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Designing Self-assembled Nanostructures: Metal-Organic Coordination Networks at Surfaces STEVEN TAIT, NIAN LIN, SEBASTIAN STEPANOW, KLAUS KERN, Max Planck Institute for Solid State Research — Networks consisting of organic molecules and isolated metal atoms have been demonstrated to self-assemble at surfaces. The components of the networks are designed to assemble in a desired pattern, forming periodic arrays of isolated metal atoms (or dimers) separated by organic molecule ligands. This 'bottom-up' formation of a nanometer-scale structure opens a wide range of questions related to the properties of the components of the networks: metal atom nodes, molecule ligands, and nanopores within the networks. Our group explores these properties, including the magnetic and catalytic properties of the isolated metal atoms and adsorptive properties of the nanopores within the networks. Some properties can be 'tuned' by rational design of the organic molecule size, structure, and functionality. The ability to tailor the size and functionality of nanometer-scale arrays produced by self assembly represents a fantastic opportunity for molecular recognition, heterogeneous catalysis, and other fields. We present here recent results from our group, including the use of ligands containg pyridyl groups and recent adsorption measurements on the networks.

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