

Handbook on Oleoresin and Pine Chemicals (Rosin, Terpene Derivatives, Tall Oil, Resin & Dimer Acids)

Author: H Panda

Format: paperback

Code: NI207

Pages: 608

Price: Rs 2200 | US\$ 200

Publisher: NIIR PROJECT CONSULTANCY SERVICES

Shipping: 5 days

About the Book

Oleoresin and pine chemicals are a fascinating group of substances derived from the sap of coniferous trees. This diverse family of products includes rosin, terpene derivatives, tall oil, resin, and dimer acids, each with their own unique properties and characteristics. Rosin, also known as colophony, is a sticky substance that is obtained by distilling the resin from pine trees. Terpene derivatives, on the other hand, are a broad class of compounds that are derived from terpenes, which are the primary components of essential oils in plants. Tall oil is a byproduct of the pulping process in the paper industry. It is obtained by extracting fatty acids from the black liquor, a waste stream generated during pulp production. Resin refers to the mixture of gum and resin obtained from pine trees. It is often processed to remove impurities and concentrated into a solid or liquid form. Dimer acids are a specific type of fatty acid derived from tall oil or other vegetable oils. They are created through a chemical reaction called dimerization, which involves the linking of two fatty acid molecules. Dimer acids are known for their excellent performance as raw materials in the production of various products such as coatings, adhesives, and synthetic lubricants.

The global oleoresin market size is anticipated to witness a compound annual growth rate (CAGR) of 6.9%. Growing demand from healthcare, pharmaceutical, food, and beverage industries are driving forces of the global oleoresin market. Oleoresins are made from varied ingredients and spices, which are found all around the world. It is usually found in semi-solid extract form. A variety of oleoresins has multiple characteristics based on the spice they are derived from. They exhibit numerous therapeutic as well as antioxidant properties as well and are utilized in the pharmaceutical, healthcare, food, and beverage industries. The European region led the market with a revenue share of more than 30%. This is attributed to the increasing demand for flavors and coloring agents from the food & beverage industry. Another factor contributing to increased demand for the product in the region is the demand from cosmetic, fragrance, and personal care products industries that act as a hefty end-use industry for oleoresins.

The Major Contents of the books are Pinus, Oleoresin Extraction, Processing of Oleoresin, Rosin Derivatives, Terpene Based Adhesives, Essential Oil, Wood Turpentine Oil, Turpentine Products, Tall Oil, Dimer Acids.

A comprehensive reference to manufacturing and entrepreneurship in the Oleoresin and Pine Chemicals products business. This book is a one-stop shop for everything you need to know about the Oleoresin and Pine Chemicals products manufacturing industry, which is ripe with potential for manufacturers, merchants, and entrepreneurs. This is the only comprehensive guide to commercial Oleoresin and Pine Chemicals products manufacture. It provides a feast of how-to knowledge, from concept through equipment purchase.

Contents

1. PINUS

Introduction

Distribution

Distribution in India

Morphology

Key to the Identification of Indian Species

Anatomy

Root

Root-Stem Transition

Shoot Apex

Stem

Leaf

Embryology

Male Cones

Female Cones

Pollination

Receptive Spot

Fertilization

Embryogeny

Seed Coat

Wing

Germination

Cytology

Seed Testing

Seed Production and Dormancy

Breeding

Diseases

Mycorrhiza

Pests

2. PINE OLEORESIN EXTRACTION METHODS

Introduction

Cup the Larger-Diameter Trees for Increased Yields and Greater Profits

Double-Facing

Gum Yield from Shoulders

Use Current Tin Lengths

First-Year Installation of Spiral Gutters with Double-Headed Nails

Shaving the Bark

Attach the Apron First

Attaching the Spiral Gutter

Completed Installation

Use of the Advanced Streak

Turpentine and Growth

Bark Chipping

Mounting and Sharpening the Bark Hack

Treating the Streak

Acid Penetration Above the Streak

Wounding the Tree for Gum Production

Metal Cups, Acid Corrosion and Gum Grades

Raising Tins Installed with Double-Headed Nails

Bark Pulling and Acid Treatment

How to Use the Spray-Puller

Acid Paste Method
Applying the Paste
Chipping and Paste Treatment
Streak Height
Turpented Section Suitable for Other Wood Products
Beetle Attacks and Control Measures
The Black Turpentine Beetle
The Ips Beetle
Solutions for Beetle Control
3. PINES FOR THEIR OLEORESIN
Occurrence, Formation and Exudation of Oleoresin in Pines
Oleoresin Tapping
French Methods
Spanish Method
Greek Method
Indian Method
Mexican Method
American Bark-Chipping Method
The Austrian and German "Herringbone" Methods
Russian Methods
Methods in Other Countries
Felled Pine Wood as Source of Rosin and Turpentine
Composition of Oleoresin
Summary
4. PROCESSING OF OLEORESIN
Processing of Oleoresin
Olustee Gum Cleaning Process
Recovery of Turpentine and Rosin
Stripping Column
Multiple Tube Column
Luwa Columns
Fractionation of Turpentine
Batch Operation
Semi-Continuous Operation
Continuous Operation
Column Packings
Isomerisation of α -Pinene
Camphene Via Bornyl Chloride
Catalytic Isomerisation of α -pinene
Reaction Mechanism
Design Aspect of an Isomerisation Reactor
Liquid Phase
Vapor Phase
5. ROSIN DERIVATIVES AND ITS POTENTIAL
6. HYDROGENLESS HYDROGENATION OF RESIN ACIDS
Experimental
Results and Discussion
Transfer Hydrogenation of Isopimaric/Pimaric Acids
Transfer Hydrogenation of Abietic Acids
Reaction Mechanism



