MICROWAVE SPECTROSCOPY OF THE HEAVY-ATOM CARBENE ANALOGS: HSiI and DSiI

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The pure rotational spectra of 6 silicon isotopologues, of HSiI and of DSiI have been recorded in natural abundance by pulsed-jet Fourier transform microwave (FTMW) spectroscopy. Neon was passed over dry ice cooled H_3SiI or D_3SiI and introduced into the pulsed valve of the FTMW spectrometer. The HSiI and the DSiI were produced in-situ with a 1000 V DC-discharge nozzle. Only a-type transitions can be observed from 6 - 26 GHz; $K_a = 0$ transitions for the HSiI and $K_a = 0$ and 1 transitions for the DSiI isotopologues. All observed transitions were assigned unambiguously. The molecular structure and chemical bonding of this heavy atom carbene will be discussed.