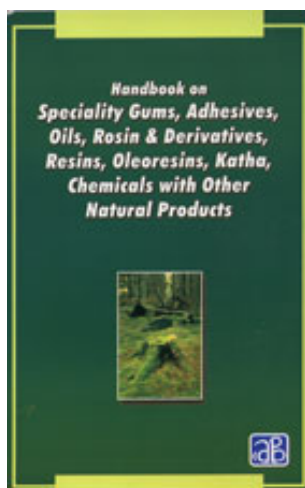


# Handbook on Speciality Gums, Adhesives , Oils, Rosin & Derivatives, Resins, Oleoresins, Katha, Chemicals with other Natural Products



**Author:** H.Panda

**Format:** Paperback

**ISBN:** 8178330253

**Code:** NI149

**Pages:** 834

**Price:** Rs. 1,275.00 **US\$** 125.00

**Publisher:** Asia Pacific Business Press Inc.

Usually ships within **3** days

The forest in India yields a large number of products, which play an important role in the economy of the country. Natural products may be extracted from tissues of terrestrial plants, marine organisms or microorganism fermentation broths. A crude (untreated) extract from any one of these sources typically contains novel, structurally diverse chemical compounds, which the natural environment is a rich source of. There are numerous products which have vital commercial applications for example gum karaya, locust bean gum, tamarind gum, rosin and rosin derivatives, turpentine and its derivatives, tall oil and its derivatives, essential oil of deodar, essential oils of cinnamum species and many more. Gum is any of a number of naturally occurring resinous materials in vegetative species. Various essential oils are also obtained from natural resources like deodar, Juniperus recurvar, Suamata, Cinnamum species, agar wood etc. Tall oil products find use in many product applications because of their economy and ready availability. Tall oil is more like a chemical product with a constant and dependable supply and a steady price. It has a large number of applications like; adhesives, carbon paper, cement addition agent, detergents, drawing oils, fungicides, lubricants, soaps, rubber additives, surface coating etc. Phenolic adhesives continue to be the most significant adhesives for the production of weather resistant wood products. In terms of volume of trade, revenue and employment potential, the minor forest products have surpassed the traditional major forest products viz, timber, firewood, pulp, wood etc. Aromatic and medicinal plants are one of the major resources from forests; the medicinal plants have been used since ancient times for the treatment of human ailments. Rosin, also called colophony is a solid form of resin obtained from pines and some other plants, mostly conifers, produced by heating fresh liquid resin to vaporize the volatile liquid terpene components. It is semi transparent and varies in color from yellow to black. At room temperature rosin is brittle, but it melts at stove top temperatures. It chiefly consists of different resin acids, especially abietic acid. Oleoresin is a naturally occurring mixture of oil and a resin extracted from various plants, such as pine or balsam fir. Over three quarters of the world population relies mainly on plants and plant extracts for health care. Natural products have evolved to encompass a broad spectrum of chemical and functional diversity. It is this diversity, along with their structural complexity, that enables small natural molecules to target a nearly limitless number of

biological macromolecules and often to do so in a highly selective fashion. Because of these characteristics, natural products have seen great success as therapeutic agents. However, this vast pool of compounds holds much promise beyond the development of future drugs.

This book makes an attempt to provide information of chemical nature, physical properties, manufacturing process, purification, applications, and compatibility of gums, adhesives, oils, rosin & derivatives, resins, oleoresins, katha, chemicals with other natural products. This book contains chapter on rosin and rosin derivatives, esterification of methylolated rosin, turpentine and its derivatives, tall oil and its derivatives, tall oil in liquid soaps, essential oils of cinnamum species, utilization of tannin from waste conicer barks, katha production in Tarai area of Uttar Pradesh, adhesives for wood based on natural polyphenolic substance, etc. This book contains process of forest based products like Gums, Resins, Oleoresins, Essential Oils and other natural products obtained from Indian forests. It gives an insight of richness and vastness of the forest wealth. This book is first of its kind, which covers comprehensive treasure of information on a wide variety of products. This is very resourceful book for students, growers and marketing agencies, country where there is rich flora and fauna awaiting proper exploitation, production and utilization.

## Contents

### CHAPTER 1

#### GUM GHATTI

Chemical Nature

Physical Properties

Manufacture

Biological/Toxicological Properties

Handling

Application Procedures

Commercial Uses

Industries using Gum Ghatti

Formulations Wax Emulsion

Table Syrup Emulsion

Laboratory Techniques

Bark and Foreign Organic Matter (BFOM)

Viscosity (5% Solution)

Viscosity (7% Solution)

