Supplementary info

Figure S1: SEM micrographs of pristine $Ni(OH)_2$ NW, after annealing and after OER.

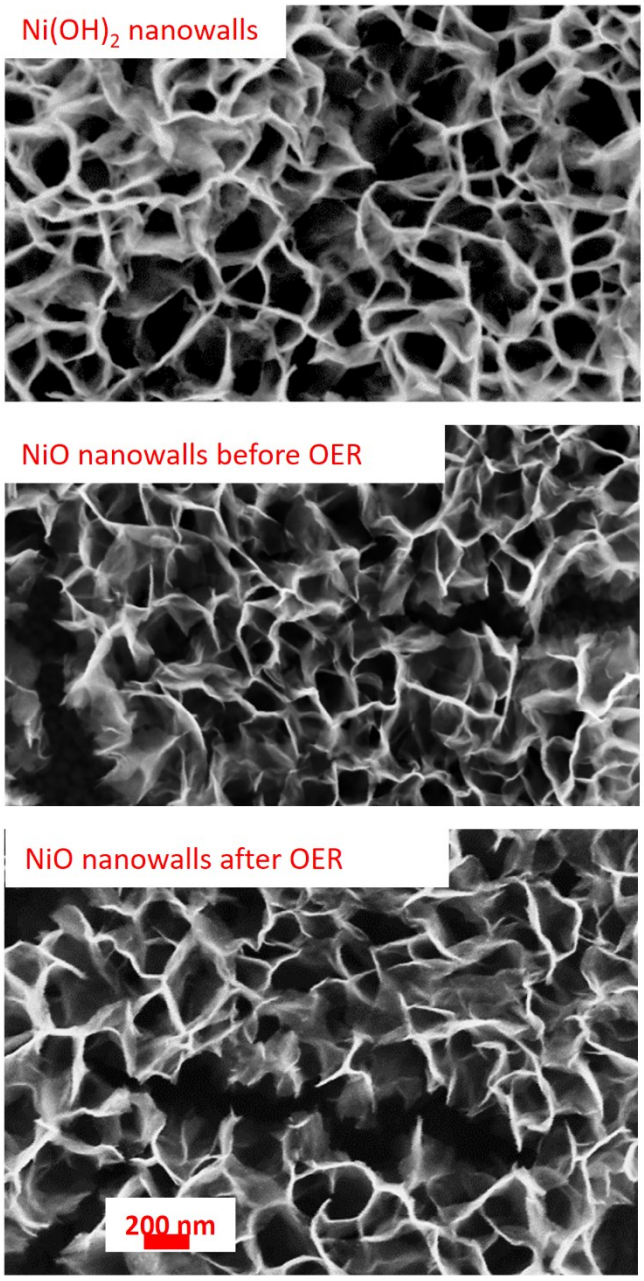

Figure S2: SEM cross-sections and calibration of NiO NW thickness and active sites.

