

Modern Technology of Synthetic Resins & Their Applications (2nd Revised Edition)

Author: NIIR Board of Consultants & Engineers

Format: Paperback

ISBN: 9788178330921

Code: NI71

Pages: 592

Price: Rs. 1,575.00 US\$ 42.56

Publisher: Asia Pacific Business Press Inc.

Usually ships within **5** days

Modern Technology of Synthetic Resins & Their Applications

(Acetal, Acrylonitrile, Alkyd, Amino, Casein, Cashewnut Shell Liquid, Epoxy, Phenolic, Polyamide, Polyurethane, Rubber, Silicon, Polyvinyl Acetate, Shellac, Sucrose, Terpene Resins)

(2nd Revised Edition)

Synthetic resin is typically manufactured using a chemical polymerization process. This process then results in the creation of polymers that are more stable and homogeneous than naturally occurring resin. Since they are more stable and are cheaper, various forms of synthetic resin are used in a variety of products such as plastics, paints, varnishes, and textiles. There are various kinds of synthetic resins; acetal resins, amino resins, casein resins, epoxy resins, hydrocarbon resins, polyamide resins, etc. The classic variety is epoxy resin, manufactured through polymerization, used as a thermoset polymer for adhesives and composites. Epoxy resin is two times stronger than concrete, seamless and waterproof. Polyamide resin is another example of synthetic resins. Polyamide resins are products of polymerization of an amino acid or the condensation of a diamine with a dicarboxylic acid. They are used for fibers, bristles, bearings, gears, molded objects, coatings, and adhesives. The term nylon formerly referred specifically to synthetic polyamides as a class. Because of many applications in mechanical engineering, nylons are considered engineering plastics. Resins are valued for their chemical properties and associated uses, such as the production of varnishes, adhesives, lacquers, paints, rubber and pharmaceutical uses. The applications of synthetic resins are seen in some important industries like paint industry, adhesive industry, the printing ink industry, the textile industry, the leather industry, the floor polish, paper, agricultural industry etc. As it can be seen that there is an enormous scope of application of resins hence it is one of the major field to venture.

Synthetic Resins are materials with properties similar to natural plant resins. They are viscous liquids capable of hardening permanently. Chemically they are very different from resinous compounds secreted by plants. Synthetic resins are of several classes.

The growth of the synthetic resins market can be attributed to the high demand from the packaging sector due to favorable properties, including lightweight and ability to act as an excellent barrier, which allows for their usage in applications such as barrier packaging, shrink wraps, and pharmaceutical packaging.

The major contents of the book are properties, manufacturing process, formulae of synthetic resins and applications of synthetic resins, derivatives of resins, use of resins in polymer field, alkyd resin technology, epoxy resins, manufacture of polystyrene based ion-exchange, phenol formaldehyde reactions, polycarbonates resins, polyester coating compositions, synthetic rubbers, modification with synthetic resins,

water-soluble polymers, cross-linking of water-soluble coatings etc. This book also contains the list of manufacturers and dealers of raw materials, list of Chemical Plant, Photographs of Machinery with Suppliers Contact Details, Sample Plant Layout and Process Flow Chart.

The book will be very useful for new entrepreneurs, manufacturers of synthetic resins who can easily extract the relevant formulation and manufacturing process from the book.

Contents

1. ACETAL RESINS

- Properties of Formaldehyde and Trioxane
- Preparation of Polymers
- New Polymers of Formaldehyde
- Polymerization of Trioxane
- Higher Aldehydes
- Other Aldehydes
- Properties of Aldehyde Polymers
- Polymers of Other Aldehydes
- Processing of Formaldehyde Polymers
- Uses of Polymers of Formaldehyde

2. ACRYLIC SOLUTION RESINS

- Terminology
- Backbone Monomers
- Thermoplastic Acrylics
- Thermosetting Acrylics
- Processing Industries
- Aqueous Solution Acrylics
- Non-Aqueous Dispersions (NAD)
- Machinery & Equipments

