

## **Synthesis of direct-patternable ZnO film incorporating Pt Nanoparticles**

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**Abstract** : ZnO film has been investigated during several decades because it has excellent optical property like a transmittance among the range of visible light for using transparent conducting oxide (TCO) films. But ZnO film has not enough conductivity for applying to TCO devices. Therefore we synthesized platinum nanoparticles and they incorporated into ZnO due to improve the electrical property of ZnO film by sol-gel synthesis method. Also, we fabricated photosensitive ZnO thin film containing Pt nanoparticles by sol-gel process and spin-coating for using photochemical solution deposition. Photosensitive ZnO film could carry out the direct-pattern which allow the etching process to be convenient. The optical and electrical properties of ZnO film with or without various atomic percent of Pt nanoparticles annealed at various temperatures were investigated by using UV-Vis spectroscopy and 4-point probe method, respectively. We characterized the ZnO thin film containing Pt nanoparticles using X-ray diffraction, scanning electron microscopy, and X-ray photoelectron spectroscopy.

**Key Words** : Photosensitive ZnO films, Pt nanoparticles, sol-gel process, Pt nanoparticles synthesis