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## Manganese hexacyanoferrate reinforced by PEDOT coating toward high-rate and long-life sodium-ion battery cathode

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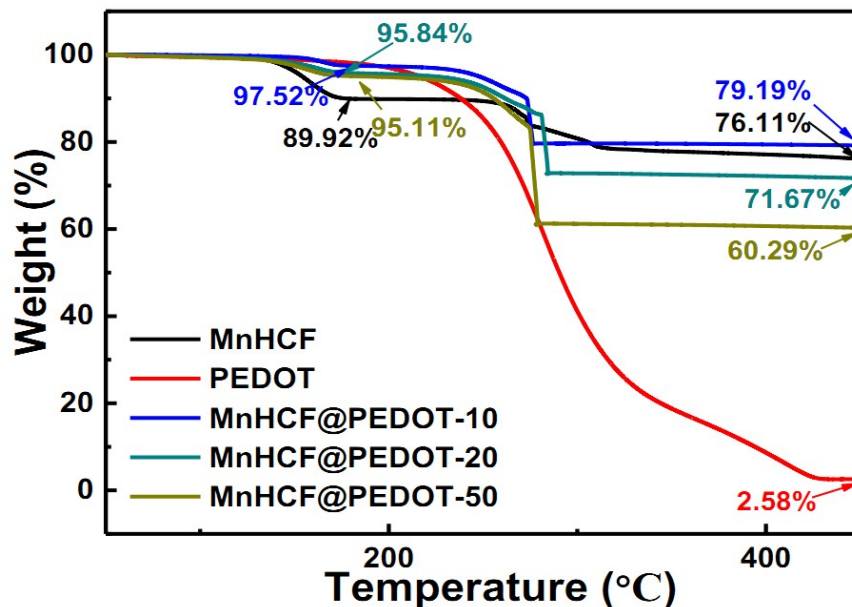


Fig. S1 TG profiles of MnHCF, PEDOT, MnHCF@PEDOT-10/20/50.

