ISOTOPOMER DEPENDENCE AND BORN-OPPENHEIMER BREAKDOWN IN MID AND FAR INFRARED SPECTRA OF CdH

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New measurements of far infrared transitions within the $v = 1$ levels of the $X\,^2\Sigma^+$ state of 6 different isotopomers of CdH and CdD are combined with previous mid-infrared[a,b] and far-infrared[c] data in a combined-isotopomer analysis which yields improved rotational constants, spin-rotation constants and Born-Oppenheimer breakdown (BOB) parameters for this system. Recent work by one of us[c] had reported the measurement and analysis of far infrared transitions within the $v = 0$ level of 12 isotopomers CdH and CdD, but the combined-isotopomer analysis reported there found that the CdH and CdD data appeared to be incompatible unless separate Cd-atom BOB parameters were introduced for the inertial rotation constants of CdH and CdD, and BOB parameters introduced for the spin-rotation constants. The present work shows that taking account of the v–dependence of the mechanical rotationl parameters for $v = 0$ isotopomers implied by the reduced-mass-scaling of vibrational quantum numbers allows the far infrared data to be accounted for without invoking these two assumptions.

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[b] H. Birk, R.-D. Urban, P. Polomsky and H. Jones, *J. Chem. Phys.* **94**, 5435-5442 (1991).
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