

Supporting Information

**Construction of MWNTs supported ultra-small Ag@MnO₂ nanoparticle
for ORR and Al-air battery**

Supplementary Figures

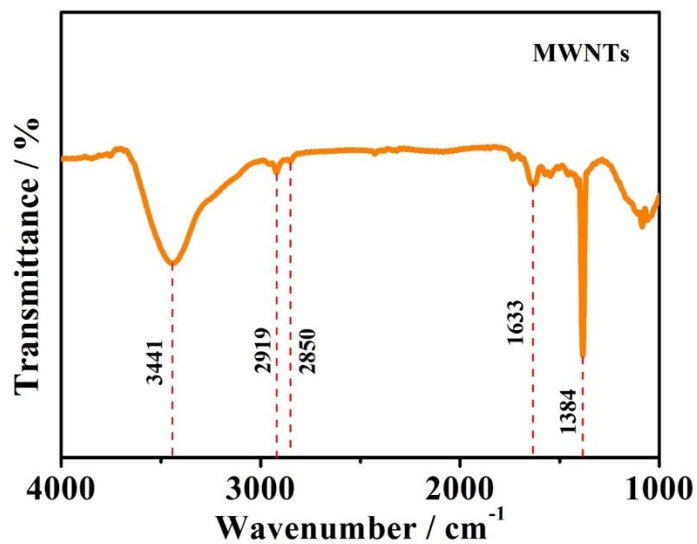


Fig. S1 FTIR of pretreated MWNTs

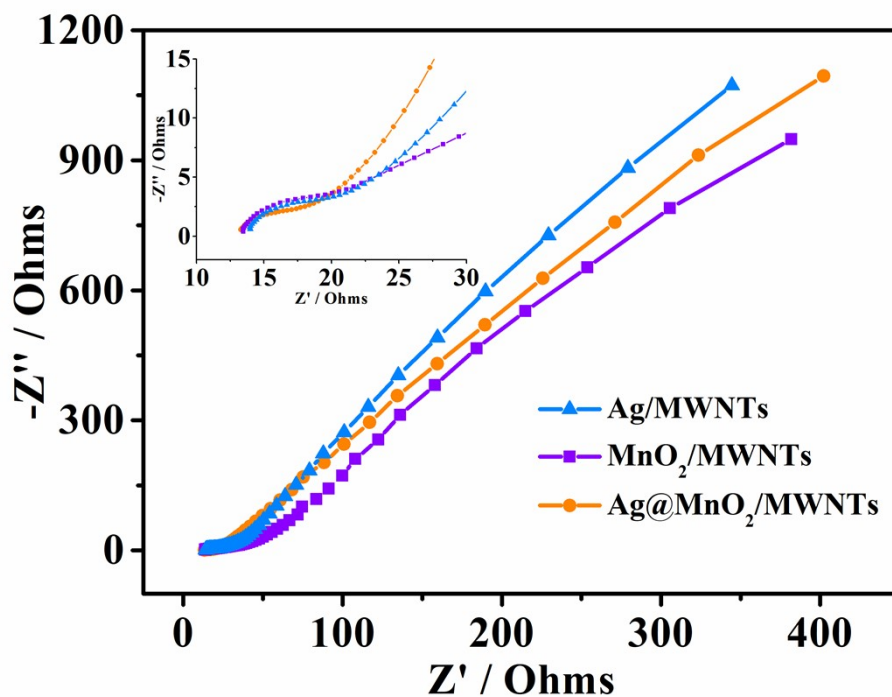


Fig. S2 EIS of Ag/MWNTs, MnO₂/MWNTs, and Ag@MnO₂/MWNTs catalysts

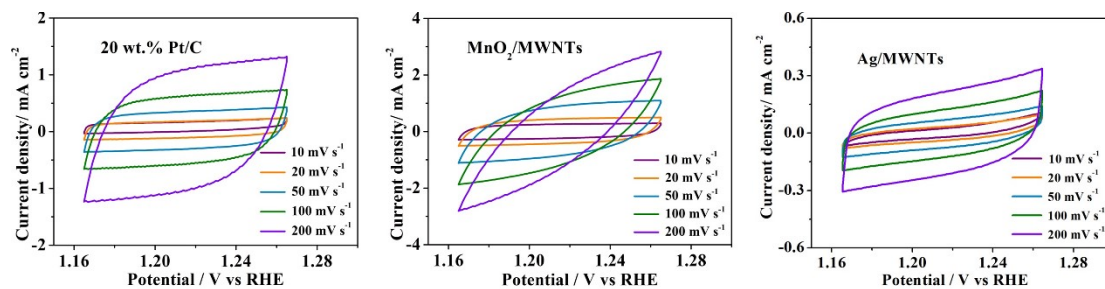


Fig. S3 CV curves of 20 wt% Pt/C, Ag/MWNTs, and MnO₂/MWNTs in N₂-saturated 0.1 M KOH solution

