STRUCTRURAL DETERMINATION OF SILACYCLOBUTANE AND SILACYCLOPENTANE USING FOURIER TRANSFORM MICROWAVE (FTMW) AND CHIRPED PULSE FOURIER TRANSFORM MICROWAVE (cp-FTMW) SPECTROSCOPY

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The pure rotational spectra of the ground states of silacyclobutane (SCB) and silacyclopentane (SCP) were measured in a supersonic jet in the 6-24 GHz range using Fourier transform microwave spectroscopy and the chirped-pulse variant of this technique. Heavy atom isotopic substitution for the silicon and each of the carbon atoms within the rings enabled the accurate determination of the r_s and r_0 structural parameters of the ring backbones of both SCB and SCP. For SCB, splitting due to ring inversion in the ground state has been observed and analyzed.