SYNCHROTRON-BASED STUDY OF THE FAR IR SPECTRUM OF SILACYCLOBUTANE: THE ν_{29} AND ν_{30} BANDS

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Rotationally-resolved vibrational spectra of the four-membered ring silacyclobutane (c-C_3H_8Si) from 100-1000 cm^{-1} have been collected (resolution: 0.00096 cm^{-1}) using the far infrared beamline at the Canadian Light Source synchrotron. The two lowest frequency vibrational bands recorded correspond to motions that are best described as ring puckering (ν_{30}) at 158 cm^{-1} and SiH_2 rocking (ν_{29}) at 410 cm^{-1}. Close examination of the two bands reveals that each is split into two tunneling components due to ring inversion. The assignment and analysis of the dense rovibrational patterns in these two regions will be detailed. Ongoing work involving the assignment of higher frequency bands will also be discussed.