Topics for projects, BSc and Diploma thesises

Department of Physical Chemistry

Dr. Attila Bényei

(chemical engineering BA, chemistry MA, 1 person)
Study of solid state structures of transition metal complexes determined by single crystal X-ray diffraction
Basic use of software packages to solve and refine small molecular structures from single crystal X-ray diffraction data.

(chemical engineering BA, chemistry MA, 1 person)
Use of crystallographic database to compare solid state structure of organic molecules
Search of Cambridge Structural Database and comparison of a given molecule family.

Department of Inorganic and Analytical Chemistry

Dr. József Kalmár / Péter Veres / Attila Forgács
(Chemistry BSc./M.Sc.; Chem. Eng. BSc./M.Sc.)
Kinetics and mechanism of sorption processes involving suspended porous sorbents.

- Kinetics and mechanism of adsorption of dyes, heavy metal cations and proteins on different aerogels in aqueous suspensions.
- Desorption mechanism of active pharmaceutical ingredients from loaded aerogel samples.
- Investigation of the mechanism of the interaction of aerogels with different solvents.

Dr. József Kalmár / Péter Veres / Attila Forgács
(Chemistry BSc./M.Sc.; Chem. Eng. BSc./M.Sc.)
Biomedical applications of aerogels.

- Synthesis of biocompatible hybrid aerogels. Preparation of cell-sized aerogel microspheres.
- Functionalization of aerogels with active pharmaceutical ingredients.
- In vitro and in vivo toxicity studies.

Dr. József Kalmár / Péter Veres / Attila Forgács
(Chemistry BSc./M.Sc.; Chem. Eng. BSc./M.Sc.)
Photophysical and photochemical studies using laser flash photolysis.

- Steady-state and a time-resolved fluorescence spectroscopy.
- Investigation of the solvatochromic properties of different biological dyes.

Functionalization of biocompatible aerogels with biological dyes