

Part I

Spectroscopy and Photodissociation of ClF in Ar and Kr

Before femtosecond pump-probe experiments on a new molecular system can be performed, the spectroscopy of the constituent molecules has to be clarified. This chapter provides the first spectroscopic account of excited electronic states of ClF in the condensed phase. The absorption of ClF should be known for the choice of the pump pulses. The selection of the probe pulses in recombination dynamics requires the knowledge of the excited state absorption of ClF . The absorption of F radicals in Kr is needed to monitor the cage exit dynamics of the F fragment. The fluorescence bands after pump-probe excitation are recorded to provide an assignment of the LIF measured in the pump-probe spectra. The main motivation for the choice of ClF is to investigate the competing dissociation and recombination processes in the condensed phase. The expected cage exit of F atoms is essential, and therefore also the photodissociation yield is examined here.