### CHAPTER 2

#### GUAR GUM

Manufacture

Seed Structure

Purification

Grades

Chemical and Physical Properties

Structure

Solubility in Water

Rheology

Reactivity

Biological Properties

Handling

Dry Storage

Solution Preparation

Applications

Oil and Gas

Explosives  
Textile  
Food  
Paper  
Mining  
Commercial Applications: Compounding and Formulating  
Food  
Explosives  
Commercial Uses: Processing Aids  
Oil and Gas  
Textile  
Carpets  
Paper  
Kraft Papers  
Kraft Linerboard  
Recycled Linerboard  
Corrugating Medium  
Boxboard  
Offset News Stock  
White Papers  
Mining  
Industries using Guar Gum  
Oil and Gas  
Explosives  
Food  
Paper  
Textile  
Mining  
Formulations  
Ice Cream  
Ice Milk  
Sherbet  
Sour Cream  
Buttermilk  
Yogurt  
Instant Imitation Bakery Jelly  
Whipping Composition for Frozen Deserts

CHAPTER 3  
GUM ARABIC  
Chemical Nature  
Physical Properties  
Manufacture  
Biological/Toxicological Properties  
Rheological Properties  
Additives/extenders  
Additives  
Extenders Handling  
Applications  
Application Procedures  
Compatibility  
Commercial Uses  
Food Applications

Confectioneries  
Dairy Products  
Bakery Products  
Flavor Fixation  
Flavor Emulsification  
Beverages  
Pharmaceutical  
Suspending Agent  
Demulcent Agent  
Emulsification  
Antiseptic Preparation  
Miscellaneous Applications Medicines  
Cosmetics  
Adhesives  
Paints  
Inks  
Lithography  
Textiles  
Miscellaneous Uses  
Industries using Gum Arabic  
Food Industry  
Pharmaceutical Industry  
Cosmetic Industry  
Other Industries  
Formulations  
Confectioneries  
Food Emulsions  
Pickle Oil Emulsion  
Pickle Juice  
Beverages  
Stabilized Fruit Drink  
Dry mix Lmitation Orange Drink  
Cloud Gum  
Beverage Stabilizers  
Nut Coating  
Inks  
Gloss finish Inks Wood grain Inks  
Laboratory Techniques  
30% Viscosity Method  
Insoluble Residue  
Sediment and Color  
Peroxidase Content

CHAPTER 4  
GUM KARAYA  
General Information  
Chemical Nature  
Physical Properties  
Films  
Adhesiveness  
Hydrolysis  
Pastes  
Grades

Manufacture  
Biological/Toxicological Properties  
Short term Studies  
Long term Studies  
Special Studies  
Rheological Properties  
Handling  
Applications  
Application Procedures  
Compatibility  
Future Developments Commercial Uses  
Commercial Uses  
Pharmaceuticals  
Pulp and Paper  
Food Products  
Textiles  
Petroleum and Gas Recovery  
Industries using Gum Karaya  
Formulations : Pharmaceuticals  
Denture Adhesive  
Colostomy Rings  
Cosmetic  
Alcohol Wave set Concentrate  
Typical Wave set Formula  
Food Products : Sherbet Stabilization

## CHAPTER 5

### GUM TRAGACANTH

Chemical Nature  
Structure  
Reactivities Acid  
Labile Sugars  
Electrochemical Properties  
Physical Properties : Rheological Properties  
Biological/Toxicological Properties  
Consumer Exposure Data  
Caloric Value  
Hypercholesterolemia  
Tumors  
Allergenic Properties  
Lethal Effects  
Manufacturing and Quality Control  
Handling  
Additives and Extenders  
Application Procedures  
Specialties  
Future Developments  
Commercial Uses: Compounding and Formulating  
Pharmaceutical and Medical  
Food Products  
Ice Cream Stabilizers  
Water Ices

Commercial Uses: Processing Aids  
Crayon Manufacture  
Ceramics Manufacture  
Leather Curing  
Textiles Processing  
Paper Processing  
Wooden Match Manufacture  
Industries using Gum Tragacanth  
Food Industry  
Pharmaceutical and Cosmetic Industries  
General Industrial Uses  
Formulations  
Italian Dressing  
Russian Dressing  
Blue Cheese Dressing  
French Dressing  
Low calorie Italian type Dressing  
Sweet and Sour Sauce  
Low calorie French type Dressing  
Barbecue Sauce  
Dietetic (artificial) Fruit Jelly  
Citrus flavor Beverage Emulsions  
Low calorie Chocolate Syrup  
Low calorie Chocolate Pudding  
Marshmallow Topping  
Nondairy Sour Cream  
Toasted Onion flavored Chip Dip  
Mexican flavored Chip Dip  
Tuna, Chicken and Ham Salad Spreads

Cole Slaw Dressing  
Imitation Mayonnaise Dressing  
Mustard Sauce  
Spaghetti Sauce  
Pickle Relish  
Laboratory Techniques  
Identification  
Microscope Instrument  
Viscosity Testing

## CHAPTER 6

### LOCUST BEAN GUM

Manufacture  
Seed Structure  
Purification  
Grades  
Properties  
Structure  
Solubility in Water  
Rheology  
Reactivity : Derivatives  
Commercial Uses : Compounding and Formulating  
Food Products

