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Semiconductor Conjugated Polymer-Quantum Dot Nanocomposites at the Air/Water Interface and Their Performance in Thin Film Solar Cells ZHIQUN LIN, MATTHEW GOODMAN, JUN XU, JUN WANG, Iowa State University — Organic-inorganic nanocomposites consisting of electroactive conjugated polymer, poly(3-hexylthiophene) (P3HT) intimately tethered on the surface of semiconductor CdSe quantum dot (i.e., P3HT-CdSe nanocomposites) at the air/water interface formed via Langmuir isotherms were explored for the first time. The P3HT-CdSe nanocomposites displayed a high pressure plateau in the Langmuir isotherm, illustrating their complex packing at the air/water interface. Furthermore, photovoltaic devices fabricated from the LB depositions of the P3HT-CdSe nanocomposites exhibited a relatively high short circuit current, I_{SC} , while maintaining a thin film profile. These studies provide insights into the fundamental behaviors of semiconductor organic-inorganic nanocomposites confined at the air/water interface as well as in the active layer of an organic-based photovoltaic device.

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