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Dissociative recombination study of HCO^+ STEFANO TONZANI, JILA and Department of Chemistry, University of Colorado, Boulder, AASA LARSON, Department of Physics, Royal Institute of Technology, Stockholm, Sweden, ROBIN SANTRA, Institute for Theoretical Atomic, Molecular and Optical Physics, Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass., CHRIS H. GREENE, Department of Physics and JILA, University of Colorado, Boulder
— From accurate quantum chemistry calculations, we have found that the electron collision dynamics of HCO^+ is driven by capture into Rydberg states. The Renner-Teller effect is not important for higher Rydberg states. From calculated potentials, the effective quantum numbers are fitted in three dimensions. The full vibrational dynamics of the molecule is considered, and the joint electron-nuclear dynamics is treated using quantum defect theory and a frame transformation approach. Results on autoionization widths for Rydberg states and dissociative recombination cross section are given.

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