

## Supporting Information

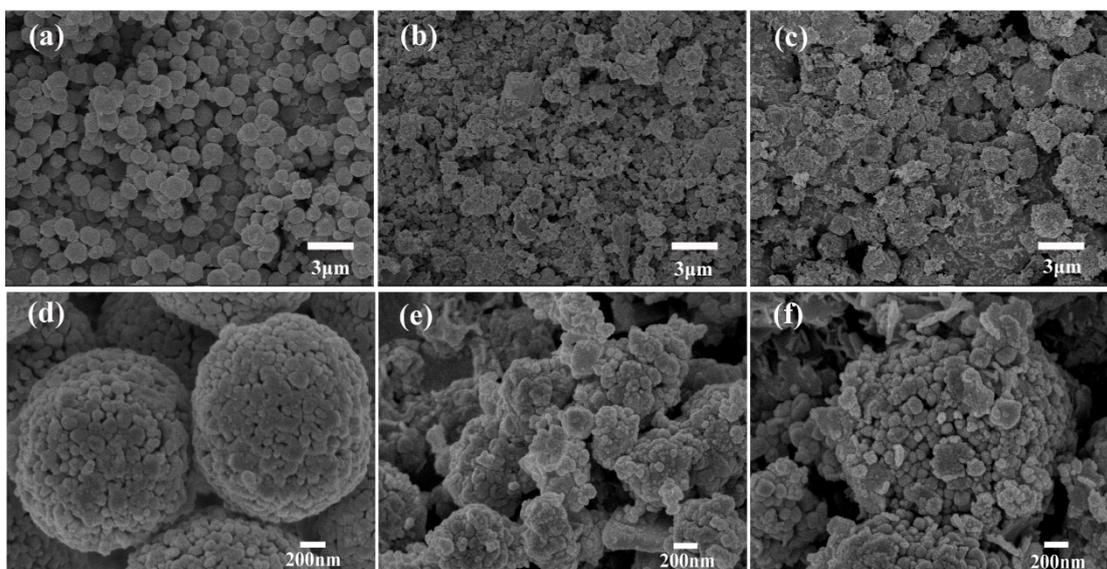


Figure S1. SEM images of (a,d) MnO, (b,e) MnS, and (c,f) MnSe.

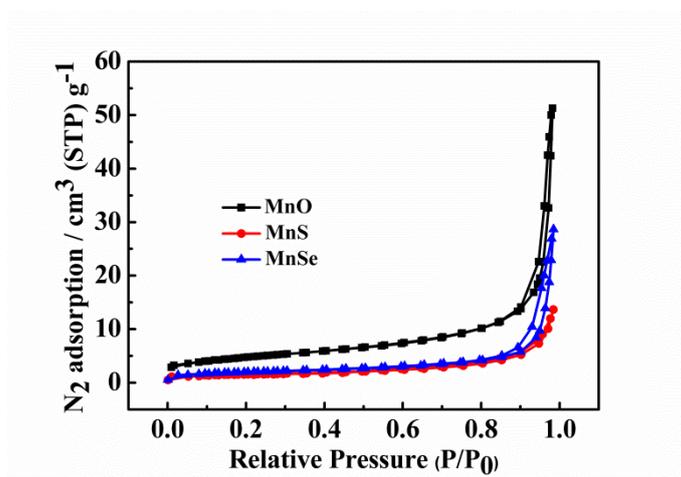


Figure S2. N<sub>2</sub> sorption isotherms (measured at 77K) of the MnX catalysts.

