

Abstract Submitted
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Molecular self-assembly of dichloropentacene and C₆₀ for a model organic solar cell heterojunction JUN WANG, AMANDA BROWN, IRVINDER KAUR, JIAN-MING TANG, GLEN MILLER, KARSTEN POHL, Univ. of New Hampshire — Organic molecular self-assembly is a bottom-up approach to create molecular architectures that are suitable for a variety of applications including functional materials and molecular electronics. Specifically, the co-assembly of functionalized acenes (electron-donor materials) and fullerenes (electron-acceptor materials) on metal substrates provides a model for studying the structural and electronic properties for novel organic photovoltaic heterojunctions. Previously, we have fabricated a persistent self-assembled monolayer composed of single-domain 6,13-dichloropentacene (DCP) over large areas on the stepped Au(788) surface. Here we present the subsequent growth of C₆₀ on a DCP monolayer covered gold surface by STM investigation and ab-initio calculations. After mild annealing C₆₀ molecules are forced to the Au(788) step edges forming very long C₆₀ chains, in contrast to the short C₆₀ chains reported on bare vicinal gold steps. These final structure formations are attributed to the delicate intermolecular interactions and molecule-substrate interactions.

Jun Wang
Univ. of New Hampshire

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