

Supplementary information

Cobalt phosphate nanorod bundles for the efficient supercapacitor and oxygen evolution reaction applications and its temperature dependence

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Keywords: cobalt phosphate; supercapacitor; electrocatalysis; energy generation and storage; oxygen evolution reaction

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Table S1 Mass loading of cobalt oxide and cobalt phosphate on nickel foam.

Name of Sample	Co ₁₅₀	Co ₂₅₀	Co ₃₅₀	Co ₄₅₀	Cp ₁₅₀	Cp ₂₅₀	Cp ₃₅₀	Cp ₄₅₀
Mass loaded (mg cm ⁻²)	2.9	2.9	2.9	2.9	3.1	3.1	3.1	3.1

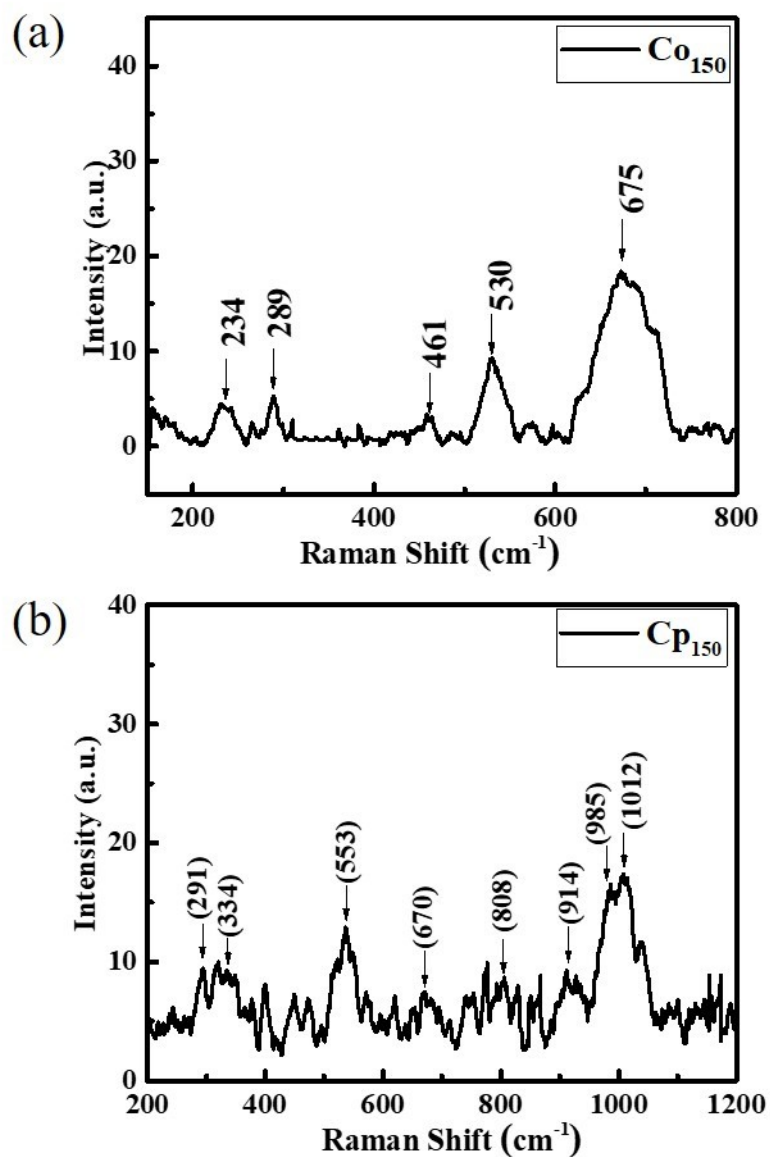


Figure S1 Raman spectra of the samples (a) Co₁₅₀ and (b) Cp₁₅₀

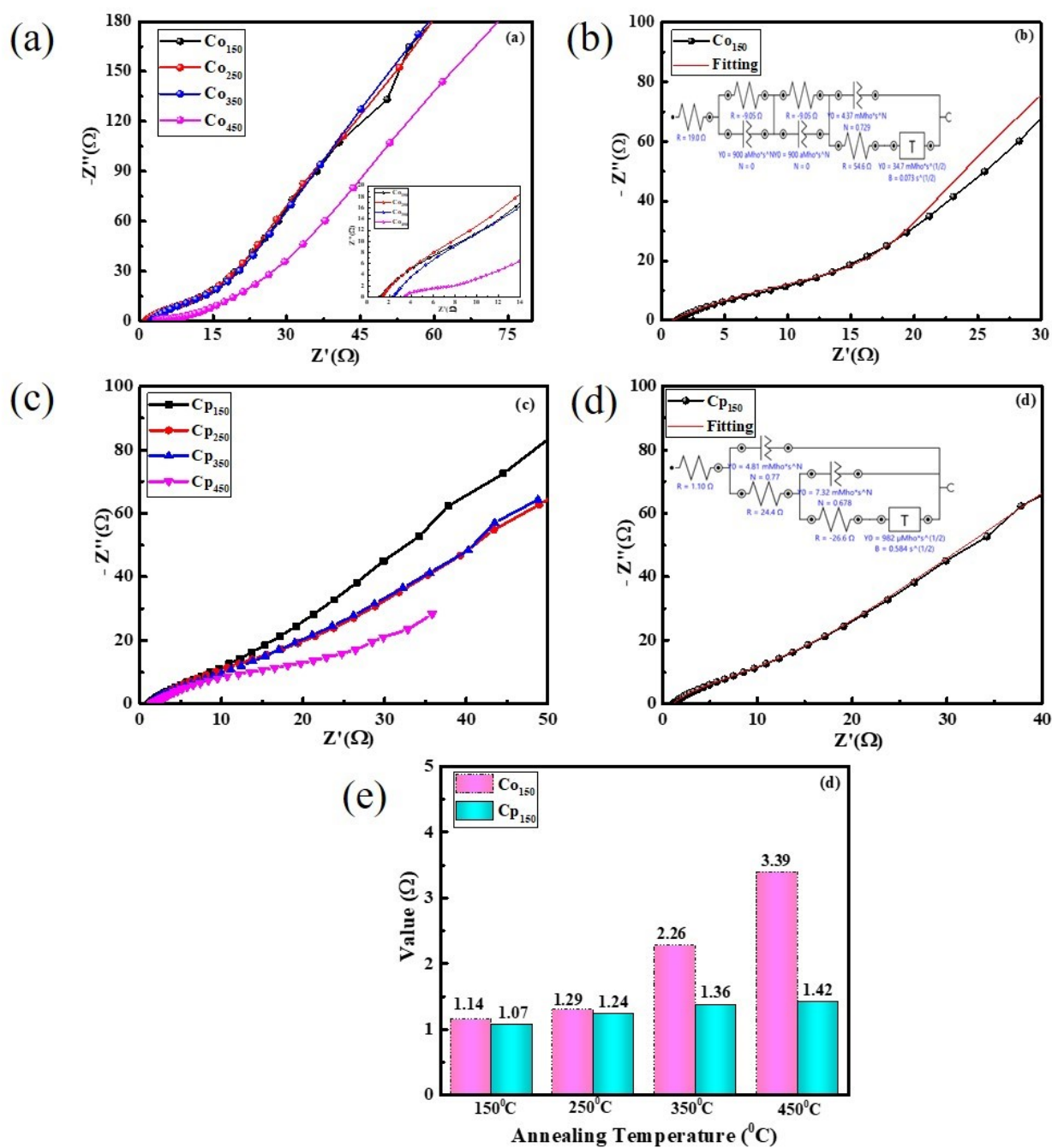


Figure S2. (a) EIS plot of Cobalt oxide at different annealing temperatures, (b) electrochemical circuit fitting of Co_{150} electrode, (c) EIS plot of cobalt phosphate at different annealing temperatures, (d) electrochemical circuit fitting of Cp_{150} electrode, (e) Comparison of resistance values of Co_{150} and Cp_{150} .

