

The characteristics of organic solar cell with Ga-doped ZnO thin films as anodic electrode

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Transparent conducting oxide (TCO) thin films have been widely used as transparent electrodes in flat panel displays, such as liquid crystal displays(LCD), organic light emitting diodes (OLED) and organic solar cell(OSC), due to their excellent electrical and optical properties. In this study, we deposited transparent Ga-doped(5%) zinc oxide (GZO) thin films on the glass at various substrate temperature by pulsed DC magnetron sputtering method. We investigated the dependance of characteristics of GZO films as the anodic electrode in OSC. The GZO thin film, which exhibited a high average visible transmittances of greater than 80%. The deposited GZO thin film on the substrate temperature of 200 °C shows the lowest roughness and resistance characteristics. Moreover, the OSC with GZO thin film anodic electrode on the substrate temperature of 200 °C exhibited higher shot circuit current density(J_{sc}) and power conversion efficiency than other devices. These results indicated that GZO films make promise to application of the anodic electrode in the OSC.