

## DETECTION OF THE ROTATIONAL SPECTRUM OF SULFOXYLIC ACID (HOSO<sub>H</sub>)

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Sulfoxylic acid (HOSO<sub>H</sub>) is a chemical intermediate that falls roughly midway in the oxidation states of sulfur, between its highly reduced (H<sub>2</sub>S) and oxidized (H<sub>2</sub>SO<sub>4</sub>) forms. It is likely formed during atmospheric oxidation of anthropogenic and natural sulfur emissions, and might also be produced by UV processing of circumstellar ices. Despite considerable theoretical work, no gas-phase spectra of sulfoxylic acid or any of its structural isomers have previously been observed. We report the detection of the rotational spectra of the  $C_2$  and  $C_s$  rotamers of HOSO<sub>H</sub> using a combination of Fourier transform microwave spectroscopy and microwave-microwave double resonance techniques, guided by new high-level quantum chemical calculations of their structures. The present work enables radioastronomical searches for these species, and also lays the groundwork for further chemical studies of its gas-phase formation and spectroscopic studies of other H<sub>2</sub>SO<sub>2</sub> isomers.

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