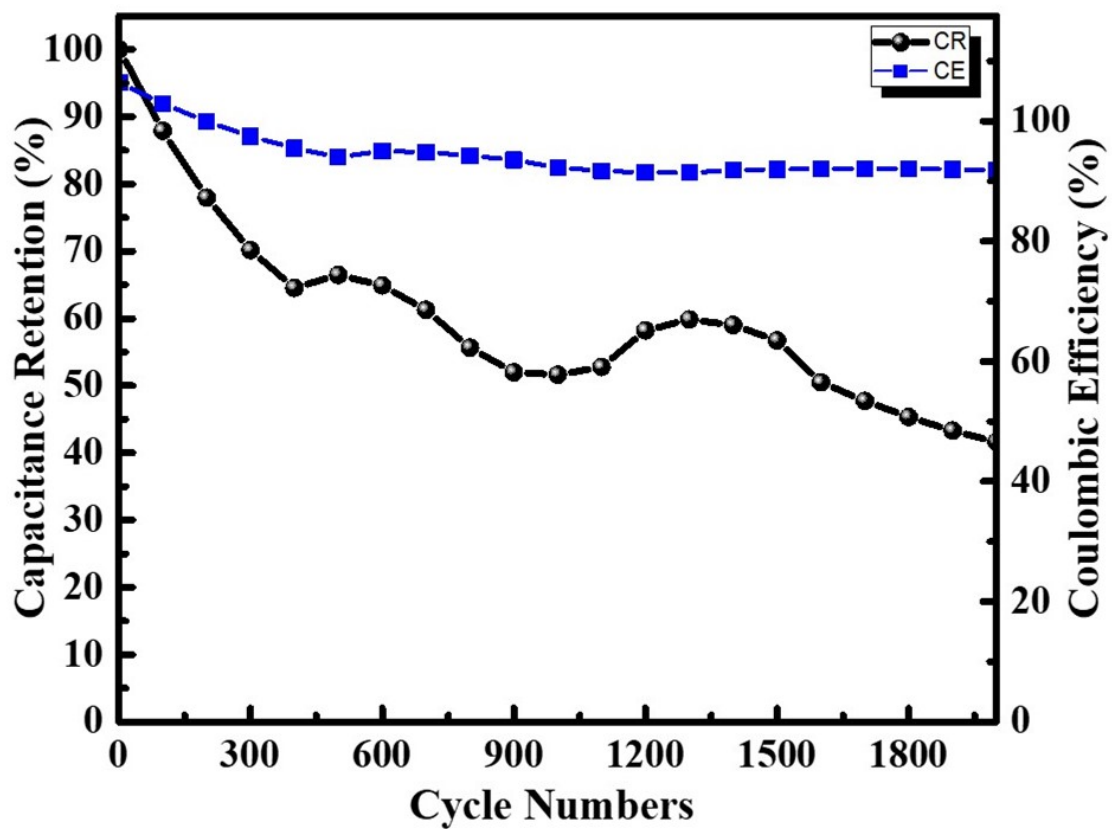


Figure S3. Capacitance retention and Coulombic efficiency for different a number of cycles.

