

MILLIMETER/SUBMILLIMETER SPECTROSCOPY OF THE METHYLAMINE PHOTODISSOCIATION PRODUCT AMINOMETHYL RADICAL ($\dot{\text{C}}\text{H}_2\text{NH}_2$)

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Methylamine (CH_3NH_2) is the simplest primary amine and a precursor of the simplest amino acid, glycine. Therefore, methylamine is a molecule of particular interest in astrochemistry and prebiotic chemistry. Previous astronomical observations have detected methylamine in multiple star-forming regions, molecular clouds, meteorites, and the atmosphere of Titan. Studying the formation and dissociation mechanisms of methylamine is thus important for the modeling of chemistry in these environments and for laying the groundwork for future astronomical observations. This work focuses on the aminomethyl radical ($\dot{\text{C}}\text{H}_2\text{NH}_2$), which is one of the expected products arising from the cosmic-ray induced photodissociation of methylamine. A pulsed supersonic expansion of methylamine in argon was coupled with a high-voltage needle discharge source to produce $\dot{\text{C}}\text{H}_2\text{NH}_2$ in a vacuum chamber. The rotational spectrum of $\dot{\text{C}}\text{H}_2\text{NH}_2$ was collected in the millimeter/submillimeter regime, and the results were compared to theoretical predictions based on the molecular structure of $\dot{\text{C}}\text{H}_2\text{NH}_2$. Here we will present the laboratory measurements and the results of the spectral analysis, as well as initial searches for $\dot{\text{C}}\text{H}_2\text{NH}_2$ in the interstellar medium.