

HIGH RESOLUTION LASER SPECTROSCOPY OF THE NITRIC OXIDE DIMER IN SUPERFLUID HELIUM NAN-ODROPLETS

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Previously, the ν_1 and ν_5 bands of helium solvated nitric oxide clusters were investigated with a pulsed OPO system having a resolution of 0.25 cm^{-1} [1]. Here, we investigated the ν_1 band with a continuous-wave quantum cascade laser at high resolution (10 MHz), and uncover substructure that provides additional insight. In particular, in the vicinity of the fundamental band of the nitric oxide dimer, we observed baseline-resolved rotational substructure with relative intensities that are consistent with the *cis*-(ON-NO) isomer, along with a weaker band with similar substructure shifted slightly to lower frequencies. We tentatively attribute this weaker band to an anharmonic resonance between the fundamental and a combination band (which could be, e.g., $4\nu_6 + \nu_3$), although we cannot rule out that it is due to the higher energy triplet nitric oxide dimer.

[1] Hoshina et al., *J Phys. Chem. A*. **2016**, 120, 527.