

Supplementary Information

Optimized Sulfonated Poly(Ether Ether Ketone) Membranes for In-House Produced Small-Sized Vanadium Redox-Flow Battery Set-up

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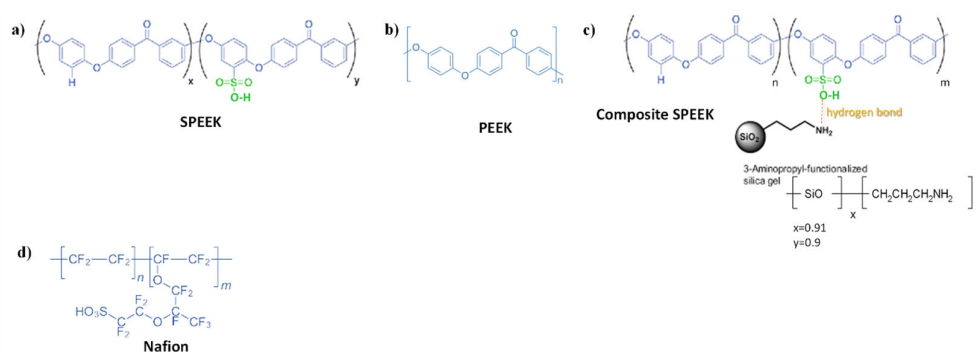


Figure S1. Chemical structures of (a) Nafion, (b) PEEK, (c) SPEEK, and (d) composited SPEEK.



Figure S2. The in-house VRFB five-cell stack.

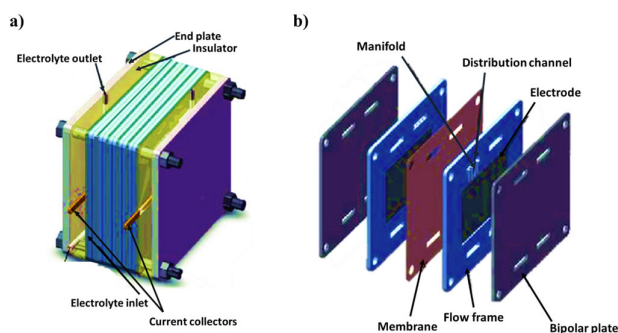


Figure S3. (a) Scheme of the five-cell VRFB stack; (b) exploded view of a single cell VRFB.

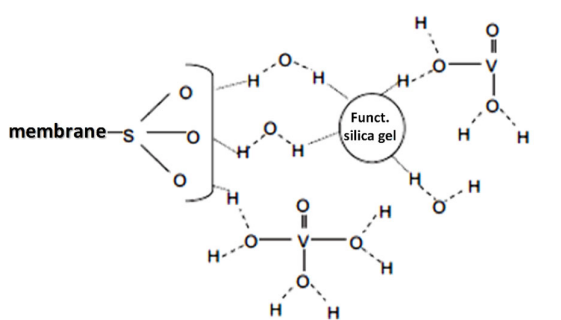


Figure S4. Possible interactions involved in the vanadium uptake process; dotted lines represent hydrogen bonding.

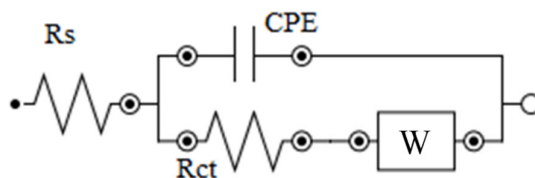


Figure S5. The proposed model of the equivalent electric circuit for the single cell VRFB.

Table S1. Charge-discharge performances parameters of evaluated single-cell VRFB configurations.

Configurations	Current Density (mA cm ⁻²)	Charge Cycle Time (h)	Discharge Cycle Time (h)	Mean Charge Voltage (V)	Mean Discharge Voltage (V)	Coulombic Efficiency (%)
OPT-Nafion115	20	9.48	8.42	1.52	1.21	88.9
	40	4.47	4.09	1.51	1.09	91.7
	60	2.67	2.37	1.72	0.98	88.7
	80	1.41	1.10	1.83	0.86	77.9
	100	-	-	-	-	-
OPT-SPEEK50_0	20	8.96	8.38	1.44	1.19	93.4
	40	4.20	4.02	1.65	1.07	95.8
	60	2.66	2.56	1.72	0.97	96.3
	80	1.86	1.76	1.79	0.89	95.2
	100	1.22	1.10	1.83	0.82	89.9

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