Electronic Supplementary Information

Controllable Synthesis and *In-situ* TEM Study of Lithiation Mechanism of High Performance NaV_3O_8 Cathodes

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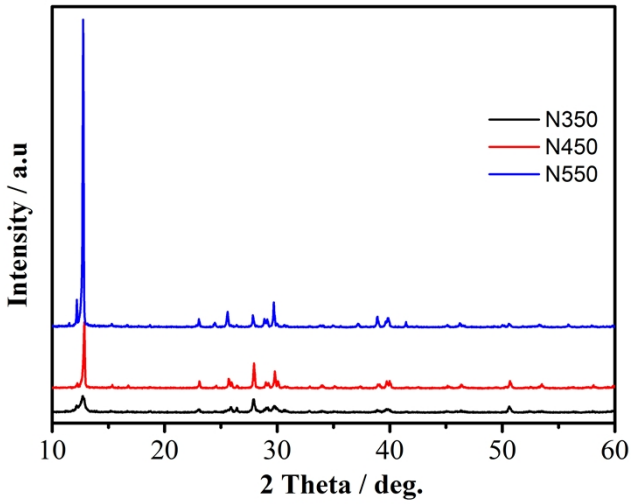

Figure S1. XRD patterns of NaV_3O_8 products synthesized at different temperatures (350 °C, 450 °C, and 550 °C) for 12 h, which are designated as samples N350, N450 and N550, respectively.

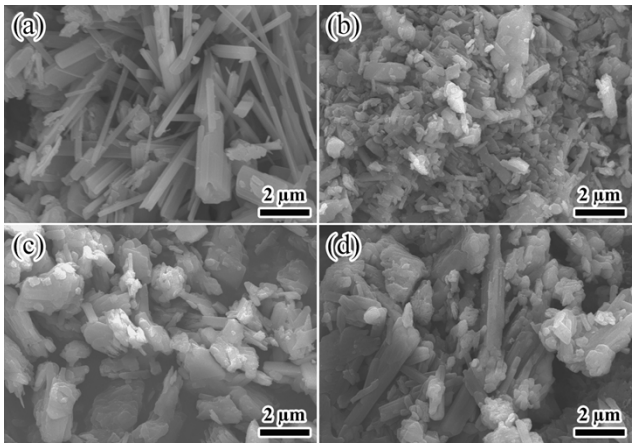

Figure S2. SEM images of NaV_3O_8 products synthesized by (a) NaCl, (b) NaOH, (c) $NaNO_3$ and (d) Na_2SO_4, the calcination condition is same as the synthesis of the N450 sample.

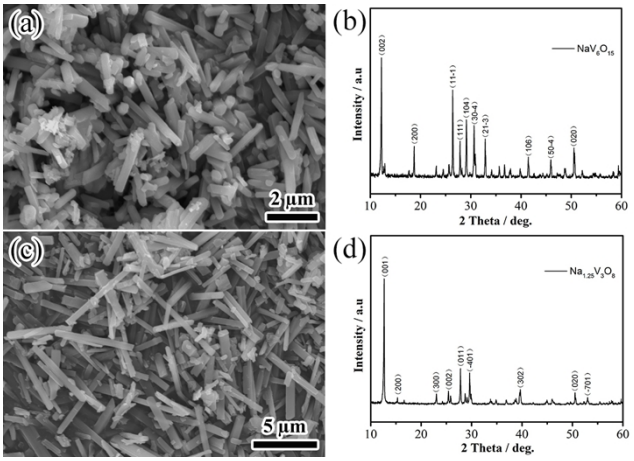

Figure S3. SEM image (a) and XRD pattern (b) of NaV_6O_{15} nanorods calcined at 450 °C; SEM image (c) and XRD pattern (d) of $Na_{1.25}V_3O_8$ nanorods calcined at 450 °C.

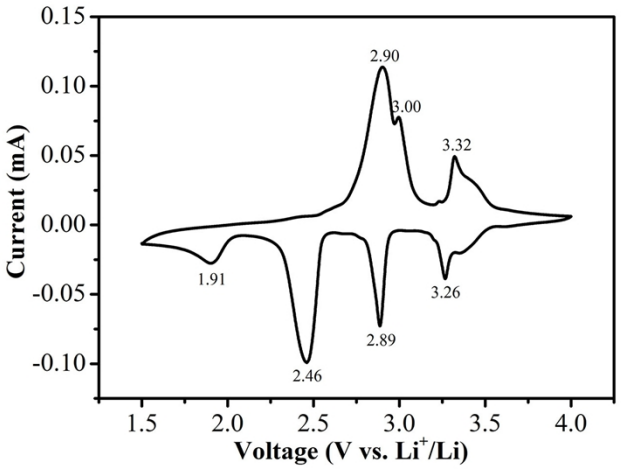

Figure S4. Cyclic voltammetry (CV) curves of NaV_6O_{15} calcined at 450 °C at a scan rate of 0.1 mV s^{-1} from 1.5 to 4.0 V.

