

Ion-neutral reactive scattering studies

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The Savin group has long-standing expertise in reactive scattering studies involving neutral atoms and atomic or molecular ions. The measurements are performed using either a single-source or dual-source merged-fast-beams apparatus, enabling us to measure absolute integral cross sections (ICSs) for translational collision energies E_T from ~ 2 meV to ~ 20 eV. In recent years we have measured the reactive scattering ICS for associative detachment of $\text{H}(\text{D}) + \text{H}(\text{D})^- \rightarrow \text{H}_2(\text{D}_2) + e^-$ [1-4], proton- and H_2^+ -transfer from H_3^+ onto C and O [5,6], and isotope exchange of D with H_3^+ , H_2D^+ , and D_2H^+ [7,8]. Our studies are motivated by astrophysical questions, but the techniques and some of the reactions are also relevant for fusion studies. In my presentation, I will discuss some of our recent work, illustrating our experimental capabilities, and highlight some of the shortcomings in state-of-the-art reactive scattering theory.

References

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