

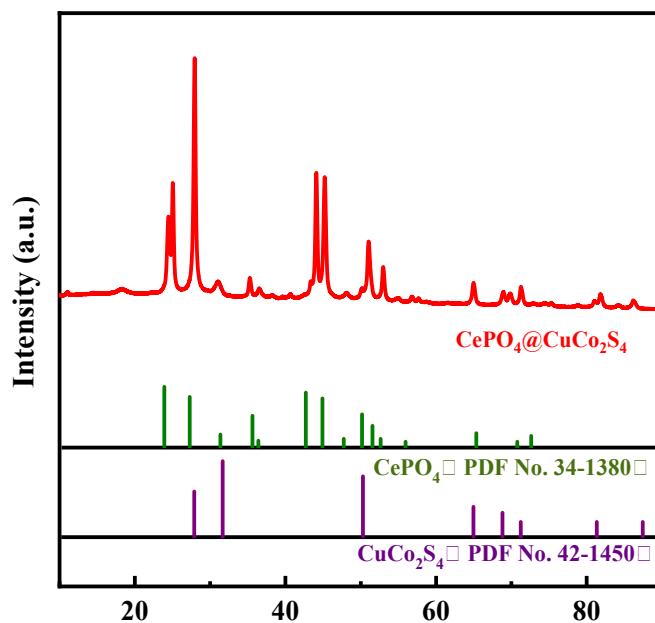
# In Situ Growth of Core-Shell Heterostructure CePO<sub>4</sub>@CuCo<sub>2</sub>S<sub>4</sub> As Advanced Electrodes for High-performance Supercapacitor

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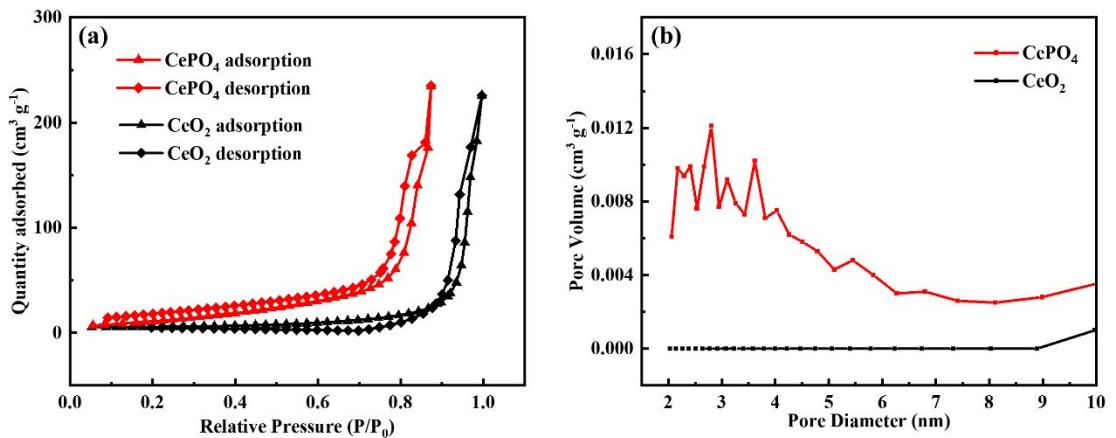
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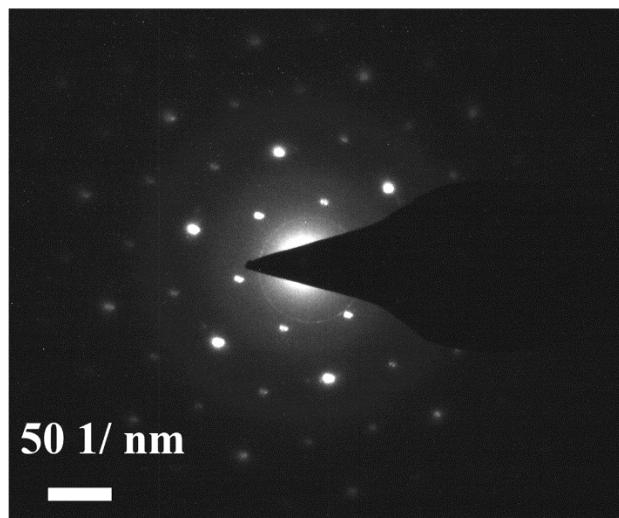
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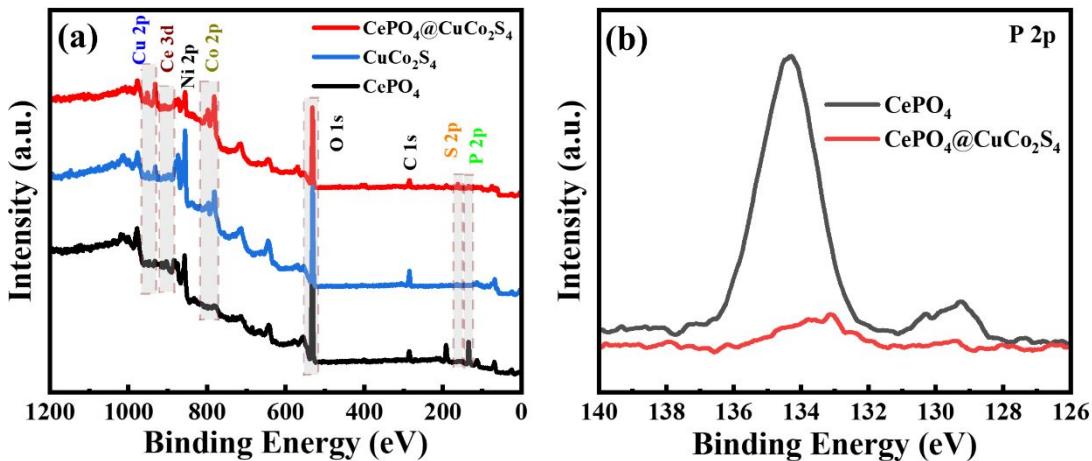
**Fig. S1.** XRD powder patterns of CePO<sub>4</sub>@CuCo<sub>2</sub>S<sub>4</sub>



