Abstract Submitted
for the GEC17 Meeting of
The American Physical Society

N_2H^+ recombination with electrons in low temperature afterglow plasma[1] PETR DOHNAL, ABEL KALOSI, DMYTRO SHAPKO, RADEK PLASIL, JURAJ GLOSIK, Faculty of Mathematics and Physics, Department of Surface and Plasma Science, Charles University, Prague, Czech Republic, RAINER JOHNSEN, Department of Physics and Astronomy, University of Pittsburgh, Pittsburgh, Pennsylvania 15260, United States — A study on N_2H^+ recombination with electrons in afterglow plasma is presented. The cavity ring-down absorption spectroscopy in continuous wave modification was used as a principal diagnostics tool to probe number densities of several rotational states of the ground and the lowest excited vibrational state of the N_2H^+ ion. The recombination rate coefficients were measured at 300 K in afterglow of a microwave discharge ignited in a mixture of $He/H_2/N_2$ and of H_2/N_2 with typical number densities on the order of $10^{17}/10^{14}/10^{14}$ cm^{-3} and $10^{17}/10^{14}$ cm^{-3}, respectively. The dependencies of the measured recombination rate coefficient on number densities of He and H_2 were evaluated to obtain upper limit for three body recombination rate coefficient of N_2H^+.

[1]This work was partly supported by Czech Science Foundation projects GACR 17-08803S, GACR 15-15077S and GACR 17-18067S.

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Date submitted: 08 Jun 2017 Electronic form version 1.4