SUB-MILLIMETER WAVE SPECTROSCOPY OF NS RADICAL

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NS radical has been investigated since the early stage of microwave spectroscopy and radio astronomy. Anacona et al[a] observed the lines in the excited vibrational states of up to $v = 5$. Several years ago Amano[b] detected the lines as high as $v = 17$ in the 350 GHz region in a discharge reaction system of a mixture of N_2($\sim$30 mTorr) and CS_2($\sim$1 mTorr). More recently Lee et al[c] performed more accurate measurements up to 350 GHz region and obtained much improved molecular constants for the ground state. In this work, we extended the measurements to 680GHz and, by observing the higher-J transitions, the Λ-type doubling is resolved for the $^2\Pi_{3/2}$ state. We combined all the available data to determine the best fit molecular constants for higher vibrational excited states. The vibrational dependence of the molecular constants, in particular, the Λ-doubling constants will be discussed.

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[b] T. Amano and T. Amano, paper TD9, Symposium on Molecular Spectroscopy, June 1990
[c] S. K. Lee, H. Ozeki, and S. Saito, Astrophys. J.(Supplement), 98, 351(1995)