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### **Herbal Soaps & Detergents Handbook**

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## **Description**

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 personnel 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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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, Linm

(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.—Scitaminaceae)

**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. - Liiiaceae)

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 (Canaga odorata)

**Associated Oils** 

Preparation and Properties of Surface Active Agents from Castor Oil

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Typical Experimental Details

Major raw materials

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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

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Capital outlay required

Flow Sheet

Points requiring specific emphasis

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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

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CASTILE SOAP BY BOILING PROCESS

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Combination in Soap No. 2

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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 sugested 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

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A Typical Charge

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LIQUID SHAVING CREAM

**Basic Combination** 

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Aerosol Package

Liquid Soaps/Shampoos

Process of Manufacture

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For Office use

For Workshop use

Soap Bubble Liquid

LIQUID WASHING SOAP CONCENTRATE

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Foam Stabilizers

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Agents for Resistance of Hard-Water

Germicidal Agents

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A Formulation

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**Medicated Dandruff Sampoos** 

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Aerosol Shampoos (Pressure Dispersed)

HERBAL TOILET SOAPS

To Prevent Pimples

To Fight Dandruff

To Kill Germs

To Present 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

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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 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

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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

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**Density of Powdered Detergents** 

Apparent Bulk Density

Apparent density, g/ml = 40/V

**Cup Density** 

Particle Size of Powdered Detergents

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**Machine Sieving** 

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Free Alkalinity

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Calculation of Interfacial Tension

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**Bundle Test** 

Foam Tests

Dynamic Foam Test

Pour Foam Test

**Wetting Test** 

Canvas Disc Test

Skein Test

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Separation of Surfactants

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Anionics

Cationics

Non-ionics

**DETERMINATION OF SURFACTANTS** 

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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

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**Batch Technique** 

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**DETERMINATION OF PROPERTIES** 

**Physical Characteristics** 

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Procedure

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**Procedures** 

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**Procedures** 

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Procedure

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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 Carboxymethylecellulose Chlorides and Available Chlorine **Procedures Enzymes** Procedure Ethanol and Isopropyl Alcohol Specific Gravity of Ethanol-Water Solutions at Varying Concentrations Specifie Gravity of Isopropyl Alcoho-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

# **About NIIR Project Consultancy Services (NPCS)**

NIIR Project Consultancy Services (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. Its various services are: Prefeasibility study, New Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Preparation of Project Profiles and Pre-Investment and Pre-Feasibility Studies, Market Surveys and Studies, Preparation of Techno-Economic Feasibility Reports, Identification and Selection of Plant and Machinery, Manufacturing Process and/or Equipment required, General Guidance, Technical and Commercial Counseling for setting up new industrial projects and industry. NPCS also publishes various technology books, directories, databases, detailed project reports, market survey reports on various industries and profit making business. Besides being used by manufacturers, industrialists, and entrepreneurs, our publications are also used by Indian and overseas professionals including project engineers, information services bureaus, consultants and consultancy firms as one of the inputs in their research.

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