



M icrostructural analyzes

- FESEM, Hitachi SU5000 + EDS / WDS Thermo Scientific (ANAMAT)
- SEM Jeol Neoscope JCM 6000
- X-ray diffraction Panalytical X'Pert Pro
- Confocal Microscope Leica DCM 3D high resolution
- Optical Microscope Zeiss with image processing
- Binocular Nikon SMZ-2T with image acquisition

T extural and surface analyzes

- Laser diffraction particle size analyzer, Mastersizer MALVERN 3000
- BET Micromeritics Tristar II Plus (specific surface measurement)
- Mercury porosimeter Micromeritics Autopore IV
- Helium pycnometer Micromeritics AccuPic II 1340
- Density measurement by hydrostatic weighing
- Tap Density, ASTM standard, USP
- Geopycnometer Micromeritics 1360 (density)
- Contact angle KRUSS DSA100

T hermal analyzes

- TGA/DTA/DSC, SETARAM LabSys Evo
- Dilatometer NETZSCH DL 402C
- Thermal balance Metler Toledo HR83

M echanical characterizations

- Machine Instron 1185, 1KN à 100KN, 300°C, traction, compression, flexion.
- Machine Testometric M250-3CT, 0,5-3KN, traction, compression, flexion.
- Vickers hardness tester, Zwick/Roell ZHU0.2
- Vickers micro-hardness tester, Testwell FM
- Pin on disc Tribotechnic (friction coefficient measurement)
- Portable durometers Vickers, Rockwell, Shore A, Shore D

C hemical, mineralogical, rheological analyzes

- Fourier transform infrared, Jasco FT-IR 4600
- Rhéomètre, Netzsch GEMINI Bohlin Instrument
- Zétamètre Nanoplus Particulate Systems

E lectrical characterizations

- Radian 609 B TREK, ferroelectric measurements, hysteresis curve
- Impedance analyzer HP 4194 (capacitance, permittivity, piezo properties)
- Piézomètre, d_{33} measurement
- NDT M100A, resistivity meter for conductive materials
- TF analyser 2000E aixACCT Systems, piezoelectric analyse

N on-destructive testing

- Portable laser vibrometer, PDV-100 Polytec
- US (defects, Young's modulus and Poisson's ratio)

