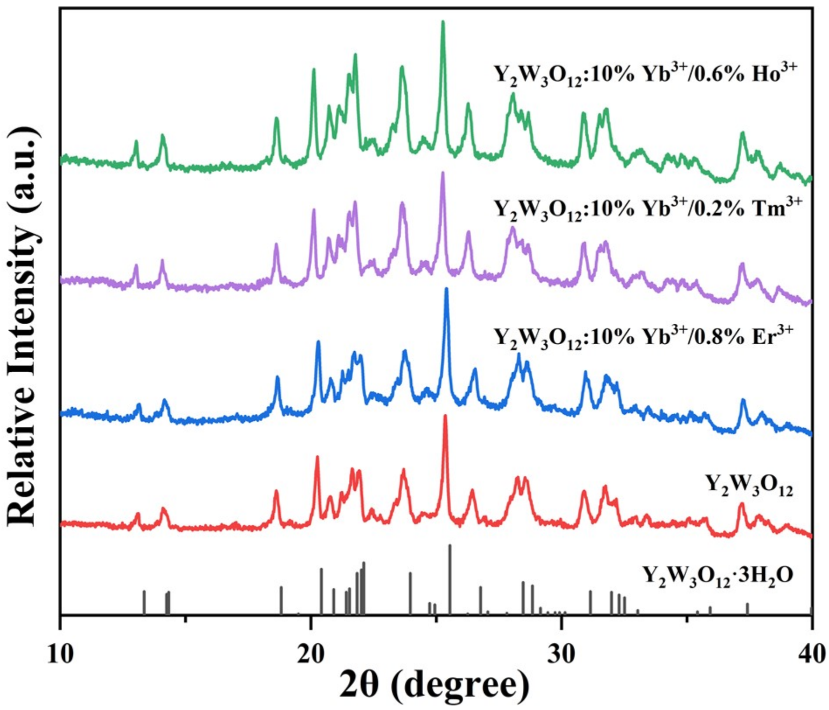
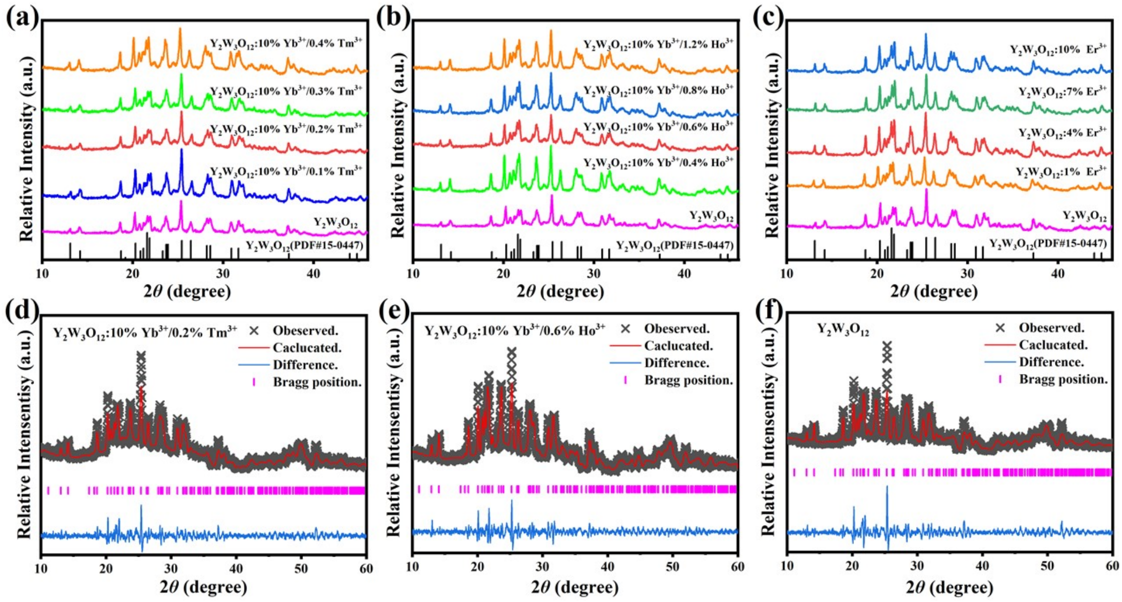
Supporting information

