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Self-assembled structurally complex double-layers of 3-HPLN on Cu(111) SUMIT BENIWAL, DONNA KUNKEL, Department of Physics and Astronomy, University of Nebraska - Lincoln, Lincoln, NE 68588, JAMES HOOPER, SCOTT SIMPSON, EVA ZUREK, Department of Chemistry, State University of New York at Buffalo, 331 Natural Sciences Complex, Buffalo, NY 14360, AXEL ENDERS, Department of Physics and Astronomy, University of Nebraska - Lincoln, Lincoln, NE 68588 — The self-assembly of 3-Hydroxyphenalenone (3-HPLN) on metal surface has been studied with scanning tunneling microscopy and first principles theory. 3-HPLN belongs to the group of topological ferroelectric organics, where the electric polarization is related to the hydrogen bonds between the molecules. It is observed that the structure of the self-assembled 2D networks is strongly dependent of the substrate material and the preparation conditions. Of particular interest in this presentation is the chiral Kagome lattices of 3-HPLN observed after annealing on Cu(111). A unique feature of the molecular network is the CH-pi bond formation between flat-lying molecules and molecules attached perpendicular to the surface. It will be demonstrated that the addition of a second layer on the first monolayer of 3-HPLN triggers a structural reorganization in the first layer, to form a complex double layer structure that is not merely the addition of two single layers. The chiral pores in the film can serve as a host or a template for metal nanoparticles, such as Fe. The so-obtained hybrid nanostructures might be a useful milestone towards self-asembled metal-organics multiferroics.

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