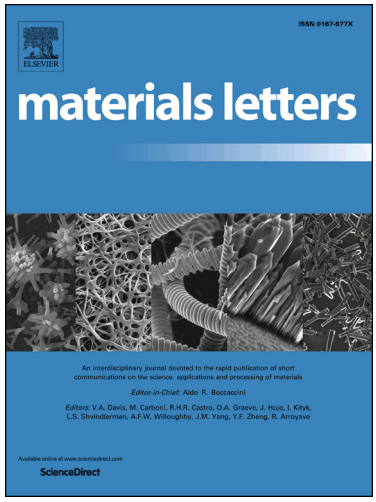

Low temperature deposited Ag films exhibiting highly preferred orientations

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PII: S0167-577X(17)31699-3
DOI: https://doi.org/10.1016/j.matlet.2017.11.074
Reference: MLBLUE 23440

To appear in: *Materials Letters*

Received Date: 25 October 2017
Revised Date: 15 November 2017
Accepted Date: 16 November 2017

Please cite this article as: X. Gao, M. Hu, Y. Fu, L. Weng, W. Liu, J. Sun, Low temperature deposited Ag films exhibiting highly preferred orientations, *Materials Letters* (2017), doi: https://doi.org/10.1016/j.matlet.2017.11.074

Low temperature deposited Ag films exhibiting highly preferred orientations

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Abstract

Due to the crystal anisotropy, highly oriented films normally exhibit unique properties and performances. In this paper, Ag films were deposited using arc ion plating (AIP) at different substrate temperatures, substrate bias voltages and Ar pressures, and the relationship between the preferred orientation and deposition parameter of the films was investigated. The results exhibited that the preferred orientation of Ag films was influenced significantly by the deposition parameter due to the competition between the surface- and strain-energy minimization, and so both Ag films that exhibited highly preferred orientations of (111) and (200), respectively, were obtained at the optimum conditions. The relatively low friction was observed from the Ag film with highly preferred orientations of (111) because the (111) plane was the slip plane of face-centred cubic crystals.

Keywords: Physical vapour deposition; Crystal structure; Thin films; Low temperature