

Supporting Information

Transformation of Potassium Lindquist Hexaniobate to Various Potassium Niobates: Solvothermal Synthesis and Structural Evolution Mechanism

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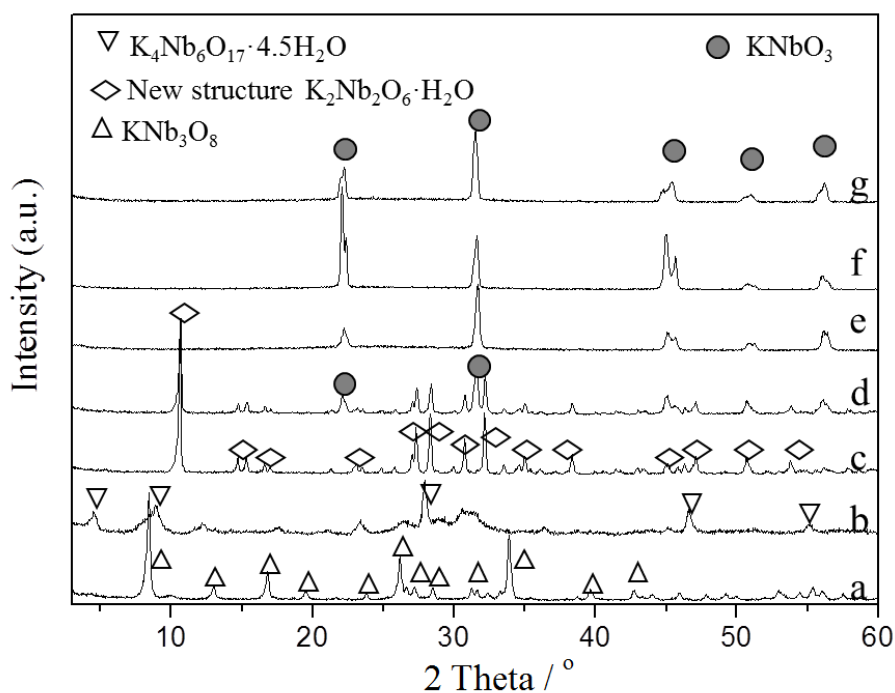


Figure S1 XRD patterns of samples obtained by solvothermal treatment of potassium hexaniobate in (a) pH=5.5, (b) KOH-0.1mol/L, (c) KOH-0.3mol/L, (d) KOH-0.5mol/L, (e) KOH-1.0mol/L, (f) KOH-2.0mol/L, (g) KOH-3.0mol/L water-ethanol (volume ratio=1/2) solution at 230 °C for 12h, respectively.

