

Supporting Information for

Structural influence on the photoluminescence properties of Eu³⁺ doped

Gd₃MO₇ (M = Nb, Sb, Ta) Red Phosphors

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This supporting information includes:

1. Rietveld refinement data
2. Crystal Structure
3. EDS Spectra and X-ray dot mapping

1. Rietveld refinement data

The observed, calculated and the difference powder diffraction profiles of the samples (M = Nb, Sb, Ta) are given in the Figures S1, S2 and S3.

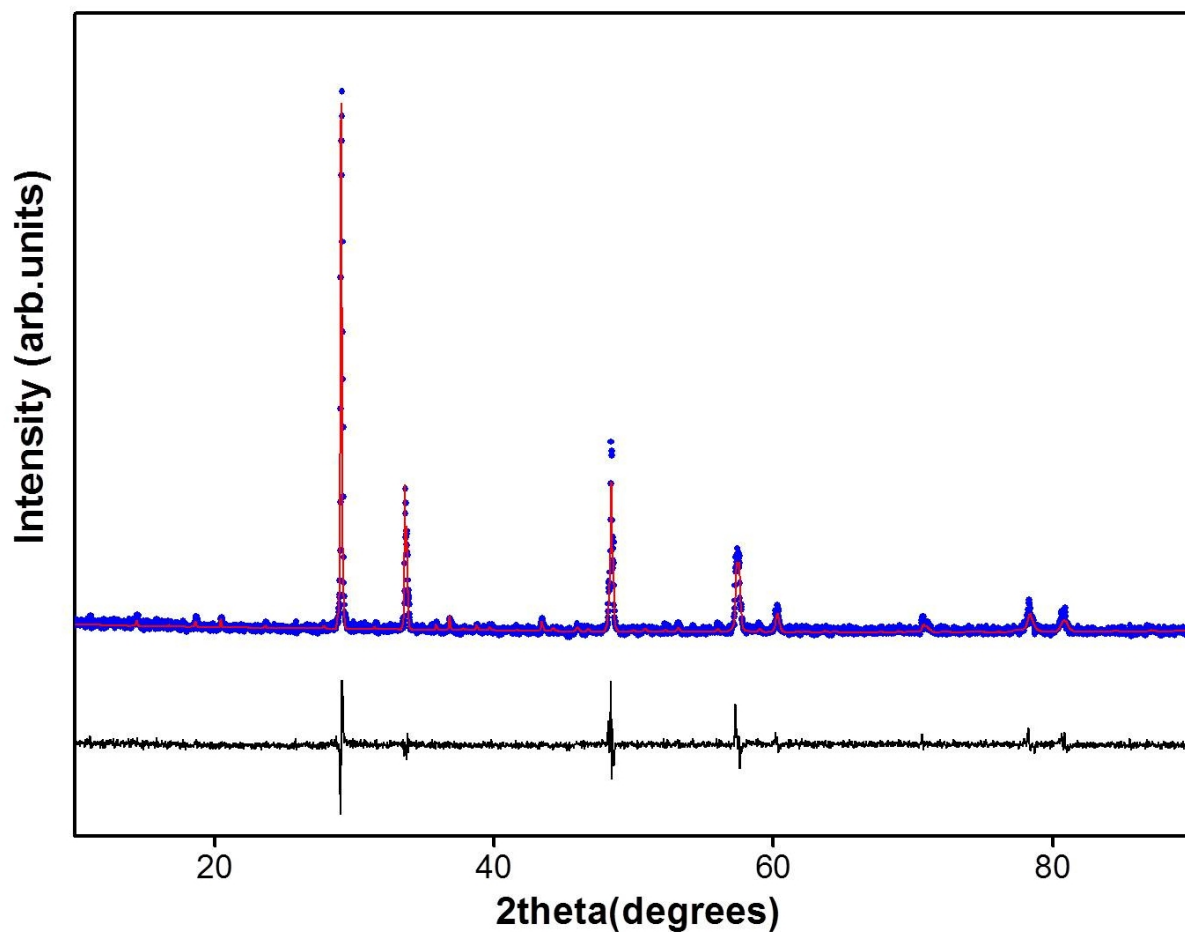


FIG.S1.Observed (points), calculated (continuous line) and the difference $I_{\text{obs}} - I_{\text{calc}}$ (bottom line)

