Electronic Supplementary Information

Manipulating the Formation of NH_4TiOF_3 Mesocrystals: Effects of Temperature, Surfactant and pH

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Figure S1. XRD of the as-synthesized particles grown at (a) 4˚C with Brij 58, (b) 4˚C without Brij 58, (c) 23˚C with Brij 58, (d) 23˚C without Brij 58.

Figure S2. As-synthesized particles prepared at 4˚C in the presence of Brij 58. The solution pH was controlled by the amount of KOH solution (6.1 M).

Table S1. Summary of the particles grown at various conditions.

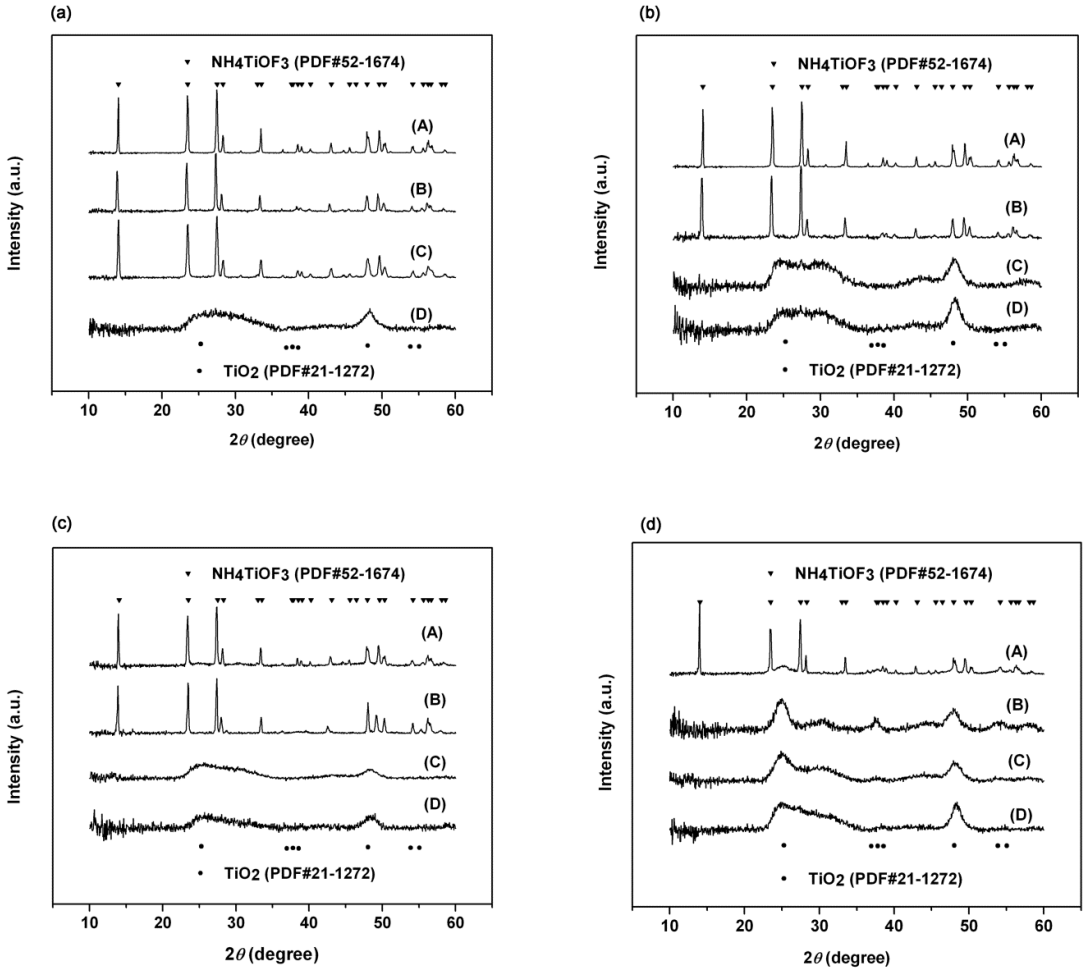

Figure S1. XRD of the as-synthesized particles grown at (a) 4˚C with Brij 58, (b) 4˚C without Brij 58, (c) 23˚C with Brij 58, (d) 23˚C without Brij 58. The amount of ammonia solution added into the reaction solutions: (A) 0 μL, (B) 80 μL, (C) 160 μL, (D) 240 μL.

