Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Supporting Information

IrO_2-incorporated $La_{0.8}Sr_{0.2}MnO_3$ as bifunctional oxygen catalysts with enhanced activities

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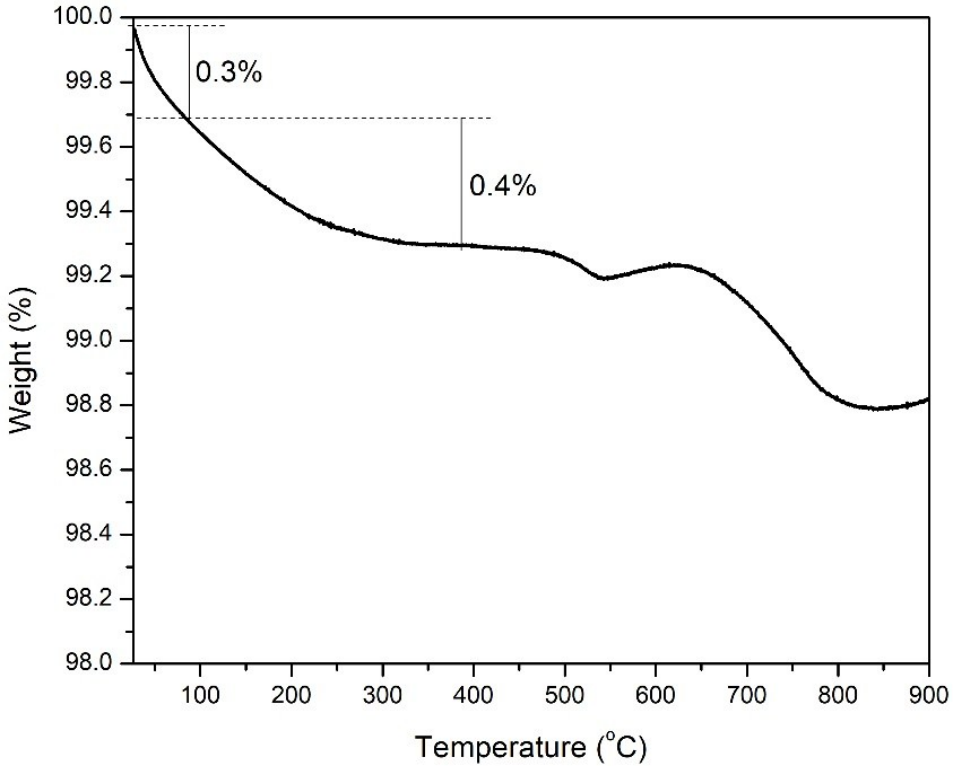

Figure S1. TGA test of $La_{0.8}Sr_{0.2}MnO_3$ under O_2 atmosphere.

