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Alignment of Hydrogen Bonded Liquid Crystalline Block Copolymers by Magnetic Fields[1] MANESH GOPINADHAN[2], PAWEL MAJEWSKI [3], EVAN BEACH[4], PAUL ANASTAS[5], CHINEDUM OSUJI[6], Yale University, OSUJI LAB TEAM, ANASTAS LAB TEAM — Hydrogen bonding between a poly(styrene-b-acrylic acid) backbone and an imidazole terminated biphenyl mesogen results in the formation of a side-group liquid crystalline block copolymer (LC BCP). We use a combination of FTIR, X-ray scattering and DSC to characterize the phase behavior of the PAA-LC system, which is largely dominated by the sub-stoichiometric saturation of the binding capacity of the chain. Alignment of a hierarchically ordered lamellar BCP was performed using a 5 T magnetic field at elevated temperature in the melt state and characterized by SAXS. The system exhibits a tilted smectic structure, which on alignment by the field displays scattering patterns akin to those observed in bookshelf or chevron-type structures. These results demonstrate that simple non-covalent interactions can be used to generate LC order and thus provide a convenient handle for subsequent alignment of BCP structures by magnetic fields.

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