Activating Cobalt Inverse Spinel Oxides via Fe Substitution for Enhanced Water Splitting Reaction

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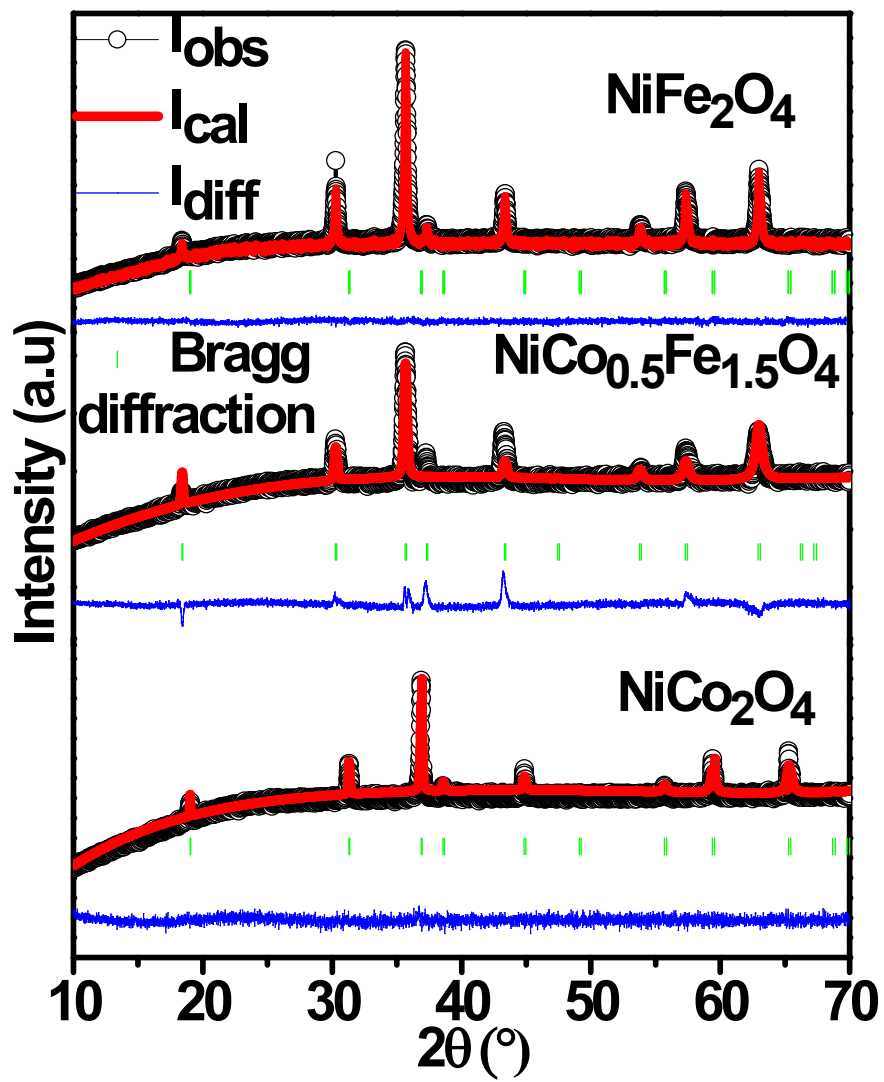
Fig. S1 Rietveld refinement of the three oxides.

Table S1. The reliability factors along with refined lattice parameters of three oxides.

