

Technical equipment

Instruments for infrared spectroscopy and Raman spectroscopy

- FT-IR spectrometer NICOLET 6700 with FT-Raman module NICOLET NXR (Thermo Fisher Scientific).
- FT-IR microscope NICOLET iN10 (Thermo Fisher Scientific).
- FT-IR spectrometer NICOLET Avatar 320 (Thermo Fisher Scientific).

Instruments and software for microscopy and image analysis

- Optical polarization and fluorescence microscope NIKON Eclipse 80i with motorized scanning stage MÄRZHÄUSER Scan-24-410.
- Optical polarization microscope NIKON Eclipse LVDIA-N.
- Optical polarization and fluorescence microscope OLYMPUS BX 50.
- Laser confocal microscope OLYMPUS LEXT OLS 3100.
- Stereomicroscopes NIKON SMZ25 and NIKON SMZ2T.
- Image processing and analysis systems NIS Elements (Nikon), LUCIA (Laboratory Imaging, Ltd.), and Matlab Image Processing Toolbox.

Instruments for thermal analysis

- Thermal analyser SETSYS TG-DTA/DSC 24 with mass spectrometer (Setaram Instrumentation).
- Thermal analyser SETSYS 12 (Setaram Instrumentation).
- Izomet 2104 for measurement of thermal conductivity and specific thermal capacity.



FT-IR spectrometer NICOLET 6700 with FT-Raman module NICOLET NXR



Thermal analyser SETSYS TG-DTA/DSC 24 with mass spectrometer



MTS servo-hydraulic testing system

Instruments for testing physical-mechanical properties of rocks

- MTS servo-hydraulic testing system for testing of stress and strain properties of rocks, max. force 4600 kN.
- Triaxial cell 656.06 with possibility of temperature control (up to 200 °C) and water permeability measurement.
- Mechanical press ZWICK 1494, max. force 600 kN.
- Karman's triaxial cell KTK 100 with confining pressure up to 100 MPa and possibility of permeability measurement in deformation process.
- Micro Hardness Tester 240V 50 - 60Hz (CSM Instruments).
- Apparatus for measurement of ultrasonic wave velocity in the process of loading.

Instruments for gas analysis

- Gas chromatograph DANI 1000 DPC: uhlovodíky ($C_1 - C_4$), H_2 , range of content: 0 – 5000 ppm. Hydrocarbons $C_1 - C_4$ are determined by the column Rt Alumina Plot with FID detection, gas chromatography with μ TCD detection is used for analysis of hydrogen.
- Stationary gas analysers for CH_4 , CO, CO_2 , O_2 .