MICROWAVE SPECTRUM AND MOLECULAR STRUCTURE OF THE CHIRAL TAGGING CANDIDATE, 3,3-DIFLUORO-1,2-EPOXYPROPANE, AND ITS COMPLEX WITH THE ARGON ATOM

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Continuing our efforts in characterizing small molecules for use as potential chiral tags for the conversion of enantiomeric molecules into spectroscopically distinct diasteromeric complexes for chiral analysis, we examine the microwave spectrum and molecular structure of 3,3-difluoro-1,2-epoxypropane. This compound is available as a high vapor pressure liquid, both in enantiomerically pure form and as a racemic mixture, and it is easily incorporated into a free jet expansion for complex formation and spectroscopic analysis. Like the structurally similar 3,3,3-trifluoro-1,2-epoxypropane, it has a simple, hyperfine-free rotational spectrum. This spectrum has been obtained for the most abundant and four singly-substituted isotopologues, all in natural abundance, and the structure of the molecule determined. In addition, the spectrum and structure of the 3,3-difluoro-1,2-epoxypropane-argon complex are obtained.