

KEYWORDS Heterogenous materials: polymers and composites, cements and concretes.
Microstructure, Surface characterisation, Interfacial properties.

OBJECTIVES

- Develop low environmental impact, high-performance multi-phase materials with polymer or mineral as matrix
- Improve the functional properties (mechanical, thermal, fire-reaction, durability) and end-of-life properties of materials
- Observe the phases and interphases of hetero-phase materials

ACTIVITIES

Physico-chemical characterisation of materials:

- Microstructure analysis
- Characterisation of surface state
- Chemical composition analysis
- Study of mechanical and electrical properties at microscopic and nanoscopic scales

SPECIFIC FEATURES

Materials :

- Polymers and organic-matrix composites
- Minerals or mineral-matrix materials

FIELDS OF APPLICATION

- Civil Engineering
- Transportation
- Electrotechnics
- Medical
- Sports and leisure activities
- Marine industry

WHAT WE OFFER

Training
Collaborative research
Feasibility studies – Service-provision – Expert assessments

MAIN PARTNERS

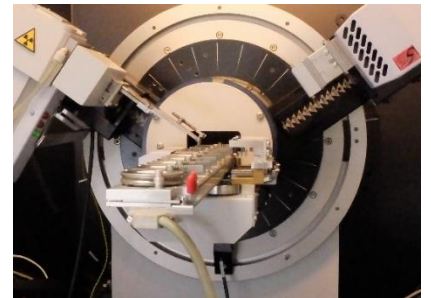
CEA, Areva, Cemex, Naval Group, ACOME, Pellenc ST, Suez

MAIN EQUIPMENTS

Co-funded by



- X-rays Diffractometry (D8 Advance) XRD
- Environmental Scanning Electron Microscope (SEM)
- Asylum Research Atomic Force Microscope (AFM MFP-3D infinity)
- Leica cryo-ultramicrotome (UMEC7)



XRD



SEM

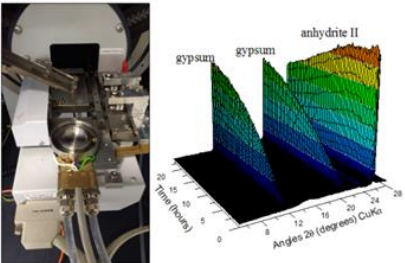


AFM

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RECENT PROJECTS



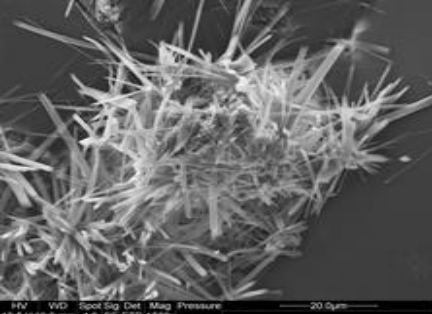
Monitoring the hydration of cement-based materials

Study of new binders for construction



- Study of combined effects of various additives on the dispersion state and reactivity of sulphoaluminate-belite cement pastes

CIFRE thesis in collaboration with the company CHRYSO: study of the principal action modes of accelerator systems on Portland and composite cements

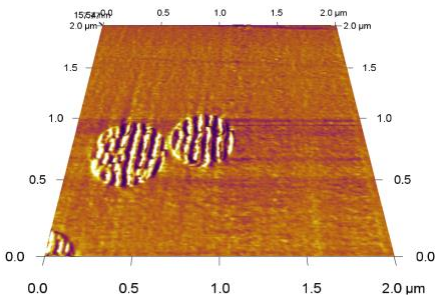


Gallic Acid Crystals (SEM)

Study of flame retardants for bio-sourced epoxy-resins

Preparation of bio-sourced synthons from Cévennes region: chestnut-tree tannins for application to epoxy resins and flame retardants

ADEME thesis with the INRA Montpellier UMR SPO research unit (Science for Oenology) and the SMACVG (Galeizon Valley development and conservation federation)

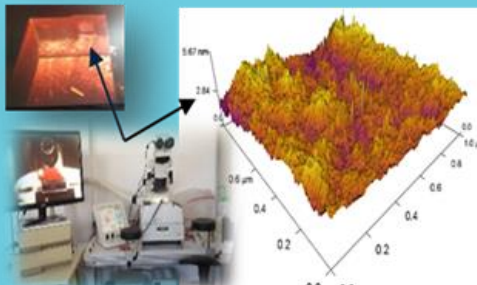
AFM mapping of nanosilica particles in a PMMA matrix

AFM mapping of nanosilica particles

Influence of the functionalisation of halloysite nanoparticles on the morphology and viscoelastic properties of Polyamide 11 / SEBS-g-MA / halloysite blends

AFM analysis of the microstructure and of rigidity evolution of different constituents in blends

Sahnoune M. et al. Effects of functionalized halloysite on morphology and properties of polyamide-11/SEBS-g-MA blends. European Polymer Journal (2017)

Nanometric surface state : preparation and AFM analysis of TPU elastomer prepared by cryo-ultramicrotomy

Would you like to develop a project ?

Don't hesitate to contact us

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Research Centres

- C2MA Materials and Civil Engineering
- LGEI Environment and Risks
- LGI2P Artificial Intelligence and Systems Engineering.