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The Phase Transition Behavior of Side Chain Liquid Crystalline Polymers Containing Sulfone Group DAEWON LEE, School of Chemical Engineering, Seoul National University, Seoul 151-744, Korea, JONG-CHAN LEE, KOOKHEON CHAR — The phase transition behavior in side chain liquid crystalline polymers (SCLCPs) based on a hydrophilic poly(ethylene oxide) (PEO) main chain and a hydrophobic alkyl side chain containing sulfone groups was investigated by using DSC, POM, synchrotron X-ray scattering, FT-IR and rheological measurements. In the case of poly[oxy(octylsulfonylhexylthiomethyl) ethylene] (8S6EO) containing sulfone groups located at the intermediate position in the side chain, the presence of sulfone groups made it possible to obtain a highly ordered layer structure mainly due to the strong dipole-dipole interactions among sulfone groups. It is also noted that the scattering patterns completely disappeared in the isotropic state. On the other hand, a series of three SCLCPs containing sulfone groups near the hydrophilic backbone, poly[oxy(n-decylsulfonylmethyl) ethylene] (nSEO, n = 14, 16, 18), showed the evident mesophase stability due to its amphiphilic character. Interestingly, it was clearly observed for SEO-series that a broad scattering, related to the correlation hole peak due to the presence of dynamic density inhomogeneity in the disordered state, persisted even above the T_i . We also investigated the effect of length of alkyl side chains on the phase transition behavior of SEO-series, showing the layered structures with a periodic undulation of backbone chains for both 16SEO and 18SEO.

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