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Preparation of Low Band Gap Fibrillar Structures by Solvent Induced Crystallization HSIN-WEI WANG, EMILY PENTZER, TODD EMERICK, THOMAS RUSSELL, University of Massachusetts, Amherst — Solution-induced crystallization of the low band gap polymer poly[*N*-9"-heptadecanyl-2,7-carbazole-*alt*-5,5-(4',7'-di-2-thienyl-2',1',3'-benzothiadiazole)] (PCDTBT) was shown to give fibril-like structures of 40-60 nm width and $\sim$ 0.5 μm length. These structures, formed by heating and cooling PCDTBT in a marginal solvent, were characterized by AFM, TEM, GI-WAXS, and steady state absorption and emission spectroscopy. The width of the PCDTBT structures suggests that the polymer chains are oriented perpendicular to the fiber axis, while the observed undulated structures, as revealed by AFM, suggest that the nanostructures may be composed of smaller crystalline units, suggesting a crystal face-specific assembly. Surprisingly, no spectroscopic signatures in either absorption or emission were observed upon crystallization of PCDTBT, in sharp contrast to the well-known conjugated polymer poly(3-hexyl thiophene) (P3HT). The solution-based crystallization of PCDTBT offers insight into the self-assembly of conjugated polymers and a better understanding of their role in photovoltaic devices

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