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Morphology and structure of copper-phthalocyanine and iron-phthalocyanine thin films on Ag(111) KEDAR MANANDHAR, KENNETH PARK, Baylor University, ZHEN SONG, TANHONG CAI, SHUGUO MA, JAN HRBEK, Brookhaven National Laboratory, BAYLOR UNIVERSITY COLLABORATION, BROOKHAVEN NATIONAL LABORATORY COLLABORATION — Copper-phthalocyanine and iron-phthalocyanine have been in situ deposited onto Ag(111) surface at room temperature by vacuum sublimation. Thin heteroepitaxial films formed thereof have been investigated using scanning tunneling microscopy. When annealed up to $\sim 500^\circ$ K, both molecules form well-ordered square lattices on the hexagonal substrate lattice but result in different molecular orientations within the surface unit cell. For CuPc, benzo units of the molecules are rotated by approximately 30° with respect to the surface lattice vectors forming a high-density packing whereas for FePc the benzo units are rotated by about 45°. Consequently, the square lattice constant for CuPc measured at $\sim$14 Å is significantly smaller than that of $\sim$16 Å for FePc. Annealing to $\sim 700^\circ$ K results desorption of as much as 70% of surface monolayer of phthalocyanine molecules. The aggregates are observed in dendrite-like form, and further discussion of temperature effects on CuPc and FePc thin films will be presented.

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