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Gold-Catalyzed Growth of Aluminium-Doped Zinc Oxide Nanorods by Sputtering Method (Article)

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Abstract

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Aluminium-doped zinc oxide (AZO) nanorods thin films were grown by RF magnetron sputtering on gold (Au) metal catalyst. The Au catalyst layers with 5, 10, and 15 nm thickness were deposited on glass substrates by sputtering method followed by annealing for 15 min at 500°C to form Au nanostructures on the glass substrate. The AZO thin films were then deposited on the Au catalyst at different deposition temperature varying from 200 to 500°C. Postdeposition annealing processes of the Au catalyst resulted in different morphologies of the Au catalyst layers depending on their thicknesses. This in turn gave different AZO morphologies which suggest that the Au catalyst layer thickness and the deposition temperature contribute to the growth mechanism of the AZO nanostructures. AZO nanorods thin films having hexagonal wurtzite structure with individual nanorods on the film surface were obtained from the samples deposited on 5 and 10 nm thick Au catalyst with the deposition temperature of 300°C. © 2014 A. B. Rosli et al.

Indexed keywords

Engineering
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Nanorods Nanostructures Oxide films Substrates Thin films Zinc Zinc oxide
Zinc sulfide

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