

O(¹D) INSERTION REACTIONS FOR THE PRODUCTION AND SPECTRAL ANALYSIS OF INTERSTELLAR ORGANIC MOLECULES

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O(¹D) insertion reactions with stable precursors have proved an efficient way of producing important prebiotic molecules that are highly reactive and otherwise unstable under laboratory conditions. In 2015, Hays et al.^b reported successful production of gaseous methanol and vinyl alcohol by exothermic O(¹D) insertion into methane and ethylene, respectively, and collected their rotational spectra in the millimeter/submillimeter region. Prior to this, in 2013 Hays et al.^c reported a computational study predicting the formation of methanediol, methoxymethanol and aminomethanol, through O(¹D) insertion into methanol, dimethyl ether and methylamine, respectively. These species are all important prebiotic molecules and have been shown to be stable under interstellar conditions. We therefore seek to collect their spectra for comparison to interstellar observations. Here we will report experimental progress toward producing and characterizing the spectra of aminomethanol and methanediol using O(¹D) insertion reactions and millimeter/submillimeter spectroscopy.

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