Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

H-atom elimination of n-propyl and *iso*-propyl radicals: a photodissociation study[1] JINGSONG ZHANG, WEIDONG ZHOU, YAN YUAN, University of California, Department of Chemistry — The H-atom elimination channels in the UV photodissociation of jet-cooled n-propyl and *iso*-propyl radicals are studied in the region of 237 nm using the high-n Rydberg-atom time-of-flight technique. Upon excitation to the $3p$ state by the UV photolysis radiation, n-propyl radical and *iso*-propyl radical dissociate into the H atom and propene products. The product center-of-mass translational energy release of both n-propyl and *iso*-propyl radicals have bimodal distributions. The H-atom product angular distribution in n-propyl is anisotropic (with $\beta \sim 0.5$), and that in *iso*-propyl is isotropic. The overall average translational energy release is $\langle \mathrm{E}_T \rangle \sim 0.27\mathrm{E}_{avail}$ for n-propyl and $\langle \mathrm{E}_T \rangle \sim 0.21\mathrm{E}_{avail}$ for *iso*-propyl. The bimodal translational energy distributions indicate two dissociation pathways: (i) a unimolecular dissociation pathway from the ground-state propyl after internal conversion from the $3p$ state, and (ii) a repulsive pathway directly connected with the excited state of the propyl radical. Isotope labeling has also been carried out. The possible photodissociation mechanisms will be discussed.

[1] Acknowledgement: National Science Foundation and Sloan Foundation

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Date submitted: 15 Jan 2006 Electronic form version 1.4