

## Supplementary Information

### Rapid Synthesis of Cobalt Phosphate Microplates for Supercapacitors

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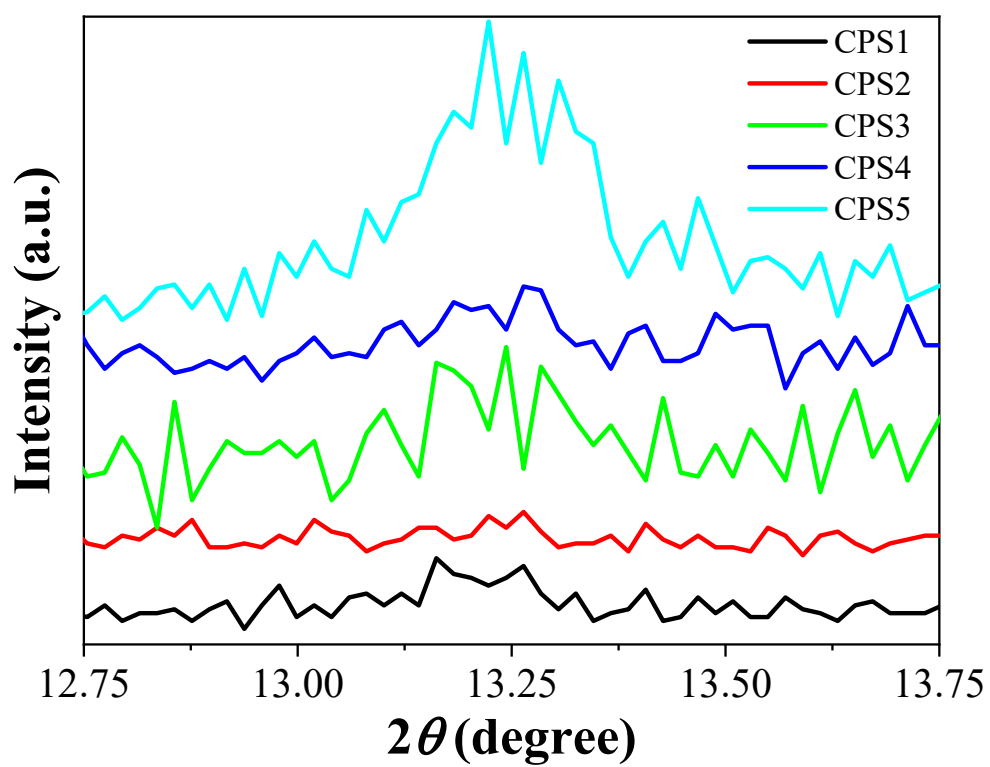
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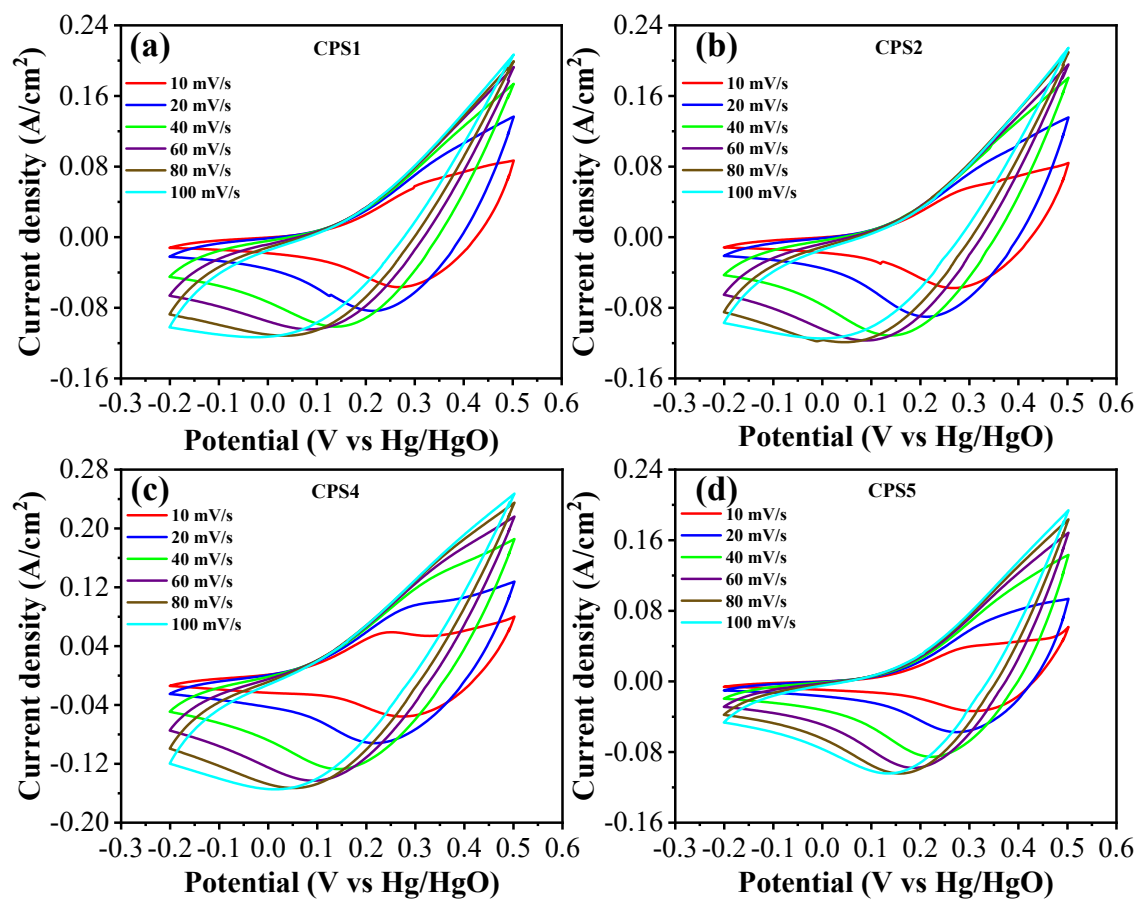
### Characterization techniques