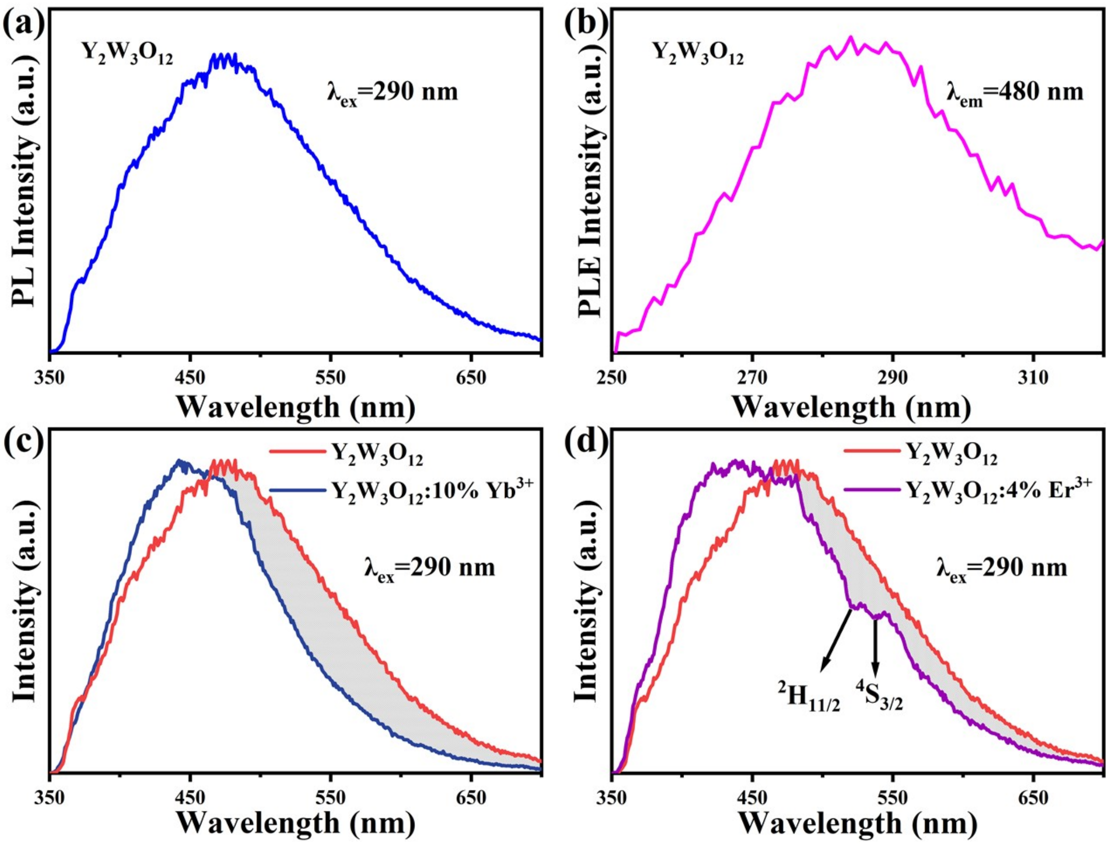


FS1 XRD of $Y_2W_3O_{12}\cdot 3H_2O$, $Y_2W_3O_{12}$ samples and

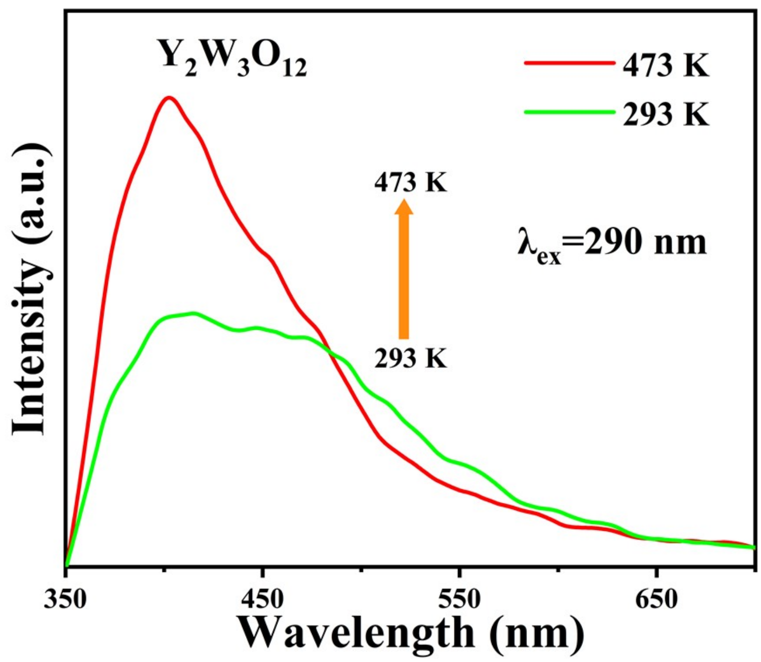
$Y_2W_3O_{12}$:RE^{3+}(RE=0.8%Er/0.6%Ho/0.2%Tm)/10%Yb^{3+} sample



FS2 (a-c) XRD of $Y_2W_3O_{12}$: x%RE^{3+}(RE=Tm/Ho)/10%Yb^{3+} samples and $Y_2W_3O_{12}$:x%Er samples. (d-f) Rietveld plots of $Y_2W_3O_{12}$: x%RE^{3+}(RE=Tm/Ho)/10%Yb^{3+} samples and $Y_2W_3O_{12}$ samples.



FS3 (a) PL spectra of $Y_2W_3O_{12}$. (b) PLE spectra of $Y_2W_3O_{12}$. (c) $Y_2W_3O_{12}$ versus $Y_2W_3O_{12}$:Yb and (d) $Y_2W_3O_{12}$ versus $Y_2W_3O_{12}$:Er, which confirms $WO_4^{2-} \rightarrow Yb^{3+}$ and $WO_4^{2-} \rightarrow Er^{3+}$ energy transfer, respectively.



FS4 PL spectra of $Y_2W_3O_{12}$ at different temperatures.