

Structuring Edible Oil with Lecithin and Sorbitan tri-stearate

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The gelation of edible oil by a mixture of lecithin and sorbitan tri-stearate (STS) was studied. The two components individually in oil do not give structure at concentrations between 6% and 20% w/w: viscous, pourable solutions are obtained. A synergetic effect is observed with their mixture, at specific ratios of lecithin:STS, between 40:60 and 60:40, when firm gels are obtained. The interaction of the two structurants was studied by varying concentration and ratio of lecithin:STS and evaluated through microscopy, texture analysis, X-Ray diffraction, rheology and NMR. The gels are shear-sensitive, they irreversibly lose their firmness upon deformation. The gels collapse at about 30°C but this phenomenon is reversible, since upon cooling they regain their firmness. Under polarized light, the microstructure of 50:50 lecithin:STS mixture in oil is given by needle-like crystals. Oil with pure STS and oil with lecithin and STS at a ratio 50:50 show similar X-ray scattering patterns. Both X-ray scattering patterns and NMR relaxation curves show that no solid or crystalline matter is present in samples containing only lecithin in oil. The analytical results lead to the hypothesis that the structure is mainly given by STS crystals, assuming needle or plate shape due to the lecithin action and connected by weak junctions, also due to lecithin.