MILLIMETER WAVE SPECTROSCOPY OF THE CoCO RADICAL PRODUCED IN A SUPERSONIC JET EXPANSION BY THE ULTRAVIOLET PHOTOLYSIS OF $Co(CO)_3NO$.

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Rotational transitions of the CoCO radical were observed by millimeter wave spectroscopy. The CoCO radical was produced in a supersonic expansion by the ultraviolet photolysis of $Co(CO)_3NO$. The $J = 8.5 - 7.5$, $9.5 - 8.5$, $10.5 - 9.5$, and $11.5 - 10.5$ rotational transitions in the Ω = 5/2 spin state of the $X^2\Delta_i$ electronic ground state were assigned in the 75-130 GHz region. Each rotational transition was split into 8 hyperfine components due to the electron orbital-nuclear spin interaction, electron spin-nuclear spin interaction, and nuclear quadropole interaction of the Co atom. The Λ-type doublet was not resolved in the Ω = 5/2 spin state. Effective molecular constants for the Ω = 5/2 spin state, including rotational constant, B, centrifugal distortion constant, D, nuclear quadropole interaction constant, eQq, and the linear combination, $a + (1/4)b + (1/6)c$, of the electron orbital-nuclear spin interaction a, Fermi contact interaction b, and magnetic dipole interaction of the electron spin and nuclear spin c, were determined by the least squares fitting of the observed spectrum.