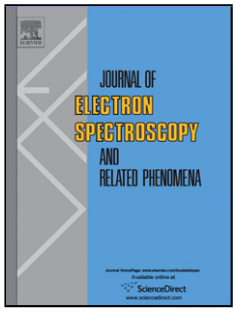

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Monte Carlo Simulation of Auger Electron Emission from Thin Film on Substrate

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Highlights

- Calculation of Auger signal intensity variation with overlayer thickness.
- Performance of the Monte Carlo simulation of the Auger electron *EN*(*E*)-spectrum.
- The intrinsic Auger electron spectrum obtained by two subtracing methods.
- Single value of EAL is not enough for accurate measurement of film thickness.
- Using of two parameters to characterize the calibration curve.

Abstract

A Monte Carlo simulation of production and emission of Auger electron signals in Auger electron spectroscopy (AES) has been performed to calculate the dependence of Auger electron intensity on film thickness for a film/substrate specimen. The electron spectrum is simulated, covering the energy range from the elastic peak down to Auger electron peak, by including bulk loss peak of electronic excitation. This simulation is based on the use of Mott's cross section for electron elastic scattering and Penn's dielectric function approach to electron inelastic scattering. Bulk plasmon excitation peaks contributed from both film and substrate are found in the low loss region near the elastic peak and the AES signal peak. The background subtraction was then performed for the simulated Auger electron spectrum, leading to obtain the approximate exponential decay behavior of Auger signal intensity