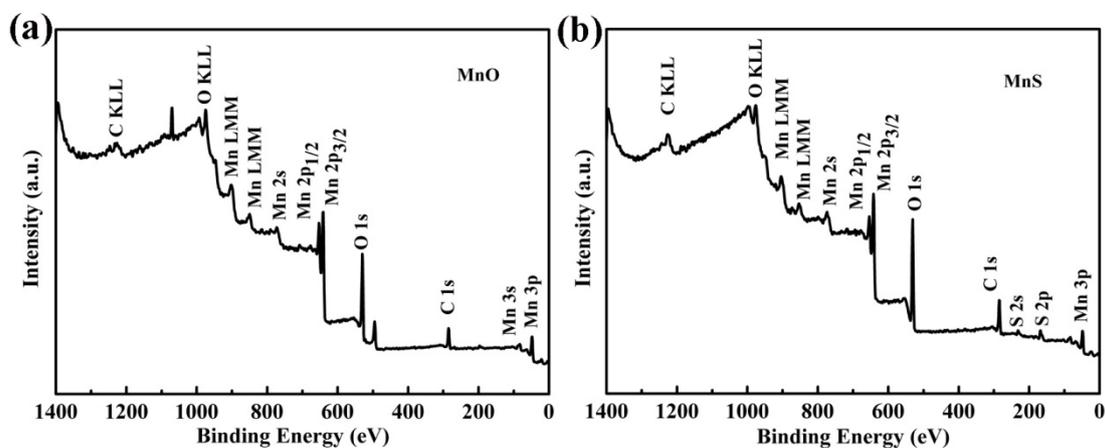
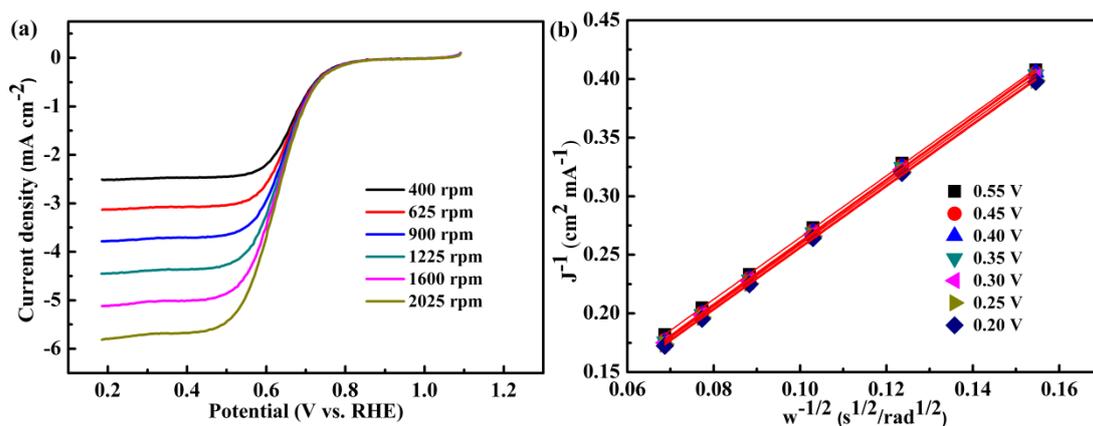
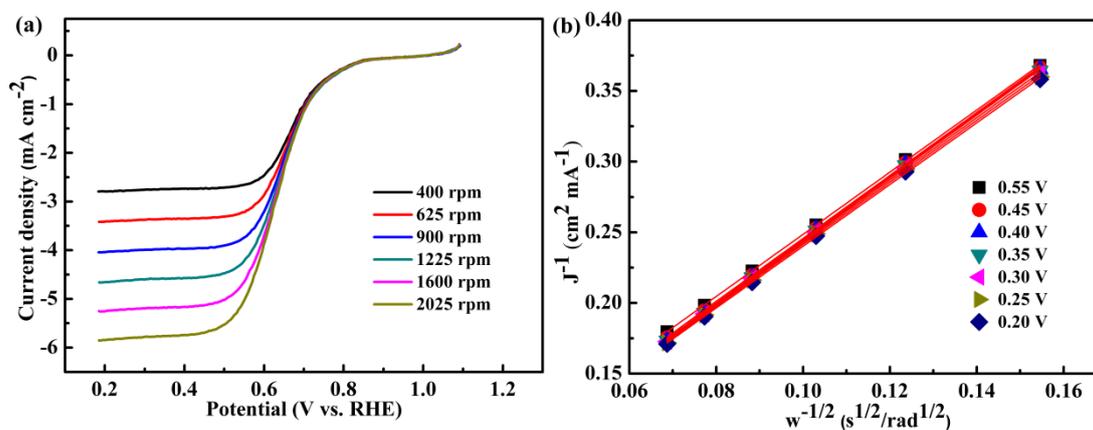


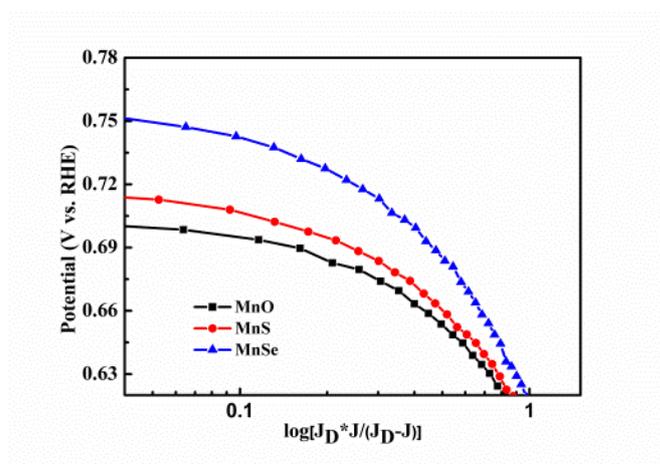
Figure S3. XPS survey scan spectra of (a) MnO and (b) MnS.



