

Electronic Supplementary Information

A new route through the layered hydroxide form for the synthesis of GdVO₄ dispersible in polar solvents

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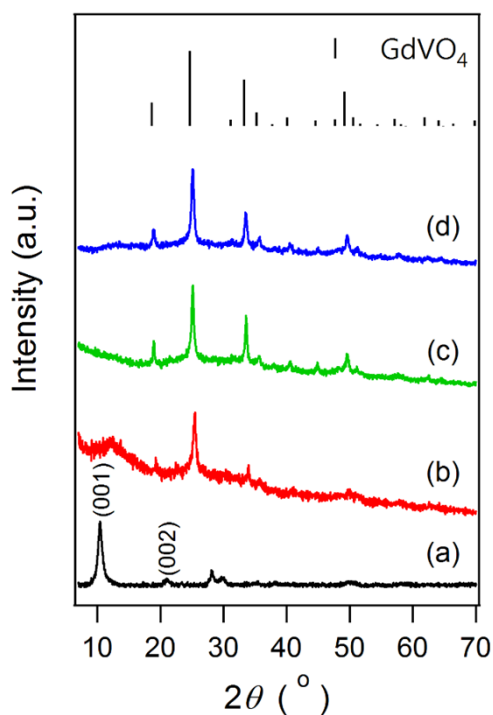


Fig. S1 Powder XRD patterns of (a) LGdH:Eu and its products obtained after reaction in (b) 10, (c) 25, and (d) 50 mM NaVO₃ solutions for 12 h at room temperature. Relative diffraction intensities of GdVO₄ according to its JCPDS card (No. 86-0996) are given for comparison.

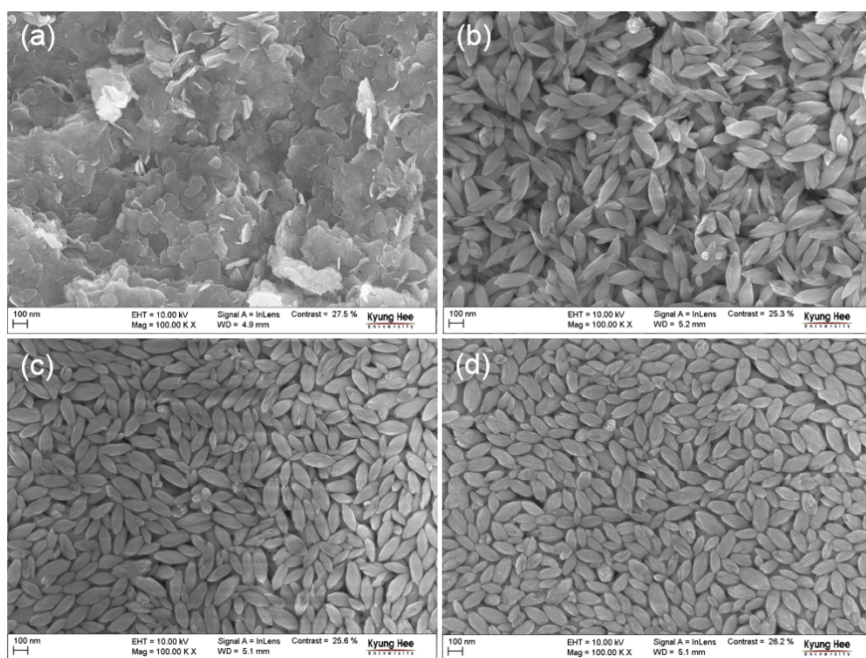


Fig. S2 FE-SEM images of (a) LGdH and its products obtained after reaction in (b) 10, (c) 25, and (d) 50 mM NaVO₃ solutions for 12 h at room temperature.