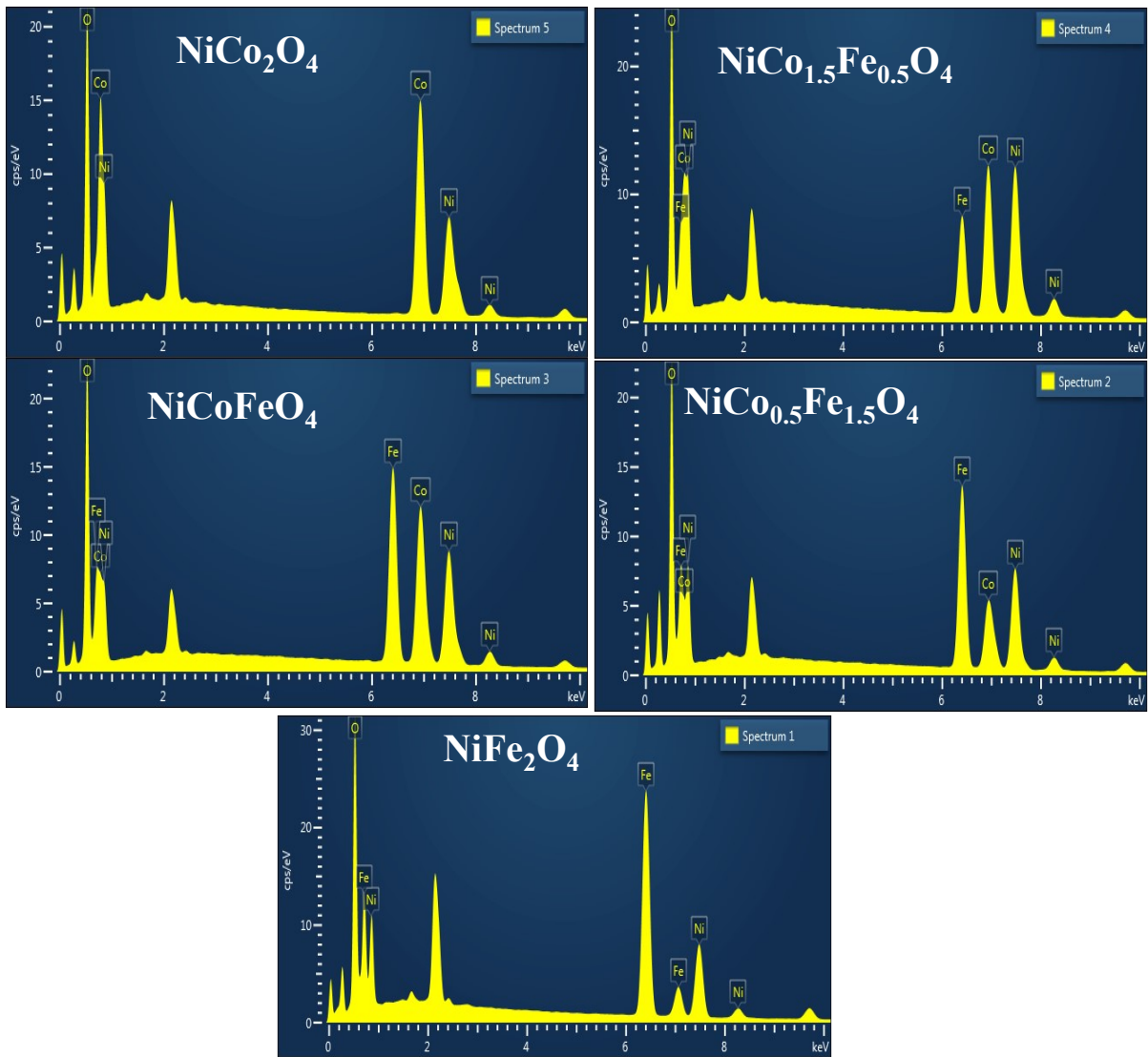|	$NiCo_2O_4$			$NiCo_{0.5}Fe_{1.5}O_4$				$NiFe_2O_4$		
a (Å) = b (Å) = c (Å)	8.1025 (3)			8.3472 (1)				8.4009 (5)		
Space group	Fd-3m			Fd-3m				Fd-3m		
Occupancy	Ni	Co	O	Ni	Co	Fe	O	Ni	Fe	O
	1 (3)	1 (4)	0.999(3)	1 (3)	0.25(5)	0.75(3)	0.959(2)	1 (2)	1 (3)	0.999 (3)