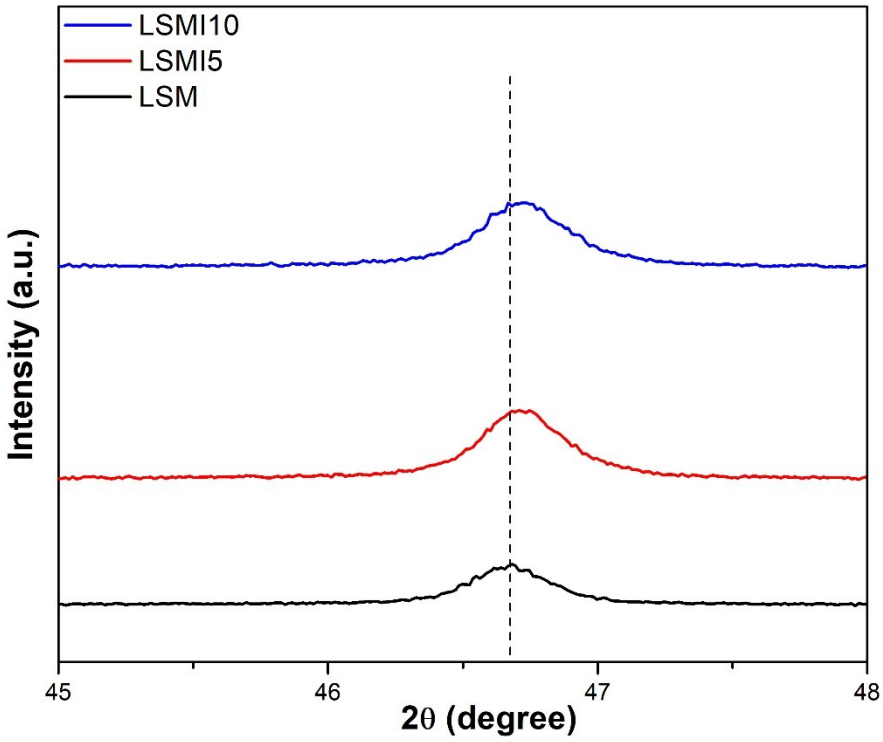

Figure S2. The enlarged XRD of the pristine $La_{0.8}Sr_{0.2}MnO_3$ (LSM), 5 wt% IrO_2-$La_{0.8}Sr_{0.2}MnO_3$ (LSMI) and 10 wt% IrO_2-$La_{0.8}Sr_{0.2}MnO_3$ (LSMI10) in the range of 2θ from 45-48°, respectively.

