Supporting Information

Stable Manganese-Based High-Entropy Prussian Blue for Enhanced Sodium-Ion Storage

Congcong Li 1, Yang Xiao 1, Dingyi Zhang 1, Xinyao Yuan 1, Jun Xiao 2,*, Yufei Zhao 3, Hong Gao 1,* and Hao Liu 3,*

1 Joint International Laboratory on Environmental and Energy Frontier Materials, School of Environmental and Chemical Engineering, Shanghai University, Shanghai 200444, China
2 Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen 518055, China
3 Centre for Clean Energy Technology, University of Technology Sydney, Broadway, Sydney, NSW 2007, Australia; yufei.zhao@uts.edu.au

* Correspondence: j.xiao@siat.ac.cn (J.X.); hgao1122@shu.edu.cn (H.G.); hao.liu@uts.edu.au (H.L.)

1.Figures

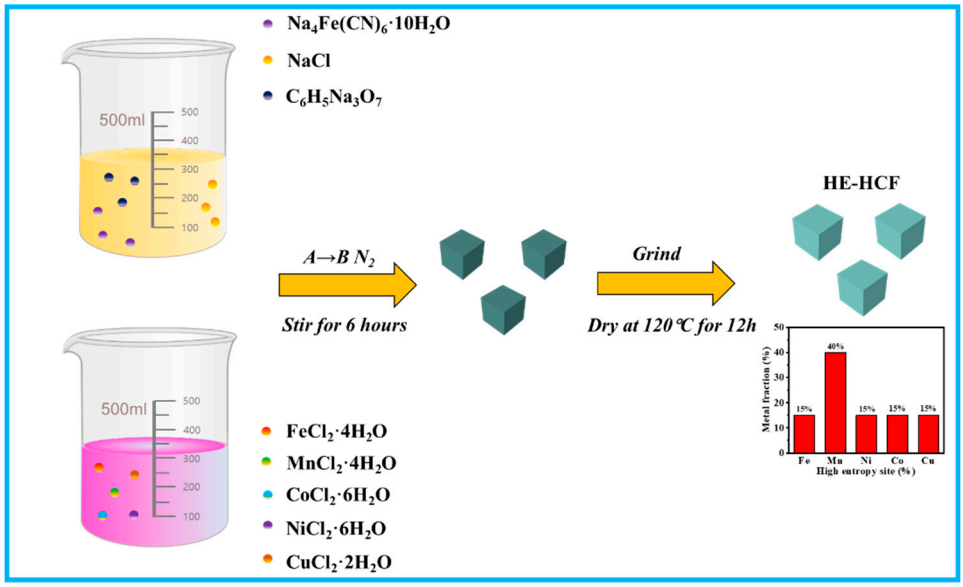


