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Charge exchange of Si ions with clean and I-covered Al(100) XIAOJIAN CHEN, ZDENEK SROUBEK, JORY YARMOFF, University of California, Riverside — Ion-surface charge exchange is a central process in many surface analysis and processing methods. Charge exchange of alkali, halogen and noble gas ions with surfaces has been investigated in previous ion scattering studies, while the interaction between a semiconductor atom and a metal surface has not been measured despite its importance. Si^+ ions were incident on an atomically clean Al (100) surface in ultra-high vacuum. The absolute ionization probability of scattered Si and recoiled Al were measured with time-of-flight, and detailed spectra of the ion yield were collected with an electrostatic analyzer. All of the scattered Si was neutralized, as expected for resonant charge transfer (RCT) of Si, which has a large ionization potential. Multi-charged recoiled Al ions were emitted, however. Surprisingly, Si scattered from iodine adatoms is partially ionized and the ionization changes little with respect to the coverage, energy and exit angle. This is in direct contrast to Li scattering from I/Fe*, and cannot be explained by RCT. * J.A. Yarmoff, Y. Yang and Z. Sroubek, Phys. Rev. Lett. **91**, 086104/1-4 (2003).

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