Wyckoff position	8b Ni(1) 16c Ni(2)	8b Co(1) 16c Co(2)	32e	8b Ni(1) 16c Ni(2)	8b Co(1) 16c Co(2)	8b Fe(1) 16c Fe(2)	32e	8b Ni(1) 16c Ni(2)	8b Fe(1) 16c Fe(2)	32e
R_{Bragg} (%)	3.29			4.02				5.08		
R_f (%)	1.21			1.07				1.16		
R_{wp} (%)	2.97			3.37				3.21		
R_p (%)	2.17			2.24				3.81		
χ^2	1.17			1.84				2.03		

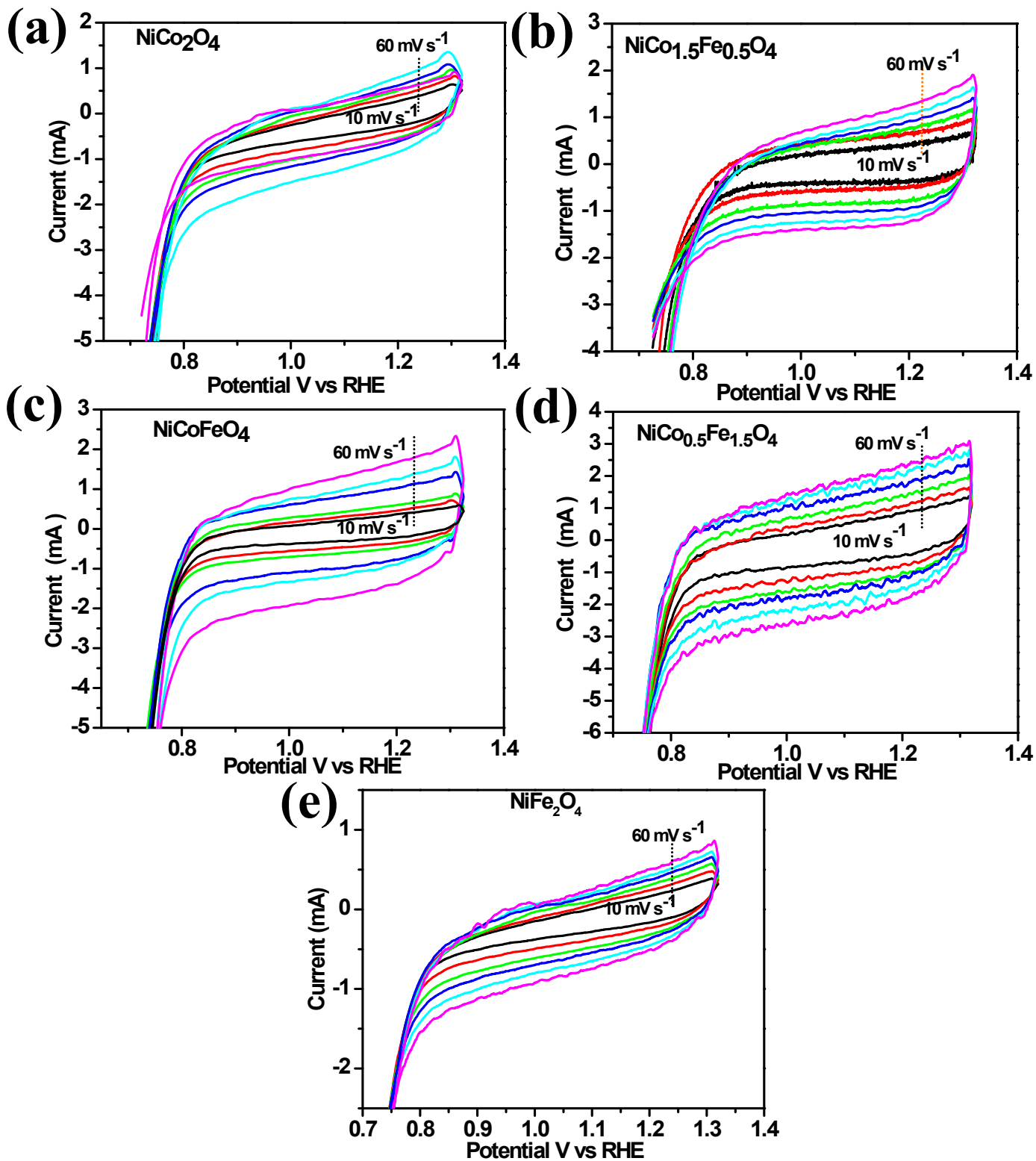**Fig. S2** EDS of all five synthesized catalysts.

