

Supporting Information

**Enhancement of oxygen reduction activity of iron phthalocyanine
electrocatalyst supported on carbon nanotubes through molecular
encapsulation**

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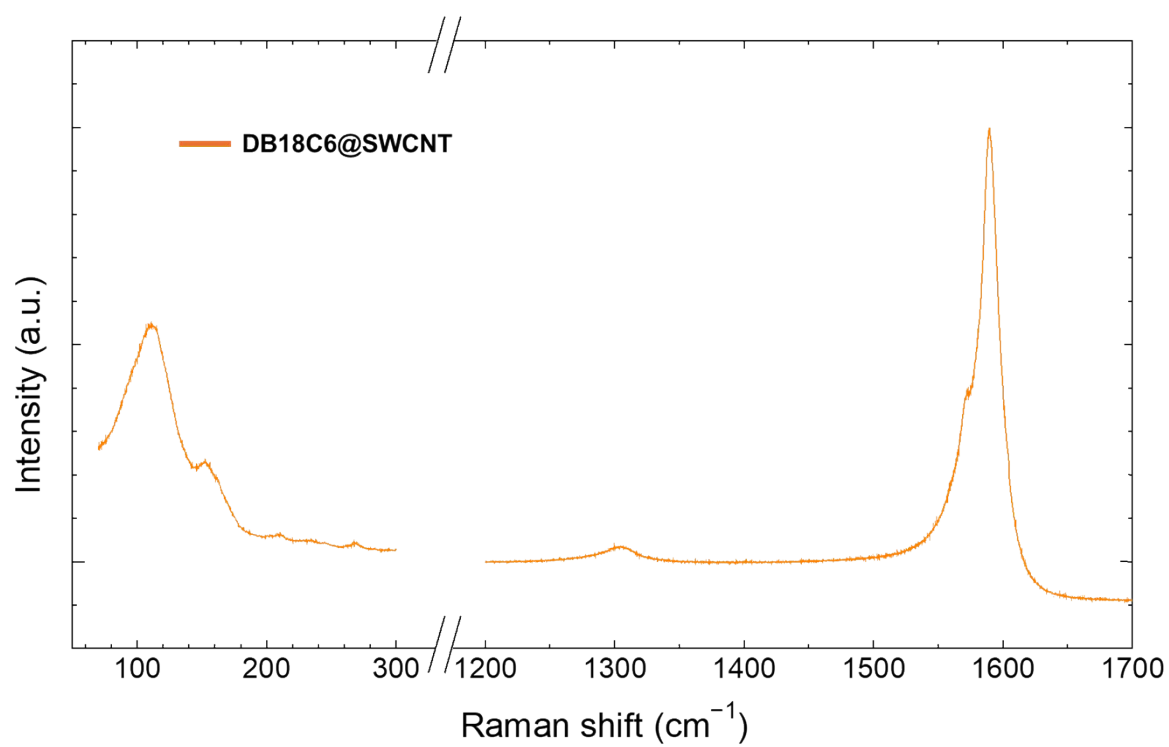


Figure S1. Raman spectra of DB18C6@SWCNT.

