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Exciton transfer rate between two neutral *trans*-polyacetylene chains QING LU, Boston University, Mechanical Engineering Department, MINGHAI LI, XI LIN, Boston University, Mechanical Engineering Department — We use the perturbation theory to compute the exciton transfer rate between two neutral *trans*-polyacetylene chains described by the Su-Schrieffer-Heeger (SSH) Hamiltonian. Considering the highly polarizable nature of *trans*-polyacetylene, we compute Coulomb interactions directly without the point dipole approximation as introduced in the conventional Forster approach. We find a much softer chain separation dependence of the energy transfer rate between two *trans*-polyacetylene chains, scaling as $1/r^n$ where n $\sim$ 4 which is different from the well-known n= 6 in the Forster formula or n= 5 in the Hamaker formula for one-dimensional pairwise interactions. At a typical separating distance of 3.5 Å, the $\pi - \pi$ interaction density is 0.21 eV/ Å and the exciton transfer time is 72.6 ps. We are extending our calculations for poly-(*p*-phenylenevinylene) (PPV) and the complex porphyrin assembly using our recently developed adapted SSH Hamiltonian.

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