Figure S1. Diagram of the preparation process of HE-HCF

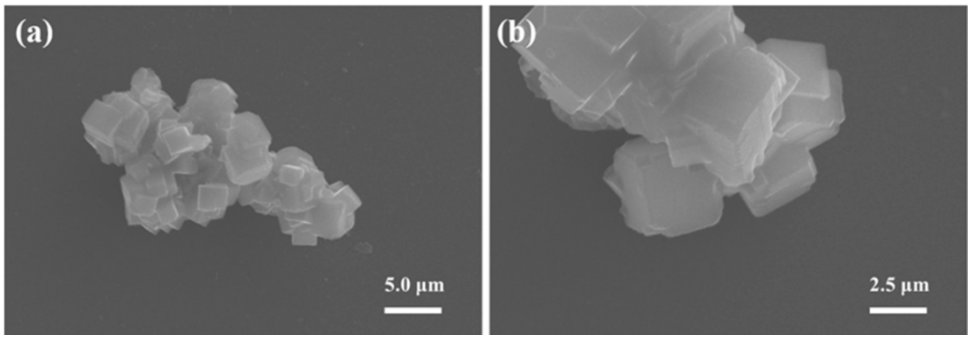


Figure S2. SEM image of (a, b) FeMn-HCF

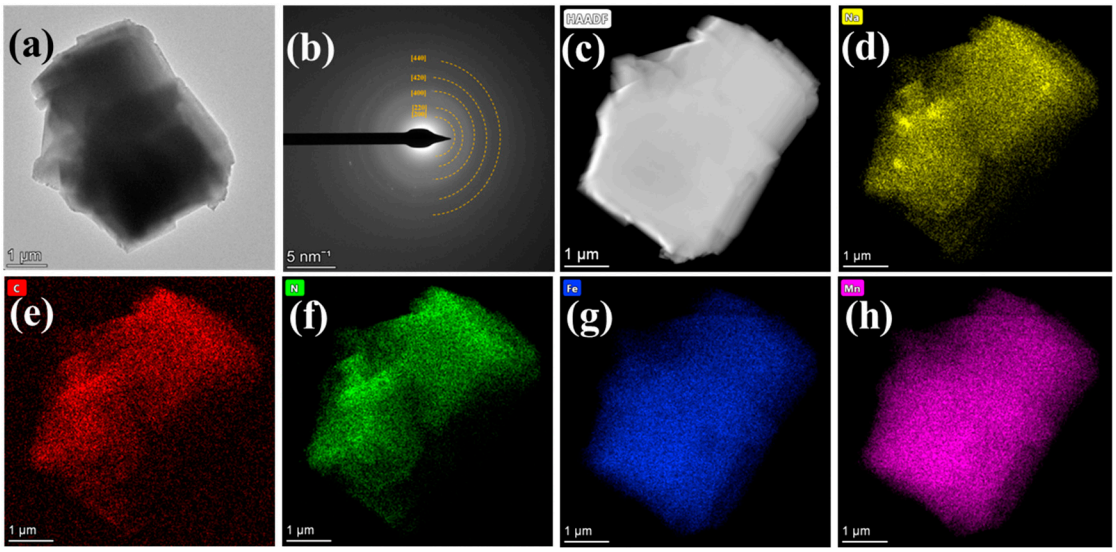


Figure S3. (a) TEM image of FeMn-HCF; (b) Selected electron diffraction pattern of FeMn-HCF; (c) HAADF diagram of FeMn-HCF; (d-h) EDS mapping images of FeMn-HCF.

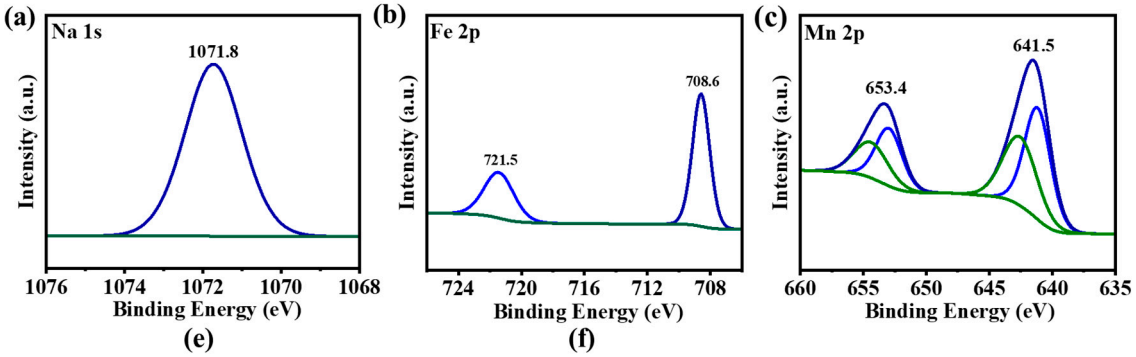


Figure S4. (a) High-resolution spectra of FeMn-HCF:(a) Na 1s; (b) Fe 2p; (c) Mn 2p.

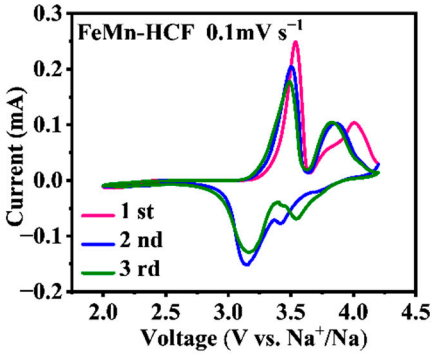


Figure S5. CV curves of FeMn-HCF at a scan rate of 0.1 mV s^{-1}.

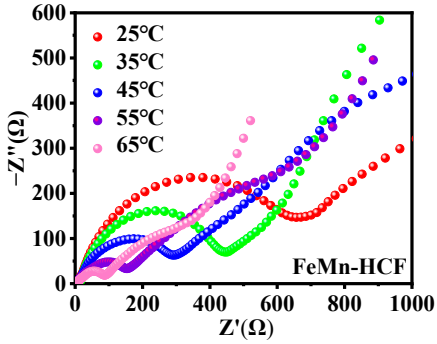


Figure S6. EIS spectra of FeMn-HCF at different temperatures of 25, 35, 45, 55 and 65°C.

