

Physikalisches Kolloquium



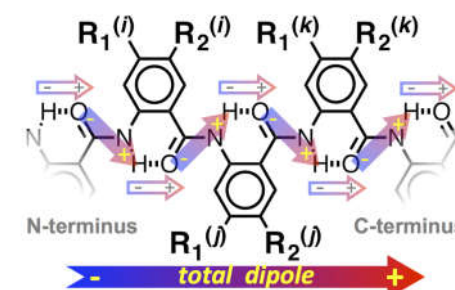
Thursday, 6th July 2017, 17:15, HS 100
 Reception with coffee & cookies 16:45

Prof. Valentine I. Vullev, University of California, Riverside/USA:

Bioinspired Molecular Electrets: Are They Just a Collection of Dipoles

Abstract

Controlling charge transfer (CT) at a molecular level is key for electronic, photonic and energy applications. As electrostatic analogues of magnets, electrets present an excellent choice for a source of fields that can guide movement of charges. Electrets are dielectrics, which makes them impractical for mediating long-range CT. Conversely, biology presents numerous examples for efficient CT through dielectric media. We, therefore, develop bioinspired molecular electrets, composed of non-native aromatic amino acids that can mediate long-range CT. The accepted notion about the dipole effect on CT focuses on the Franck-Condon aspect of the kinetics. We, however, demonstrate that the synergy with electronic coupling leads to “unusual” CT behaviour of the bioinspired molecular electrets. In certain cases, for example, the electrons migrate faster toward the negative poles of the dipoles than toward the positive poles. The emergence of the synergies between the nuclear and electronic aspects of the kinetics presents unexplored paradigms for controlling CT at nanometer and molecular scales



All of you interested in physics are cordially invited!