

**Effect of buffer layer on structural and optical properties of ZnO films on Si substrates by atomic layer deposition**

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ZnO films deposited on ZnO homo-buffer layer with different thicknesses were successfully prepared by atomic layer deposition. This two-step growth technique using homo-buffer layer is necessary to overcome the negative effects caused by hetero-buffer layer and lattice, thermal mismatch between ZnO and silicon. Crystallinity of ZnO films was characterized by X-ray diffractometer. FWHM of ZnO (002) peak is decreased with buffer layer thickness up to 327Å. Surface morphology is also observed by scanning electron microscope (SEM). When the thickness of buffer layer is 327Å, it shows mirror-like surface. The photoluminescence (PL) spectra show a strong UV emission at near 380nm. However, defect-related visible band also appears at all samples. The intensity ratio of the UV band to the visible band is largest at sample (c) with 327Å buffer. The above results indicate that the optimum buffer layer thickness to improve the ZnO film quality is 327Å.