Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supplementary information

Full color-emitting (Y,Tb,Eu)NbO_4 nanophosphors: calcination-assisted hydrothermal synthesis, energy interaction, and application in deep UV chip-based WLEDs

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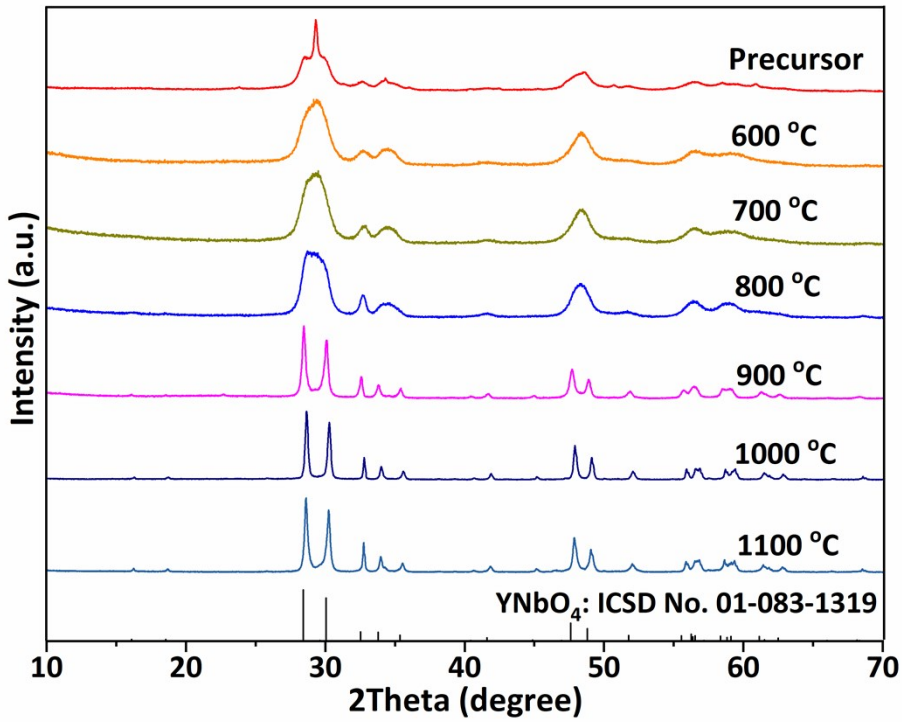

Fig. S1 XRD patterns of the hydrothermally crystallized $YNbO_4$ precursor and its products calcined at various termperatures.