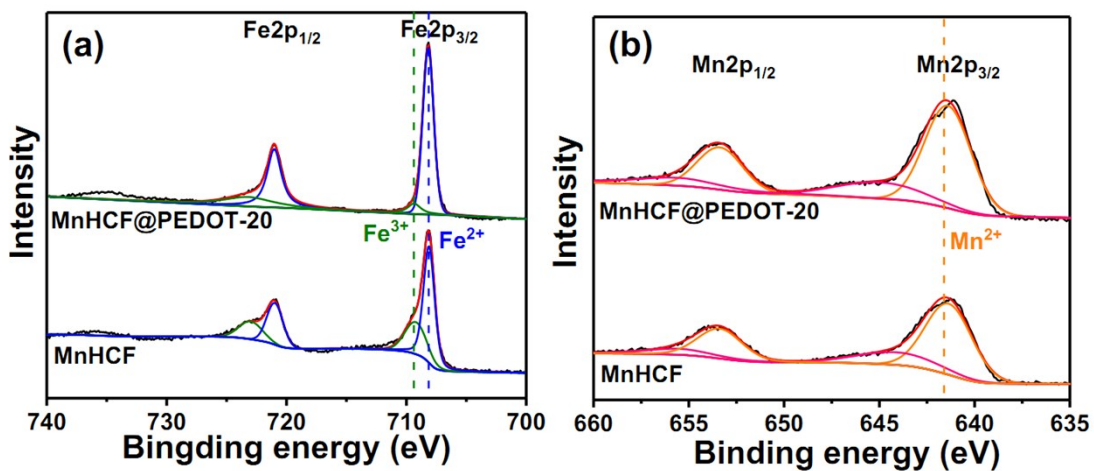
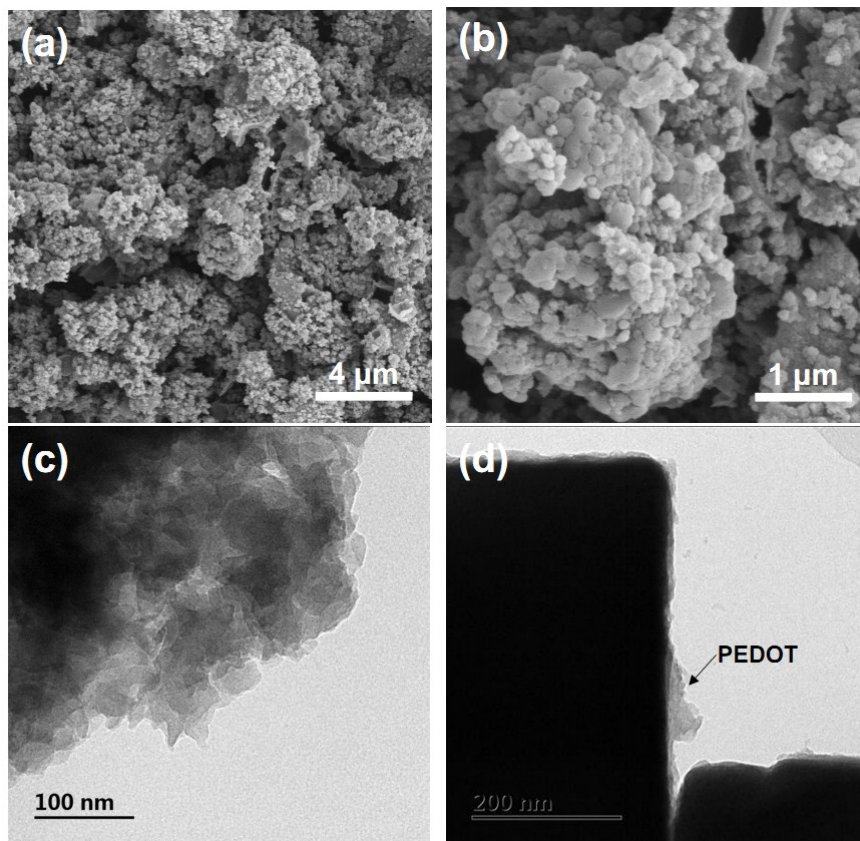
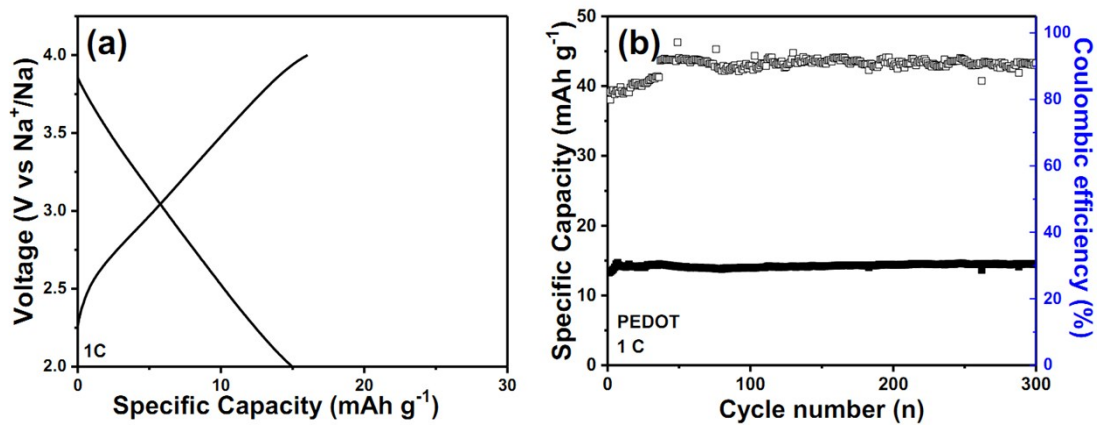


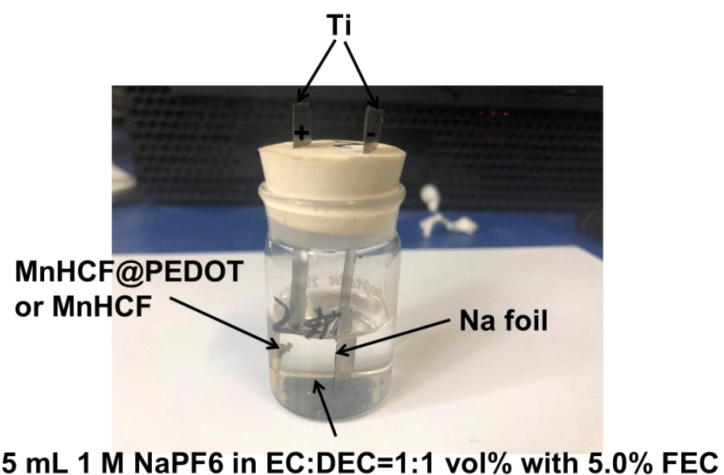
Fig. S2 Fe 2p and Mn 2p XPS spectra of MnHCF and MnHCF@PEDOT-20.



