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Effect of Li-doping on low temperature solution-processed indium–zinc oxide thin film transistors

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ABSTRACT

Lithium (Li)-doped indium zinc oxide (IZO) thin film transistors (TFTs) were fabricated on solution-processed zirconium oxide gate dielectrics using a low temperature all solution process. Li-doping in IZO thin films led to higher crystallinity, even at process temperature lower than 300 °C, and to the formation of favorable oxidation states of metal ions. The results were confirmed by electrical property analysis of the Li-doped IZO TFTs. For Li content varied from 0 to 16.6 at%, the highest field-effect mobility, on/off current ratio, subthreshold slope and stress bias stability were obtained for Li-doping concentration of 9.0 mol%.

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