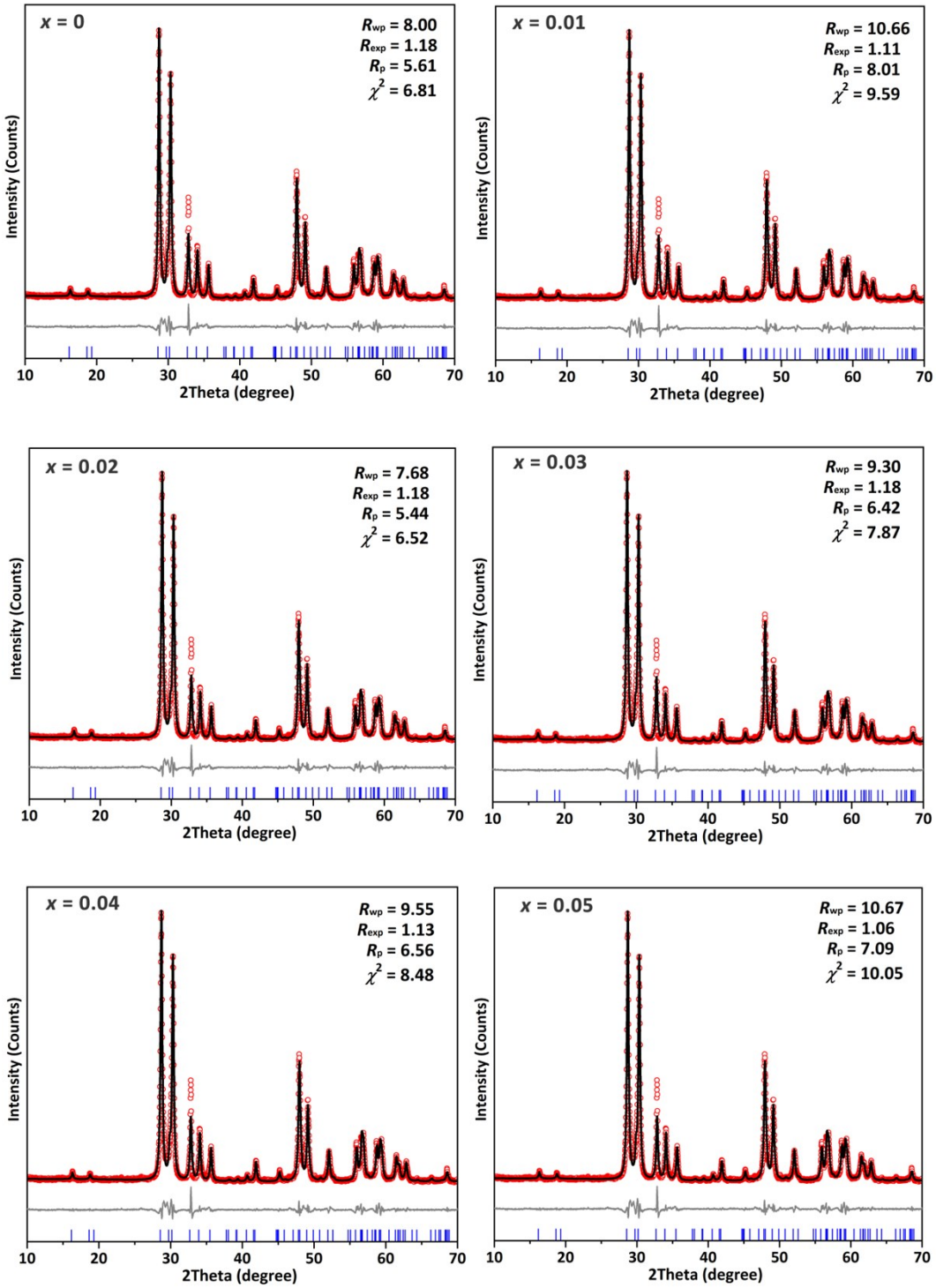

Fig. S2 Riteveld refinements of the $(Y_{1-x}Tb_x)NbO_4$ samples obtained after 1000 °C calcination.

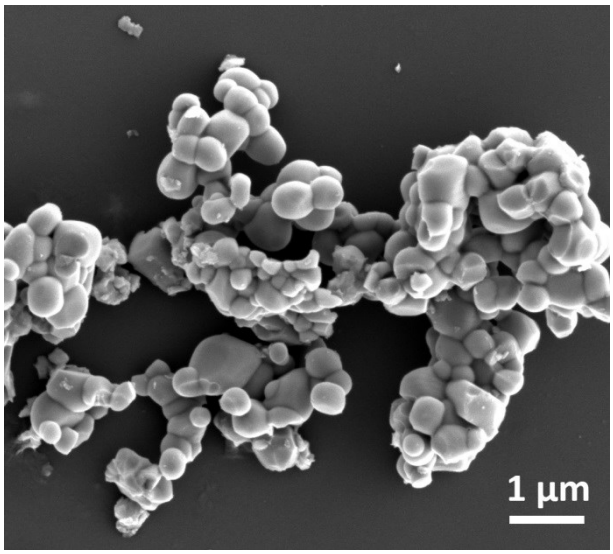

Fig. S3 SEM morphology of the $YNbO_4$ sample obtained after 1100 ^oC calcination.

