

Self-Assembly of Metal Complexes at the Liquid-Solid Interface

The liquid/solid interface offers an ideal environment to study 2D self-assembly. The sub-molecular resolution of scanning tunneling microscopy (STM) provides unprecedented information on inter- and intra-molecular interactions and allows for the investigation of thermodynamically driven processes at equilibrium. 2D crystal engineering at surfaces relies on the understanding, and controlling, non-covalent interactions. Using scanning tunneling microscopy (STM), we have explored the charge-assisted hydrogen bond-directed self-assembly of *N,N'*-dioctadecyl *p*-quinonemonoimine at the liquid-solid interface. Due to their strength, directionality and reversibility, hydrogen bonding and metal-ligand interactions are ideal templates for 2D self-assembly. We also have facile access to isomeric 2,5-*bis*(alkylamino)-1,4-benzoquinones which have the ability to form conventional 2D hydrogen-bond networks. Square planar metal complexes of these benzoquinone derivatives will be used to exploring hierarchical 2D self-assembly at the liquid-solid interface. The metallosupramolecular aspect of this research will be carried out in the Hanan group (U. Montréal) while the STM imaging will be carried out in the Cuccia group (Concordia).

