

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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Isolates
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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

Sulphation of Esters

Hexane Extraction of the Sulphated Product

Typical Experimental Details

Major raw materials

Method

Products

Cottonseed Oil for Soapstock

Genesis of Investigation

Novel Features and Method of Utilisation of the Process

Refining of three oils of different types

Refining of a highly colour-fixed sample of solvent extracted cottonseed oil

Likely scope of its application

The stage to which the laboratory investigations have been conducted

The scale and duration of pilot-plant working

Availability of Raw Materials

Estimates of the cost of utilisation of the method

Capital outlay required
Flow Sheet
Points requiring specific emphasis

Development and Application of New Herbal Functional Surfactants

Introduction

New Trend of Surfactants

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

Older Methods

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
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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 Gabmle'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
Requisites of surfactants for formulating liquid detergents
Surfactants most commonly used
Consumption of Surfactants in Detergents (in kilotons)*
Builders
Viscosity Controlers
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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