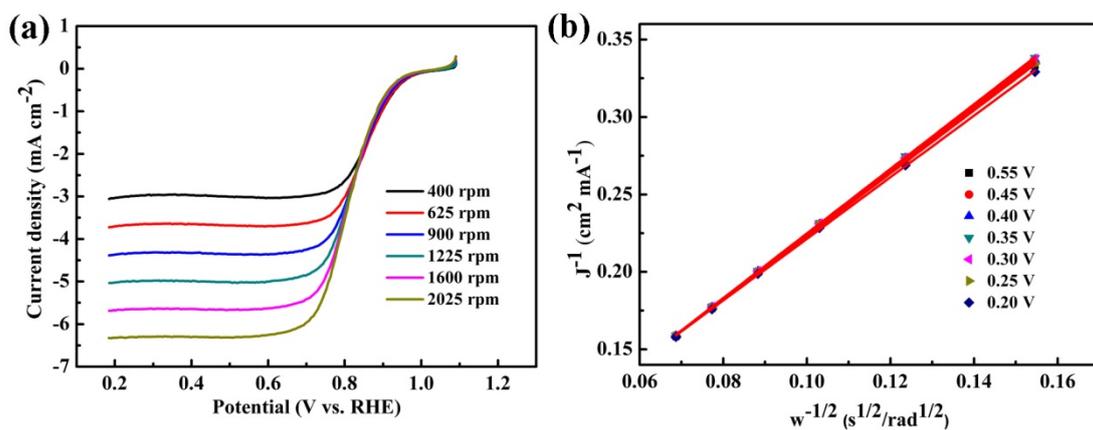
**Figure S4.** (a) LSV curves of MnO at various speeds and (b) the corresponding K-L plots at different potentials.



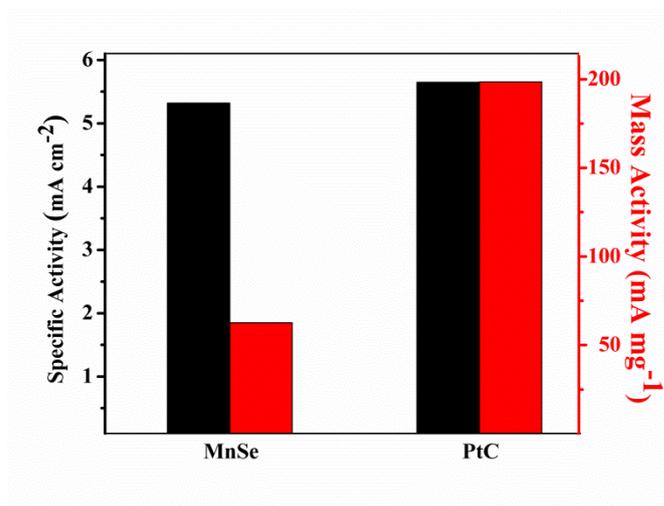
**Figure S5.** (a) LSV curves of MnS at various speeds and (b) the corresponding K-L plots at different potentials.



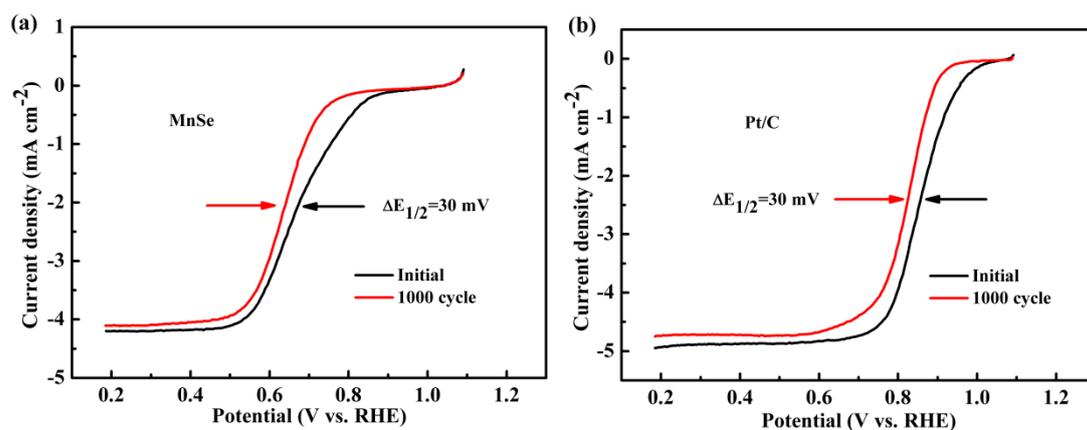
**Figure S6.** Tafel plots derived from LSV results for the different catalysts.



**Figure S7.** (a) LSV curves of MnS at various speeds and (b) the corresponding K-L plots at different potentials.



**Figure S8.** Comparison of specific and mass activities for MnSe and Pt/C catalysts.



**Figure S9.** ORR response initially and after 1000 CV cycles for (a) MnSe and (b) Pt/C.