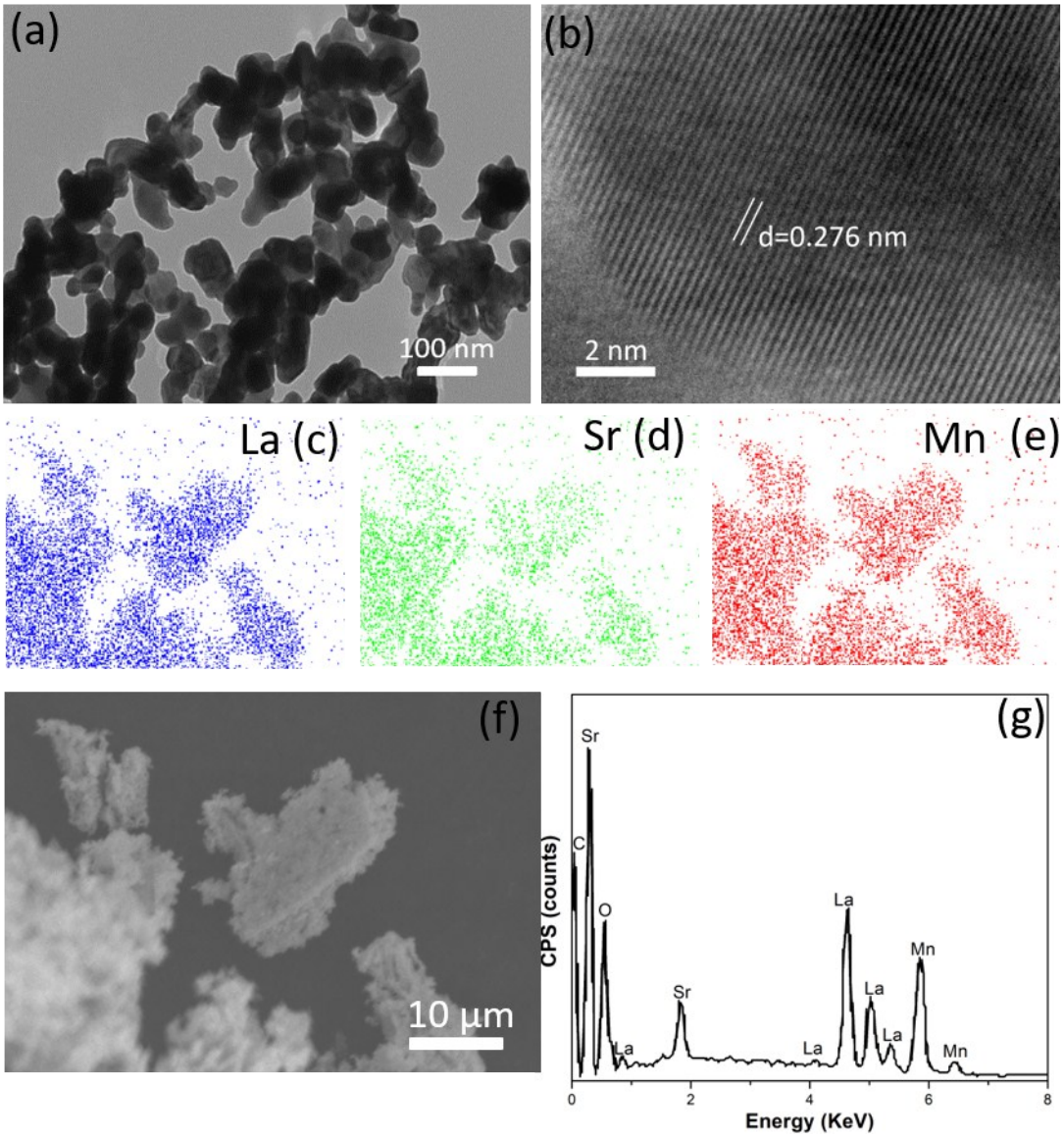

Figure S3. TEM (a), HRTEM (b) and SEM (f) image of the pristine $La_{0.8}Sr_{0.2}MnO_3$; EDX mapping of (c) La, (d) Sr, (e) Mn and (g) EDS spectra of pristine $La_{0.8}Sr_{0.2}MnO_3$, respectively.

