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Interaction of Slow, Highly Charged Ions with Surfaces

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Recent advances in the studies of the interaction of slow ($v < v_{\text{Bohr}}$), very highly charged ions (such as Xe\textsuperscript{52+} and Au\textsuperscript{69+}) with surfaces of metals, semiconductors, and insulators (including biological materials) will be reviewed.

After a brief summary of past developments, we describe key experimental techniques for studies of secondary particle emission and the de-excitation dynamics of the highly charged ions. Recent progress in measurement and determination of the mechanisms leading to secondary electron yields, secondary ion yields and total sputtering yields will be discussed. The de-excitation dynamics are addressed in experiments on projectile neutralization and energy loss in thin films of material. We review theoretical concepts briefly and introduce theoretical models in the discussion of experimental results.

Following the presentation of fundamental studies we will address emerging applications of slow, very highly charged ions in surface analysis and surface modification.

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