

Highly Efficient NIR-NIR Upconversion in Potassium Substituted $\text{CaMoO}_4:\text{Er}^{3+},\text{Yb}^{3+}$ Phosphor for Potential Biomedical Applications

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Electronic Supplementary Information (ESI):

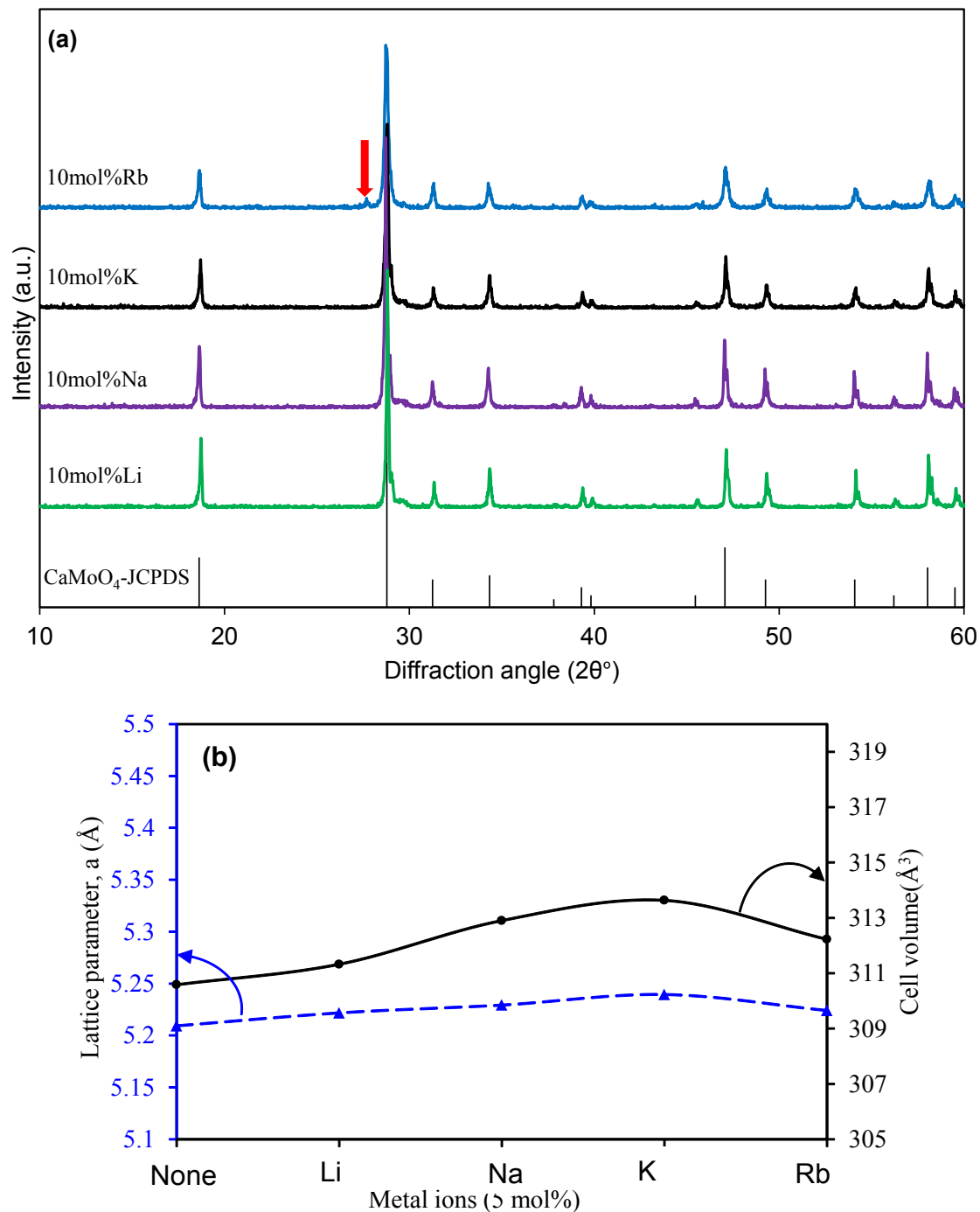


Fig. S1 XRD patterns of 10 mol% M^+ ($\text{M} = \text{Li}, \text{Na}, \text{K}, \text{Rb}$) substituted $\text{CaMoO}_4:0.001\text{Tm}^{3+}, 0.1\text{Yb}^{3+}$ phosphors (a) and variation of lattice parameters with alkali metal ions substitution (b).

