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IUFoST 17th WORLD CONGRESS OF FOOD SCIENCE AND TECHNOLOGY & EXPO

BOOK OF ABSTRACTS*

* Please note if you do not find a set of abstracts for a Concurrent Session, this is because we did not receive a set of abstracts for that session.

10:30 **Effect of Structure and Concentration of Gelator on Organogels Properties: A Rheological and Small-Angle X-ray Spectroscopy Study (YOUNG SCIENTIST AWARD WINNER)** **CS1.4.2**

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Organogels are solid-like systems structured in an organic solvent due to molecular interactions of the gelator; their structure network will depend on the concentration and structure of the gelator. Aiming at evaluating the influence of gelator structure and concentration in organogels' properties, rheological analyses, polarized microscopy and Small-Angle X-ray spectroscopy (SAXS)

were performed. Four different gelators (glyceryl tristearate--GT; sorbitan tristearate--ST; sorbitan monostearate--SM; glyceryl monostearate-GM) were tested in medium-chain-triglycerides (MCT) oil phase. Organogels were prepared by mixing the oil phase and gelator at different concentrations (5, 10, 15, 20 and 25% (w/w)) at 80 °C during 30 min. Flow curves were obtained using shear rate values ranging from 0 to 300 s−1 and frequency sweeps were done from 0.01 to 10 Hz with 1% deformation. Micrographs were obtained under a polarized light microscope equipped with a digital camera, being samples pre-prepared directly in the support. Small angle X-ray scattering (SAXS) measurements were performed using a synchrotron beamline. All organogels presented birefringence confirming the formation of a crystalline structure that changes with the increase of gelator concentration. Organogels produced with GT, ST and GM as gelators presented a pattern characteristic of a lamellar structure, while organogels using SM as gelator showed a rod-like structure. Microscopic observations were confirmed by SAXS analyses through log-log SAXS curves at low angles, where the three-dimensional structure of the organogels was confirmed (i.e. rods for SM organogels and flat disks to GT, ST and GM). Through the evaluation of SAXS peaks following Braggs Law it has been shown that all structures were organized as lamellas but with different d-spacings. These particularities at micro- and nanoscale level lead to differences in rheological properties of organogels. As example for ST and SM organogels all the rheological analyses show a gel-like behaviour (i.e. G' > G''), however for GT and GM organogels this behaviour is not always observed. Organogels produced with GM gelator showed the strongest structure, with high values of G' and G'' (around 60 MPa for 25% of gelator). Results also showed that the hydrophobic chain (stearic acid) and hydrophilic head of gelators influence the three-dimensional network of the organogels, indicating the possibility of tailoring the functionality of organogels.