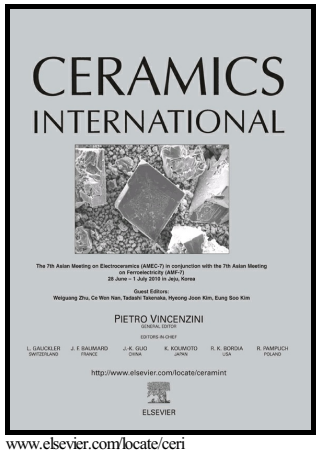

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Gd^{3+} doping induced enhanced upconversion luminescence in Er^{3+}/Yb^{3+} co-doped transparent oxyfluoride glass ceramics containing $NaYF_4$ nanocrystals

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Abstract

In this article, transparent oxyfluoride glass ceramics containing β -$NaYF_4$ nanocrystals were successfully prepared via Gd^{3+} doping. Compared to conventional non-doped glasses, the thermal treatment temperature required for the precipitation of β-$NaYF_4$ nanocrystals can be lowered with the doping of Gd^{3+}. Furthermore, under the same thermal treatment condition, more β-$NaYF_4$ nanocrystals were precipitated in Gd^{3+} doped ones, which greatly improves the luminescence efficiency of rare earth doped glass ceramics. Possible mechanism for the Gd^{3+} doping induced enhanced upconversion luminescence phenomenon was proposed, based on thorough structural and optical characterizations. The results revealed that the doping of Gd^{3+} ions could