DIODE LASER SPECTROSCOPY OF N2–D2O COMPLEX IN THE V2 BEND REGION OF D2O

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The rovibrational spectrum of N2–D2O complex was measured in the v2 bend region of D2O using a rapid-scan diode laser spectrometer to probe a pulsed supersonic slit jet. Three subbands, namely Ka = 1–0, 0–0, and 0–1, were recorded. All the transitions in the spectrum are doubled, due to D2O tunneling within the complex. The spectrum was analyzed in terms of a standard asymmetric rotor Hamiltonian, yielding band origins, rotational and centrifugal distortion constants for the upper and lower tunneling levels. The band origin of N2–D2O is slightly blue-shfited from the monomer, indicating that the intermolecular bond becomes weaker upon vibrational exciation of the v2 bend mode of D2O. The tunneling dynamics within the complex will be discussed.