

Synthesis and luminescence properties of Er^{3+} doped and $\text{Er}^{3+}\backslash\text{Yb}^{3+}$ codoped $\text{YBa}_3\text{B}_9\text{O}_{18}$

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ABSTRACT

We report the synthesis, optical and electronic structure of Er^{3+} monodoping and $\text{Er}^{3+}\backslash\text{Yb}^{3+}$ codoped $\text{YBa}_3\text{B}_9\text{O}_{18}$. X-ray diffraction results show that Er^{3+} , Yb^{3+} doping does not change the hexagonal structure. The characteristic emission peak of Er^{3+} was observed for $\text{YBa}_3\text{B}_9\text{O}_{18}:\text{Er}^{3+}$ by using 325nm light excitation, the energy transfer between $\text{YBa}_3\text{B}_9\text{O}_{18}$ and Er^{3+} was observed. The upconversion luminescence of Er^{3+} were observed on Er^{3+} doped and $\text{Er}^{3+}\backslash\text{Yb}^{3+}$ co-doped $\text{YBa}_3\text{B}_9\text{O}_{18}$ phosphor excited by using 980nm laser. The conversion process was explained by the energy level diagram. Experimental results show that the upconversion luminescence of Er^{3+} can be sensitized by Yb^{3+} .

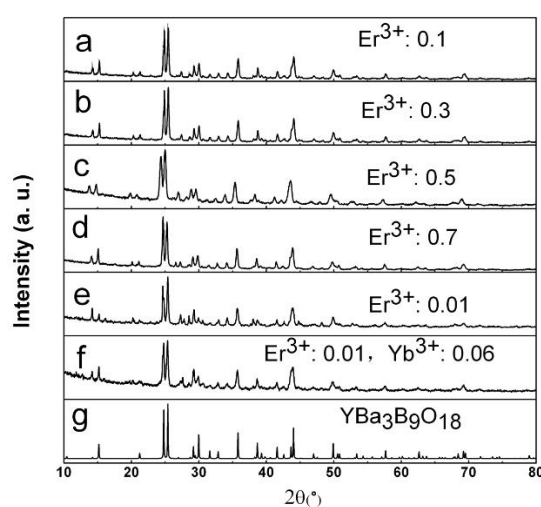


Fig.1 The XRD patterns of $\text{YBa}_3\text{B}_9\text{O}_{18}:\text{Er}^{3+}$, Yb^{3+} and standard pattern of $\text{YBa}_3\text{B}_9\text{O}_{18}$.