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Perforated layer structures in liquid crystalline block copolymers KISHORE TENNETI, Drexel University, XIAOFANG CHEN, Peking University, CHRISTOPHER LI, Drexel University, YINGFENG TU, XINHUA WAN, QI-FENG ZHOU, Peking University, IGORS SICS, BENJAMIN HSIAO, University of Stony Brook, DREXEL UNIVERSITY TEAM, PEKING UNIVERSITY COLLABORATION, UNIVERSITY OF STONY BROOK COLLABORATION — Phase structures of a series of poly(styrene-block-(2,5-bis-(4- methoxyphenyl)oxycarbonyl)styrene) (PS-b-PMPCS) liquid crystalline rod-coil block copolymers (LCBCPs) were investigated using thermal analysis, X-ray analysis and transmission electron microscopy. In the low molecular weight asymmetric BCP system, perforated layer structures were observed where the excessive PS molecules punctured the PMPCS domains and these perforations uniquely possess tetragonal in- plane symmetry. In the high molecular weight system, these perforated layer structures were observed in symmetric samples. Randomly initiated perforations became more regular and uniform upon blending with PS homopolymer in symmetric BCPs. These regular perforations also possess tetragonal in-plane symmetry.

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