

Lecture 5.4 – Pigments and Their Types

Learning Objectives

- Identify and classify industrial pigments by color and composition.
- Understand their chemical properties and environmental concerns.

1. What are Pigments?

- Pigments are colored, insoluble particles used in paint, plastic, ink, etc.
- Provide color, opacity, and resistance to external conditions.

2. Types of Pigments by Color

- White: Titanium dioxide (TiO_2), Zinc oxide (ZnO).
- Blue: Ultramarine blue, Phthalocyanine blue.
- Red: Iron oxide red, Cadmium red.
- Yellow: Chrome yellow, Cadmium yellow.
- Green: Chromium oxide.
- Brown: Burnt umber, natural iron oxides.

3. Desired Properties of Pigments

- Chemical stability, UV resistance, opacity, dispersibility.

4. Environmental Aspects

- Heavy metals in pigments (e.g., cadmium, lead) are toxic.
- Shift to eco-friendly organic and inorganic pigments.

References

1. Industrial Dyes by K. Hunger
2. NPTEL: Industrial Chemistry – Pigments and Colorants

Assignment Questions

1. Classify pigments used for white and green shades.
2. Why is titanium dioxide widely used as a white pigment?
3. Discuss environmental issues with traditional pigments.