

Gums, Adhesives & Sealants Technology (with Formulae & their Applications) 2nd Edition

Author:- NIIR Board

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Naturally occurring polysaccharides from plant exudates have been in use from many decades in immense quantities. Natural gums are natural polymers, which mainly consists of carbohydrates sometimes with small amounts of proteins and minerals. Gum and its derivatives are widely used in various industries as per its needs. The appearance and properties of natural gums determine their commercial value and end use. Due to their extraordinary, unrivalled technological & functional properties gum is used in many industries. Gums not only modify viscosity and consistency, they also often attenuate odour, taste and flavour intensity. Adhesive or sealant is a mixture in a liquid or semi-liquid state that is capable of holding materials together by surface attachment. Adhesives and sealants are used as a raw material for the manufacturing industry or for the service of different processing industries. Adhesives and sealants virtually touch every part of our lives. The adhesives and sealants are two chemically similar but functionally different groups of formulated products. There is no end in sight to the new materials, new formulation, and new uses to which adhesives and sealants will be put in the future.

Some of the fundamentals of the book are advantages of adhesive bonding, hybrids and coupling agents, adhesive films, designing polymers for adhesives, fundamentals of adhesion, designing polymers for adhesives, thermodynamics of adhesion, casein and mixed protein adhesives, lime-free casein adhesives, foil to paper laminating adhesives, casein and protein blend glues as wood adhesives, chemistry of protein blend glues, natural rubber adhesives, vulcanizing latex adhesives, solution adhesives from natural rubber, halogenated butyl rubber, butyl rubber and poly isobutylene lattices, polysulfide sealants and adhesives etc.

This book covers a wide range of polymeric adhesives and sealants, gums along with their essential formularies, distinguished by applications and based on technology. The main areas covered in details are the basic fundamentals, properties, uses and applications, formulations and chemistry, methods of manufacturing and lastly testing methods. This book will be very resourceful to its readers who are just beginners in this field and also to upcoming entrepreneurs, engineers, existing industries, technologist, technical institution etc.

I INTRODUCTION TO ADHESIVES

ADVANTAGES OF ADHESIVE BONDING

HISTORY

TYPES OF ADHESIVES

Application and Setting

Origin

Cure; Solubility; Crosslinking
Hybrids and coupling Agents
Adhesive Films
High Temperature Resistance; Flame Retardance
MATCHING ADHESIVE TO ADHEREND
Critical Surface Tension
Solubility Parameter
Figure
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Copolymerization
Block Copolymers
Interpenetrating Polymer Network (IPN)
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Introduction

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MANUFACTURING

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TESTING

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FLEXIBLE AND NON-WARP GLUES

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GREASELESS BUFFING COMPOUNDS

GUMMED TAPE

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SIZING AND COATING
PAPER
COMPOUNDED RUBBER
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Formulation and Chemistry of Casein-Lime Glues

Mixing Casein Glue

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Laminating Adhesives

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SBR (SOLID) IN ADHESIVES

General

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Major Applications

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Peel Adhesion
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Peel Adhesion Testing
Shear Resistance Testing
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I FACTORS INFLUENCING GUM COSTS AND APPLICATIONS

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FACTORS AFFECTING RAW GUM COSTS

1. Exudate Gums
2. Seaweed Gums
3. Seed Gums
4. Starch and Cellulose Derivatives

INDUSTRIALLY VALUABLE PROPERTIES OF GUMS

1. Linear Natural Polysaccharides
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3. Polysaccharides with Carboxyl Groups
4. Polysaccharides with Strong Acid Groups
5. Polysaccharides with basic Groups

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2. Introduction of Acidic Groups
3. Introduction of Groups
4. Graft Polymers
5. Other Chemical Modifications of Natural Polysaccharides

I AGAR

INTRODUCTION

SOURCE

1. Raw Material
2. Processing
3. Finished Product

HISTORY

1. Discovery
2. Manufacture
3. Use
4. Present Applications
5. Derivatives

IV. STRUCTURE

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2. Sols
3. Gels

I ALGIN

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3. Harvesting
4. Processing
5. Grades
6. Industrial Importance
7. Potential Amount

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3. Foods

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BAKERY PRODUCTS

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5. Industrial Applications

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4. Pharmaceuticals and Cosmetics
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3. Films and Fibers
4. Adhesiveness
5. Compatibilities

I GUM ARABIC

INTRODUCTION

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3. Nigeria
4. Tanganyika
5. Morocco
6. British Somaliland and Abyssinia
7. South Africa
8. India
- 9 Australia
10. Miscellaneous

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1. Preparation
2. Properties
3. Degraded Gum Arabic
4. Derivatives of Arabic Acid

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4. pH
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6. Aging
7. Mechanical Treatment
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2. Freezing Point

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2. Gum Arabic-Gelatin Coacervates
3. Preparation of Coacervates
4. General Properties, Physical Appearance, and Composition
5. Effect of Temperature
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7. Reactions of Salts
8. Physical Phenomena
9. Uses of Gum Arabic-Gelatin Coacervates
10. Coexisting Coacervates
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1. Isolation of Gum Arabic from Commercial Products
2. Systematic Analytical Scheme
3. Physical Confirmatory Tests
4. Chemical Confirmatory Tests
5. Direct Tests for Gum Arabic in Some Commercial Products

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2. Adhesives

3. Paints
4. Inks
5. Lithography
6. Textiles
7. Miscellaneous

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DEVELOPMENT OF USE

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I GUAR GUM

INTRODUCTION

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2. Agronomics

3. Purification

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5. Paper Industry

6. Explosives

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2. Gels

3. Films

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5. Miscellaneous

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INTRODUCTION

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3. Seasonal Effect

4. Collection

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1. History

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1. Source
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3. Seasonal Effects
4. Collection
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DIRECTORY SECTION

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SUPPLIERS OF RAW MATERIALS

SUPPLIERS OF THE PLANT M/C & EQUIPT.

About NIIR

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

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