Supporting Information

A Facile method to Synthesize Small Size and Superior Crystalline $Cs_{0.32}WO_3$ Nanoparticles for Transparent NIR Shielding Coatings

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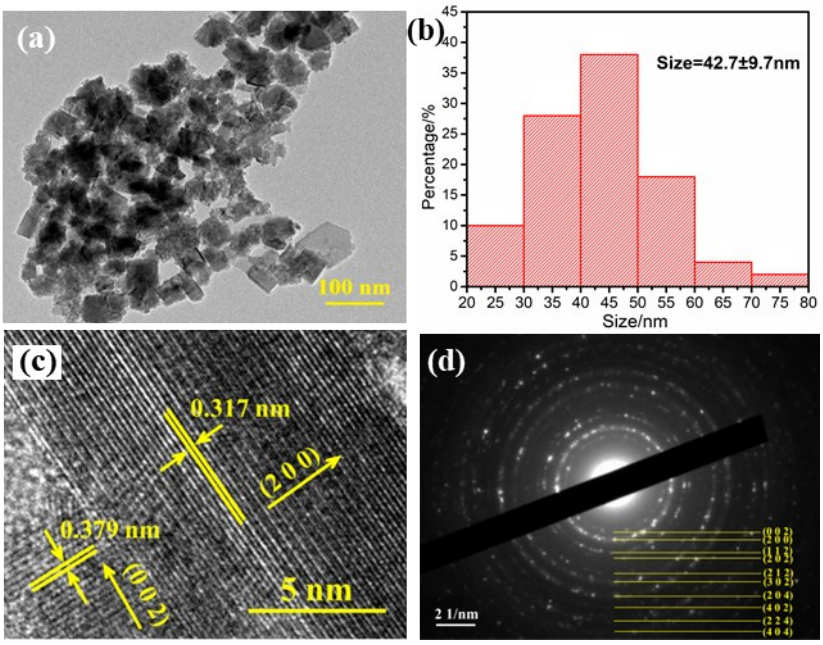

Fig. S1. (a) TEM image, (b) Size distribution result, (c) HR-TEM image and (d) SAED pattern of the optimal Cs_xWO_3 nanoparticles.

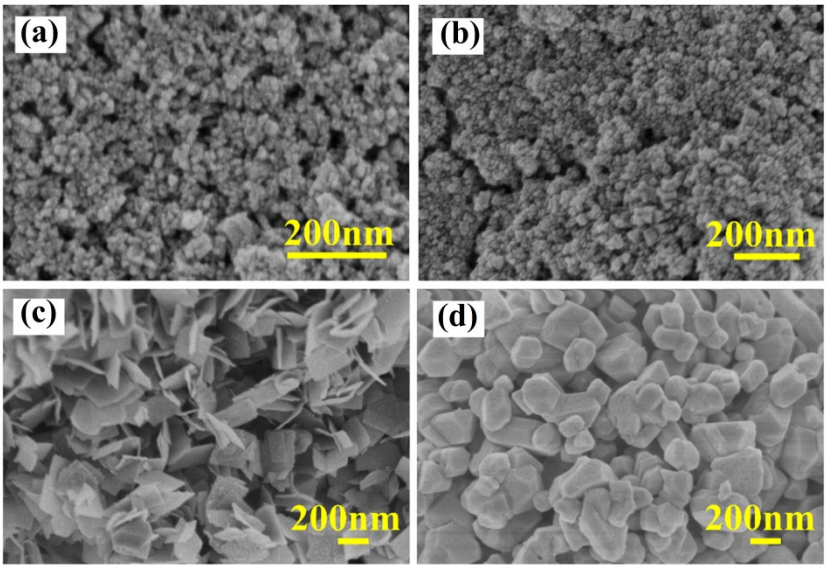

Fig. S2. SEM images of obtained blue, orange and mauve precursor precipitate, respectively, after solvothermal reaction at 100 ºC for 4 h (a, c and d) and obtained blue precursor precipitate after solvothermal reaction at 200 ºC for 4 h (b).

