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Self-Assembly of Novel Amphiphilic 21-Arm, Star-Like Coil-Rod Diblock Copolymers at Interfaces ZHIQUN LIN, LEI ZHAO, XINCHANG PANG, CHAOWEI FENG, Georgia Institute of Technology — A series of novel amphiphilic 21-arm, star-like diblock copolymers, poly(acrylic acid)-*b*-poly(3-hexylthiophene) (PAA-*b*-P3HT) based on β-cyclodextrin (β-CD) with well defined molecular architectures and ratio of two chemically distinct blocks were prepared, for the first time, via a combination of quasi-living Grignard metathesis method (GRIM), click reaction, and atom transfer radical polymerization (ATRP). The star-like PAA-*b*-P3HT diblock copolymers consist of hydrophilic coil-like PAA cores and hydrophobic rod-like P3HT shells with narrow molecular weight distribution and controllable molecular weight of each block. Owing to the compact structure, the amphiphilic star-like PAA-*b*-P3HT formed a unimolecular micelle. Vesicles based on these novel amphiphilic star-like, coil-rod diblock copolymers were readily produced at the oil/water interface by crosslinking hydrophilic coil-like PAA cores with a bifunctional crosslinker, ethylenediamine. They also self-assembled into a nanotubular structure at the air/water interface.

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