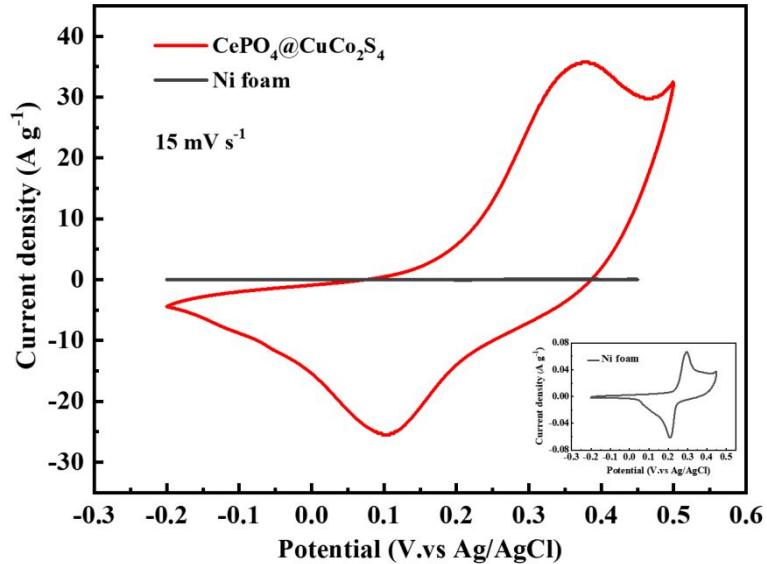
**Fig. S2.** BET measurements of CeO<sub>2</sub> and CePO<sub>4</sub> samples: (a) N<sub>2</sub> absorption/desorption curves and (b) pore distribution curves.



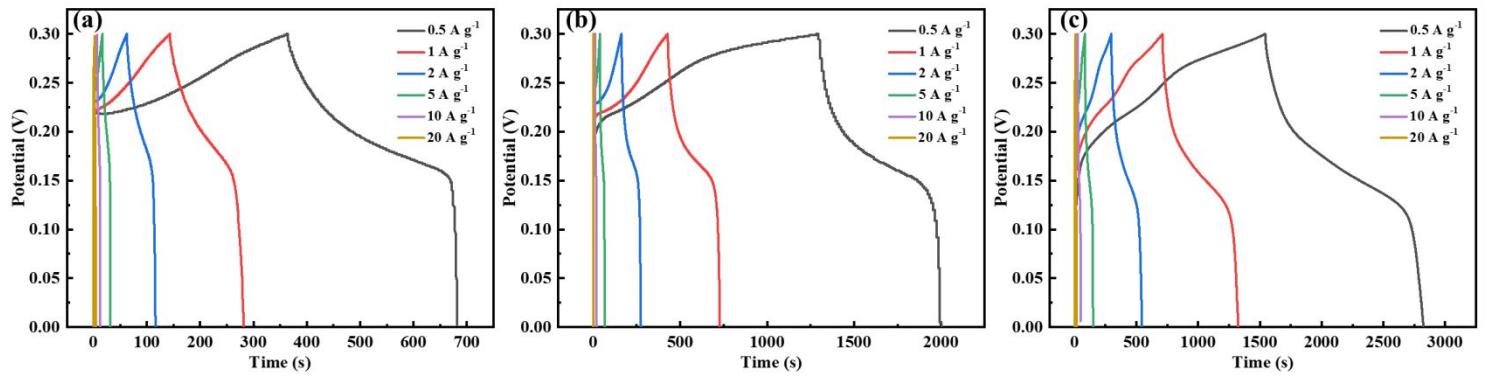
**Fig. S3.** Electron diffraction pattern (SAED) of CePO<sub>4</sub>@CuCo<sub>2</sub>S<sub>4</sub>



