ELECTRONIC SUPPORTING INFORMATION

Table S1: Lattice parameters obtained from the refined powder XRD patterns collected on the as synthesized materials and after the stability tests in 2 M NaOH solution.

Sample		Phase	Cell parameters				Secondary phases (wt.%)	
			a (Å)	b (Å)	c (Å)	Vol (Å^3)		
La_2NiO_4	as synthesised	Fmmm	5.458	5.461	12.693	378.3	La_2O_3 (4.9)	NiO (4.1)
	2 M NaOH	Fmmm	5.456	5.462	12.697	378.4	La_2O_3 (5.8)	NiO (5.5)
$La_{1.8}Ce_{0.2}NiO_4$	as synthesised	Fmmm	5.448	5.447	12.681	376.3	CeO_2 (11.4)	
	2 M NaOH	Fmmm	5.449	5.448	12.684	376.5	CeO_2 (11.3)	
$La_{1.9}Pr_{0.1}NiO_4$	as synthesised	Fmmm	5.458	5.458	12.671	377.5	none	
	2 M NaOH	Fmmm	5.457	5.457	12.670	377.3	none	
$La_{1.8}Pr_{0.2}NiO_4$	as synthesised	Fmmm	5.454	5.454	12.666	376.8	none	
	2 M NaOH	Fmmm	5.454	5.452	12.664	376.6	none	
$La_{1.9}Sr_{0.1}NiO_4$	as synthesised	Fmmm	5.444	5.446	12.697	376.4	(La,Sr)NiO_3 (traces)	
	2 M NaOH	Fmmm	5.445	5.445	12.696	376.4	(La,Sr)NiO_3 (traces)	
La_2CuO_4	as synthesised	Bmeb	5.353	13.153	5.393	379.7	none	
	2 M NaOH	Bmeb	5.353	13.153	5.394	379.8	none	
$La_{1.9}Pr_{0.1}CuO_4$	as synthesised	Bmeb	5.356	13.144	5.404	380.4	none	
	2 M NaOH	Bmeb	5.404	13.143	5.355	380.3	none	
$La_{1.9}Sr_{0.1}CuO_4$	as synthesised	Bmeb	5.344	13.193	5.351	377.3	none	
	2 M NaOH	Bmeb	5.345	13.199	5.355	377.8	none	