7. NEW DEVELOPMENTS IN ROSIN ESTER AND DIMER CHEMISTRY

New Rosin Esters
Chemistry of Rosin Dimers

8. TERPENE RESINS

Physical Properties
Chemical Properties
Manufacture
Uses

9. TERPENE BASED ADHESIVES

Introduction
Chemistry
Beta-Pinene Resins
Initiation
Propagation
Termination
Dipentene Resins
Alpha-Pinene Resins
Physical Characteristics of Resins
Pressure Sensitive Adhesives
Hot Melt Adhesives
Analytical Methods
Commercial Resins and Their Uses
Commercial Production
Applications in Pressure Sensitive Adhesives
Applications in Hot Melt Adhesives

10. OZONOLYSIS OF ALPHA-PINENE

Effect of Solvent, Ozone Concentration and Temperature on Yields were Investigated
Experimental Conditions are Discussed

11. α -BROMOLONGIFOLENE

Steam Distilled Products
Residue
Chromic Acid Oxidation of Dilongifolenyl Ether
Lead Tetraacetate Oxidation of Longifolene

12. PEROXIDES FROM TURPENTINE

Peroxide Number and Degree of Unsaturation are Tests of Product Quality
Catalytic Hydrogenation of Pinene to Pinane is First Step in Hydroperoxide Production
Small and Large Scale Techniques of Pinane Oxidation are Investigated
Cold-Rubber Polymerization
Decomposition of Pinane Hydroperoxide
Over-all Yield of 85% is Realized in Production of High Purity Hydroperoxide
Peroxidation
Stripping of Oxidates
Polymerization
Heavy Metal Salts Accelerate Decomposition of Pinane Hydroperoxide
Decomposition
Summary

13. PINONIC ACID

Ozonolysis of α -Pinene in Acetic Acid Solution Proved Best Method
Yields were Determined by Partition Chromatography
Ozone Source

Reagents

Ozonization

Calculations and Analyses

Direct Ozonolysis was not Successful

Ozonization in Methanol

Ozonization and Decomposition in Aqueous Acetic Acid at Room Temperature

Ozonization in Aqueous Acetic Acid at 0Å°C. Decomposition in the Presence of Oxidants

Ozonization in Nitromethane

14. SYLVESTRENE AND SOME OF ITS DERIVATIVES

Sylvestrene

Sylvestrene Nitrosochloride

Sylvestrene Oxide

m-Terpeneols

Sylvedihydrocarvone

15. 8-ACETOXYCARVOTANACETONE

16. RECOVERY OF 3-CARENE FROM CHINESE

TURPENTINE AND SYNTHESIS OF

ACETYLCARENES

Introduction

Distillation of Wood and Sulfate Turpentine

Material and Methods

Distillation Results

Synthesis of Acetyl-Carene

Materials and Methods

Results and Discussion

Synthesis Products

17. HOMOPOLYMERS AND COPOLYMERS OF

ACRYLATES

Introduction

Results and Discussion

Monomers

Homopolymerization

Copolymerization

Terpolymerization

Epoxidation

Curing

Hydrolysis of Polymethacrylate of I

Experimental

Reduction of i•j-Campholene Aldehyde

Typical Preparation of a Monomer: Methacrylate of II

Typical Homopolymerization Recipe: Homopolymer Methacrylate of II

Typical Copolymerization Recipe: Copolymer of the Methacrylate of II and Acrylate of I

Solution Copolymer of the Methacrylate of II and Fumaronitrile

Typical Terpolymerization Recipe: Terpolymer of the Acrylate of I, Acrylonitrile and Butadiene

