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Properties of ZnO with Changing O_2 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 O_2 flux. ZnO ZnO film was fabricated by RF magnetron sputtering at Room temperature. O_2 flux was controlled changing of ratio in Ar to O_2. In order to analyze the characteristics, ZnO film was measured by X-ray diffraction (XRD), resistivity, Atomic Force Microscopy (AFM), scanning election micrograph (SEM). This results will be applicable to thin film transistors(TFTs).

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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~10Ω/□) 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.