Inelastic Ion-Atom Collisions: Cross Sections for Electronic Excitation

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Cross sections for excitation of specific electronic states are measured as a function of energy by a crossed ion beam-atom beam technique and spectroscopic observation of fluorescence from excited states: the systems investigated include collisions of alkali ions with alkali atoms, zinc. cadmium, mercury, and the energy ranges from threshold to ~ 2 keV.

The analysis of the large nonadiabatic effects observed, and of the quantum interference oscillations which show up in the energy dependence of cross sections, allows to establish correlations between the dynamics of the elementary collision event and the potential energy curves of the diatomic molecule temporarily formed by the collision partners.

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