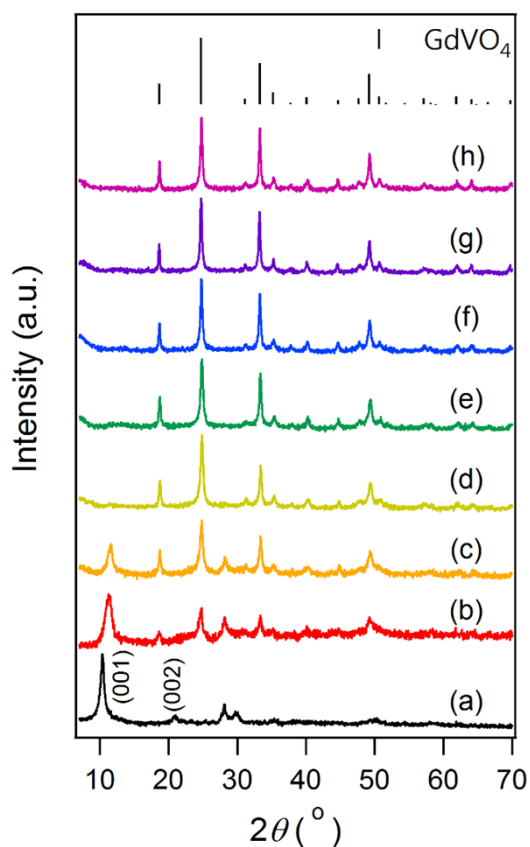


Fig. S3 Powder XRD patterns of LGdH:Eu (a) before and after reaction in 50 mM $NaVO_3$ solution for (b) 5 min, (c) 30 min, (d) 1 h, (e) 2 h, (f) 3 h, (g) 6 h, and (h) 12 h at room temperature. Relative diffraction intensities of $GdVO_4$ according to its JCPDS card (No. 86-0996) are given for comparison.

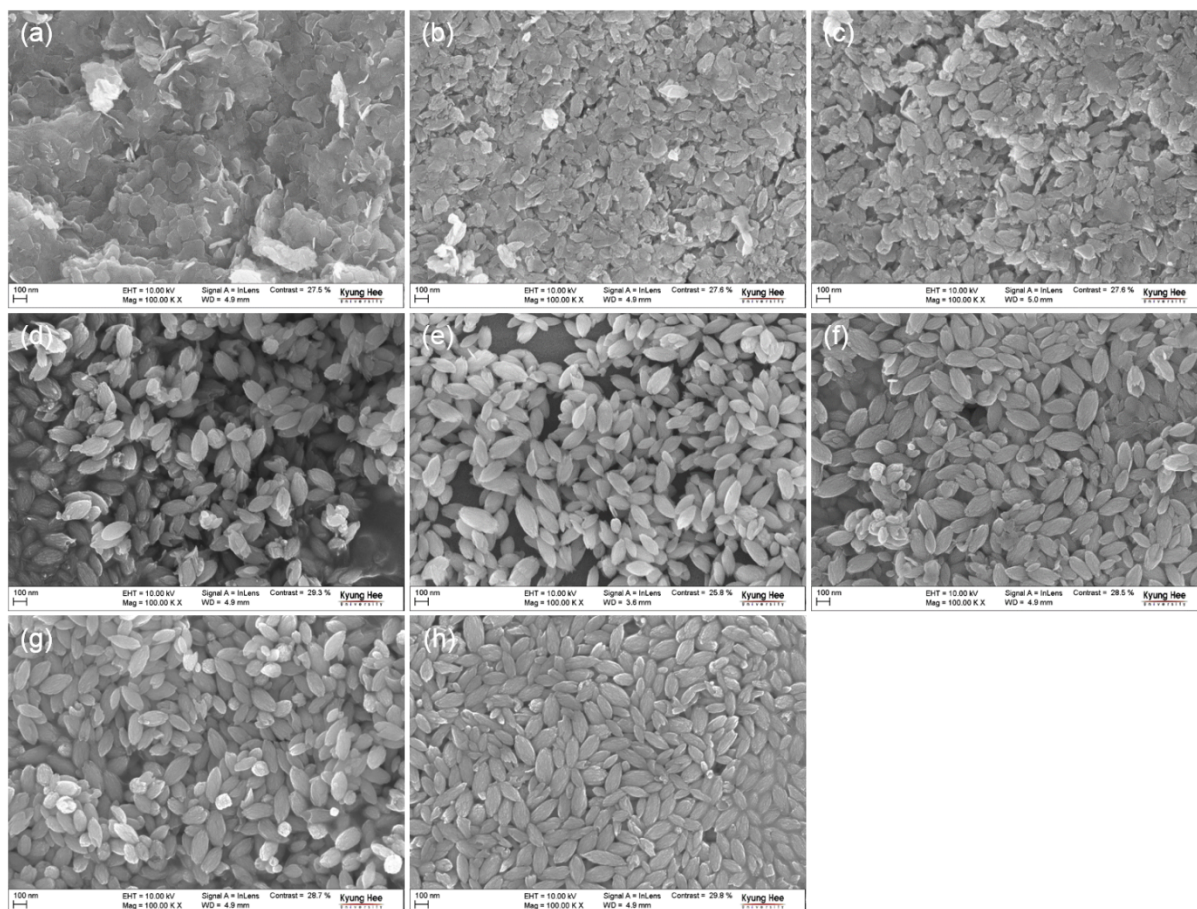


Fig. S4 FE-SEM images of LGdH:Eu (a) before and after reaction in 50 mM aqueous NaVO_3 solution for (b) 5 min, (c) 30 min, (d) 1 h, (e) 2 h, (f) 3 h, (g) 6 h, and (h) 12 h at room temperature.