Crystal structure of the synthesized electrodes were studied using Bruker AXS D8 Advance X-ray diffractometer Cu K $\alpha$  ( $\lambda=1.54$  Å). The XRD measurements were carried out under the following conditions: voltage - 40 kV, current - 40 mA, step scan size - 0.0204, and counting time - 813.089 s. The Renishaw INVIA 0120 Raman spectrometer used to record the Raman spectra of the CoS electrodes. The Raman spectra were recorded in the range of 50 - 4000 cm<sup>-1</sup> with a spectral resolution of 0.5 cm<sup>-1</sup>. Two scans were accumulated for each measurement using a laser with a wavelength of 532 nm. The morphological study was carried out using JEOL JSM 6360 scanning electron microscopy (SEM) instrument. The EDS analysis was carried out using JEOL JSM-IT200 integrated with the SEM. A small portion of the cobalt phosphate film was carefully cut and mounted on the SEM sample holder. To improve electrical conductivity, a thin layer of gold was sputter-coated onto the surface for 20 s. The

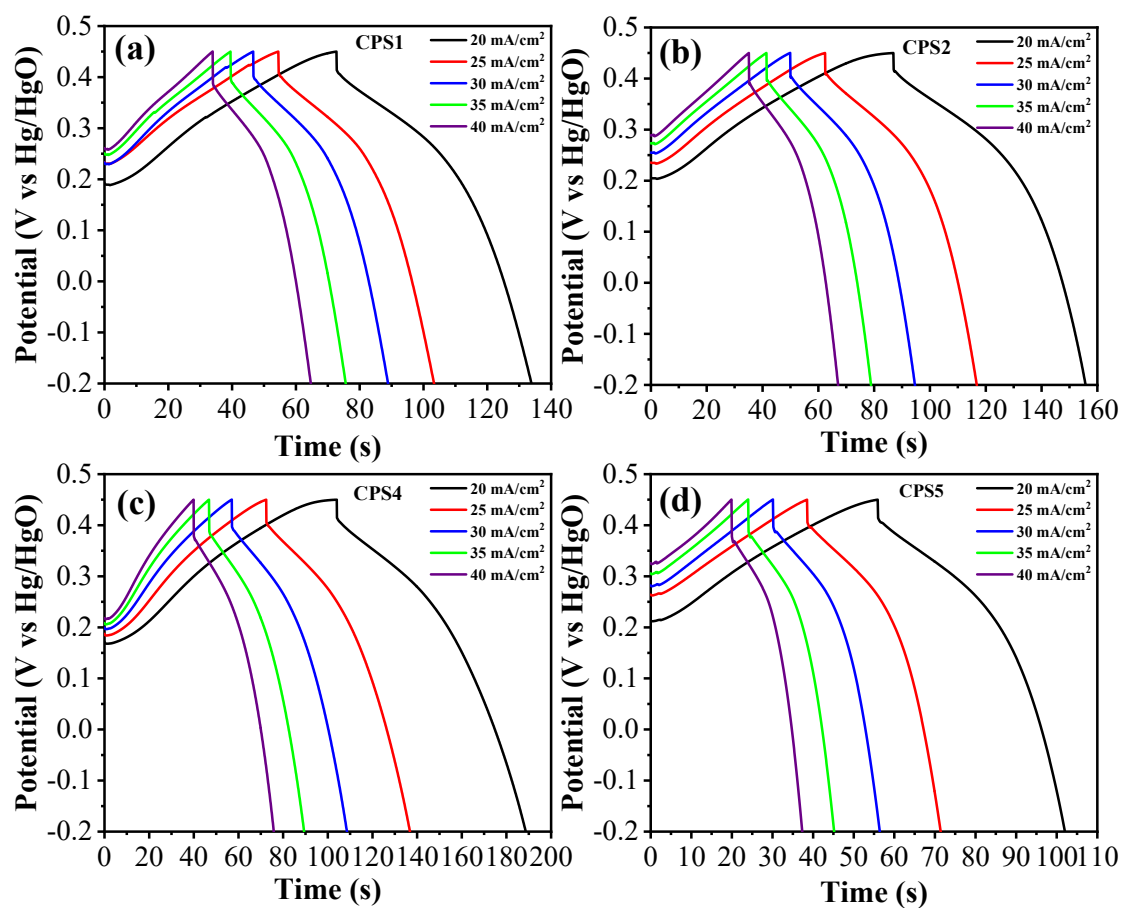
prepared sample was then placed in the SEM analysis chamber for imaging. The electrochemistry (CV, GCD & EIS) was tested using Metrohm Autolab potentiostat (PGSTAT302N) with platinum wire (counter) and Hg/HgO (reference) electrodes.



