Supporting Information

Highly Stable $K_2SiF_6:Mn^{4+}@K_2SiF_6$ Composite Phosphor with Narrow Red Emission for White LEDs

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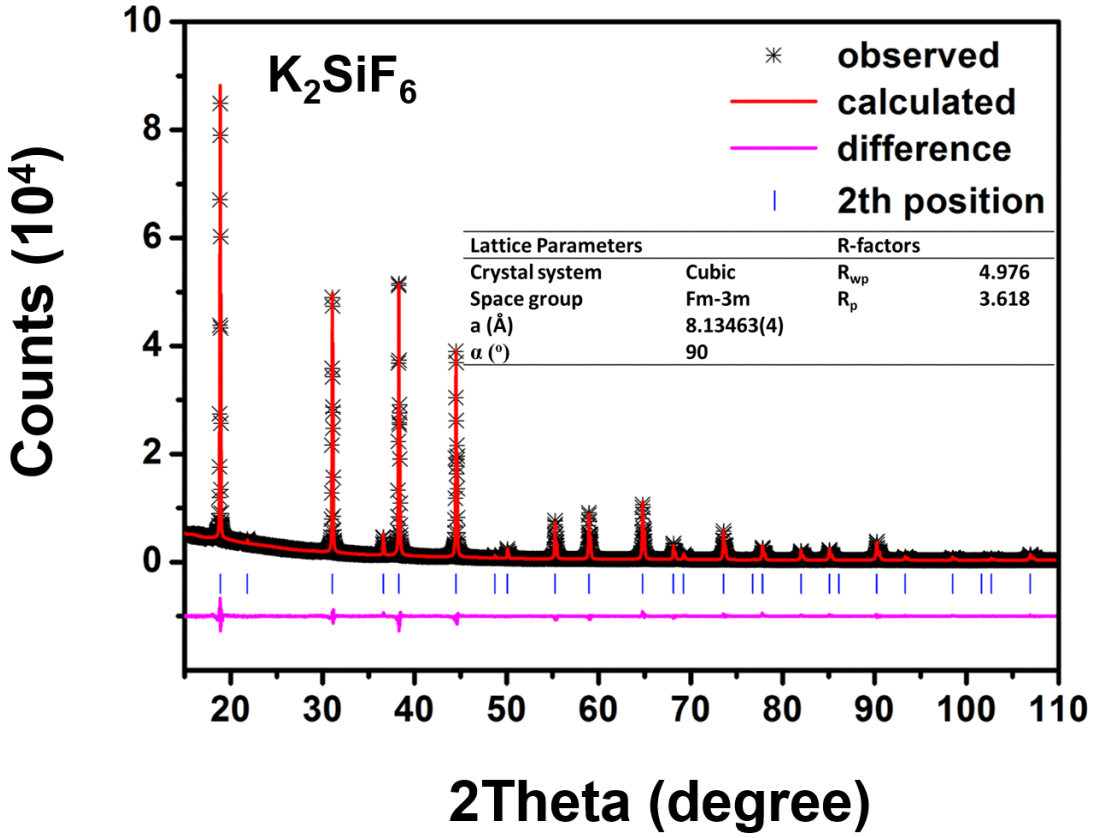

Figure S1 XRD refinement results of as-prepared K_2SiF_6 matrix.

