Structural and electrical properties of zinc oxides thin films prepared by thermal oxidation

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Résumé en anglais	We report on zinc oxide (ZnO) thin films (d = 55–120 nm) prepared by thermal oxidation, at 623 K, of metallic zinc films, using a flash-heating method. Zinc films were deposited in vacuum by quasi-closed volume technique onto unheated glass substrates in two arrangements: horizontal and vertical positions relative to incident vapour. Depending on the preparation conditions, both quasi-amorphous and (0 0 2) textured polycrystalline ZnO films were obtained. The surface morphologies were characterized by atomic force microscopy and scanning electron microscopy. By in situ electrical measurements during two heating–cooling cycles up to a temperature of 673 K, an irreversible decrease of electrical conductivity of as flash-oxidized Zn films was revealed. The influence of deposition arrangement and oxidation conditions on the structural, morphological and electrical properties of the ZnO films is discussed.
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