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Supporting information

Rational design of cobalt-chromium layered double hydroxide as a highly efficient electrocatalyst for water oxidation

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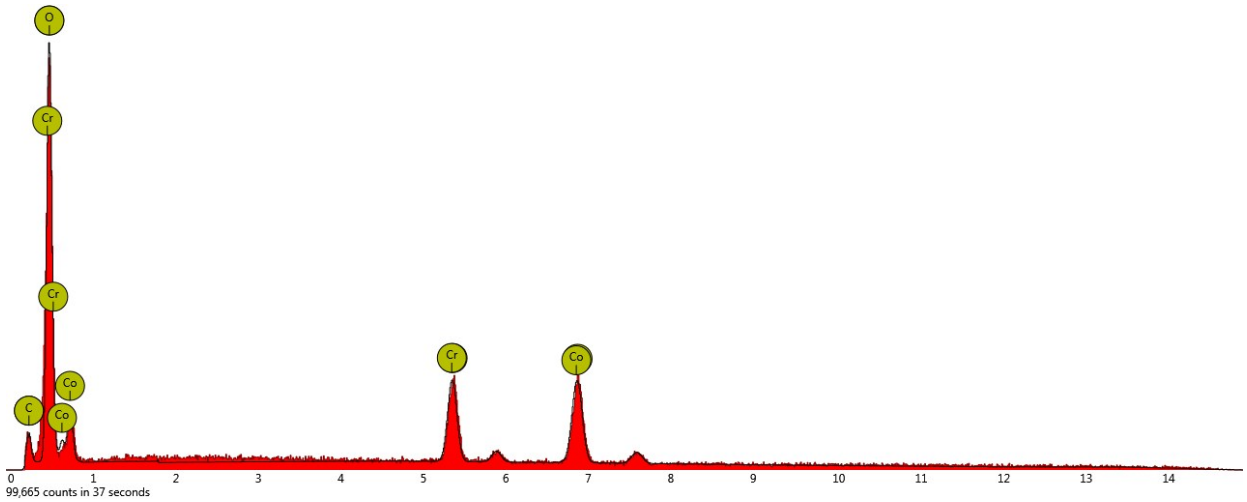

Figure S1. Energy dispersive X-ray spectrum of CoCr LDH powder (2:1).

Table S1. Element analysis of CoCr LDH.

Element Number	Element Symbol	Element Name	Concentration (%)	Error (%)
8	O	Oxygen	58.4	0.8
27	Co	Cobalt	14.6	1.4
24	Cr	Chromium	7.4	1.5
6	C	Carbon	19.5	3.7

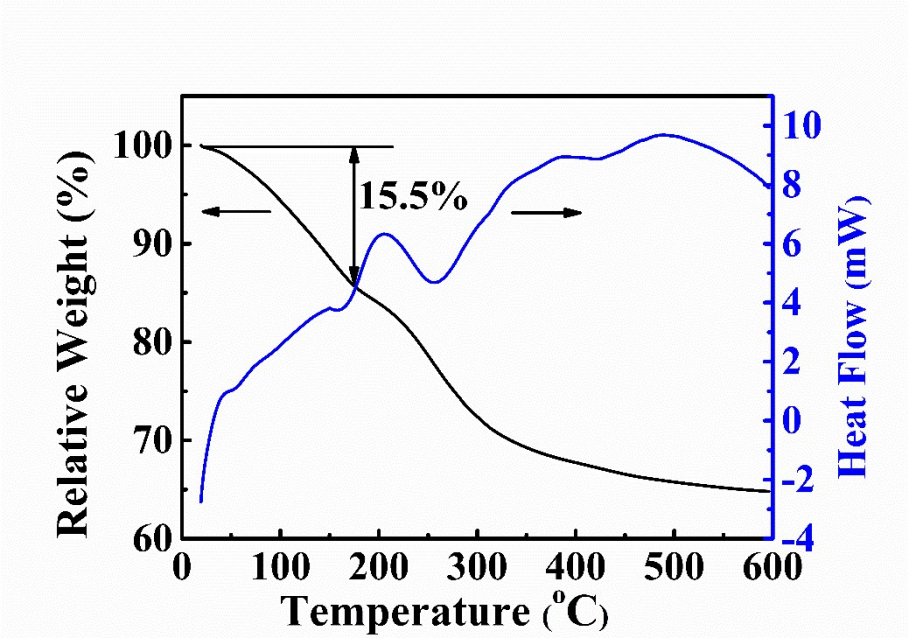

Figure S2. The TG/DSC curves of CoCr LDH (2:1)

