

Low Temperature Optical Properties of NiO coated ZnO Nanorods

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We fabricated NiO coated ZnO nanorods using ZnO nanorods grown on a Si substrate. After thermal hydrogenation process of these NiO-ZnO core-shell nanorods, we confirm that Ni nanodots were built up on the surface of ZnO nanorods. Photoluminescence (PL) measurements at T=5 K were made to understand the optical properties of these various nanorods. As samples sequentially transformed into ZnO → NiO-ZnO → Ni nanodot-ZnO, PL transition energies and intensities are varied as well. In comparison to pure ZnO nanorod, the acceptor bound exciton (A^0X) became the minor peak for NiO-ZnO nanorods. On the other hand, for Ni nanodot-ZnO sample, (A^0X) transition peak intensity became the most dominant peak. This is due to the fact that during thermal hydrogenation process, appreciable amounts of hydrogen ions defused into ZnO nanorod which played as accepters.

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