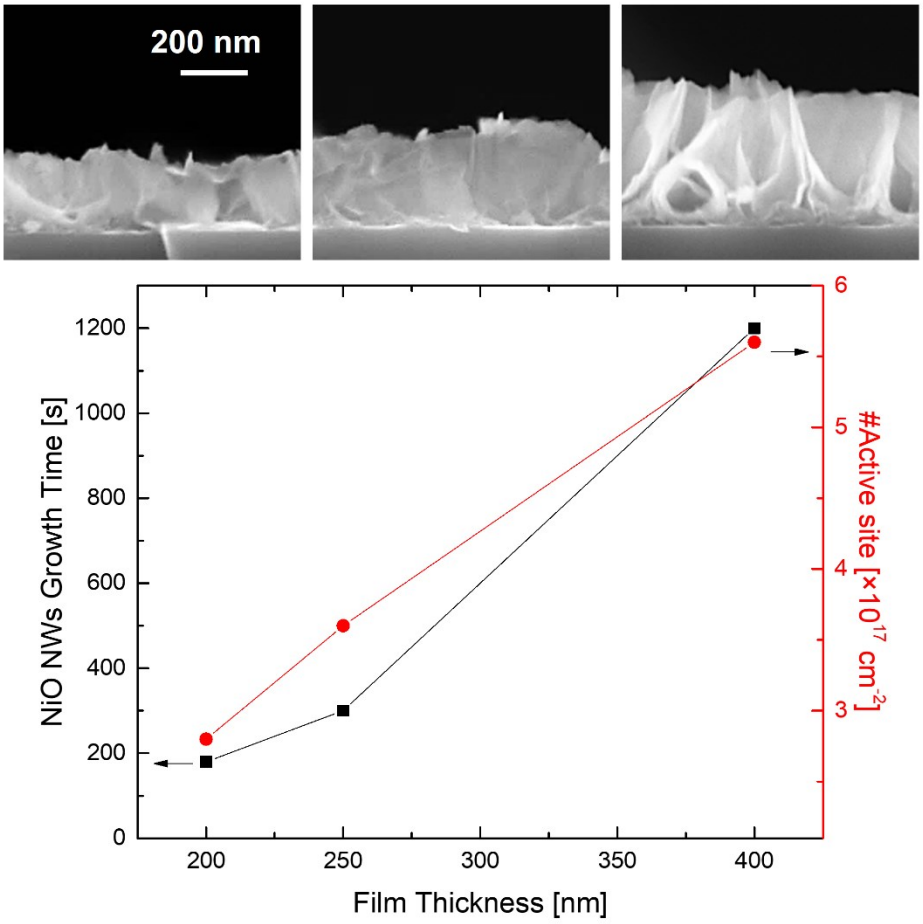

Table S1: Film thickness, area and density of $Ni(OH)_2$ and NiO NW grown on Au/Ti/quartz electrodes.

	$Ni(OH)_2$_200	**NiO_200**	**NiO_400**
NW film thickness [nm]	200	200	400
Sample Area [cm^2]	1.5	1.35	1
Film density [$\mu g/cm^2$]	32	30	119
Electrocatalyst density [$\mu mol/cm^2$]	0.35	0.40	1.59

Figure S3: SEM-EDX atomic survey map of NiO NW before and after OER.

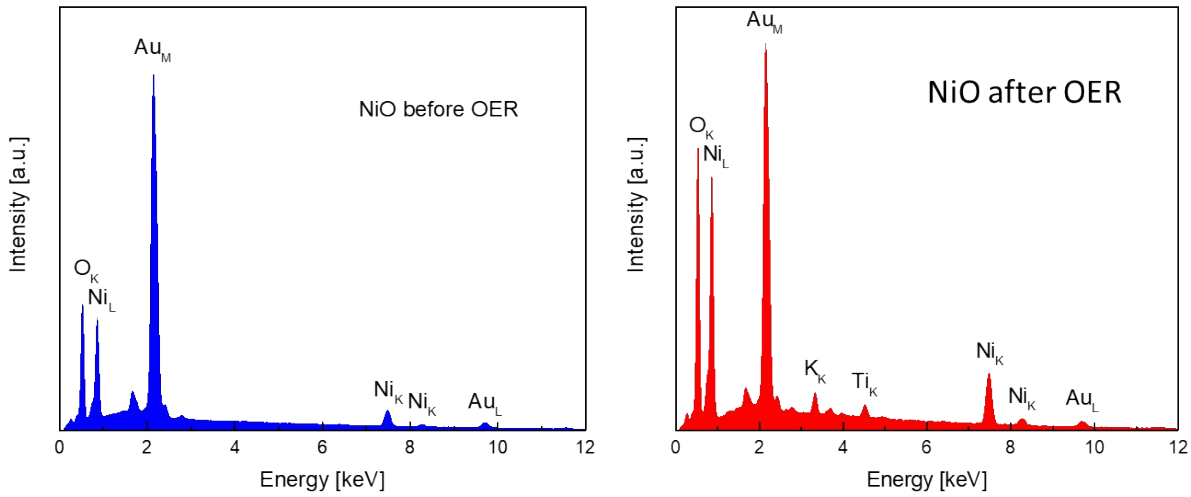

Figure S4: Nyquist plots of Ni(OH)2 and NiO NW and estimated values of R_{ct} and R_u.