**Fig. S3** (a, b) SEM images of PEDOT; TEM images of (c) PEDOT and (d) MnHCF@PEDOT-50.



**Fig. S4** (a) Galvanostatic charge–discharge profile and (b) cycling performance and coulombic efficiency of PEDOT at 1 C.



**Fig. S5** Photo image of amplified half-cell.

The amplified half-cell is assembled in an Ar-filled glovebox by using the MnHCF or MnHCF@PEDOT electrode as cathode, Na foil as anode, titanium sheet as current collector, and 1 mol L<sup>-1</sup> NaPF<sub>6</sub> in EC/DEC (1:1 by volume) as electrolyte. The active material loading of all cathode electrode is 2 mg and the active area is 1 cm<sup>2</sup>. The amounts of electrolyte solution are kept at 5 mL and the working electrode is totally immersed in the electrolyte. After 100 galvanostatic charge-discharge cycles at a current density of 100 mA g<sup>-1</sup>, the contents of element Mn and Fe in the electrolyte solution are analyzed by inductively coupled plasma-optical emission spectrometry (ICP-OES).

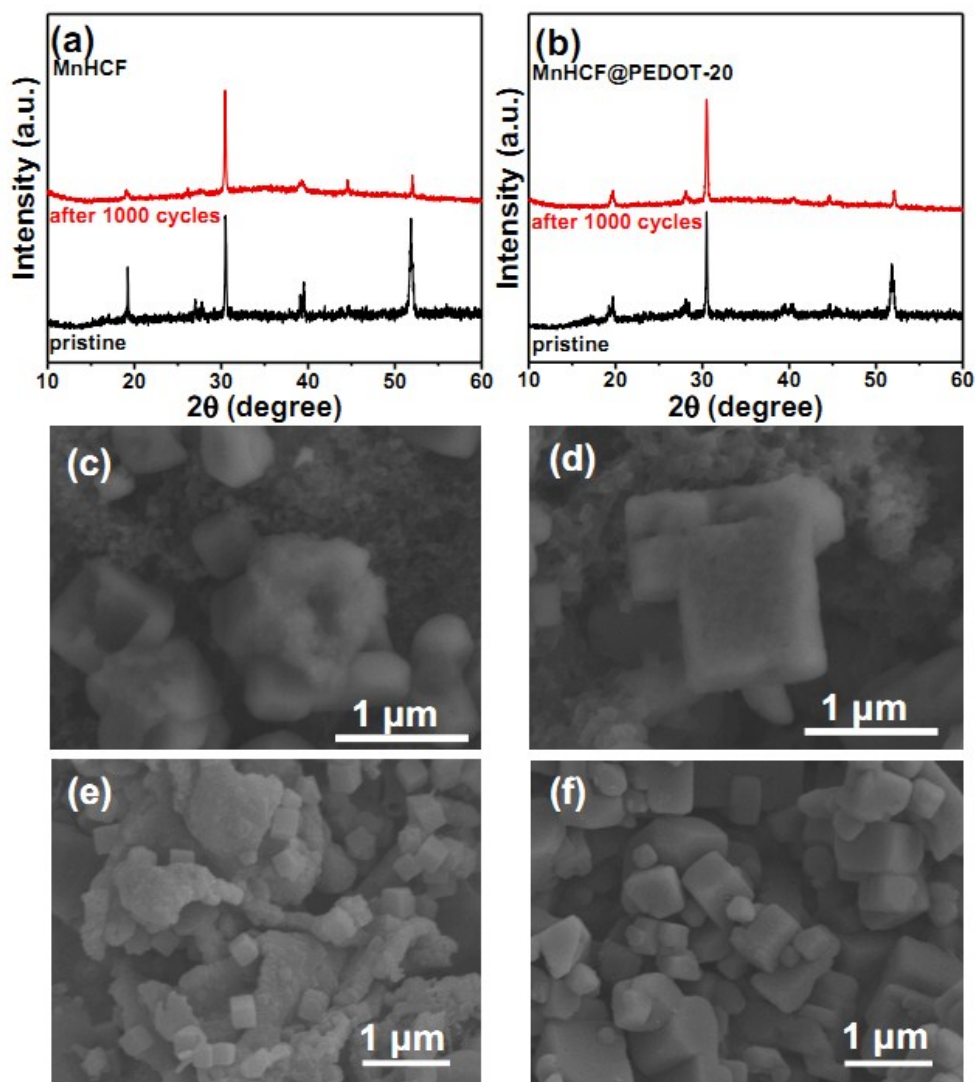


Fig. S6 XRD of (a) MnHCF and (b) MnHCF@PEDOT-20 after 1000 cycles; SEM of (c) MnHCF and (d) MnHCF@PEDOT-20 after 1000 cycles, and (e) MnHCF and (f) MnHCF@PEDOT-20 after etching in 0.1 M HF solution at 100 °C for 4 h.

