

SPECTROSCOPIC STUDY OF THE N₂-H₂O COMPLEX IN THE 2 OH STRETCHING REGIONS

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Rovibrational spectra of N₂-H₂O van der Waals complexes were measured in the overtone range, around the 2 OH stretching regions. The rotationally resolved $(\nu'_1, \nu'_2, \nu'_3) \leftarrow (\nu''_1, \nu''_2, \nu''_3) = (2, 0, 0) \leftarrow (0, 0, 0)$ and $(1, 0, 1) \leftarrow (0, 0, 0)$ vibrational bands were observed; where ν_1, ν_2, ν_3 are the vibrational quantum numbers of the isolated water molecule. As well, a combination band involving the (1,0,1) state and the intermolecular in-plane N₂ bending vibration will be presented. The spectra were measured using continuous wave cavity ringdown spectroscopy in a supersonic expansion, as implemented in the FANTASIO+ setup [1,2]. These spectra were analyzed by considering the feasible tunneling motions of this complex, fitted as separate asymmetric rotors for the four observed tunneling states. The tunneling splittings are discussed as a function of the vibrational state and compared with other isotopologues. The assignment of a rovibrational perturbation will also be discussed.

[1] M. Herman, K. Didriche, D. Hurtmans, B. Kizil, P. Macko, A. Rizopoulos, P.V. Poucke, *Molecular Physics*, 2007, 105 (5-7), 815-823.

[2] A.S. Bogomolov, A. Roucou, R. Bejjani, M. Herman, N. Moazzen-Ahmadi, C. Lauzin, *Chemical Physics Letters*, 2021, 774, 138606.