Supporting information

Synthesis of Uniform Hierarchical Na$_3$V$_{1.95}$Mn$_{0.05}$(PO$_4$)$_2$F$_3$@C Hollow Microspheres as a Cathode Material for Sodium Ion Batteries

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Fig. S1 Partial magnified view of XRD patterns of the NVPF and NVMPF.

Fig. S2 XPS spectra of Mn 2p of NVMPF.

Fig. S3 Low magnification SEM image of NVPF.
Fig. S4 SEM images of (a-b) NVMPF and (c-d) NVPF@C; low magnification SEM images (a, c) and enlarged images (b, d) of broken NVMPF and NVPF@C.

Fig. S5 TG curve of NVMPF@C.
**Fig. S6** XRD patterns of NVPF with different hydrothermal time.

**Fig. S7** TEM image of NVPF obtained with no citric acid.
Fig. S8 CV curves of (a) NVPF, (b) NVMPF, (c) NVPF@C and (d) NVMPF@C for the anterior five cycles.
**Fig. S9** TEM images of (a) bulk and (b) nanoparticles NVPF samples; XRD patterns (c) and cycling performance (d) of bulk and nanoparticles NVPF samples at 0.2 C for 30 cycles.

**Fig. S10** Cycling performance of NVPF obtained at 2 h.
Fig. S11 Rate performance of Na$_3$V$_{2-x}$Mn$_x$(PO$_4$)$_2$F$_3$ (x=0, 0.01, 0.05, 0.07) at different rates.

Fig. S12 SEM image of NVMPF@C electrode after 500 cycles at 0.2C.