Self-assembly of isonicotinic acid molecules into supramolecular films on Ag (111) — BO XU, HUI LI, JANICE REUTT-ROBEY, Univ. of Maryland

— Self assembly processes of isonicotinic acid (INA) molecules into supramolecular structures on Ag (111) surface are studied with UHV-STM, XPS, and IR spectroscopy. INA molecule contains both a ring nitrogen and carboxyl tail, which lead to a tape-like molecular solid. At room temperature, INA molecules organize into 2D islands that exceed 100 nm on Ag (111), demonstrating 2D H-bonding interactions. A series of carboxy O-H⋅⋅⋅N hydrogen bonds assemble INA molecules into linear chains, while weaker hydrogen bonds between carbonyl O and aromatic H link the chains sideways into ordered 2D structures. Different orientational domains are observed and the domain walls (carboxyl-carboxyl coupling) establish the molecular dipole direction. XPS spectroscopy corroborates the H-bonding interactions, while IR spectroscopy was used to assess INA molecular orientation with respect to the surface plane.

Bo Xu
Univ. of Maryland

Date submitted: 01 Dec 2004