Disorder-induced neutral solitons in degenerate ground state polymers.

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Details

Abstract

We study the effects of weak off-diagonal disorder on π-conjugated polymers with a doubly degenerate ground-state. We find that disorder induces a finite density of neutral solitons in the lattice dimerization of a polymer chain. Interchain interactions result in a linear potential between the solitons and, if sufficiently strong, bind them into pairs resulting in an exponential suppression of the soliton density. As neutral solitons carry spin 1/2, they contribute to the polymer's magnetic properties. We calculate the magnetic susceptibility and suggest measurements of the magnetic susceptibility in *trans*-polyacetylene at low temperatures.

Beteiligte Forschungseinheiten

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