THE HIGH RESOLUTION INFRARED SPECTRUM OF N_2-H^+-N_2

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The first high resolution infrared spectrum of the ionic complex N_2-H^+-N_2 and its deuterated derivative is reported. The spectra were obtained in direct absorption in a supersonic planar plasma. The observed rovibrational transitions were assigned to the antisymmetric NN stretching vibration and the spectrum is consistent with a linear centrosymmetric equilibrium structure. The band origin is found at 2352.2364(6) cm^{-1} and the ground state rotational constant is determined as $B'' = 0.081809(14)$ cm^{-1}. The assignment is supported by *ab initio* calculations. The best estimate for the equilibrium struture is R_e (NN) = 1.095 Å and r_e (N-H)= 1.277 Å.[a]

[a]D. Verdes, H. Linnartz, J.P. Maier, P. Botschwina, R. Oswald, P. Rosmus, and P.J. Knowles, J. Chem. Phys. **111**, 8400 (1999).