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Aqueous foams stabilised solely by nanoparticles

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Particles are being increasingly used to stabilise foams and emulsions, the corresponding emulsions being known as “Pickering” emulsions. One of the peculiarities of these systems is the absence of Ostwald ripening: since the bubbles or drops do not grow (coalescence seems also suppressed) both foams and emulsions are stable over extremely long periods of time (months). These features make particles very interesting surface active agents as compared to standard surfactants or polymers/proteins. The origin of the suppression of ripening can be traced to the unusual behaviour of the interfacial layers made by these particles. The layers are solid-like and the usual characterisation methods (surface tension, surface rheology) are not straightforward to use. In this presentation, we will illustrate these difficulties with experiments made with partially hydrophobic silica nanoparticles. We will also discuss the relevance of foam characterisations methods such as multiple light scattering and X-ray tomography.