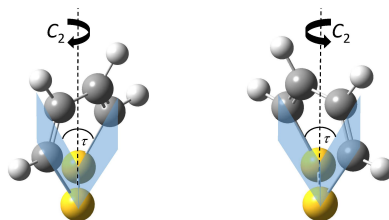


## High Resolution Gigahertz and Terahertz Spectroscopy and Theory of Parity Violation and Tunneling for 1,2-dithiine ( $C_4H_4S_2$ ) as a Candidate for Measuring the Parity Violating Energy Difference between Enantiomers of Chiral Molecules

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Electroweak parity violation leads to a slight energy difference between the enantiomers of chiral molecules (on the order of 100 aeV to 1 feV depending on the molecule) and also to a slow time dependent intramolecular process changing parity with time on the order of *ms* to *ks* [1, 2]. Recently we have identified 1,2-dithiine (Figure 1) as a possible candidate for measuring  $\Delta_{pv}E$  using the experimental set up described in [3]. Here we report spectroscopic and theoretical studies needed for the preparation of such experiments on 1,2-dithiine ([4, 5] and references therein). We shall also refer to the evolution of the biomolecular homochirality, which may be related to parity violation [6].



**Figure 1.** Two enantiomers of 1,2-dithiine ( $C_4H_4S_2$ ), left P, right M enantiomer.

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