

## MILLIMETER WAVE SPECTRUM OF THE NH<sub>3</sub> - N<sub>2</sub> COMPLEX

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The only previous spectroscopic study of the ammonia - nitrogen van der Waals complex was made by Fraser et al.<sup>b</sup> in 1986. They observed one main  $K = 0$  series of rotational transitions,  $R(0)$  to  $R(3)$ , in the 6 to 27 GHz region using the MBER technique. Another pair of lines near 13.5 GHz (reported in a footnote) was evidently the first member,  $R(1)$ , of a series with  $K = 1$ .

We have studied the NH<sub>3</sub> - N<sub>2</sub> spectrum in the 76 to 106 GHz region using a newly-developed pulsed jet millimeter wave spectrometer.<sup>c</sup> Thirty-five lines were observed and assigned as  $R(11)$  to  $R(15)$  pure rotational transitions, belonging to six series which involve all combinations of the parent molecule nuclear spin species, *ortho/para* ammonia and *ortho/para* nitrogen. Two of these series are continuations to higher  $J$ -values of the transitions observed in the microwave region,<sup>b</sup> and the remaining four series are new. We are thus able to predict a number of new microwave transitions for NH<sub>3</sub> - N<sub>2</sub> whose observation will help to confirm the present assignments of  $K$ -values and spin species.

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<sup>b</sup>G.T. Fraser, D.D. Nelson, Jr., K.I. Peterson, and W. Klemperer, *J. Chem. Phys.* **84**, 2472 (1986)

<sup>c</sup>K.A. Walker and A.R.W. McKellar, *J. Mol. Spectrosc.* **205**, 331 (2001).