Ice Cream  
Cheese  
Sauces and Salad Dressings  
Canned Pet Food  
Commercial Uses : Processing Aids  
Textiles Processing  
Carpets Processing  
Dyeing Carpets  
Paper Products  
Wet end Addition  
Gum Preparation  
Mining Industry  
Industries using Locust Bean Gum : Food Industry  
Mining Industry  
Paper Industry  
Textiles Industry  
Formulation Ice Cream  
Ice Milk  
Sherbet  
Sour Cream  
Buttermilk  
Yogurt  
Instant Lmitation Bakery Jelly  
Whipping Cream Composition (for Frozen Desserts)

## CHAPTER 7

### TAMARIND GUM

Chemical Nature  
Molecular Weight  
Derivatives  
Miscellaneous  
Physical Properties  
Manufacture  
Biological/Toxicological Properties  
Electrochemical Properties  
Rheological Properties  
Handling  
Applications  
By Result  
By End Product  
By Industry  
Application Procedures  
Future Developments  
Commercial Uses  
Processing Aids  
Industries using Tamarind Gum  
Formulations  
Size for Jute Yarn  
Size for Cotton Warps  
Latex Manufacture  
Other Uses  
Laboratory Procedures  
Viscosity Method

Acid Insoluble Residue (Air)  
Fat Content 33  
Term Glossary  
General Information  
Chemical Structure  
Physical Properties  
Solution Properties  
Effect of Salts on Viscosity  
Effect of PH on Viscosity  
Gelation With Metals  
Regulatory Status  
Commercial Uses : Food  
Xanthan Gum  
Dressings  
Foods and Drinks  
Other Products  
Xanthan Gum With Locust Bean Gum  
Commmercial Uses : Industrial  
Xanthan Gum  
Viscosity Control  
Other Applications  
Xanthan Gum With Locust Bean Gum  
Agricultural Sprays  
Gelled Products  
Slurried Explosives  
Fire Fighting  
Paper Sizing  
Photographic Processing  
Formulations  
Dessert Souffles  
Vanilla Souffle  
Chocolate Souffle  
Lemon Souffle  
Bakery Jellies  
Salad Dressings  
Green Goddess  
Creamy Russian  
French Dressing  
Creamy Italian  
Italian Dressing  
Dry Sauce Mixes  
Cheese Sauce Mix  
Barbecue Sauce Mix  
Spaghetti Sauce Mix  
White Sauce Mix1  
Frozen Pizzas  
Animal Feeds (Liquid)  
Laboratory Techniques  
Viscosity (Food Grade)  
Viscosity (Industrial Grade)  
Moisture Content  
Powder Color  
Determination of Gum in Mixtures



CHAPTER 8  
CASSIA SIAMEA LAM. SEED  
A NEW SOURCE OF COMMERCIAL GUM  
Material and Methods  
Results and Discussion

CHAPTER 9  
ROSIN AND ROSIN DERIVATIVES  
Composition  
Reaction and Derivatives  
Isomerization  
Maleation  
Oxidation  
Photosensitized Oxidation  
Hydrogenation  
Hydrogenless Hydrogenation  
Polymers of Vinyl Esters of Hydrogenated Rosin  
Perhydrogenation  
Hydrocracking of Rosin  
Dehydrogenation  
Polymerization  
Analysis  
Instrumental Analysis  
Phenolic Modification  
Salt Formation  
Esterification  
Hydrogenolysis  
Polyesterification  
Copolyesters  
Ammonolysis  
Preparations  
Typical Uses  
Styrenation  
Decarboxylation  
Hydroxymethylation and Hydroxylation  
Nitrogenous Intermediates  
Oxonation  
Esterification of Methylolated Rosin  
Amidation (12 AEAA)  
Halogenated Rosin  
Non phthalic Alkyd Resins  
Shellacemodified Rosin  
Use of Rosin in the Polymer Field  
Adhesives  
Hot Melt Adhesives  
Chewing Gum  
Floor Polishes  
Flooring Materials (Vinyl Flooring)  
Linoleum  
Paper Sizing  
Printing Inks  
Letter Press Inks

Flexographic Inks  
Gravure Inks  
Lithographic Inks  
Protective Coatings  
Air Drying Hammer Finish  
Epoxy Esters  
Lacquers  
Varnishes  
Rubber  
Pharmaceutical Uses

