Electronic Supplemental Information

SYNTHESIS AND CHARACTERIZATION OF $Co_{2-x}Rh_xP$ NANOPARTICLES AND THEIR CATALYTIC ACTIVITY TOWARDS THE OXYGEN EVOLUTION REACTION.

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Table S1: Phosphidation parameters for different compositions of $Co_{2-x}Rh_xP$ nanoparticles.

Target composition	Phosphidation temperature (°C)	Phosphidation duration (hours)
$Co_{1.9}Rh_{0.1}P$	305	1
$Co_{1.75}Rh_{0.25}P$	310	3
$Co_{1.5}Rh_{0.5}P$	330	3
$Co_{1.25}Rh_{0.75}P$	330	3
Co_1Rh_1P	330	3
$Co_{0.75}Rh_{1.25}P$	350	3
$Co_{0.5}Rh_{1.5}P$	350	3

Table S2: A summary of EDX Data for $Co_{2-x}Rh_xP$ nanoparticles

Targeted Composition	Calculated Composition
$Co_{1.75}Rh_{0.25}P$	$Co_{1.78}Rh_{0.22}P_{1.31}$
$Co_{1.5}Rh_{0.5}P$	$Co_{1.52}Rh_{0.48}P_{1.74}$
$Co_{1.25}Rh_{0.75}P$	$Co_{1.18}Rh_{0.82}P_{2.10}$
Co_1Rh_1P	$Co_{1.10}Rh_{0.90}P_{0.73}$
$Co_{0.75}Rh_{1.25}P$	$Co_{0.84}Rh_{1.16}P_{0.64}$
$Co_{0.5}Rh_{1.5}P$	$Co_{0.59}Rh_{1.41}P_{0.77}$

Table S3: Summary of fitted peak positions, particle size, and d-spacing for $Co_{2-x}Rh_xP$ nanoparticles where $x \geq 1$ (antifluorite structure).

Target composition	(220) Peak position (2Θ)	d-spacing (Å)	Crystallite size (nm)
Co_1Rh_1P	47.696 ± 0.002	1.906 ± 0.002	5.2 ± 0.2
$Co_{0.75}Rh_{1.25}P$	47.362 ± 0.034	1.918 ± 0.003	5.1 ± 0.2
$Co_{0.5}Rh_{1.5}P$	47.129 ± 0.026	1.927 ± 0.002	5.7 ± 0.2
Rh_2P	46.764 ± 0.015	1.941 ± 0.001	4.4 ± 0.1

Table S4: ICP-MS Data for $Co_{1.75}Rh_{0.25}P$ nanoparticles before and after OER catalysis

Sample	Co (molar ratio)	Rh (molar ratio)	P (molar ratio)
As-prepared sample	1.8	0.2	1.5
Post-catalysis sample	1.8	0.2	Below Detection Limit

