

Abstract Submitted
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The high vibrational levels of the $B''\bar{B}^1\Sigma_u^+$ state of H_2 ALEXANDER M. CHARTRAND, WENQI DUAN, Bryn Mawr College, ROBERT C. EKEY, JR., University of Mount Union, ELIZABETH F. MCCORMACK, Bryn Mawr College — The *ungerade* $B''\bar{B}^1\Sigma_u^+$ state of H_2 is of interest in molecular physics due to its double-well shape that supports extremely long range, high vibrational levels converging to the third dissociation limit. The highest vibrational levels are expected to have ion-pair character and therefore follow an energy pattern that smoothly connects to the ion-pair series previously observed above the third dissociation limit. Resonantly enhanced multiphoton ionization (REMPI) spectroscopy through the $E, F, v = 6$ state and time of flight ion detection was used to acquire the vibrational spectrum of the $B''\bar{B}$ state over an energy range of 2000 cm^{-1} leading up to the third dissociation limit. Vibrational energies inclusive of $v = 51$ to $v = 69$ were measured to a precision of $\sim 0.5 \text{ cm}^{-1}$. Assignments were aided by previous measurements and theoretical predictions from the literature. The results are used to explore the ion-pair nature of these high vibrational states.

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