Advanced polymer design for energy materials ENG.H503 ACEEES No.1

> 1Q1-0-0 Assoc. Prof. Reiko Saito Friday1.2 H117

Aims

• There are many limitation for synthesis of polymers as energy materials. This course focuses strategy of polymerization for energy materials, based on metal free polymerization of well-define polymer, emulsion polymerization for mass production., poly(acrylic acid) with different architecures, highly transparent and hard organic-silica nanomaterials. The concept of Smith-Ewart theory is an essential tool to analyze and design the emulsion polymerization. This approach is not only useful for energy materials, but is applicable to medial and other materials. Students will have the chance to tackle practical problems by applying knowledge acquired through this course. This course facilitates students' understanding of development of novel materials in polymer field.

Schedules

	Date	Content
1	April 13	Overview of radical polymerization and emulsions
2	April 20	Smith-Ewart theory I
3	April 27	Smith-Ewart theory II
4	May 11	Emulsion Co-polymerization
5	May 18	Semi-batch polymerization
6	May 25	Self-study
7	June 1	Emulsion polymerization on living radical polymerization
8	June 8	Summery and examination

All contents of lecture are uploaded in OCW-i.

References

- "Catalysis in Micellar and Macromolcular Systems", Janos H. Fendler and Eleanor J. Fendler, Academic Press
- "INTERMOLECUAR AND SURFACE FORCES", Jacob N. Israelachvili, Academic Press
- "EMULSION POLYMERIZATION AND EMULSION POLYMERS" Peter A. Lovell and Mohamed S. El-Aasser, Wiley
- http://www.firp.ula.ve/archivos/historicos/76_Book_ HLB_ICI.pdf