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Synergistically Enhanced Oxygen Evolution Catalysis with Surface Modified Halloysite Nanotube

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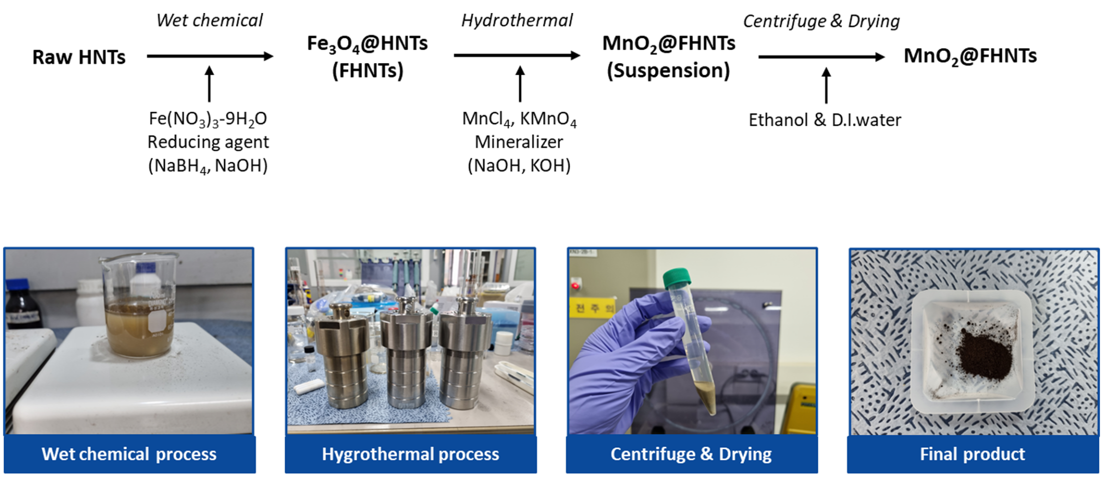

Fig. S1. Schematic illustration of MnO_2@FHNTs synthesis process.

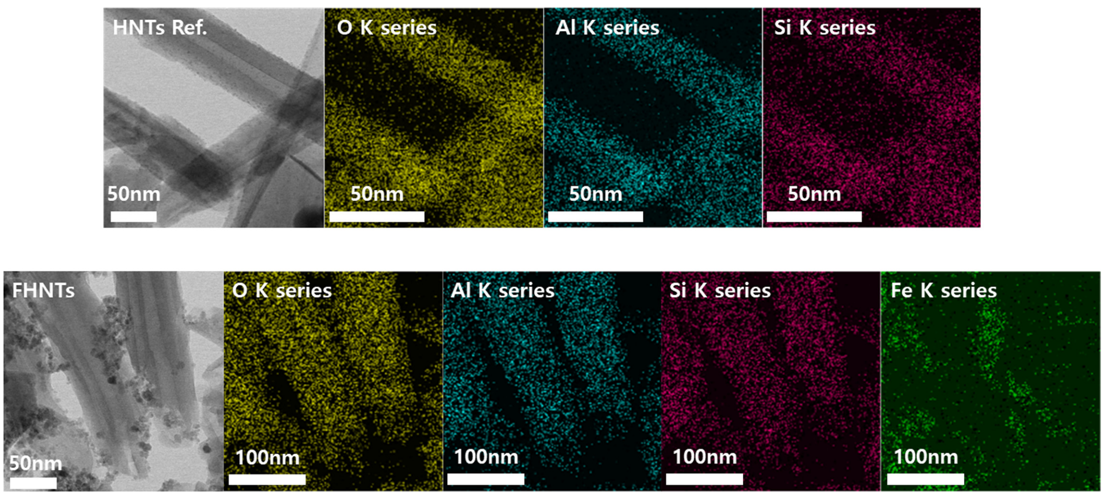

Fig. S2. TEM/EDS result for surface chemical elements analysis of HNTs Ref. and FHNTs surface.