XRD profiles of $\text{Gd}_{2.85}\text{NbO}_7:0.15\text{Eu}^{3+}$

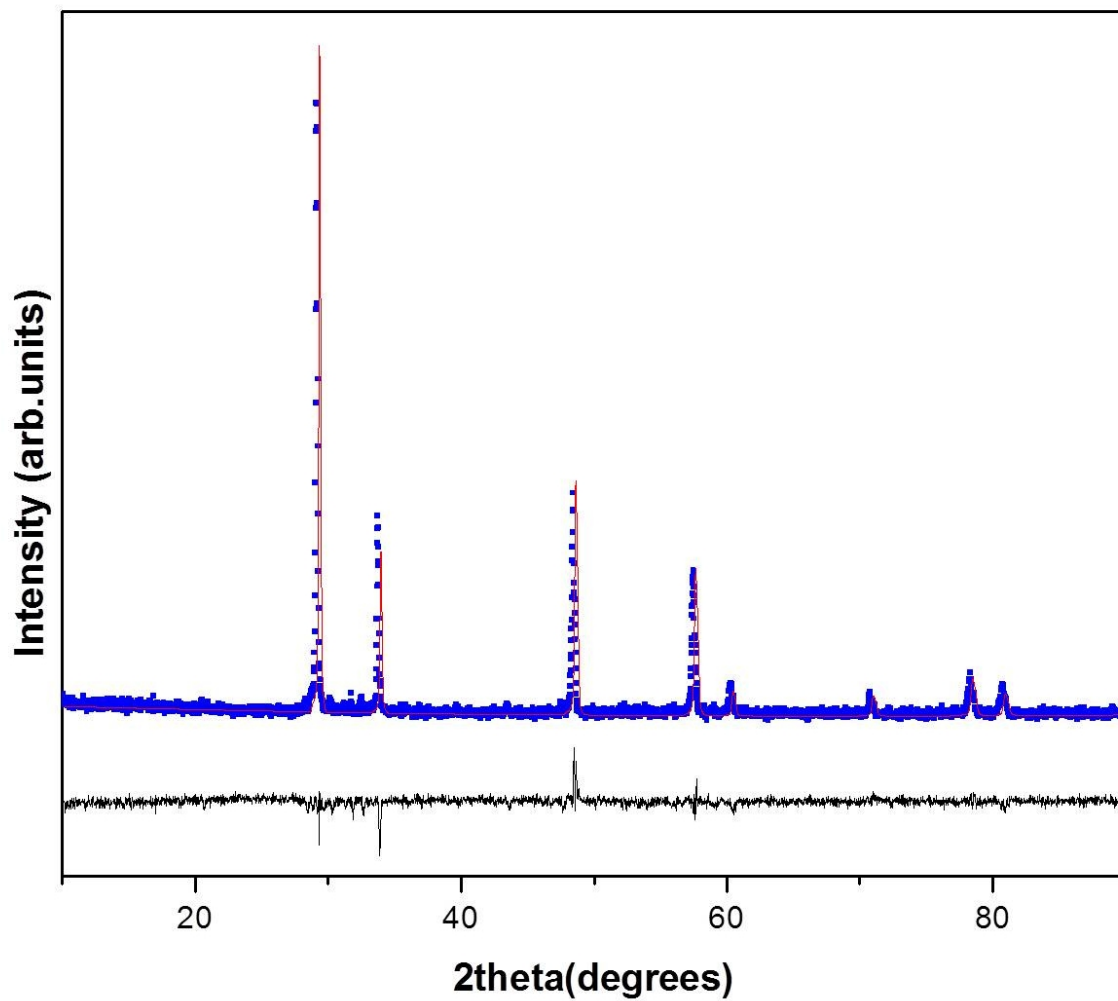


FIG. S2. Observed (points), calculated (continuous line) and the difference $I_{\text{obs}} - I_{\text{calc}}$ (bottom line)

