The Complete Technology Book on Dyes & Dye Intermediates (2nd Edition)

Author: Dr. Himadri Panda

Format: Paperback **ISBN**: 9788194737957

Code: NI91 Pages: 544

Price: Rs. 1,995.00 **US\$** 52.95

Publisher: NIIR PROJECT CONSULTANCY SERVICES

Usually ships within 5 days

Dyeing is the process of imparting colours to a textile material. Different classes of dyes are used for different types of fiber and at different stages of the textile production process, from loose fibres through yarn and cloth to completed garments. Dyes are any substance, natural or synthetic, used to colour various materials, and have wide industry applications ranging textiles, leather, and food, paper etc. They are available in widest ranges for different applications like acid dyes for wool and nylon, direct dyes for cotton, etc. Dyes and its intermediates are specifically used to make the textiles decorative and attractive. At present, India contributes about 6% of the share in the global market with a CAGR of more than 15% in the last decade. The organized sector dominates, with 65% share of the total market, while the unorganized sector controls the remaining 35% of the market. The demand for dyes and dye intermediates is expected to grow at around 6%, backed by strong demand from the textiles, leather, and inks industries. Dyestuff sector is one of the core chemical industries in India. It is also the second highest export segment in chemical industry. The major users of dyes in India are textiles, paper, plastics, printing ink and foodstuffs. The textiles sector consumes around 80% of the total production due to high demand for polyester and cotton, globally. Globally the dyestuffs industry has seen an impressive growth.

This book majorly deals with classification & nomenclature of dyes, commercial form of dyes, properties, formulae, applications of dyes, manufacturing process of dye intermediates, plant and machinery used etc. The major contents of the book are diazotization, coupling, azo coupling, oxidative coupling, anthraxquinone dyes; disperse dyes, dispersion, effect of dispersing agents etc.

Due to increasing growth of textile industries, demand of dyes and dye Intermediates are also increasing very fast in domestic as well as in global market. The book gives stress on syntheses of different types of dyes and dye Intermediates. The formulae and processes have been described in very proper way. Professionals, corporate houses and new entrepreneurs will find this book very useful.

Contents

The Dyes and Dye Intermediate Industry
What are Dyes and Dye Intermediates?
Classification of Dyes
Prices of Raw Materials
Competition from Other Developing Countries
Unit Processes and Operations
Waste Generation
Liquid Waste

Solid Waste

Gaseous Emissions

The Concept of Cleaner Production

Benefits of Cleaner Production

How to Undertake Cleaner Production:

An Introduction to Cleaner Production Assessments

Cleaner Production Techniques

Technology Modification

Recovery and Recycling

Material Recovery

Recovery of By-products

Product Modification

Energy Conservation

Best Practices in Unit Operations and Processes

Best Practices in Isolation

Best Practices in Filtration

Best Practices in Blending

2. Azo Dyes

Diazotization

Coupling

Azo Coupling

Oxidative Coupling

Classification of Azo Dyes

Primary Disazo Dyes

Secondary Disazo Dyes

Miscellaneous Disazo Dyes

Types of Azo Dyes: Structures,

Application, Uses

Methods of Manufacture

Manufacture Congo Red

Diazotization

Coupling

Isolation

Diazotization of Benzidine

First Coupling

Second Coupling

CONTENTS

Third Coupling

Isolation

Diazotization

Coupling

Isolation

Diazotization of Benzidine

Coupling

Isolation

Ethylation

Diazotization of Dianisidine

Coupling

Yield

Direct Light Fast Blue 4GH

Plant for Azo Dyes

Important Notes for Diazotization and Coupling

Methods of Analysis of Azo Dyes

Indentification

Methods of Analysis of Azo Dyes

Procedure

Hydrolysis

Nitric Acid Split

Procedure

Identification of Arylamines in Cleavage Products

Procedure

Identification of Diamines in Cleavage Products

Separation

Blowout Method

Identification of Coupling Components

Assay Methods

Salt Test

Adsorption Chromatography

Procedure

Application Method

Titanous Chloride Reduction

Standardization

Preparation of Methylene Blue Solution

Absorption Spectrophotometry

Standardization

Preparation of Ferric Ammonium Sulfate

Standardization

Direct Reduction Method

3. Reactive Dyes

Introduction

Development of Reactive Dyes

Chromophoric System

The Bridging Group

The Reactive System

Synthesis

Reactive Dyes for Cellulosic Materials, Wool & Nylon

Cellulosic Materials

Reactive Systems Based on Nucleophilic Substitution

Reactive Systems Based on Nucleophilic Addition

Reactive System Based on Both

Nucleophilic Addition and Substitution

Dyes that React with Fibers Under Acid Conditions

Polyfunction Fixing Agents from Covalent Bonds

with Both the Dyestuff and the Substrate

Dyes Containing several Reactive Groups

Wool

Reactive Systems Based on Nucleophilic Substitution

Reactive Systems Based on Nucleophilic Addition

Reactive Systems Based on Both Nucleophilic

Addition and Substitution

Reactions Involving Disulfide Bonds

Reactions Involving Modified Wool

Reactive Dyes for Nylon

Classification of Reactive Dyes

Vinyl Sulfone Reactive Dyes

Tetrachloro Pyrimidine Dyes

Chemistry of tetrachloropyrimidines

Reactive Dyes Based on Epoxides

Other types of Reactive Dyes

Reactivity of Different Types of Reactive Dyes

Application

Purification of Reactive Dyes

Advantages and Limitations of Reactive Dyes

Fabric Preparation

Washing off

New Development of Reactive Dyes

Kayacelon Reaction Dyes

Cibacron C Dyes

Procion Supra Dyes of (I.C.I.)

