

## Simultaneous Coupling of DSC and Time-Resolved Synchrotron X-ray Diffraction for the Study of Colloids of Pharmaceutical Interest

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Self-organisation is one of the main features of long chain compounds such lipids and surfactant molecules from which most of the colloidal particles are constituted or stabilized. The structures developed depend on the interactions of these molecules with water (lyotropism). The weakly polar lipids such as triglycerides self-organise in crystalline or liquid-crystalline layers displaying thermotropism [1-3]. The molecules bearing both long-chain(s) and polar or ionised group(s) such as phospholipids or surfactants self pack in supramolecular multidimensional structures or aggregates like micelles, vesicles emulsions, [4-6] of complex topology. This class of polar molecules displays both lyotropic and thermotropic behaviours. The diversity of the structures formed is imposed by the infinite possibilities of local curvature of the oil-water interface. Such structures are stable or metastable with lifetimes spreading from less than one second to several years. Such organisations and their time- or temperature-dependent evolutions should be analysed by fast and easy-to-use techniques of characterisation. A new technique coupling time-resolved synchrotron X-ray diffraction and DSC from the same sample has been developed [7]. Some exemples, insertion of an antibiotic molecule within a phospholipidic membrane, crystallisation in emulsion, formation of vesicle by enzymatic reaction,... chosen from the recent studies will illustrate the capabilities of the new techniwue to investigate the structures formed by these amphiphiles.

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