

Characterization of ejected CaF₂ by swift heavy ion bombardment using MEIS

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Electronic sputtering effects caused by $\sim 1 \text{ MeV u}^{-1}$ Au ions impinging on (111) CaF₂ surfaces are investigated by the catcher technique [1]. Sputtered eject were collected on different catcher surfaces and analyzed by Medium-Energy Ion Scattering (MEIS) after an initial characterization with Transmission Electron Microscopy (TEM) and Atomic Force Microscopy (AFM). This previous characterization indicated a bimodal distribution for analyses of TEM projected images, while AFM topography showed the aggregation of spherical particles. Depending on the areal density, these nanoparticles are isolated, overlap or completely coat the catcher. Modeling such deposition with the PowerMEIS code [2] yields good agreement with MEIS spectra. By performing measurements at different collection angles for a fixed incidence angle of the primary ions, the data allow the determination of total yields as well as angular distributions. Independent of beam incidence, electronic sputtering of CaF₂ exhibits a jet-like component normal to the sample surface, as previously observed for LiF [3].

References.

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