

583f Rheostructural Study of a Discotic Thermotropic Liquid Crystalline Mesophase Pitch

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The rheostructural study of a discotic thermotropic liquid crystalline pitch (AR-HP) is reported in dynamic rheological experiments, conducted at different temperatures (270 - 305°C). The loss modulus (G'') was found to be dominating over the storage modulus (G') at all frequencies and temperatures. The slope of the terminal zone for storage modulus was found to be varying from 1.1 at 270°C to 0.7 at 305°C. The lower slope of storage modulus is likely due to polydomain, disclination filled structure of the liquid crystalline pitch material. The role of various preconditioning steps is established in determining the initial microstructure that, in turn, governs the dynamic response. Domain size and orientation is shown to have a significant effect on the storage modulus; however, loss modulus remained fairly unchanged. The low value of G' , measured during dynamic experiments, is consistent with the low N_1 observed during steady-shear experiments.