Typical Epoxidation Procedure

18. POLYMERS AND COPOLYMERS OF VINYL

PINOLATE

Preparation of Vinyl Pinolate

Polymerization

Reaction of Vinyl Pinolate Copolymers with Isocyanates

Experimental

Preparation of Vinyl Pinolate
Polymerization of Vinyl Pinolate in Solution
Polymerization of Vinyl Pinolate in Suspension
Polymerization of Vinyl Pinolate in Emulsion
Copolymerization of Vinyl Pinolate and Vinyl Acetate in Solution
Copolymerization of Vinyl Pinolate and Vinyl Chloride in Solution
Copolymerization of Vinyl Pinolate and Vinyl Chloride in Emulsion
Reaction of Polymers with Isocyanates
Evaluation of Vinyl Pinolate and Vinyl Chloride Copolymers
19. HOMOPOLYMERIZATION OF HYDRONOPYL VINYL ETHER
Discussion
Experimental
Materials
Preparation of 2-Hydronopoxyethyl Vinyl Ether
Polymerization of HVE and HEVE
X-Ray Analysis of Poly (HVE)
Evaluation of Poly (HEVE)
20. TERPOLYMERS OF ETHYLENE AND PROPYLENE WITH d-LIMONENE AND α -PINENE
Introduction
Results and Discussion
Experimental
Materials
Preparation of EPT Rubber
Analysis of Unsaturation
Determination of Gel Content
Determination of Methyl Group Content in Polymer
21. LOW MOLECULAR WEIGHT POLYMERS OF d-LIMONENE
Experimental
Materials
General Procedure
Results
Infrared Spectra
Nuclear Magnetic Resonance Spectra
Optical Activity
Perbenzoic Acid Oxidation
Discussion
22. BASE-CATALYSED ISOMERISATIONS OF TERPENES
Hydrocarbons
Alcohols
Aldehydes
Ketones
Acids
Esters
Epoxides
Conclusion
23. COPOLYMERS OF VINYL CHLORIDE OF PINENE
Experimental

Homopolymerization
Copolymerization
Test of Heterogeneity of a Copolymer
Evaluation of New Polymers
24. POLYALLOÏ-CIMENE
Experimental
Monomer
Polymerizations
Polymer
Ozonolysis
Discussion of Results
25. ESSENTIAL OIL IN CHLOROPHYLL-CAROTENE
PASTE FROM PINE NEEDLES AND TWIGS
Abstract
26. ESSENTIAL OIL OF THE CONE OF PINUS
SYLVESTRIS VAR. MONGOLICA
27. COMPONENTS OF PINE ROOTS
Conclusions
Composition of the Remaining Neutral Fraction
Composition of the Carbonyl Fraction
Composition of the Hydroxyl Fraction
Results and Discussion
Composition of Turpentine
Composition of the Resin Acid Fraction
28. WOOD TURPENTINE OIL FROM PINE STUMPS
29. BLENDING OF TURPENTINE PRODUCTS
Lilac
Pine Bouquet
Cuir De Russe (for leather)
Violet
Lavender Bouquet
Oriental
Gardenia
Fougere
Eau De Cologne
Amber
Chypre
Ylang Syn
Sweet Pea
30. BIOLOGICALLY ACTIVE COMPOUND FROM
TURPENTINE
Terpenoids as Antimicrobials
Terpenoids as Anthelmintics
Terpenoids as Insecticides
Terpenoids as Plant Growth Hormones
Terpenoids as Anticancer Agents
Terpenoids as Pharmacological Agents
Terpenoid Derivatives as Biodynamic Agents
Terpenoids as Intermediates for Synthesis of Bio-dynamic Agents
31. INSECTICIDES BASED ON TURPENTINE
Toxaphene (C₁₀H₁₀ Cl₈)



Strobane (C₁₀H₁₁Cl₇)

32. TALL OIL

History of Tall Oil

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

Safety Notes

Applications of Tall Oil

The Chemistry of Tall Oil Fatty and Rosin Acids

Chemical Composition of Tall Oil Fatty Acids

General Reactions of Tall Oil Fatty Acids

Chemical Composition of Tall Oil Rosin

General Reactions of Tall Oil Rosin

Tall Oil Products in Surface Coatings

Tall Oil in Alkyd Resins

Tall Oil Formulations in Alkyd Resins

Esters of Tall Oil Products

Tall Oil Formulations in Esters

Other Uses for Tall Oil Products

Tall Oil in the Plasticizer Field

Esterification of Tall Oil for Plasticizers

Tall Oil in Adhesives and Linoleum Cement

Tall Oil in Rubber-based Adhesives

Tall Oil in Hot-Melt Adhesives

Tall Oil Products in Linoleum Cements

Formulation with Tall Oil

Formulation with Tall Oil Esters

33. DIMER ACIDS

The General Characteristics of Dimer Acids

Introduction

Dimer Acids Manufacture and Feedstock

By Products of the Dimerization Reaction

Monomer Acids

Trimer Acids

Structure and Properties of Dimer Acids

Structure of Dimer Acids

Analysis of Dimer Acids

Physical Properties of Dimer Acids
Chemical Reactions of Dimer Acids
Reactions of the Double Bonds and at the α -Carbon Atoms
Reactions of the Carboxyl Groups to Produce Monomeric Derivatives
Reactions of the Carboxyl Groups to Produce Polymeric Derivatives
Commercial Applications of Dimer Acids and Their Derivatives
Introduction
Applications of Dimer Acids
Applications of Monomer Acids and Derivatives
Applications of Trimer Acids and Derivatives
Applications of Low-Molecular Weight Derivatives of Dimer Acids
Applications of High-Molecular Weight Dimer Acids Derivatives
Applications of Other Polymeric Nitrogen Derivatives of Dimer Acids

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.

Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.

NIIR PROJECT CONSULTANCY SERVICES, 106-E, Kamla Nagar, New Delhi-110007, India. **Email:** npcs.india@gmail.com **Website:** NIIR.org