

Alteration of lyotropic textures of lecithin in an aqueous ethanol solvent by adding chiral and non-chiral mesogens

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Lecithin is a group of phospholipids essential for both plants and animals. With its molecular structure possessing a polar head group and two long alkyl chains, it exhibits emulsification and lubricant properties of a surfactant. In some solvents, it forms lyotropic liquid crystal phase, *i.e.*, Maltese cross, myelin finger and hexagonal column [1]. In this study, a number of phase textures of lecithin in aqueous ethanol solvents at various concentrations were studied. It was found that at a certain length of time after mixing, Maltese cross textures came out first, followed by those of myelin finger and hexagonal column. The image taken from a polarized light microscope clearly showed the structure of the phases, Figure 1. Then, some additives were dissolved into the lecithin-aqueous ethanol mixtures and the phase behavior was elucidated. For the mixture of non-chiral additives, hexagonal textures came out together with the Maltese cross and myelin finger, using less time than the pure lecithin. In contrast, the mixture of chiral additives showed distinct phase images of rectangular textures, Figure 2. The additives markedly influenced the formation of liquid crystal phase textures of lecithin in the aqueous ethanol solvents. This presentation will also propose the possible molecular orientational structure that results in the observation.

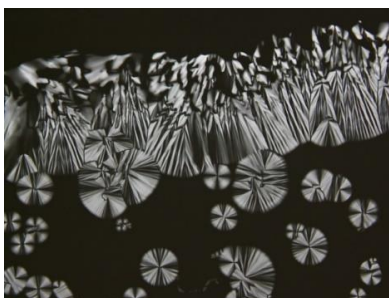


Fig. 1. Lyotropic textures of lecithin without additives.



Fig. 2. Lyotropic textures of lecithin with chiral additives, where the rectangular textures are clearly seen.

References

- [1] D. Demus, J.W. Goodby, G.W. Gray, H.-W. Spiess and V. Vill, *Handbook of Liquid Crystals, Vol. 1*, Wiley-VCH, Weinheim, Germany, pp.409-410 (1998).

Speaker Biography

[Sukrit Tantrawong](#) is now holding an Associate Professor position at the Department of Chemistry, Faculty of Science and Technology, Thammasat University, Pathumthani, Thailand. He started his higher education at Mahidol University in 1979 and later graduated in 1988 with a Master degree in Physical Chemistry. After joining the department later in the year, he went to study in The University of Hull, UK, between 1990-1994, where he received the doctoral degree in Chemistry under the supervision of Professor Dr. Peter Styring and Professor Dr. John Goodby. During his duty at Thammasat University, he has been visiting Japan in many occasions and has very fruitful collaboration with Dr. Yo Shimizu of AIST Kansai in Osaka. His research work evolves around both thermotropic and lyotropic liquid crystals.