## CHAPTER 10 TURPENTINE AND ITS DERIVATIVES

Introduction

(i) Processing of Oleoresin

I. Olustee Gum Cleaning Process

II. Recovery of Turpentine and Rosin

Batch Processing

Continuous Processing

Heater

Stripping Column

1. Multiple Tube Column

2. Luwa Columns

(ii) Fractionation of Turpentine

Batch Operation

Semi continuous Operation

Continuous Operation

Column Packings

Catalytic Isomerization of alpha pinene

pinene

carene

Longi Folene

Methods of Preparation of Terpene Derivatives

Camphene

Thaite : Properties

Applications

P Menthadienes and P cymene

Myrcene

Alloocimene

Geraniol and Nerol

Linalool

Citral

Ionones and Methylionones

Citronellol

Citronellal

Myrcenol

Menthol

Carvone

Camphor

Pine Oil

Terpin Hydrate

Terpineols

Isobornyl Acetate and Isoborneol

Cinedles  
Terpen Resing (TPR)  
Thymol  
Xtone 505  
Terpinyl Acetate  
Isolongi Folene  
Actyl Longifolene  
Camphor Oil  
Fenchone  
Aclinol  
Acinone  
Pinetar  
Future Utilizations  
Uses of Terpene Derivatives  
Perfumes and Flavours  
Jasmin  
Orange Flower and Neroli  
Vidlet  
Fougere (Fern)  
Lily of the Valley  
Linden (Lime Blossom)  
Green Perfumes  
Perfumes for Men  
Soap  
Masking  
Agarbatti  
Textile Perfumes  
Aerosol Products  
Supari Chewing Tobacco  
Cigarettes  
Boot Polish  
Perfumed Disinfectants  
Medicines  
Pressure Sensitive Adhesives (PAS)  
Hot Melt Adhesives (HMA) and Coatings  
Other Uses  
Latest Uses of Terpene Solvent

## CHAPTER 11

### TALL OIL AND ITS DERIVATIVES

Production Processes for Tall Oil  
Recovery of Tall Oil  
Acid Refining of Tall Oil  
Fractionation of Tall Oil  
Composition and Properties of Tall Oil  
Crude Tall Oil  
Distilled Tall Oil  
Acid Refined Tall Oil  
Fractionated Tall Oil  
Analysis and Testing of Tall Oil Products  
Shipping, Storage, and Handling of Tall Oil Products  
Crude Tall Oil  
Acid Refined Tall Oil

Tall Oil Fatty Acids and Distilled Tall Oils  
Tall Oil Heads  
Tall Oil Pitch  
Tall Oil Rosin  
Applications of Tall Oil

## CHAPTER 12

### THE CHEMISTRY OF TALL OIL FATTY AND ROSIN ACIDS

Chemical Composition of Tall Oil Fatty Acids  
General Reactions of Tall Oil Fatty Acids  
Reactions Involving the Double Bonds  
Reactions Involving the Carboxyl Group  
Chemical Composition of Tall Rosin  
General Reactions of Tall Oil Rosin  
Reactions Involving the Carboxyl Group  
Reactions Involving the Double Bonds

## CHAPTER 13

### TALL OIL PRODUCTS IN SURFACE COATINGS

Tall Oil in Alkyd Resins  
Tall Oil Formulation in Alkyd Resins  
Short Oil Banking Alkyd solvent Process  
Short Oil Banking Alkyd fusion Process  
Long Oil Alkyd fusion Process  
Rosin Modified Alkyd fusion Process  
Epoxy Modified Alkyd  
Esters of Tall Oil Products Tall Oil Fatty Acids  
Tall Oil Rosin  
Tall Oil Formulations in Esters  
Glycerine Ester  
Maleic Modified Ester  
Distilled Tall Oil Epoxy Ester  
Tall Oil Pitch  
Other Uses for Oil Products  
Limed Tall Oil Rosin  
Limed Acid Refined or Distilled Tall Oils  
Styrene Resins  
Latex Paints  
Polyurethanes  
Putty and Caulking Compounds  
Varnishes  
Tallate Driers  
Tempering Oils for Hardboard

## CHAPTER 14

### TALL OIL IN THE PLASTICIZER FIELD

Tall Oil Plasticizers  
Esterification of Tall Oil for Plasticizers

## CHAPTER 15

### TALL OIL IN ADHESIVES AND LINOLEUM CEMENT

Tall Oil Rubber Adhesives  
Tall Oil in Hot Melt Adhesives

Tall Oil Products in Linoleum Cements  
Formulation With Tall Oil  
Formulation With Tall Oil Esters

## CHAPTER 16

### TALL OIL IN ASPHALT PRODUCTS AND PETROLEUM USES

Tall Oil in Asphalt  
Roads  
Soil Treatments  
Roofing  
Adhesives  
Antistripping Agents  
Plasticizers  
Miscellaneous  
Tall Oil in Petroleum Applications  
Oil and Gas Well Fracturing  
Drilling Muds  
Demulsification Agents  
Corrosion Inhibitors  
Catalyst  
Lubricating Oil Additives

## CHAPTER 17

### TALL OIL IN LIQUID SOAPS

Tall Oil in Disinfectants  
Tall Oil in Synthetic Detergents and Wetting Agents  
Syndet Types  
Syndet Products  
Tall Oil in Biodegradable Detergents

