Supporting information for Phase Transition of Layered Titanate under Supercritical N, N-dimethylformamide and Supercritical Water

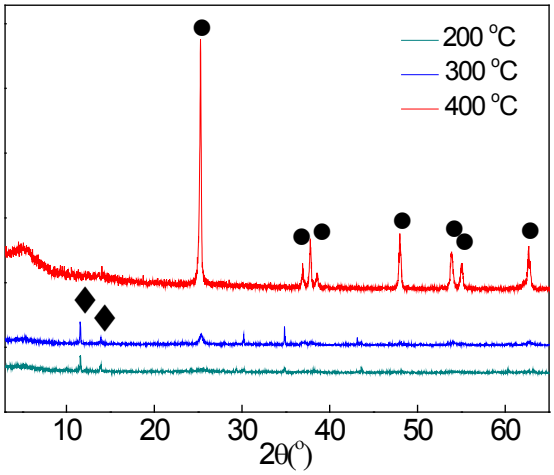

Figure.S1 Sediment XRD of $H_{1.07}Ti_{1.73}O_4 \cdot H_2O$ was treated by subcritical and supercritical water (2 h, 10 ml) with temperature. Anatase, and $K_2Ti_6O_{13}$ designated by the ● and ◆, respectively.

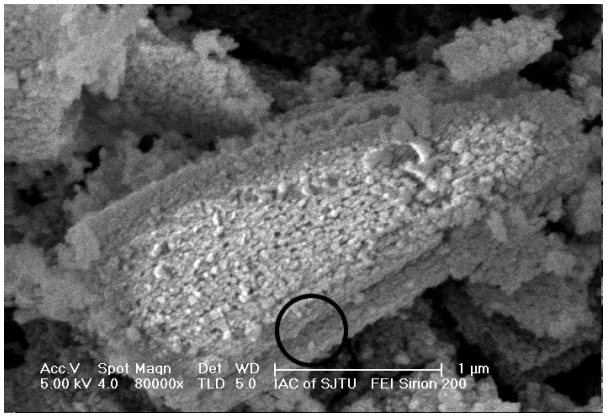

Figure.S2 SEM of sediment of $H_{1.07}Ti_{1.73}O_4 \cdot H_2O$ was treated by supercritical water (400 °C, 2 h, 10 ml)

