

# Growth of nanostructured Cu-Al-O film deposited on porous aluminium oxide

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## ARTICLE INFO

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### *Article history:*

Received 8 July 2009

Received in revised form

20 October 2009

Accepted 23 October 2009

Available online 4 November 2009

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### *Keywords:*

Anodic aluminium oxide

Vacuum deposition

Thin film growth

Nanopatterning

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## ABSTRACT

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Anodic aluminium oxide has been gaining much attention due to the formation of a highly ordered porous structure, and this self-ordered structure is very appealing as an alternate method for fabricating various nanostructures and devices. On top of this porous aluminium oxide substrate prepared by two-step anodization technique, we have RF-sputtered Cu-Al-O thin films from a single-phase  $\text{CuAlO}_2$  target at room temperature. These films show the formation of a highly ordered array of clusters on the nucleation sites provided by the porous substrate with their sizes increasing with film thickness, following the hexagonal pattern underneath. The corresponding surface coverage of the film on the substrate is proportional to the square of film thickness, which can be understood with a simple two-dimensional disk model. Our study suggests that the underlying structure of the anodic aluminium oxide substrate plays a crucial role on the growth of nanostructured thin films and affects the detailed growth mechanism.

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