## CHAPTER 18

### TALL OIL IN FLOTATION COLLECTORS AND CORE OILS

Tall Oil in Flotation Collectors  
Flotation Collectors  
Flotation Applications  
Tall Oil in Core Oils

## CHAPTER 19

### TALL OIL IN RUBBER

Styrene butadiene Rubber  
Cold SBR Formulation (SBR 1500 Series)  
Hot SBR Formulation (SBR 1000 Series)  
Cold High Solids SBR 2105 Latex Formulation (SBR 2100 Series)  
Hot SBR Latex Formulation (SBR 2000 Series Type II)  
Foam Rubber

## CHAPTER 20

### TALL OIL IN PAPER SIZE

Paper Making Process  
Rosin Sizing Materials  
Forms of Size Available  
Paste Size  
Dry Size

Methods of Preparing Liquid Size  
Cooking Process  
Emulsion Process  
Bewoid Process  
Delthirna Process  
Internal and External Sizing  
Effect of Wet Strength Resins and  
Paper Coating Resins on Sizing  
Sizing of Nonconventional Paper  
Testing of Sizing  
Water Resistance of Paper and Paperboard T433 M 44  
(Dry Indicator Method)  
Water Immersion Test of Paperboard  
Water Absorption of Paperboard  
Water Absorptiveness of Nonbibulous Paper and Papeboard  
T441 M 60 (Cobb Test)  
Degree of Curl and Sizing of Paper T466 M 52  
Ink Penetration Test  
Fotosize Penetration Test Lactic Acid Test

## CHAPTER 21

### TALL OIL IN PRINTING INKS

Typographic Printing and Typographic Inks  
Heat Set Inks  
Steam Set Inks  
Newsprint Inks  
Lithographic Printing and Lithographic Inks  
Intaglio or Gravure Printing and Gravure Inks  
Silk Screen Printing Inks  
Overprint Varnishes  
Bag Inks

## CHAPTER 22

### MISCELLANEOUS APPLICATIONS OF TALL OIL

Tall Oil Fatty Acids for Chemical Intermediates  
Polymerized Fatty Acids  
Azelaic and Pelargonic Acids  
Tall Oil in Corecipitated Barium Salts  
Tall Oil in Defoamers  
Tall Oil Pigment Dispersants  
Tall Oil in Masonry and Cement Coatings

## CHAPTER 23

### EUCALYPTUS : A VERSATILE MATERIAL FOR AROMA CHEMICALS

## CHAPTER 24

### HIMALAYAN CEDARWOOD OIL

Indian Himalayan Cedarwood Oil  
Comparative Studies  
Export of Himalayan Cedarwood Oil from India  
Solvent Extraction of the Oil  
Purification of the Oil

Empyreumatic Himalayan Cedarwood Oil Vern. Chiloon Oil

CHAPTER 25

ESSENTIAL OIL OF DEODAR (CEDRUS DEODARA)

The Essential Oil

Raw Material

Physico chemical Properties

Chemical Composition of C. Deodara

Distillation

Latest Research Work

Uses of Cedarwood Oils

CHAPTER 26

ESSENTIAL OIL OF JUNIPERUS RECURVA VAR.

SQUAMATA AND OTHER OILS OF JUNIPERUS SPP.

Oil From Berries

Oil From Leaves

Oil From Wood

Experimental

Tlc of the Oil

Glc of the Oil

CHAPTER 27

AGARWOOD AND OIL OF ARARWOOD

Physico chemicals Properties and Chemical Composition

Trade and Production of Agar and Its Oil

Uses

CHAPTER 28

ESSENTIAL OILS OF CINNAMUM SPECIES

Cinnamum Cassia (nees) Nees Ex Blume

Export Import of Cassia and Tejpat Leaves

CHAPTER 29

LIGNIN AND ITS DERIVATIVES

Primary Source

Manufacture of Lignin and Its Derivatives:

General Properties

Commercial Lignins

Uses

CHAPTER 30

UTILIZATION OF TANNIN FROM WASTE CONICER BARKS

Chir Pine and Its Availability

Technical Analysis

(a) Evaluation Studies

(b) Leaching Studies

(c) Tanning Procedure : (1)

Conclusion and Suggestions

CHAPTER 31

LEACHING AND TANNING STUDIES ON

COMMERCIAL GRADE NASPAL (POMEGRANATE RIND)

Experimental  
Conclusions

CHAPTER 32  
CHEMICAL EXAMINATION OF THE TANNIN  
PEARING PLANTS OF THE FORESTS OF ANDHRA PRADESH

CHAPTER 33  
SAL SEEDS A NEW SOURCE OF TANNING MATERIAL  
Isolation and Identification of Polyphenolic Constituents  
Separation and Utilisation of Sal Tannings