XRD profiles of $\text{Gd}_{2.85}\text{SbO}_7:0.15\text{Eu}^{3+}$

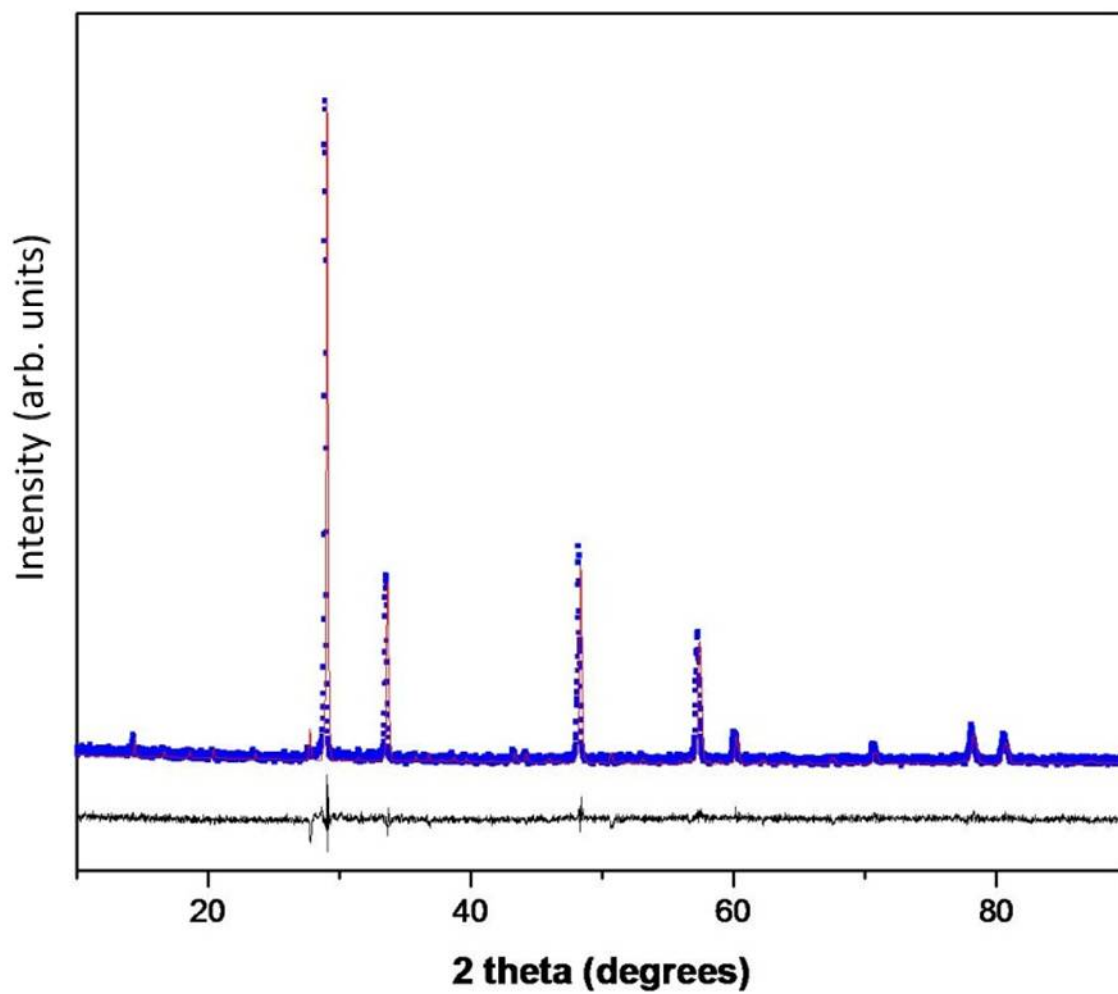


FIG. S3.Observed (points), calculated (continuous line) and the difference $I_{\text{obs}} - I_{\text{calc}}$ (bottom line)

XRD profiles of $\text{Gd}_{2.85}\text{TaO}_7:0.15\text{Eu}^{3+}$.

