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## Controlling the Performance of P-type Cu<sub>2</sub>O/SnO Bilayer Thin-Film Transistors by Adjusting the Thickness of the Copper Oxide Layer

By: [Al-Jawhari, HA](#) (Al-Jawhari, H. A.)<sup>[1]</sup>; [Caraveo-Frescas, JA](#) (Caraveo-Frescas, J. A.)<sup>[2]</sup>; [Hedhili, MN](#) (Hedhili, M. N.)<sup>[2]</sup>

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### Abstract

The effect of copper oxide layer thickness on the performance of Cu<sub>2</sub>O/SnO bilayer thin-film transistors was investigated. By using sputtered Cu<sub>2</sub>O films produced at an oxygen partial pressure, O<sub>2</sub>, of 10% as the upper layer and 3% O<sub>2</sub> SnO films as the lower layer we built a matrix of bottom-gate Cu<sub>2</sub>O/SnO bilayer thin-film transistors of different thickness. We found that the thickness of the Cu<sub>2</sub>O layer is of major importance in oxidation of the SnO layer underneath. The thicker the Cu<sub>2</sub>O layer, the more the underlying SnO layer is oxidized, and, hence, the more transistor mobility is enhanced at a specific temperature. Both device performance and the annealing temperature required could be adjusted by controlling the thickness of each layer of Cu<sub>2</sub>O/SnO bilayer thin-film transistors.

### Keywords

**Author Keywords:** p-Type TFTs; tin monoxide; cuprous oxide; transparent bilayer channel

**KeyWords Plus:** MOBILITY; OXIDATION

### Author Information

**Reprint Address:** Al-Jawhari, HA (reprint author)

+ King Abdulaziz Univ, Dept Phys, Jeddah 21589, Saudi Arabia.

#### Addresses:

+ [ 1 ] King Abdulaziz Univ, Dept Phys, Jeddah 21589, Saudi Arabia

+ [ 2 ] King Abdullah Univ Sci & Technol KAUST, Thuwal 239556900, Saudi Arabia

**E-mail Addresses:** [haljawhari@kau.edu.sa](mailto:haljawhari@kau.edu.sa)

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