The ground state of CoH has been determined experimentally as the $^3\Phi$ by the far-infrared magnetic resonance study, and theoretically by \textit{ab initio} methods. However, MR-SDCI and MR-SDCI + Q \textit{ab initio} molecular orbital calculations predicted that the lowest electronic state is $^5\Phi$. The size-consistent MR-ACPF method correctly predicted that $^3\Phi$ should be the ground state. As is previously reported by Tanaka et al. on FeH, the controversial results in MR-SDCI may arise through truncation error inherent in the size-inconsistent MR-SDCI method. Another difficulty is that we cannot clearly separate the $\Phi$ and $\Pi$ states when CoH is treated under $C_{2v}$ symmetry, not under its real symmetry of $C_{nv}$. The best results we obtained at the moment are: $r_e = 1.528$ Å, $B_e = 7.291$ cm$^{-1}$, and $\omega_e = 2005$ cm$^{-1}$ at the level of the MR-ACPF + relativistic correction using the Roos ANO (Co) and Dunning aug-cc-pVQZ (H) basis sets.

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