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Low-temperature transport in metallic polyaniline[1] EVAN KANG, EUNSEONG KIM, Center for Supersolid & Quantum Matter Research and Department of Physics, KAIST, Korea — Since the first observation of true metallic transport in polyaniline (PANI) [Lee et al. Nature, 441, 65 (2006)], one of the outstanding properties of metallic state in PANI, the positive temperature dependence of resistance has not been systematically investigated. We studied the underlying mechanism of the intriguing low-temperature transport in PANI synthesized with self-stabilized dispersion polymerization. [Lee et al. Adv. Funct. Mater. 15, 1495 (2005)] The positive temperature dependence was successfully reproduced at all range of low temperatures. More disordered samples showed negative temperature dependence, indicating disorder-induced metal-insulator transition. In addition, the charge-density-dependent transport in PANI will be presented for profound understanding of this metallic state.

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