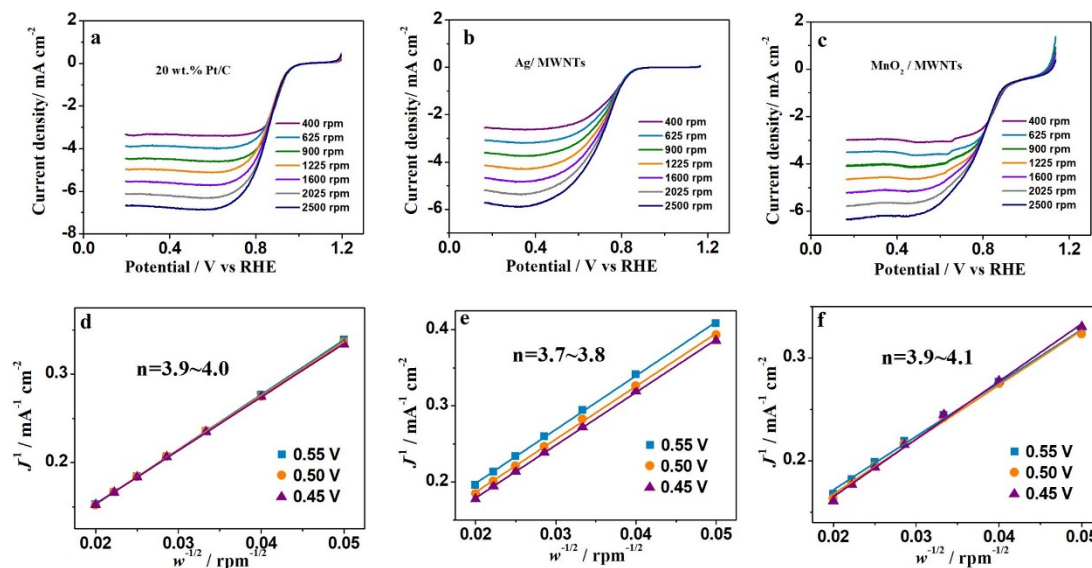


Fig. S4 RDE polarization curves for 20 wt%Pt/C(a), Ag/MWNTs(b), MnO₂/MWNTs(c), K-L curves for 20 wt%Pt/C(d), Ag/MWNTs(e), MnO₂/MWNTs(f).

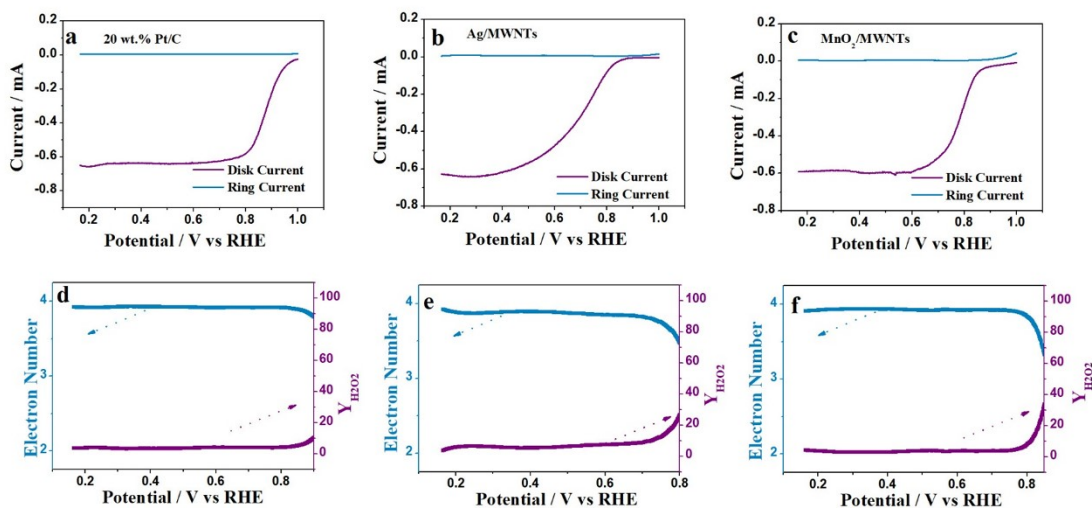


Fig. S5 20wt %Pt/C, Ag/MWNTs, MnO₂/MWNTs (a, b, c) RRD polarization curves, electron transfer numbers and H₂O₂ yield curves (d, e, f)