| **Name of the course** | **Silicates and silicate glasses** |
|---|---|
| Number of instruction hours | 20 |
| Outline of course/module content | Principles of [SiO4] tetrahedra polymerization. Structures of silicates. Classification of silicates. Technically important silicate systems. Mullite: SiO2-Al2O3 phase diagram, crystal structure, properties. Layered silicates: kaolinite, talc, mica, chlorite, vermiculite, montmorillonite, illite. Clays: clay-water system, ion exchange. Zeolites: structure, properties, application, fabrication of synthetic zeolites. Feldspars. Silica: polymorphous modifications of SiO2, fabrication and use of synthetic SiO2. Organosilicon compounds: silicon halides, silanoles, siloxanes, silicones. Silicate-based molecular nanotechnology. Silicate melts and its transformation into gassy state. Structure and kinetical theoryes. Types of silicate glasses. Relationship between glass composition and properties. Glass surface and its modification. Controled glass crystallization. Phase separation in glasses. Crystallization mechanism and kinetics of crystal growth. Glassceramic and its properties. |
| Description of instruction methods | Lectures |
| Description of course/module requirements | Oral exam |