3. ACRYLONITRILE RESINS

- Manufacture of Acrylonitrile
- From Acetylene
- Acrylonitrile : styrene Copolymers
- Acrylonitrile : butadiene-styrene
- Uses and Economic Aspects

4. ALKYD RESIN TECHNOLOGY

- The Nature of Alkyd Resins
- Raw Materials
- Modifiers for Alkyd Resins
- Formulation of Alkyd Resins
- Formula Development
- Calculation of Alkyd Formulations
- Typical Formulations
- Manufacture of Alkyd Resins
- Alcoholysis
- Acidolysis
- Fatty Acid Process
- Estrification

Raw Materials Handling
Alkyd Manufacturing Plant
Corrective Measures During Processing
Applications of Alkyd Resins

5. AMINO RESINS

Formation of Amino Resins
Urea Formaldehyde Resins
Melamine Formaldehyde Resins
Other Amino Resins
Production of Amino Resins
Uses of Amino Resins
Machinery And Equipments
Economics of the Melamine-Formaldehyde
Resin/Urea-formaldehyde resin

6. BHILAWAN NUT SHELL LIQUID RESINS

7. CASEIN RESINS

Manufacture
Properties
Casein Adhesives for Bonding Paper
Casein Adhesive for a Binding Dissimilar Materials
Lime-Free Glue Formulations
Methods of Application

8. CASHEWNUT SHELL LIQUID RESINS

Chemistry of Cashew nut shell Liquid
Utilisation of Cashewnut Shell Liquid
Chemically Modified Cardanol Polymer

9. EPOXY RESINS

Introduction
Epoxy Resin Manufacture and Characterization
Curing Agents For Epoxy Resins
Principles in Formulating with Epoxy Resins
Solventless coating for application by heated two
component air less spray equipment
Water Dispersible Epoxy Coatings
Epoxy Baking Enamels
Water-Dispersible Epoxy Resin Coatings
for Electrodeposition
Epoxy Aqueous powder Suspensions (APS)

10. FURAN RESINS

11. HYDROCARBON RESINS

Petroleum Resins
Terpene Resins
Resins from Pure Monomers

12. ION-EXCHANGE RESINS

Theory and Mechanism

Types of Ion-Exchange Resins
Types of Ion-Exchange Resins
Properties
Applications
Manufacture
Manufacture of Polystyrene Based Ion-Exchange Resins
Polymerisation
Alternative Method of Synthesis of an Ion-Exchange Resin
Process of Manufacture
Methods of Analysis
Determination of Physical Properties:
Chemical Properties

13. INDENE-COUMARONE RESINS

Raw Material and Source
Method of Preparation
Mechanism of Polymerization
Physical Chemical Properties and Type
Hydrogenated Resins
Applications
Application in Adhesives
Coumarone-indene Resin Adhesives
Health and Hygiene Factors
Test Methods
Economics for Coumarone-indene Resin Plant

14. PHENOLIC RESINS

Raw Materials
Phenol Formaldehyde Reactions
Catalysts
Modified Phenolic Resins
Baking Phenolics
Dispersion Resins
Novolak Resins
Resols
Fillers for Phenolic Moulding Powders
Thermal degradation
Modified and Thermal - Resistance Resins
Oil Soluble Phenolic Resin
Heat and Sound Insulation Materials
Foundry Resins

