Food Grade Monoglyceride-Based Cubosomes In The Presence Of Laponite Investigated By Means Of Cryogenic Transmission Electron Microscopy.

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The use and role of colloids as stabilizers in water of internally self-assembled domains dispersed from lipid-based lyotropic liquid crystalline phases is investigated and discussed. We focus on the relation between stabilization and formation of a colloidal armor around the lyotropic phase drops. Two different geometries (sphere-like or disk-like) of colloids with similar radius, chemical surface, and charge have been successfully used to stabilize the nanostructured droplets of different lyotropic liquid crystalline phases (from cubic phases to inverse micellar phases) [1-7]. In particular, this has been shown using small angle x-ray scattering that the high pH due to Laponite (disk-like colloids) induced as transition from cubic phase (Cubosomes) to hexagonal phase (Hexosomes) when using monoglyceride lipids forming the lyotropic liquid crystalline phases. However, not much is known about the local structural composition of the cubosomes (morphology, topology…) stabilized by Laponite. This is the aim of the present study in which Cubosomes made of food-grade monoglyceride mixtures (Myverol product) stabilized in water by the presence of Laponite nanocolloids (disk-like solid colloids) have been examined using cryogenic transmission electron microscopy (cryo-TEM). The different morphologies locally observed have been determined, and characterized by FFT as well as describing the cubosomes by minimal surfaces. The study has been performed for fresh samples and for samples during time in order to characterize the in-situ pH-induced transition. The results are discussed in the viewed of the exact chemical composition of the lipid products.