

Theoretical study of ion-atom collisions in low and intermediate energy range

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The collisions between ions and atoms/molecules exist extensively in various environments, such as low temperature plasma, fusion plasma and the interstellar atmospheres etc. Therefore, the scattering cross sections and rate coefficients are the fundamental atomic data needed in the simulation and diagnosis of these plasma.

In this talk, I will report our recent studies of the charge transfer processes in ion-atom/molecule collisions in low and intermediate energy range. Combining the fully quantum-mechanical molecular-orbital close-coupling method (MOCC) with the two-center atomic-orbital close-coupling method (AOCC), the electronic correlations effects in charge transfer processes can be well treated and the charge transfer cross sections can be obtained at high precision in a large impact energy range. At the end of the talk, I will briefly introduce the recent progresses of the atomic and molecular database in IAPCM.

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