

The Complete Book on Water Soluble Gums and Resins

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Format: paperback

Code: NI240

Pages: 640

Price: Rs.1675US\$ 150

Publisher: NIIR PROJECT CONSULTANCY SERVICES

Usually ships within **5** days

Resins, gums and latex are almost ubiquitous in the plant kingdom and many of them continue to play an important role in our daily lives. Numerous plants produce some kind of resin, latex or gum, but only a few are commercially important today, even though their uses and applications are truly manifold. They have been used as adhesives, emulsifiers, thickening agents, they are added to varnishes, paints and ink; they lend their aromas to perfumes and cosmetics and even play a role in pharmacy and medicine. Gums are viscous substances which are secreted by the bark of certain trees. Usually transparent (but sometimes slightly tinted) they contain a mucilage which when dissolved in water makes the latter become viscous. When this mucilage is dissolved in water it can be made to precipitate with alcohol. Resins, on the other hand, are gluey and viscous substances which may be whitish, brownish, or red and are secreted by certain trees when they are incised. Resins contain an essence and are usually not water soluble. Most commonly found types of plant exudates are chemically completely different to gums. Several acacia species are important economically. True gums are complex organic substances mostly obtained from plants, some of which are soluble in water and others of which, although insoluble in water, swell up by absorbing large quantities of it. They are used in adhesives, pharmaceuticals, inks, confections, and other products. Resins are terpene based compounds. Terpenes constitute one of the largest groups of plant chemicals and they can be very complex. They are not water soluble, but can be either oil soluble or spirit soluble, depending on their specific chemical composition. Worldwide interest and activity in gums and resins has grown dramatically in the last few years. Governments, environmentalists, research institutions and other interest groups are among those who have begun to push for stronger support for gums and resins as a way to meet a range of economic, social and environmental goals.

Some of the fundamentals of the book are photosynthesis and metabolism of carbohydrates, occurrence, properties and synthesis of the monosaccharides, nitrogen derivatives, carbohydrates in parenteral nutrition, essential carbohydrates, ethers, anhydro sugars and unsaturated derivatives, constitution of nicotinic acid and of nicotinamide, industrial methods of preparing nicotinic acid and nicotinamide, general physiology, metabolism and mechanism of the vitamin action etc.

This book gives a complete insight of water soluble gums and resins that are used in day to day life in various Industries. It is an invaluable resource to all its readers, students, scientist, new entrepreneurs, existing industries and others.

1. CARBOHYDRATES

1. PHOTOSYNTHESIS AND METABOLISM OF CARBOHYDRATES

Photosynthesis

Introduction

Structural Aspects of the Photosynthetic Apparatus

Kinetic Studies on Photosynthesis

Bacterial Photosynthesis

The Hill Reaction

The Path of Carbon in Photosynthesis

The Biosynthesis of Carbohydrates by Plants

Monosaccharides

Oligosaccharides

Starch

Sugar Alcohols

Sugar Acids

Carbohydrate Biochemistry

Pathways for the Metabolism of Carbohydrates

Interconversion of the Sugars

2. OCCURRENCE, PROPERTIES AND SYNTHESIS OF THE MONOSACCHARIDES

Naturally Occurring Monosaccharides

Origin and Preparation of Some Naturally Occurring Monosaccharides

Synthetic Sugars

Complete Synthesis of the Sugars

Methods for Lengthening the Carbon Chain of the Sugars

Methods for Shortening the Carbon Chain of Sugars

Methods Based on Changing the Configuration of Other Sugars

Methods for the Synthesis of Deoxysugars

Preparation of Ketoses by Biochemical Oxidation of Alcohols

Aldose to Ketose Conversion Utilizing the Osones

Methods for Isotope-Labeled Sugars

3. OLIGOSACCHARIDES

Synthesis of Oligosaccharides

Rearrangement and Degradation of Oligosaccharides

Condensation of Two Monosaccharide Units

Determination of Structure

Ease of Acid Hydrolysis

Preparation, Properties, and Structures of Some Oligosaccharides of Natural Origin

Miscellaneous Disaccharides

Tri-, Tetra-, and Pentasaccharides

Miscellaneous Tri- and Tetrasaccharides

Enzymic Synthesis of Oligosaccharides

Synthesis of Sucrose by the Mechanism of Phosphorolysis

Synthesis of Analogs of Sucrose and Maltose by Sucrose and Maltose Phosphorylases

Synthesis of Disaccharides by Transglycosidation Through the Action of Sucrose

Phosphorylase

Synthesis of Oligosaccharides by Transglycosidation Through the Action of Hydrolytic Enzymes

Miscellaneous Oligosaccharides

4. NITROGEN DERIVATIVES

Glycosylamines, Nucleic Acids and Hydrolysis Products, Hydrazones, Osazones, Oximes, Amino Sugars, etc.