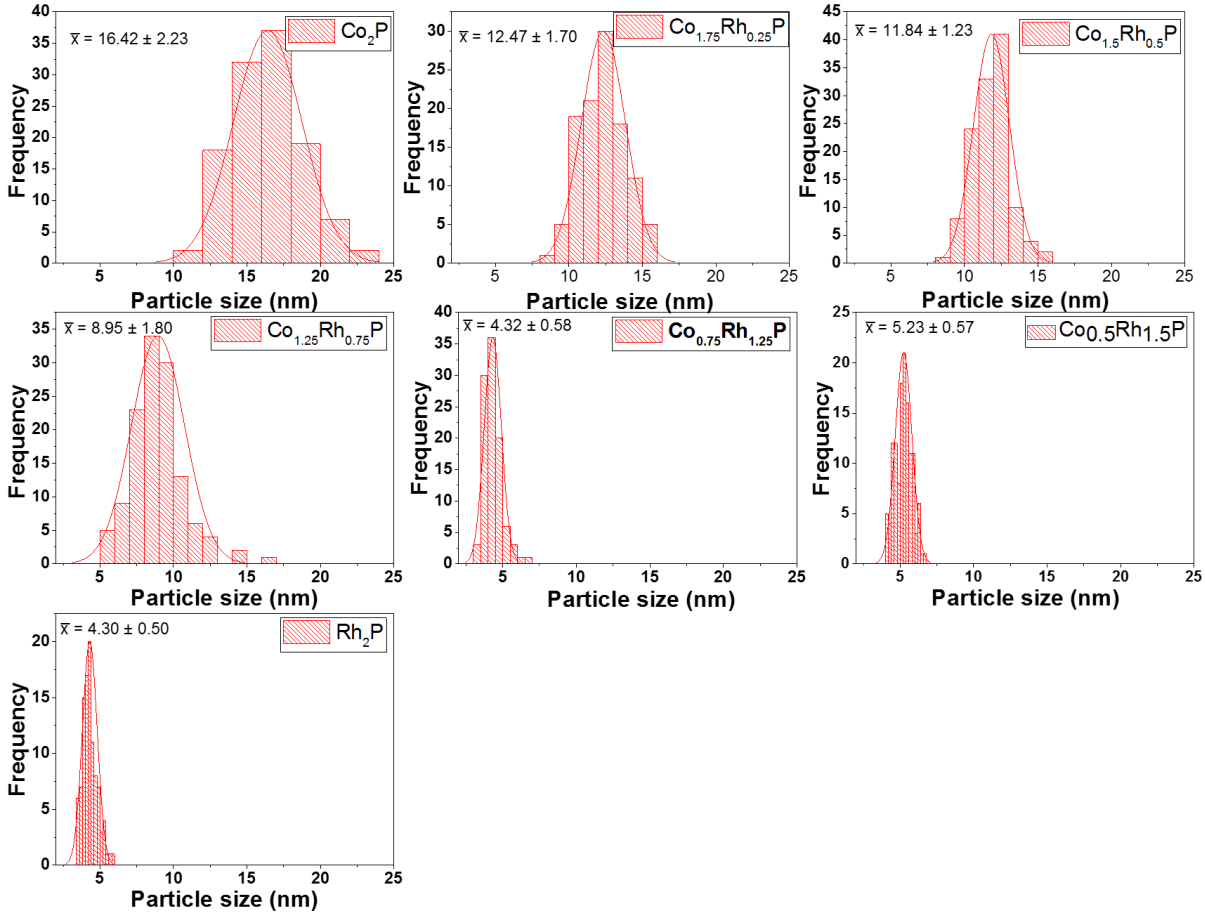

Fig. S1: A compilation of histograms derived from TEM data for different $Co_{2-x}Rh_xP$ compositions. Data for the Co_1Rh_1P target composition was not included here due to a high degree of polydispersity and phase segregation.

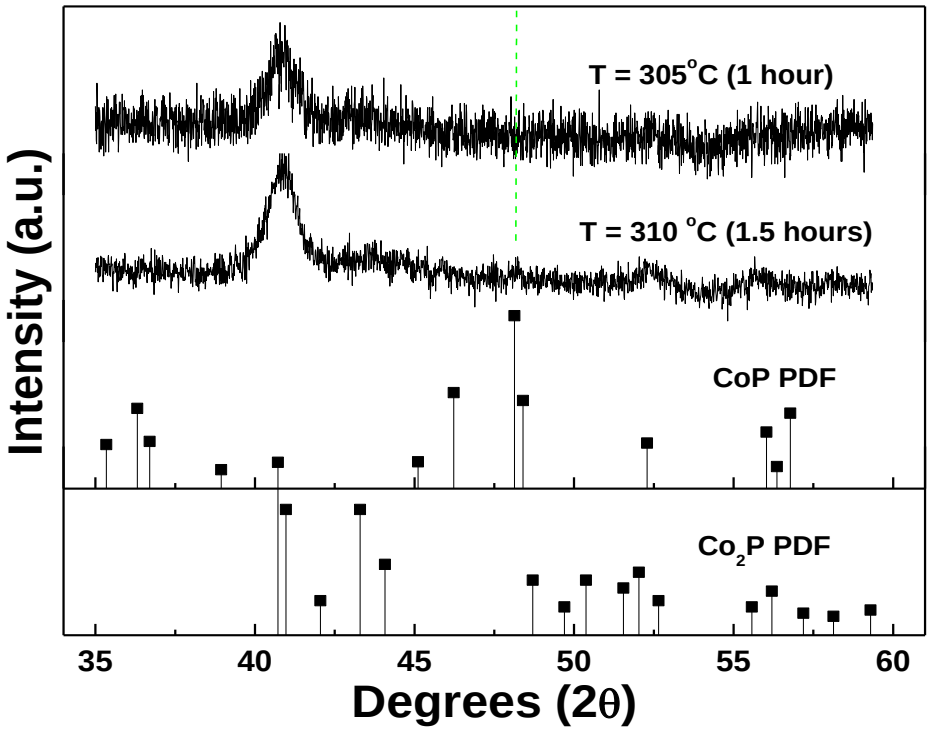

Fig. S2: PXRD data for $Co_{1.9}Rh_{0.1}P$ target composition under slightly different phosphidation conditions. A small CoP (211) peak can be seen in the sample that was phosphided at 310°C.