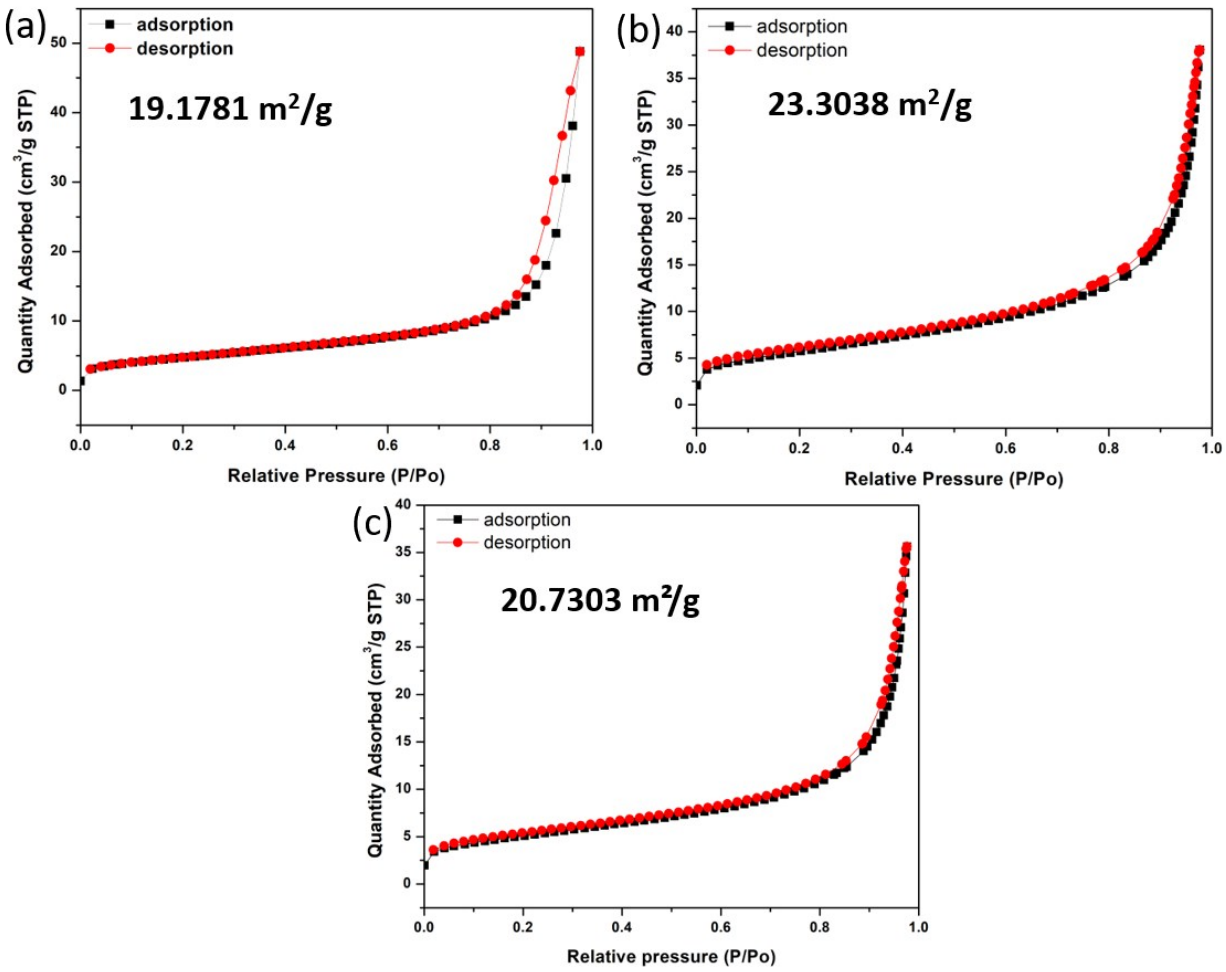

Figure S4. BET test for the pristine $La_{0.8}Sr_{0.2}MnO_3$ (a), 5 wt% IrO_2-$La_{0.8}Sr_{0.2}MnO_3$ (b) and 10 wt% IrO_2-$La_{0.8}Sr_{0.2}MnO_3$ (c), respectively.

