

## Solution Processed Metal-Doped ZnO Nanoparticles and Its Ink-Printing Application

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Transparent conducting films (TCFs) are optically transparent and electrically conductive in thin layers. Inorganic TCFs typically are made up of a layer of transparent conducting oxide(TCO), generally in the form of indium doped tin oxide(ITO), fluorine doped tin oxide(FTO) via complex fabrication process. Herein, we investigated zinc oxide is strong TCO candidate as it can be both highly transparent and highly conductive; ZnO is furthermore an abundant, low cost material and is non-toxic. To increase the carrier concentration, silver (Ag) and aluminum (Al) are used as a dopant. Various dopant concentrations were also investigated to control the electrical conductivity. Moreover, with the advantage of Ink-jet printing technology as non-contact and maskless process for roll-to-roll fabrication, we formulated metal-doped ZnO nanoparticles in mixed solvents. The fabricated metal-doped ZnO films with spin coating and inkjet-printing shows increase electrical conductivity compared to with undoped ZnO films.