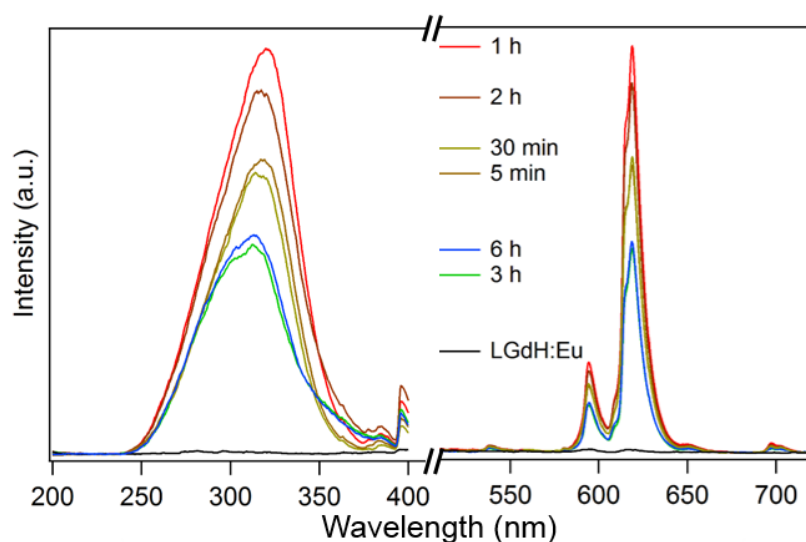


Fig. S5 Excitation ($\lambda_{\text{em}} = 618 \text{ nm}$) and emission ($\lambda_{\text{ex}} = 314 \text{ nm}$) spectra of LGdH:Eu before (black curve) and after reaction in 50 mM NaVO_3 solution for 5 min – 6 h at room temperature.

