

Supporting information

Figure S1: Morphology of the $\text{Na}_7\text{V}_3(\text{P}_2\text{O}_7)_4$ -based hybrid foam. (a) Low-resolution TEM image, (b) TEM image partially enlarged from a, (c) HRTEM image of polyanion crystal. The well-resolved lattice fringe indicates the single-crystal nature of polyanion crystals.

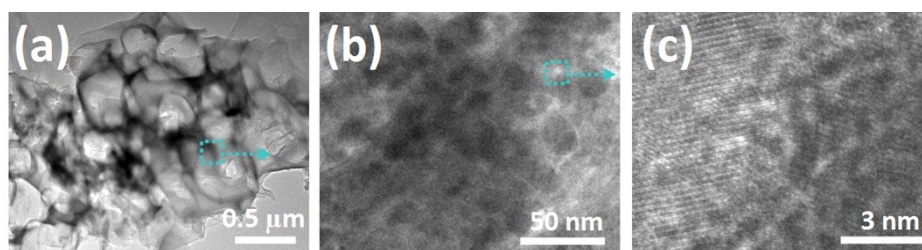


Figure S2: Morphology of the (a, b) $\text{Na}_7\text{V}_4(\text{P}_2\text{O}_7)_4(\text{PO}_4)$ - and (c, d) $\text{Na}_7\text{V}_3(\text{P}_2\text{O}_7)_4$ -based reference samples. Both reference samples have large microscale particles in solid nature.

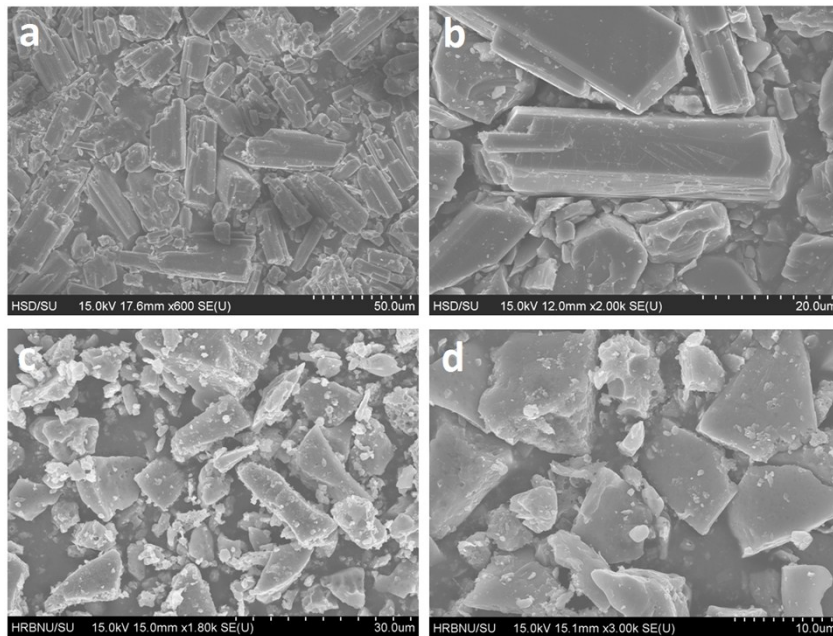


Figure S3: XRD patterns of the (a) $\text{Na}_7\text{V}_4(\text{P}_2\text{O}_7)_4(\text{PO}_4)$ - and (b) $\text{Na}_7\text{V}_3(\text{P}_2\text{O}_7)_4$ -based reference samples. All the diffraction peaks of the $\text{Na}_7\text{V}_4(\text{P}_2\text{O}_7)_4(\text{PO}_4)$ -based reference sample can be indexed to the tetragonal phase with space group of $P-42_1c$, and those of the $\text{Na}_7\text{V}_3(\text{P}_2\text{O}_7)_4$ -based reference sample can be indexed to the monoclinic structure with $C2/c$ space group. The absence of impurity phases indicates the high purity of all the reference samples.

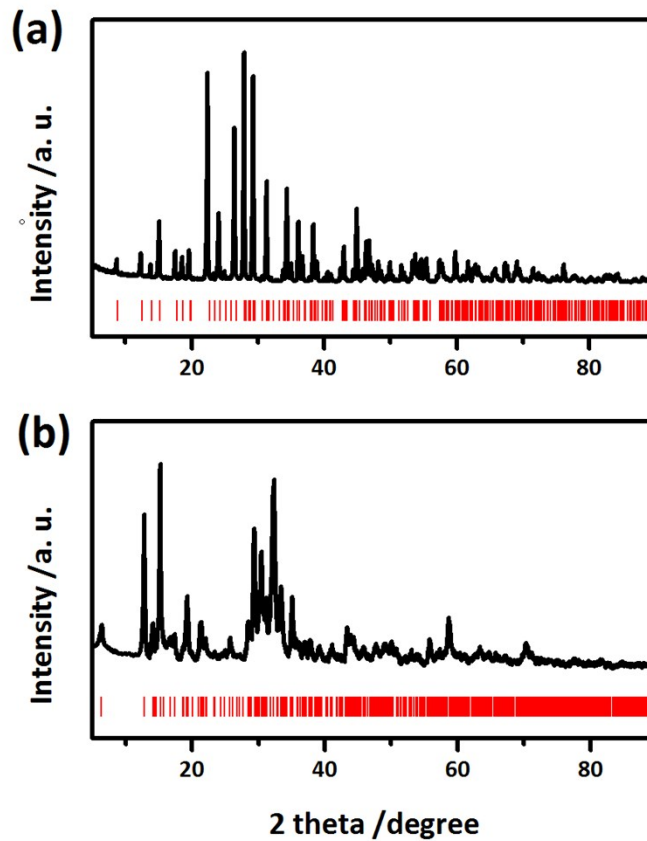


Table S1 Atomic ratios of the (a) $\text{Na}_7\text{V}_4(\text{P}_2\text{O}_7)_4(\text{PO}_4)$ - and (b) $\text{Na}_7\text{V}_3(\text{P}_2\text{O}_7)_4$ - based hybrid foams and reference samples.

Element ratio of Na: V: P	$\text{Na}_7\text{V}_4(\text{P}_2\text{O}_7)_4(\text{PO}_4)$	Element ratio of Na: V: P	$\text{Na}_7\text{V}_3(\text{P}_2\text{O}_7)_4$
Hybrid foam	6.987:4:9.041	Hybrid foam	6.991:3:8.031
Reference sample	7.021:4:9.032	Reference sample	6.997:3:8.026
Designed value	7:4:9	Designed value	7:3:8