One-Dimensional Transport in Polymer Nanofibers Y.W. PARK, A.N. ALESHIN, H.J. LEE, School of Physics and NSI-NCRC, Seoul National U, Seoul, Korea, K. AKAGI, Institute of Materials Science and TIMS, U of Tsukuba, Tsukuba, Japan — We report our transport studies in quasi-one-dimensional (1D) conductors—helical polyacetylene fibers doped with iodine—and the data analysis for other polymer single fibers and tubes. We found that at 30 K<T<300 K, the conductance and the current-voltage characteristics follow the power law $G(T) \propto T^{\alpha}$ with $\alpha \sim 2{:}2\text{--}7{:}2$ and $I(V) \propto V^{\beta}$ with $\beta \sim$ 2–5:7. Both $G(T)$ and $I(V)$ show the features characteristic of 1D systems such as Luttinger liquid or Wigner crystal. The relationship between our results and theories for tunneling in 1D systems is discussed.

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Date submitted: 08 Dec 2004   Electronic form version 1.4