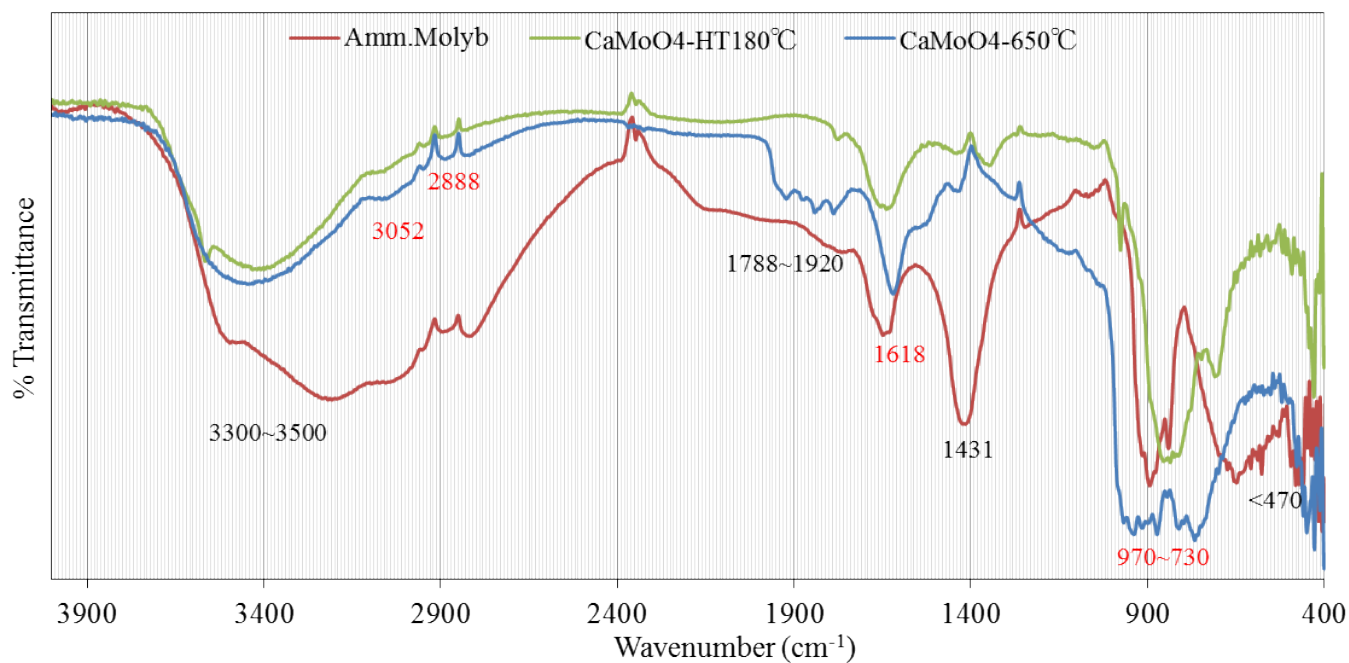


Fig. S2 FT-IR spectra of Ammonium molybdate tetrahydrate (precursor used during HT process), CaMoO₄ phosphor prepared by HT at 180 °C and CaMoO₄ phosphor post annealed at 650°C for 1hour.

