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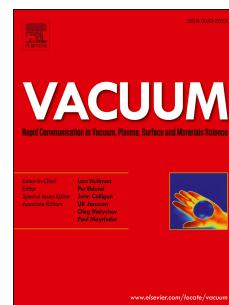
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Irradiation of sputtered Al-Si-N coatings by pulsed 200 keV C⁺ ion beam

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Abstract

This paper reports on the effect of the irradiation of Al-Si-N coatings by an intense pulsed ion beam. The Al-Si-N coating was deposited on a steel substrate by a reactive magnetron sputtering. The Al-Si-N coating with a high silicon content (30 at.%) was irradiated by a high-intense pulsed C⁺ ion beam. It was shown that metastable growth defects (GDs) created in the Al-Si-N coating during deposition can be healed up by its post-deposition irradiation using several pulses (1 and 10) of C⁺ ions with energy $E_i = 200$ keV, ion current density $i_s = 7$ A/cm², pulse duration $t_p = 110$ ns and radiation dose 2 MGy. The reduction in deposition-induced GD density results in an increased transmittance of the Al-Si-N coatings.

Keywords: Ion beam; Al-Si-N coating; Irradiation; Light transmittance; Magnetron sputtering.

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