VIBRATIONALLY EXCITED HCl AND HF PRODUCED FROM PHOTODISSOCIATION OF CH_3CFCl_2 AT 193 NM BY MEANS OF TIME-RESOLVED FTIR

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We have determined the emission spectra of HF and HCl at various interval safter photolysis of CH_3CFCl_2 at 193 nm by means of time-resolved Fourier-transform spectroscopy. Typical resolution used was 1.0 cm^{-1} with acquisition intervals of 5 us for 100 data points, and the signal was averaged for 60-80 laser pulses at each scan step. IR emission was collected by a Welsch-type cell and focused to the entrance aperture of the emission port of the spectrometer. Emission of HF from 1 ¡= v ¡= 5 was observed, with intensity peaked at varied time intervals after photolysis. Fitting the temporal profiles of emission from each vibrational level yielded rates of quenching and nascent population. Preliminary results indicate that the nascent vibrational population distribution of HF is 0.42:0.31:0.14:0.08:0.05 for v = 1-5, respectively. Measurements of rates of quenching at varied partial pressure of CH_3CFCl_2 yielded rate coefficients of quenching of HF (1¡ v ¡ 4) by parent molecule. The results are compared with those reported for photolysis of similar molecules. Emission of HCl (v ¡ 4) was also observed after photolysis of CH_3CFCl_2. The formation mechanism and associated kinetics will be presented.