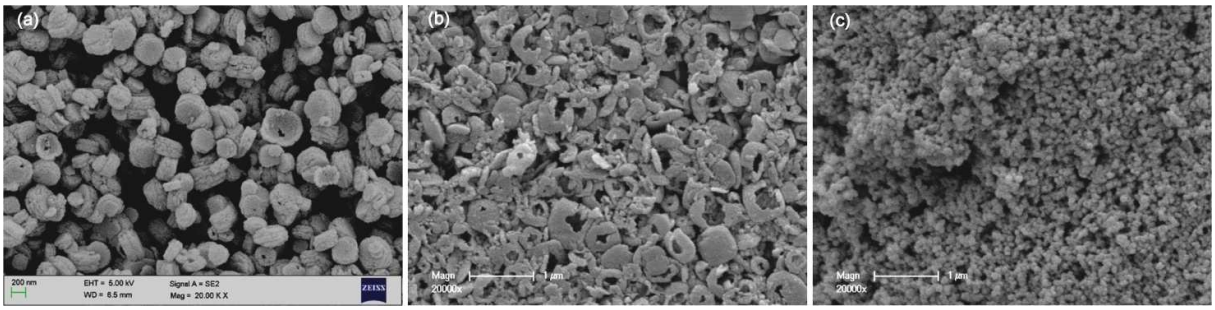

Figure S2. As-synthesized particles prepared at 4˚C in the presence of Brij 58. The solution pH was controlled by the amount of KOH solution (6.1 M). The amounts of KOH solution: (a) 80 μL; (b) 240 μL; (c) 720 μL. (a) and (b) are NH_4TiOF_3 mesocrystals; (c) aggregates of TiO_2 (anatase) nanoparticles.

Table S1. Summary of the particles grown at various conditions.

Reaction Condition	Crystalline Phase(s)	Morphology
Brij 58, $NH_3 \cdot H_2O$ (0 μL), 4˚C	NH_4TiOF_3	mesocrystal
Brij 58, $NH_3 \cdot H_2O$ (80 μL) , 4˚C	NH_4TiOF_3	mesocrystal
Brij 58, $NH_3 \cdot H_2O$ (160 μL) , 4˚C	NH_4TiOF_3	mesocrystal
Brij 58, $NH_3 \cdot H_2O$ (240 μL) , 4˚C	TiO_2	aggregates
$NH_3 \cdot H_2O$ (0 μL) , 4˚C	NH_4TiOF_3	aggregated mesocrystal
$NH_3 \cdot H_2O$ (80 μL) , 4˚C	NH_4TiOF_3	aggregates
$NH_3 \cdot H_2O$ (160 μL) , 4˚C	TiO_2	aggregates
$NH_3 \cdot H_2O$ (240 μL) , 4˚C	TiO_2	aggregates
Brij 58, $NH_3 \cdot H_2O$ (0 μL), 23˚C	NH_4TiOF_3	mesocrystal
Brij 58, $NH_3 \cdot H_2O$ (80 μL) , 23˚C	NH_4TiOF_3	mesocrystal
Brij 58, $NH_3 \cdot H_2O$ (160 μL) , 23˚C	TiO_2	aggregates
Brij 58, $NH_3 \cdot H_2O$ (240 μL) , 23˚C	TiO_2	aggregates
$NH_3 \cdot H_2O$ (0 μL) , 23˚C	NH_4TiOF_3 & TiO_2	aggregated mesocrystal
$NH_3 \cdot H_2O$ (80 μL) , 23˚C	TiO_2	aggregates
$NH_3 \cdot H_2O$ (160 μL) , 23˚C	TiO_2	aggregates
$NH_3 \cdot H_2O$ (240 μL) , 23˚C	TiO_2	aggregates