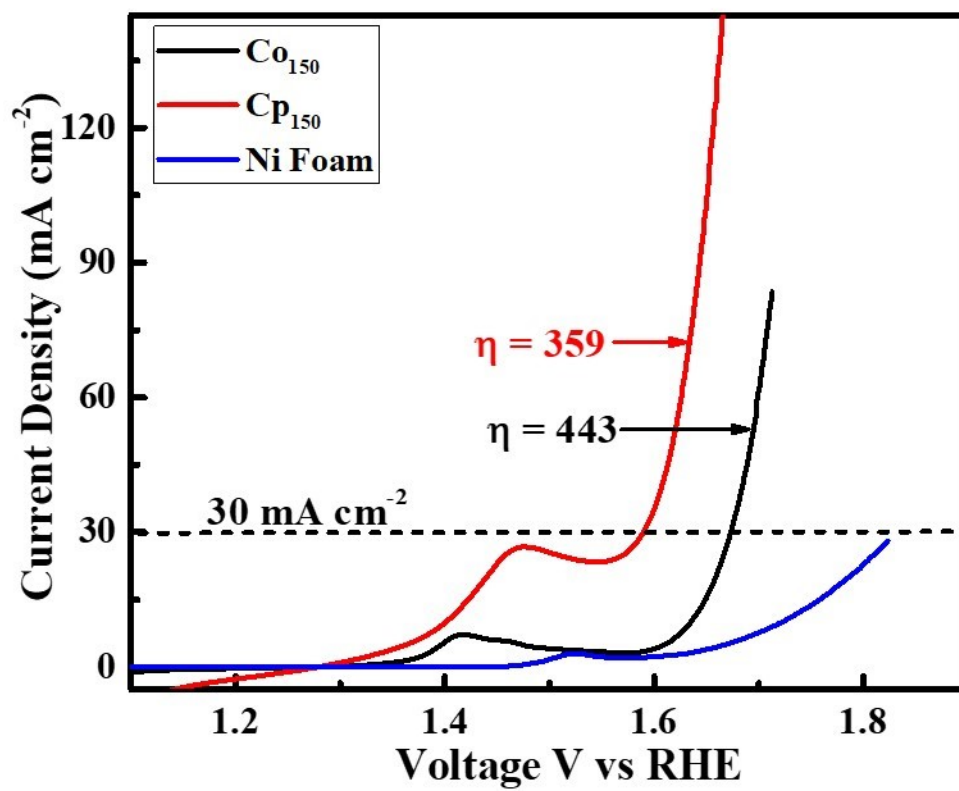


Figure S4. Comparative LSV polarisation curve of the Co₆₀ and Cp₆₀ electrode and Ni Foam

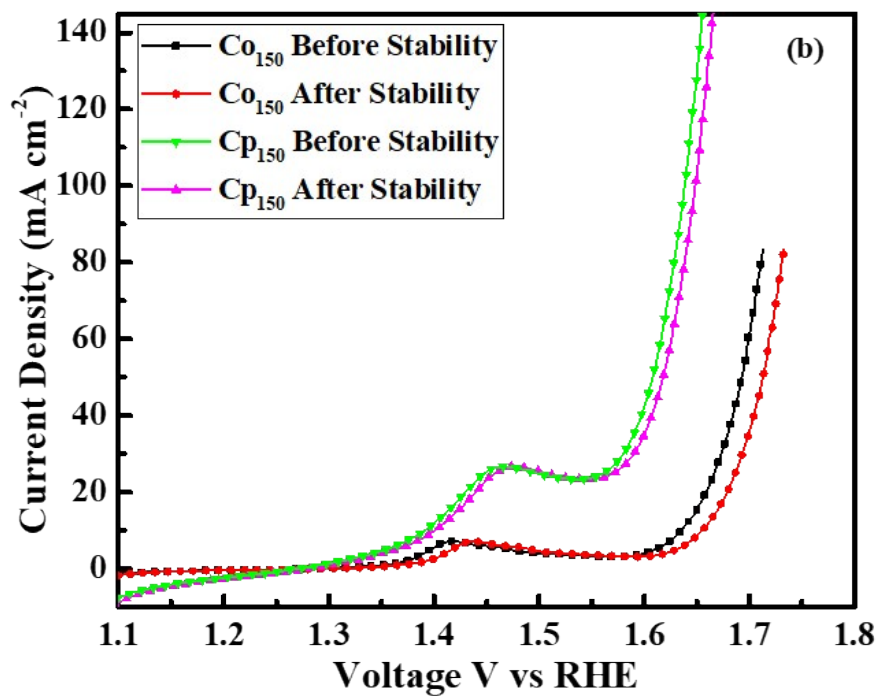


Figure S5. LSV curves of the Co₁₅₀ and Cp₁₅₀ sample in 1 M KOH electrolyte before and after stability measurements.

