

Industrial Chemicals Technology Hand Book

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Growth in demand for chemicals in developing countries is high leading to substantial cross border investment in the chemical sector. The chemical industry comprises the companies that produce industrial chemicals. Chemicals are used to make a wide variety of consumer goods, as well as thousands inputs to manufacturing, construction, and service industries. The applications of industrial chemical are in various fields like in organic chemicals, paint, varnishes, resins, petroleum, pigments, printing inks, acrylics polyesters engineering thermoplastics. The chemical industry itself consumes 26 percent of its own output. In modern age chemical industries have permeated most extensively in comparison with other industries and are progressing at a very rapid pace. Chemical industry is one of the oldest industries in India. It not only plays a crucial role in meeting the daily needs of the common man, but also contributes significantly towards industrial and economic growth of the nation. The chemical industry forms the backbone of the industrial and agricultural development and provides building blocks for downstream industries; it is an important constituent of the Indian economy. The chemical industry in India which generates almost 13% of total national export is growing annually at a growth rate anywhere between 10% and 12%. Global chemical production is growing and the growth is contributed by the chemical industry of developing countries. The book contains manufacturing processes, reactions, equipments details, process flow diagram of number of chemicals, which have huge industrial uses. The major contents of the book are iodine from oil well brines, lactic acid from corn sugar, modern production of chlorine and caustic soda, organic chemicals, chemicals derived from methane and so on. This book is very useful for new entrepreneurs, industrialists, consultants, research scholars, technical institutions, chemists and libraries. This book is recommended to all related to field of chemical process technology.

1. Iodine From Oil Well Brines

Brine Collection

Brine Cleanup

Blowing-Out And Recovery

Iodine Finishing

Process Control

2. Lactic Acid From Corn Sugar

Dextrose, Whey, Or Molasses May Be Used For Lactic Acid Fermentations

Four Different Grades

In Commercial Practice Yields Of 85% Of Fermentable Hexose Are Normal

L. Delbruckii Is Culture Used; Corn Sugar Is Principal Fermentation Medium
Calcium Lactate Is Produced During 4- To 6-Day Fermentation Period
Recycled Calcium Sulfate Added To Aid Filtration
Calcium Lactate And Sulfuric Acid React To Form Lactic Acid
Stainless Steel Is Used For Acid Evaporators
Calcium Lactate Is Also Processed As An End Product
Fermentation Processes Operate Around The Clock
Corrosion Is A Major Problem In Production Of Lactic Acid
Foods And Tanning Industries Use Large Quantities Of Lactic Acid
Salts And Other Derivatives Are Used In Diversified Industries
Future Expansions In Lactic Acid Production Must Supply A Quality Product At A Lower Price

3. Modern Production Of Chlorine And Caustic Soda

Raw Materials
Storage And Preparation
Chlorine Production
Caustic Preparation
Hydrogen Chloride
Filling And Storage Systems
Instrumentation And Safety

4. Nitrofurans

Uses For Nitrofurans Extend Into Fields Of Both Human And Veterinary Medicine
Synthesis Of 5-Nitro-2-Furaldehyde Diacetate Is Initial Phase Of Batchwise Procedure
5-Nitro-2-Furaldehyde Diacetate Is Reacted With Semicarbazide To Form Nitrofurazone
Synthesis Of Furazolidone Is Based On Reaction Of 3-Amino-2-Oxazolidone With
5-Nitro-2-Furaldehyde Diacetate
Analytical Tests Are Run On All Raw Materials And Final Products

5. Organic Chemicals

Chemicals Derived From Methane
Synthesis Gas
Chloromethanes
Acetylene
Hydrogen Cyanide
Carbon Disulfide
Chemicals Derived From Ethylene
Polyethylene
Ethylene Oxide
Chlorinated Ethanes And Ethylenes
Ethanol
Ethylbenzene
Acetaldehyde, Acetic Acid, Acetic Anhydride, Vinyl Acetate
Ethylene Oligomers (Alpha Olefins) And Linear Primary Alcohols
Ethylene-Propylene Elastomers
Propionaldehyde
Other Ethylene Uses
Chemicals Derived From Propylene
Polypropylene
Acrylonitrile
Propylene Oxide
Isopropyl Alcohol
Cumene

