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White light upconversion emission and color tunability in $\text{Er}^{3+}/\text{Tm}^{3+}/\text{Yb}^{3+}$ tri-doped YNbO_4 phosphor

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ABSTRACT

$\text{Er}^{3+}/\text{Tm}^{3+}/\text{Yb}^{3+}$ tri-doped YNO phosphors were obtained by the solid-state reaction method. X-ray diffraction, Raman spectroscopy, and FE-SEM were employed for characterization of the materials, and no significant structural changes have been noticed. The materials exhibited red, green and blue (RGB) upconversion emissions under 980nm excitation. The increase of the Tm^{3+} concentration reduced the blue and green UC emissions due to possible $\text{Tm}^{3+}\text{-Tm}^{3+}$ and $\text{Er}^{3+}\text{-Tm}^{3+}$ energy transfer processes, respectively. White UC emission with CIE color coordinates equal to $x =$

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