

O(¹D) INSERTION REACTIONS FOR THE FORMATION AND SPECTRAL ANALYSIS OF IMPORTANT INTER-STELLAR MOLECULES

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Insertion of O(¹D) into stable precursors has proved an efficient way of producing molecules that are reactive or otherwise unstable under terrestrial conditions. O(¹D) reaction with hydrocarbons occurs preferentially via a barrierless insertion into C-H bonds. Previously in our lab, O(¹D) has been produced via photodissociation of ozone at 248 nm. We have reported successful production of methanol and vinyl alcohol from insertion into methane and ethylene respectively^a, where the excess rotational and vibrational energy was quenched using a supersonic expansion, thereby stabilizing the direct insertion product. Using this technique described by Hays et. al., we aim to produce the important glycine precursor, aminomethanol, via insertion into methylamine. Preliminary results have been obtained using O₃ as the precursor for O(¹D) production, but the side reactions between O₃ and methylamine produce such a wide variety of products that spectral assignment for aminomethanol is hampered. We propose to photodissociate N₂O using 193 nm light as a source of O(¹D) production in order to eliminate the multitude of side reactions observed with ozone. Here we will present the efforts made towards producing aminomethanol and collecting its rotational spectrum in the millimeter/sub-millimeter region.

^aB. M.Hays, N. Wehres, B. Alligood DePrince, A. A.M. Roy, J. C. Laas, S. L. Widicus Weaver, *Chem.Phys. Lett.*, 630, 18 (2015)