Salt-resilient Pickering emulsions stabilized by solid stacks of catanionic micro-crystals of controlled size and charge.

Natascha Schelero, Antonio Stocco, Helmuth Möhwald and Thomas Zemb

LEA “SONO” between Max Planck MPIKG Postdam, Gremany and ICSM UMR 5257 Marcoule, France

Abstract:

We show here that a temperature-quench from above the chain melting temperature produces stable Pickering emulsions in the absence of Ostwald ripening. The external aqueous phase contains crystalline discs adsorbed in stacks. The number of discs in a stack can be derived from conductivity, scattering and dzeta potential measurements. Catanionic nanodiscs are ideal solid particles for Pickering emulsions since they present no density difference, present a controlled surface charge and hence contact angles with water as well as oil: the energy of adhesion and the repulsion between droplets is much larger than kT. As a consequence of these unique properties of nanodiscs, this type of emulsions present an extremely high resistance towards coalescence and creaming, even in the presence of salt.