

Synthesis and characterization of ZnO flower-like multisheets grown on metal buffer layer

ABSTRACT

ZnO flower-like multisheets were synthesized on Si (1 1 1) and corning glass substrates with Cu and Au-Cu alloy buffer layers via vapor phase transport (VPT) method. The structures and morphologies of the products were investigated using X-ray diffraction (XRD) and field emission scanning electron microscopy (FESEM). The flowers have several parallel petal-like nanosheets that are perpendicular to the main axis. The metal buffer layer affects the growth rates and initial nucleation of ZnO structures, resulting in different numbers and shapes of petals. The optical properties were studied with photoluminescence (PL) and Raman spectroscopy. The intensity of the visible emission peak for Cu coated silicon was the lowest, which may indicate that the surface of defects being covered with Cu atoms. The presence of the E1(LO) and A1(LO) phonon peaks in the Raman spectra reveal the status of c-axis and the surface of the samples. In addition, the growth mechanism of the ZnO flower-like multisheet structure was investigated based on the FESEM images for different growth times.

Keyword: ZnO nano/microstructure; Flower-like; ZnO multisheet; Superlattice.