

Accepted Manuscript

Full Length Article

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PII: S0169-4332(18)31571-X
DOI: <https://doi.org/10.1016/j.apsusc.2018.06.005>
Reference: APSUSC 39513

To appear in: *Applied Surface Science*

Received Date: 24 January 2018
Revised Date: 8 May 2018
Accepted Date: 1 June 2018

Please cite this article as: W. Xu, L. Hu, C. Zhao, L. Zhang, D. Zhu, P. Cao, W. Liu, S. Han, X. Liu, F. Jia, Y. Zeng, Y. Lu, Low Temperature Solution-Processed IGZO Thin-Film Transistors, *Applied Surface Science* (2018), doi: <https://doi.org/10.1016/j.apsusc.2018.06.005>

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Low Temperature Solution-Processed IGZO Thin-Film Transistors

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Abstract:

We reported the low-temperature high performance IGZO TFTs by solution processing. The influence of IGZO composition over broad range on thin films and devices properties were investigated by a wide range of characterization techniques. The schematic of TFT solution-processed IGZO TFTs mobility with different compositions has been obtained. In order to achieve decent TFT performance, the In content should be much high for solution-processed IGZO TFTs. The optimal solution-processed IGZO TFTs with In:Ga:Zn=5:1:1 composition exhibited a large mobility of $9.1 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$, low subthreshold swing of 0.22 V/decade, and high on/off ratio of 10^6 at 300 °C processing temperature.

Keywords: Solution-processed; Low-temperature; IGZO; Thin-film transistors

1. Introduction

Oxide thin-film transistors (TFTs) have attracted worldwide attention in the last decade owing to their high carrier mobilities, good transparency, smooth surfaces, and excellent uniformities.[1-6] A large number of oxide semiconductors have been

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