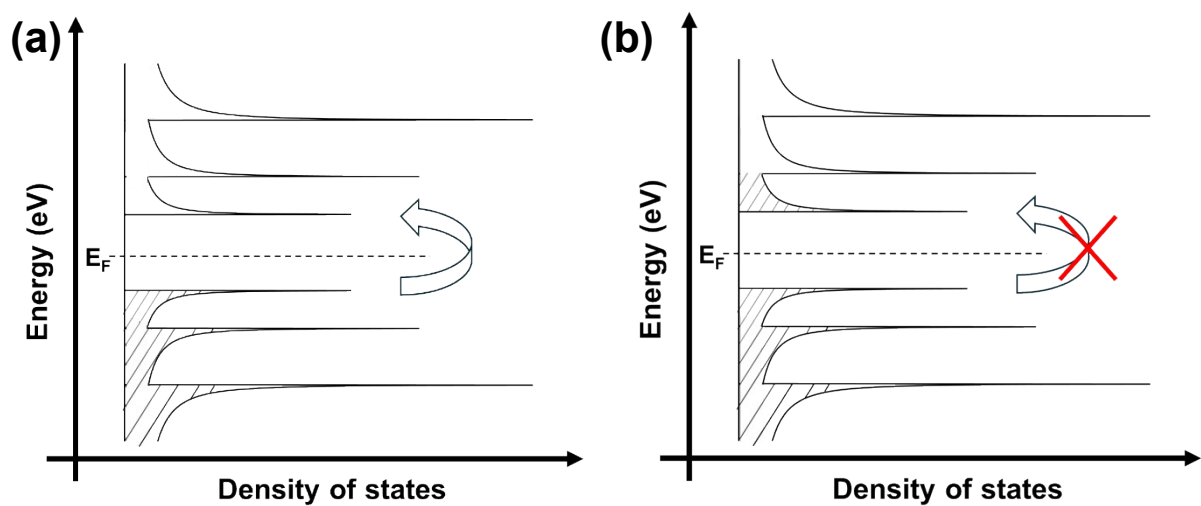


Figure S2. Density of states model of (a) pristine SWCNT and (b) K^+ -DB18C6@SWCNT.

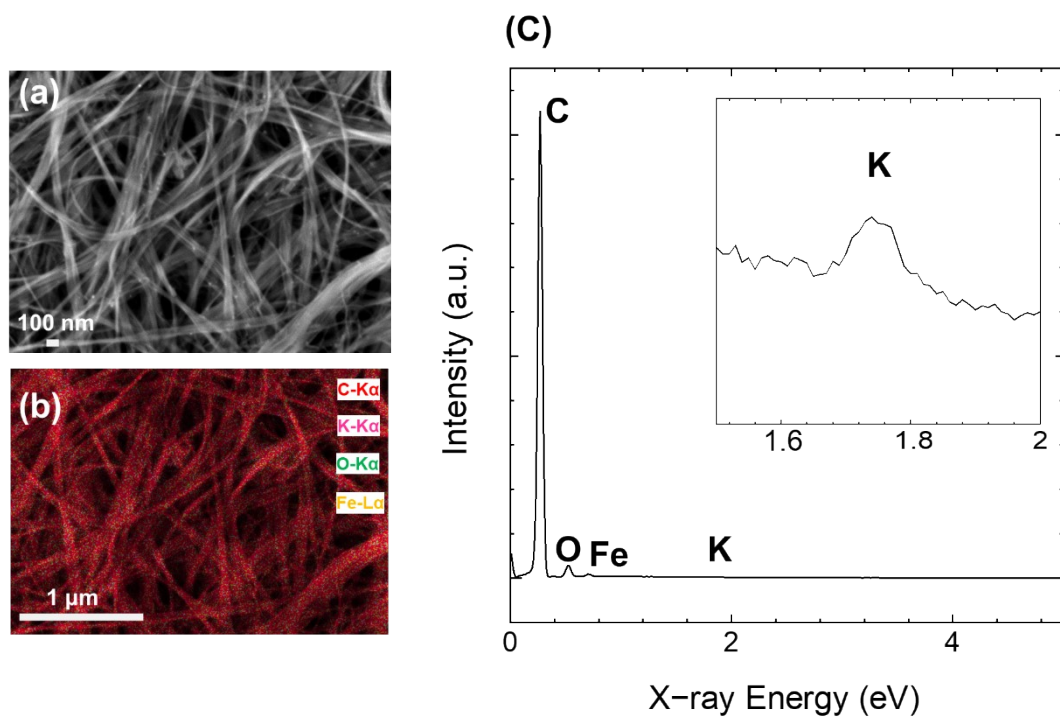


Figure S3. (a) SEM image, (b) Elemental mapping data, (c) EDS spectrum of FePc/ K^+ -DB18C6@SWCNTs.