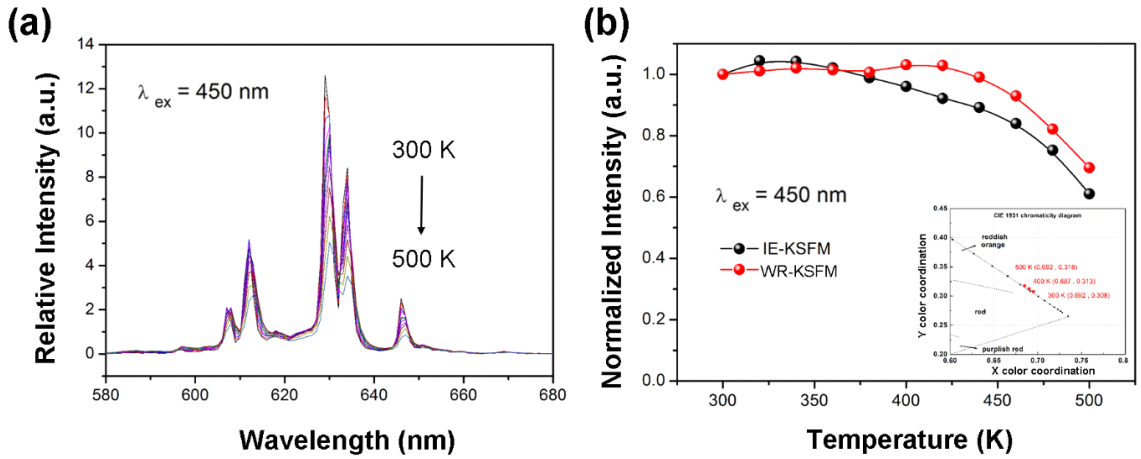

Figure S2 (a) PL spectra of WR-KSFM-8 and (b) thermal quenching curves of WR-KSFM and IE-KSFM at the temperature range from 300-500 K. The inset of (b) shows the CIE color coordinates.

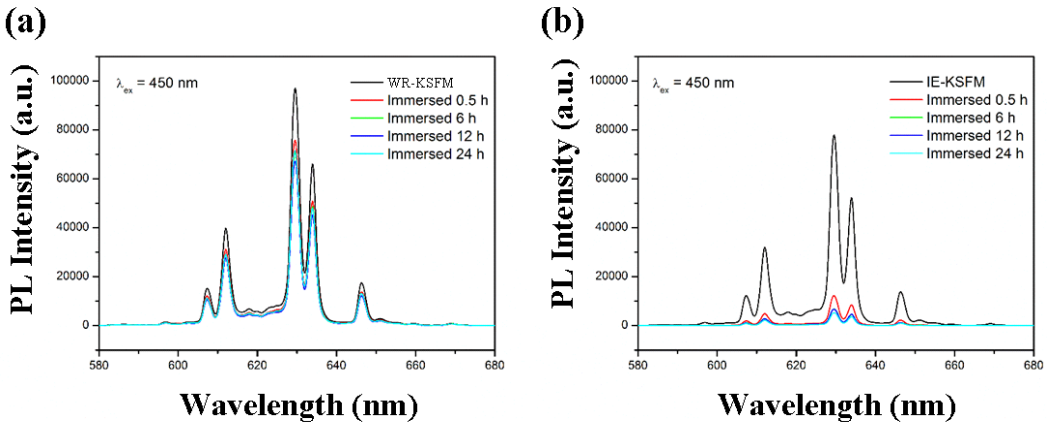

Figure S3 PL spectra of (a) WR-KSFM-8 and (b) IE-KSFM samples after immersion in water for different time.