Glycosylamines

Unsubstituted Glycosylamines
N-Substituted Glycosylamines
Nucleotides
Preparation and Structures
Nucleoside Di- and Triphosphoric Acids
Biologically Important Substances Related to Nucleotides
Nucleic Acids
Combinations of Sugars with Amino Acids and Proteins
Preparation
Protein-Carbohydrate Compounds as Synthetic Antigens
Reactions of the Sugars with Substituted Hydrazines and Hydroxylamine
Hydrazones and Osazones
Comparison of Weygand-Reckhaus and Bloink-Pausacker Mechanisms
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Derivatives in which an Amino Group Replaces a Primary or Secondary Hydroxyl Group
Amino Sugars (Glycosamines)
Glycamines and Aminodeoxyalditols

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Carbohydrate Sweeteners in Nutrition: Fact and Fantasy
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Cost
Acceptability
Safety
Availability, Convenience, Quality

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Digestion and Absorption
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Dextrins
Maltose
Sucrose
D-glucose (Dextrose)
D-fructose (Levulose)
D-Mannose
D-galactose and Lactose
Lactose and the Microflora of the Digestive Tract
β-Lactose vs. α-Lactose

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Laxative Action of Lactose
Cataractogenic Action of Lactose
Galactosemia Associated with Cataracts in Humans
Lactose and Calcium Metabolism
Cellobiose
Rare Sugars
Xylose Toxicity
Sugar Alcohols (Alditols)
Hexosamines
Cellulose and Related Substances
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Appetite for Carbohydrate

Blood Glucose and the Urge to Eat

Synthesis of Vitamins by the Intestinal Microflora

Protein Sparing Action

Sugar in Candy and Carbonated Beverages

Carbohydrates and Weight Control

Carbohydrates in Parenteral Nutrition

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The Active Compounds and Their Properties

Pathological States Caused by a Deficiency of the Active Compounds

Specificity Studies

The Physiological Action of the Active Compounds

Requirements

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Nomenclature

Names

Chemical formula

Empirical Formula

Occurrence

Isolation

Properties

Chemistry

Industrial Methods of Preparation

Biogenesis

Specificity

Determination

Physiology of Plants and Microorganisms

Animal Physiology

Avitaminosis

Hypervitaminosis

Requirements

9. ETHERS, ANHYDRO SUGARS AND UNSATURATED

DERIVATIVES

Ether Derivatives (External)

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Trityl Derivatives

Anhydro Derivatives

Methods of Preparation

Reactions of Anhydro Sugars

Unsaturated Derivatives

Glycals

Glycoseens and Alditoleens

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Nomenclature and Survey

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Probably also identical with

Empirical formula

Structural formula

Chemical name

Efficacy

Occurrence

Isolation

Properties

Chemical Constitution

Synthesis
Industrial Methods of Preparation
Biogenesis
Specificity
Determination
Standards
Physiology of Plants and Microorganisms
Animal Physiology
Avitaminosis and Hypovitaminosis
Hypervitaminosis
Requirements
11. NICOTINIC ACID—NICOTINAMIDE
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Chemical names
Empirical formulas
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Constitution of Nicotinic Acid and of Nicotinamide
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Biochemical Methods
Biological Methods
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Physiology of Plants and Microorganisms
Animal Physiology
General Physiology, Metabolism and Mechanism of the Vitamin Action
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Methods of Analysis

Cellulose Acetate

Methods of Analysis

Cellulose acetate Butyrate and Cellulose Acetate Propionate

Properties

Methods of Analysis

Ethylcellulose

Properties

Methods of Manufacture

Methods of Analysis

Methylcellulose and Its Derivatives

Properties

Methods of Manufacture

Methods of Analysis

Hydroxyethylcellulose and Its Derivatives

Properties

Methods of Manufacture

Methods of Analysis

Sodium Carboxymethylcellulose

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Methods of Manufacture

Commercial Grades and Specifications

Methods of Analysis

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IN RELATION TO FABRIC GEOMETRY

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Wet Strength, Dimensional Stability, Wash and Crease-resistance and Drape

Bulk Density and Warmth

Lustre

Slipperiness and Resistance to Clinging

Resistance to Soiling

Permeability

Water Repellency, Absorbency, Quick Drying, Electrical Insulation and Dye-receptivity

Mildew and Rot resistance

Heat and Flame Resistance

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About NIIR

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business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.

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Sat, 17 May 2025 07:16:06 +0000