

Properties of ZnO thin films with various buffer layer thickness deposited by Atomic Layer Deposition

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ZnO films were deposited on Si substrates by a two-step growth technique using atomic layer deposition (ALD). We investigated to improve the film quality depends on thickness of ZnO buffer layer. Surface morphology was investigated by atomic force microscopy (AFM) and field emission scanning electron microscopy (FESEM). The crystallinity and optical properties of the ZnO films were also investigated by X-ray diffraction (XRD) and photoluminescence (PL), respectively. ZnO films depending on the thickness of buffer layer showed the strongest ZnO (0002) diffraction peak and flat surface. The room temperature PL spectrum showed a strong NBE peak at 373nm. It was found that the thickness of ZnO buffer layer affects surface morphology, crystallinity and optical properties of ZnO films.