

Electronic Supplementary Information (ESI)

Luminescence properties of Cr³⁺-doped near-infrared emissive fluoroyttrates for light-emitting diodes

Song Qing,^a Xi Zhang,^a Tao Yang,^a Lingxiang Chu,^a Yayun Zhou,^{*b} Jing Wan,^a Zhengliang Wang,^a

Huajun Tang,^a and Qiang Zhou^{*a}

^a Key Laboratory of Green Chemistry Materials in University of Yunnan Province, Key Laboratory of Advanced Synthetic Chemistry (Yunnan Minzu University) of National Ethnic Affairs Commission, School of Chemistry and Environment, Yunnan Minzu University, Kunming 650500, P. R. China.

^b State Key Laboratory of Luminescent Materials and Devices, Guangdong Provincial Key Laboratory of Fiber Laser Materials and Applied Techniques, South China University of Technology, Guangzhou 510641, P. R. China

Corresponding Author:

***Email:** q-zhou@ymu.edu.cn (Q. Zhou)

zhou-yayun@foxmail.com (Y. Zhou)

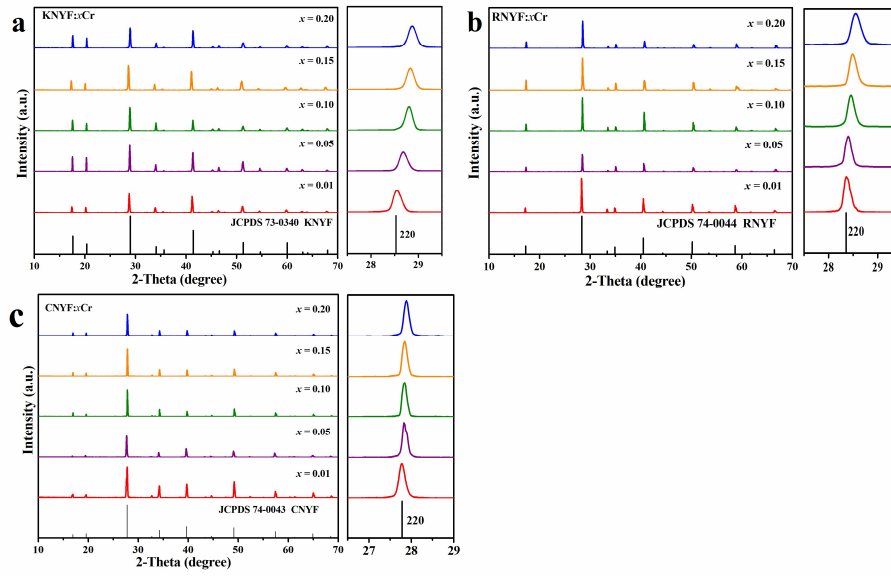


Figure S1. XRD patterns of ANYF:Cr phosphors with different dopant contents.