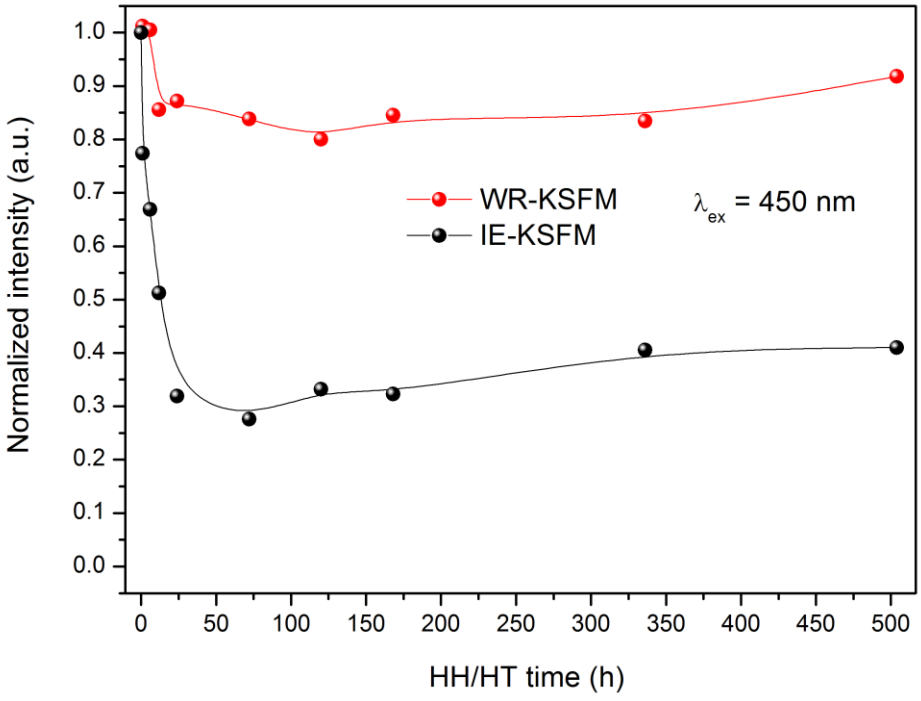

Figure S4 The emission intensity of WR-KSFM (red line) and IE-KSFM (black line) after being aging under HH and HT conditions for t hours (t= 0 ~ 504; normalized at t = 0).

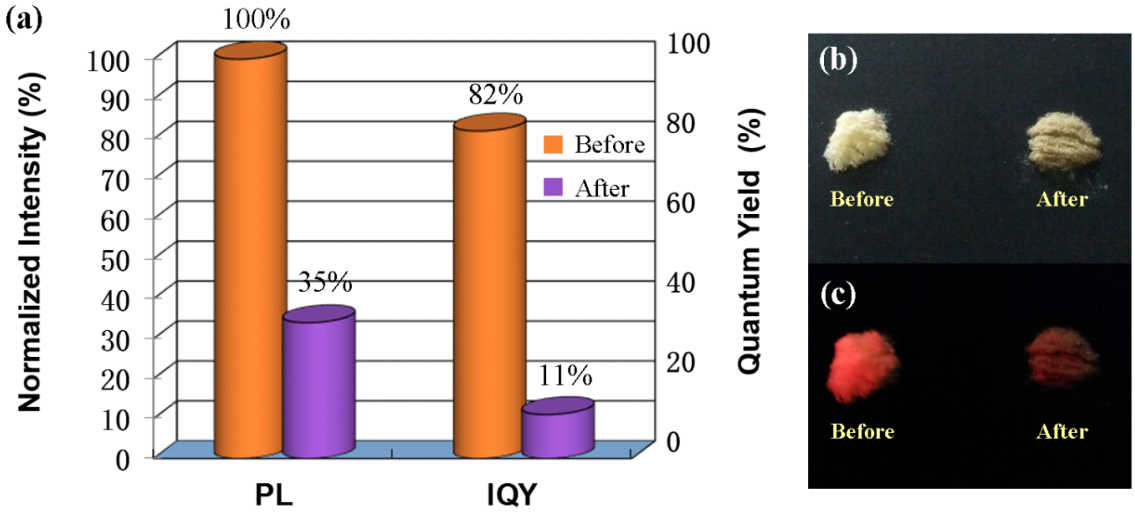

Figure S5 (a) The emission intensity and inner quantum yield and photographs (b and c under natural light and 365-nm UV-lamp, respectively) of CO-KSFM before and after 6 h immersion in water.