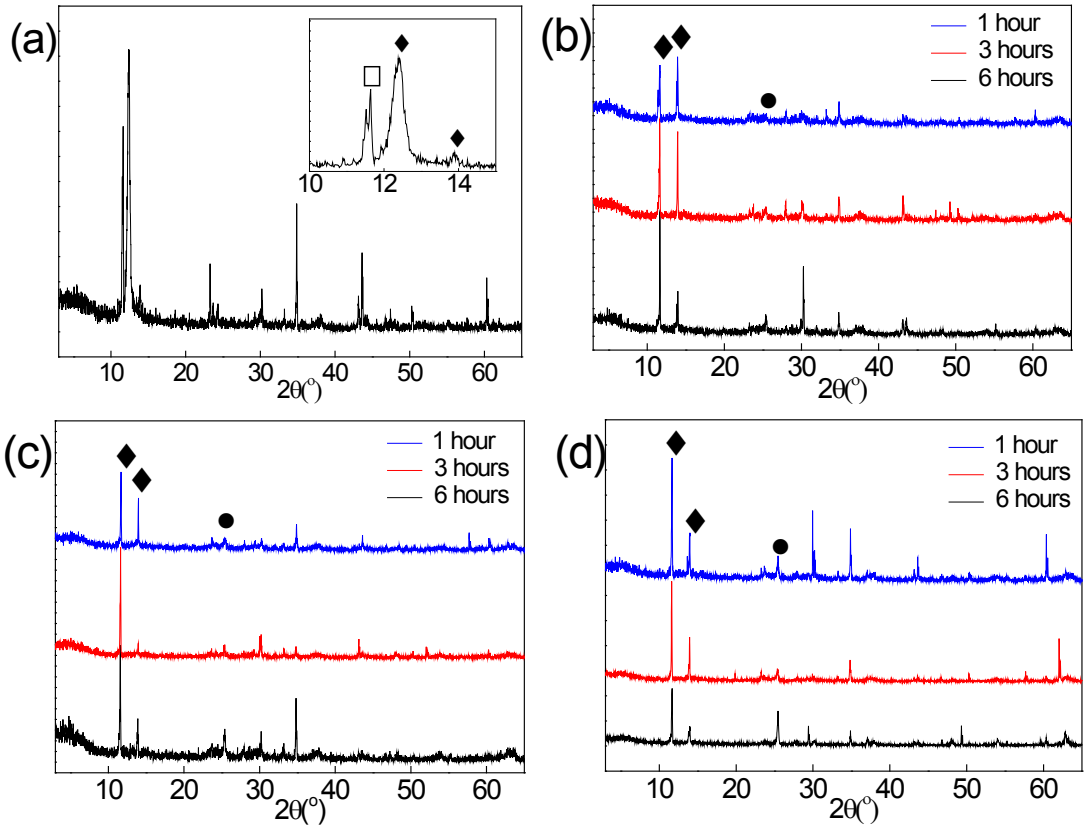

Figure.S3 XRD patterns (a) the calcination of $H_{1.07}Ti_{1.73}O_4 \cdot H_2O$ under air (180 ^oC, 30 min), inset shows the enlarge images; (b) the calcination of $H_{1.07}Ti_{1.73}O_4 \cdot H_2O$ under air (400 ^oC); (c) the calcination of $H_{1.07}Ti_{1.73}O_4 \cdot H_2O$ under air (500 ^oC); (d) the calcination of $H_{1.07}Ti_{1.73}O_4 \cdot H_2O$ under air (600 ^oC); $H_{1.07}Ti_{1.73}O_4 \cdot H_2O$ layered structure, anatase, and $K_2Ti_6O_{13}$, designated by the □, ●, and ◆, respectively.

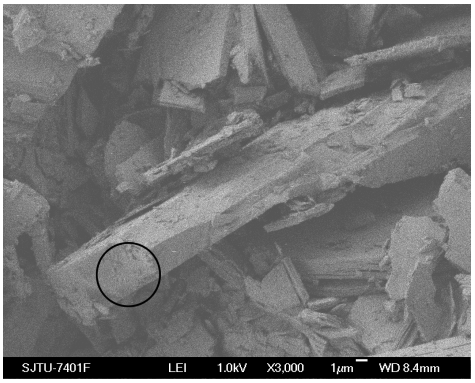

Figure.S4 SEM images of $H_{1.07}Ti_{1.73}O_4 \cdot H_2O$ was treated by calcination under air condition (400 ^oC, 2 h).

Fig. S3.a shows the XRD of heat treated sample under air (180 ^oC, 30 min). From the enlarge image, we can observe that the strong layered peak (2θ=9.8 ^{o}) becomes weak and shifts into high angle (2θ=11.6 ^{o}). This result confirms that the interlayer distance becomes small and dehydration happens. The SEM of $H_{1.07}Ti_{1.73}O_4 \cdot H_2O$ treated by calcination is shown in Fig. S4. From the SEM images, we find that the morphology of product was transformed from layered into rods. The distance between interlayer (cross section) disappeared due to dehydration. This phenomenon accords with the XRD results, and it confirms the dehydration process is underway. Fig. S3 b, c, d shows the temperature and time effect on the phase transition of $H_{1.07}Ti_{1.73}O_4 \cdot H_2O$ under air. When the temperature is higher than 400 ^oC, the layered peak (2θ=9.8 ^{o}) disappeared and the anatase (2θ=25.2 ^{o}) formed.