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Structure and optical properties of self-assembled distyrylbenzene electrolytes TIRTHA CHATTERJEE, JULIA H. ORTONY, ARKADIUSZ CHWOROS, EDWARD J. KRAMER, University of California Santa Barbara — Conjugated Oligoelectrolytes (COEs) are of interest as optical components in solution based biosensors and as electron transport layers in organic light-emitting diodes (OLEDs). These applications require solution processing of the COEs where the packing of oligoelectrolyte aggregates (directed by intermolecular interactions) governs their optical and electronic properties. The structural organization of distyrylbenzene derivatives dissolved in water is systematically studied as a function of the oligoelectrolyte concentration. Small angle neutron scattering (SANS) shows that above a critical micelle concentration these oligoelectrolytes self-assemble into cylindrical micelles with diameter ~ 3.5 nm. The inter micelle distance decreases with increasing concentration and finally these organization arrange themselves into a cluster with a characteristic length scale ~ 50 nm as derived from Guinier analysis of the SANS. Complementary structural studies have also been performed using liquid atomic force microscopy and cryogenic transmission electron microscopy techniques. The optical properties of this self-assembled oligoelectrolyte system will also be presented. We acknowledge NCNR NIST for facilitating the SANS experiments.

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