



Add-on Certificate Course
Department of Chemistry
Nalbari College
Course Title: Dyes and Pigments



Course Duration: 32 Hours

Course Code: CHE-Ad-on-03

Dyes and pigments have played a significant role throughout history, from ancient civilizations to modern times. They are extensively used in various industries such as textiles, cosmetics, food, printing, paints etc. Understanding their properties and applications is crucial for students pursuing careers in these fields. Learning about dyes and pigments introduces students to the principles of organic chemistry, including molecular structures, chemical reactions, and synthesis processes. Many dyes and pigments have environmental implications due to their production processes and potential pollution. Teaching students about these substances helps raise awareness about environmental issues and encourages them to seek more sustainable alternatives.

Objective: To cope up with the demand of New educational policy (NEP) 2020, it is necessary that higher educational institutions should provide some additional skill-based knowledge apart from the traditional subjective knowledge. The main objective of this certificate course is to equip our students with a comprehensive understanding of these substances, their applications, and their implications across scientific, artistic, environmental, and cultural domains.

Learning outcome of the course: By completing this course students will be able to learn about dyes and pigments, differences between them, various sources of natural dyes and pigments and their extraction procedures, advantage and disadvantages of natural dyes. Also, they will be able to learn about synthetic dyes and pigments, advantages vs disadvantages and their industrial applications in various sectors. Students will be able to explore health hazards and environmental impacts caused by synthetic dyeing industries. Moreover, they will be able to acquire some practical knowledge of extraction of dyes from natural sources as well as laboratory preparation of synthetic dyes.

Course Details:

Module I: 6L

Definition, Historical background of dyes and pigments.

Pigments vs Dyes: Understanding the Differences Between Dyes and Pigments

Nomenclature, classification and properties of dyes and pigments. Chemistry of dyes and pigments.

Module II: 6L

Natural Dyes: Definition and sources, extraction methods and their applications.

Classification of natural dyes according to the method of application.

Advantages and disadvantages of natural dyes and Dyeing methods.

Module III: 8L

Synthetic Dyes: Definition, Properties, Types and Classification.

Advantages and disadvantages of synthetic dyes.

Application of Synthetic Dyes in various sectors like Textile, Food, Cosmetics, Pharmaceuticals, Printing, Paints, Dyeing Plastics etc.

Module IV: 3L

Natural and Synthetic pigments: Natural versus Synthetic pigments

Pros and cons of synthetic pigments

Industrial applications

Module V: 3L

Health and environmental hazards of synthetic dyes and pigments

Module VI: 4L

Practicals: (i) Extraction of natural dye from fruits and dyeing of fabric

(ii) Synthesis of azo dyes in the laboratory

Assessment and Certification: 2 hours

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