PROJECTILE NEUTRALIZATION DURING GRAZING INTERACTIONS OF MULTICHARGED IONS WITH LiF(100)[1]

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Measurements are reported of scattered neutral fractions for Na, K, and Cs multicharged ions, and of scattered negative ion fractions for incident O, F, and B projectiles grazingly incident on Li(100) as function of projectile velocity. The possibility of the involvement in the projectile neutralization of occupied surface states within the band gap of the alkali halide target is considered. A model treatment of the projectile charge fraction velocity dependence is utilized to demonstrate that an occupied surface band having work function and Fermi energy of 3.8 eV and 0.8 eV, respectively, can produce the velocity dependences of all the above experimental data, as well as that of the image charge acceleration of Ne^{6+} grazingly incident on LiF(100) in the range 0.1 - 0.52 a.u.

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