

SUB-DOPPLER SPECTROSCOPY OF *trans*-HOCO RADICAL IN THE OH STRETCHING MODE

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Rovibrational spectroscopy of the fundamental OH stretching mode of *trans*-HOCO radical has been studied via sub-Doppler high resolution infrared laser absorption in a discharge slit-jet expansion. The *trans*-HOCO radical is formed by discharge dissociation of H₂O to form OH, which then combines with CO and cools in the Ne expansion to a rotational temperature of 16 K. Rigorous assignment of both *a*-type and *b*-type spectral transitions is made possible by 2-line combination differences from microwave studies^a, with full rovibrational analysis of the spectrum based on a Watson asymmetric top Hamiltonian. Additionally, fine structure splittings of each line due to electron spin are completely resolved and thus permitting all three ϵ_{aa} , ϵ_{bb} , ϵ_{cc} spin rotation constants to be experimentally determined. Furthermore, the ratio of transition dipole moment along the molecule A and B axis is determined to be $\mu_a/\mu_b = 1.72(5)$, in agreement with quantum theoretical calculations(1.85).

^aT. Oyama, W Funato, Y. Sumiyoshi, and Y. Endo, J. Chem. Phys. 134, 174303.