

Abstract Submitted
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Stationary-Afterglow measurements of dissociative recombination of H_2D^+ and HD_2^+ ions¹ PETR DOHNAL, ABEL KALOSI, RADEK PLASIL, Charles University in Prague, Prague 18000, Czech Republic, RAINER JOHNSEN, University of Pittsburgh, Pittsburgh, PA 15260, USA, JURAJ GLOSIK, Charles University in Prague, Prague 18000, Czech Republic — Binary recombination rate coefficients of H_2D^+ and HD_2^+ ions have been measured at a temperature of 80 K in an afterglow plasma experiment in which the fractional abundances of H_3^+ , H_2D^+ , HD_2^+ , and D_3^+ ions were varied by adjusting the $[\text{D}_2]/([\text{D}_2] + [\text{H}_2])$ ratio of the neutral gas. The fractional abundances of the four ion species during the afterglow and their rotational states were determined in situ by continuous-wave cavity ring-down absorption spectroscopy (CRDS), using overtone transitions from the ground vibrational states of the ions. The experimentally determined recombination rate coefficients will be compared to results of advanced theoretical calculations and to the known H_3^+ and D_3^+ recombination rate coefficients. We conclude that the recombination coefficients depend only weakly on the isotopic composition. Astrophysical implications of the measured recombination rate coefficients will be also discussed.

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