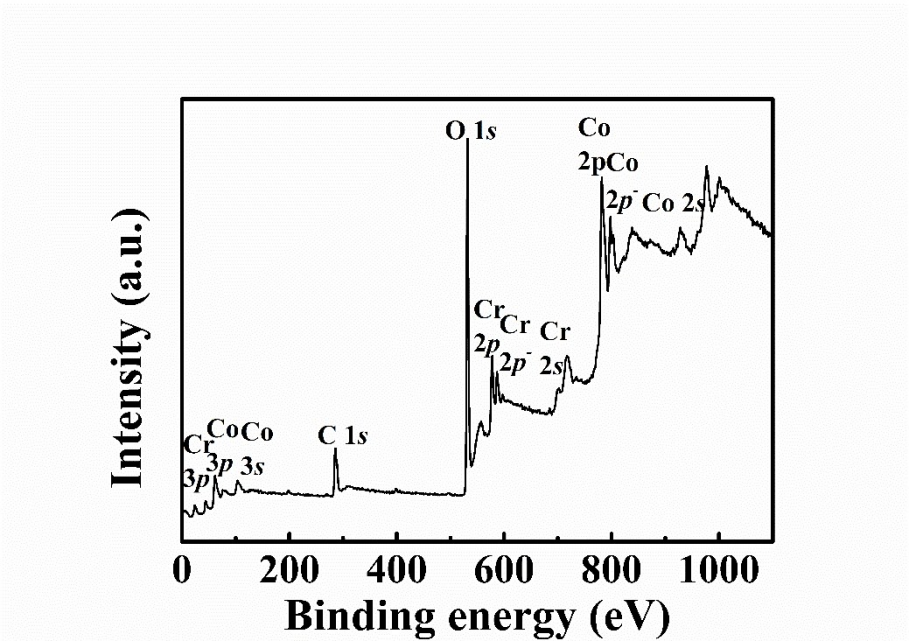

Figure S3. The XPS survey of CoCr LDH (2:1)

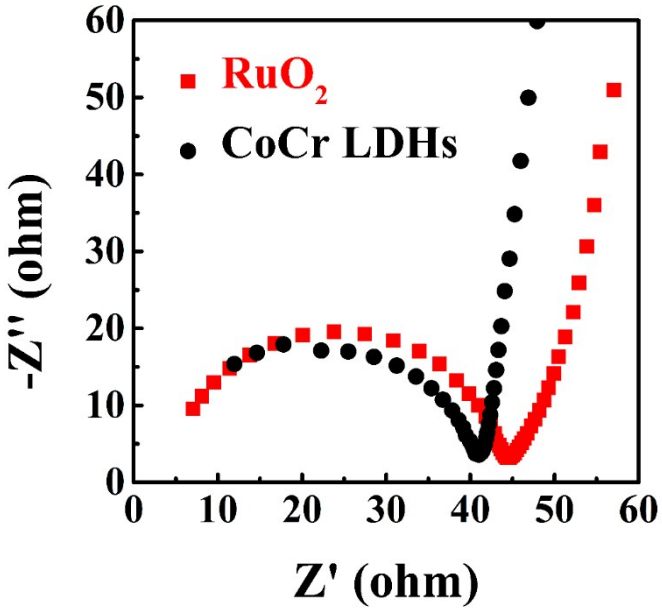

Figure S4. Nyquist plots of CoCr LDH and RuO_2.