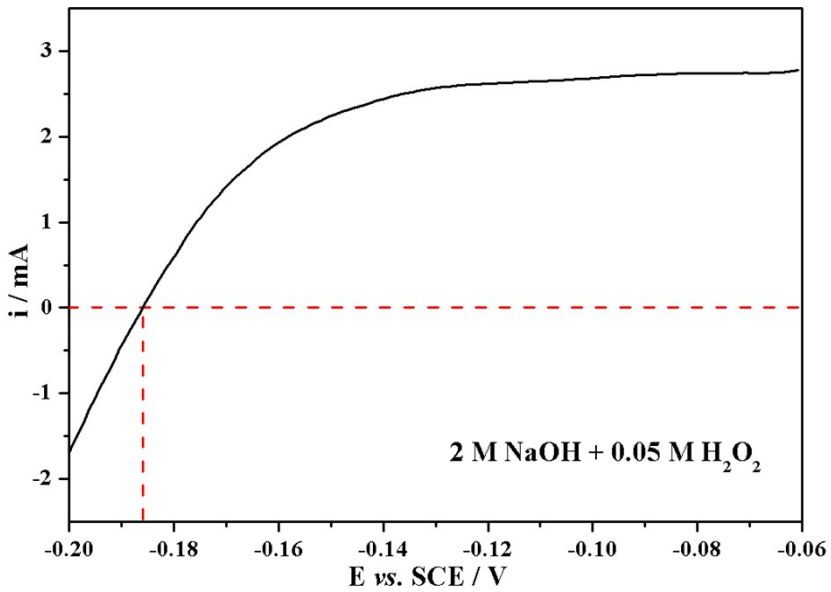

Figure S1: LSV of a Pt electrode at 10 mV s^{-1} in 0.05 M H_2O_2 + 2 M NaOH solution (pre-saturated with H_2) used for calibration of SCE to RHE reference scale. Similar curves were recorded for the solutions containing 0.5 and 1 M H_2O_2. From these measurements, the formula E_{RHE} = E_{SCE} + 0.186 V, 0.215 V or 0.219 V, for 0.05 M, 0.5 M or 1 M H_2O_2 solutions, respectively, was determined.

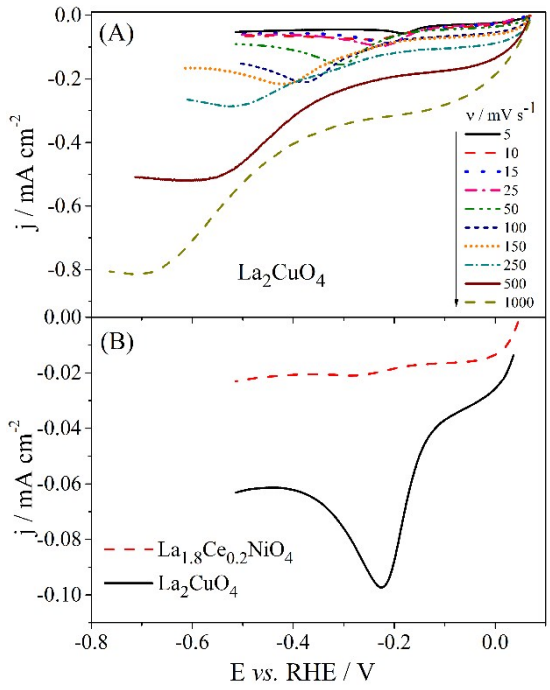

Figure S2: Effect of potential scan rate on the LSVs of La_2CuO_4 in 0.05 M H_2O_2 + 2 M NaOH (A) and comparison of LSVs of La_2CuO_4 and $La_{1.8}Ce_{0.2}NiO_4$ electrodes at 25 mV s^{-1} (B).