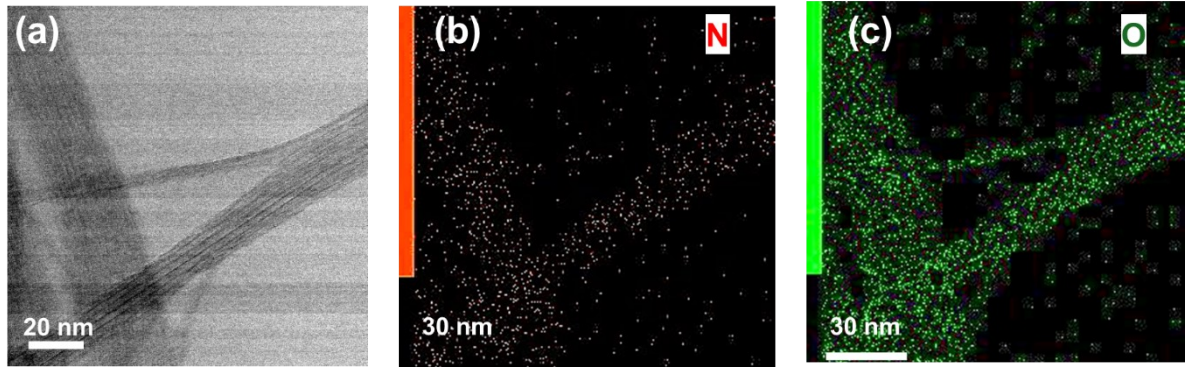


Figure S4. (a) HRTEM image, (b),(c) Elemental mapping data of FePc/K⁺-DB18C6@SWCNTs.

Table S1. Atomic Concentration Table.

Sample	Concentration of Carbon	Concentration of Potassium	Concentration ratio of C to K
K ⁺ -DB18C6@SWCNT	82.43	0.3709	0.00450
FePc/K ⁺ -DB18C6@SWCNT	84.43	0.3459	0.00410

Table S2. G-band peak positions, Raman intensity (I_D/I_G , I_{RBM}) and FWHM for pristine

SWCNTs, DB18C6@SWCNTs, K⁺-DB18C6@SWCNTs, and FePc/K⁺-DB18C6@SWCNTs.

Sample	I_D/I_G	FWHM	I_{RBM}	G band peak position
Pristine SWCNT	0.28	5.0	806.3	1589.5
K ⁺ -DB18C6@SWCNT	0.27	8.0	447.0	1590.7
FePc/K ⁺ -DB18C6@SWCNT	0.15	5.7	1570.3	1589.0

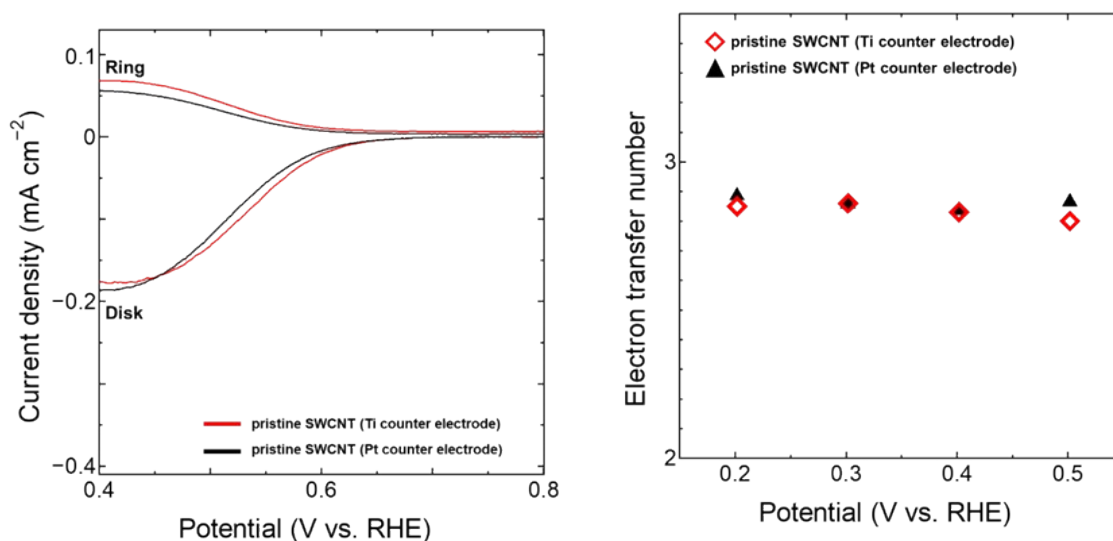


Figure 5. RRDE LSV curves of pristine SWCNT using Pt and Ti as counter electrodes.

