



Effects of NSAIDs on the Dynamics and Phase Behavior of DODAB Bilayers

Monday, 20 March 2023 16:00 (2 hours)

Diocetyltrimethylammonium bromide (DODAB) show rich phase behaviour at different temperature and concentration [1]. We have studied the effects of Non-steroidal inflammatory drugs (NSAIDs), aspirin (Asp) and indomethacin (Indo), on the phase behaviour and the dynamics of DODAB lipid bilayer using quasielastic neutron scattering techniques (QENS). Elastic window scan showed that Asp and Indo shift coagel to fluid phase transition at lower temperatures, compared to pure DODAB. While cooling, Asp and Indo suppress the intermediate gel phase, found in pure DODAB. QENS data analysis showed that only internal motion exists in the coagel phase whereas in the fluid phase DODAB involves both lateral and internal motions. In the coagel phase, although the rotational diffusion coefficient of DODAB is almost twice with both NSAIDs, the dynamically active hydrogen fraction in DODAB becomes twice for Asp but remains the same for Indo. In the fluid phase, lateral motion decreases in the presence of Indo, whereas, Asp does not affect lateral diffusion. DODAB's internal diffusion remains unchanged in presence of Indo, whereas, Asp enhances the internal diffusion of DODAB. This study reveals that NSAIDs, Asp and Indo affect DODAB lipid bilayer phase and dynamics uniquely.

[1] F.-G. Wu, N.-N.Wang, Z.-W Yu. *Langmuir*, 25, 13394–13401 (2009).

[2] P. S. Dubey, H. Srinivasan, V. K. Sharma, S. Mitra, V. Garcia Sakai and R. Mukhopadhyay, *Scientific Reports*, 8, 1862 (2018).

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