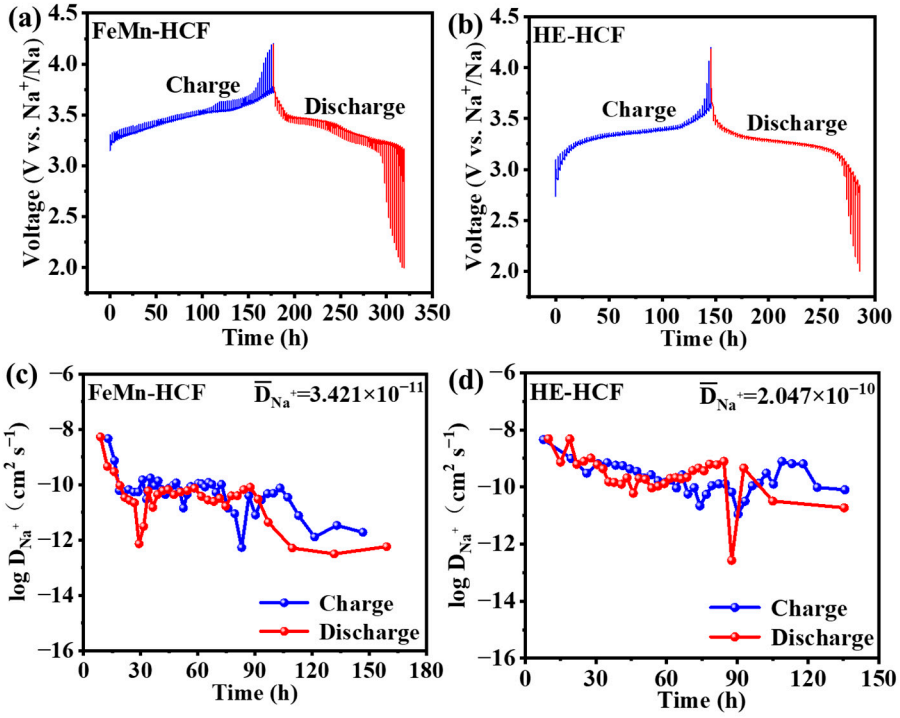


Figure S7. (a, b) GITT profiles of FeMn-HCF and HE-HCF; (c, d) The corresponding Na^+ diffusion coefficients of FeMn-HCF and HE-HCF.

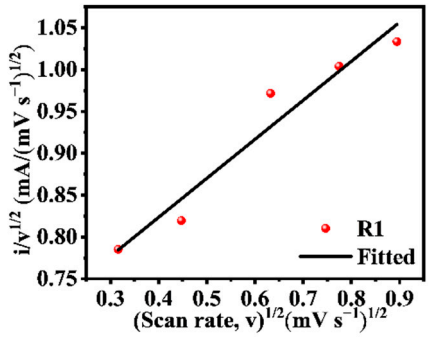


Figure S8. Plot of $v^{1/2}$–$i/v^{1/2}$ used for calculating k_1 and k_2

2.Tables

Table S1 Crystallographic parameters of FeMn-HCF by Rietveld method

Space group	P21/n	x	y	z	Occ
atom	site				
Na	4e	0.28583	0.53810	0.00050	0.650
Mn	2a	0.50000	0.50000	0.50000	1.000
Fe	2d	0.50000	0.00000	0.00000	0.777
C1	4e	0.50570	0.19110	0.82420	0.777
C2	4e	0.18350	0.50170	0.50250	0.777
C3	4e	0.50240	0.17980	0.18880	0.777
N1	4e	0.49940	0.30420	0.71600	0.777
N2	4e	0.29070	0.49680	0.50100	0.777
N3	4e	0.49930	0.29050	0.29050	0.777
a=10.55Å	b=7.55Å	c=7.39Å	V=588.19 Å3		

Table S2 Crystallographic parameters of HE-HCF by Rietveld method

Space group atom	P21/n site	x	y	z	Occ
Na	4e	0.25570	0.49600	0.97990	0.630
Mn	2a	0.50000	0.50000	0.50000	0.380
Fe1	2a	0.50000	0.50000	0.50000	0.150
Fe2	2d	0.50000	0.00000	0.00000	0.820
Ni	2a	0.50000	0.50000	0.50000	0.140
Co	2a	0.50000	0.50000	0.50000	0.150
Cu	2a	0.50000	0.50000	0.50000	0.160
C1	4e	0.50570	0.19110	0.82420	0.820
C2	4e	0.18350	0.50170	0.50250	0.820
C3	4e	0.50240	0.17980	0.18880	0.820
N1	4e	0.49940	0.30100	0.72600	0.820
N2	4e	0.29070	0.49580	0.50100	0.820
N3	4e	0.49930	0.28860	0.28720	0.820
a=10.42 Å	b=7.44 Å	c= 7.37 Å	V=571.71 Å^3		

Table S3 ICP-OES results of FeMn-HCF and HE-HCF

Sample	Molar ratio in the chemical formula						
	Na	Mn	Fe	Ni	Co	Cu	ΔS_{conf}
HE-HCF	1.20	0.38	0.97	0.14	0.15	0.16	1.5R
FeMn-HCF	1.74	1.00	0.88	0	0	0	0.85R