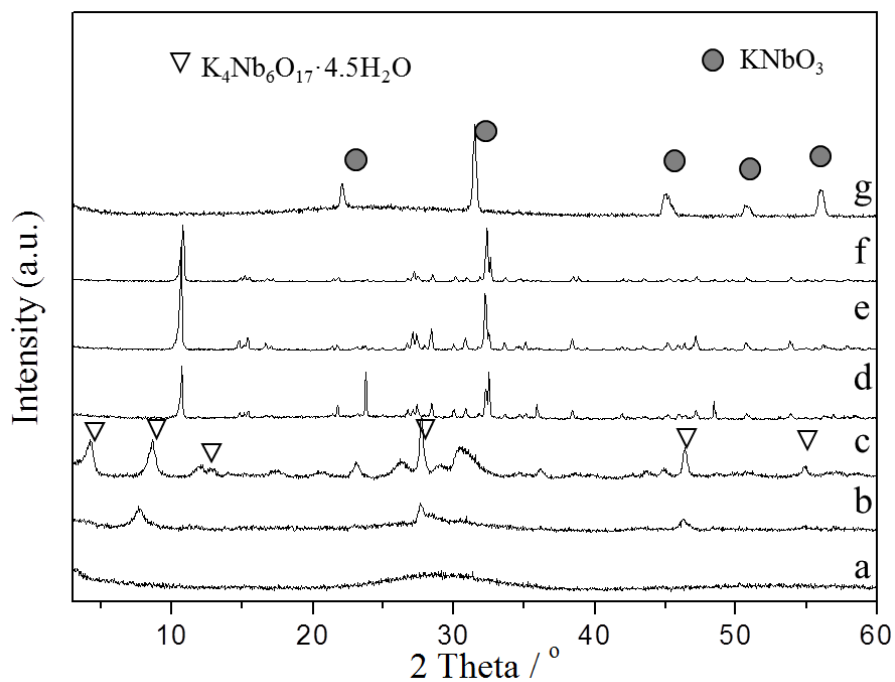


Figure S2. XRD patterns of samples obtained by solvothermal treatment of potassium hexaniobate in (a) pH=5.5, (b) KOH-0.1mol/L, (c) KOH-0.3mol/L, (d) KOH-0.5mol/L, (e) KOH-1.0mol/L, (f) KOH-2.0mol/L, (g) KOH-3.0mol/L water-ethanol (volume ratio=1/1) solution at 200 °C for 12h, respectively.

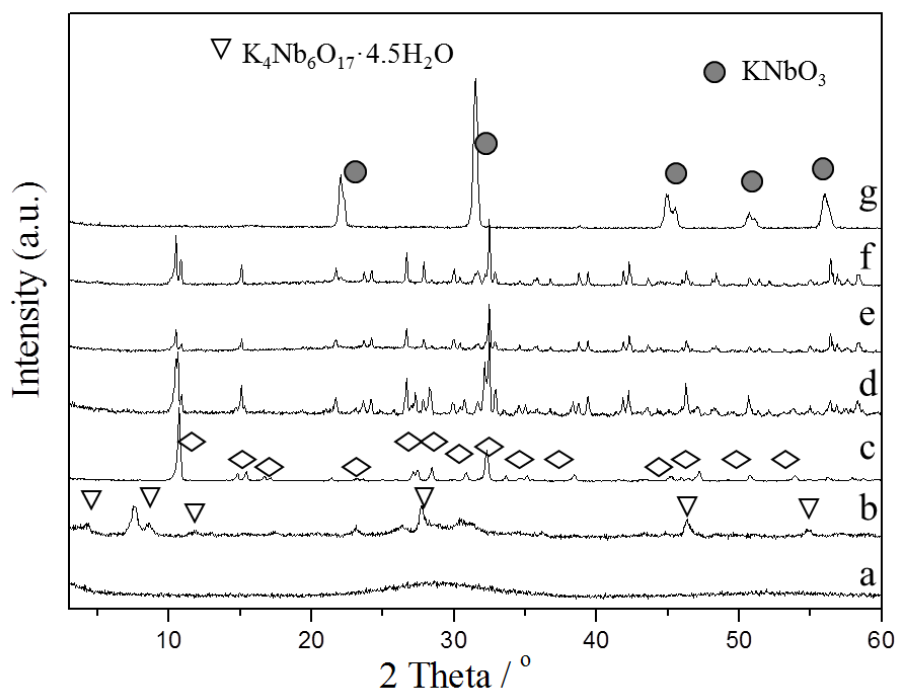


Figure S3 XRD patterns of samples obtained by solvothermal treatment of potassium hexaniobate in (a) pH=5.5, (b) KOH-0.1mol/L, (c) KOH-0.3mol/L, (d) KOH-0.5mol/L, (e) KOH-1.0mol/L, (f) KOH-2.0mol/L, (g) KOH-3.0mol/L water-ethanol (volume ratio=1/2) solution at 200 °C for 12h, respectively.

