

Vibration Energy Accumulation and Redistribution in Organic Molecules Irradiated by Infrared Photons

Hartmut Jungclas, Anna M. Popova, Viacheslav V. Komarov, Lothar Schmidt, and Alexander Zulauf

Fachbereich Chemie, Philipps-Universität, D-35032 Marburg, Germany

Reprint requests to Prof. Dr. H. J.; E-mail: jungclas@staff.uni-marburg.de

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A theoretical approach to the dissociation and low-energy electronic excitation of polyatomic organic molecules with donor and acceptor substructures is suggested. The donor hydrocarbon molecular substructures can serve as antennas for low-energy infrared (IR)-photon absorption, which coherently induce collective vibrational excitations (excimols). Due to dipole-dipole interactions, the accumulated energy can transit to the molecular acceptors: dipole-type trap-bonds or molecular parts with π -electron orbits. The analytical expressions for the probability functions of molecular fragmentation and electronic excitation induced by IR-multiphoton absorption are derived. The vibrational energy accumulation and redistribution in the molecules of diphenylalkanes irradiated by infrared photons are considered from the presented point of view. – PACS numbers: 30.00 – 34.10 – 36.40

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