

Topics of FChT dissertations for admission to doctoral studies in 2026

Analytical Chemistry

- Development of HPLC and HPLC/MS methods for separation and quantification of biologically active compounds present in different natural products (herbs, plants, foods etc.).
Supervisor: prof. Lenka Česlová
- Metabolic pathways of (glycol)sphingolipids in cancer
Supervisor: prof. Michal Holčápek
- Development of multidimensional separation methods in miniaturized systems coupled with mass spectrometry for analysis of low-molecular compounds in biological samples
Supervisor: assoc. prof. Petr Česla, Ph.D.
- Advanced elemental and data-driven approaches in modern analytical spectrometry
Supervisor: assoc. prof. Lenka Husáková, Ph.D.

Inorganic Chemistry

- Coordination compounds for cooperative and sequential catalysis
Supervisor: prof. Aleš Růžička
- Polyhedral boron compounds with superbasic properties
Supervisor: prof. Aleš Růžička
- Transition metal complexes as catalysts for the activation of unsaturated bonds
Supervisor: Dr. Michal Horáček

Biochemistry

- Development of electrochemical immunosensors for sensitive detection of disease-associated biomarkers
Supervisor: assoc. prof. Lucie Korecká
- Evaluation of newly developed materials in terms of antimicrobial properties and biodegradability
Supervisor: assoc. prof. Marcela Pejchalová

Physical Chemistry

- Synthesis and catalytic applications of nanoparticles and subnanometric clusters encapsulated in microporous supports
Supervisor: prof. Roman Bulánek
- Molecular sieves for sustainable separations of difficult-to-separate gas mixtures with industrial importance
Supervisor: prof. Roman Bulánek

- Organometallic coordination porous polymers for adsorption and catalytic applications
Supervisor: prof. Roman Bulánek
- Study of the flexibility of zeolite lattices and their use for adsorption-separation applications
Supervisor: prof. Roman Bulánek
- Universality of structural relaxation in glassy materials (material time and its consequences for theoretical models describing bulk and enthalpic relaxation)
Supervisor: prof. Jiří Málek
- Development of sustainable methods for epoxidation of vegetable oils and their derivatives
Supervisor: assoc. prof. Martin Hájek
- Synthesis and characterization of heterogeneous catalysts for the conversion of renewable raw materials into valuable chemicals
Supervisor: assoc. prof. Martin Hájek
- Surface phenomena in amorphous materials (focused on the viscosity of mainly thin layers, structure spreading, self-diffusion, and possibly surface tension)
Supervisor: Dr. Jaroslav Barták
- Direct study of crystal growth kinetics in amorphous materials (focused on the comparison of growth in materials prepared by various methods and the relationship of crystal growth to self-diffusion)
Supervisor: Dr. Jaroslav Barták

Chemistry and Technology of Inorganic Materials

- Advanced Strategies for the Preparation of Functional Nanostructured Materials for Multidisciplinary Applications
Supervisor: prof. Tomáš Wágner
- Amorphous Chalcogenide Thin Films: Preparation and Characterization
Supervisor: prof. Petr Němec

Engineering of energetic material

- The applicability of methods based on Bayesian networks for process risk assessment
Supervisor: assoc. prof. Miloš Ferjenčík
- Explosions of dusts in layer and dispersion in various geometries
Supervisor: assoc. prof. Břetislav Janovský
- Study of the properties of improvised explosives
Supervisor: assoc. prof. Robert Matyáš

- Characterization of primary explosives and their precursors
Supervisor: assoc. prof. Robert Matyáš, Ph.D.
- Characterization of the properties of modern energetic materials
Supervisor: assoc. prof. Jiří Pachman, Ph.D.
- Study of the effects of energetic materials
Supervisor: assoc. prof. Jiří Pachman, Ph.D.
- Possibilities of using lasers in the study of energetic materials
Supervisor: assoc. prof. Jiří Pachman, Ph.D.

Organic Technology

- New wound covers
Supervisor: prof. Radim Hrdina
- New sequestrants
Supervisor: prof. Radim Hrdina
- New anti-corrosion compounds
Supervisor: prof. Radim Hrdina
- New indigoid-type molecules
Supervisor: prof. Radim Hrdina
- Optimization of technological processes of organic synthesis using advanced data processing methods
Supervisor: prof. Aleš Imramovský
- Development and implementation of "flow" technologies for the production of organic intermediates
Supervisor: prof. Aleš Imramovský
- Synthesis and characterization of organic materials with targeted optical properties
Supervisor: prof. Aleš Imramovský
- Synthesis and study of new biologically active peptidomimetics
Supervisor: prof. Aleš Imramovský
- Preparation of nitrocellulose from recycled materials
Supervisor: assoc. prof. Zdeněk Jalový

Surface Engineering

- Oxide and oxychalcogenide thin films for active and passive photonics application
Supervisor: prof. Virginie Nazabal
- Chemical recycling and upcycling of waste polylactic acid
Supervisor: assoc. prof. Jan Honzíček