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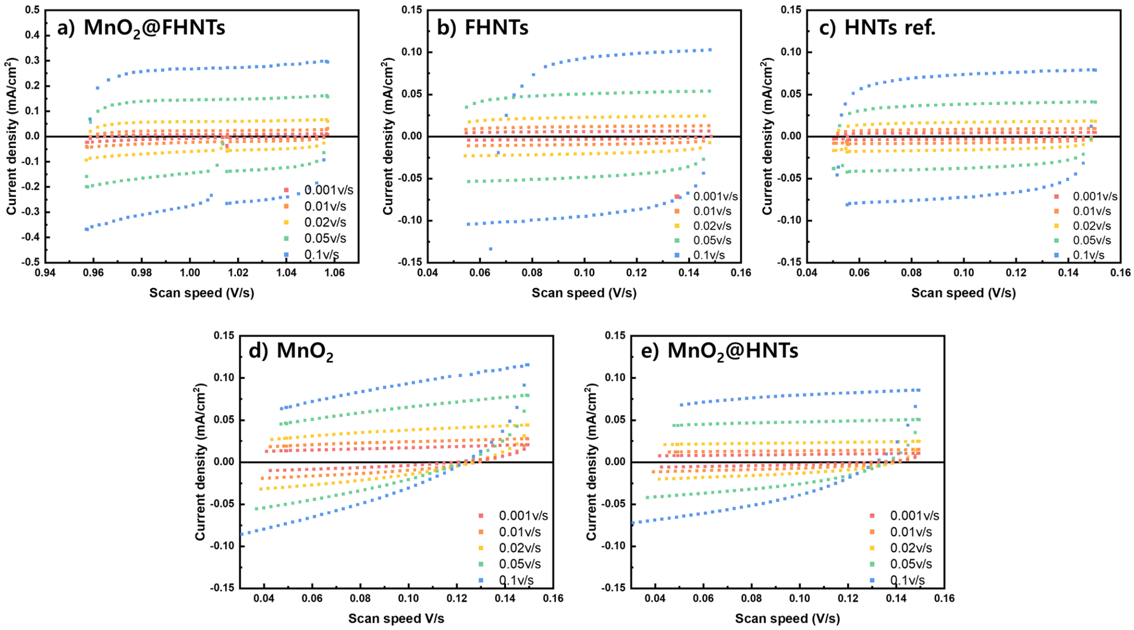

Fig. S3. Cyclic voltammetry of (a) MnO_2@FHNTs, (b) FHNTs, (c) HNTs ref., (d) MnO_2 and (e) MnO_2@HNTs for calculating double layer capacitance of each catalyst sample.

The double-layer capacitance value was measured via cyclic voltammetry with different scanning speed. The relations between the scanning rate (v), double-layer capacitance (D_{CL}), and collected disk current (i_{DL}) could be summarized as follows.

$$i_{DL} = C_{DL} \cdot v$$

Table S1. Comparison of MnO_2 based OER catalytic materials

	Materials	Overpotential (at 10 mA)	Tafel slope (mA/dec)	Electrolyte	Reference
1	MnO_2@FHNTs	0.46	99	0.1 M KOH	This work
2	MnO_2 (KIT-6)	0.61	60	0.1 M KOH	[1]
3	Cs doped MnO_x	0.42	n/a	0.1 M KOH	[2]
4	MnO_x	0.49	n/a	0.1 M KOH	[2]
5	α-MnO_2 (SF)	0.49	77.5	0.1 M KOH	[3]
6	α-MnO_2 (HT)	0.49	87.7	0.1 M KOH	[3]
7	MnO_2 (amorphous)	0.59	178.7	0.1 M KOH	[3]
8	β-MnO_2	0.60	180.2	0.1 M KOH	[3]
9	δ-MnO_2	0.74	188.6	0.1 M KOH	[3]
10	Fe-doped MnO_2 (Nano-rod)	0.66	58	0.1 M KOH	[4]
11	α-MnO_2 (Nano-rod)	0.45	73.1	1.0 M KOH	[5]
12	β -MnO_2 (Hollow nano-rod)	0.6	109.3	1.0 M KOH	[5]
13	MnO_2 (Glassy carbon substrate)	0.5	n/a	1.0 M NaOH	[6]
14	MnO_2 (Carbon fiber substrate)	0.47	111.7	1.0 M KOH	[7]
15	MnO_2/Ti	0.41	241	1.0 M KOH	[8]

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