A HIGH-RESOLUTION STUDY OF THE FOUR LOWEST FUNDAMENTAL BANDS AND ACCURATE DETERMINATION OF THE GROUND STATE CONSTANTS OF $H_3Si^{37}Cl$

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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 $D_3Si^{35}Cl$ (previous communication), we report here on the analysis of the monoisotopic $H_3Si^{37}Cl$ species. Here too, the two fundamental bands ν_3 (543.968cm^{-1}) and ν_6 (663.736 cm^{-1}) are linked by a Coriolis resonance but its effects are less important than for D_3SiCl and especially than for the two nearly degenerate fundamental bands ν_2 (947.982 cm^{-1}) and ν_5 (950.657 cm^{-1}). The 'normal' ground state constants B_0, D_J^0, D_{JK}^0, H_J^0, H_{JK}^0, and D_{KJ}^0 were deduced from more than 6000 GSCD. As for the constants A_0 and D_K^0, they were obtained by the same method as for $D_3Si^{35}Cl$. Calibration errors were detected and corrected by checking the closed loop between ν_6, $(2\nu_6)^0$ and $(2\nu_6)^0$ - ν_6. The values obtained are A_0 = 2.84564 cm^{-1} and D_K^0 = 2.54$\times$ 10^{-6} cm^{-1} (provisional values). Upper state energies were also determined for ν_3, ν_6, ν_2, ν_5, $(2\nu_6)^{\pm 2}$, $(2\nu_6)^0$, $2\nu_3$, and ν_3 + ν_6. Some interesting features of the hot bands ν_3 + ν_6 - ν_3 and ν_3 + ν_6 - ν_6 will also be reported.