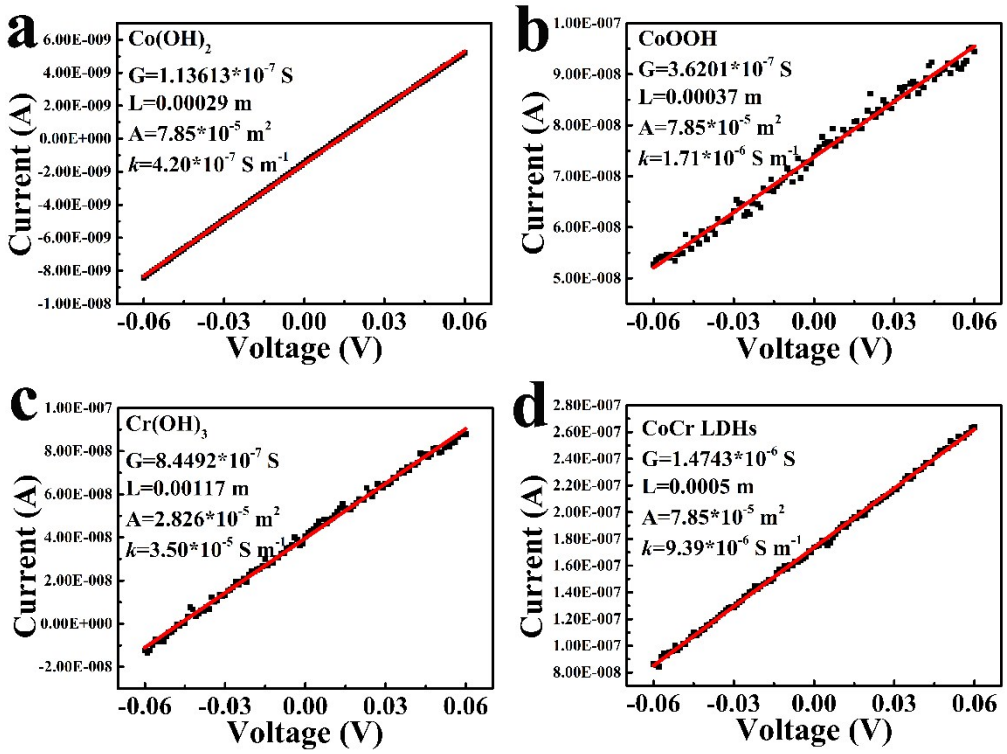

Figure S5. The I-U curve by LSV measurements of (a) $Co(OH)_2$, (b) CoOOH, (c) $Cr(OH)_3$ and (d) CoCr LDH.

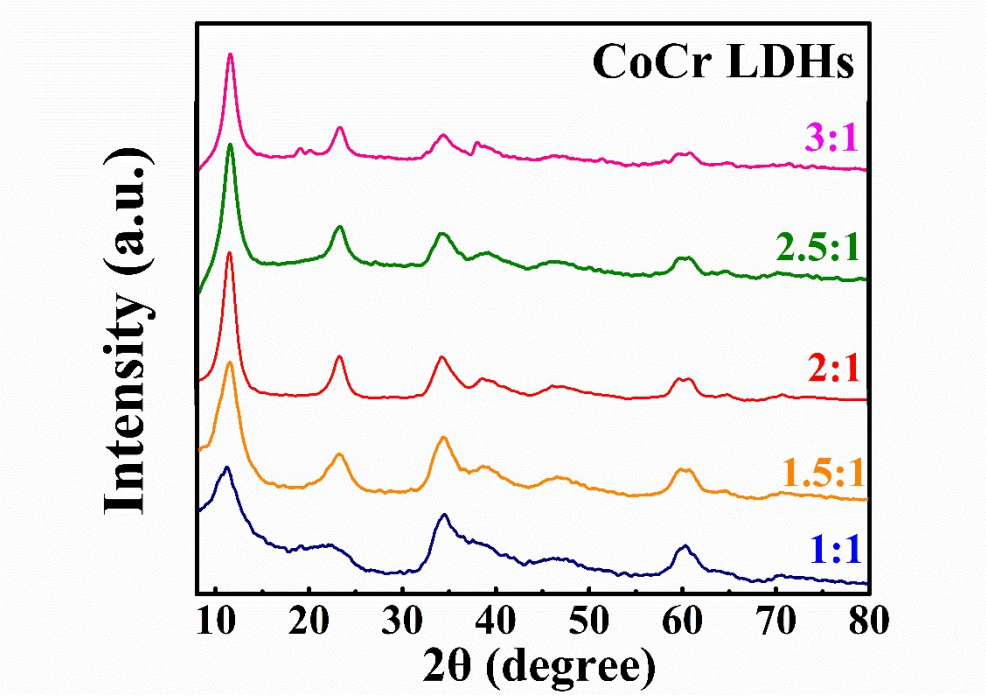

Figure S6. The XRD patterns of CoCr LDH with different ratios of Co to Cr.

