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## Multiple Outer-Shell Ionization Induced by Heavy Ion Impact on Bi, Gd, and Y Targets.

The phenomenon of multiple ionization induced by heavy ion impact plays a significant role in altering the atomic structure during inner-shell ionization processes. In this work, we investigate the degree of multiple ionization in the outer shells (M, N, etc.) accompanying L-shell ionization of Bi, Gd, and Y targets bombarded by carbon ions with incident energies ranging from 0.33–1.0 MeV/u. The degree of outer-shell ionization was estimated from observed shifts in L x-ray line energies and deviations in intensity ratios, in comparison to both standard values and those obtained using proton impact. The presence of outer-shell spectator vacancies leads to complex electronic configurations and results in measurable shifts in the L x-ray diagram lines. Analysis of the recorded spectra reveals a clear dependence of multiple ionization effects on the charge state and energy of the carbon projectiles. The results contribute to a better understanding of heavy-ion induced atomic processes and their dependence on projectile parameters, offering valuable insights for theoretical modelling of ion-atom collisions.

### Apply for student award at which level:

None

### Consent on use of personal information: Abstract Submission

Yes, I ACCEPT

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