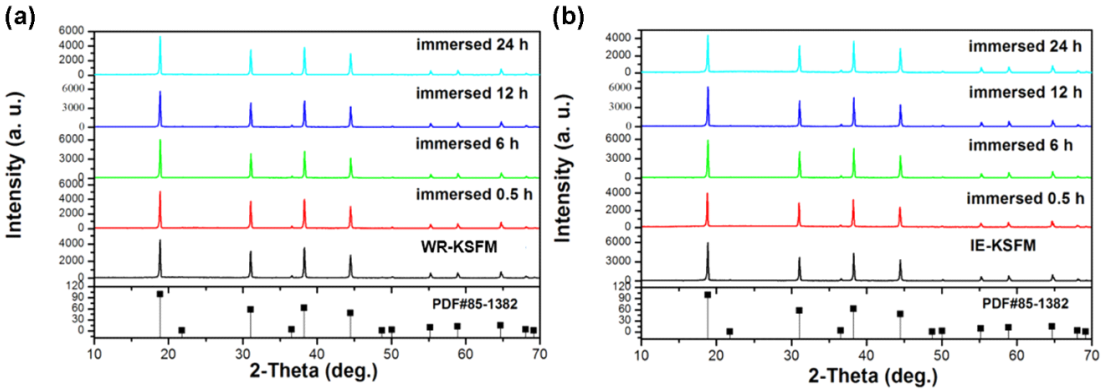

Figure S6 XRD patterns of (a) WR-KSFM and (b) IE-KSFM before and after t h immersion in water (t=0.5, 6, 12 and 24).

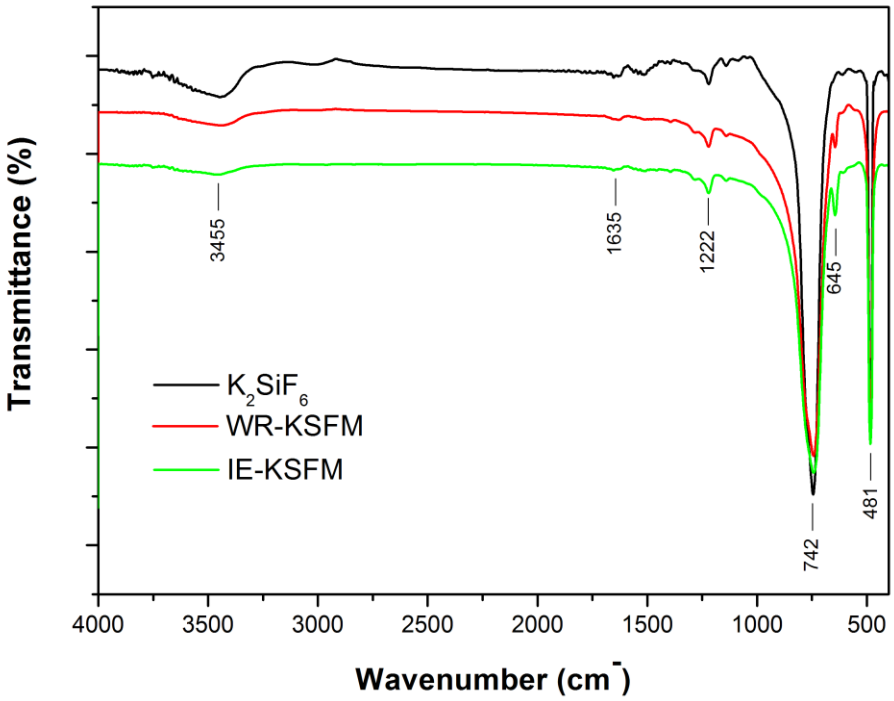

Figure S7 FT-IR spectra of the WR-KEFM (red line), IE-KSFM (green line) and K_2SiF_6 (black line).