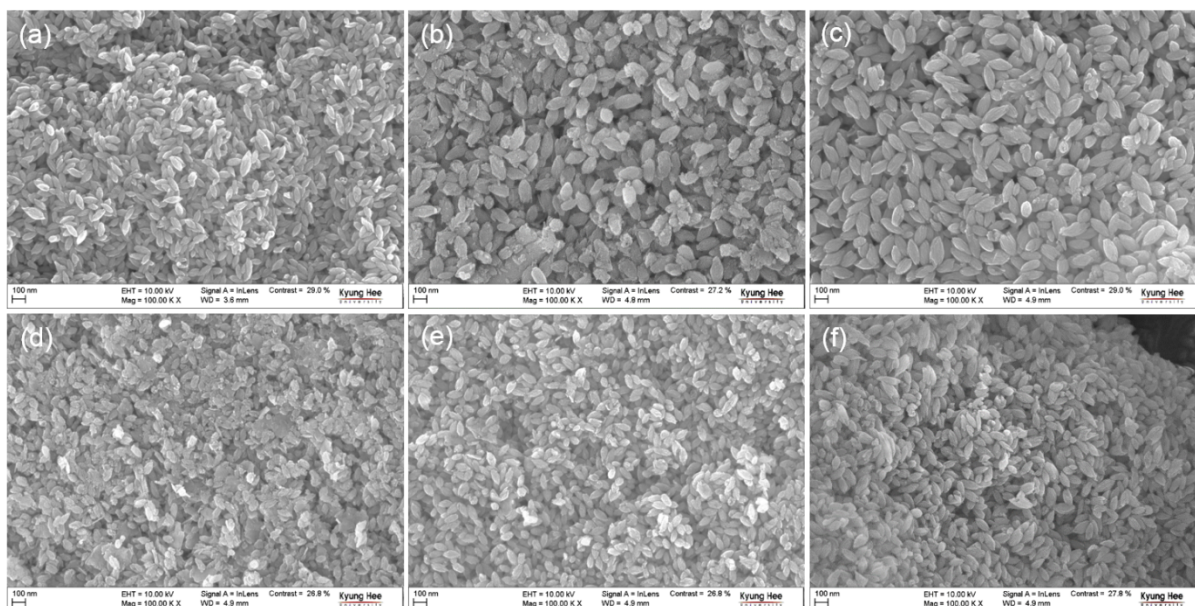


Fig. S6 FE-SEM images of $\text{GdVO}_4:\text{Eu}$ obtained after reacting LGdH:Eu in 50 mM aqueous NaVO_3 solution at pH = 8 for (a) 1 h, (b) 2 h, and (c) 3 h and at pH = 9 for (d) 1 h, (e) 2 h, and (f) 3 h at room temperature.

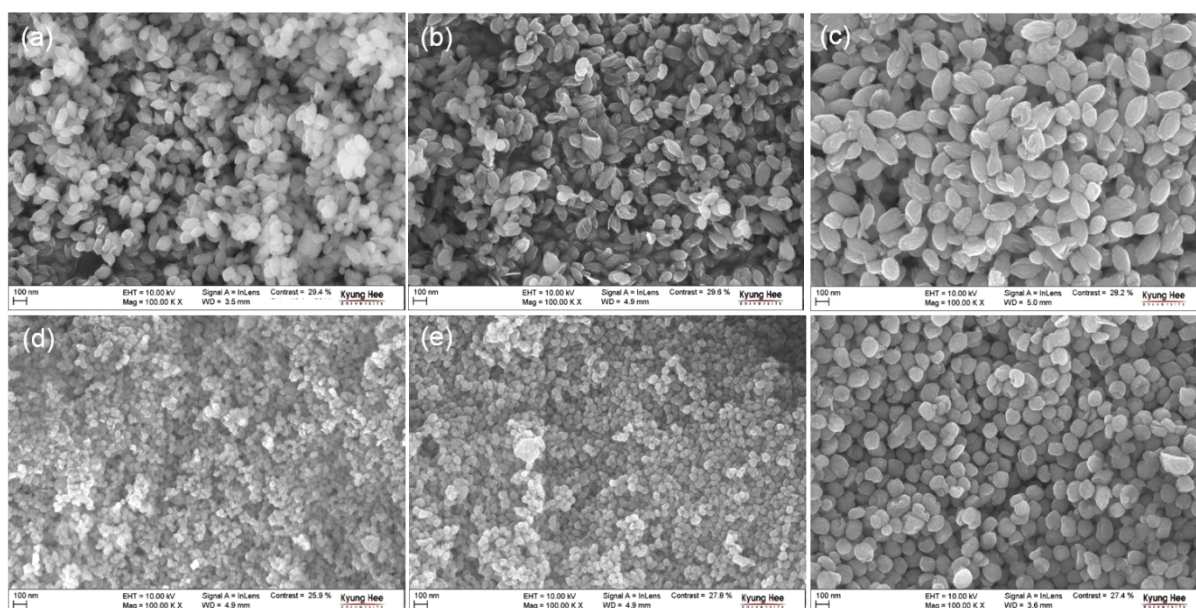


Fig. S7 FE-SEM images of $\text{GdVO}_4:\text{Eu}$ obtained after reacting LGdH:Eu in 50 mM NaVO_3 / 100 mM NaCl solution for (a) 1 h, (b) 2 h, and (c) 3 h and in 50 mM NaVO_3 / 1.0 M NaCl solution for (d) 1 h, (e) 2 h, and (f) 3 h at room temperature.