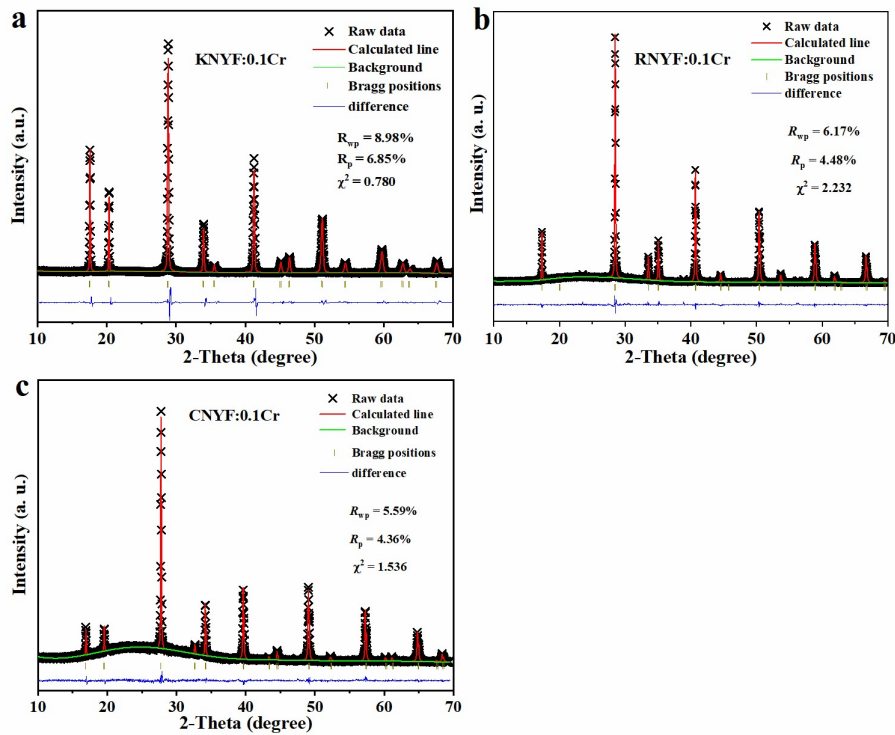


Figure S2. Rietveld refinement results of ANYF:0.10Cr samples.

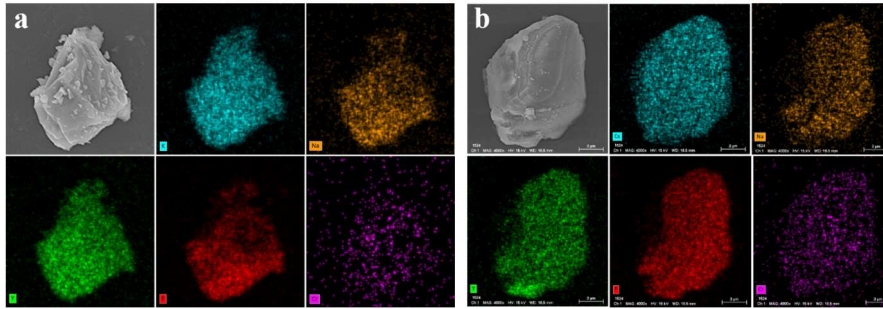


Figure S3. Elemental mapping images of the (a) KNYF:0.10Cr and (b) CNYF:0.10Cr samples.

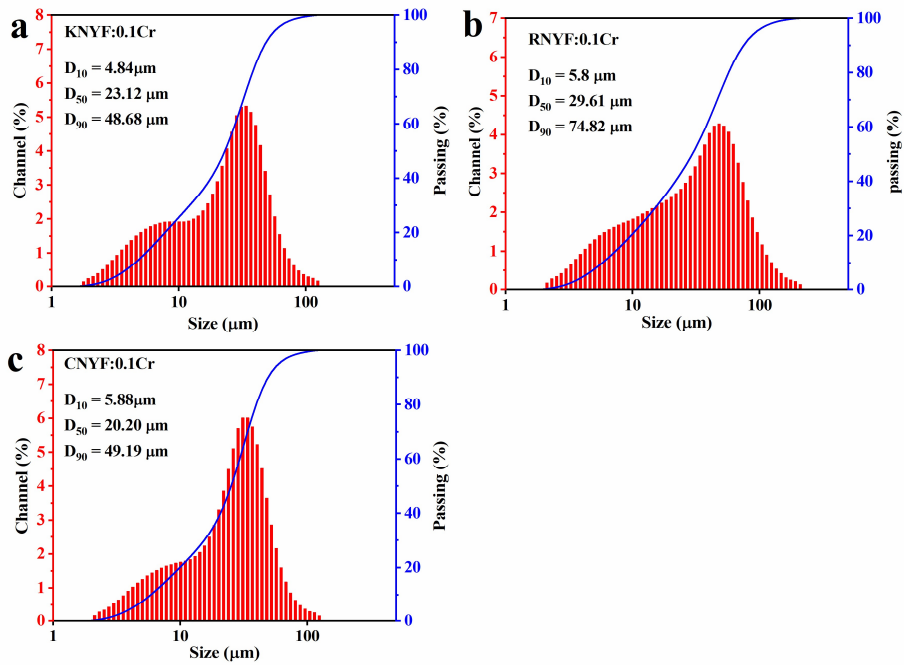


Figure S4. Particle size distribution of the (a) KNYF:0.10Cr, (b) RNYF:0.10Cr, and (c) CNYF:0.10Cr phosphors.