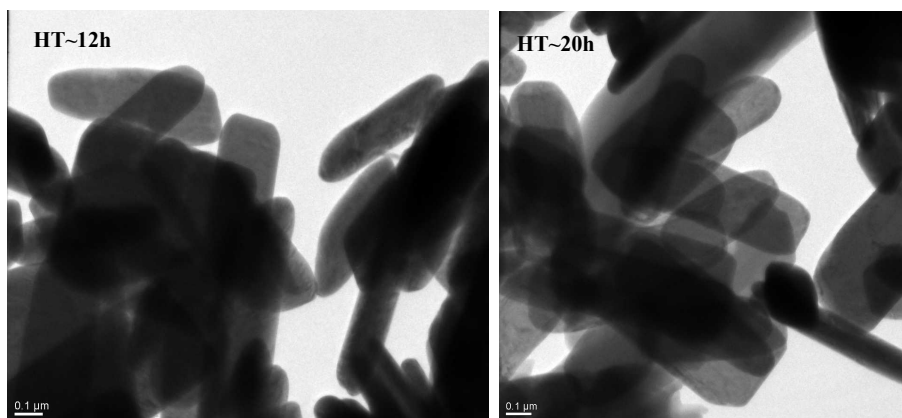


Fig. S3 TEM images of rice grains CaMoO₄:Tm³⁺, Yb³⁺ size changed with hydrothermal treatment time.

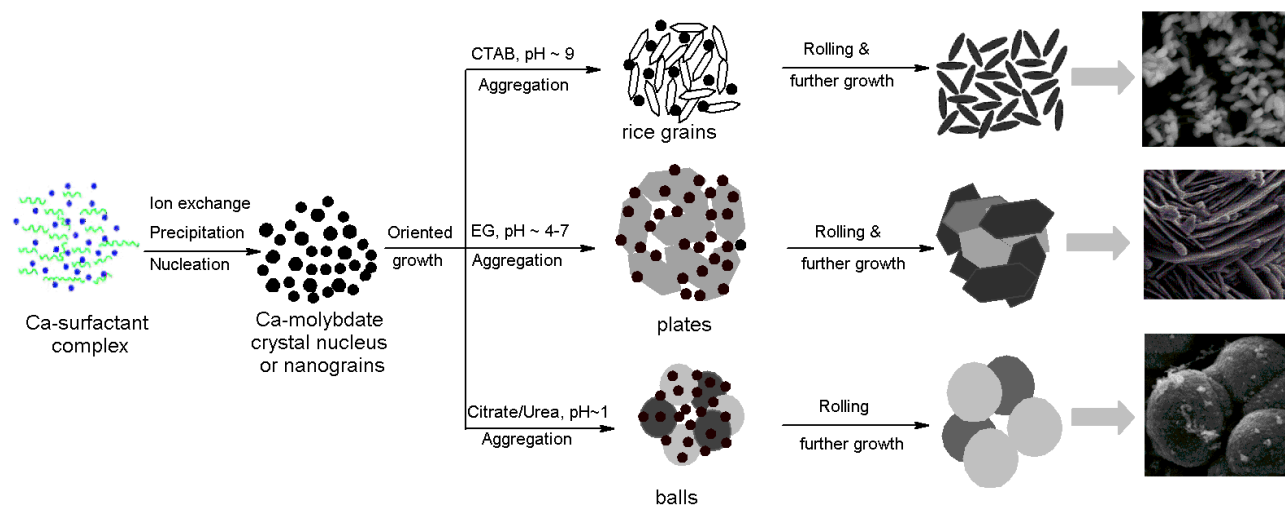


Fig. S4 Formation mechanism of different shaped $\text{CaMoO}_4:\text{Tm}^{3+}, \text{Yb}^{3+}$ phosphors according to the reaction conditions.