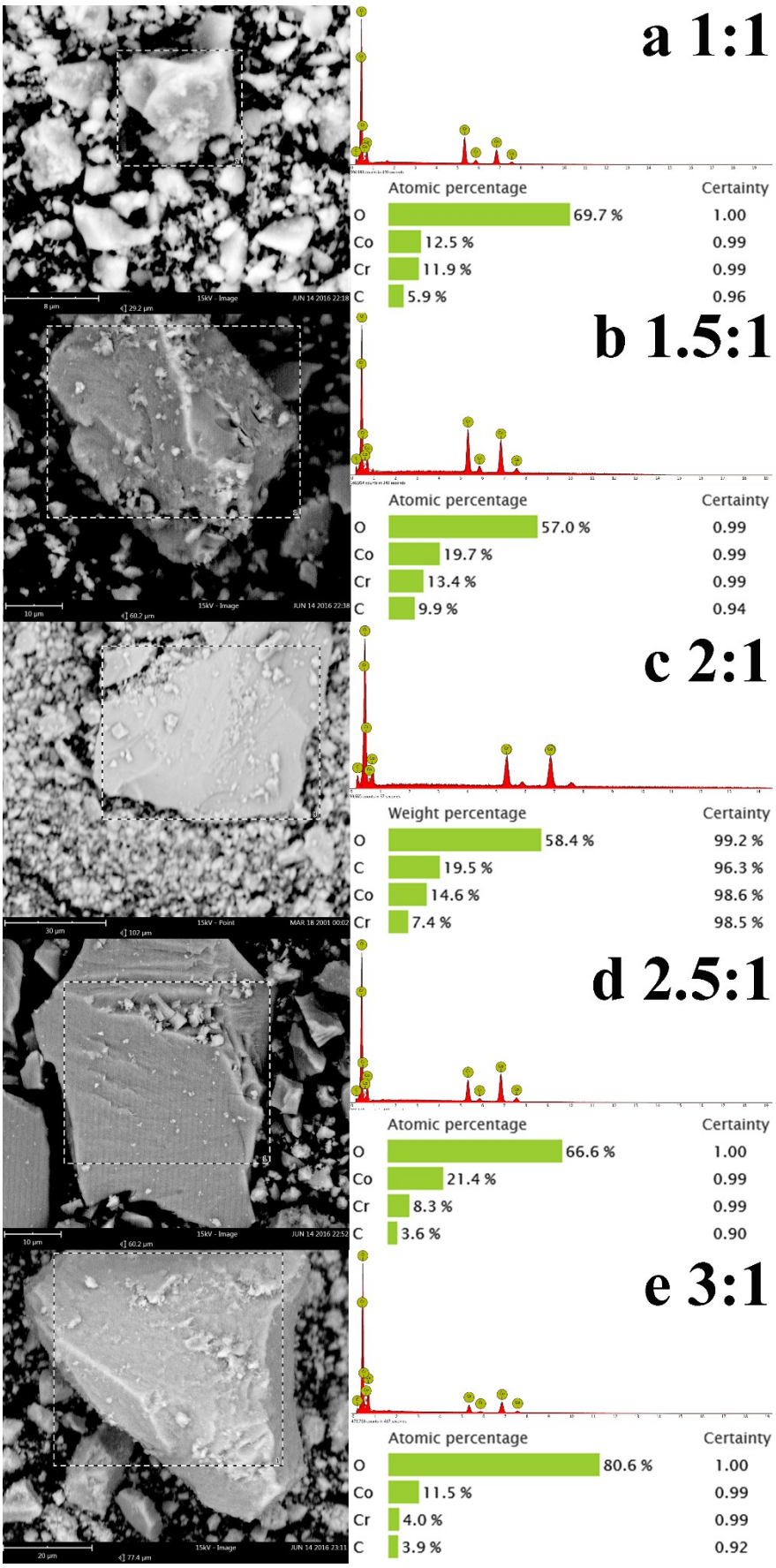

Figure S7. The SEM-EDX patterns of CoCr LDH with different ratios of Co to Cr.

