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Theoretical study of dissociative recombination of tri-atomic molecular ions VIATCHESLAV KOKOOULINE, Department of Physics, University of Central Florida, CHRIS H. GREENE, Department of Physics and JILA, University of Colorado, Boulder — We consider the process of dissociative recombination of tri-atomic ions. Successful theoretical treatment of the dissociative recombination in H_3^+ motivated us to extend the treatment to other small molecular ions. The most straightforward extension is to apply the treatment to other isotopomers of H_3^+. In this work, we calculated the dissociative recombination rate of H_2D^+ and D_2H^+. To represent properly vibrational motion we use hyperspherical coordinates within so-called Slow Variable Representation. The calculated rates for the dissociative recombination of H_2D^+ and D_2H^+ are in good agreement with recent experiments in storage rings. In this work, we also suggest a possible solution to the problem posed by a recent stationary afterglow experiment. In that experiment, a very low dissociative recombination rate was found that seems to contradict with the results from storage ring and our calculation. In addition, preliminary results for the dissociative recombination in HCO^+ are presented. This work is supported by NSF-ITR grant PHY-0427460

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