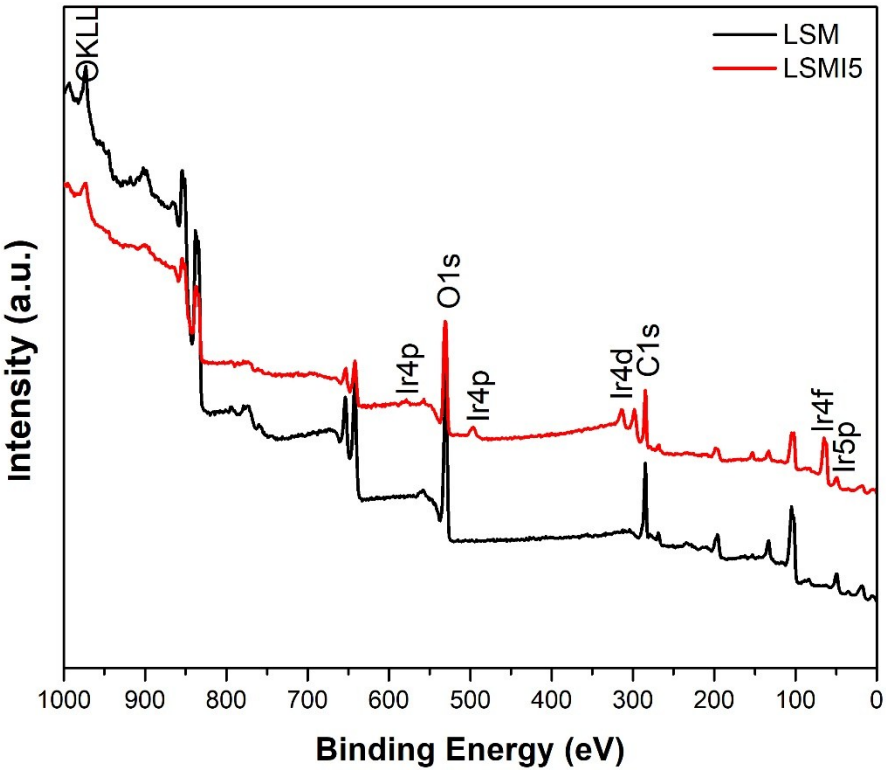

Figure S5. The XPS entire survey scan for the pristine $La_{0.8}Sr_{0.2}MnO_3$ (LSM) and 5 wt% IrO_2-$La_{0.8}Sr_{0.2}MnO_3$ (LSMI5), respectively.

