

Properties of Sputtered ZnO:Al Film on Flexible Substrates

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Aluminum-doped ZnO (ZnO:Al) film was prepared by RF-sputtering on glass, A-PET, C-PET substrates. XRD confirms that sputtered ZnO:Al films shows a polycrystalline wurtzite structure with c-axis perpendicular to the substrate in (002) direction. The highest and lowest peak intensities were observed on the films deposited on glass and C-PET substrates, respectively. SEM result shows the difference of surface morphology of sputtered ZnO:Al film on A-PET, C-PET substrates. The film on A-PET substrate shows the columnar structure of the oval grain shape whereas the C-PET substrate displays the island structure of the spherical grain shape. EDS also confirms that the atomic percent of Zn element of the film on C-PET substrates is slightly higher than that on A-PET substrate. The average transmission in 900-1400 nm of the film on A-PET and C-PET substrates is about 80%. The averaged transmission in visible region of the film on A-PET and C-PET substrates is about 75% and 80%. It can be concluded that the structure, morphology and optical transmission of sputtered ZnO:Al film are substrate material dependent and the flexible material can be an appropriate substrate to improve the properties of deposited films.

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