

## Nozzle-Jet Printed NiO ink for Fabrication of Flexible Transparent and High-Mobility Field Effect Transistors (FETs) at Low Temperature

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The rapid development of printing techniques has received much attention because printing approaches not only can achieve multifunctional energy devices through using less-waste materials, but also can deposit accurately functional ink materials on desired areas. Challenges remain, however, in obtaining uniform printed patterns on various substrates and in fabricating high efficiency, high stability, high sensitivity and high flexibility devices. In addition, until now, it has been seldom reported that p-type printing ink formulations were deposited on flexible substrates to fabricate energy devices by printing techniques. In this regard, we report here a simple solution method to synthesized NiO printing ink and their printed behaviors on various substrates by a nozzle-jet printing technique. Simultaneously, we have been successfully achieved NiO printed line patterns based FETs on the polyimide substrate. Nozzle-jet printed NiO printed line based flexibility FETs showed a p-type semiconducting nature with a high mobility of  $1.87 \text{ cm}^2\text{v}^{-1}\text{s}^{-1}$  and an on/off current ratio of  $6 \times 10^5$  at low annealing temperature.