Internal quantum efficiency enhancement of GaInN/GaN quantum-well structures using Ag nanoparticles.

We report internal quantum efficiency enhancement of thin p-GaN green quantumwell structure using self-assembled Ag nanoparticles. Temperature dependent photoluminescence measurements are conducted to determine the internal quantum efficiency. The impact of excitation power density on the enhancement factor is investigated. We obtain an internal quantum efficiency enhancement by a factor of 2.3 at 756 W/cm², and a factor of 8.1 at 1 W/cm². A Purcell enhancement up to a factor of 26 is estimated by fitting the experimental results to a theoretical model for the efficiency enhancement factor.

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