CHAPTER 34  
PREPARATION OF PHENOLIC RESINS FROM  
MYROBALAN TANNIN EXTRACTS  
Polyphenolic Compounds of Myrobalan  
Reaction of Formaldehyde With Myrobalan Extract in Presence of  
Both Acid and Alkali Catalyst  
Condensation With Formaldehyde  
Condensation Reaction of Gallic Acid with Formaldehyde  
Reimer Tieman Reactions  
Duff Reaction  
Villsmeyer Reaction

CHAPTER 35  
KATHA PRODUCTION IN TARAI AREA OF UTTAR PRADESH  
Chipping  
Extraction  
Concentration  
Crystallization  
Filtration  
Hydraulic Press  
Hydraulic Press  
Drying of Katha Batties  
Manufacture of Deshi Katha  
Utilization of Byproducts

CHAPTER 36  
STUDIES ON THE EFFECTS OF WOOD MOISTURE ON  
THE RECOVERY OF KATHA FROM ACACIA CATECHU  
Experimental  
Result & Discussion  
Inferences

CHAPTER 37  
EXTRACTION OF PURE CATECHIN FROM KHAIR WOOD  
AND KATHA SAMPLES AND AN IMPROVED METHOD FOR  
ITS ESTIMATION  
Experimental  
Extraction of Catechin From Wood by using Organic Solvents

CHAPTER 38  
ADHESIVES FOR WOOD BASED ON



## NATURAL POLYPHENOLIC SUBSTANCE

Adhesives Based on Tannins

Tannins are Classified in two Groups

Adhesives Based on Lignins

## CHAPTER 39

LAC PRODUCTION, UTILISATION AND FUTURE

Production

Utilisation

## CHAPTER 40

HIGH ALPHA CELLULOSE PULP EXPERIMENTAD

RESUMS & DISCUSSION FROM POPLAR CASALE

Analysis

## CHAPTER 41

HIGH ALPHA CELLULOSE FROM FAST GROWING

PLANTS SUCH AS CROTALARIA JUNCEA AND

CROTALARIA RETUSA

Experimental

Results & Discussions

## CHAPTER 42

UTILIZATION OF PINUS CARIBAEA NEEDLES FOR

FIBRE BOARDS

Material & Method

Board Formation

Additives Blending

Pressing

Results and Discussions

## CHAPTER 43

WOOD POLYMER COMPOSITES AND

THEIR INDUSTRIAL APPLICATIONS

Chemistry of the Process

Impregation Process

Monomers for Wood Polymer Composites

Physical Properties

Commercial Applications

Catalys Heat Process

World Wide Production

## CHAPTER 44

POLYURETHANE FOAMS FROM THE REACTION OF

BARK AND DIISOCYANATE

## CHAPTER 45

PARTICLEBOARD MANUFACTURE AND PROCESSING

Definition

Raw Materials

Wood

Adhesive

Wax Emulsions

Manufacturing : Particle Preparation  
Particle Drying  
Blending  
Mat Formation  
Pressing Operation  
Finishing  
Surface Finishing  
Grain Printing on Flat Panels  
Conclusion

CHAPTER 46  
CARBOHYDRATE MODIFIED PHENOL FORMALDEHYDE  
RESINS FORMULATED AT NEUTRAL CONDITIONS  
Experimental Methodology : Adhesive Formulation  
Veneer  
Bonding  
Determination of Shear Strength  
Prehydrolysis of Southern Red Oak  
Extraction of Cured, Modified Phenol formaldehyde Resins  
Isolation of Compounds VI VIII  
Results and Discussion : Bonding Veneer Panels  
Incorporation of Carbohydrate Into Cured Resin

CHAPTER 47  
UTILIZATION OF MINOR OIL SEEDS  
Appendix  
Mahuva : (Madhuca Latifolia or M. Lonoifolia)  
Sal : (Shorea Rubra)  
Kusum : (Schleichera Trijuga)  
Khakhan : (Salvadora Oleocedus)  
Tamarind : (Tamarindus Indica)  
Undi : (Calophyllum Inophyllum)  
Karanda Oil : (Pongamia Glabra)  
Pisa : (Aetnodaphne Bookerii)  
Neem : (Azadirachta Indica)  
Kokum : (Garcinia Indica)  
Dhupa : (Vateria Indica)

CHAPTER 48  
CHEMICAL INVESTIGATION OF FATTY OIL OF  
BURSERA PENICILLATION SEED  
Composition of the Seed Kernel Oil

CHAPTER 49  
ABUTILON INDICUM SEED OIL: CHARACTERISATION OF  
HBR REACTIVE ACIDS

CHAPTER 50  
A NEW  $\beta$  HYDROXY OLEFINIC FATTY ACID  
IN PLANTAGO MAJOR (PLANTAGINACEAE) SEED OIL

CHAPTER 51  
GYANOLIPIDS OF BORAGINACEA SEED OILS

CHAPTER 52  
STYRENE COPOLYMERIZATION OF BABUL (ACACIA)  
OIL AND ITS ALKYL  
Experimental Materials Used  
Refining and Bleaching of the Oil  
Isomerization  
Styrenation of Babul Oil  
Preparation of Styrenated Alkyds  
Pre styrenation Process  
Formulation  
Post Styrenation Process  
Formulation  
Testing  
Results and Discussion  
Conclusion