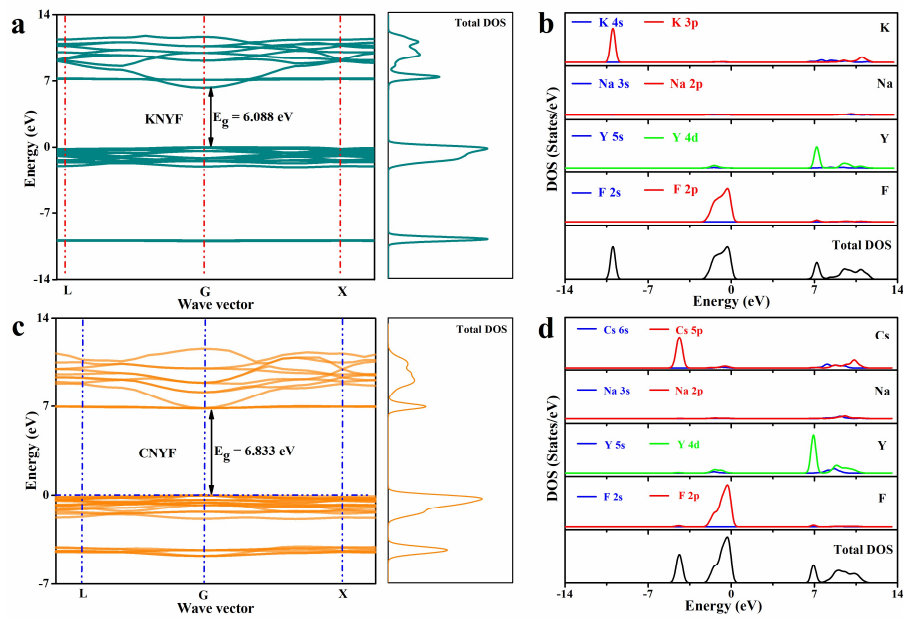


Figure S5. Calculated band structures, TDOS and PDOS of (a, b) KNYF and (c, d) CNYF hosts.

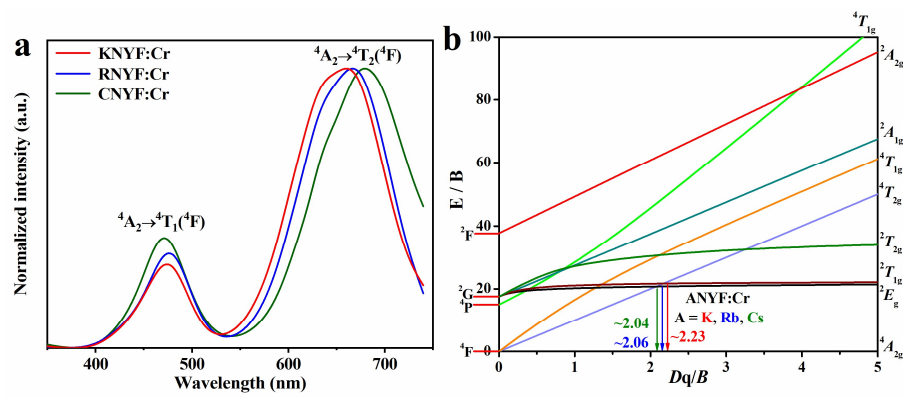


Figure S6. (a) Normalized PLE spectra, and the (b) Tanabe-Sugano diagram with calculated Dq/B ratios of ANYF:Cr products.