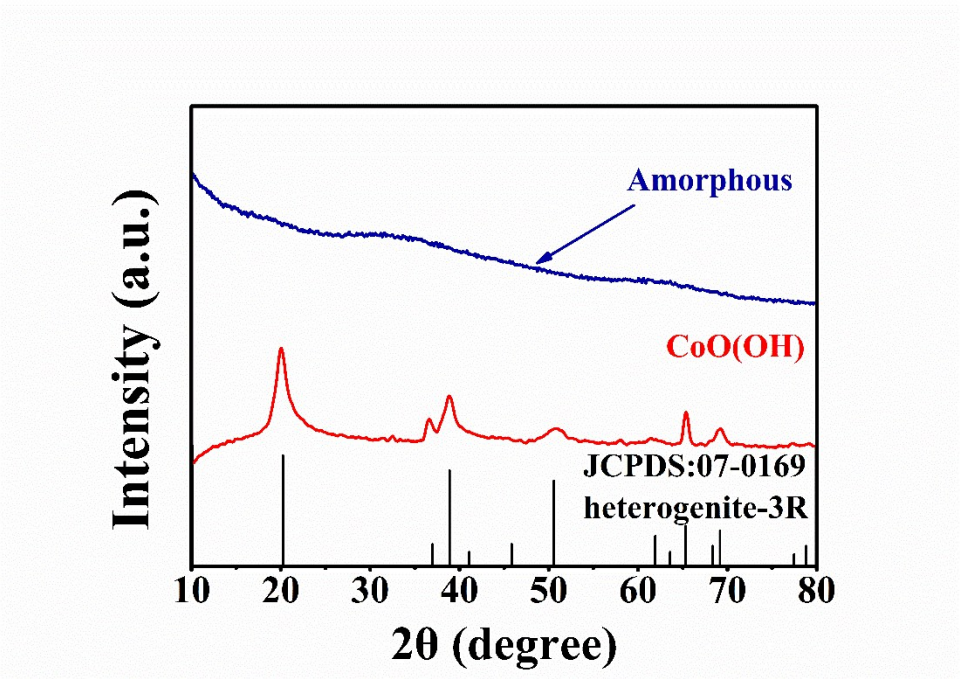

Figure S8. The XRD patterns of Co and Cr hydroxide.

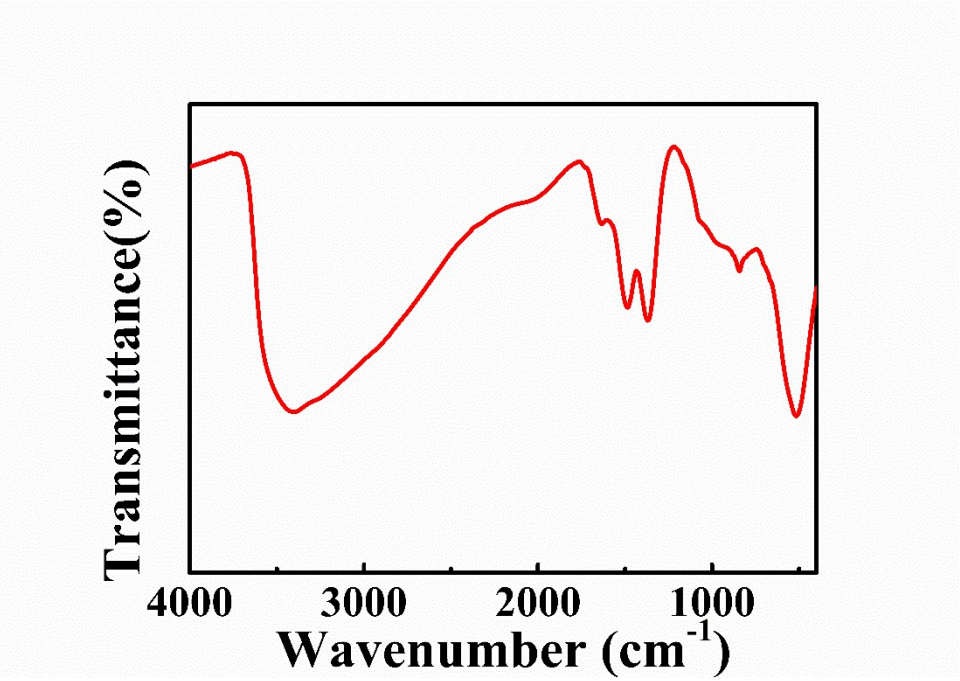

Figure S9. The FTIR pattern of amorphous Cr hydroxide.

Table S2. Comparison with some reported Co-based OER catalysts.

Catalyst	Onset overpotential (mV)	Overpotential (mV)@ 10 mA/cm^2	Tafel slope (mV dec^{-1})	Electrolyte	reference
This work	240	340	81	0.1 M KOH	This work
NiCo LDH	290	420	113	0.1 M KOH	1
ZnCo LDH	340	530	—	0.1 M KOH	2
CoFe LDH	310	465	—	0.1 M KOH	3
CoC_2O_4	330	436	73	0.1 M KOH	4
$LiCo_{0.8}Fe_{0.2}O_2$	260	340	50	0.1 M KOH	5
$Co_3O_4/NiCo_2O_4$	300	340	88	0.1 M KOH	6
ZnCo LDH/rGO	330	430	73	0.1 M KOH	7
CoOOH	370	550	55	0.1 M KOH	8
CoMn LDH	260	325	43	1 M KOH	9
$Mn_3O_4/CoSe_2$	290	450	49	0.1 M KOH	10
Au/Co oxide	260	—	—	0.1 M KOH	11

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