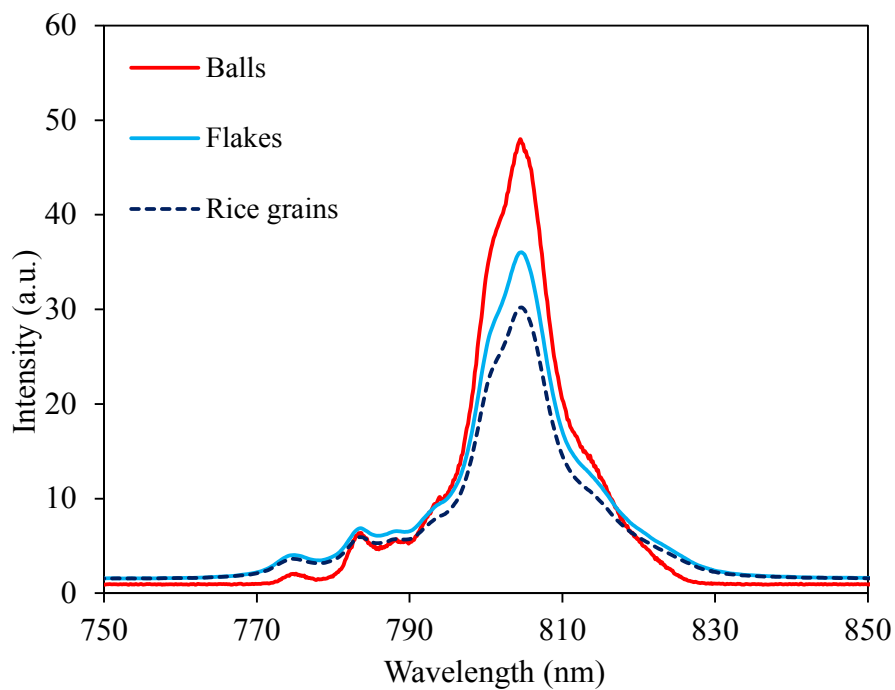


Fig. S5 Variation of UC emission intensity of $\text{CaMoO}_4:\text{Tm}^{3+}, \text{Yb}^{3+}, \text{K}^+$ phosphors according to the particles shape.

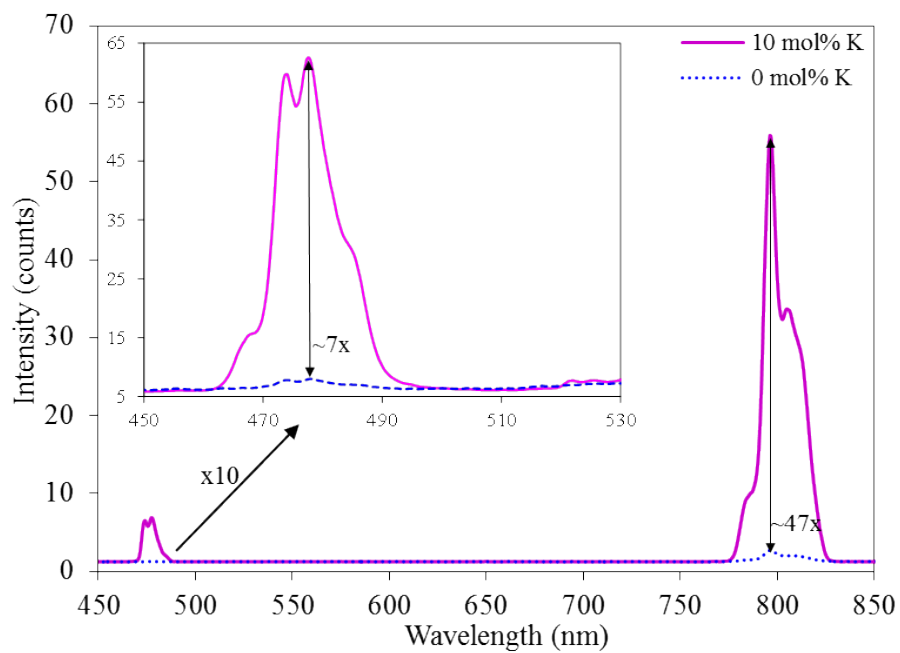


Fig. S6 UC emission (477nm Vs 797nm) intensification of $\text{CaMoO}_4:\text{TM}^{3+}, \text{Yb}^{3+}$ phosphors by K^+ substitution.