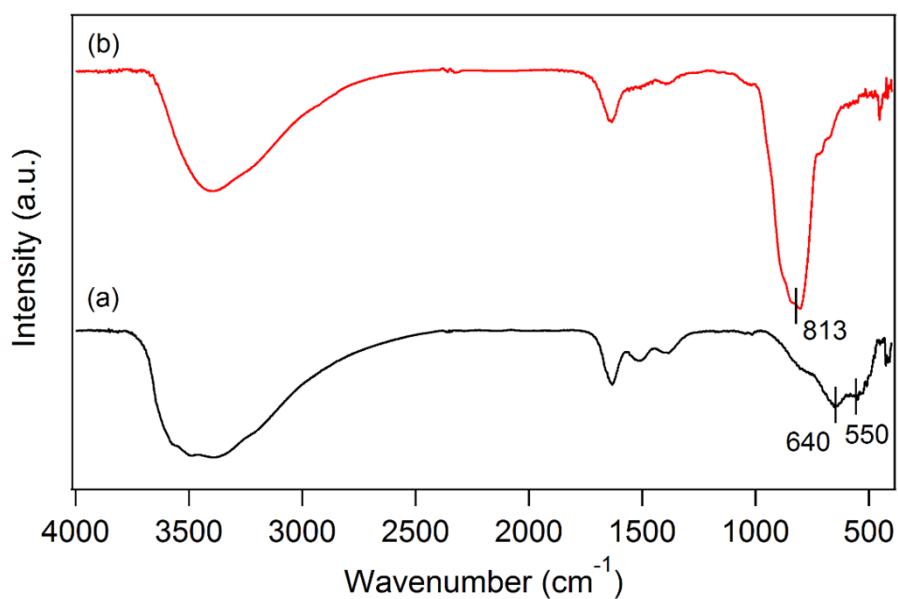


Fig. S8 FT-IR spectra of (a) LGdH:Eu and (b) GdVO₄:Eu obtained after its reaction in 50 mM VO₃⁻ solution for 2 h.

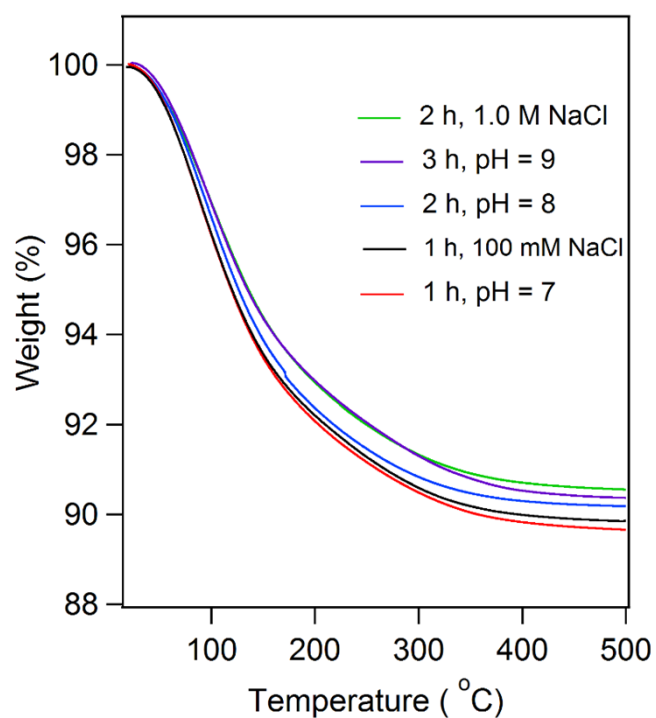


Fig. S9 TG curves of GdVO₄:Eu obtained after reacting LGdH:Eu in 50 mM VO₃⁻ solution at various conditions for different reaction times.

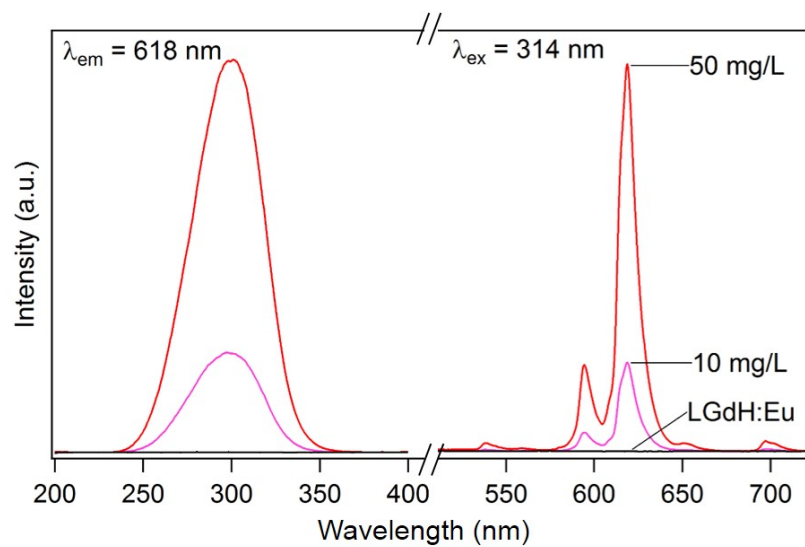


Fig. S10 Excitation and emission spectra of aqueous colloidal suspensions containing LGdH:Eu (50 mg/L) and GdVO₄:Eu (50 mg/L and 10 mg/L).