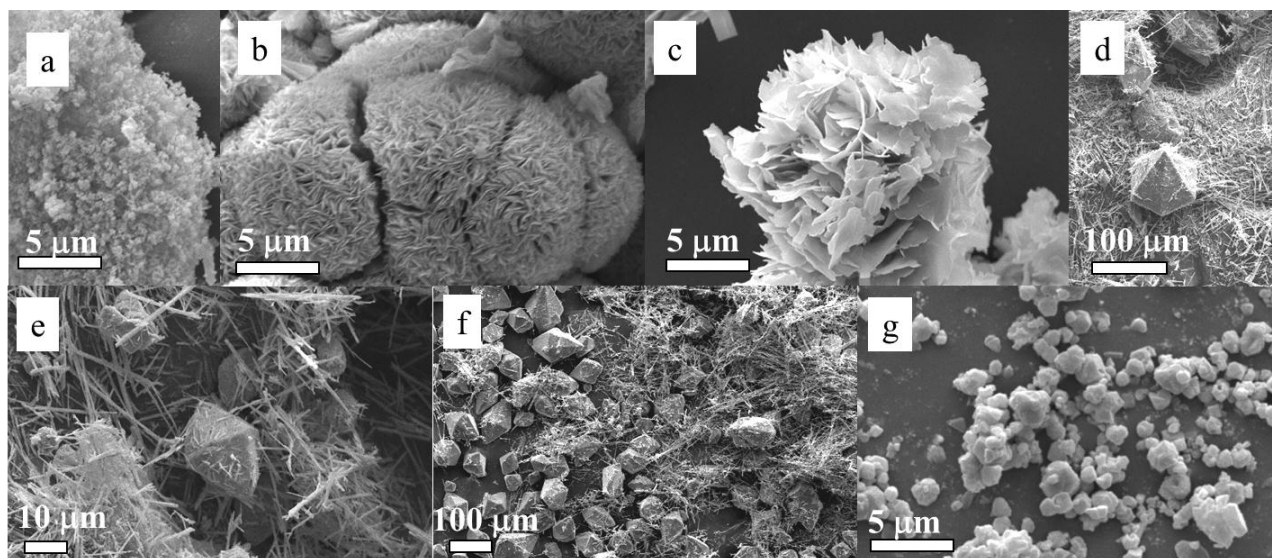


Figure S4. SEM images of samples obtained by solvothermal treatment of potassium hexaniobate in (a) pH=5.5, (b) KOH-0.1mol/L, (c) KOH-0.3mol/L, (d) KOH-0.5mol/L, (e) KOH-1.0mol/L, (f) KOH-2.0mol/L, (g) KOH-3.0mol/L water-ethanol (volume ratio=1/1) solution at 200 °C for 12h, respectively.