CHAPTER 53  
INVESTIGATION OF NEEM SEED SHELL FLOUR  
Experimental : Preparation of Sample  
Treatment of the Shell Flour  
Preparation of Moulding Powder

CHAPTER 54  
DEVELOPMENT OF SALSSEED OIL INDUSTRY

CHAPTER 55  
STUDIES ON TAMARIND KERNEL OIL  
Experimental : Materials  
General Methods  
Extraction, Purification and General Characterization of  
Tamarind Kernel Oil  
Analysis of Fatty Acid Composition  
Extraction and Identification of Monoglycerides  
Extraction and Identification of Free Fatty Acids  
Isolation and Characterization of Unsaponifiable Matter  
Fractionation of Tamarind Kernel Oil  
Analysis of Neutral Lipids  
Deacylation of Phospholipid Fractions  
Hydrolysis of Phospholipids, Identification of Bases  
Identification of Polyhydroxy Compounds  
Analysis of Glycolipid Fraction  
Identification of Component Sugars  
Tlc Analysis of Glycolipid Fraction  
Analysis of Sterol Glycoside  
Componental Analysis of Asg  
Results and Discussion : Total Fatty Acids  
Neutral Lipids  
Unsaponifiable Matter  
Samples Phospholipids  
Glycolipids

CHAPTER 56

TECHNOECONOMIC EVALUATION OF ANGELICA  
ARCHANGELICA ROOTS AS A COMMERCIAL SOURCE  
OF ANGELICA OIL

Materials and Methods

Technoeconomic Evaluation

CHAPTER 57

COMMERCIAL UTILISATION OF INDIAN BERBERSIS

Raw Material

Chemical Evaluation

Resources

CHAPTER 58

PROCESS DEVELOPMENT FOR HECOGENIN AND  
SOLASODINE

Hecogenin From Agave Species

Solasodine From : Solanum Khasianum

CHAPTER 59

PRODUCTION OF STRYCHINE AND BRUCINE FROM  
NUX VOMICA PROCESS:

Process

Yields

Equipments Required

Raw Materials

Economics

CHAPTER 60

AN IMPROVED METHOD FOR THE PRODUCTION OF  
SRUCINE AND STRYCHNINE FROM STRYCHNOS  
NUX VOMICA BARK

Uses

Earlier Methods of Extraction of Strychnine and Brucin

Improved Method for the Extraction of Brucine and Strychnine

CHAPTER 61

HERACLEUM SPECIES AS SOURCES FOR  
FURANOCOUMARINS

CHAPTER 62

MEDICINAL AND AROMATIC PLANT RESOURCES OF  
THE KUMAON HIMALAYAS: PRESENT POSITION, FUTURE  
STRATEGIES AND PROSPECTS

Appendix 1 : Medicinal Plants Bearing Alkaloids

Appendix II: Plants Bearing Glycosides

Appendix III : Plants Bearing Edible and

Appendix IV : Plants Bearing Tannins

Appendix V : Plants Bearing Essential Oils

CHAPTER 63

UTILIZATION OF APRICOT KERNELS AND  
A SOURCE OF VITAMIN B15

CHAPTER 64  
SOLVENT EXTRACTION OF ARTEMISIA ANNUAL ON  
PILOT PLANT SCALE  
Experimental Procedure  
A. Bench Scale Study  
B. Pilot Plant Scale Study  
Results and Discussion

CHAPTER 65  
CANDELILLA WAX  
Results and Discussion  
Transplanting and Harvesting  
Yield of Stems and Wax  
Physico Chemical Properties  
Results & Discussion

CHAPTER 66  
CHEMURGY OF KALPVRIKSHA  
Collection  
Transportation  
Drying  
Decortication  
Crushing/Extraction  
Solvent Extraction  
Saponin  
Wet Rendering Process  
Production of Palmitic Acid  
High Pressure Splitting  
Meal  
Seed Coat

CHAPTER 67  
UTILIZATION OF MOHUA FLOWERS FOR  
CITRIC ACID PRODUCTION  
Materials and Methods  
Microorganism  
Growth of the Organism  
Viscosity  
Determination of Sugar  
Determination of Citric Acid: Fermentation Conditions  
Results and Discussion  
Effect of Cultural Conditions of Citrate Production

CHAPTER 68  
INDUSTRIAL UTILIZATION OF KOKAM

CHAPTER 69  
NUTRITIVE VALUE OF SOME LESSER KNOWN  
WILD FRUITS OF JAMMU & KASHMIR STATE  
Availability and Utilization  
Experimental  
Results and Discussion

