

Electronic Supplementary Information (ESI)

β -NaGdF₄ Nanotubes: One-Pot Synthesis, Growth Mechanism, and Luminescence Properties

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Table S1 The dopant concentration measured by EDS.

Sample	NaGdF ₄ :2 mol% Ce ³⁺ ,2 mol% Eu ³⁺	NaGdF ₄ :2 mol% Ce ³⁺ ,2 mol% Tb ³⁺	NaGdF ₄ :2 mol% Ce ³⁺ ,2 mol% Dy ³⁺
Concentration	Ce: 2.11	Ce: 2.18	Ce:2.05
(mol%)	Eu: 1.89	Tb:2.19	Dy:1.90

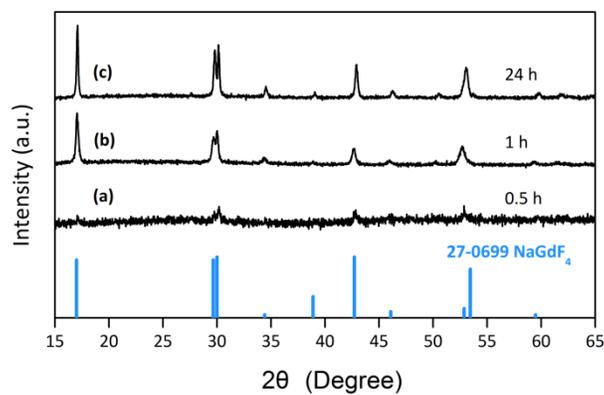


Fig. S1 XRD patterns of samples obtained after different reaction time: (a) 0.5 h, (b) 1 h, (c) 24 h.

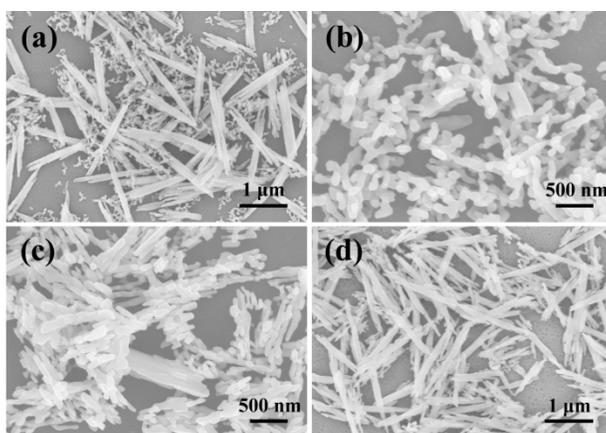


Fig. S2 SEM images of samples prepared with (a) sodium hydroxide, (b) butylamine, (c) propylamine, and (d) aqueous ammonia as alkaline source.

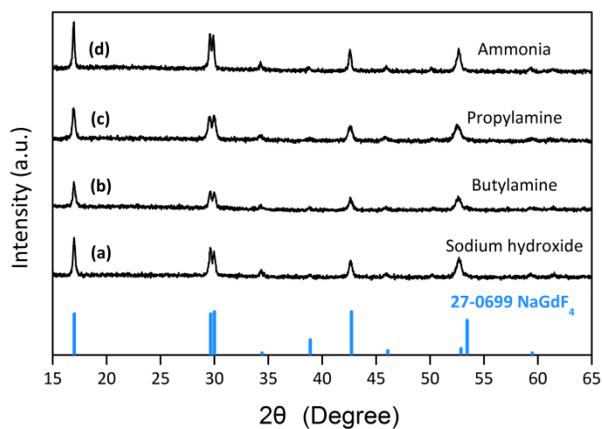


Fig. S3 XRD patterns of samples prepared with (a) sodium hydroxide, (b) butylamine, (c) propylamine, and (d) aqueous ammonia as alkaline source.

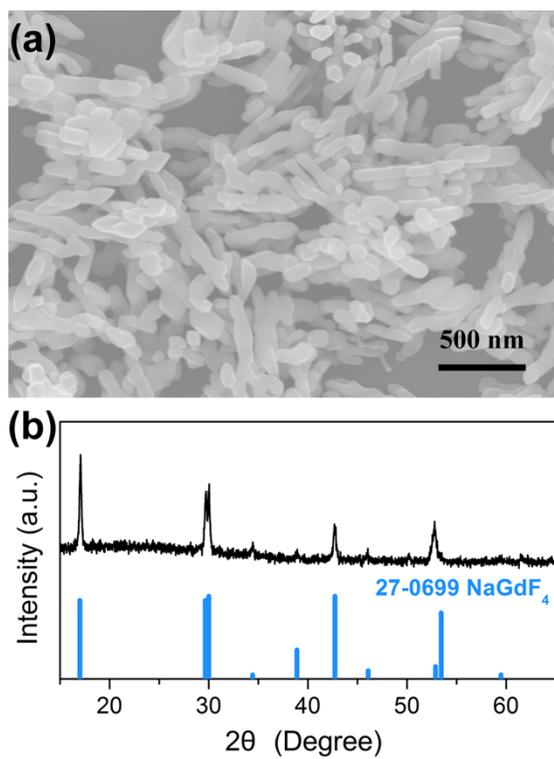


Fig. S4 XRD pattern and SEM image of sample using NaF as fluorine source.

