

Physical Chemistry at the University of Vienna – Recent Research Highlights

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Research at the Department of Physical Chemistry of the University of Vienna currently focusses around two main topics:

- (1) Interactions between femto- and nanosecond laser pulses and matter for investigating and engineering materials and interfaces.
- (2) Developing self-organized (polymer) systems that are able to bind a range of species, to use them as receptors in sensing/rapid testing.

This activity led to the following highlights:

- Formation mechanism of microbumps and nanojets on Ag/Cu films and double layers irradiated by a single 60 fs laser pulse both experimentally and in atomistic simulations.
- Mechanistic evaluation of the electrodeposition of alloys by in-situ techniques.
- Electrotyping in Nature Printing: physico-chemical reconstruction and characterization of electrodeposited printing plates of the 1840s in Vienna.
- Development of self-organized single strand DNA sub-monolayers for in-situ rapid detection of Lysteria contamination via LAMP amplification products.
- Design of molecularly imprinted polymers targeting engineered nanoparticles.
- Raman microscopy studies to characterize polymer surfaces imprinted with different bacteria species.
- Pickering emulsion strategies for synthesizing bacteria-imprinted polymer microbeads.
- Relating the macroscopic wetting with the molecular level water organization at the silica-water interface by surface specific sum frequency vibrational spectroscopy.
- Determining the water structure at the photocatalytic TiO₂-water interface as function of the pH.