## CHAPTER 70

### WILD VEGETABLE OOD MATERIALS OF JAMMU AND KASHMIR

Bauhinia Variegata Linn  
Bombax Ceiba Linn  
Capparts Spinosa Linn  
Caralluma Tuberculata N.E. Br.  
Cicer Soongaricum Stapf  
Coccinia Cordifolia  
Codonopsis Ovata Benth  
Corylus Colurna Linn.  
Diplaium Esculentum  
Emblica Officinalis Gaertn.  
Eremurus Spp.  
Euphorbia Royleana Linn.  
Megacarpaea Polyandra Benth.  
Momordica Dioica Roxb.  
Morniga Oleifera Lamk  
Punica Ranatum Linn  
Rheum Spp. R.emodi Wall  
Taraxacum Officinale Weber  
Telosma Pallia Craib. (D.Goalmanda)

## CHAPTER 71

### EDIBLE MUSHROOMS OF JAMMU & KASHMIR FORESTS

Morels (Morchella Sp.)  
Dhingri (Pleurotus)  
Pleurotus Fossulatus (Cooke) Sacc  
Pleurotus Flabellatus (Berk, and Br.) Sacc; Vern  
Other Edible Mushrooms  
Coprinus  
Geopora Arenicola  
Boletus Sp.  
Agrocybe Cylindracea (D.C. ex. Fr) R.maire  
Flammulina Velutipes Curt. Ex. Fr. (Karst): Lactarius  
Scrobiculatus Scop. Ex. Fr.  
Tuber Cibarium Sibth.

## CHAPTER 72

### PROSPECTS OF FURFURAL AND FURFURAL BASED INDUSTRIES IN INDIA

Uses  
Conventional Processes  
Possibilities  
Conclusion

## CHAPTER 73

### KEWDA INDUSTRY IN ORISSA

Distribution Pattern and Availability of the Plant  
Historical Development and Present Set Up of the Industry  
Uses and Demand of the Perfume  
Collection  
Distillation  
Cost Estimation

## Present Position and Future Prospects of the Industry

### CHAPTER 74

#### PENCIL RAW MATERIALS IN KERALA

Industry A Birds Eye View

Specification of Wood

Species Used and Availability

Some Suggestions conclusion

Conclusion

### CHAPTER 75

#### FOREST BASD RAW MATERIALS IN NEPAL

Tropical Zone (below 1000 M)

Sub Tropical Zone (1000 2000 M)

Temperate Zone (2000 3000 M)

Sub Alpine Zone (3000 4000 M)

Climate and Temperature

Raw Materials

Plants Yielding Vegetable Gums and Resins

Bengal Kino Gum or Palash Gum

Sal Gum

Sahanjan Gum

### CHAPTER 76

#### MINOR FOREST PRODUCTS OF BIHAR

### CHAPTER 77

#### INDUSTRIALLY IMPORTANT MINOR FOREST PRODUCTS OF ORISSA

Plants Used in Drug and Pharmaceutical Industry

Plants Used in Perfumery Industry

Vetiveria Zizanioides (Vetiver)

Cymbopogen Flexuosus (Lemongrass)

Hyptis Suavelens (Linn.) Poit

Plants Yielding Gums and Resins of Industrial Use

Plants Used in Vegetable Oil and Fat Industry

Madhuca Latifolia (Roxb)

Pongamia Pinnate (Linn.)

Sehleichera Elesa (Lour)

Plants Used in Food or Food colourant Industries

Bixa Orellana Linn

Plants Used in Leather Tanning Industry

Cleistanthus Collinus (Karade)

Broomgrass for Broom Industry

Kendu for Bidi Manufacturing Industry

Bamboo for Pulp in the Paper Industry

Fibre Yieldig Plants for Cordage Industry

List of Address of Machinery Suppliers

# 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.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Start-up Ideas, Business Ideas for Entrepreneurs, Start up Business Opportunities, entrepreneurship projects, Successful Business Plan, Industry Trends, Market Research, Manufacturing Process, Machinery, Raw Materials, project report, Cost and Revenue, Pre-feasibility study for Profitable Manufacturing Business, Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Business Opportunities, Investment Opportunities for Most Profitable Business in India, Manufacturing Business Ideas, Preparation of Project Profile, Pre-Investment and Pre-Feasibility Study, Market Research Study, Preparation of Techno-Economic Feasibility Report, Identification and Section of Plant, Process, Equipment, General Guidance, Startup Help, Technical and Commercial Counseling for setting up new industrial project and Most Profitable Small Scale Business.

NPCS also publishes various 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.

---

**NIIR PROJECT CONSULTANCY SERVICES** , 106-E, Kamla Nagar, New Delhi-110007, India. **Email:** [npcs.india@gmail.com](mailto:npcs.india@gmail.com) **Website:** [NIIR.org](http://NIIR.org)

Thu, 21 Sep 2017 12:49:19 +0530