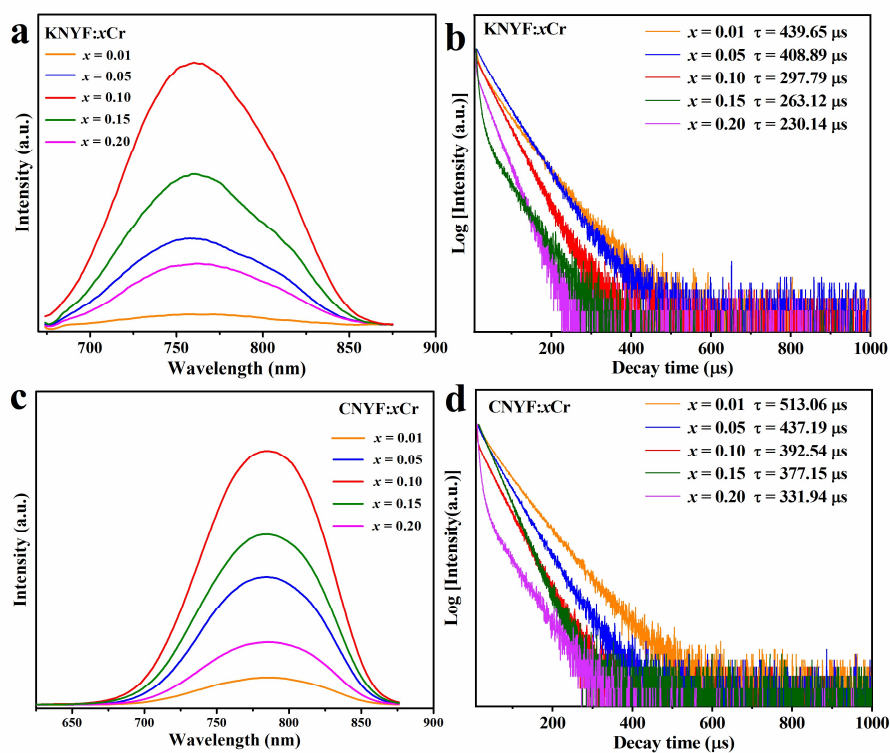


Figure S7. The concentration-dependent PL spectra and decay curves of (a, b) KNYF: x Cr and (c, d) CNYF: x Cr phosphors monitored at room temperature.

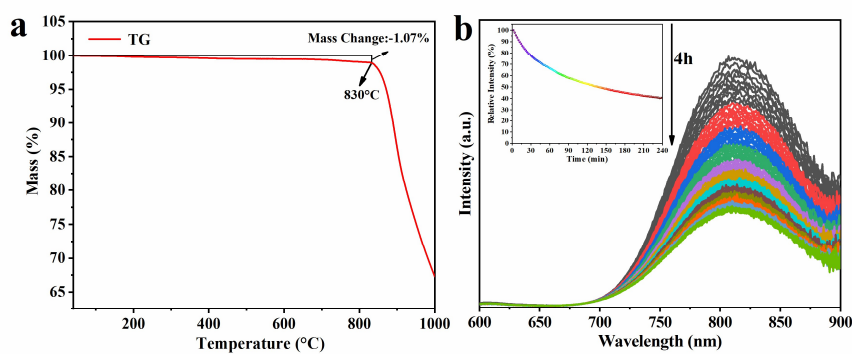


Figure S8. TG curve, PL spectra and relative emission intensities of RNYF:0.10Cr immersed in water as a function of time.

Table S1. Crystallographic information of ANYF:0.10Cr near-infrared phosphors.

Formula	KNYF:0.1Cr	RNYF:0.1Cr	CNYF:0.1Cr
Space group	Fm $\bar{3}$ m	Fm $\bar{3}$ m	Fm $\bar{3}$ m
$a = b = c$ (Å)	8.6910	8.8685	9.0749
$\alpha = \beta = \gamma$ (°)	90	90	90
V (Å ³)	656.23	697.51	747.37
R_{WP}	8.98%	6.17%	5.59%
R_P	6.85%	4.48%	4.36%
χ^2	0.780	2.232	1.536
Z	4	4	4