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Original Articles

Study of the Cholesteric-to-Cholesteric Phase Transitions on the Lyotropic Mixture of KL/K_2SO_4/1-Undecanol/Water/Brucine Presenting the Cholesteric Biaxial Phase

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Abstract

Lyotropic cholesteric liquid crystalline phases were prepared by doping the quaternary mixture of potassium laurate (KL)/potassium sulfate (K_2SO_4)/1-undecanol (UndeOH)/water with brucine. The phase diagram was constructed as a function of the brucine concentration. Three cholesteric phases were identified: cholesteric biaxial, calamitic uniaxial, and discotic uniaxial. It was observed that there is a critical brucine concentration (X^*_b) to cholesterize the nematic host phase

when the mixture is confined in a thin sample holder, below which the cholesteric helical arrangement is not achieved. The helical twisting power of brucine was calculated as 12.12 ± 0.40 μm^{-1}.

Keywords: Lyotropic liquid crystal cholesteric phases phase transition brucine helical twisting power intrinsically biaxial micelles model

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