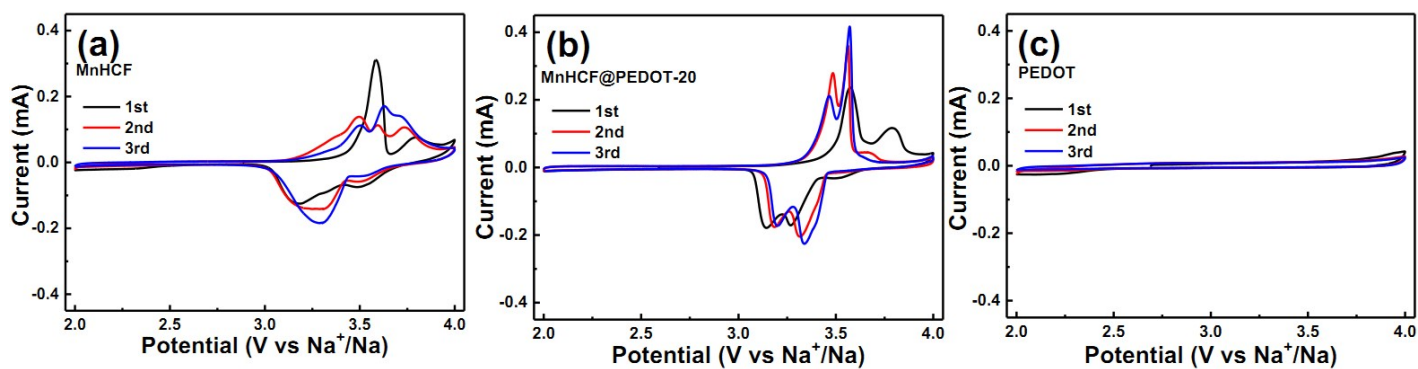


Fig. S7 CV curves of (a) MnHCF, (b) MnHCF@PEDOT-20 and (c) PEDOT at a sweep rate of 0.1  $\text{mV s}^{-1}$ .