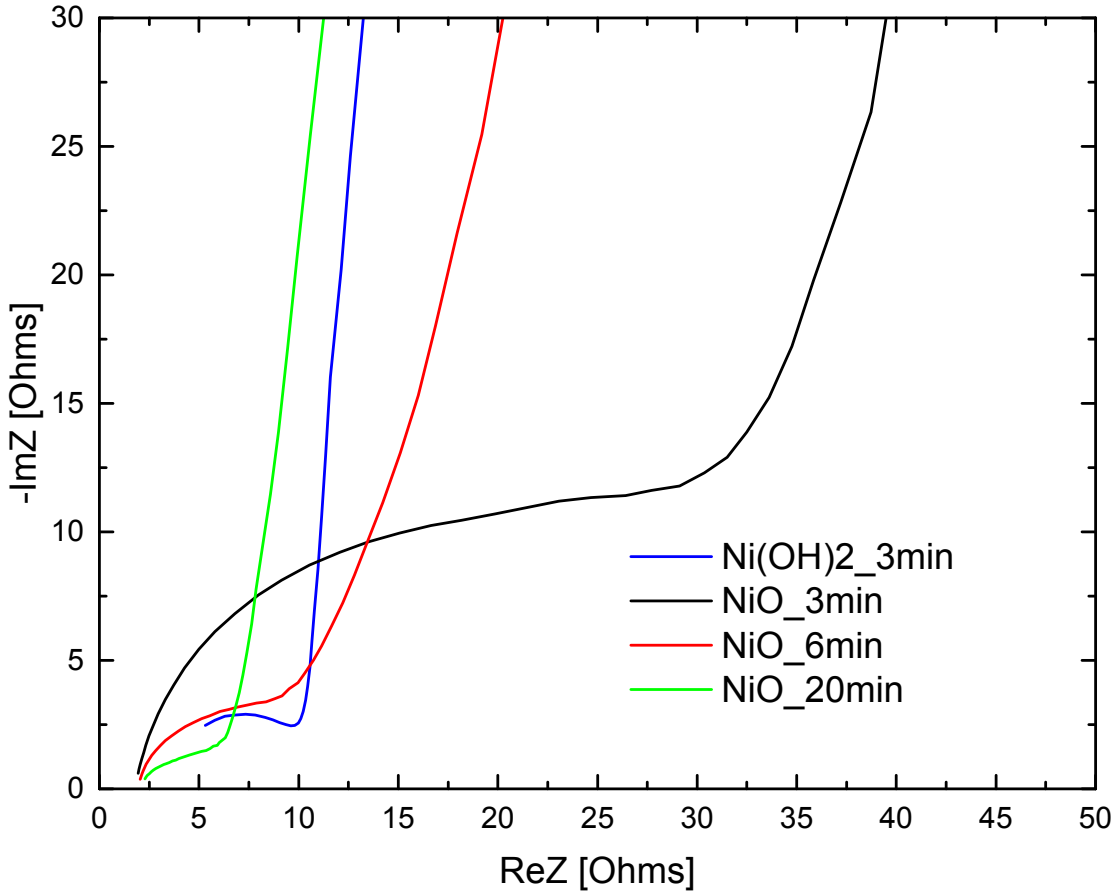

Figure S5: Multiple CV (10 cycles) of NiO and $Ni(OH)_2$ NW recorded at 10 mV/s scan rate in 1 M KOH.

