

Graphic Abstract:

All of the $\text{GdAlO}_3:\text{Er}^{3+},\text{Yb}^{3+}$ phosphors that have Al^{3+} substituted by Ga^{3+} have three main emission bands with maxima at 524 nm (green), 546 nm (green), 659nm (red) excited by 980 nm radiation. The green emission peaks are assigned to ${}^2\text{H}_{11/2} \rightarrow {}^4\text{I}_{15/2}$ and ${}^4\text{S}_{3/2} \rightarrow {}^4\text{I}_{15/2}$ transitions of Er^{3+} , and the red emission peak is ascribed to the ${}^4\text{F}_{9/2} \rightarrow {}^4\text{I}_{15/2}$ transition of Er^{3+} . Moreover, the position of the emission peak did not shift significantly with the substitution of Ga^{3+} . Clearly, a marked improvement in the emission spectra at 546nm is observed with Ga^{3+} doping.

