CAVITY RINGDOWN SPECTROSCOPY OF CIS-CIS HOONO AND THE HOONO/HONO2 BRANCHING RATIO IN THE REACTION OH + NO2 + M

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The termolecular association reaction OH + NO2 + M was studied in a low pressure discharge flow reactor, and both HONO2 and HOONO products were detected by Infra-Red Cavity Ringdown Spectroscopy (IR-CRDS). The absorption spectrum of the fundamental $\nu 1$ band of the cis-cis isomer of HOONO (pernitrous or peroxynitrous acid) was observed at 3306 cm^{-1}, in good agreement with matrix isolation studies and ab initio predictions. The rotational contour of this band was partially resolved at $1 cm^{-1}$ resolution and matched the profile predicted by ab initio calculations. The integrated absorbances of the $\nu 1$ bands of the cis-cis HOONO and HONO2 products were measured as a function of temperature and pressure.