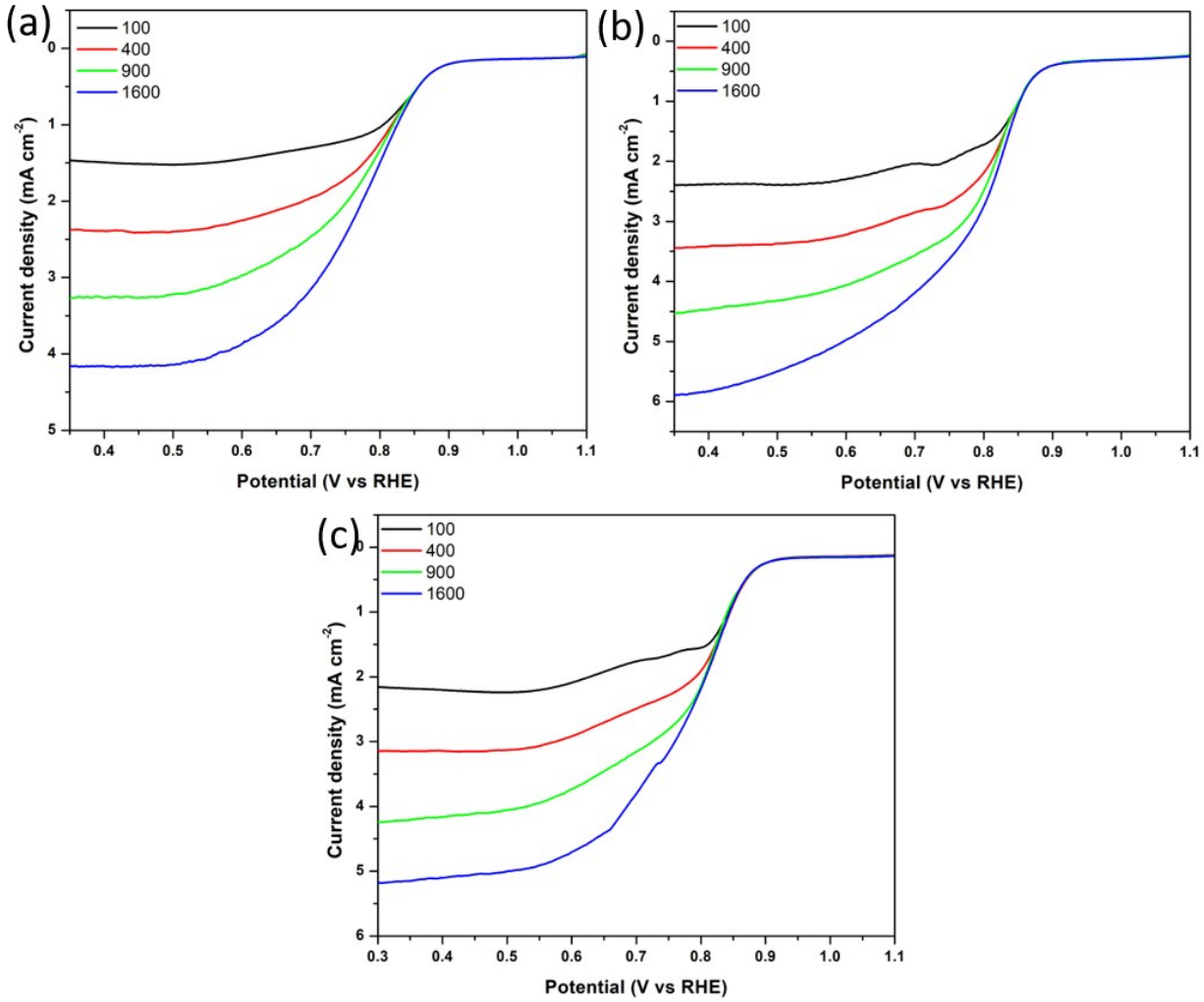

Figure S6. LSV polarization curves (ORR) of (a) $La_{0.8}Sr_{0.2}MnO_3$, (b) 5 wt% IrO_2-$La_{0.8}Sr_{0.2}MnO_3$ and (c) 10 wt% IrO_2-$La_{0.8}Sr_{0.2}MnO_3$ in O_2-saturated 0.1 mol L^{-1} KOH with a scan rate of 10 mV s^{-1} under four (100, 400, 900 and 1600 rpm) different rotation rates.

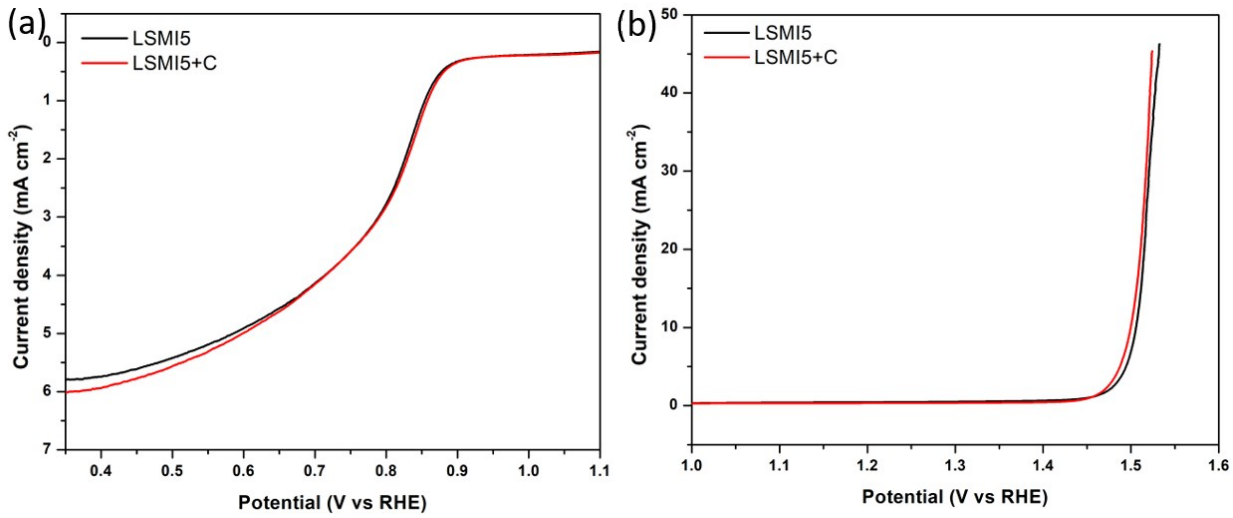

Figure S7. LSV curves of ORR (a) and OER (b) performance comparison between LSMI5 with/without carbon black in 0.1 mol L^{-1} KOH solution with a scan rate of 10 mV s^{-1} at a rotation speed of 1600 rpm.