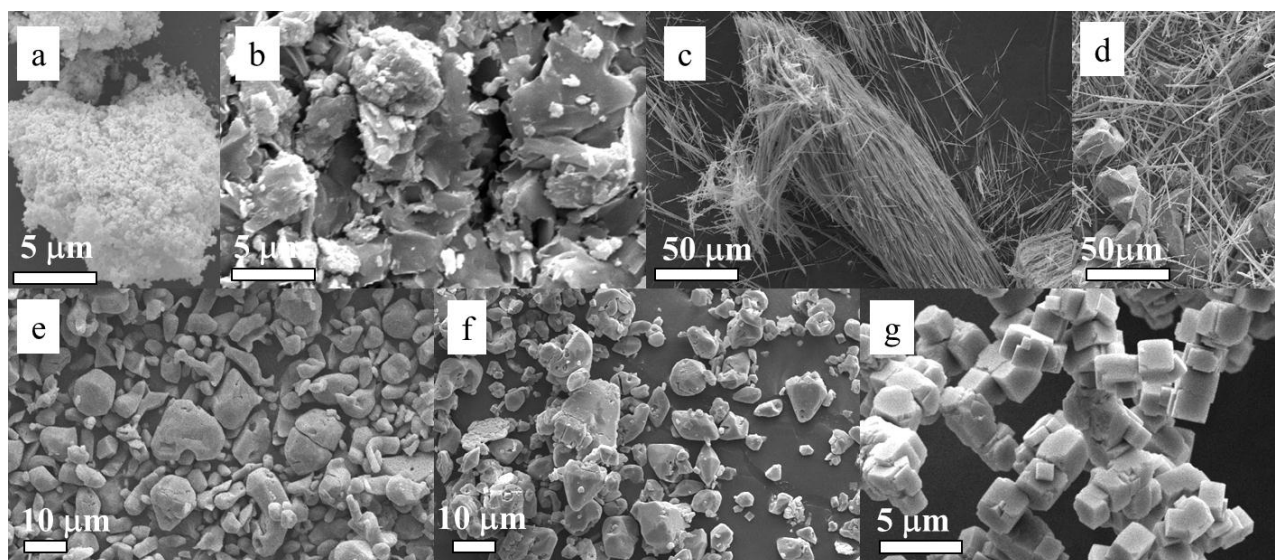


Figure S5 SEM images of samples obtained by solvothermal treatment of potassium hexaniobate in (a) pH=5.5, (b) KOH-0.1mol/L, (c) KOH-0.3mol/L, (d) KOH-0.5mol/L, (e) KOH-1.0mol/L, (f) KOH-2.0mol/L, (g) KOH-3.0mol/L water-ethanol (volume ratio=1/2) solution at 200 °C for 12h, respectively.

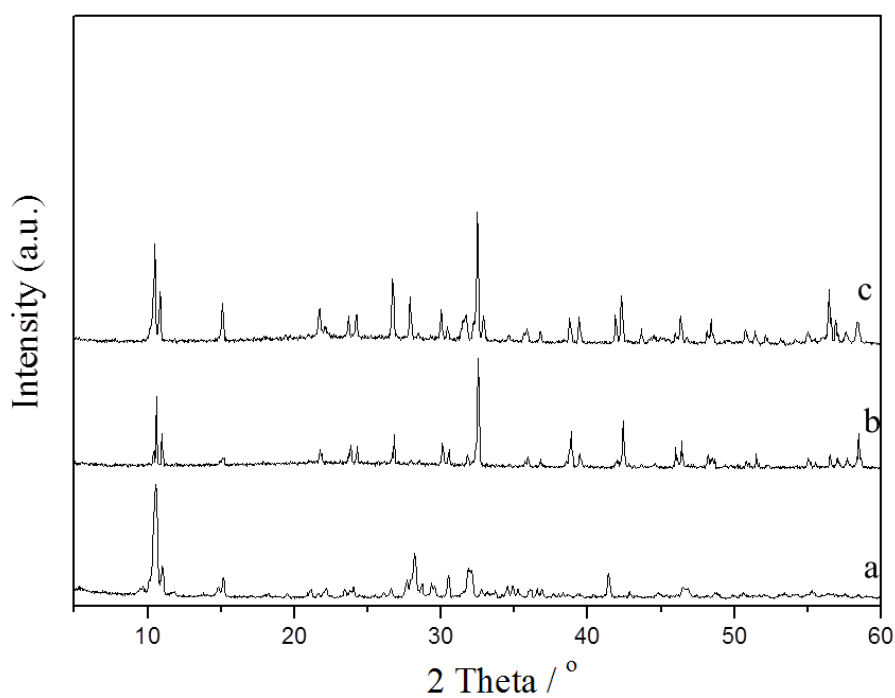


Figure S6 XRD patterns of (a) potassium hexaniobate precursor, (b) $K_{8-x}H_xNb_6O_{19}$ with dodecahedral morphology and (c) $K_{8-x}H_xNb_6O_{19}$ with irregular morphology.

