Design and geometry of hybrid white light-emitted diodes for efficient energy transfer from the quantum well to the nanocrystals

We demonstrate light color conversion in patterned InGaN light-emitting diodes (LEDs), which is enhanced via nonradiative exciton resonant energy transfer (RET) from the electrically driven diode to colloidal semiconductor nanocrystals (NCs). Patterning of the diode is essential for the coupling between a quantum well (QW) and NCs, because the distance between the QW and NCs is a main and very critical factor of RET. Moreover, a proper design of the pattern can enhance light extraction.

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