

Comparative Study of the Structure and Electronic Property of Molecular Chains on Organic Conductor Surfaces

R.F. Dou^a, F. Lin^b, F.W. Liu^a, Y. Sun^a, J.Y. Yang^a, B.F. Lin^a, L. He^a, C.M. Xiong^a, and J.C. Nie^a

^aDepartment of Physics, Beijing Normal University, Beijing 100875, P. R. China

^bSchool of Physics, State key laboratory for mesoscopic physics, Peking University, Beijing 100871, China

The surface structures, stability and electronic property of three TCNQ-based charge transfer complexes (CTCs), PrQ (TCNQ)₂, MPM (TCNQ)₂ and MEM (TCNQ)₂, have been investigated by STM and STS. STM observations reveal that only presence of ac-surface in three CTCs surfaces, which are all terminated with TCNQ molecular arrays. For PrQ(TCNQ)₂, it is found that a tetramer structure behaves as a wavelike row and possesses a angle with about 18 degree between the adjacent molecules. Meanwhile, the dimer structures are resolved on the remainder ac-surfaces. In addition, the tetramer structure is the most stable, which is corresponding to the metal-like I-V curves. However, the dimer structures are unstable, which exhibit a semiconductor feature. The relationship between the surface structure and the electronic property is discussed in detail.