Programma del corso

Introductive seminar school to nuclear magnetic resonance (NMR) and
Fourier transform infrared (FTIR) spectroscopy

Porto Conte Ricerche, Tramariglio, Alghero

9.30 - 11.00
Introduction to NMR and Materials Science
F. Babonneau - University of Pierre et Marie Curie, Paris
(Visiting professor at the University of Sassari, in the frame of the visiting professorship programme)
This lecture will give a brief introduction in Nuclear Magnetic Resonance (NMR) with emphasis in some recent developments for the characterization of solid materials.

11.00 – 11.15 Coffee break (coffe will be served next to the seminar room)

11.15 – 12.00
Introduction to infrared spectroscopies
P. Innocenzi - University of Sassari, D.A.P., Laboratorio di Scienza dei Materiali e Nanotecnologie
It is a short introduction to the principles of infrared spectroscopy with some examples of applications for materials science, biomedicine, diagnostics and advanced infrared techniques. Imaging infrared applications with synchrotron light will be also shortly introduced.

12.00 – 13.00 Solid State NMR Characterisation of organic-inorganic interfaces in hybrid materials.
(F. Babonneau)
This presentation will illustrate through various examples how advanced characterization techniques such as high resolution solid state Nuclear Magnetic Resonance can provide unique information to describe organic-inorganic interfaces in hybrid materials:
1) Characterization of organic/inorganic interfaces in various polymer/oxide systems;
2) New insights in the self-assembly mechanism of surfactant templated mesostructured (organo)silicas powders;
3) Role of H-bonding in the design of bio-inspired materials,
4) Characterization of the host-guest interactions in a drug delivery system based on mesoporous silicas developed for controlled drug release and pollutant trapping.

13.00 -14.00 Lunch (please sign in at the front desk before 11.00)

14.00 – 15.00 Time resolved infrared spectroscopy and 2D correlation analysis (P. Innocenzi)

The application of time resolved techniques by FTIR will be introduced:
1. Time resolved infrared techniques
2. Rapid scan and step scan time resolved spectroscopy
3. Application to time dependent phenomena: the evaporation of solvents
4. 2D correlation analysis

Florence Babonneau is Research Director at CNRS and Head of the research group in Solid State Chemistry at the University Pierre et Marie Curie in Paris. She is President of the International Sol-gel Society and recipient of the 2005 CNRS Silver Medal and Ulrich Award in 1993. She is author of 180 publications in scientific journals and has been invited to 50 international conferences. The main research interest is in the structural characterization of advanced functional materials by nuclear magnetic resonance.

Plinio Innocenzi is Full Professor of Materials Science at the University of Sassari. He is member of the board of directors of the International Sol-gel Society and author of more than 100 publications in international journals, he has been invited to 25 international conferences. He has been associate researcher at the University of Kyoto, Japan and researcher at the University of Padova. His main research interest is the field of nanoscience, self-assembly materials and sol-gel processing.