Optical study of excitation and deexcitation of Tm in GaN quantum dots

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Abstract: We report on the optical properties of molecular beam epitaxy grown GaN quantum dots (QDs) doped with Tm. Under optical excitation above the fundamental energy of GaN QDs, the fundamental transition emission from the GaN QD host was not observed while bright emission from Tm3+ manifolds demonstrated the efficient energy transfer from the host to Tm3+ ions. The photoluminescence as a function of temperature was fast quenched for transition from the high-lying manifolds state but very stable for the blue one resulting from the D21 ?? F43 transition. Mechanisms for excitation to and deexcitation from Tm3+ ions are discussed. ?? 2006 The American Physical Society.

Year: 2006
Source title: Physical Review B - Condensed Matter and Materials Physics
Volume: 74
Issue: 15
Art. No.: 155310
Cited by: 3
Link: Scorpus Link
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ISSN: 10980121
CODEN: PRBMD
DOI: 10.1103/PhysRevB.74.155310
Language of Original Document: English
Abbreviated Source Title: Physical Review B - Condensed Matter and Materials Physics
Document Type: Article
Source: Scopus
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