THE MILLIMETER AND SUBMILLIMETER SPECTRUM OF BANH($X^1\Sigma^+$)

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The pure rotational spectrum of BaNH in its $X^1\Sigma^+$ ground electronic state has been recorded using millimeter/submillimeter direct absorption methods in the range 366 - 415 GHz, as well as that of its deuterium isotopomer. The molecules were produced in the presence of a d.c. discharge by the reaction of ammonia or ND_3 and barium vapor, produced in the Broida - type oven. Transitions arising from the ground vibrational state and the excited vibrational bending mode (01^10) were measured. The molecule appears to be linear, with B_0(BaNH) = 7984.549 MHz and B_0(BaND) = 7060.446 MHz. An r_0 structure indicates r_0(BaN) = 2.078 $\mathring{A}$ and r_0(NH) = 1.011 $\mathring{A}$.