



Photodissociation Dynamics: Spectroscopy and Fragmentation of Small Polyatomic Molecules

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*****. Photodissociation induced by the absorption of single photons permits the detailed study of molecular dynamics such as the breaking of bonds, internal energy transfer and radiationless transitions. The availability of powerful lasers operating over a wide frequency range has stimulated rapid development of new experimental techniques which make it possible to analyse photodissociation processes in unprecedented detail. This text elucidates the achievements in calculating photodissociation cross-sections and fragment state distributions from first principles, starting from multi-dimensional potential energy surfaces and the Schrodinger equation of nuclear motion. Following an extended introduction in which the various types of observables are outlined, the book summarises the basic theoretical tools, namely the time-independent and the time-dependent quantum mechanical approaches as well as the classical picture of photodissociation. The discussions of absorption spectra, diffuse vibrational structures, the vibrational and rotational state distributions of the photofragments form the core of the book. More specific topics such as the dissociation of vibrationally excited molecules, emission during dissociation, or nonadiabatic effects are also discussed. It will be of interest to graduate students and...



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