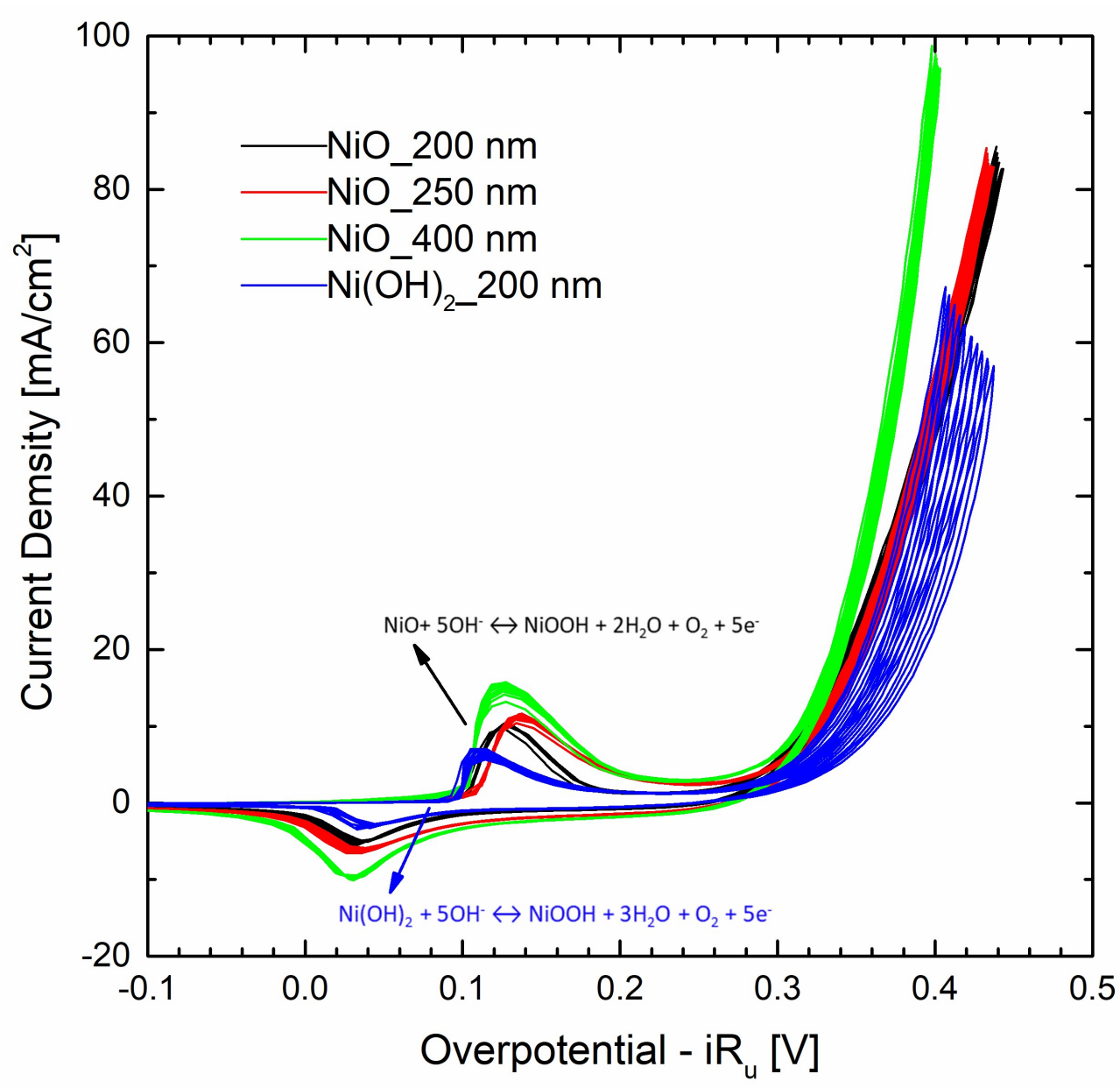

Figure S6: CP measurements performed at 10 mA/cm2 of NiO and $Ni(OH)_2$ NW.