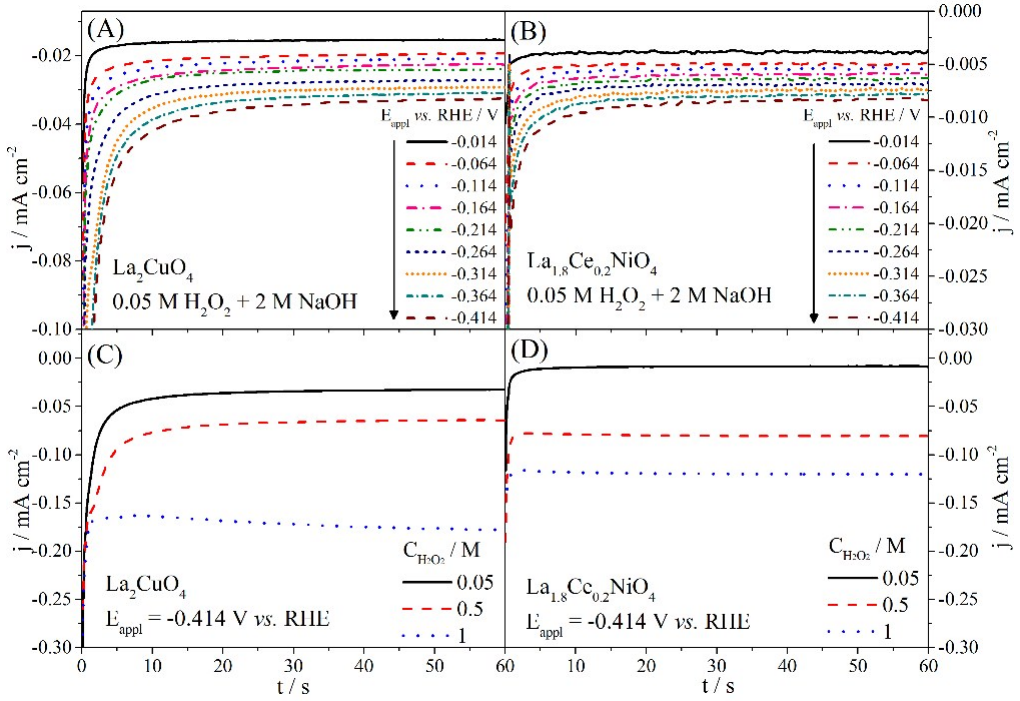

Figure S3: CA curves of La_2CuO_4 (A) and $La_{1.8}Ce_{0.2}NiO_4$ (B) electrodes in 0.05 M H_2O_2 + 2 M NaOH solutions for different applied potentials, and CA curves of La_2CuO_4 (C) and $La_{1.8}Ce_{0.2}NiO_4$ (D) in solutions with different H_2O_2 concentrations at applied potential of -0.414 V.

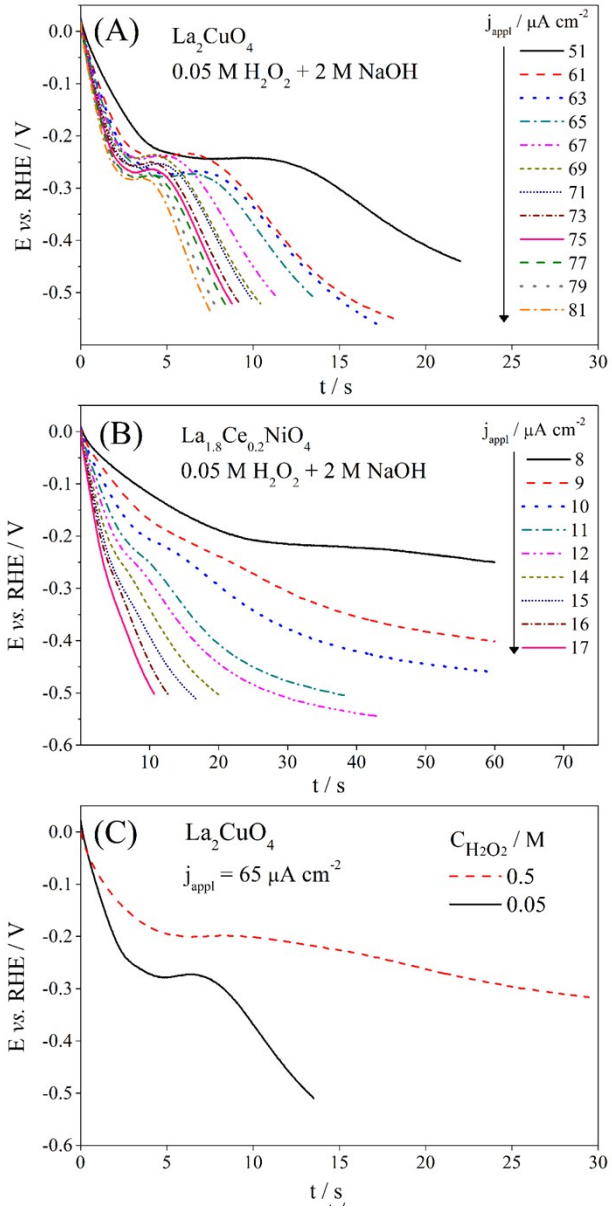

Figure S4: CP curves of La_2CuO_4 (A) and $La_{1.8}Ce_{0.2}NiO_4$ (B) electrodes in 0.05 M H_2O_2 + 2 M NaOH, and of La_2CuO_4 in two different H_2O_2 concentrations and current density of 65 μA cm^{-2} (C).