HYDROGEN ABSTRACTION FROM CH_3D BY CHLORINE RADICALS WITH VARYING KINECTIC ENERGY DISTRIBUTIONS

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Vibrationally driven hydrogen abstraction from methane and its isotopologues has become nearly ubiquitous as a standard in gas phase reaction dynamics studies. To obtain a more complete view of the reaction dynamics of the hydrogen abstraction reaction of CH_3D with Chlorine radicals, we have studied how a dramatic change in the kinetic energy distribution of the Cl radicals affects the abstraction dynamics of our system. To this end, we have performed pump-probe experiments, exciting the $2\nu_4$ CH_3D antisymmetric C-H stretch overtone, photolyzing Cl_2 with laser pulses of 309 nm, 355 nm, and 416 nm, then probing the products with (2+1) REMPI. We find both similarities and marked differences in the abstraction dynamics at the three different photolysis energies.