Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Atomic Scale Proximity Effect at a Molecular Superconductor-Metal Boundary[1] KYAW ZIN LATT, SAJIDA KHAN, Ohio University, ANH NGO, Argonne National Lab, HAO CHANG, Ohio University, ABDOU HASSANIEN, J. Stefan Inst., SLovenia, LARRY CURTISS, Argonne National Lab, SAW-WAI HLA, Ohio University/Argonne National Lab — We report a new organization of nanoscale molecular clusters that exhibits superconducting properties on Ag(111) surface below 8K substrate temperature. The clusters here are composed of a few molecular chains formed by BETS (donors) and GaCl4 (acceptor). In STM images, these molecular clusters appear as ordered parallel chains resembling the rafts. Using scanning tunneling microscope (STM) manipulation, small molecular clusters are repositioned on the surface at desired locations. From the tip height signals, the dynamics of molecular clusters during their movements across the surface has been unveiled. Repeated manipulation experiments reveal that the rafts move only along [211] surface directions with single atomic site hops. Then by means of tunneling spectroscopy, interaction of two dimensional surface state electrons with these two dimensional clusters are investigated at the molecule-metal boundary regions. The results provide how electrons interact with the superconducting clusters in addition to the electronic and mechanical properties of these superconducting rafts.

[1]DE-FG02-02ER46012, OU-CMSS

Kyaw Zin Latt
Ohio University

Date submitted: 11 Nov 2016 Electronic form version 1.4