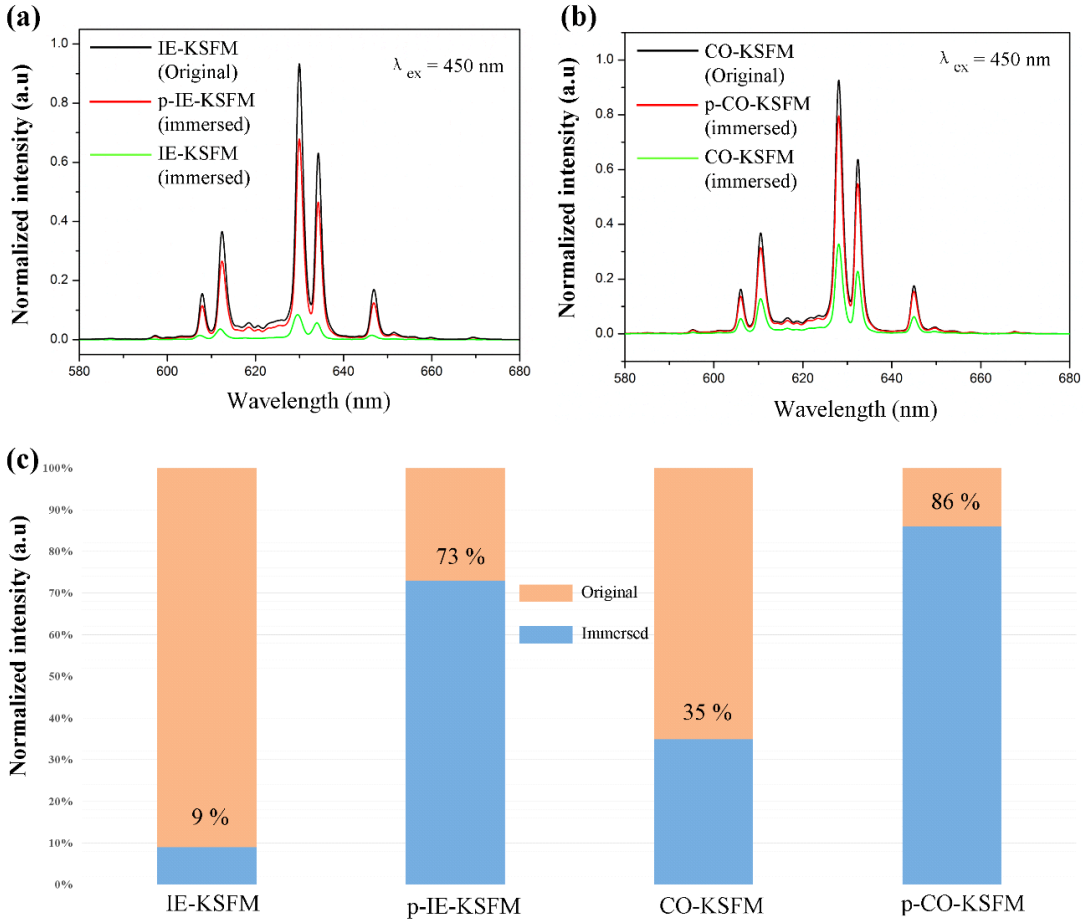

Figure S8 (a, b) PL spectra and (c) the emission intensity of IE-KSFM/p-IE-KSFM and CO-KSFM/p-CO-KSFM before and after 6 hours immersion.