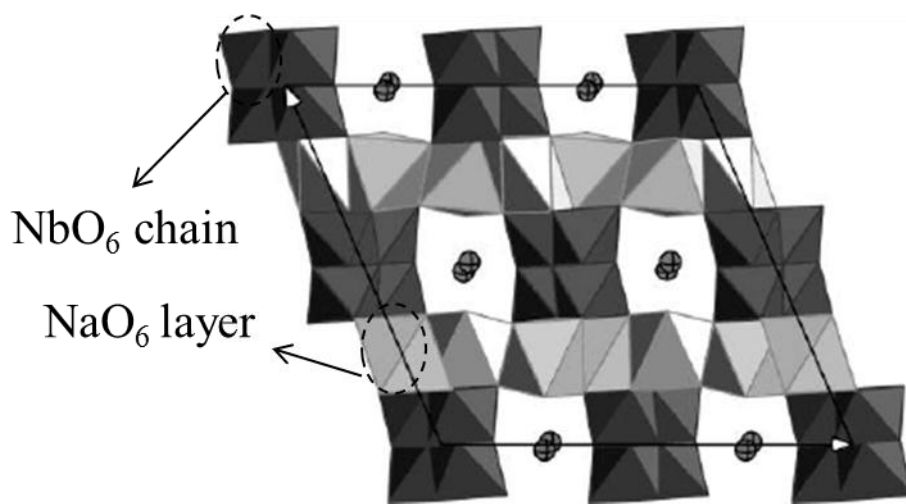


Figure S7. Crystal structure of Na₂Nb₂O₆·H₂O projected down [010].⁴⁵

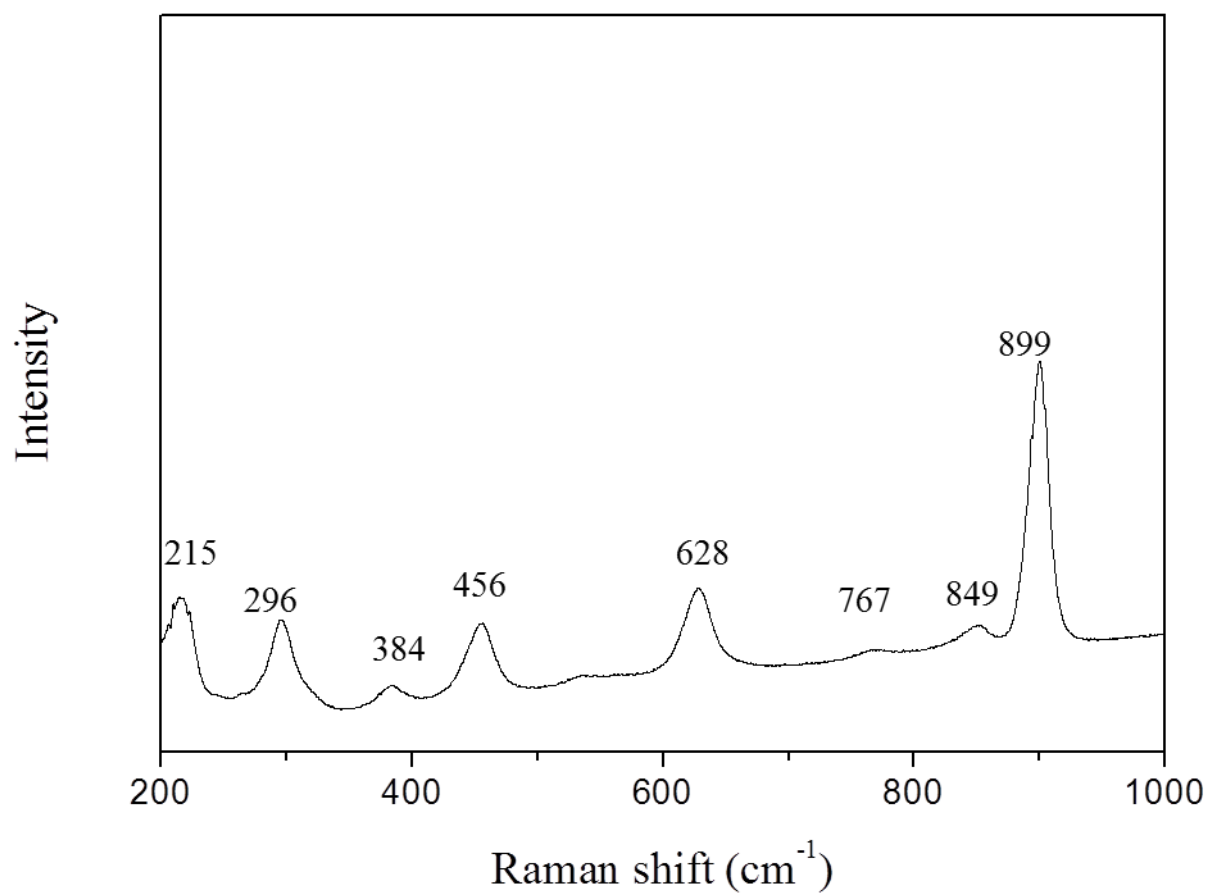


Figure S8. Raman spectrum of K₂Nb₂O₆·H₂O.

