Morphology/phase controllable synthesis of monodisperse $ScVO_4$ microcrystals and tunable multicolor luminescent properties in $Sc(La)VO_4(PO_4):Bi^{3+},Ln^{3+}$ phosphors

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Table S1 Summary of the photoluminescence properties of $ScVO_4$:6%Ln^{3+} (Ln = Sm, Eu, Sm, Dy, Ho, Er and Tm) microcrystals under 278nm excitation.

No.		Emission peaks (nm)	Emission transition
a	$ScVO_4$:6%Sm^{3+}	498	host
		569	$^4F_{5/2}$-$^6H_{5/2}$
		607	$^4F_{5/2}$-$^6H_{7/2}$
		651	$^4F_{5/2}$-$^6H_{9/2}$
b	$ScVO_4$:6%Eu^{3+}	599	$^5D_0$- $^7F_1$
		619	$^5D_0$- $^7F_2$
c	$ScVO_4$:6%Dy^{3+}	485	$^4F_{9/2}$- $^6H_{15/2}$
		579	$^4F_{9/2}$- $^6H_{13/2}$
d	$ScVO_4$:6%Ho^{3+}	502	host
		548	$^5F_4$ -$^5I_8$
e	$ScVO_4$:6%Er^{3+}	528	$^2H_{11/2}$- $^4I_{15/2}$
		549,559	$^4S_{3/2}$- $^4I_{15/2}$
f	$ScVO_4$:6%Tm^{3+}	478	$^1D_2$ - $^3F_4$

Table S2 Emission peaks and FWHM of $Sc(VO_4)_{1-x}(PO_4)_x$:1% Bi^{3+} (x = 0, 0.2, 0.4, 0.6, 0.8, 1).

No.	Compounds	E_m/nm	FWHM/nm
1	$Sc(VO_4)$:1%Bi^{3+}	560	93
2	$Sc(VO_4)_{0.8}(PO_4)_{0.2}$:1%$Bi^{3+}$	550	107
3	$Sc(VO_4)_{0.6}(PO_4)_{0.4}$:1%$Bi^{3+}$	541	122
4	$Sc(VO_4)_{0.4}(PO_4)_{0.6}$:1%$Bi^{3+}$	502	152
5	$Sc(VO_4)_{0.2}(PO_4)_{0.8}$:1%$Bi^{3+}$	470	220
6	$ScPO_4$:1%Bi^{3+}	376	81

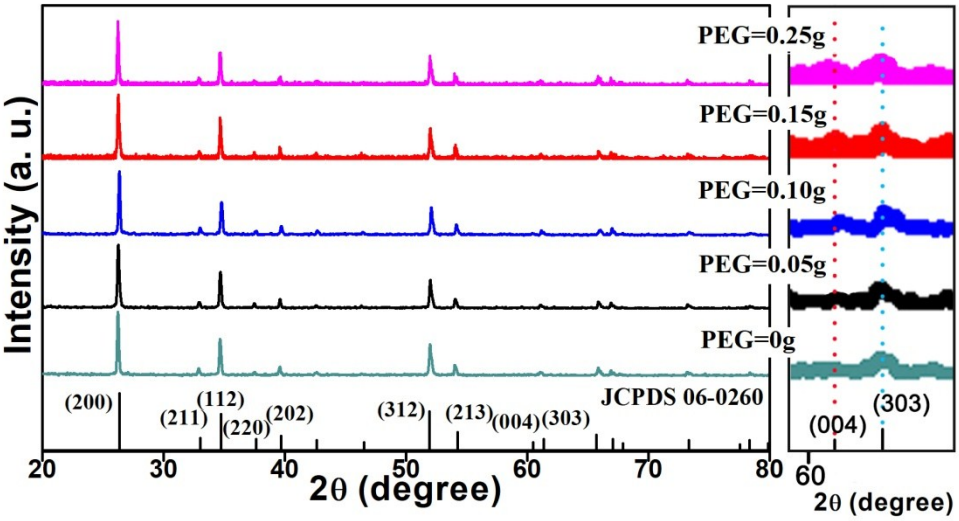

Fig. S1 Magnified the XRD patterns of the as-prepared $ScVO_4$ samples formed in the presence of different amount of PEG. The relative intensity ratio of (004)/(303) increases a little with the increase of PEG from 0 to 0.25 g, which is consistent with structural alterations in Figure 6g.

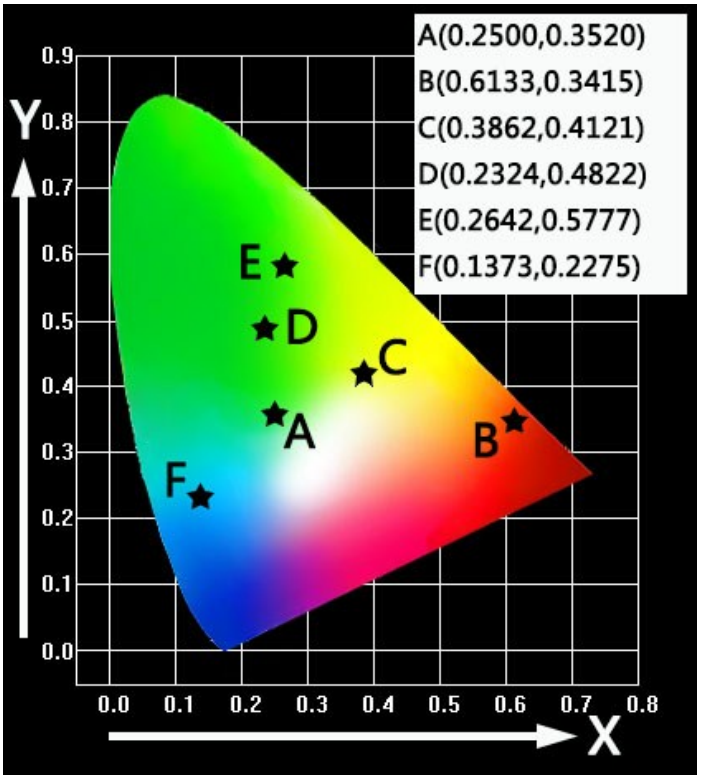

Fig. S2 The CIE chromaticity coordinates of $ScVO_4$:6%Sm^{3+} (A), 6%Eu^{3+} (B), 6%Dy^{3+} (C), 6%Ho^{3+} (D) , 6%Er^{3+} (E), 6%Tm^{3+} (F), respectively.