

the subsequent photon absorption results in the production of fragment ions, as recently observed by Zandee and Bernstein [1]. The results are also consistent with those indicated from an MPI mass spectrometric study by Boesl *et al.* [2].

1 Zandee and Bernstein, *J. Chem. Phys.*, 71 (1979) 1359.

2 Boesl, Neusser and Schlag, *J. Chem. Phys.*, 72 (1980) 4327.

Two-photon excitation of H₂O, HCN and CS₂ with a KrF laser (248 nm)

R.J. DONOVAN, C. FOTAKIS, M. MARTIN and A. HOPKIRK

Department of Chemistry, University of Edinburgh, West Mains Road, Edinburgh (Gt. Britain)

UV multiphoton excitation with intense laser sources allows access to *highly* excited (Rydberg) molecular states which can undergo dissociation to yield an interesting variety of excited state products. In the work presented, photofragment fluorescence after two-photon excitation of H₂O, HCN and CS₂ with a KrF laser (248 nm) is discussed. For H₂O it is shown that OH radicals are formed in the A ²Σ⁺ state and that a strong rotational population inversion is produced. Similar results for HCN and CS₂ are also presented. The results are compared with those for single-photon excitation in the vacuum UV region at 124 nm.

193 nm photodissociation of CS₂ and probing of the CS fragment

JAMES L. BUTLER

U.S. Naval Research Laboratory, Code 6110, Washington, DC 20375 (U.S.A.)

Single- and multiple-photon processes are identified in the 193 nm laser photolysis of CS₂. A partial internal energy distribution of the CS(X ¹Σ⁺) fragment was measured by dye-laser-induced fluorescence after the single-photon photolysis of CS₂. The 193 nm multiple-photon-induced emission of the CS(A ¹Σ⁺ → X ¹Σ⁺) system was studied using a narrow-bandwidth (about 0.1 Å) tunable ArF excimer laser. This unique spectroscopic probing allows the determination of the ground state of CS(X ¹Σ) over a 45 000 cm⁻¹ range of vibronic bands from $v'' = 0$ to $v'' = 45$.