Fig. S3 Non-faradic region CV at 10 to 60 mV s^{-1} scan rate of synthesized catalysts.
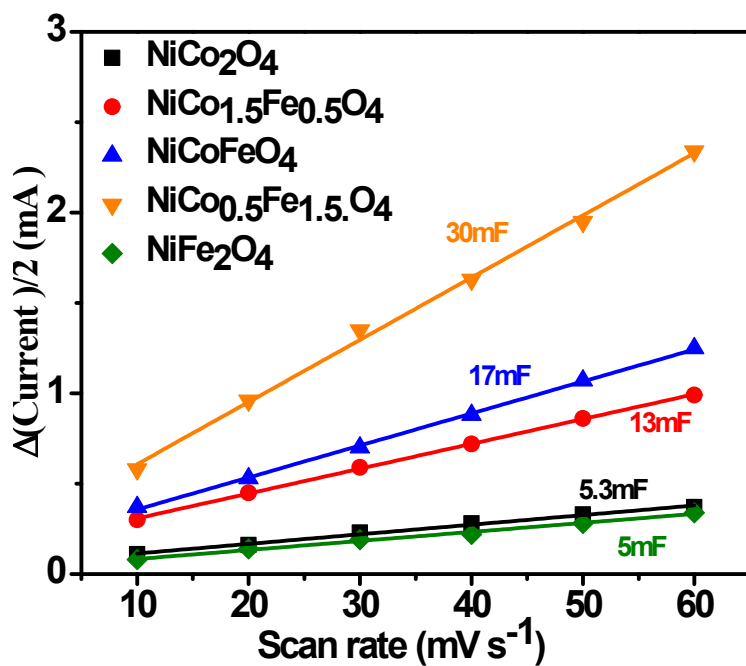
Fig. S4 linear regression between the current density differences in the 1.25 V potential window of CV vs. scan rates of synthesized catalysts.
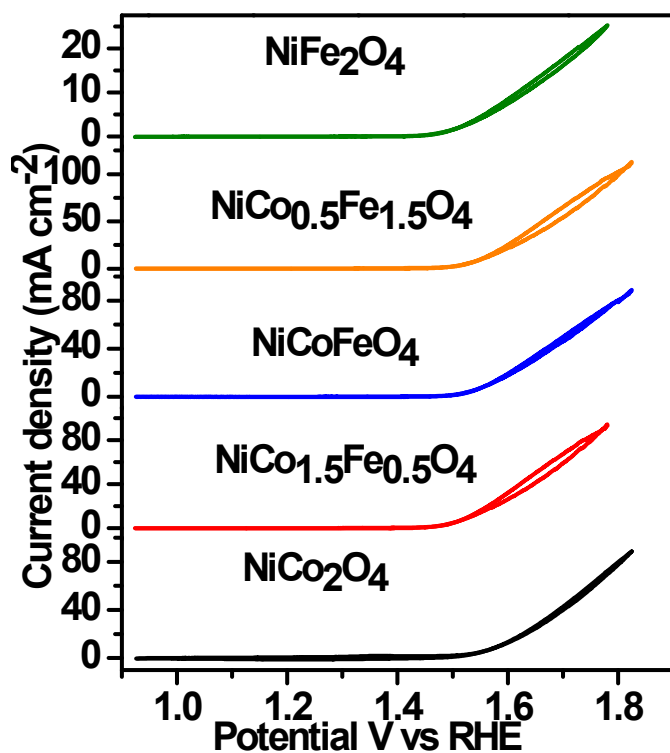

Fig. S5 Faradic region CV at 10 to 60 mV s^{-1} scan rate of synthesized catalysts.
