

Advanced Kinetics and Chemical Reaction Engineering
Postgraduate 3 credit course in Polymer Engineering-Color Industries
curriculum

Amirkabir University of Technology

1. Brief review on kinetics and chemical reaction engineering in homogenous reactions (intrinsic versus overall reaction rates, microscopic-local and chemical reaction engineering view on a chemical reactor, governing equations for batch, CSTR and PFR reactors)
2. Chemical reaction engineering of complex systems (semi-batch reactors, continuous reactors in transition state)
3. Effect of temperature on kinetics, thermodynamics and chemical reaction engineering (single reactions and multiple reactions, batch, CSTR and PFR)
4. Kinetics of heterogeneous catalytic reactions (concepts, Langmuir-hinshelwood isotherm, effectiveness factor, governing equations for different conditions)
5. Kinetics of heterogeneous reactions (gas-solid and liquid-liquid systems)
6. Kinetics of curing of thermoset resins (thermoset resins film formation, kinetics of curing, different kinetics models for thermoset resins curing, DSC for kinetics study)
7. Kinetics of reactions in corrosion (case study)
8. Kinetics for waste water treatment in textile industries (case study)
9. Kinetics of polymerization reactions (case study)

References:

- Levenspiel O. "Chemical Reaction Engineering", 3rd ed., McGraw-Hill, 1999
- Missen R.W., Mims C.A. and Saville B.A. "Introduction to Chemical Reaction Engineering and Kinetics", John Wiley, 1999.
- Zoski C.G. (ed), "*Handbook of electrochemistry*", ScienceDirect publishers, 2007.
- Odian G. "Principles of polymerizations", 4th ed., Wiley, 2004.