

Charge transfer and transport in carbon polymers and biopolymers

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I will discuss charge transfer and transport in polymers like atomic carbon wires and biopolymers like DNA. Transfer denotes that a carrier, created, e.g. by oxidation or reduction, at a specific site, moves, time passing, to more favorable sites without the application of external bias. Transport implies the application of external bias between electrodes. Nucleic acids like DNA and RNA are crucial for life with potential nanoscientific applications. Atomic carbon wires or carbynes represent the ultimate nanowire since their width is that of an atom. They are divided into cumulenic (with equidistant carbon atoms) and polyynic (with alternating shorter and longer distances between carbon atoms). We use analytical and numerical Tight Binding as well as Real-Time Time-Dependent Density Functional Theory to study charge transport and transfer along such polymers [1-9].

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