A HIGH-RESOLUTION STUDY OF THE FOUR LOWEST FUNDAMENTAL BANDS AND ACCURATE DETERMINATION OF THE GROUND STATE CONSTANTS OF H$_3$Si$^{35}$Cl

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In order to determine the structure and force field of silyl chloride, the infrared spectra of several isotopomers were studied. After monoisotopic D$_3$Si$^{35}$Cl (previous communication), we report here on the analysis of the monoisotopic H$_3$Si$^{35}$Cl species. Here too, the two fundamental bands $v_3$ (543.968 cm$^{-1}$) and $v_6$ (663.736 cm$^{-1}$) are linked by a Coriolis resonance but its effects are less important than for D$_3$SiCl and especially than for the two nearly degenerate fundamental bands $v_2$ (947.982 cm$^{-1}$) and $v_6$ (950.657 cm$^{-1}$). The 'normal' ground state constants $B_0$, $D^j_0$, $D^j_{JK}$, $H^j_0$, $H^j_{JK}$, and $P^j_{JK}$ were deduced from more than 6000 GSCD. As for the constants $A_0$ and $D^0_0$, they were obtained by the same method as for D$_3$Si$^{35}$Cl. Calibration errors were detected and corrected by checking the closed loop between $v_6$, $(2v_6)^0$ and $(2v_6)^0 - v_6$. The values obtained are $A_0 = 2.84564$ cm$^{-1}$ and $D^0_0 = 2.54 \times 10^{-6}$ cm$^{-1}$ (provisional values). Upper state energies were also determined for $v_3 + v_6$, $v_2 + v_6$, $(2v_6)^0$, $(2v_6)^0$, $(2v_3)^0$, $v_2$, and $v_3 + v_2$. Some interesting features of the hot bands $v_3 + v_6 - v_3$ and $v_3 + v_6 - v_6$ will also be reported.