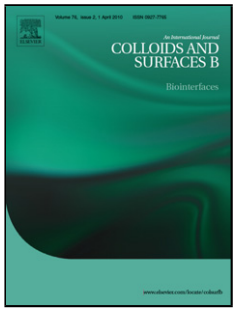

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Effect of temperature, water content and free fatty acid on reverse micelle formation of phospholipids in vegetable oil

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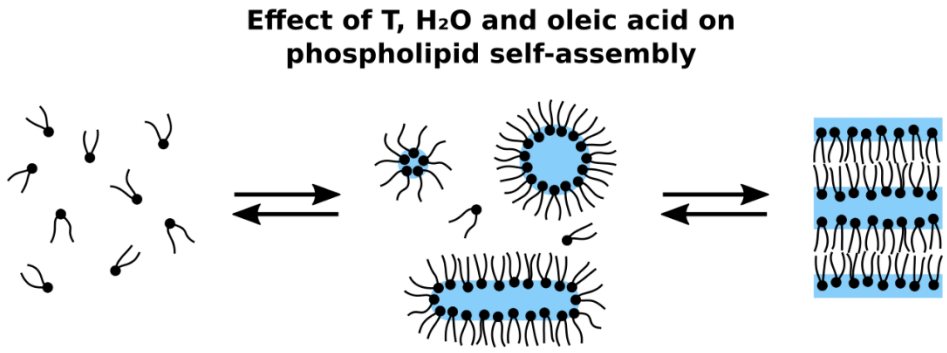
Graphical abstract



Highlights

Abstract

The self-assembly of phospholipids in oil, specifically lecithin in rapeseed oil, was investigated by combining experimental and computational methods. The influence of temperature, water, and free fatty acids on the onset of lecithin aggregation in the rapeseed oil was determined using the 7,7,8,8 - tetracyanoquinodimethane dye (TCNQ) solubilization method and the size and shape of the self-assembled lecithin structures were investigated by small-angle X-ray scattering and cryogenic transmission electron microscopy. In the absence of excess water in the system (0.03 wt-% water in oil), stable cylindrical lecithin reverse micelles were observed above the critical micelle