MATRIX ISOLATION SPECTROSCOPY OF Cl_3

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A new visible emission system, tentatively assigned to the trichloride radical, has been observed in a solid Ar matrix. Cl_3 was prepared by photodissociation of HCl and permanent cage exit of the H atom in HCl/Cl_2 dimer trapping sites. Following photodissociation at 193 nm, a new emission at 470 nm was observed upon excitation at 308 nm. The intensity of the 470 nm emission increased with 193 nm irradiation time, and could be used to monitor the photodissociation dynamics of HCl in the argon matrix. Similarly the intensity of the Cl_2 $A \rightarrow X$ emission near 800 nm decreased with 193 nm irradiation. LIF and excitation spectra were used to characterize the trihalogen species. A model of the ionic states of Cl_3 is presented to describe the excitation spectra.