

ROTATIONAL SPECTRUM OF ACETOIN ($\text{CH}_3\text{COCH}(\text{OH})\text{CH}_3$)

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Acetoin ($\text{CH}_3\text{COCH}(\text{OH})\text{CH}_3$) is a common additive to e-cigarette fluids. Though not toxic itself, it decomposes into diacetyl ($\text{CH}_3\text{COCOCH}_3$), which is known to cause lung damage. Diacetyl may be important in interstellar chemistry because it has been observed as a VUV desorption product from an interstellar ice analog experiment studying acetaldehyde-based ices. We reported on an attempt to study this molecule at this conference in 2021. Given its extremely small dipole moment and multiple methyl rotors, the study of diacetyl is challenging. Acetoin, conversely, has a strong dipole moment of 2.55 D, which allows its spectrum to be easily observed. The microwave spectrum of acetoin has been collected by Gou and coworkers as reported in the Microwave Newsletter. We extended measurements of rotational lines from 70 to 115 GHz and from 140 to 800 GHz. These data were collected using a long-path length direct absorption flow cell spectrometer. The spectral analysis is underway. The results of this spectrum will enable astronomical observations for both acetoin and, by proxy, diacetyl. Here we will report on the millimeter/submillimeter spectrum of acetoin and our progress towards its analysis and comparison to observations.