Oxo Chemicals
Propylene Oligomers, Dodecene, And Nonene 91
Acrylic Acid And Esters
Glycerin
Chemicals Derived From Butanes And Butylenes
N-Butane Derivatives
Isobutanes
Butylenes
Isobutylene
Butadiene
Higher Aliphatic Hydrocarbons
Cyclopentadiene
Isoprene
N-Paraffins
Linear Olefins
Primary And Secondary Higher Alcohols
Chemicals Derived From Benzene, Toluene, And Xylene
Chemicals From Benzene
Styrene
Cumene (Phenol)
Cyclohexane
Maleic Anhydride
Detergent Alkylate
Nitrobenzene (Aniline)
Chlorobenzenes
Derivatives Of Toluene
Toluene Diisocyanate (Tdi)
Benzoic Acid
Benzyl Chloride
Chemicals From Xylene
Terephthalic Acid (Dimethyl Terephthalate)
Phthalic Anhydride
Isophthalic Acid
Naphthalene Derivatives

6. Paint, Varnishes, Resins

Butyl Acetate
N-Butyl Acetate
Iso-Butyl Acetate
Sec. Butyl Acetate
Tert-Butyl Acetate
Manufacturing Process
Note
Reaction
Flow Diagram
Uses
Grades
Toxicity
Epoxy Resins
Properties
Properties Of Typical Commercial Bisphenol A Epoxy Resins.
Manufacturing Process
Formaldehyde

Manufacturing Process
From Methanol
Hexamethylene Tetramine
Manufacturing Process
From Formaldehyde And Ammonia
Reaction
Flow Diagram
Uses
Grades
Toxicity
Solubility Of Pentaerythritol
Manufacturing Process
From Formaldehyde And Acetaldehyde
Reaction
Flow Diagram
Note
Uses
Grades
Specifications Of Pentaerythritol
Toxicity

7. Petroleum And Its Products

The Nature Of Petroleum
Largest Energy Supplier
Product Names
Refined Product
Product Specifications
Product Yields
Petrochemicals
Refining Schemes
Feedstock Identification
Crude Oil Pretreatment
Crude Oil Fractions
Gasoline
Volatility
Sulfur Content
Octane Number
Distillates
Residuals
Producing More Light Products
Cracking
Vacuum Distillation
Reconstituting Gases
A Modern Refinery
Petrochemicals
Process Details
Crude Desalting
Crude Distillation
Hydrotreating
Catalytic Reforming
Catalytic Cracking
Coking
Hydrocracking

Polymerization
Alkylation
Ether Processes
Future Processing

8. Pigments

Carbon Black

From Oil Or Natural Gas (Furnace Process)

Reaction

Flow Diagram

Note

From Natural Gas (Channel Process)

Reaction

Note

Uses

Grades

Titanium Dioxide

Typical Pigment Properties Of Anatase And Rutile TiO_2

Typical Crystal Properties Of Rutile And Anatase TiO_2

Manufacturing Process

Sulphate Process

Note

Reaction

Chloride Process

Note

Grades

Toxicity

Manufacturing Process

From Zinc Metal

(French Or Indirect Process)