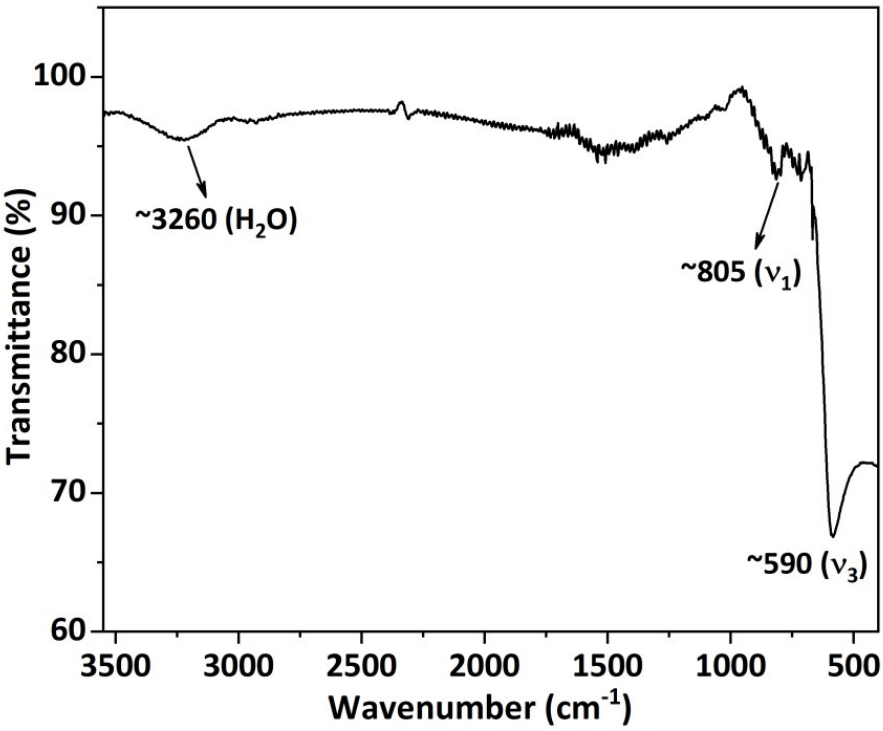

Fig. S4 FT-IR spectrum of the hydrothermal crystallized $YNbO_4$.

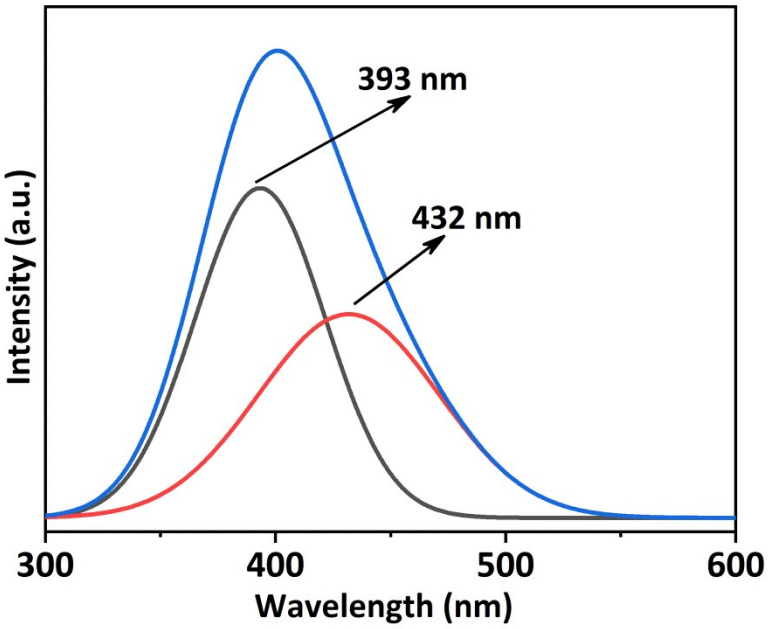

Fig. S5 Deconvolution of the 401 nm emission peak by Gaussian fitting for $YNbO_4$.

