Electronic Supplementary Information

Facile hydrothermal synthesis of $Tb_2(MoO_4)_3:Eu^{3+}$ phosphors: controllable microstructures, tunable emission colors, and the energy transfer mechanism

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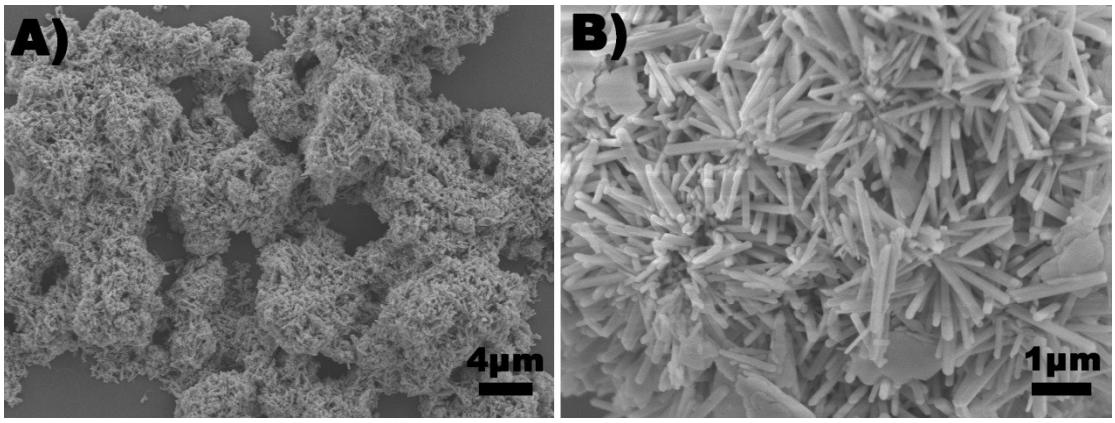

Fig. S1 (A) SEM image of $Tb_2(MoO_4)_3$ precursors prepared with 0.84g citric acid; (B) Detailed surface information of image (A).

When the added citric acid was 0.84g, the nanorods assembled into irregular agglomerations, without regular shapes being detected. A closer observation of the surface of agglomeration, it was found that the nanorods grow further to about 2 μm in length and 140 nm in diameter (900-1100 nm in length and 100 nm in diameter when citric acid = 0.42g).

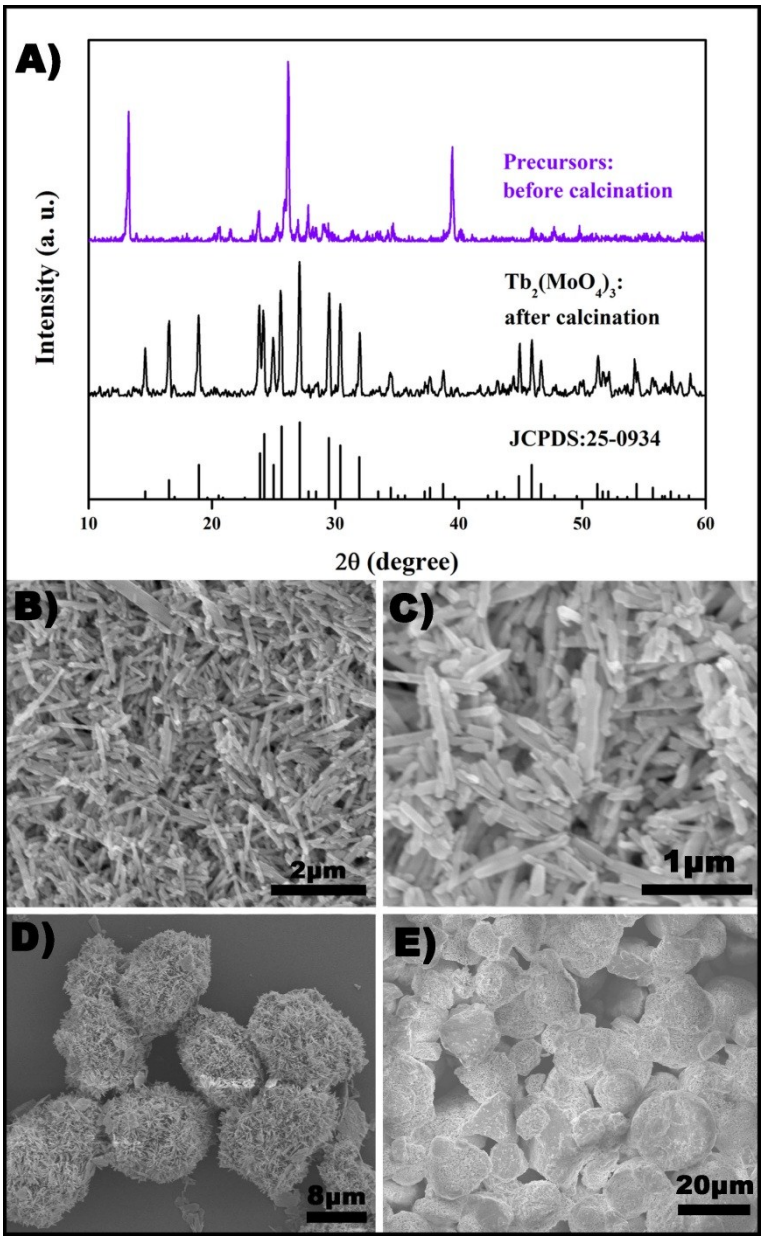

Fig. S2 (A) XRD patterns of the samples obtained before and after calcination (citric acid = 1.26g); (B) and (C) are microstructures of the samples obtained before and after calcination (citric acid = 0.42g); (D) and (E) are microstructures of the samples obtained before and after calcination (citric acid = 1.26g).

The XRD pattern of the precursors (before calcination) cannot be indexed into pure monoclinic $Tb_2(MoO_4)_3$ phase (No.25-0934); whereas, after calcination, the obtained pattern (Citric acid = 1.26g) matches well with the pure $Tb_2(MoO_4)_3$ phase, implying that the calcination changes the phase of precursors and is essential to achieve the pure $Tb_2(MoO_4)_3$ phase.

The SEM images demonstrate that the calcination did not cause any significant changes in microstructures of the final products, except for the nanorods on the microsphere' surface binding to each other more tightly (Citric acid = 1.26g).