

Abstract Submitted
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Conjugated polyelectrolyte assembly at water-oil interfaces.

FENG LIU, CAILI HUANG, RUSSELL THOMAS, University of Massachusetts-Amherst, RUSSELL TEAM — Conjugated polyelectrolytes featured with conjugated backbone and functional side chains are interesting optoelectronic materials and widely used to modify electrodes in electronic devices such as light emitting diodes and solar cells to enhance device performance. Conjugated polyelectrolyte can be designed to have alternating hydrophilic and hydrophobic side chains, and thus inducing interesting surface and interface properties. In this work, we using polyfluorene based material, to study its behavior at water-toluene interface. The aliphatic side-chains will favorably interact with toluene, and amine side-chains will interact with water, making this material a good surfactant. At interface the polymer chain is stretched to a Janus type of geometry. Flattened molecules will assemble into ultra thin films via pi-pi intermolecular stacking, and thus creating barriers between liquids. When liquid volume is reduced, jamming at interface will show up. These properties are strongly affected by the environment of the liquids, such as temperature and PH values, and polyelectrolyte diffusion to interfaces. This study leads to new methods to structure liquids using single component, which can be extended to applications such as electro-spinning or fabricate flow devices.

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