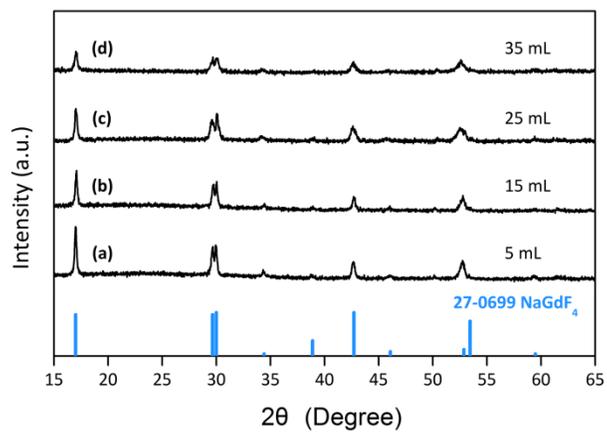


Fig. S5 XRD patterns of samples synthesized with different EG amount: (a) 5 mL, (b) 15 mL, (c) 25 mL, (d) 35 mL.

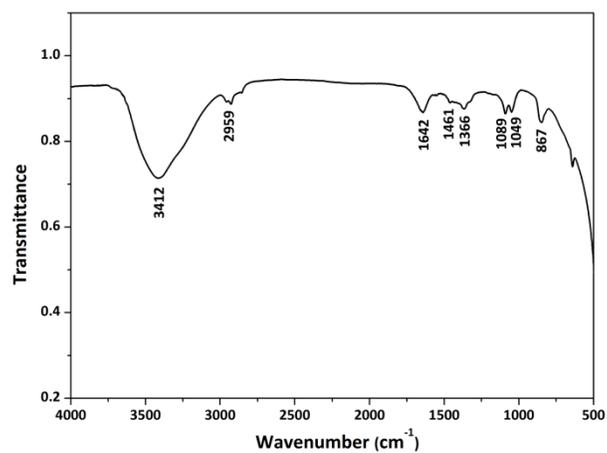


Fig. S6 FT-IR spectra for the typical NaGdF₄ sample.

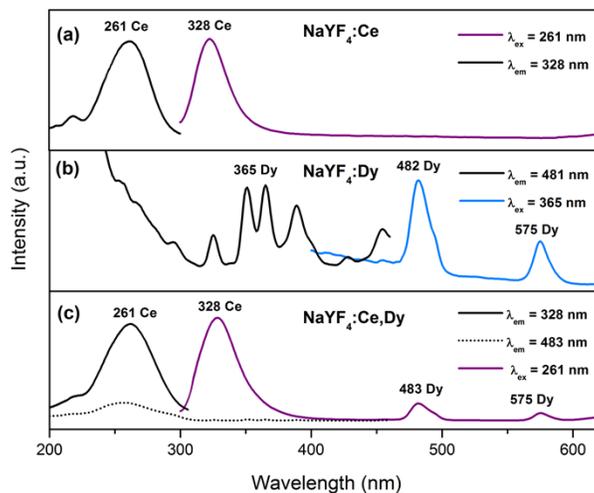


Fig. S8 Excitation (left) and emission (right) spectra of the (a) NaYF₄:Ce, (b) NaYF₄:Dy, and (c) NaYF₄:Ce,Dy samples.

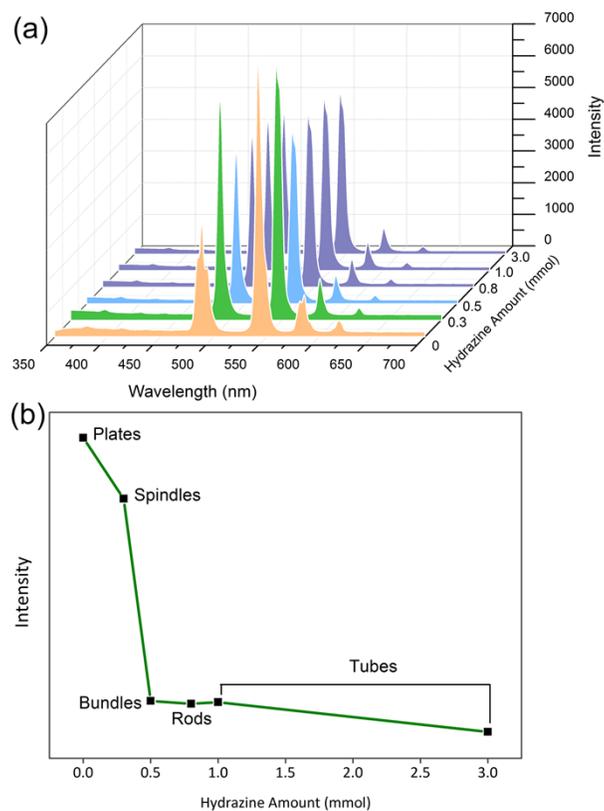


Fig. S9 (a) Emission spectra of the (a) NaYF₄:Ce,Tb samples prepared with different hydrazine addition. (b) The dependence of the luminescence intensity of the samples on the hydrazine amount.