TORSIONAL SPECTRUM OF $^{12}CH_3{}^{13}CH_3$: A 2-STATE FREQUENCY ANALYSIS OF THE TORSIONAL BANDS AND THE ν_{12} VIBRATIONAL FUNDAMENTAL

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The far-infrared spectrum of $^{12}CH_3{}^{13}CH_3$ is studied between $220 - 350$ cm^{-1} at an effective resolution of $0.004 - 0.005$ cm^{-1} using a Bruker IFS-120 HR . Observation of the torsional fundamental ν_6 (289 cm^{-1}) and the torsional hot band $2\nu_6 - \nu_6$ (255 cm^{-1}), together with the lowest frequency vibrational fundamental ν_{12} (821.5 cm^{-1}), also obtained with the same spectrometer at an effective resolution of 0.0025 cm^{-1}, gives information on the torsional stack of the ground vibrational state and that for $v_{12} = 1$ state. The frequencies are analysed in terms of a 2-state fit to determine the torsion mediated Coriolis interactions between the torsional stacks. A comparison is made with a 2-state fit of similar data for $^{12}CH_3{}^{12}CH_3$.