

Investigation on morphological and structural evolution of Ga-doped ZnO Nanocrystals

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ZnO:Ga nanocrystals were synthesized by vapor-solidification method to investigate morphological and structural evolution induced by Ga-doping. We have optimized the graphite content in the source in terms of photoluminescence properties. As Ga-content increasing, the shape of products changed from tetrapod to rod-type structure due to structural evolution from ZnO (wurtzite) to Ga₂O₃ (monoclinic) structure. Ga-content was controlled within full composition range with varying Ga₂O₃-content in the source mixture, which implies the feasibility of Ga as a efficient impurity for ZnO nanocrystals, but HXPES also indicates a possibilities of phase separation especially for the ZnO:Ga with high Ga-content, concentrated at the surface area.

Keywords: GZO, ZnO:Ga, nanocrystal, Ga-doped ZnO

Molecular Beam Epitaxy of ZnSe/ZnTe superlattice buffer layers for the growth of antimonides thin films

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Molecular beam epitaxy (MBE) of high quality GaSb films on GaAs (001) substrates is achieved by inserting a ZnTe/ZnSe superlattice (SLS) buffer layer. The growth condition for the ZnTe/ZnSe SLS buffer was optimized in terms of in-situ RHEED intensity observation. We have compared the quality of GaSb layer grown on GaAs and ZnTe/ZnSe SLS, and the role of ZnTe/ZnSe SLS buffer layer is discussed. The crystal quality and surface morphology of grown films were investigated by high resolution X-ray diffraction measurement (HR-XRD), atomic force microscopy (AFM) of GaSb films.

Keywords: MBE, GaSb, ZnSe/ZnTe, Superlattice