

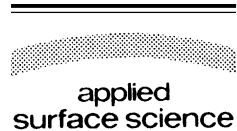


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Growth properties and structural analysis of ZnO films and of Au clusters on ZnO

M. Ay^{*}, A. Nefedov, H. Zabel

Institut für Experimentalphysik/Festkörperphysik, Ruhr-Universität Bochum, Bochum 44780, Germany

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Abstract

We have studied the possibility to grow O-terminated ZnO(000 $\bar{1}$) films on Al₂O₃ substrates with high epitaxial quality. After growth via sputtering methods, the ZnO films were annealed to increase the film quality resulting in a mosaicity of 0.60° and a surface roughness of <3 Å. Finally, gold films were sputtered at room temperature on the surface. The structural properties of the samples were investigated by X-ray scattering, reflection high-energy electron diffraction (RHEED) and by atomic force microscopy (AFM). AFM images clearly demonstrate that gold films with a nominal thickness of <50 Å form clusters, which can be as high as 300 Å. X-ray diffraction (XRD) studies reveal a predominant (1 1 1) texture of the clusters. Further deposition of Au leads to coalescing clusters smoothing out the surface.

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Keywords: Reflection high-energy electron diffraction; Atomic force microscopy; X-ray scattering; ZnO