Table S3. Experimentally measured values of pristine SWCNT.

catalyst	E_{onset} (V vs RHE)	$E_{1/2}$ (V vs RHE)	n (RRDE)
pristine SWCNT (Pt counter electrode)	0.617	0.521	2.89
pristine SWCNT (Ti counter electrode)	0.624	0.543	2.86

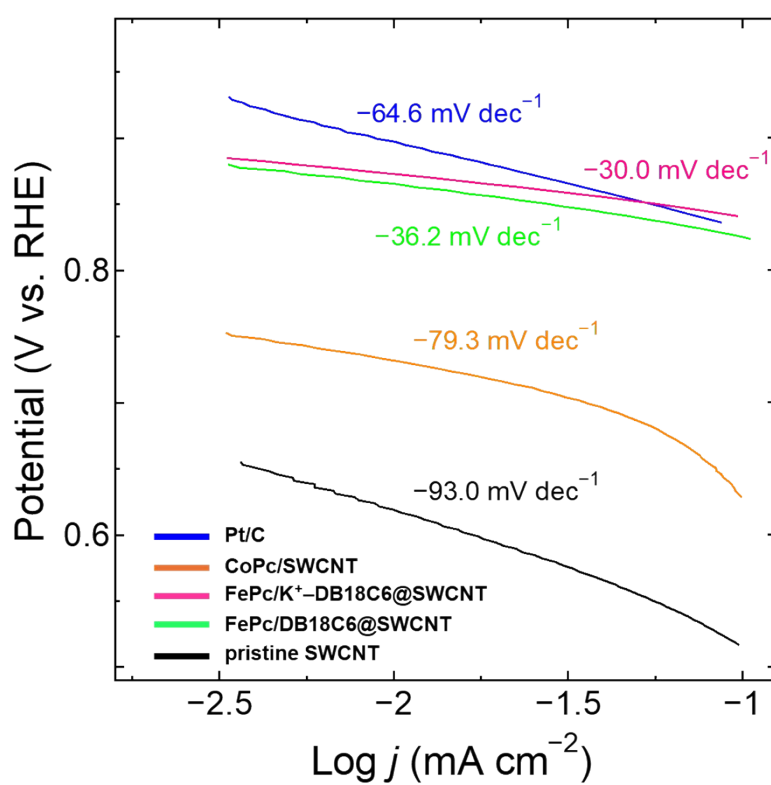


Figure S6. Tafel plots of ORR on pristine SWCNT, FePc/DB18C6@SWCNT, FePc/K⁺–DB18C6@SWCNT, CoPc/SWCNT and Pt/C at 1600 rpm.