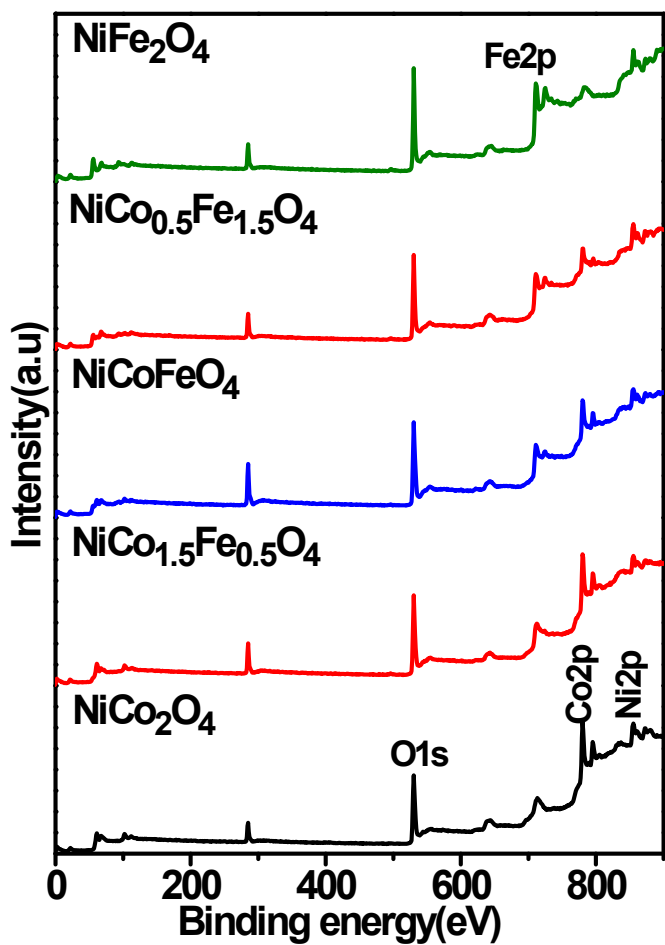
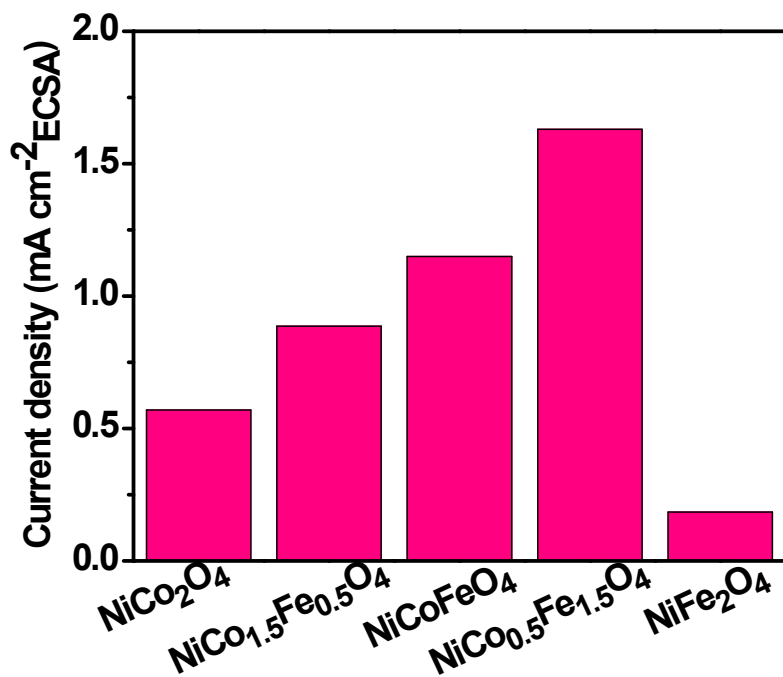**Fig. S6** XPS survey spectra of five synthesized catalysts.

