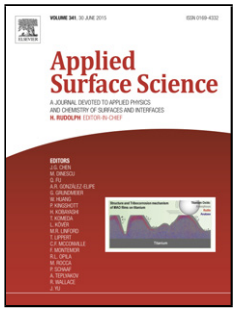

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Structural and physical properties of tin oxide thin films for optoelectronic applications

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Abstract

Tin oxide films were deposited on glass substrates by RF magnetron sputtering. At a lower sputtering pressure, the tin oxide film comprised nanocrystalline orthorhombic SnO with a (110) orientation, greater p-type conductivity and better hydrophobicity. Increasing substrate temperature resulted in the coexistence of nanocrystalline orthorhombic SnO and tetragonal SnO_2 in the deposited film, favoring hydrophilicity, changing the p-type conductivity to n-type conductivity, and reducing resistivity. As the sputtering pressure or substrate temperature increased, the tin oxide film exhibited a lower surface roughness, a larger optical energy gap, and