DC SLICED PHOTODISSOCIATION STUDY OF OZONE AT 226NM

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Ozone photodissociation below 234 nm gives rise to a bimodal recoil velocity dstribution in the minor channel giving O (^3P_j) as a product, and the source of this bimodality has so far eluded definitive explanation. It has long been asribed to coincident production of highly vibraitonally excited O_2 possibly through some distinct intersection seam of the relevant potential energy surfaces, but extensive theoretical effort has failed to find a plausible pathway for this. We have used the DC sliced imaging method to reinvestigate the product O (^3P_j) of ozone photodissociation at 226nm at very high velocity resolution. The experimental results are focused exclusively on the slow component for the O (^3P_j) fragments formed in the photodissociation of ozone at the 226.06 nm for J=1 and 225.65 nm for J=2. The total translational energy distributios for the slow components show two distinct peaks that are coincident, within 0.01 eV, with the onset of v=0 and 1 of the $A'^3\Delta_u$ state of O_2 as a cofragment. Furthermore, trajectory calculations show that, at this excitation energy, the region of the ozone B state that correlates with the Herzberg states of oxygen is accessible, and a fraction of trajectories reach this intersection region. These combined experimental and theoretical investigations provide compelling evidence that the origin of the slow peaks in the O(^3P_j) product of ozone dissociation below 234 nm is the channel yielding the $A'^3\Delta_u$ state of O_2 as a coproduct.