

Properties of ZnO with Changing O₂ Flux grown by R.F magnetron sputtering

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Recently, Zinc Oxide(ZnO) has been widely researched for the application such as UV laser diodes, UV-blue light-emitting diodes (LEDs), gas sensor, electronic displays, surface acoustic wave(SAW) devices. ZnO is typical material of a II-VI compound semiconductor. ZnO has a wide direct bandgap (3.3 eV), mostly n-type, large exciton binding energy (60 meV). ZnO films have many methods of deposition techniques as sputtering, Chemical vapor deposition (CVD), molecular beam epitaxy (MBE), pulsed laser deposition (PLD), sol-gel, and more. In this work, we investigated the properties of ZnO films in accordance with changing O₂ flux. ZnO film was fabricated by RF magnetron sputtering at Room temperature. O₂ flux was controlled changing of ratio in Ar to O₂. In order to analyze the characteristics, ZnO film was measured by X-ray diffraction (XRD), resistivity, Atomic Force Microscopy (AFM), scanning electron micrograph (SEM). This results will be applicable to thin film transistors(TFTs).

Electrical properties of pentacene TFT using PVP as gate dielectric material with the solvent ratio

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We demonstrates electrical properties of pentacene thin film transistors(TFTs) using poly-4-vinylphenol (PVP) as gate dielectric material with the solvent(PGMEA) ratio. The indium-tin-oxide(ITO) coated glass(sheet resistance~10 Ω/\square) was used as the substrate and the gate electrode. The gate dielectric layer was PVP. The PVP was used as solutes and propylene glycol monome thyl ether acetate(PGMEA) as a solvent in the formation of organic gate insulators. The cross-link ing of organic gate insulators was also attempted by adding the thermosetting material, poly(mela mine-co-formaldehyde) as a hardener in the compound. The electrical characteristics are obtained by the metal-insulator-metal(MIM) structures which showed insulating properties of PVP materials. Also we compared : 5 wt% cross-linked PVP(10 wt%), 5wt%cross-linked PVP(20 wt%), 5 wt% cross-linked PVP(30 wt%). Finally, OTFTs based 5wt% cross-linked PVP(20 wt%) layer showed improve output characteristics with the field effect mobility, on/off current ratio and threshold voltage.