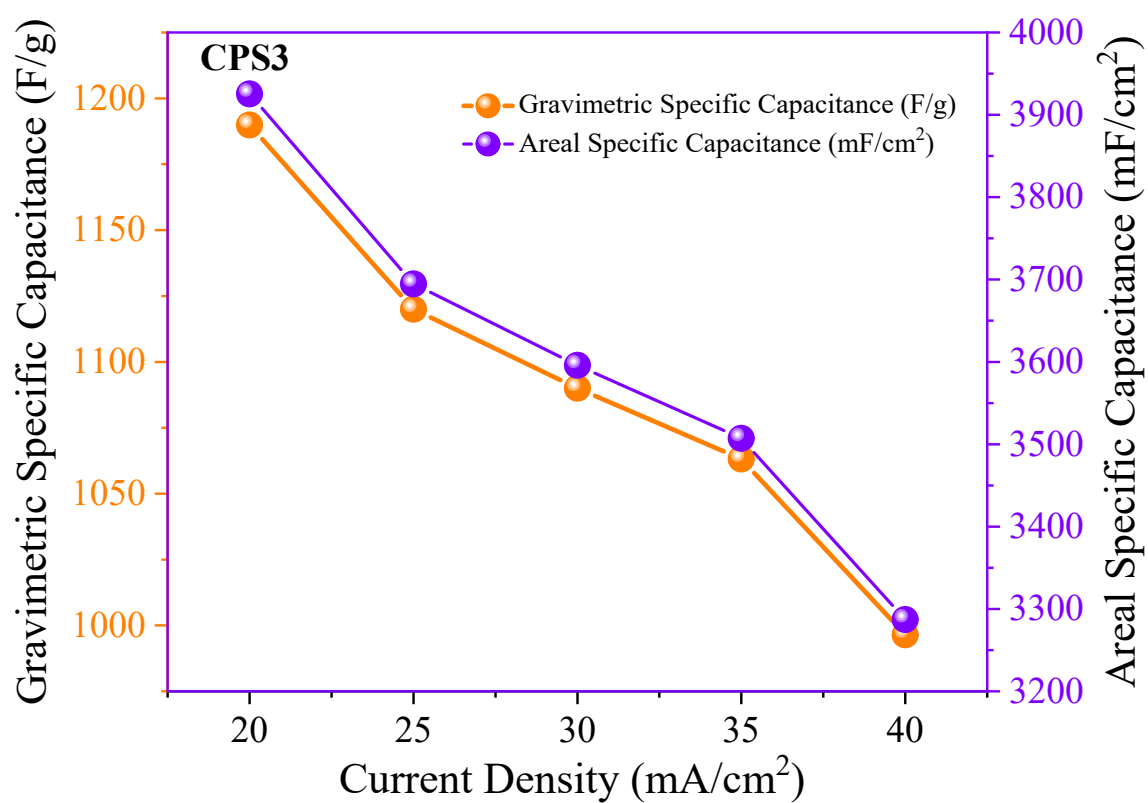
**Fig. S1** Enlarged XRD pattern of all the CPS electrodes.



**Fig. S2** CV at various scan rates for all the CPS electrodes.



**Fig. S3** GCD at various current densities for all the CPS electrodes.



**Fig. S4** comparison of computed gravimetric and aerial specific capacitance at various current densities.

**Table S1:** Elemental composition of the CPS3 electrode.

| <b>Element</b> | <b>Mass percentage</b> | <b>Atomic percentage</b> |
|----------------|------------------------|--------------------------|
| <b>O</b>       | 40.38±1.13             | 66.47±1.85               |
| <b>P</b>       | 17.09±0.74             | 14.53±0.63               |
| <b>Co</b>      | 42.53±1.75             | 19.00±0.78               |
| <b>Total</b>   | 100.00                 | 100.00                   |