CAVITY ENHANCED ABSORPTION SPECTROSCOPY OF THE 1.5 μm BAND SYSTEM OF JET COOLED AMMONIA

GIEL BERDEN, RUDY PEETERS, AND GERARD MEIJER, *Department of Molecular and Laser Physics, University of Nijmegen, Toernooiveld 1, NL-6525 ED Nijmegen, The Netherlands*.

The high resolution absorption spectrum of ammonia in the 6400–6800 cm^{-1} region, measured at room temperature, contains about 1700 spectral features. Lundsberg-Nielsen at al.[a] have assigned 381 rotational-vibrational transitions to the v_1+v_3 band (at 6609.6 cm^{-1}) and to the $2v_3$ band (at 6794 cm^{-1}).

In order to aid in the further analysis, we decided to focus on the rotational states with low rotational quantum numbers by recording the absorption spectrum of ammonia in a supersonic molecular jet. Due to rotational cooling the spectrum is strongly simplified, and an assignment of the lowest rotational-vibrational transitions can be made.

The spectrum is recorded with a diode laser (tunable over 6270–6630 cm^{-1}) using the Cavity Enhanced Absorption technique[b] in combination with a slit nozzle expansion.

[a] L. Lundsberg-Nielsen, F. Hegelund, and F. M. Nicolaisen, *J. Mol. Spectrosc.* 162, 230 (1993).

[b] R. Engeln, G. Berden, R. Peeters, and G. Meijer, *Rev. Sci. Instrum.* 69, 3763 (1998).