2. Crystal Structure

The crystal structures and the coordination polyhedras of the niobate sample generated using the diamond software is given in the Figure S3.

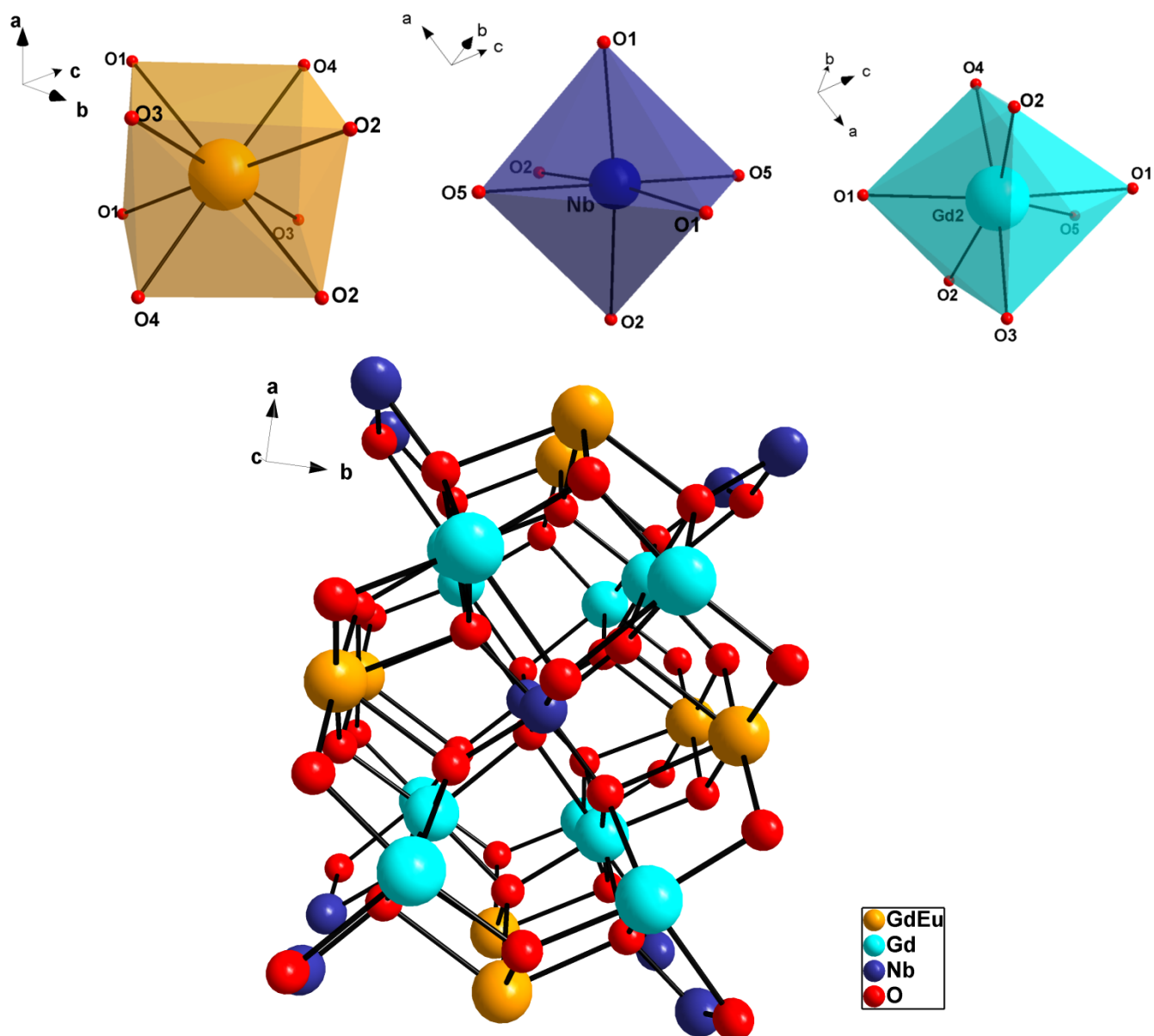


FIG. S4. Schematic representation of crystal structure and the coordination polyhedra of $\text{Gd}_{2.85}\text{NbO}_7:0.15\text{Eu}^{3+}$.

2. EDS Spectra and X-ray dot mapping

EDS spectra of the samples are given in Figures S4, S5 and S6. Incorporation of Eu^{3+} ions can be clearly understood from the stoichiometric ratios of the elements. X-ray dot mapping shows the more uniform distribution of Eu^{3+} in the tantalate system.

