On the structured green band in ZnO nanowires

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Abstract: ZnO nanowires have been synthesized by using the vapor evaporation method. The material source was ZnO powder mixed with graphite. The nanowires have the shape of long rods with diameters ranging from 100 to 300 nm and lengths of several tens of micrometers. The photoluminescence (PL) was measured from 15 K to 300 K. At room temperature, the PL exhibited a relatively strong deep-level emission around 500 nm (green band) and a small UV emission peak at 380 nm (UV band). At low temperatures, the PL spectrum consisted of a group of sharp UV peaks and a smaller green band having the fine structure of a broad multiphonon side band. The fine structure was observed to include doublets at the higher energy side. The temperature dependences of the peak position and of the full width at half maximum height (FWHM) of the PL spectra for green band were investigated. The origin of the green band is attributed to a copper impurity.
Author Keywords: Nanomaterials; Photoluminescence; ZnO nanowires

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