

**Colloid Chemistry (in English) \*Time: 2 -3 pm \*lecture room 1.003**

19.4.1. Introduction, History, Definitions (KL)

26.4.2. Thermodynamics of interfaces: surface tension, surface and interfacial tension measurements (KZ)

17.5. 3. DLVO-Theory: introduction of the DLVO theory; electrostatic stabilization, steric stabilization, depletion destabilization/stabilization, (KL)

10.5.4. Surfactants: introduction into amphiphilic molecules, aggregation behavior of surfactants, micelle formation, measurements of the critical micelle concentration (cmc), Bancroft rule, packing parameter, HLB value, ionic and non-ionic surfactants, low molecular weight and high molecular weight surfactants, influence of molecular structure of the surfactant on the aggregation behavior, Pickering stabilization (KL)

24.5.5. Emulsions, Miniemulsions, Microemulsions: Thermodynamics of the different emulsion types, coalescence, Ostwald ripening, importance of hydrophobe/lipophile (MB)

31.5.6. Heterophase polymerization: emulsion polymerization kinetics, miniemulsion polymerization kinetics, molecular weights, molecular weight distributions, copolymers/core-shell particles (MB)

7.6.7. Applications: film formation, coatings, adhesives and cosmetics (MB)

14.6.8. Emulsification methods: high pressure homogenization, ultrasonication (cavitation), membrane emulsification, microfluidics (KL)

21.6.9. Foams: classical polymer foams, polyHIPEs, isolation behavior, absorption and filtration, catalysis and catalyst support (KZ)

28.6.10. Anorganische Nanopartikel: metal and metal oxides, silica nanoparticles, sol-gel process, pigments (KZ)

12.7.11. Colloid analytics (4 hours, in German/English): Light scattering, electron microscopy (SEM and TEM), zeta potential measurements., particle charge detection, ultra microscopy, confocal microscopy, STED, isothermal titration calorimetry, NMR, FCS, AFM, FFF, ultrafiltration (MB)

19.7.12. Colloid Chemistry in the Kitchen: The colloidal chemistry of the "SchwarzwälderKirschtorte" (KL)

**Vorlesung Kolloidchemie im Sommersemester 2016 (Zeit: 12.15 Uhr - 13.45 Uhr), \* Ort: Hörsaal 1.003, Max-Planck-Institut für Polymerforschung)**

19.4.1. Einführung, Geschichte (KL)

26.4.2. Thermodynamik von Grenzflächen (KZ)

10.5.3. DLCO Theorie (KL)

17.5.4. Tenside (KL)

24.5.5. Emulsionen, Miniemulsionen, Mikroemulsionen (MB)

31.5.6. Heterophasenpolymerisation (MB)

7.6.7. 10. Anwendungen: Filmbildung, Lacke, Adhäsive (MB)

14.6.8. Emulgiermethoden (KL)

21.6.9. Schäume (KZ)

28.6.10. Anorganische Nanopartikel (KZ)

5.7. Studentenvorträge (KZ, KL, MB)

12.7.11. Kolloidanalytik (4 Stunden! Deutsch/Englisch kombiniert) (MB)

19.7.12. Kolloidchemie in der Küche: Die Kolloidchemie der Schwarzwälderkirchtorte (KL)