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Reactions of Interstellar Ions O^+ and N_2H^+ with Electrons and Molecules[1] PETR DOHNAL, STEPAN ROUCKA, ARTEM KOVALENKO, DMYTRO SHAPKO, THUY DUNG TRAN, SERHIY REDNYK, RADEK PLASIL, JURAJ GLOSIK, Faculty of Mathematics and Physics, Charles University — We present the experimental results of study of reaction rate coefficients for selected reactions of atomic (O^+) or molecular (N_2H^+) ions with hydrogen isotopologues or electrons, respectively. The recombination of N_2H^+ ions with electrons was studied in the temperature range of 80 – 350 K using cryogenic stationary afterglow apparatus equipped with cavity ring-down spectrometer. The thermal recombination rate coefficients were evaluated from the time evolutions of number densities of selected rovibrational states of N_2H^+. The cryogenic 22-pole radiofrequency ion trap was utilized to study the reactions of the ground electronic state of O^+ ions with HD in the temperature range of 15 – 200 K and with D_2 in the temperature range of 15 – 300 K. For the reaction of O^+ ions with HD, the product branching ratios for the production of OH^+ and OD^+ ions were obtained. A careful attention was given to ensure that the obtained reaction rate coefficients pertained to the ground electronic state of O^+ ion.

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