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Femtosecond laser surface structuring of molybdenum thin films

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Abstract

This contribution reports on the femtosecond surface structuring of molybdenum thin coatings deposited by electron beam evaporation onto Corning glass substrates. The 1-D type periodic grating lines created by such an ablation showed that the widths of the shallow grooves followed a logarithmic dependence with the laser energy incident on the molybdenum film. The electronic valence "x" of the created oxide surface layer MoO(subx) was found to be incident laser power dependent via Rutherford back scattering spectrometry,X-ray photoelectron spectroscopy and X-ray diffraction investigations. Such a photo-induced MoO(subx)–Mo nanocomposite exhibited effective selective solar absorption in the UV–vis–IR spectral range.