PhD position (36 Months)

Rheology and structure of attractive hard-soft binary colloidal suspensions

Research project: Mixtures of hard and soft colloids in solvent, involving natural or synthetic particles, are ubiquitous in several everyday life formulated products such as cosmetics, toothpastes, pharmaceutical gels. The rich colloidal landscape offers many possibilities to tailor flow properties and performance of complex fluid. Repulsive hard-soft binary colloidal suspensions are now relatively well understood. However, systems where attractive interactions between particles are present remain much less studied, let alone understood, and the role of interactions in the final properties remains unexplored.

The objectives of this PhD project is to develop model systems of attractive binary hard-soft colloidal suspensions, based on microgel (soft colloid) and spherical silica particles (hard colloid) mixture, and investigate their behavior in terms of phase diagram, rheology and structural properties. To reach theses aims, their phase diagrams will be established in water, based on linear and non-linear rheological measurements, varying physical-chemical. Structure will be investigated by static and dynamic light scattering, in order to establish structure-properties relationship.

This project will be implemented within the laboratory d'Ingénierie des Matériaux Polymères (IMP, UMR CNRS 5223). The IMP team is renowned for his research activities in polymer science, with important facilities. Its main research aim is to establish and control relationships between chemistry, structure, rheology and processing.

Candidate profile: Highly motivated students with a Master degree, or equivalent, in the field of polymer science or/and or colloid are encouraged to apply. A prior knowledge on physical-chemical characterization, especially in rheology and scattering technique will be also appreciate. Excellent writing and oral communication skills. International mobility.

Application: Send to the contact below your CV, cover letter, grades and qualification (achieved and/or expected), and two references for recommendation letter.

Deadline for application: 20th April 2019
Duration: 36-months contract, from October 2019
Location: Saint-Etienne, France
Contacts: Dr. Fabien Dutertre (fabien.dutertre@univ-st-etienne.fr ; 0033 477 48 15 57)
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