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Metallic Transport Behavior in a Two-Dimensional Metal Organic Framework: Copper Benzene Hexathiol (Cu-BHT) RYUICHI TSUCHIKAWA, NEDA LOTFIZADEH, Department of Physics and Astronomy, University of Utah, NABAJIT LAHIRI, JANIS LOUIE, Department of Chemistry, University of Utah, VIKRAM DESHPANDE, Department of Physics and Astronomy, University of Utah — Two-dimensional (2D) metal organic frameworks (MOF) have flexibilities in controlling the material properties owing to their bottom-up synthesis process and to the selectivity of metal species. We synthesized layers of 2D MOF, Copper benzene hexathiol (Cu-BHT), of thickness less than 100nm and investigated its electronic transport properties. In particular, the resistance of our highly crystalline samples decreased as the temperature was lowered, showing a metallic temperature dependence. This metallic behavior has not been observed in many organic conductors and is a prerequisite to superconductivity that can be realized in the 2D MOFs. Finally our capability of synthesizing high quality 2D MOFs paves a way to the realization of organic topological insulators [1] [2]. [1] Z.F. Wang, Zheng Liu, Feng Liu, Nature commun. 4, 1471 (2013) [2] Z.F. Wang, Ninghai Su, Feng Liu, Nano lett. 13, 2842 (2013)

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