ENMat **European Network of Materials Research Centres**

NAME : CENTRE FOR MATERIALS OF ÉCOLE DES MINES D'ALES (C2MA)

INSTITUTION : ÉCOLE DES MINES D'ALES (EMA)

COUNTRY : FRANCE

Profile :
The Centre for Materials of École des Mines d'Alès (C2MA) belongs to the Institute Mines Telecom (IMT) which is the leading group of engineering and business schools in France. In the C2MA, three main areas of research are present: Advanced Polymer Materials, Civil Engineering Materials and Material- Environment Interactions. The total staff of the C2MA is 90 persons including 7 professors and 22 permanent researchers also involved in teaching at the École des Mines d'Alès.
C2MA participates in numerous collaborative projects at national and international level and takes part in organizing manifestations as Eurofillers, FRPM, EPF conferences.

Activities :
- Education mainly at the École des Mines d'Alès which is a public national school under the auspices of ministry delegated to the industry. C2MA is involved in the high education fields related to civil engineering and engineering of materials and mechanics.
- Research in the field of materials science: in advanced polymer materials with the aim to study the relationship between composition- microstructure- synthesis and processing- properties- applications and the life cycle of polymer based materials; in civil engineering materials with the aim to study the relationship between composition- microstructure- properties of construction materials; in material- environment interactions with the aim to evaluate, investigate and control materials impact and their process on the sanitary quality and perception.

Expertise on following materials :
- (bio)polymers
- cement-based materials
- polymer composites
- nanomaterials
- wood and wood-based materials

Actual research domains concerning materials technology / Competences :

Advanced Polymer Materials area
- Eco-materials and life cycle
- Thermal damage and fire retardant and resisting materials
- Mechanics behavior and service life
- Compatible and functionalized surfaces and interfaces
- Biopolymers- conditioning and interface

Civil Engineering Materials area
- Dispersion and stability of suspension
- Cement and concrete materials

Material-Environment interactions

- Sanitary-environment characteristics
- Psycho-sensorial properties

Available research infrastructure :

Elaborations of materials

- Fully-equipped polymer processing laboratory (extrusion, mixing, injection molding, compression molding, pressing, pelleting, grinding, etc.)
- Fully-equipped civil engineering laboratory (concrete mixers, …)

Characterization of materials

- laser granulometer
- zeta meter
- rheometer
- mercury intrusion porosimeter (MIP)
- permeability measuring instrument
- thermal analysis (TGA coupled with IR, DTA, DSC, TMA)
- laser conductometer
- cone calorimeter- coupled with infrared spectroscopy (IR)
- pyrolysis combustion flow calorimeter (PCFC)- coupled with IR
- pyrolysis gas chromatography mass spectrometer (PyGCMS)
- environmental scanning electron microscope (ESEM)
- inductively coupled plasma mass spectrometry (ICPMS)
- gas chromatography
- solid phase micro extraction (SPME)
- X- ray diffractometer (XRD), high temperature in situ measurements possible
- environmental scanning electron microscope (ESEM)
- spectroradiometer
- mechanical testing machine for static and dynamic measurements

Access to the analytical platform of the University of Montpellier 2 and ENS (TEM, NMR, AFM, etc.)

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