IR CAVITY RINGDOWN STUDY OF HOONO FORMATION FROM OH + NO_2

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The reaction of OH + NO_2 $\rightarrow$ HNO_3 is a critical sink of HO_x and NO_x radicals in the atmosphere. The unstable intermediate HOONO has long been proposed as a minor channel. Because HOONO is predicted to be bound by $<$20 kcal/mol, it would thermally decompose to reactants and would not serve as a sink for OH radicals; hence, its formation would reduce the rate of stable nitric acid formation. We report direct detection of this adduct at $3280\mathrm{cm}^{-1}$by IR cavity ringdown spectroscopy in a discharge flow cell, and present a study of its relative yield and significance in the troposphere and stratosphere.