Resonant IR Photon Induced Dissociation in Organic Molecules with Chain-like Substructures

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Z. Naturforsch. **57a,** 270–276 (2002); received December 11, 2001

A nonstatistical model for the resonant IR photon induced dissociation of organic molecules by IR photons is suggested. The model is based on the excimol theory for molecules which contain chains of identical diatomic dipole groups. IR photon radiation can induce resonantly collective vibrational excitations (excimols) in these molecular substructures. The accumulation of several excimols in the molecular chain causes a local heating of the molecule and its fragmentation on a time scale of several hundreds of femtoseconds. An analytical expression for the fragmentation probability is derived and analysed.

Key words: Photon induced Dissociation.

PACS: 30.00 – 34.10 – 36.40