

DISPERSION AND CURRENT-VOLTAGE CHARACTERISTICS OF HELICAL POLYACETYLENE SINGLE FIBERS

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To study the transport properties of individual helical polyacetylene (PA) fibers, we developed a method to extract a single fiber from tightly entangled ropes of helical PA bulk film. After a few minutes of sonication of a piece of helical PA bulk film in an organic solution containing surfactant, a droplet of solution is deposited on the pre-patterned electrode under argon atmosphere. AFM images show that extracted helical PA fibers are typically 10 μm in length and 100-200 nm in diameter. We found that the helicity of bulk materials is conserved. We present the temperature dependencies of current-voltage characteristics of individual helical PA fibers doped with iodine. The relationship between our results and theories for tunneling in 1D systems is discussed.

[References]

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