Features of L-menthol crystallization in optically active medium based on L- and D-asparaginate chitosan

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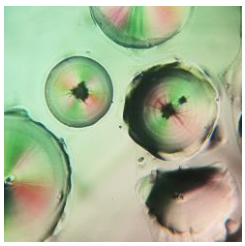
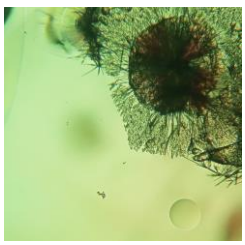
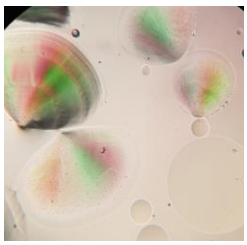
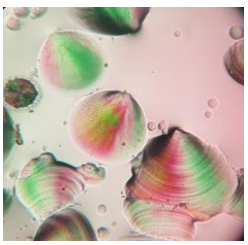
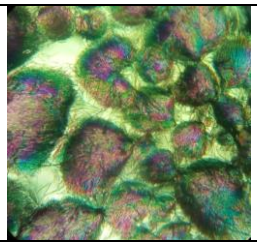
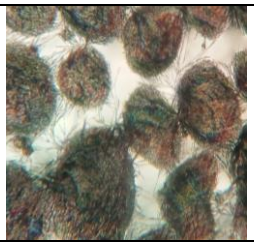
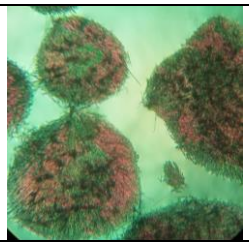
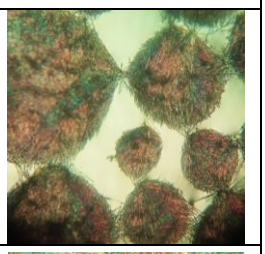
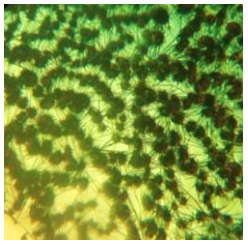
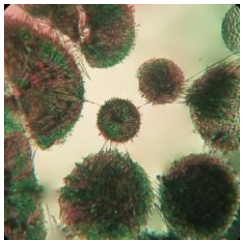
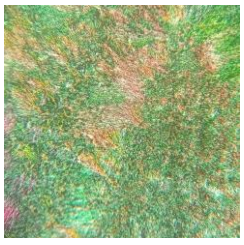
Abstract

The kinetics of intensity attenuation of optical anisotropy of L-menthol + ethanol system during its phase separation in aqueous solution of L- (CS : L-AsrA) and D-asparaginate chitosan (CS : D-AsrA) was studied. Influence of asparagic acid stereoisomer and polymer molecular weight on optical, structural-morphological and dimensional characteristics of the condensed phase L-menthol during its extraction crystallization in optically active medium was estimated.

Polarized microscopy of L-menthol crystallization kinetics in optically active medium based on L- and D-asparaginate chitosan

Concentration CS : L-(D-)AspA, $g \cdot dl^{-1} : g \cdot dl^{-1}$	CS : L-AspA		CS : D-AspA	
	Extraction crystallization time, min			
	5	30	5	30
0.3 : 0.2				
0.6 : 0.4				
0.8 : 0.6				

Conclusions

• The kinetics of the formation and growth of the L-menthol solid phase during the extraction crystallization of the L-menthol + ethanol system in an aqueous solution of chitosan L- and D-aspartate was studied.
• The effect of aspartic acid stereoisomer, variation of the CS : L-(D-)AspA ratio, and polymer molecular weight (38 and 200 kDa) on the optical anisotropy, morphostructure, and size of phase aggregates of the L-menthol crystalline phase was evaluated.
• It has been established that in CS : D-AspA, in contrast to CS : L-AspA, larger particles of aggregated L-menthol crystals are formed, which coalesce in time into a continuous optically anisotropic phase.
• It has been shown that with an increase in the concentration of CS : L-(D-)AspA and the molecular weight of the polymer, the rate of formation of the condensed phase of L-menthol increases.
• Aqueous solutions of CS : D-AspA and CS : L-AspA can be used to create new types of chirooptic waveguides and sensors.

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