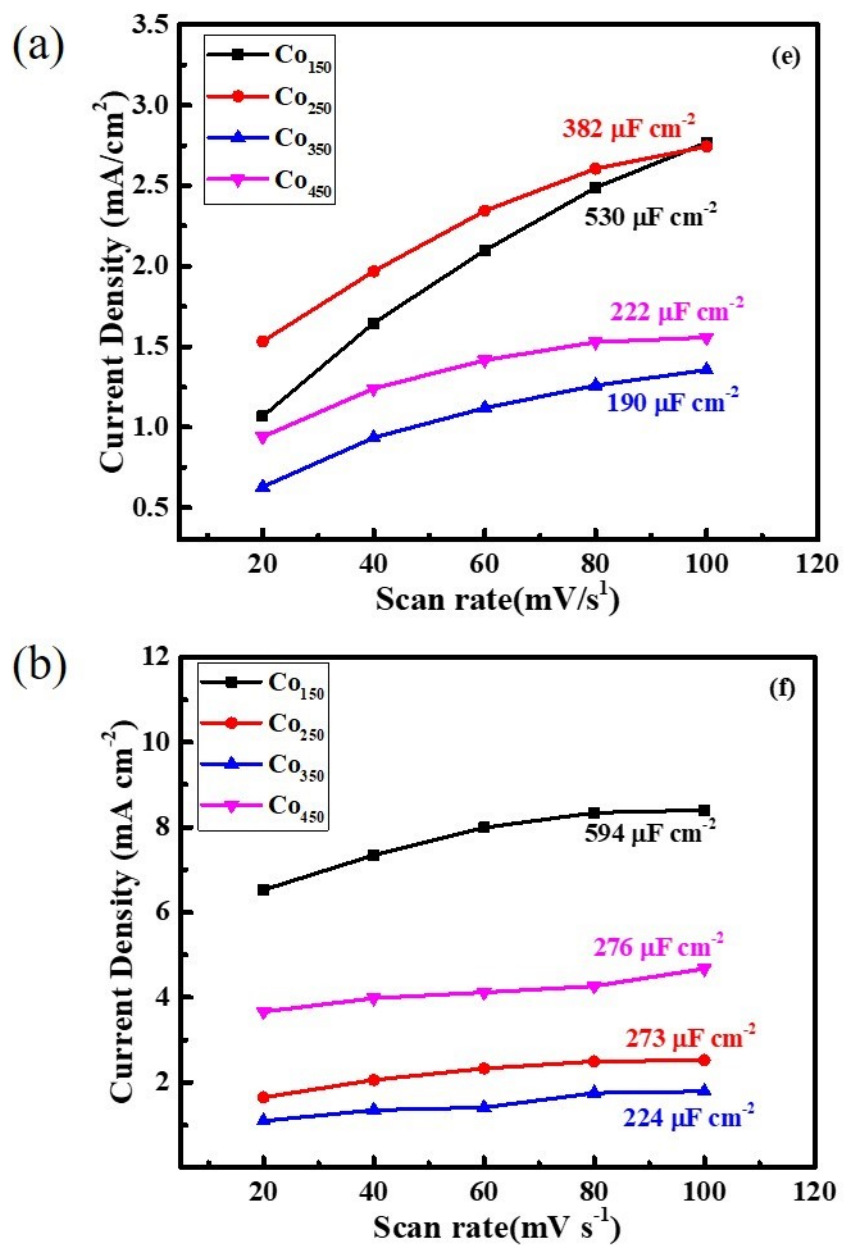


Figure S6. (a) and (b) ECSA plot of Cobalt oxide and Cobalt phosphate at different annealing temperatures respectively.