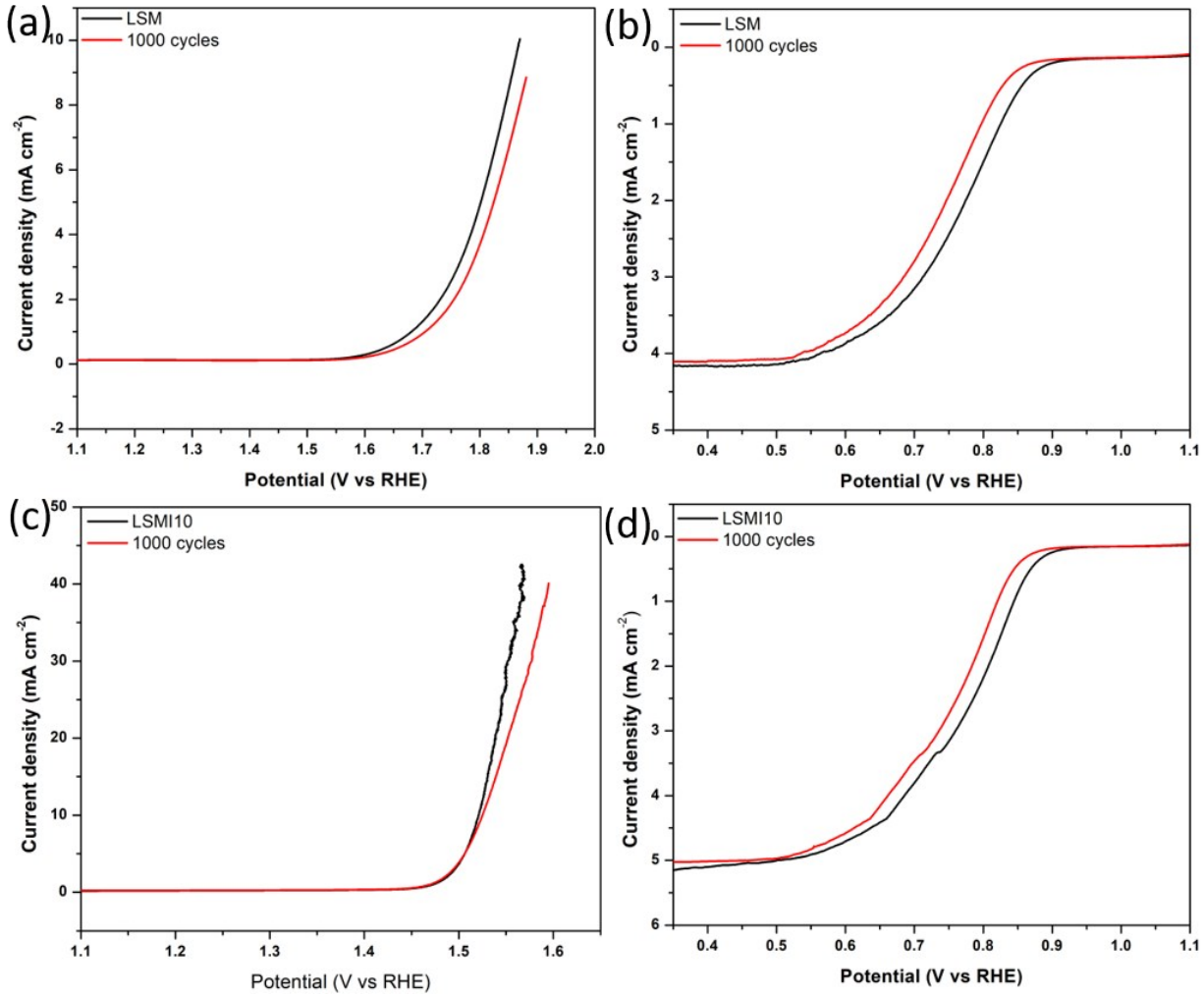

Figure S8. Stability test of the pristine $La_{0.8}Sr_{0.2}MnO_3$ (LSM) and 10 wt% IrO_2-$La_{0.8}Sr_{0.2}MnO_3$ (LSMI10). LSVs of OER (a, c) and ORR (b, d) tested in O_2-saturated 0.1 mol L^{-1} KOH solution before and after 1000 cycles at a sweep rate of 50 mV s^{-1} with a rotation speed of 1600 rpm.