Procion HEXL Dyes

Prociline N Dyes

Manufacturing Processes

Acetylation of H Acid

Diazotisation of Tobias Acid

Reactive Dyes with Trichloropyrimidine as

Reactive Group

Reactive Dyes with 2, 3-Dichloroquin-oxaline

-6-Carbonyl Chloride as Reactive Group

Reactive Dyes with Chloroacetyl as

Reactive Group

Reactive Dyes with 6-amino-2-chlorobenzo-thia-zole-5

Sulphonic Acid as Reactive Group

Control Test

Properties of Cynuric Chloride

Chlorosulfonic Acid

Commercial Grades and Specificaion of

Chlorosulphonic Acid

Identification of Reactive Dyes

Analysis

4. Anthraquinone Dyes

Disperse Dyes

Dispersion

Effect of Dispersing Agents

Levelling Agents

Classification

Disperse Dyes in the Dye Bath

Disperse Dyes in the Fibre

Sensitivity to Metal

Solacet Dyes (Water Soluble)

Current Research Work

Manufacturing Processes

Emulsion of Diphenylamine

Diazontisation of Aniline

Acid Pasting and Dispersion

Treatment with Hydrochloric Acid

Reactions

Reduction

Aminoanthraquinone Dyes

Anthrarufin and Chrysazin Derivatives

Vat Dyes

Acylaminoanthraquinones

Aminoanthraquinone Anthramides

Anthraquinone-Carbozoles

Ring Closure with Aluminium Chloride

Ring Closure with Titanium Tetrachloride

Ring Closure with Sulphuric Acid

Ring Closure with Potassium Hydroxide

Oxidation

Characterisation of Anthrimides and

Anthraquinone Carbozoles

Spectral Differentiation

Infrared

C = O Stretching and NH Deformation Vibrations

Aminoanthraquinone Indanthrones

Vat Paste

Manufacturing of Vat Paste

Manufacturing Process

Standarisation of Vat Dyestuffs

Identification of Vat Dyes

5. Acid Dyes

Sample Acid Dyes

Mordant Acid Dyes

Premettalized Acid Dyes

Manufacturing Processes

Mordant Dyes

Heat transfer Dyes

Economic Aspects

6. Basic Dyes

Classification of Basic Dyes

Manufacturing Processes

Economic Aspects

Health and Safety Factors

Uses

Methods of Analysis

Identification

Dyes on Substrates

Assay Methods

Titration Methods

Miscellanous Assay Methods

Application Methods

Determination of Impurities

7. Sulfur Dyes

Chemical Properties

Manufacturing Process

Oxidation

Grain Standarisation

Manufacture

Application

Economic Aspects

Commercial Forms of Sulfur Dyes

Health and Safety Factors

Uses

8. Cyanine Dyes

Properties

Examples of Nuclie Occuring in Important

Cyanine Dyes

Photophysical Properties

Synthesis of Cyanines and Related Dyes

Reactivity of Cyanine Dyes

Uses and Suppliers

9. Sensitizing Dyes

Introduction

Sensitization Wavelength and Efficiency

Structural Classes of Spectral Sensitizers

Spectral Sensitization of Silver Halides

Spectral Sensitization of Inorganic and

Organic Solids

Spectral Sensitization of Photoresists,

Photopoly, and Photopolymerization

10. Dye Intermediates

Introduction

Sources of Raw Material

List of Intermediates, Nomenclature;

Auxiliary Agents

Equipment and Manufacture

Chemistry of Dye Intermediates

Electrophilic Substitution

Transformation of Primary

Substitution Products

Examples of the Most Important

Reactions Sulfonation

Reduction

Alkeali Fusion

Nucleophilic Replacement of Activated CL

Special Reactions and Rearrangements

Benzidine Rearrangement

Bucherer Reaction

Kolbe-Schmitt Reaction

Project Briefs

Aceto Acetanilide

Anthraquinone

2-Chloroanthraquinone

2-Amino Anthraquinone

1-Hydroxy Anthraquinone

1-Hydroxy Anthraquinone

1:4 Dihidroxy Anthraquinone (Quinizarine)

1:4 Diamino Anthraquinone

1-Amino-2-Methyl-Anthraquinone

2-Methyl Anthraquinone

1-Nitro-2-Methylanthraquinone

1-Amino-2-Methylanthraquinone

Benzanthrone

Manufacturing Process

Bromobenzanthrone

Benzidinc Derivatines

Chicago Acid and Peri Acid

Cyanuric Chloride

Gamma Acid

H Acid

Laurant's Acid

Metanilic Acid

Orthanilic Acid

R Salt/R Acid

Sulfanilic Acid

Tobias Acid

Vinyl Sulfone

P-Aminophenol

o-Phenylene Diamine

o-And P-Nitrochlorobezenc

p-Phenylencdiamnie

1-Phenyl 3-Methyl 5-Pyrazolonc

1-Amino-2-Naphthol-4-Sulphonic Acid

Schaefeer's Acid

J-Acid

Alkali Fusion of Amino J-Acid

N-Phenyl J-Acid

11. Photographs of Machinery with

Suppliers Contact Details

Agitator Reaction Vessel

Limpet Coil Reaction Vessels

Reactor Vessel

Melting Tank

Storage Tank

Furnace

Extractor Machine

Hydro Extractor

Dye Centrifuge Machine

Dyes Filter Press

Dye Ball Mill

Dye Mixing Machine

Dyes Pulverizer Machine

Calcinatory

Tray Dryer

Fusion Chamber

Vacuum Distillation Plant

Dyes Packing Machine

Diesel Generator Set

12. Plant Layout and Process

Flow Chart & Diagram

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 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.

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

Sun, 28 Apr 2024 21:08:11 +0530