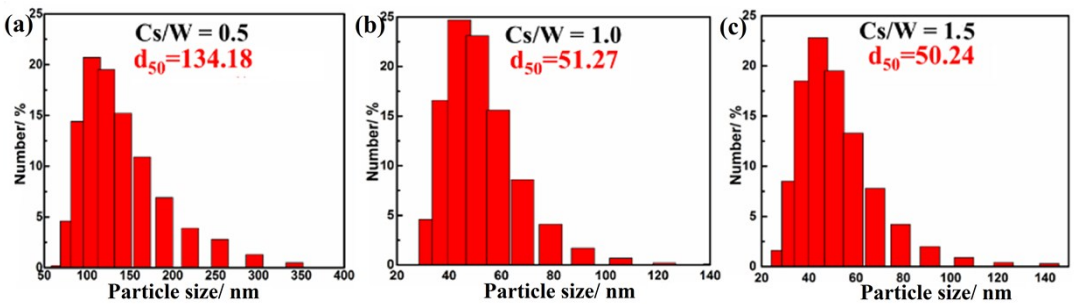

Fig. S3. Particle size distributions of aqueous dispersions of Cs_xWO_3 synthesized with Cs/W ratio of (a) 0.5, (b) 1 and (c) 1.5.

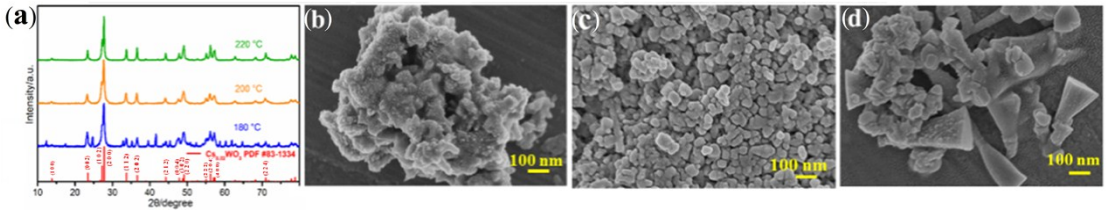

Fig. S4. XRD patterns (a) and SEM images of Cs_xWO_3 at 180 °C (b), 200 °C (c), 220 °C (d) with reaction time of 4 h.

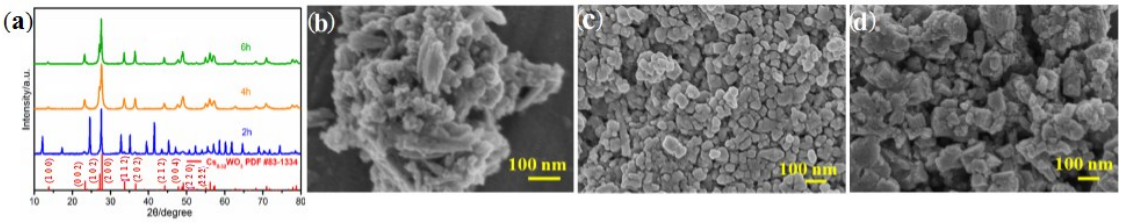

Fig. S5. XRD patterns (a) and SEM images of Cs_xWO_3 at 200 °C with reaction time of 2 h (b), 4 h (c) and 6 h (d).

The XRD patterns and SEM images shown when the reaction temperature exceeded 200 °C (Fig. S4) or time exceeded 4 h (Fig. S5), the size of particles are usually more than several hundred nanometers but the improvement of crystalline is modest. In addition, when the reaction temperature under 200 °C or time shorter than 4 h, the impure phase would appear. Hence, the factor, namely 200 °C and 4 h was selected for the manuscript.

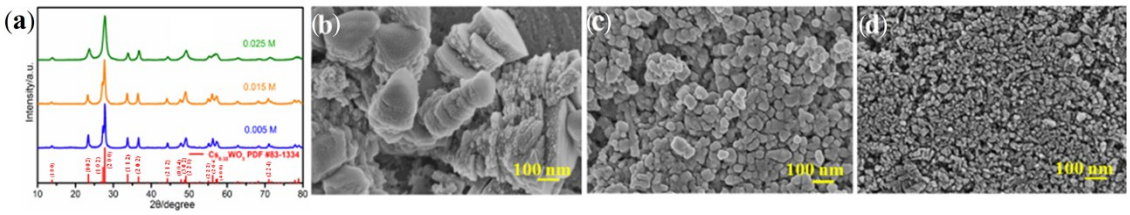

Fig. S6. XRD patterns (a) and SEM images of Cs_xWO_3 at 200 °C, 4h with concentration of WCl_6 at (b) 0.005 M, (c) 0.015 M, and (d) 0.025 M.

The concentration of WCl_6 also has a great impact on reaction process (Fig. S6). When concentration of WCl_6 is 0.005 M, the nanoparticles is of good crystalline but larger size. Increasing the concentration to 0.025 M, instead, the particles are too small to have a high degree of crystalline.