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Atomic Scale Proximity Effect at a Molecular Superconductor-Metal KYAW ZIN LATT, SAJIDA KHAN, Ohio University, ANH NGO, Argonne National Laboratory, HAO CHANG, Ohio University, ABDOU HASSANIEN, J. Stefen Inst., Slovenia, LARRY CURTISS, Argonne National Laboratory, SAW-WAI HLA, Ohio University and Argonne National Laboratory — How a superconductor interacts with metal at a superconductor-metal boundary is vital for fundamental understanding of important phenomena such as Andreev reflection, and proximity effect. Here we investigate how the cooper pairs from a charged transfer based molecular superconducting cluster interact with 2-D surface state electrons from Ag(111) surface at the atomic scale using tunneling microscopy/ spectroscopy, and atomic/molecular manipulation schemes at low temperatures in an UHV environment. The superconducting molecular clusters 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 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. Tunneling spectroscopy measurements across metal superconductor boundary provides variation of electron structures highlighting how surface state electrons interact with the superconducting clusters.

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