15. BISPHENOL-FURFURAL RESIN

16. PARA-TOLUENE SULFONAMIDE RESINS

17. POLYCARBONATES RESINS

Properties
Methods of Manufacture

18. POLYAMIDE RESINS

Properties
Methods of Manufacture

19. POLYIMIDE RESINS

Polyimide Adhesives

Adhesive and Bonding Technology

20. POLYURETHANE RESINS

Raw Materials

Hazards of Isocyanates

Classification of Polyurethanes

21. POLYVINYL ALCOHOL RESINS

Introduction

Chemical Nature

Physical Properties

Modifiers

Commercial uses : Compounding and Formulating

Commercial uses : Processing Aids

Formulations

Preparation Process

Adhesives

Economics for Polyvinyl alcohol

22. POLYVINYL ACETATE SOLID RESINS

Manufacture

Vinyl Acetate Copolymers

Polyvinyl Acetate Emulsions

Manufacture

Laboratory Preparation of Polyvinyl Acetate

Commercial Preparation

Special Formulation Acetate Adhesive

As Adhesives In the Building Industry

Economics for Polyvinyl acetate

23. RUBBER RESINS

Introduction

Natural Rubber

Synthetic Rubbers

Chlorinated Rubber Resins

Cyclized Rubber Resins

Application And Formulations

High Styrene-Butadiene Rubber Resins

Styrene-Butadiene Rubber Adhesives

Chlorinated Biphenyls

Chlorinated Paraffins

Synthetic Rubber Resin Latexes

Nitrile rubber Adhesives

Butyl Rubber And Polysobutylene Adhesives

Processing for Butyl Polymers

Carboxylic Resin Polymers in Adhesives

Carboxylic elastomers in PSA

Carboxylic Functional Neoprenes as Contact Adhesives

24. SILICONE RESINS

Preparation of Silicoes
Silicone Resins
Preparation and Formulation of Silicone-Resin
based Coatings
Application Guides
Other Silicone Resin Application
Other Silicoes for Surface Coatings

25. SHELLAC RESINS

Commercial Forms of Lac
Chemical Composition
Modification with Synthetic Resins

26. SUCROSE RESINS

Transesterification
Sucrose modified resins
Sucrose acetate isobutyrate (SAIB)

27. ROSIN & ROSIN DERIVATIVES

Composition, Reaction and Derivatives, Isomerization
Maleation
Oxidation, Photosensitized Oxidation
Hydrogenation
Hydrogenless Hydrogenation
Hydrocaraking of Rosin
Phenolic Modification
Salt Formation
Hydrogenolysis
Polyesterification
Preparations, Typical Uses
Chemical and Physical Properties of Amine D Acetate
Decarboxylation
Hydroxymethylation and Hydroxylation
Poly-Oxyalkylation
Oxonation

28. TERPENE RESINS

Hot Melt Adhesives (HMA) and coatings
Terpene-phenolic Resin (TPR)

29. WATER-SOLUBLE POLYMERS

Classification
Applications of Starches
The textile industry
Adhesive Applications
Liquid Adhesives
Miscellaneous Uses
Properties of Cellulose Ethers
Emulsion Polymerization

30. ALKYL AND HYDROXYALKYL CELLULOSE

Cellulosic Ethers, General Information
Manufacture

Powder and Film properties
Physical and chemical properties
Commercial Uses : Compounding and Formulating
Commercial Uses

31. WATER-REDUCIBLE RESINS

Water Soluble Polymers
Cross-Linking of Water-Soluble Coatings
Additives For Coatings, Pigments
Formulation of water-soluble coatings
Trouble Shooting with water-soluble polymers

32. PHOTOGRAPHS OF MACHINERY WITH SUPPLIERS CONTACT DETAILS

Reactor
Condenser
Thermic Fluid Heating System
Octagonal Blender
Industrial Storage Vessels
Ribbon Blender
Filter Press
Filter Tank
Moulding Machine
Ball Mill
Blender
Dryer
Roller Mill
Conveyor Dryer
Resin Plant
Blender Machine
Air Compressor
Heat Exchanger
Storage Tank

33. SAMPLE PLANT LAYOUT AND PROCESS FLOW CHART

Alkyd Resin Manufacturing
Resin Production Equipment
Process Flow Chart for Toner Resins
Polyester Resin Production
Factory Layout for production of Alkyd Resin Production Plant

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.

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

Tue, 21 May 2024 21:32:42 +0530