**Table S1** Comparison between MnHCF@PEDOT-20 and reported MnHCF for SIBs.

<b>Cathode Active material (loading mg cm<sup>-2</sup>, percentage)</b>	<b>Specific capacity (capacity mAh g<sup>-1</sup>, rate)</b>	<b>Cycle life (retention, cycles, rate)</b>	<b>Rate capability (capacity mAh g<sup>-1</sup>, rate)</b>
<b>This work</b> ~2, 70%	<b>147.9, 15 mA g<sup>-1</sup></b>	<b>78.2%, 1000, 1.5 A g<sup>-1</sup></b>	<b>95.2, 1.5 A g<sup>-1</sup></b>
Na <sub>1.40</sub> MnFe(CN) <sub>6</sub> <sup>1</sup> /	111, 6 mA g <sup>-1</sup>	95.9 %, 30, 6 mA g <sup>-1</sup>	/
Na <sub>1.72</sub> MnFe(CN) <sub>6</sub> <sup>1</sup> /	134, 6 mA g <sup>-1</sup>	89.5 %, 30, 6 mA g <sup>-1</sup>	45, 4.8 A g <sup>-1</sup>
Na <sub>1.72</sub> MnFe(CN) <sub>6</sub> @PPy <sup>2</sup> ~7, 70 %	124, 12 mA g <sup>-1</sup>	67 %, 200, 240 mA g <sup>-1</sup>	55.6, 4.8 A g <sup>-1</sup>
Na <sub>2-8</sub> MnHCF <sup>3</sup> 6~10, 70%	150, 15 mA g <sup>-1</sup>	75 %, 500, 100 mA g <sup>-1</sup>	121, 3 A g <sup>-1</sup>
Na <sub>1.32</sub> Mn[Fe(CN) <sub>6</sub> ] <sub>0.83</sub> ·3.5H <sub>2</sub> O <sup>4</sup> /, 70%	109, 0.5 C	90 %, 100, 0.9 C	19, 40 C
R-Na <sub>x</sub> MnFe(CN) <sub>6</sub> ·zH <sub>2</sub> O <sup>5</sup> 4.5~5, 70%	150.1, 31 mA g <sup>-1</sup>	88 %, 50, 155 mA g <sup>-1</sup>	/
Na <sub>2</sub> MnFe(CN) <sub>6</sub> @PPy <sup>6</sup> ~1.5, 70%	118, 10 mA g <sup>-1</sup>	90.7 %, 150, 10 mA g <sup>-1</sup>	65, 0.2 A g <sup>-1</sup>
Na <sub>1.80</sub> Mn[Fe(CN) <sub>6</sub> ] <sub>0.98</sub> □ <sub>0.02</sub> ·1.76H <sub>2</sub> O <sup>7</sup> ~2, 70%	144, 15 mA g <sup>-1</sup>	72.7 %, 2100, 150 mA g <sup>-1</sup>	86.6, 1.5 A g <sup>-1</sup>
Na <sub>1.66</sub> Mn[Fe(CN) <sub>6</sub> ] <sub>0.94</sub> □ <sub>0.06</sub> ·1.66H <sub>2</sub> O@G <sup>8</sup> ~2, 70%	142.7, 15 mA g <sup>-1</sup>	90.6 %, 500, 150 mA g <sup>-1</sup>	89.7, 3 A g <sup>-1</sup>
Na <sub>1.73</sub> K <sub>0.13</sub> Mn[Fe(CN) <sub>6</sub> ] <sub>0.97</sub> □ <sub>0.03</sub> @3DNC <sup>9</sup> /, 70%	211, 20 mA g <sup>-1</sup>	68 %, 100 , 40 mA g <sup>-1</sup>	105, 0.5 A g <sup>-1</sup>
Na <sub>1.76</sub> Ni <sub>0.12</sub> Mn <sub>0.88</sub> [Fe(CN) <sub>6</sub> ] <sub>0.98</sub> □ <sub>0.02</sub> <sup>10</sup> 3~4, 70%	123.3, 10 mA g <sup>-1</sup>	83.8 %, 800 , 100 mA g <sup>-1</sup>	50.2, 0.6 A g <sup>-1</sup>
Na <sub>1.87</sub> Ni <sub>0.05</sub> Mn <sub>0.95</sub> [Fe(CN) <sub>6</sub> ] <sub>0.98</sub> □ <sub>0.02</sub> ·4.06 H <sub>2</sub> O <sup>11</sup> ~2, 70%	120, 50 mA g <sup>-1</sup>	96.7 %, 100 , 50 mA g <sup>-1</sup>	78, 1.6 A g <sup>-1</sup>
Na <sub>1.44</sub> Mn <sub>0.72</sub> Fe <sub>0.28</sub> [Fe(CN) <sub>6</sub> ] <sub>0.86</sub> □ <sub>0.14</sub> ·4.1H <sub>2</sub> O <sup>12</sup> ~0.15, 70%	119, 0.1 C	88 %, 50 , 0.3 C	30, 50 C
Na <sub>1.64</sub> Mn <sub>0.74</sub> Ni <sub>0.26</sub> [Fe(CN) <sub>6</sub> ] <sub>0.91</sub> □ <sub>0.09</sub> ·3.9H <sub>2</sub> O <sup>12</sup> ~0.15, 70%	139 , 0.1 C	73 %, 50 , 0.3 C	50, 50 C
Na <sub>1.58</sub> Mn[Fe(CN) <sub>6</sub> ] <sub>0.8</sub> □ <sub>0.2</sub> ·1.8H <sub>2</sub> O <sup>13</sup> /, 70%	126, 30 mA g <sup>-1</sup>	60 %, 50 , 30 mA g <sup>-1</sup>	7, 2 A g <sup>-1</sup>
Na <sub>1.38</sub> Ni <sub>0.07</sub> Mn <sub>0.93</sub> [Fe(CN) <sub>6</sub> ] <sub>0.82</sub> □ <sub>0.18</sub> ·1.4H <sub>2</sub> O <sup>14</sup> ~2, 70%	123, 50 mA g <sup>-1</sup>	82.9 %, 600 , 50 mA g <sup>-1</sup>	52, 3.2 A g <sup>-1</sup>

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