

Controlling Low-Temperature Statistical Reactions with Fields

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The main limitation of most ultracold chemistry studies to date is the lack of an analysis of reaction products. Here, I will discuss our recent efforts towards the development of the first generally viable, rigorous theoretical framework for computing statistical product-state distributions for ultracold reactions in external fields [1]. I will show that fields may have two effects on the products of statistical reactions, by: (1) modifying the product energy levels thus potentially reshaping the product distributions; and/or (2) adding or removing product states by changing the reaction's exothermicity. By analyzing these effects and the strength of the formalism to unravel different mechanisms in benchmark reactions, I will argue that statistical predictions will help understanding how to control product formation and kinetics in ultracold reactions, and lead developments to realize the full potential of ultracold chemistry.

[1] M. L. González-Martínez, O. Dulieu, P. Larrégaray and L. Bonnet, *Phys. Rev. A* **90**, 052716 (2014)