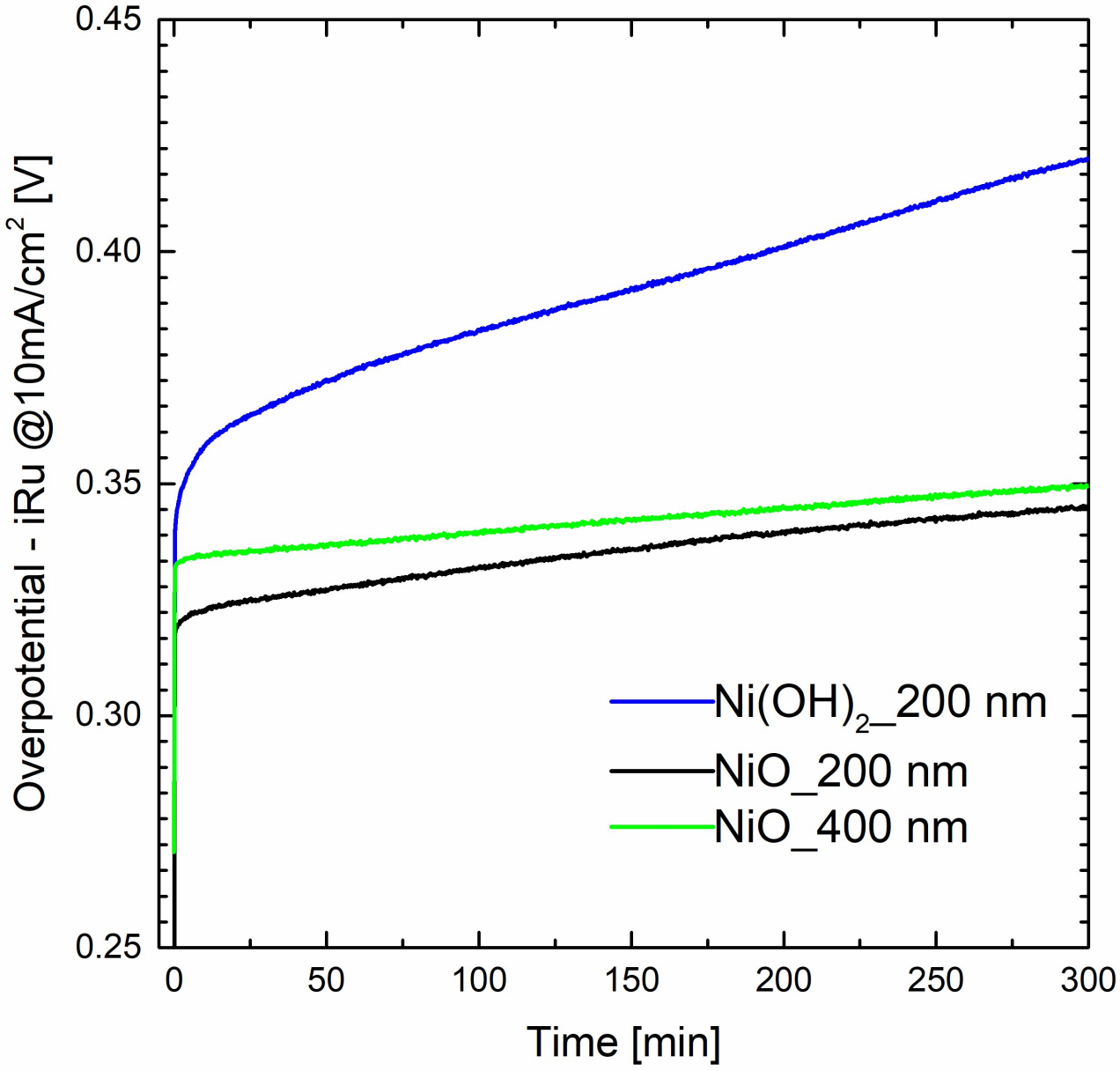
0.45
0.40
0.35
0.30
0.25
Overpotential - iRu @10mA/cm^2 [V]
0
50
100
150
200
250
300
Time [min]
Ni(OH)$_2$_200 nm
NiO_200 nm
NiO_400 nm

Table S2: Values of binding energy, area, FWHM and shape (0= Gaussian; 1= Lorentzian) used for the fit of XPS peaks.

XPS signal	Bond	binding energy [eV]	area	FWHM	shape
O1s_NiO_ before OER	Ni-O	529.6	108000	1.6	0.1
	NI(OH)2	531.1	82500	1.55	0
	C=O	532	81900	1.6	0
	metal carbonates	532	11400	1.6	0.1
	H2O	533.3	22000	1.6	0
O1s_NiO_ after OER	Ni-O	529.5	114000	1.7	0
	NiOOH	531.2	180000	1.8	0.1
	C=O	532.3	95000	1.6	0
	metal carbonates	532	17800	1.6	0
	H2O	533.5	45000	1.6	0
Ni2p_NiO 2p3/2_ before OER	NiO	853.5	105000	2	0.3
	NI(OH)2	854.7	35000	2	0.2
	NiO multiplet	855.2	55000	2.2	0.1
	Ni(OH)2	856.1	55600	2.3	0.1
	Ni(OH)2	857.7	25500	2.2	0.1
	satellite NiO	860.1	91500	3.3	0.1
	satellite Ni(OH)2	862.3	82400	4.8	0
Ni2p_NiO_ after OER	NiO	853.5	104700	1.8	0.1
	NiO multiplet	855.2	50500	2	0.2
	NIOOH	854.4	59000	2	0.1
	NIOOH	855.1	0	0	0.1
	NIOOH	855.5	94500	2.3	0.1
	NIOOH	856.3	53100	2	0.1
	NIOOH	857.6	38000	2	0.1
	satellite NiO	860.4	171500	3.6	0.1
	satellite NiOOH	863.3	51000	3.4	0.2