

Preparation of oxide thin film transistor using IGZO nanoparticles

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Indium-galium-zinc-oxide (IGZO) semiconductors have been developed as an active layer in thin-film transistor for high-definition liquid crystal display (LCD) device, E-ink display, and organic light-emitting diode (OLED). Recently, IGZO layers have been prepared by sol-gel process at relatively low temperature for the flexible electronics, in which stable and homogeneous solution of sol-gel precursors were prepared with several organic additives as ink. For better performance and lower annealing temperature, we have prepared IGZO nanoparticles suspension by simple hydrothermal method, in which size and crystallinity was controlled by changing concentration of procurers or reaction pressure, respectively. Then, particulate thin film was prepared by spin-coating on p-doped silicon wafer with silica layer (~200nm) and annealed at 500°C. Finally, simple bottom-gate thin-film transistor were fabricated and their TFT performance was investigated.