

INNER SHELL IONIZATION BY POSITRON IMPACT

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Recently large discrepancies between experimental results and the values predicted by the binary encounter approximation theory and the atomic rearrangement theory have been reported for the In and Sn L x-ray production cross sections by electron impact in the energy range from near threshold to tens of keV [1].

In the present work, we have studied inner shell ionization by positron impact for Cu K -, Ag L -, In L - and Sn L -shells [2]. Development of an x-ray detector with thin Si(Li) crystals has enabled the measurements of the absolute cross sections in the energy range below 30 keV [3].

The determined values are plotted in figure 1 against the positron impact energy. Threshold behavior has been compared with the theoretical results calculated in the binary encounter formalism [4]. The values for the Cu K - and Ag L - shells have also been compared with the results in the plane wave Born approximation with Coulomb corrections [5]. The measured cross sections for the Cu K -shell are in good agreement with the theories. The results for the Ag, In, and Sn L - shells are, however, smaller than the theoretical calculations.

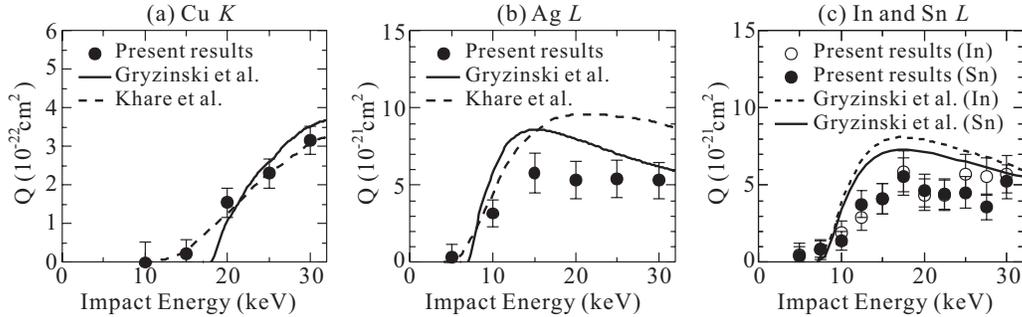


Figure 1: Inner shell ionization cross sections plotted against the positron impact energy. Theoretical results [4, 5] were also plotted.

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