

Polymer Physics

Dozent: **R. Hentschke**

Zielgruppe: Studenten im Master Physik/Chemie

		POLYMER MICROSTRUCTURE; CLASSIFICATION AND MASS	
Lec 1		Molecular Microstructure and Classification, Molecular Mass	
Lec 2		Flexibility Mechanisms and Polymer Dimension	
		EQUILIBRIUM CONFORMATION OF SINGLE CHAINS	
Lec 3		RIS/Transfer Matrix	
Lec 4		Self-Consistent Field Approach	
Lec 5		Conformation Entropy, Flory's Exponent	
Lec 6		The Scaling Concept	
Lec 7		Scattering from Ideal Chains	
Lec 8		Light Scattering and Zimm Plot	
Lec 9		Scattering from Real Chains	
		THERMODYNAMICS OF BLENDS; SOLUTIONS AND NETWORKS	
Lec 10		Lattice Model for Binary Polymer Mixtures	
Lec 11		Phase Separation in Polymer Mixtures and Polymers in Solution	
Lec 12		Swelling of Polymer Networks	
		POLYMER DYNAMICS	
Lec 13		Linear Deformation Mechanics, Ideal Fluids, Phenomenological Models of Dynamic Moduli	
Lec 14		Time-Temperature Superposition, Shear Relaxation Modulus and Relation to Storage Modulus and Loss Modulus	
Lec 15		Single Chain Dynamics: Preliminaries (friction, Brownian motion, equation of motion of the bead-spring chain with friction)	
Lec 16		Single Chain Dynamics: Rouse Model – Solution and Results	
Lec 17		Single Chain Dynamics: Zimm Model – Hydrodynamic Interactions and Their Effects	
Lec 18		Polymer Entanglement	
		SELECTED TOPICS	
Lec 19		The Glass Process	
Lec 20		Filler Effects	
Lec 21		Aspects of Polymer Mechanics	
Lec 22		Liquid Crystalline Polymers	
Lec 23		Reversibly Assembling Polymers	
Lec 24		Polyelectrolytes	

Literature:

R. Hentschke Introduction to Polymer Physics – Theoretical Concepts and Their Application (lecture notes)