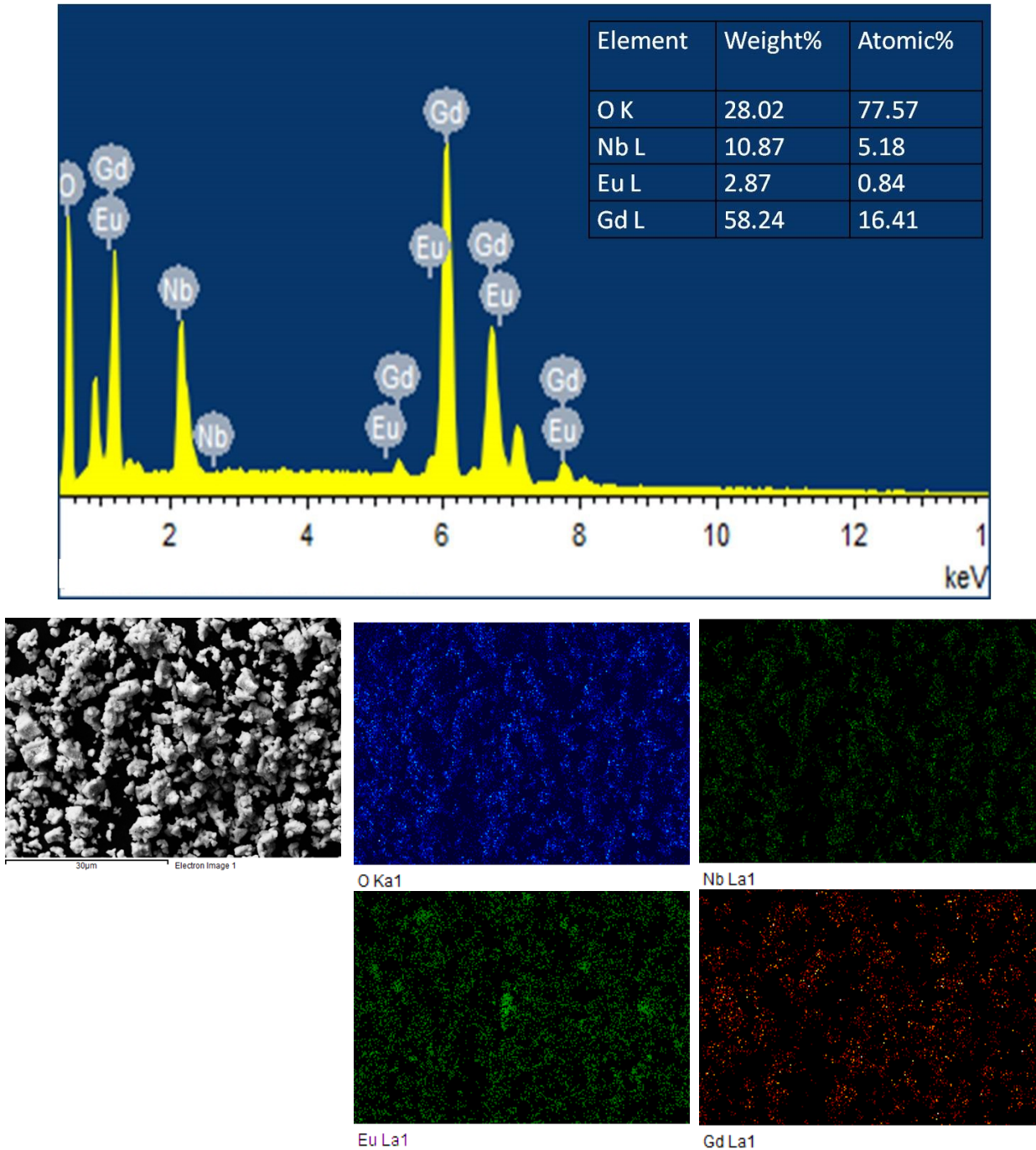


FIG S5. EDS Spectra and the X-ray dot mapping of $\text{Gd}_{2.85}\text{NbO}_7:0.15\text{Eu}^{3+}$ sample

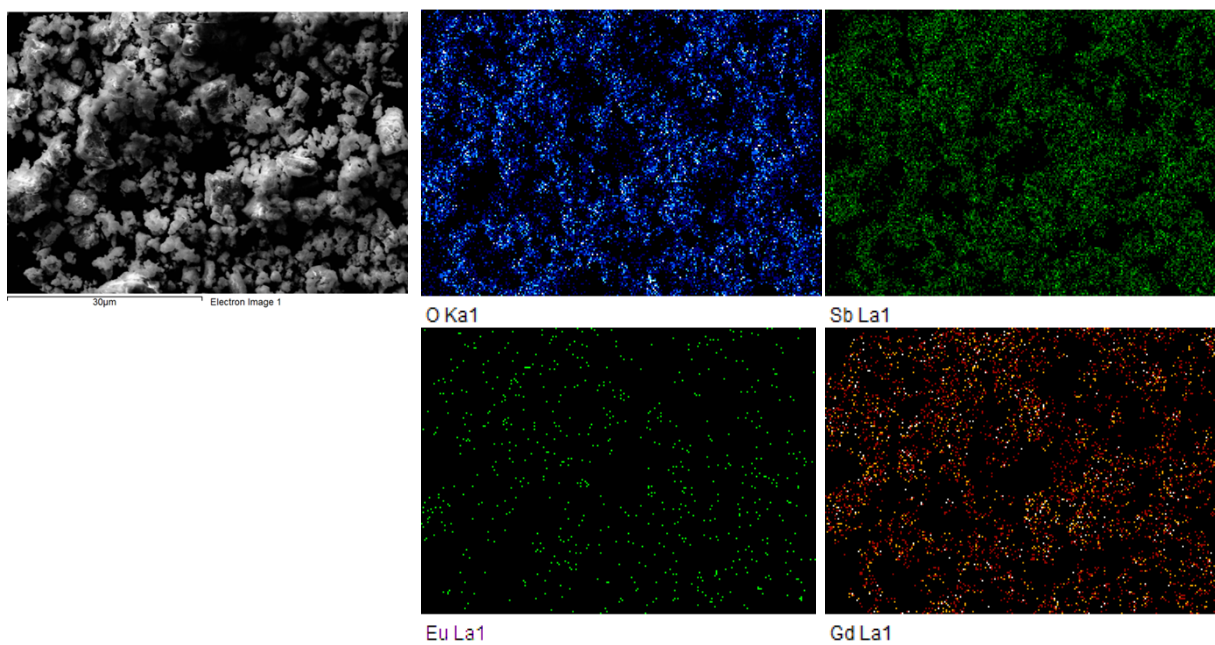
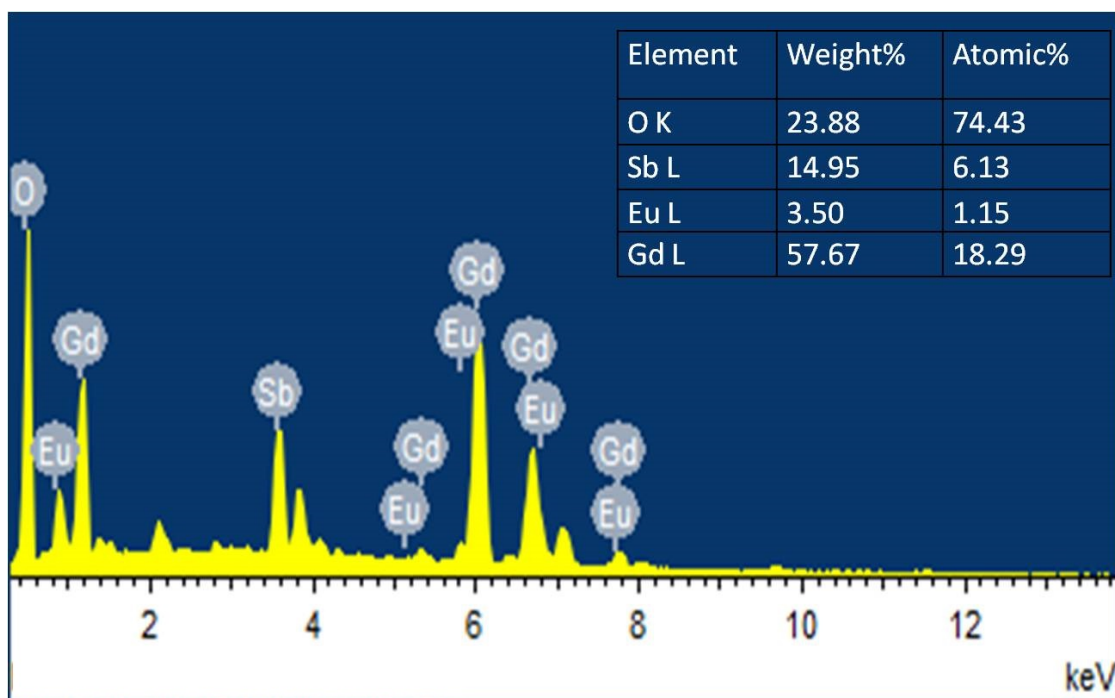