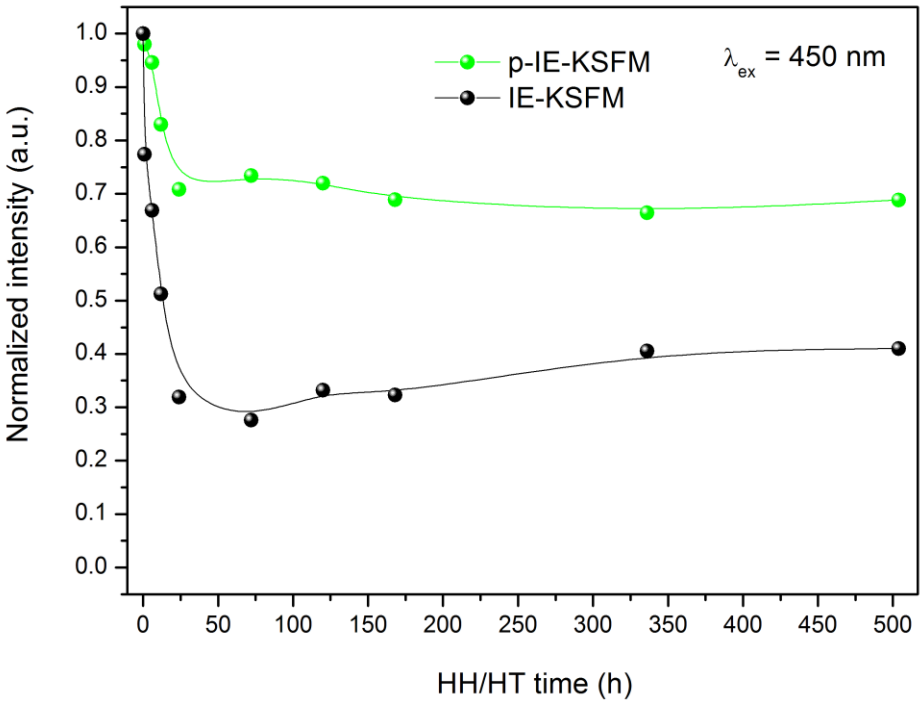

Figure S9 The emission intensity of p-IE-KSFM (green line) and IE-KSFM (black line) after being aging under HH and HT conditions for t hours (t=0 ~ 504; normalized at t=0).

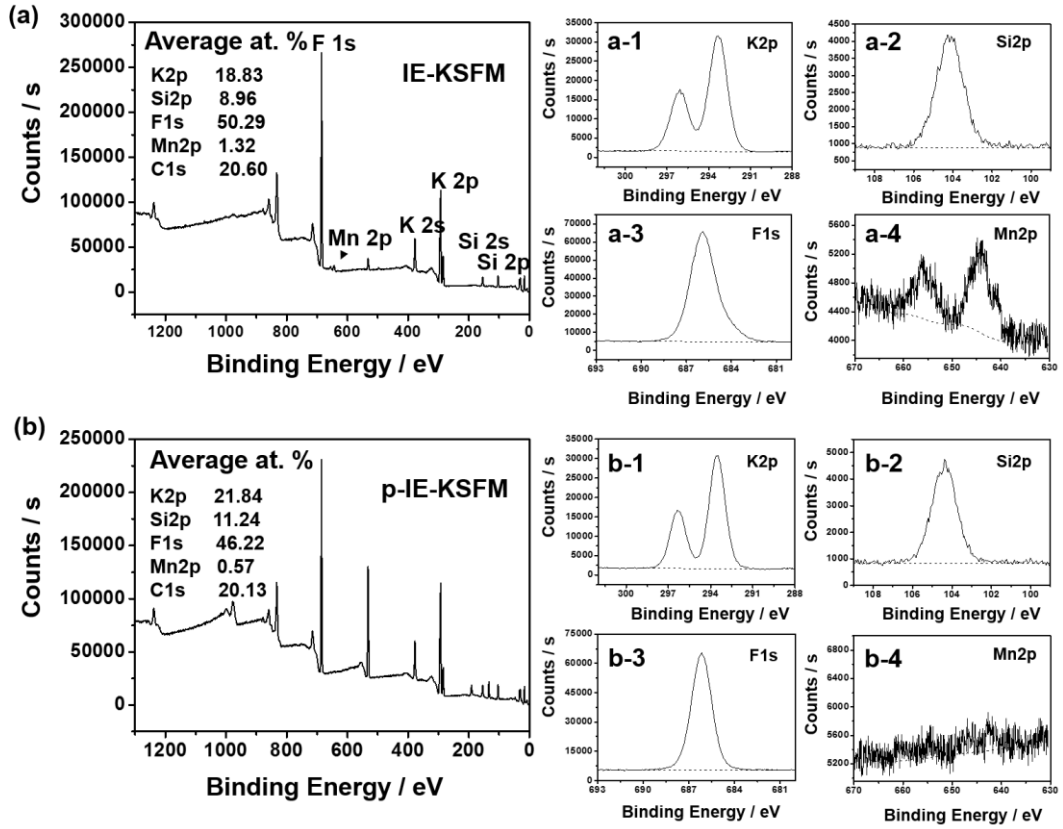

Figure S10 XPS spectra of (a) IE-KSFM, (b) p-IE-KSFM and high-resolution XPS of K2p, Si2p, F1s and Mn2p in (a) and (b).