

Investigations of the phase transition of DPPC MLVs co-dispersed in water solution with potassium chloride

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In this work we present results of SANS and SAXS studies of 1,2-dipalmitoyl-sn-glycero-3-phosphocholine (DPPC) in heavy water solution with potassium ions. Some authors claim the adding of different metal ions into solution increases the main phase transition temperature [1,2].

We used commercially available lipids produced by Sigma-Aldrich. Structural changes of lipids were studied on the spectrometer YuMO, IBR-2 at JINR, Dubna, Russia[3], and Rigaku at MIPT, Dolgoprudny, Russia[4]. The temperature induced changes to the lipid density were investigated by densimetry method on instrument AntonPaar DMA 5000M at JINR, Dubna, Russia.

The gel – liquid phase transition for DPPC dispersed in heavy water at low concentrations is known to go through the ripple phase [5]. With the help of SAXS and SANS methods we found that ripple phase formation starts at near 36°C and is not affected when changing the concentration of potassium ions in solution. Densimetry data revealed the phase transition temperature of 41,7°C that is in a excellent agreement with literature. The comparison with other authors works is made. Results of densimetry and SAS data treatment are discussed.

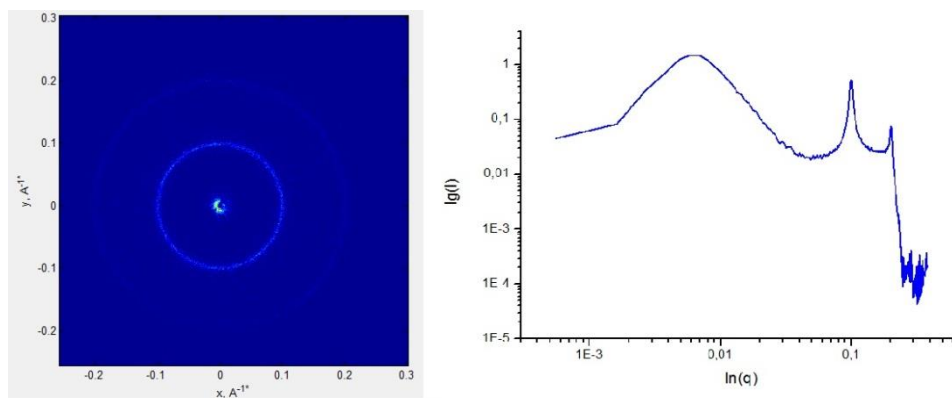


Fig.1. Typical 2D SAXS pattern (left) and Intensity of q (right) of DPPC MLVs co-dispersed in water solution with potassium chloride.