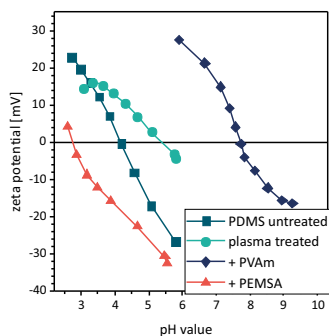
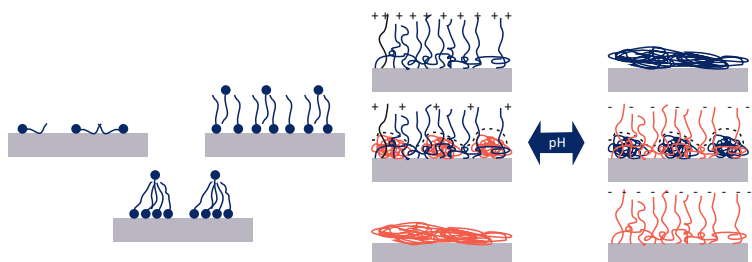
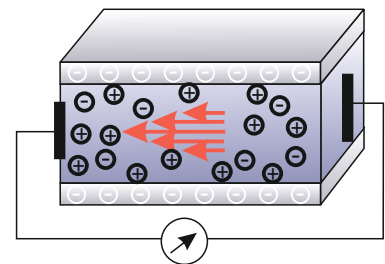


Applied Electrokinetics: Plates, Foils, Membranes

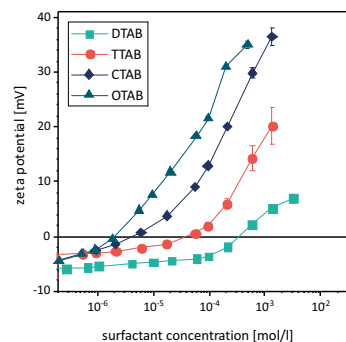
Streaming potential and streaming current measurements in a narrow streaming channel between two parallel flat surfaces are applied to determine zeta potential and surface conductivity of these surfaces, usually as function of the pH value, the concentration of adsorbing substances, or the time. From these measurements information about functional or reactive groups, chemical reactions, dissociation and adsorption processes in aqueous solutions can be derived. Combined with other methods (surface spectroscopy, wettability measurements) they allow for a deeper understanding of the properties of surfaces and thin films, the interaction between solids, the performance of membranes, and controlled modifications and improved adhesion strength of coatings and adhesive bonds.

Applications

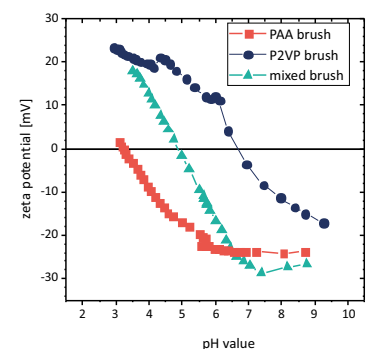
- characterization of surfaces and thin films
- chemical and physical surface functionalization
- verification of adhesive and reactive groups
- adsorption of ions, surface-active species and proteins
- responsive surfaces ("smart materials")
- microelectronics: photoresists and semiconductors
- water purification: performance and fouling of membranes
- medical technology: dialysis membranes, implants, contact lenses
- food technology: soiling of surfaces
- adhesion of coatings and glues



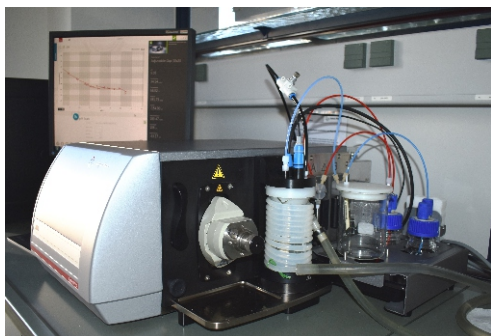
control of the adhesion properties of PDMS by plasma treatment and polyelectrolyte adsorption



adsorption of cationic surfactants on photoresist



pH response of thin polyelectrolyte layers (homogeneous and mixed brushes)



Equipment

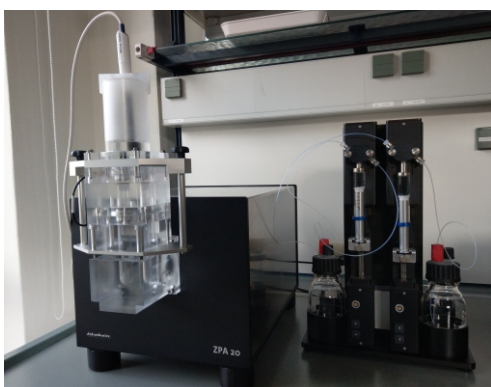
SurPASS™ 3 (A. Paar GmbH)

streaming potential and streaming current measurements
in aqueous solutions
measuring cell for rectangular specimens 10 mm x 20 mm
various special cells
pH titration, concentration dependence



EKM (ZetaScience)

streaming potential and streaming current measurements
in aqueous solutions
measuring cell for rectangular specimens 10 mm x 20 mm
pH titration, concentration dependence



ZPA 20 (DataPhysics Instruments GmbH)

streaming potential and streaming current measurements
in aqueous solutions
measuring cell for rectangular specimens 10 mm x 20 mm
pH titration, concentration dependence

Selected publications

Marschelke, C. ; Puretskiy, N. ; Raguzin, I. ; Melnyk, I. ; Ionov, L. ; Synytska, A. Effect of architecture of thermoresponsive copolymer brushes on switching of their adsorption properties. *Macromolecular Chemistry and Physics* 220 (2019) ID 1900030

Cedano-Serrano, F.J. ; Sidoli, U. ; Synytska, A. ; Tran, Y. ; Houdet, D. ; Creton, C. From molecular electrostatic interactions and hydrogel architecture to macroscopic underwater adherence. *Macromolecules* 52 (2019) 3852-3862

Synytska, A. ; Svetushkina, E. ; Puretskiy, N. ; Stoychev, G. ; Berger, S. ; Ionov, L. ; Bellmann, C. ; Eichhorn, K.-J. ; Stamm, M. Biocompatible polymeric materials with switchable adhesion properties. *Soft Matter* 6 (2010) 5907-5914

Drechsler, A. ; Synytska, A. ; Uhlmann, P. ; Elmahdy, Mahdy M. ; Stamm, M. ; Kremer, F. Interaction forces between micro-sized silica particles and weak polyelectrolyte brushes at varying pH and salt concentration. *Langmuir* 26 (2010) 6400-6410

Drechsler, A. ; Petong, N. ; Bellmann, C. ; Synytska, A. ; Busch, P. ; Stamm, M. ; Grundke, K. ; Wunnicke, O. The adsorption of cationic surfactants on photoresist surfaces and its effect on the pattern collapse in high aspect ratio patterning. *Colloids and Surfaces A: Physicochemical and Engineering Aspects* 311 (2007) 83-92

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Cooperations