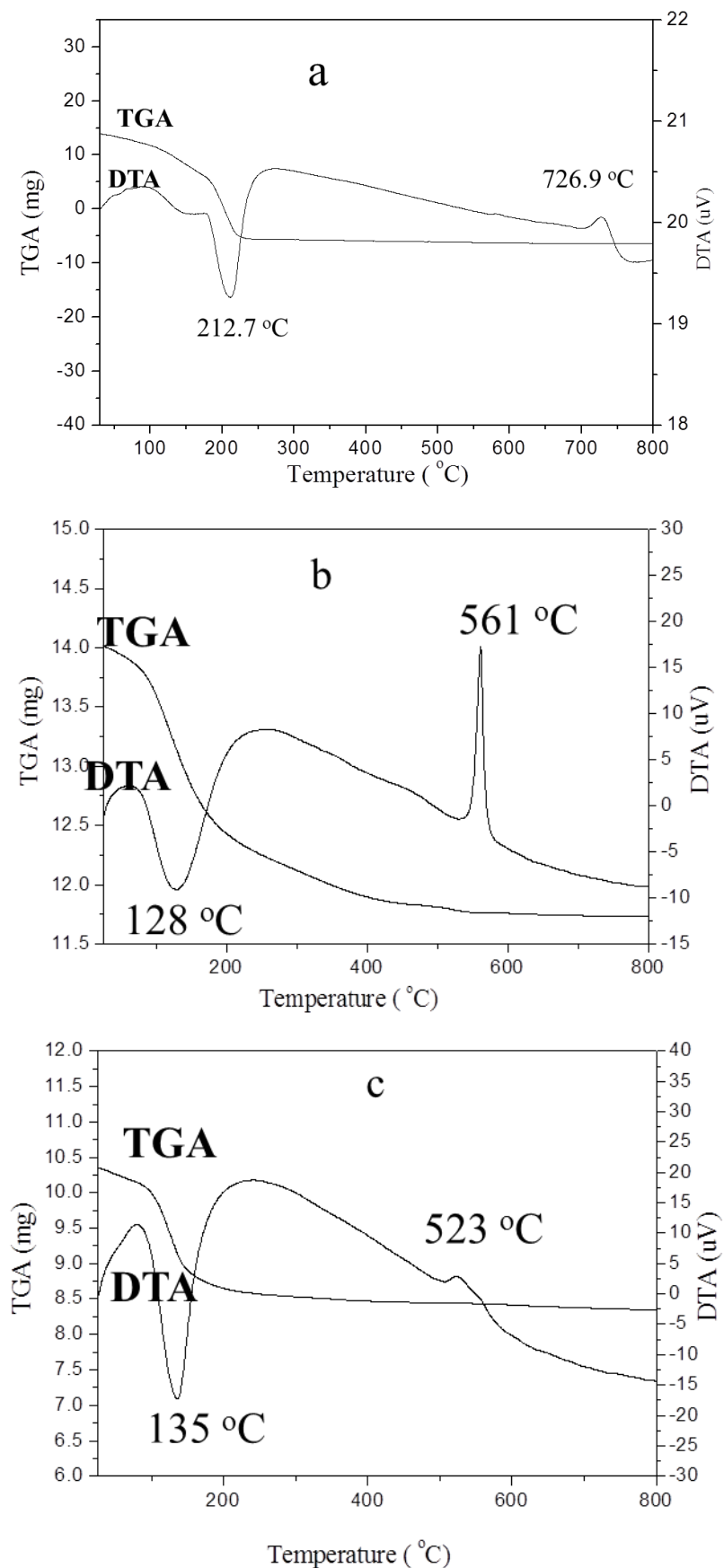


Figure S9. TG-DTA curves of (a) the $K_2Nb_2O_6 \cdot H_2O$ niobate fiber, (b) H^+ -exchanged $K_2Nb_2O_6 \cdot H_2O$ and (c) Li^+ -exchanged $K_2Nb_2O_6 \cdot H_2O$.