug Cleaning Liquid Detergent Formulations

A Recommended Formulation

Heavy-duty Liquid Detergents

Heavy-duty Liquid Detergent with 'Controlled

Opaque Lotion-type Light-duty Liquid Detergent

Light-duty Household Liquid Detergent

40% Detergent Paste

20 % Detergent Paste

Metal Degreasing Liquid Detergent

General-purpose Solvent-based Detergent

Textile Scouring Paste

Textile Degumming Detergent Paste

Low Foaming Liquid Detergents

Other Formulations of Synthetic Liquid Detergents

Light-duty Liquid Detergent

Light-duty Liquid Detergent for Dishwashing

Household Liquid Detergent Cleaner

Light-duty Clear Detergent Liquids

Light-duty Liquid Detergent Lotion

Heavy-duty Liquid Detergent

Scheme for the Manufacture of Liquid

Detergents on Small Scale

Land and Building

Projecting Cost

Plant and Machinery

Labour and Staff

Monthly Requirements of Raw Materials,

Utilities & Factory Overheads

Working Capital Requirements (3 months basis)

Total Capital Investment

Own Capital Requirements

Cost of Production (Monthly basis)

Profitability

Determination of Physical, Surface Active and Performance Characteristics of Surfactants

Physical Characteristics

Density of Powdered Detergents

Apparent Bulk Density

Apparent density, g/ml = 40/V  
Cup Density  
Particle Size of Powdered Detergents  
Hand Sieving  
Machine Sieving  
pH and Alkalinity  
Free Alkalinity  
Cloud Point of Non-ionic Detergents  
Viscosity  
Surface-Active Properties  
Ring Method  
Experimental Procedure  
Determination of Surface Tension  
Determination of Interfacial Tension  
Calculation of Surface Tension  
Calculation of Interfacial Tension  
Correction Factor 'F' for the Ring Method Factor 'F' for  
PERFORMANCE CHARACTERISTICS  
Dishwashing Tests  
Laundry Evaluation  
Split Item Tests  
Bundle Test  
Foam Tests  
Dynamic Foam Test  
Pour Foam Test  
Wetting Test  
Canvas Disc Test  
Skein Test

Analysis of Surfactants  
Separation of Surfactants  
IDENTIFICATION OF COMPONENTS  
Anionics  
Cationics  
Non-ionics  
DETERMINATION OF SURFACTANTS  
Total Organic Active Ingredient  
Procedure  
Correction for Sodium Chloride Content  
ANIONIC SURFACTANTS  
Preliminary Estimate of Mol. Wt.  
Titration with Cationic Surfactants  
Preparation and Standardization of Titrant  
Titration of Sample  
Amine Complexation Method  
Determination of Alkylaryl Sulfonates  
Determination of Alkylaryl Sulfonates in the  
Presence of Short Alkyl Chain Sulfonates  
Determination of Fatty Alcohol Sulfates  
CATIONIC SURFACTANTS  
Determination of Amine Oxides  
Non-Ionic Surfactants  
Column Techniques

## Batch Technique

### Analysis of Fats and Fatty Oils

#### Methods of Analysis

#### DETERMINATION OF PROPERTIES

##### Physical Characteristics

##### Procedure

##### Procedure

##### Chemical Characteristics

##### Procedures

#### COMPOSITION ANALYSIS

##### Gas Chromatography

##### Procedures

##### Spectroscopic Methods

##### Procedure

#### OTHER TESTS

##### Procedure

### Analysis of Detergents

#### Methods of Analysis

##### Sampling

##### Separation

##### Procedure

#### IDENTIFICATION OF COMPONENTS

##### Procedures

##### Infrared Absorption Bands of Typical Commercial Detergents

##### Typical Analysis of a Linear Alkylate Sample

##### Procedure

#### DETERMINATION OF SURFACTANTS

##### Total Organic Active Ingredients

##### Procedure

##### Anionic Detergents

##### Procedure

##### Procedure

##### Cationic Detergents

##### Procedure

##### Nonionic Detergents

##### Procedure

#### DETERMINATION OF COMPONENTS

#### OTHER THAN SURFACTANTS

##### Abrasives

##### Procedure

##### Ammonia

##### Procedure

##### Carbonates

##### Procedure

##### Carboxymethylcellulose

##### Chlorides and Available Chlorine

##### Procedures

##### Enzymes

##### Procedure

##### Ethanol and Isopropyl Alcohol

##### Specific Gravity of Ethanol-Water Solutions at

Varying Concentrations

Specific Gravity of Isopropyl Alcohol-Water

Solutions at Varying Concentrations

Procedure

Fatty Acids

Procedure

Glycerine

Hydrotropes

Procedure

Metallic Impurities

Procedure

Neutral Oil (Free Oil) and Free Fatty Alcohol

Procedure

Perborates

Procedure

Phosphates

Procedure

Silicates

Procedure

Solids

Procedure

Steam-Distillable Matter

Procedure

Sulfates

Procedure

Water

Procedure

Performance Tests

Procedure

Analysis of Soaps

Methods of Analysis

SAMPLING

Procedures

SEPARATION

Procedures

IDENTIFICATION

Procedures

DETERMINATION OF SOAP COMPOSITION

Procedures

DETERMINATION OF INORGANIC FILLERS AND  
SOAP BUILDERS

Procedures

DETERMINATION OF OTHER ADDITIVES

Procedure

Munson and Walker Sugar Equivalents

Procedure

DETERMINATION OF IMPURITIES

Procedure

OTHER QUALITY CONTROL TESTS

ANALYSIS OF SOAPS CONTAINING SYNTHETIC DETERGENTS

ANALYSIS OF METALLIC SOAPS

Procedure



## Beauty with Fruits and Vegetables

Apple

Apricot (Khubani)

Banana

Barley

Carrot

Castor Oil

Clove

Cucumber

Dhania

Egg

Honey

Lavender

Lemon

Orange

Palak

Peach

Potato

Pudina

Rose

Sage

Salt

Saunf

Tea

Thyme

Tomato

Yoghurt

## Sulfonated Oils

Historical Background

Chemistry of Sulfation and Sulfonation

Applications of Sulfonated Oils

MANUFACTURE OF SULFONATED OILS

Sulfation

Sulfonation

SULFATION OF INDIVIDUAL OILS

Characteristics and Analysis of Sulfonated/Sulfated Oils

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