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Hailong Hu, Jingguang Zhu, Maosheng Chen, Tailiang Guo, Fushan Li

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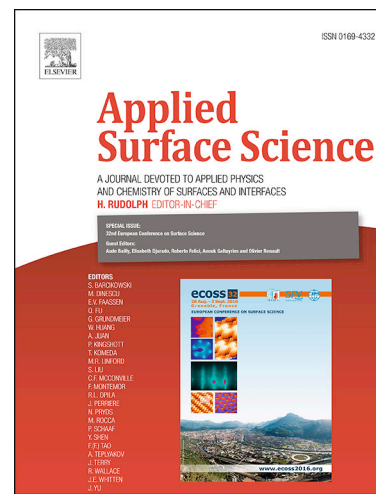
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Inkjet-Printed p-type Nickel Oxide Thin-Film Transistor

Hailong Hu*, Jingguang Zhu, Maosheng Chen, Tailiang Guo, Fushan Li*

College of Physics and Information Engineering, Fuzhou University, Fuzhou 350002, China.

E-mail: huhl@fzu.edu.cn, fushanli@hotmail.com.

High-performance inkjet-printed nickel oxide thin-film transistors (TFTs) with Al_2O_3 high-k dielectric have been fabricated using a sol-gel precursor ink. The “coffee ring” effect during the printing process was facilely restrained by modifying the viscosity of the ink to control the outward capillary flow. The impacts on the device performance was studied in detail in consideration of annealing temperature of the nickel oxide film and the properties of dielectric layer. The optimized switching ability of the device were achieved at an annealing temperature of 280 °C on a 50-nm-thick Al_2O_3 dielectric layer, with a hole mobility of 0.78 $\text{cm}^2/\text{V}\cdot\text{s}$, threshold voltage of -0.6 V and on/off current ratio of 5.3×10^4 . The as-printed p-type oxide TFTs show potential application in low-cost, large-area complementary electronic devices.

1. Introduction

Metal oxide semiconductors (MOS) thin film transistors (TFTs) have attracted tremendous attention for application in the active-matrix

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