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Temperature dependent spectroscopy of poly[bis-(2-ethyl) hexylfluorene]/ (9,9-di- n -octylfluorene) copolymers[1] HYEUNSEOK CHEUN, MICHAEL WINOKUR, University of Wisconsin, BENJAMIN NEHLS, FRANK GALBRECHT, ULRICH SCHERF, University of Wuppertal — A series of random polyfluorene (PF8) copolymers comprised of linear di-n-octyl (F8) and branched bis(2-ethylhexyl) (F2/6) units has been synthesized and characterized by temperature dependent steady-state absorption and emission spectroscopy. The F2/6 polymer is already well known for forming conformationally disordered five fold helices while the F8 polyfluorene adopts a number of distinct near-planar type conformational isomers. One of these conformational sequences is an unusual low energy absorption and emission band known as the β phase. In these copolymers the PF chains must temporize between differing interchain packing motifs, pentagonal and planar type structures, and different main chain morphologies. Increasing the content of F2/6 monomers strongly affects the formation of the β phase conformer, enhances the extent of conformational disorder (and the effective electron-phonon coupling strengths) and also alters the bulk structural phase behavior. There are only weak correlations between the overall phase behavior and the observed spectroscopy at temperatures below 100 °C.

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