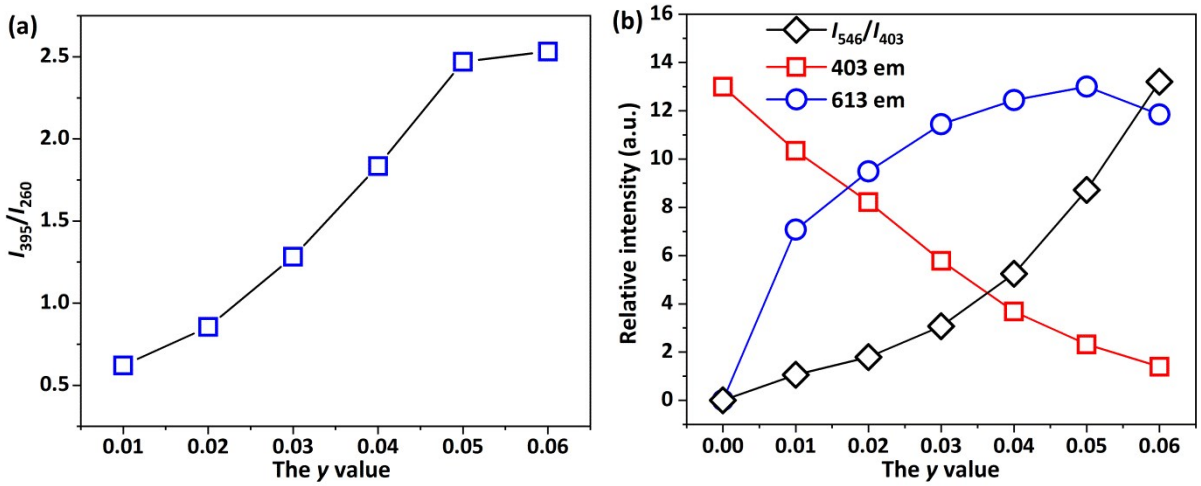

Fig. S6 The I_{395}/I_{260} intensity ratios (a) and the relative emission intensities of NbO_4^{3-} (403 nm) and Eu^{3+} (613 nm) and the I_{613}/I_{403} intensity ratios (b) of the $(Y_{1-y}Eu_y)NbO_4$ (y = 0-0.06) phosphors, as a function of the y value.

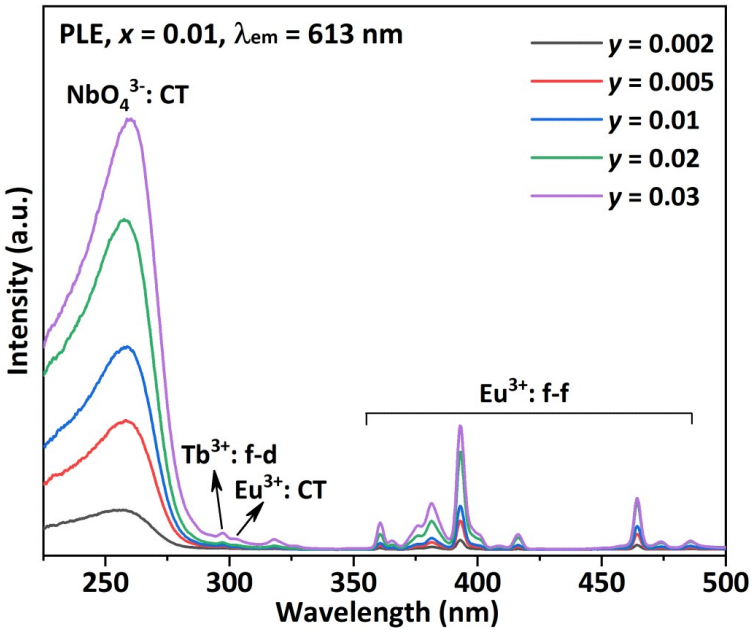

Fig. S7 PLE spectra of the $(Y_{0.99-y}Tb_{0.01}Eu_y)NbO_4$ phosphors.

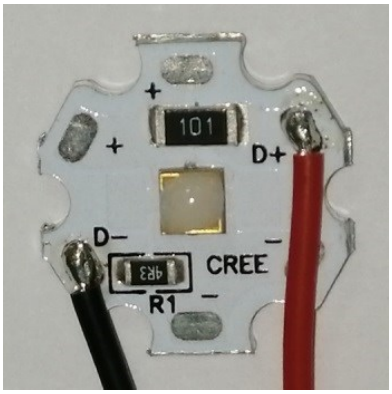

Fig. S8 Appearance of the as-fabricated 275 nm UV chip-based pc-WLED.

Table S1 Optical properties of the as-fabricated pc-WLED.

Driving current (mA)		50	60	70	80
CIE	X	0.337	0.325	0.312	0.291
	Y	0.340	0.338	0.323	0.306
CCT (K)		5517	5934	6317	6976
CRI		86.7	83.4	78.9	73.0
Luminous efficacy (lm/W)		10.77	12.31	11.71	12.02