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Perpendicular interaction between donor and accepter molecules on Au (111) U.G.E. PERERA, Department of Physics and Astronomy, Ohio University, Athens, Ohio 45701 USA, R. MISHIMA, Graduate School of Engineering Science, Osaka University, 1-3 Machikaneyama, Toyonaka 560-8531, Japan, S-WAI HLA, Department of Physics and Astronomy, Ohio University, Athens, OH 45701 — The capability to modify the electronic properties of materials by the interaction between donor and acceptor molecules plays a significant role in molecular electronics. Formation of molecular charge transfer complexes have been observed for different donor acceptor system in a lateral configuration. Here, we present the structural and electronic properties of decamethylmanganocene (Mn(C5Me5)2) and 7,7,8,8-tetracyanoquinodimethane (TCNQ) molecules on a Au(111) surface at 4.6K using low temperature scanning tunneling microscopy (STM) to investigate the perpendicular interaction between the molecules. The molecular complexes were formed by depositing Mn(C5Me5)2 onto predeposited TCNQ on Au(111). The TCNQ formed a well ordered self-assembled clusters on Au(111) and Mn(C5Me5)2 adsorbed either on TCNQ layer or on bare Au(111) surface. Perpendicular interaction between the Mn(C5Me5)2 and TCNQ were determined by means of conductance tunneling spectroscopy. This work provides an important step for manipulating and tuning charge state of molecules using donor-acceptor molecular systems. The research is supported by United States Department of Energy BES grant number DE-FG02-02ER46012.

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