ANALYSIS OF THE ROTATIONAL STRUCTURE IN A C-TYPE BAND IN THE HIGH-RESOLUTION INFRARED SPECTRUM OF $trans, trans$-1,4-DIFLUOROBUTADIENE-1-d_1

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A mixture of deuterium isotopomers of *trans,trans*-1,4-difluorobutadiene (ttDFBD) was prepared by partial exchange with NaOD/D_2O. A prominent component of the mixture was the 1-d_1 species. The rotational structure in a C-type band of this species centered at 920.5 cm^{-1} was analyzed in the high-resolution (0.002 cm^{-1}) infrared spectrum. The analysis of this band was compromised by large contributions from a C-type band at 893 cm^{-1} in the spectrum of ttDFBD-1,4-d_2. Provisional ground state rotational constants for ttDFBD-1-d_1 are reported. We have recently shown that 1-fluoroethylene can be exchanged with NaOD/D_2O to give 1-fluoroethylene-1-d_1, which can be used in known chemistry to make pure DFBD-1-d_1. An improved high-resolution infrared spectrum of ttDFBD-1-d_1 will be obtained. This method will also yield *cis,cis*-DFBD-1-d_1 for investigation. Rotational constants for ttDFBD-1-d_1 and ccDFBD-1-d_1 are needed for determining the semi-experimental equilibrium structures of the two nonpolar isomers of DFBD.