Handbook on Natural Dyes for Industrial Applications (Extraction of Dyestuff from Flowers, Leaves, Vegetables) 2nd Revised Edition

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Dyeing is the process of imparting colors to a textile material. Natural dyes are friendly and satisfying to use. They are obtained from sources like flowers, leaves, insects, bark roots etc. however, they are not readily available and involve an extraction process. With the advancement of chemical industry, all finishing procedures of textile materials have been growing constantly and, sustainable and ecological production techniques have become extremely crucial.

This is a single book which has information related to extraction of dyestuff from 19 common flowers, weeds, bark or leaves and its application on cotton silk and wool fabrics for textile industry.

The Handbook describes the step wise methodology of extraction, mordanting, dyeing with photos of the actual plants part used for extraction of Natural dye. Shade cards have been incorporated so that the full gamut of colors can be visualized from each dyestuff.

Major contents of the book are nature of material to be dyed, history of natural dyes, promotion of natural dyes, sources of natural dyes, mordanting the textiles for natural dyeing, quality standards for vegetable dyes, methods of dye extraction, dyeing methodology, chemistry of dye, some recent publications on natural dyes. This handbook is designed for use by everyone engaged in the natural dye manufacturing and explains different methods of dye extraction. Also contains addresses of machinery suppliers with their photographs.

It will be a standard reference book for professionals, entrepreneurs, those studying and researching in this important area.

About Author

The Author Dr. Padma S Vankar, works as Principal Research Scientist, in Facility for Ecological and Analytical Testing (FEAT) at Indian Institute of Technology, Kanpur. She has been engaged in the screening and characterization of newer natural dyes for the past 10 years. She also works in the area of designing synthetic strategies for Eco-friendly dyes using microwave heating system. Using innovative technology for natural dyeing has been her main emphasis. The author has conducted several workshops throughout India in order to popularize

natural dyeing.

PART I

PART II

Balsam
Bougainvillea
Canna
Carthamus
Cassia Fistula
Cineraria
Cosmos
Eucalyptus Bark
Osbeckia Chinensis
Parkia Javanica
Pomegranate
Sappan Wood
Tectona Grandis
Terminalia Arjuna
Tulsi

6. DYEING METHODOLOGY
Materials
Selection of Plant Sources for Dye Extraction
Extraction of Colorants
Aqueous Extraction
Solvent Extraction
Equipment used for Dyeing and Analysis of Dyed Fabric and their Principle
Sonicator
Ultraviolet and Visible Spectrophoto-meter
Fourier Transform Infra Red Spectroscopy
Gas Chromatograph Mass Spectrometer
Inductively Coupled Plasma Optical Emission Spectrometer
Gas Chromatograph
Xenoster
Wash Wheel
Perspirometer
Crock Meter
Material to be Dyed
Specification of the Fabric
Physical Characteristic of Cotton
Chemical Composition of Cotton Fiber
Chemicals and Reagents Used
Methodology
Preparation of Cloth For Dyeing
Desizing
Scouring
Bleaching
Treatment of Fabric Before Dyeing
Pre Mordanting
Post Mordanting
Dyeing
Assesments Of Eco Friendliness
Assessment Of Antimicrobial Properties

7. CHEMISTRY OF DYE
Basic Concept of Dyes Color
Relation Between Color and Constitution

Characterization of Natural Dyes
Solubility Studies
1. Thin Layer & Column Chromatographic Studies
2. Ultra Violet-visible Spectrophoto-metric Studies
3. Fourier Transform â€“ Infra-red Studies
4. High Performance Liquid Chromato-graphic Studies
5. Gas Chromatographyâ€”Mass Spectro-photometric Studies
Mordants used in Dyeing
Mordant
Tannins and Tannic Acid
Metal Salts or Metallic Mordants
Oil Mordants
Techniques used for Dyeing
Mechanism of Dyeing
Fastness Properties
Fastness Properties of Dyed Materials
Evaluation of Eco-friendliness
Companies Selling through Natural Dyes through Internet
Estimates of Dye Requirements
Some Important Natural Dyes
Blue Dyes
Red Dyes
Yellow Dyes

8. SOME RECENT PUBLICATIONS ON NATURAL DYES BY THE AUTHOR
1. Dyeing Cotton, Silk and Wool with Brassica Oleracea or Purple Cabbage
Introduction
Vegetable Chosen
Studies on Cotton, Silk and Wool
Chemicals Used
Nature of the Colorant
Extraction of Colorant
Optimization of Extraction Condition
Extraction Amount and Time Required
Extraction Temperature
pH of Extraction Medium
Mass to Liquor Ratio
Determination of pKa
Chemical Characterization of the Colorants
Treatment of Fabric before Dyeing
Dyeing
Color Measurements
Results and Discussion
References
2. Dyeing Wool Yarn with Hibiscus Rosa Sinensis (Gurhhal)
Abstract
Introduction
Materials and Methods
Materials
Flower Color Chosen
Studies on Wool
Chemicals Used
Methods

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