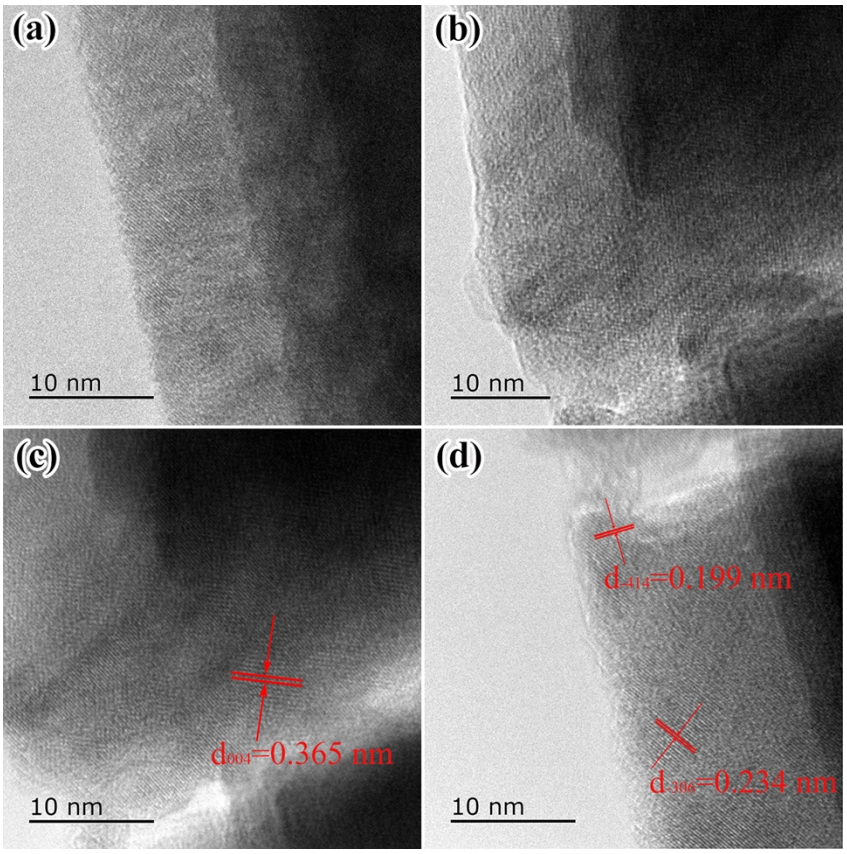

Figure S5. The HRTEM images of microstructure evolution during lithiation of the NaV_3O_8 nanorod.

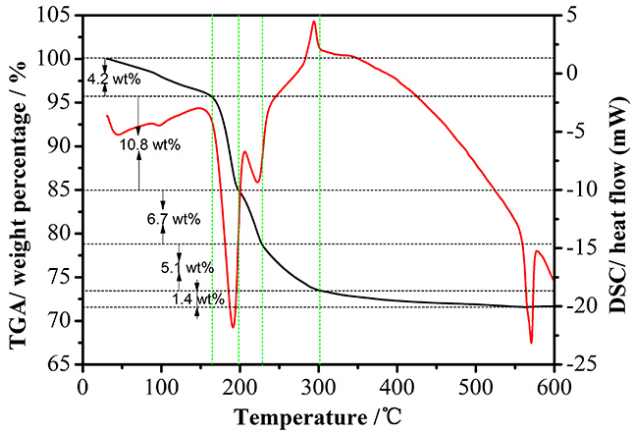

Figure S6. TG-DTA curves of the formation process of NaV_3O_8 products.

(Thermogravimetric/Differential Thermal Analyzer analysis was performed using a TG-DTA instrument: Diamond TG/DTA, PerkinEImer, under an air flow of 100 ml min^{-1} with a heating rate of 10 k min^{-1} from room temperature to 600 ^{o}C.).