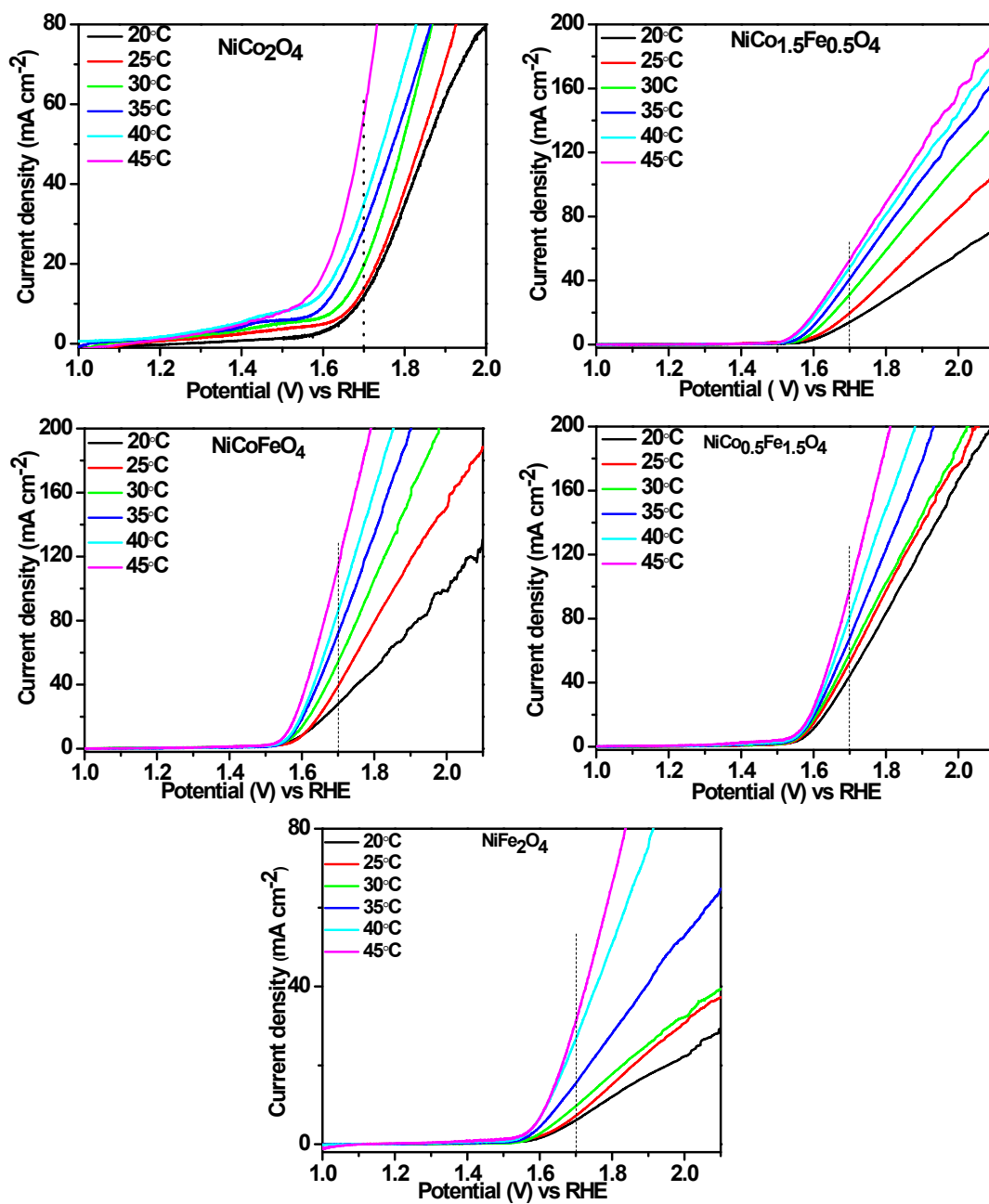**Fig. S7** Intrinsic activity of five synthesized catalysts

Fig. S8 LSV polarisation curve of five catalysts at different temperatures (20° to 45° C)