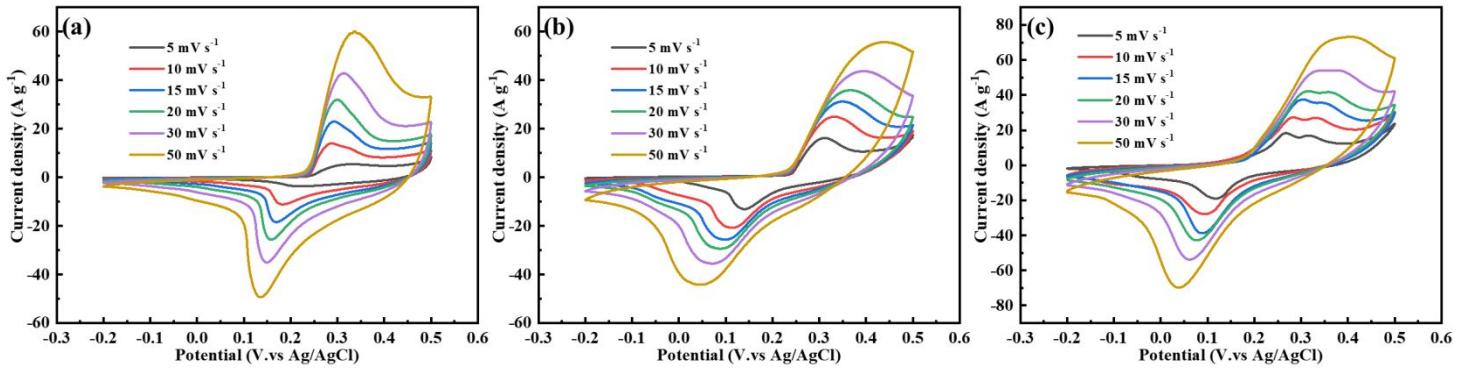
**Fig. S4.** (a) Survey spectrum of CePO<sub>4</sub> @CuCo<sub>2</sub>S<sub>4</sub>, CuCo<sub>2</sub>S<sub>4</sub> and CePO<sub>4</sub>; (b) P 2p XP spectra of CePO<sub>4</sub> and CePO<sub>4</sub>@CuCo<sub>2</sub>S<sub>4</sub>.



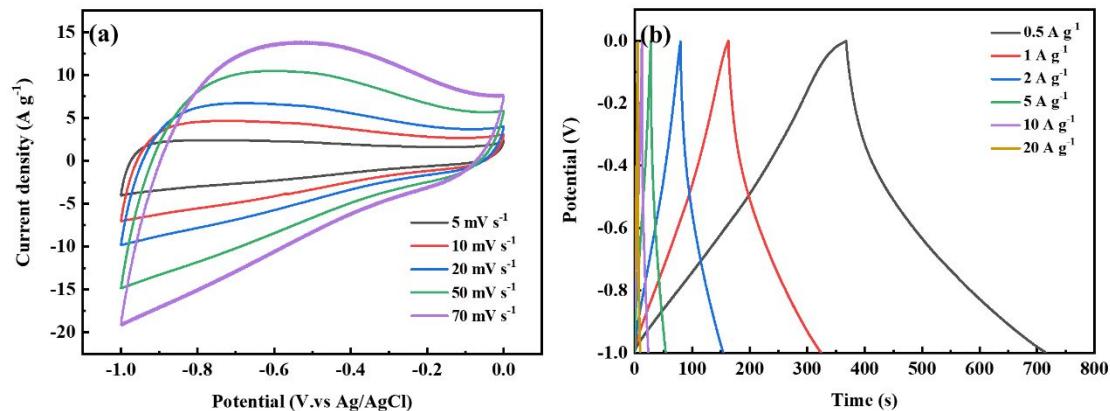
**Fig. S5.** CV curves of CePO<sub>4</sub>@CuCo<sub>2</sub>S<sub>4</sub> and bare Ni foam at  $15 \text{ mV s}^{-1}$ .



**Fig. S6.** the GCD curves of (a) CeO<sub>2</sub>/NF, (b) CePO<sub>4</sub>/NF, and (c) CuCo<sub>2</sub>S<sub>4</sub>/NF electrodes at different densities.



**Fig. S7.** the CV curves of (a) CeO<sub>2</sub>/NF, (b) CePO<sub>4</sub>/NF and (c) CuCo<sub>2</sub>S<sub>4</sub>/NF electrodes at different scan rates.



**Fig. S8.** (a)the CV curves of active carbon; (b) the GCD curve of active carbon.