Note

Reaction

Flow Diagram

From Zinc Sulphide Ores

Reaction

Flow Diagram

Note

Uses

Grades

Toxicity

9. Pigments, Paints, Polymer Coatings Lacquers, And Printing Inks

Powder Coatings

Electron Beam (Eb) And Ultraviolet (Uv) Curable Coatings

Current Automotive Coating Trends

Coatings For Plastics

New Cross-Linking Technologies

Printing Inks

Pigments

Inorganic Pigments

Organic Pigments

Pearlescent Pigments

Aluminum Pigments

Lacquers

10. Potassium Borohydride Manufacture

Like Sodium Borohydride

Metal Hydride's Process

Potassium Borohydride's Properties

First Make Sodium Hydride Dispersion

Next Major Step-Make Sodium Borohydride

Mineral Oil Dispersion

Splitting Comes Next

Analytical Program

11. P-Xylene From Petroleum

Low Temperature Crystallization Is The Standard Recovery Method

Eutectic Point Limits P-Xylene Yield To 10% Of The Xylene

First Crystallization Stage Produces 80% Purity P-Xylene

Secondary Crystallization Increases Product Purity To Better Than 95%

Product Quality Depends Largely On Crystallization Techniques

12. Reagent Grade Chemicals

Standardization

Barium Chloride

Sulfanilic Acid

Magnesium Sulfate

Ferrous Ammonium Sulfate

Potassium Metaperiodate

Cuprous Thiocyanate

Analysis And Packaging

Future Prospects

13. Salt Manufacture

The Brine Must Be Purified Before Use

Multiple Effect Evaporators Are Used For Vacuum Pan Salt

Salt Evaporation Has Many Special Problems

Dewatered Salt Must Be Dried, Screened, And Packaged

Grainer Salt Is Made By Evaporation In Open Pans

14. Sulfuric Acid From Anhydrite

Theoretical Studies And Chemistry Of Anhydrite Process

Contact Process

15. Synthetic Methanol Production

History Of Synthetic Methanol

Foreign Development

Operating Data For Methanol Process

Gas Stream

Steam Systems

Water Systems

Synthesis Gas Preparation

Addition Of Carbon Dioxide

Compressor Cycle

Converter System

Converter Auxiliaries

Refining By Distillation
Loading And Shipping
Instrumentation
Chemical Control
Maintenance Procedure

16. Synthetic Nitrogen Products

Nitrogen Fixation
Nitrogen Oxides
Ammonia
Other Processes
Calcium Cyanide
Ammonia
Manufacturing Processes
Carbon Monoxide Shift
Carbon Dioxide Removal
Water
Hot Potassium Carbonate
Monoethanolamine (Mea)
Sulfinol
Propylene Carbonate
Rectisol-Refrigerated Methanol
Giammarco-Vetrocoke
Final Purification
Methanation
Nitrogen Wash Operation
Copper Ammonium Carbonate Scrubbing
Selective Oxidation Of Carbon Monoxide
Cryogenic Purifier
Compression
Ammonia Synthesis
Modern Single-Train Ammonia Plants
Uses Of Ammonia
Nitric Acid
Chemistry Of Ammonia Oxidation
Processes
Uses Of Nitric Acid
Ammonium Nitrate
Urea
Uses Of Urea
Melamine
Aliphatic Amines
Methylamines
Hexamine
Hydrazine
Manufacture
Hydrazine Handling
Hydrogen Cyanide
Manufacture
Other Compounds
17. Synthetic Resins & Plastics
Introduction
Polymer Structure And Nomenclature

Properties Of Resins And Plastics
Important Classes Of Plastics And Ins: Thermoplastics Polyolefins
Vinyl Resins
Polystyrene And Styrene Copolymers

Acrylics
Polyesters
Engineering Thermoplastics
Important Classes Of Plastics And Resins: Tosets 433
Polyurethanes
Phenolic Resins
Unsaturated Polyester Resins
Epoxies
Silicone Resins
Polymer Synthesis
Free Radical Addition Polymerization
Ionic Chain Addition Polymerization
Ring Opening Addition Polymerization
Polymer Modification
Polymerization Methods
Polymer Rheology
Fabrication Of Plastics
Extrusion
Injection Molding
Reaction Injection Molding (Rim)
Compression And Transfer Molding
Pultrusion
Blow Molding
Thermoforming
Rotational Molding
Foamed Plastics
Plastics And Environmental Issues

About NIIR

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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.

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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.

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