Fast synthesis of Dy\textsuperscript{3+} and Tm\textsuperscript{3+} co-doped double perovskite

NaLaMgWO\textsubscript{6}: A thermally stable single-phase white-emitting phosphor for WLEDs

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Supporting Information

XRD patterns of the samples sintered at 900 °C for 5, 8, 10, 15, and 20 minutes are presented in Fig. S1. Almost all the peaks can be indexed by the double perovskite phase NaLaMgWO\textsubscript{6} except a small peak at 28° belonging to the impurity phase La\textsubscript{2}O\textsubscript{3}. Fig. S1 also shows the XRD patterns of the samples on the edge and in the middle of the crucible, which show no obvious variation. Besides, SEM images in Fig. S2 also show no obvious variation, indicating that the samples on the edge and in the middle of crucible present similar structure information. Therefore, the homogeneity of the powders synthesized in this experiment is good even the reaction time is 5 minutes.

Fig. S1  XRD patterns of the samples (on the edge and in the middle of the crucible) sintered at 900 °C for 5, 8, 10, 15, and 20 minutes
The refinement results of NaLa$_{0.95}$Dy$_{0.05}$MgWO$_6$ and NaLa$_{0.9}$Dy$_{0.1}$MgWO$_6$ are shown in Fig. S1. The spectrum of NaLa$_{0.95}$Dy$_{0.05}$MgWO$_6$ fit better than that of NaLa$_{0.9}$Dy$_{0.1}$MgWO$_6$, which may result from the increased impurity phase. For the undoped NaLaMgWO$_6$, it belongs to the monoclinic system P21[1]. The lattice parameters a, b, c, and $\beta$ of NaLa$_{1-x}$Dy$_x$MgWO$_6$ are shown in Fig. S2.

\[ R_p = 7.05\% \]
\[ R_w = 8.92\% \]
\[ \chi^2 = 5.33 \]

\[ R_p = 8.15\% \]
\[ R_w = 9.89\% \]
\[ \chi^2 = 8.62 \]
Fig. S4  Lattice parameters of NaLa$_{1-x}$Dy$_x$MgWO$_6$

Reference