Final program
Workshop of Cost Action D43
« Functionalized Materials and Interfaces »

March 17-19th 2009

Institut de Chimie
Séparative de Marcoule
MAP-FASES programme: investigating interfacial properties and stability of particle-stabilised emulsions under microgravity conditions.

L. Liggieri¹, F. Ravera¹, E. Santini¹, R. Miller², J. Kraegel², G. Loglio³, D. Clause⁴, I. Pezron⁴, C. Dalmazzone⁵, M. Antoni⁶, M. Rozieres⁷, A. Steinchen⁶, L. Del Gaudio⁷, T. Karapantsios⁸, V. Dutschk⁹, R.G. Rubio¹⁰

¹ CNR-Inst. for Energetic and Interphases, Genova, Italy, l.liggieri@ge.ieni.cnr.it
² Max-Planck Inst. for Colloids and Interfaces, Golm-Potsdam, Germany
³ Univ. of Florence, Dept. Organic Chemistry, Sesto Fiorentino, Italy
⁴ Univ. Technologie Compiègne, Dept. Chemical Eng., Compiègne, France
⁵ Institute Français du Pétrole, Bois-Malmaison, France
⁶ Université Aix-Marseille III, Marseille, France
⁷ ENI SpA., San Donato Milanese, Italy
⁸ Aristotle University Tessalonikii, Greece
⁹ Leibnitz Inst. for Polymer Research, Dresden, Germany
¹⁰ Univ. Complutense Madrid, Spain

The research project MAP-FASES (Fundamental and Applied Studies in Emulsion Stability) is supported by the European Space Agency (ESA) with the aim of understanding the relationships between interfacial properties of surfactant adsorption layers at liquid-liquid interfaces and the stability and properties of the corresponding emulsions.

The research programme also includes the investigation of particle-stabilised emulsions. In fact, solid particles have been known for long time to stabilize natural emulsions and foams. Based on these observations, synthetic micro-/nano-size particles, often in association with surfactants, are being investigated as new additives for emulsions and foams.

The project covers a wide spectrum of investigation and modelling: from the interaction of surfactants with particles, to droplet dynamic in emulsions, passing through the properties of single liquid-liquid interfaces and films. In such framework benchmark experiments are planned on board the International Space Station (ISS), which benefits from the purely diffusive conditions and from the absence of buoyancy. To this aim, specific diagnostics have been conceived by the participating laboratories, which have been developed by ESA into suitable instruments to install onboard the ISS. The experiment container FASES for the Fluid Science Laboratory, has been designed to investigate collective properties of the emulsion, such as, destabilisation process and droplets interaction and dynamics. The facility FASTER is instead suitable to investigate the dilational properties of surfactant layers at liquid interface.