

Abstract Submitted
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Light-assisted ion-neutral reactive processes in the cold regime: radiative molecule formation vs. charge exchange OLIVIER DULIEU, Laboratoire Aime Cotton, CNRS, Universite Paris-Sud, Orsay, France, FELIX J. HALL, Department of Chemistry, University of Basel, Klingelbergstrasse 80, 4056 Basel, Switzerland, MIREILLE AYMAR, NADIA BOULOUDA, MAURICE RAOULT, Laboratoire Aime Cotton, CNRS, Universite Paris-Sud, Orsay, France, STEFAN WILLITSCH, Department of Chemistry, University of Basel, Klingelbergstrasse 80, 4056 Basel, Switzerland — We present a combined experimental and theoretical study of cold reactive collisions between lasercooled Ca^+ ions and Rb atoms in an ion-atom hybrid trap. We observe rich chemical dynamics which are interpreted in terms of non-adiabatic and radiative charge exchange as well as radiative molecule formation using high-level electronic structure calculations. We study the role of light-assisted processes and show that the efficiency of the dominant chemical pathways is considerably enhanced in excited reaction channels. Our results illustrate the importance of radiative and non-radiative processes for the cold chemistry occurring in ion-atom hybrid traps.

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