Supplementary Information

Surfactant-Free Synthesis of SrTiO$_3$ Hierarchical Structures in an Ethanol/Water Mixed Solvent at Room Temperature

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![Fig. S1](image1.png)

Fig. S1 EDS spectrum of the SrTiO$_3$ sample. The signals corresponding to Cu arise from the TEM grid.

![Fig. S2](image2.png)

Fig. S2 XRD patterns of the samples prepared with different volume ration of water/ethanol in 0.45 mol·dm$^{-3}$ KOH: (a) pure water, (b) water: ethanol = 3:1, and (c) water: ethanol = 1:3.
Fig. S3 SEM images of the SrTiO$_3$ samples prepared in a solution with different volume ratio of water/ethanol and 0.45 mol·dm$^{-3}$ KOH: (a) pure water, (b) water: ethanol = 3:1, and (c) water: ethanol = 1:3.

Fig. S4 XRD patterns of the samples prepared by using 0.9 mol·dm$^{-3}$ KOH with different reaction time: (a) 5 min, (b) 1 h, (c) 24 h, and (d) 96 h.
Fig. S5 TEM images of the samples prepared by using 0.9 mol·dm$^{-3}$ KOH with different reaction time: (a) 5 min, (b) 5 h, (c) 24 h, and (d) 96 h.

Fig. S6 XRD patterns of the samples obtained by using 0.45 mol·dm$^{-3}$ KOH with different reaction time: (a) 5 min, (b) 1 h, (c) 24 h, and (d) 96 h.
**Fig. S7** TEM images of the samples obtained by using 0.45 mol·dm$^{-3}$ KOH with different reaction time: (a) 5 min, (b) 5 h, (c) 24 h, and (d) 96 h.
**Fig. S8** Size and morphology distribution of the samples prepared by using 2.7 mol·dm$^{-3}$ KOH.
**Fig. S9** Size and morphology distribution of the samples prepared by using 0.9 mol·dm\(^{-3}\) KOH.
Fig. S10 Size and morphology distribution of the samples prepared by using 0.45 mol·dm$^{-3}$ KOH.