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Pickering emulsions stabilized by magnetizable particles.

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The preparation of stable emulsions becomes a difficult task when the two liquid phases making up the emulsion are immiscible or have only limited miscibility with one another. A well-known method to stabilized such an emulsion is by adding colloidal particles which tend to become trapped at the liquid-liquid interfaces preventing the emulsion breakdown into phase-separated systems. These systems, commonly referred to as Pickering emulsions, play a crucial role in many applications related with food, cosmetics and pharmaceutical industries [1].

Understanding the stability of the emulsion requires knowledge about the structure and dynamics of the stabilizer particles on the surface of the emulsion droplets. Thus, great attention has been devoted to investigate simpler emulsion systems stabilized by well-characterized colloids whose particles are trapped at a flat interface between two phases [2]. Of particular interest are spherical polystyrene particles that arrange on a 2D-crystalline lattice at the interface as a result of the strong repulsion induced by the ionizable sulfate groups on their surface [3].

In our case, we used polystyrene particles that have embedded small magnetite crystals. These particles are superparamagnetic, i.e. they become magnetized only in presence of an external magnetic field. Using these magnetizable particles as stabilizers we have studied the particle dynamics at the interface and the impact of external magnetic fields on the stability of water/decane emulsions.

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