



RESEARCH THAT RESONATES
AUGUST 17-21, 2014 | MONTREAL, CANADA

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.

Thermal Behaviour of Organogels: Effect of Concentration and Organogels Structure

MP39.3

Miguel Cerqueira¹; Luiz Fasolin²; Carolina Picone²; Lorenzo Pastrana³; Rosiane Cunha²; António Vicente¹

¹Centre of Biological Engineering, University of Minho, Braga, Portugal;

²Department of Food Engineering, Faculty of Food Engineering, University of Campinas, Campinas, SP, Brazil; ³Biotechnology Group, Department of Analytical Chemistry and Food Science, University of Vigo, Ourense, Spain

The interest on organogels is increasing and a full understanding of their structure should be addressed in order to fully understand their properties and functionality. The aim of this work was to evaluate the influence of different gelators on the thermal behaviour of organogels produced with medium-chain-triglycerides (MCT). For this purpose four different gelators (glyceryl tristearate-GT, glyceryl monostearate-GM, sorbitan tristearate-ST and sorbitan monostearate-SM) were used for the formation of organogels. Gelators at concentrations of 15 and 20% (w/w) were mixed with oil phase (MCT) at 80°C during 30 min under magnetic stirring. Rheological oscillatory measurements were performed at cooling (80--10°C) and heating sweeps (10--80°C) at 5°C/min, 0.1 Hz and 1% strain. Small angle X-ray scattering (SAXS) measurements were performed using a synchrotron beamline at 25, 50 and 70°C. The crystallization and melting thermograms were obtained by differential scanning calorimetry (DSC) at heating-cooling cycles between 25 and 100 at 5°C/min. Rheological results showed that G' and G'' values for organogels were very similar during all temperatures presenting at low temperatures a gel-like behaviour ($G' > G''$). Sol-gel temperature values were very close to GM and SM organogels being higher than the organogels produced with GT and ST. DSC thermograms showed that organogels produced with GM gelator (at 20%) have the highest temperature and energy of melting (63°C and 39 J/g, respectively). In

all cases, the sol-gel transition temperatures during the cooling were lower than the values obtained during the heating ramp. Comparing sol-gel transition values obtained by rheological analyses and DSC is possible to see that values can be compared for organogels of GT and GM, however for ST and SM the values obtained by DSC are lower than the obtained by rheology studies. By the evaluation of SAXS spectra, following Braggs Law, was possible to see that all structures were organized as lamellas but with different d-spacings. With the increase of the temperature (25 to 50°C) happens a shift of the spectra peaks for organogels of GM and SM indicating a change of the structure. For all the organogels the intensity of SAXS peaks disappear at 70°C showing that at this temperature all the crystalline structure is melted. Thus, different gelators lead to different thermal properties of organogels showing that is possible to modulate their properties according to the gel application.