



EA 2528

20 teacher-researchers

30 doctoral and postdoctoral researchers

LPPI

POLYMER AND INTERFACE PHYSICAL CHEMISTRY LABORATORY

Laboratoire de physicochimie des polymères et des interfaces



Drawing on its multidisciplinary expertise, LPPI designs, synthesises, and characterises original materials by combining different compounds, each of which will provide one (or more) of the desired functions for the final application. Thanks to our skills and multidisciplinary approach, we can now offer innovative materials that primarily address the issues of energy storage and conversion on the one hand, and cultural heritage conservation and restoration on the other.



KEYWORDS SCIENCE

- Ion conducting polymers
- Polymer networks
- Interpenetrating polymer networks (IPN)
- π -conjugated (macro)molecules
- Aging of materials

KEYWORDS APPLICATIONS

- Energy storage and conservation
- Photovoltaics
- Reactivity at interfaces
- Electro-stimulable materials
- Heritage



APPLICATIONS AND INDUSTRIAL SECTORS

- Structural polymer materials
- Materials for energy storage and conversion: polymer membranes for fuel cells or metal-air batteries, supercapacitor electrode materials, photovoltaic, organic, or hybrid cell materials
- 'Stimulable' materials and sensors: materials with stimutable wettability, electrochemical biosensors, polymer actuators, electrochromic devices
- Vitrimers
- Aging of materials, preservation, restoration, and analysis of heritage objects

EQUIPMENT

- Thermal and thermomechanical analysis**
 FTIR coupled thermogravimetric analysis, modulated differential scanning calorimetry, dynamic thermomechanical analyser, dynamic rheometer, tensile tester, hardness tester, thermal conductivity
- Spectroscopic analysis**
 UV-visible-near infrared spectrometer with integrating sphere, spectrophotometer, spectrofluorometer, granulometer, liquid refractometer, solar simulator
- Electrochemical analysis**
 Potentiostats, dielectric interface and frequency analyser, electrical conductivity measurement
- Surface analysis**
 BET, goniometer
- Aging of materials**
 Temperature and humidity controlled programmable climatic chamber, programmable ovens from ambient temperature to 300°C, thermal shock chamber

KNOW-HOW · SKILLS · EXPERTISE · SPECIFIC FEATURES

- Synthesis of multicomponent materials, integration into devices, devices based on macromolecular materials
- Physicochemical characterisation of multicomponent and macromolecular materials
- Electrochemical modelling and characterisation
- Study of interface issues and materials' aging mechanisms

PATENTS · SOFTWARE

- 9 patents**
 Infrared reflectivity, nanotube growth, composite air electrode, composite material, fuel cell, encapsulation of electronic components, etc.

INDUSTRIAL PARTNERSHIPS · SPIN-OFFS

- 5 to 10 collaborations per year**
 Sunergy, Sadal engineering, Etandex, Saint Gobain, Nawatechnologies, EDF, Thalès, etc.

