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Polymerization of a perylene derivative on a metal surface MANFRED MATENA, JORGE LOBO-CHECA, MEIKE STOEHR, University of Basel, Switzerland, KATHRIN MUELLER, THOMAS A. JUNG, Paul-Scherrer-Institute, Switzerland, TILL RIEHM, LUTZ H. GADE, University of Heidelberg, Germany —

By utilizing the concepts of supramolecular chemistry, impressive results for molecular self-assembly on surfaces have been presented. Mostly, non-covalent interactions like metal coordination, hydrogen bonding or dipolar coupling are exploited to create supramolecular patterns. One approach to influence these structures relies mainly on the sophisticated design of the molecular functional groups. Thus it makes use of properties already inherent to the molecules. In our work we have chosen a different concept. A thermally-induced surface-assisted reaction was used to modify the end-groups of a perylene derivative (TAPP) and thereby, the molecular interactions are altered. TAPP was found to form a closed-packed assembly on Cu(111), whereas the molecular interactions are based upon vdW-forces. After annealing at 150 ° C, a rectangular network is obtained which is commensurate to the underlying Cu surface. In this case the organic molecules coordinate to Cu atoms through the lone pairs of their nitrogen atoms. A second annealing step at temperatures >240 ° C modifies the molecule on the surface and leads to covalently linked polyaromatic chains.

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