Gums are plant flours (like starch or arrowroot) that make foods & other products thick. Gums are used in foods for many reasons besides being used as a thickener. Gums are important ingredient in producing food emulsifier, food additive, food thickener & other gum products. The main reason for adding a gum or hydrocolloid to a food product is to improve its overall quality. India is the largest producer of gums specially guar gum products. Similarly stabilizers are an indispensable substance in food items when added to the food items, they smoothen uniform nature and hold the flavouring compounds in dispersion. Gum technology stabilizers are carefully controlled blends of various food ingredients. Most processed foods need some sort of stabilization at some point during production, transportation, storage and serving. The science and technology of hydrocolloids used in food and related systems has seen many new developments and advances over recent years. The breadth and depth of knowledge of gums and stabilizers has increased tremendously over the last two decades, with researchers in industry and academia collaborating to accelerate the growth. Gums as food constituents or as food additives can influence processing conditions in the following ways; retention of water, reduction of evaporation rates, alteration of freezing rates, modification of ice crystal formation and participation in chemical reactions.

Some of the fundamentals of the book are functions of gum, typical food applications, gums in food suspensions, rheology and characters of gums, natural product exudates, flavor fixation, ice cream, ices and sherbets, gelation of low methoxyl pectin, seaweed extracts, microbial gums, transformation of collagen to gelatin, cellulose gums, dairy food applications, bakery product applications, analysis of hydrocolloids, gums in food products, general isolation of gums from foods, identification of gums in specific foods, group analysis and identification schemes, group identification methods, qualitative group analysis etc.

This book contains rheology of gums, plant sheet gums, microbial gums, cellulose gums and synthetic hydrocolloids different stabilizers used in food industry. The book will be very resourceful to all its readers, new entrepreneurs, scientist, food technologist, food industries etc.

Contents

1. FUNCTIONS OF GUM
   Convenience Foods
   Instant Coffee
   Frozen Foods
   Freeze-Dried Foods
   Gum Constituents
   Effect on Processing
Pertinent Processing Parameters
Function in Food Applications
Viscosity
Definition and Meaning
Factors Effecting Hydrophilic Viscosities
Typical Food Applications
Gelation
Mechanism of Gel Formation
Types of Gel Linkage
Gel Textures
Effect of Sugar on Gels
Rheological Behavior
Gel-Enhancing Effect of Other Gums
Emulsification and Stabilization
Types of Emulsions
Preparation of Emulsions
Applications of Hydrocolloids
Breaking of Emulsions
Suspensions and Dispersions
Description
Yield Value
Gums in Food Suspensions
Foams
Description
Requirements for Stability
Food Applications
Measurement of Foam Stability
Crystallization Control
Description
Types of Crystal Bonding
Effect of Hydrocolloids
Flavor Fixation
Description
Historical Background
Basic Principles
Function of Gums
Important Parameters
Advantages of Gum Arabic
Limitations of Spray-Dried Flavors
Slab Fixation
Microencapsulation (Coacervation)
Alginate Film Encapsulation
Protective Films
Description
Applications
Synergistic Effect
Syneresis Inhibition
Selection and Application of Hydrocolloids
2. RHEOLOGY AND CHARACTERS OF GUMS
Background
Definitions
Viscosity
Newtonian Flow
Non-Newtonian Systems
Bingham Plastic
Pseudoplastic (Shear-Thinning)
Dilatancy (Shear-Thickening)
Thixotropic Flow
Rheopexy
Rheology in Foods
Flow Curve Data
Rheological Measurement of Liquids
Capillary Viscometers
Rotational Viscometers
Brookfield Synchro-Lectric Viscometer
Corn Industries Viscometer
Brabender Visco-Amylograph
Validity of Measurements
Rheological Measurements of Solids
Parameters of Solids
Food Gel Systems
Types of Gel Measurements
Bloom Gelometer
Exchange Ridgelimeter
Gel Characterization Apparatus (GCA)
Description
Advantages
Interpretation of Measurements
Typical Gel Measurements
Texturometer

3. NATURAL PRODUCT EXUDATES
Origin of Gums
Physical Properties
Gum Arabic
Standards
Structure
Properties
Confectionery
Bakery Products
Dairy Products
Beverages
Flavor Fixation
Miscellaneous
Gum Ghatti
Structure and Properties
Applications
Gum Karaya
Structure
Properties
Ice Cream, Ices and Sherbets
Meat Products
Baked Goods
Dairy Products
Miscellaneous
Gum Tragacanth
Structure
Properties
Salad Dressings and Sauces
Ice Cream, Ices and Sherbets
Bakery Products
Confectionery
Miscellaneous

4. PLANT SEED GUMS

Locust Bean Gum
Historical Background
Botany
Source
Structure
Properties
Applications

