MICROWAVE OBSERVATION OF THE OH-H_2O RADICAL COMPLEX

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The radical complex OH-H_2O has been observed by rotational spectroscopy. Spectra for ^{16}OH-$^{16}OH_2O$ and ^{18}OH-$^{18}OH_2$ have been analyzed using a two-state model which accounts for nuclear motion on both the $^2A'$ and $^2A''$ potential surfaces. Partial quenching of the OH orbital angular momentum dramatically affects the rotational spectra, and the $^2A'$-$^2A''$ energy separation, ρ, is determined to be -146.50744(42) cm^{-1}. The ground state of the complex has approximately 86% $^2A'$ character and the vibrationally averaged OH-OH_2 hydrogen bond distance is 1.952 Å. The magnetic hyperfine constants for the OH proton in the complex are significantly altered from monomer values.