

Liquid Crystalline Properties of Cellulose Derivatives

Part I : Liquid Crystalline Order of Hydroxypropylcellulose and Acetoxypropylcellulose

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The lyotropic liquid crystalline order of cellulose derivatives was studied with the series of cellulose derivatives. The rheological properties of liquid crystalline hydroxypropylcellulose (HPC) and acetoxypropylcellulose (APC) are reported here as a part of these series of studies.

The variation of physicochemical state of liquid crystals under dynamic shear conditions were measured with Rheometrics Dynamic Spectrometer (RDS) employing parallel plate geometry. Both HPC and APC showed abrupt changes of the measured values such as G'/G'' , $\tan \delta$ and η/G' in the vicinity of critical (C^*) and saturated (CS) concentrations. At low frequencies, both two lyotropic systems exhibited an increase of G'/G'' with concentration. At high frequencies, however, the value of G'/G'' was decreased at higher concentrations, which may be attributed to a significant loss of orientational order.