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H-atom elimination of \textit{n}-propyl and \textit{iso}-propyl radicals: a photodissociation study\textsuperscript{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 \textit{n}-propyl and \textit{iso}-propyl radicals are studied in the region of 237 nm using the high-\textit{n} Rydberg-atom time-of-flight technique. Upon excitation to the 3\textit{p} state by the UV photolysis radiation, \textit{n}-propyl radical and \textit{iso}-propyl radical dissociate into the H atom and propene products. The product center-of-mass translational energy release of both \textit{n}-propyl and \textit{iso}-propyl radicals have bimodal distributions. The H-atom product angular distribution in \textit{n}-propyl is anisotropic (with $\beta \sim 0.5$), and that in \textit{iso}-propyl is isotropic. The overall average translational energy release is $\langle E_T \rangle \sim 0.27E_{\text{avail}}$ for \textit{n}-propyl and $\langle E_T \rangle \sim 0.21E_{\text{avail}}$ for \textit{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 3\textit{p} 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.

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