

# Supporting Information

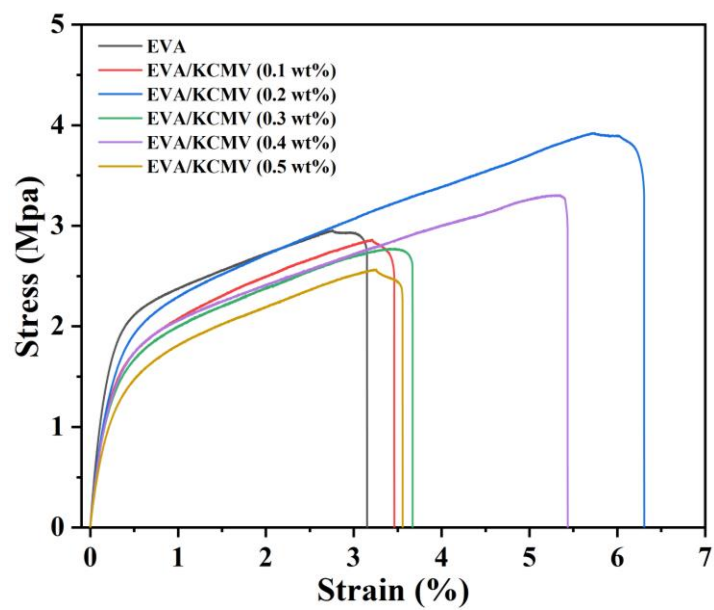
## Enhanced Photovoltaic Performance of Silicon Solar Cells Using Down-Shift $\text{KCa}_2\text{Mg}_2(\text{VO}_4)_3$ phosphor

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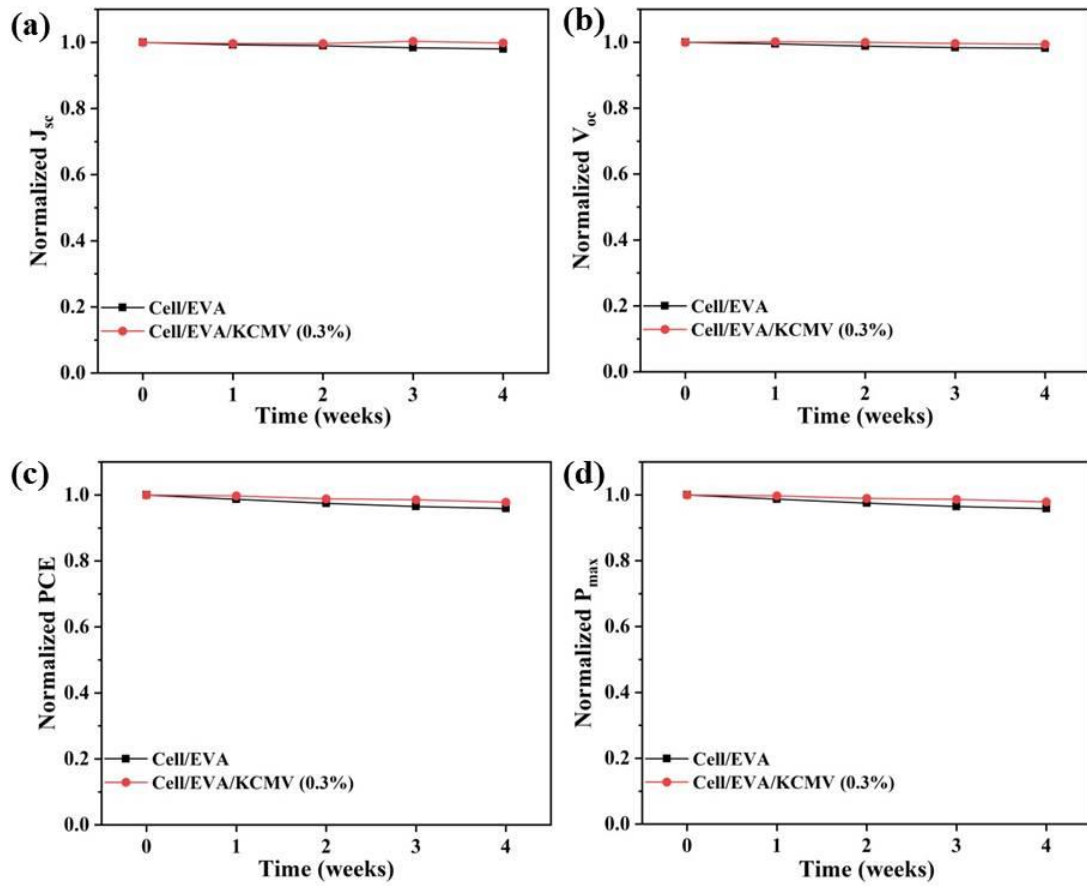
**Fig. S1** Stress-strain curves of EVA/KCMV composite films at different addition ratios.

**Table S1** Refined crystallographic parameters of KCMV phosphors.

<b>formula</b>	<b>KCa<sub>2</sub>Mg<sub>2</sub>(VO<sub>4</sub>)<sub>3</sub></b>
<b>symmetry</b>	<b>Cubic</b>
<b>Space group</b>	<b><i>Ia3d</i></b>
<b><i>a</i>/Å</b>	<b>12.4707(2)</b>
<b>Volume/Å<sup>3</sup></b>	<b>1939.4261(7)</b>
<b><i>Z</i></b>	<b>8</b>
<b>crystal density (g/cm<sup>3</sup>)</b>	<b>3.5117</b>
<b>structure refinement</b>	<b>Topas 5.0</b>
<b>temperature/K</b>	<b>293</b>
<b>2θ range/deg</b>	<b>10-120</b>
<b>Profile function</b>	<b>PV_TCHZ</b>
<b><i>R</i><sub>exp</sub></b>	<b>5.75%</b>
<b><i>R</i><sub>wp</sub></b>	<b>5.85%</b>
<b><i>R</i><sub>p</sub></b>	<b>4.57%</b>

**Table S2** Refine Atomic coordinates of KCMV from XRD data.

<b>Atom</b>	<b>Wyckoff site</b>	<b><i>x</i></b>	<b><i>y</i></b>	<b><i>z</i></b>	<b>Occ.</b>	<b>Beq.</b>
<b>Ca1</b>	<b>24c</b>	<b>0.375</b>	<b>0.5</b>	<b>0.25</b>	<b>0.667</b>	<b>3.00(7)</b>
<b>K1</b>	<b>24c</b>	<b>0.375</b>	<b>0.5</b>	<b>0.25</b>	<b>0.333</b>	<b>3.00(15)</b>
<b>Mg1</b>	<b>16a</b>	<b>0.5</b>	<b>0.5</b>	<b>0</b>	<b>1</b>	<b>2.92(9)</b>
<b>V1</b>	<b>24d</b>	<b>0.625</b>	<b>0.5</b>	<b>0.25</b>	<b>1</b>	<b>1.16(5)</b>
<b>O1</b>	<b>96h</b>	<b>0.5436(3)</b>	<b>0.5514(2)</b>	<b>0.1573(2)</b>	<b>1</b>	<b>0.91(7)</b>



**Fig. S2** The changes of photovoltaic parameters of monocrystalline silicon solar cells assembled with pure EVA and EVA/KCMV (0.3%) under different time ultraviolet light: (a)  $J_{sc}$ . (b)  $V_{oc}$ . (c)  $P_{max}$ . (d) PCE.