Guar Gum
Historical Background
Source
Structure
Properties
Applications

Psyllium Seed Gum
Source
Structure
Properties
Applications

Quince Seed Gum
Source
Structure
Properties
Applications

5. PECTINS

Nomenclature
Function in Plants
Structure
Properties
Viscosity
Low Methoxyl Pectins
Gel Formation
Theoretical Discussion
Sugar
Setting Time
Gel Strength
Gelation of Low Methoxyl Pectin
Manufacture of Pectin
Process
Standardization
Manufacture of Low Methoxyl Pectins
Uses of Pectin
Jams, Jellies and Preserves
Critical Parameters
Canned Fruits and Fruit Juices
Confectionery Products
Dairy Products
Miscellaneous
Uses of Low Methoxyl Pectins
Dessert and Pudding Mixes
Canned Fruit Sauce Gels
Canned Tomato Aspic
Frozen Foods
Soda Fountain Fruit Toppings
Variegated Ice Cream
Fruit Pie Fillings
Beverages
Edible Protective Coatings
6. LARCH GUM
Structure
Properties
Viscosity
Surfactant Properties
Refractive Index and Specific Gravity
Adhesive and Binding Properties
Shelf-Life Stability
Food Additive Status
Food Applications
7. SEAWEED EXTRACTS
Botany
Historical Background
Structure
Agar
Historical Background
Collection of Agar Weed
Processing
Structure
Properties
Applications
Carrageenan
Background
Production
Structure
Properties
Applications
Furcellaran
Background
Structure
Properties
Applications
Alginates
Background
Sources
Processing
Structure
Properties
Applications
8. MICROBIAL GUMS
Dextran
Background
Production
Structure
Properties
Applications
Polysaccharide B-1459 (Xanthan Gum)
Background
Preparation
Structure
Properties
Toxicity
Food Applications
Polysaccharide B-1973
Structure
Preparation
Properties
Deacetylated Polymer
Phosphomannan Y-2448
Preparation
Structure
Properties
Rheological Behavior
Applications
Polysaccharide Y-1401
Structure
Preparation
Properties
Rheological Behavior
9. GELATIN
Background
Collagen
Transformation of Collagen to Gelatin
Manufacture of Gelatin
Sources
Processing
Final Products
Chemical Composition
Amino Acids
Ash
Metal Content
Sulfur Dioxide Content
Organic Additives
Physical Properties
Solubility
Viscosity
Color
Turbidity
Gel Strength (Bloom)
Protective Colloid Action
Emulsion Stabilizer
Preservation
Gelling Properties and Mechanism
Gel Structure Hypotheses
Gelation of Gelatin
Phenomena Related to Gelling Mechanism
Applications
Gelatin Desserts
Confections
Ice Cream Stabilizers
Dairy Products
Meat Products
Bakery Goods
Food Coatings
Flavor Fixation
Miscellaneous

10. CELLULOSE GUMS
Cellulose Derivatives
Microcrystalline Cellulose
Properties
Food Applications
Pharmaceutical and Cosmetic Applications
Food and Drug Administration Status
Sodium Carboxymethylcellulose (CMC)
Background
Properties
Dairy Food Applications
Bakery Applications
Salad Dressings, Sauces, and Gravies
Confectionery
Dietetic Foods
Processed Foods
Packaged Dry Mixes
Food Preservation Applications
Miscellaneous
Legal Status
Methylcellulose and Hydroxypropylmethyl-cellulose
Preparation
Properties
Bakery Product Applications
Dietetic Foods
Dehydrated Foods
Frozen Foods
Salad Dressings
Breading Batters
Edible Film Applications
Legal Status
Hydroxypropylcellulose (Klucel)
Properties
Food Applications
Food and Drug Administration Status
Methylethylcellulose
Properties
Applications
Food and Drug Administration Status
Other Cellulose Derivatives
Hydroxyethylcellulose (HEC)
Ethylcellulose (EC)
Ethylhydroxyethylcellulose (EHEC)
Carboxymethylhydroxyethylcellulose (CMHEC)
11. SYNTHETIC HYDROCOLLOIDS
Polyvinylpyrrolidone (PVP)
   Background
   Properties
   Food Applications
Carboxyvinyl Polymers (Carbopol)
   Background
   Properties
   Applications
Methyl Vinyl Ether/Maleic Anhydride Polymers (Gantrez AN)
   Background
   Properties
   Applications
Ethylene Oxide Polymers (Polyox)
   Background
   Preparation
   Properties
   Applications
12. ANALYSIS OF HYDROCOLLOIDS
Examination of Industrial Gums
   Commercial Gums
   Water Solubility Properties
   Alcohol Precipitability Characteristics
   Microscopic Identification
   Flocculation Values
   Gums in Food Products
   General Isolation of Gums from Foods
   Identification of Gums in Specific Foods
   Group Analysis and Identification Schemes
   Group Identification Methods
   Qualitative Group Analysis
   Analysis by Quaternary Ammonium Salt Reactions
   Cetavlon Group Identification Scheme
   Classification by Cobalt Complex Precipitation
   Additional Analytical Methods
   Infrared Spectroscopy
   Paper Chromatography
   Electrophoresis
   X-Ray Diffraction
   Differential Thermal Analysis (DTA)
   Reagents for Gum Identification

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.

NPCS also publishes varies 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 Website: NIIR.org