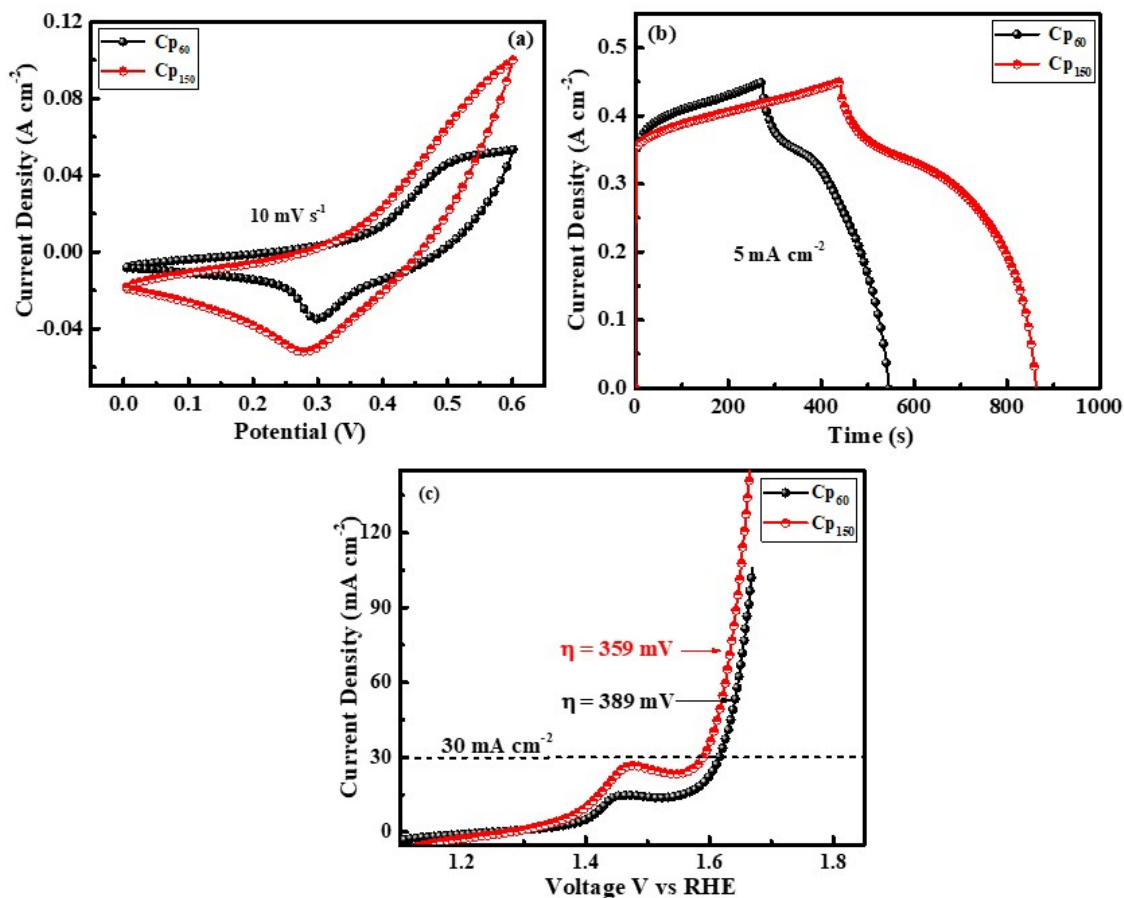


Figure S7. (a) CV plot of Cp₆₀ and Cp₁₅₀; (b) GCD plot of Cp₆₀ and Cp₁₅₀; and (c) LSV plot of Cp₆₀ and Cp₁₅₀.

To know the supercapacitor and OER performances of the samples grown at temperature lower than 150°C, we synthesized additional sample at 60°C and compared. The comparative electrochemical performances of these samples are shown in in **Fig. S7**. The CV plot of Cp₆₀ and Cp₁₅₀ is demonstrated in **Fig. S7 (a)**, which depicts that the area under the CV curve of Cp₁₅₀ is higher than Cp₆₀. The specific capacitance (**Fig. S7 (b)**) of Cp₆₀ and Cp₁₅₀ are found to be 895 Fg⁻¹ (402 Cg⁻¹) and 1512 Fg⁻¹ (681 Cg⁻¹) at 5 mA cm⁻² respectively. Moreover the **Fig. S7 (c)** demonstrates the LSV polarization curve of Cp₆₀ and Cp₁₅₀ with the overpotential of 389 mV for Cp₆₀ and 359 mV for Cp₁₅₀ at 30 mA cm⁻² current density. Hence the electrochemical performance of Cp₁₅₀ is more excellent than Cp₆₀.