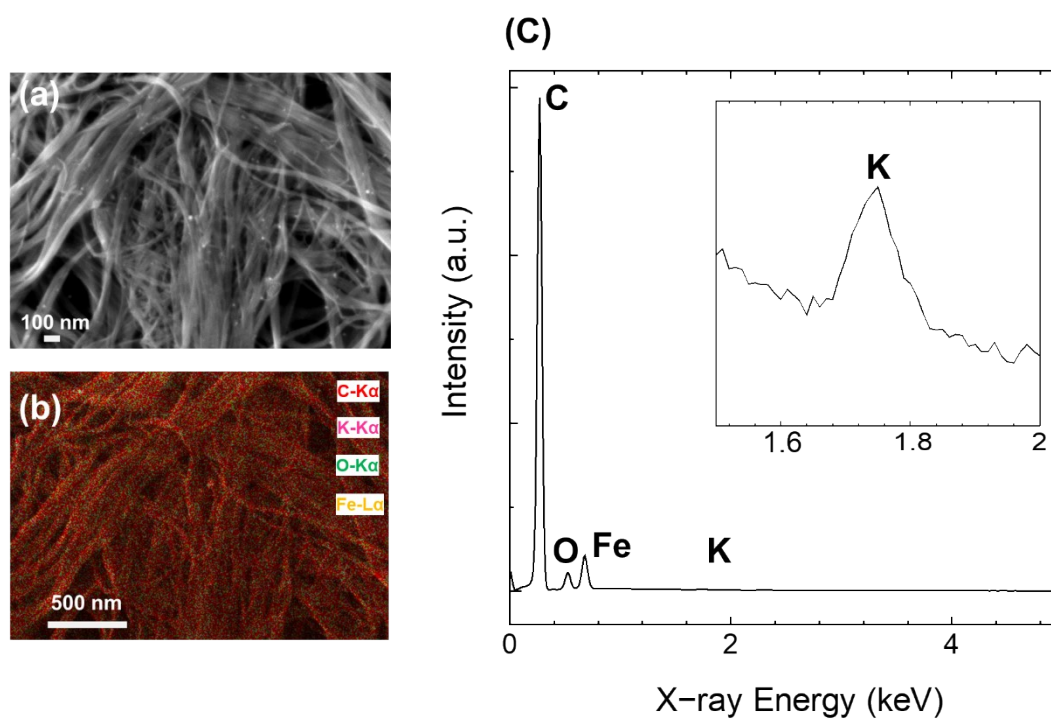


Figure S7. (a) SEM image, (b) Elemental mapping data, (c) EDS spectrum of FePc/K⁺-DB18C6@SWCNT electrode after the durability test at 0.4 V vs. RHE under 1600 rpm for 3 h.

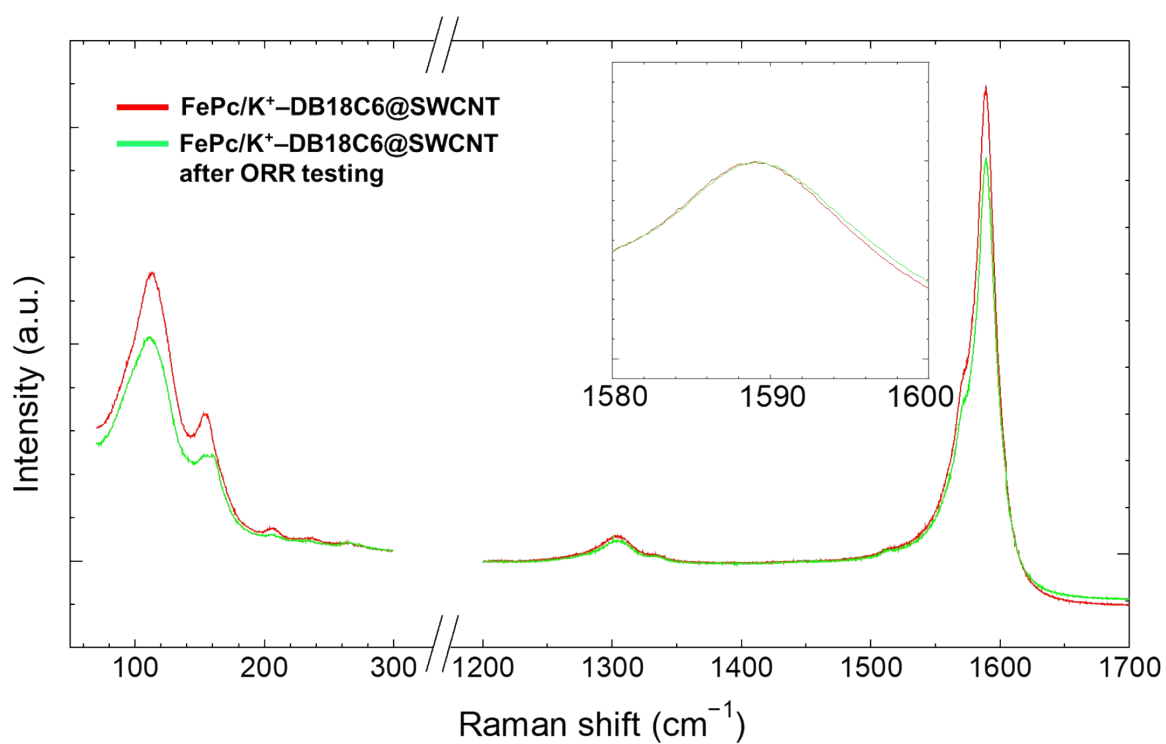


Figure S8. Raman spectra of FePc/K⁺-DB18C6@SWCNT electrode before and after the durability test at 0.4 V vs. RHE under 1600 rpm for 3 h.