FIG S6. EDS Spectra and the X-ray dot mapping of $Gd_{2.85}SbO_7:0.15Eu^{3+}$ sample

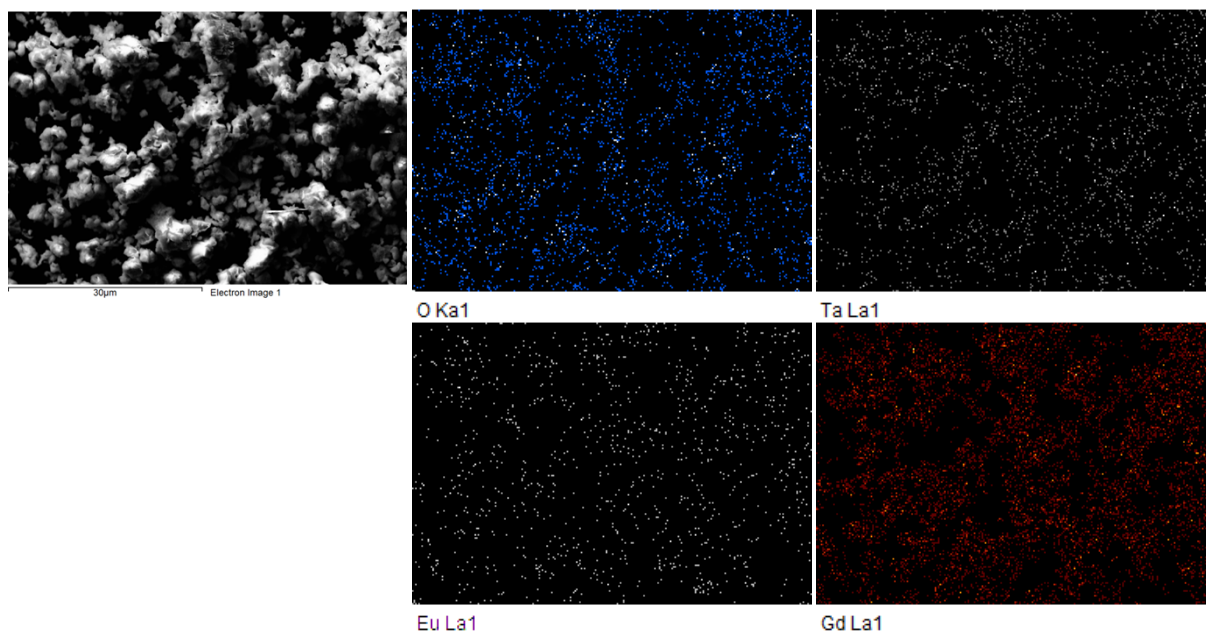
