

Inorganic Pigments and Powder Technology

Undergraduate 3 credit course in Polymer Engineering curriculum

Amirkabir University of Technology

Chapter 1 An introduction to particle (Fundamental properties of particles: particle size, size distribution, shape, density, mechanical and surface properties).

Chapter 2: Introduction to inorganic pigments (Color properties of pigments).

Chapter 3: White pigments, Colored pigments, Black pigments (titanium dioxide - zinc pigments - metal oxide and oxide-hydroxides - cadmium, bismuth, chromate, ultramarine and iron blue).

Chapter 4: Specialty pigments (magnetic - anti-corrosive - transparent and luminescent pigments).

Chapter 5: Introduction to surface forces and properties (surface tension and surface energy, van der Waals, steric and depletion forces - Contact angle and wetting - Zeta potential - Coagulation and agglomeration).

Chapter 6: Solid surfaces (Description of crystalline surface and thermodynamics of solid surfaces - Characterization by microscopy, diffraction methods and spectroscopic techniques).

Chapter 7: Fundamentals of powder systems (Adsorption and measurement techniques - Adsorption and specific surface area – Breakage, sintering and solubility).

Chapter 8: Powder processing and generation (Crushing, Grinding and Classification - Mixing, Granulation and Drying).

References:

1. G. Buxbaum, G. Pfuff, Industrial inorganic pigments, John Wiley & Sons, 2008.
2. H. Masuda, Powder technology handbook, 3rd edition, Taylor and Francis, 2006.
3. H. J. Butt, K. Graf, M. Kappl. Physics and chemistry of interfaces, John Wiley & Sons, 2013.
4. B. H. Kaye, Characterization of Powders and Aerosols, John Wiley & Sons, 2008.