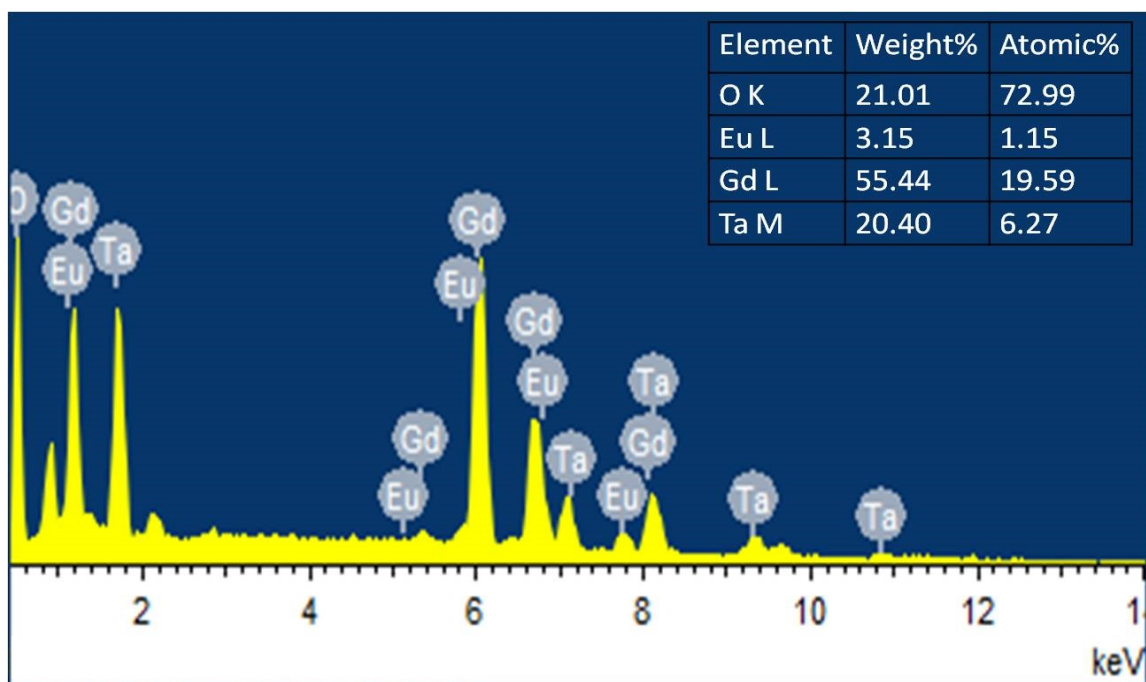


FIG S7. EDS Spectra and the X-ray dot mapping of $Gd_{2.85}TaO_7:0.15Eu^{3+}$ sample