

# **The role of the precursor on the electrochemical performance of N,S co-doped graphene electrodes in aqueous electrolytes**

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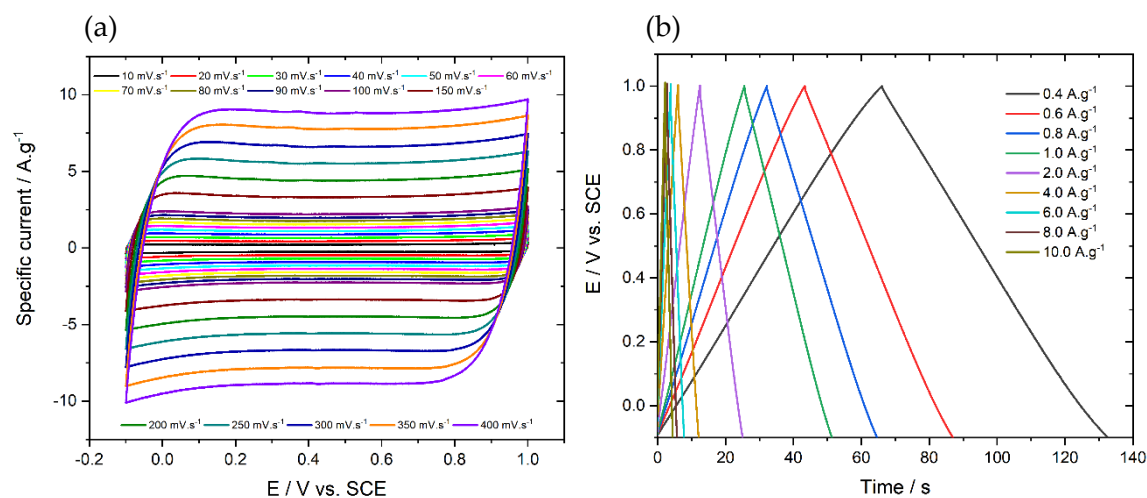
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## Content

### Electrochemical Performance

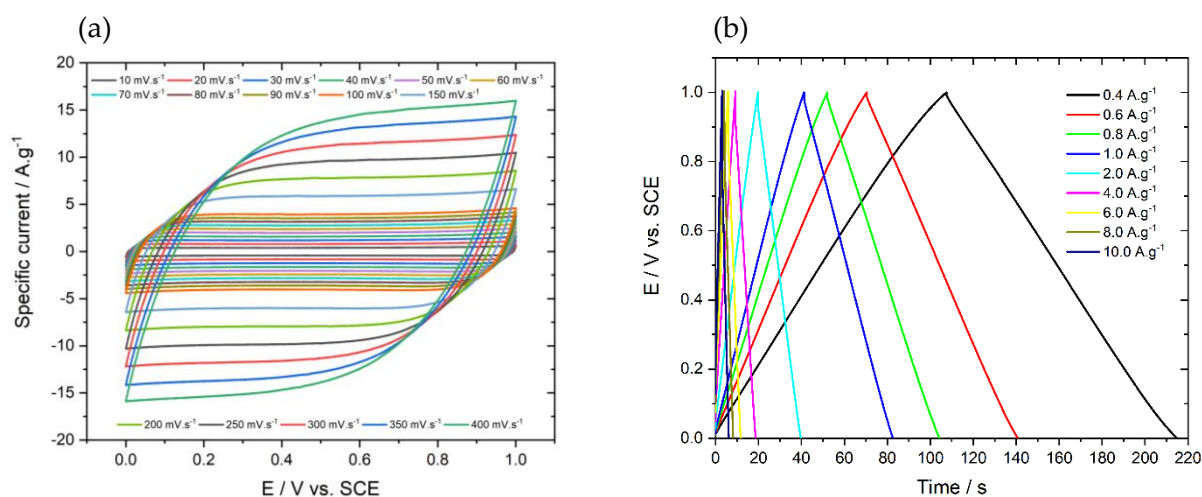
- 1 M Na<sub>2</sub>SO<sub>4</sub> electrolyte

In sequence, the electrochemical measurements of S<sub>3</sub>N<sub>3</sub>-GF (25:75) were performed as shown in Figure S1. The cyclic voltammetry presented in Figure S1 (a) S<sub>3</sub>N<sub>3</sub>-GF (25:75) – 1 M Na<sub>2</sub>SO<sub>4</sub> (-0.15 V to 1.0 V vs. SCE) evidenced an enlarged working potential window for GCDs, as plotted in Figure S1 (b).



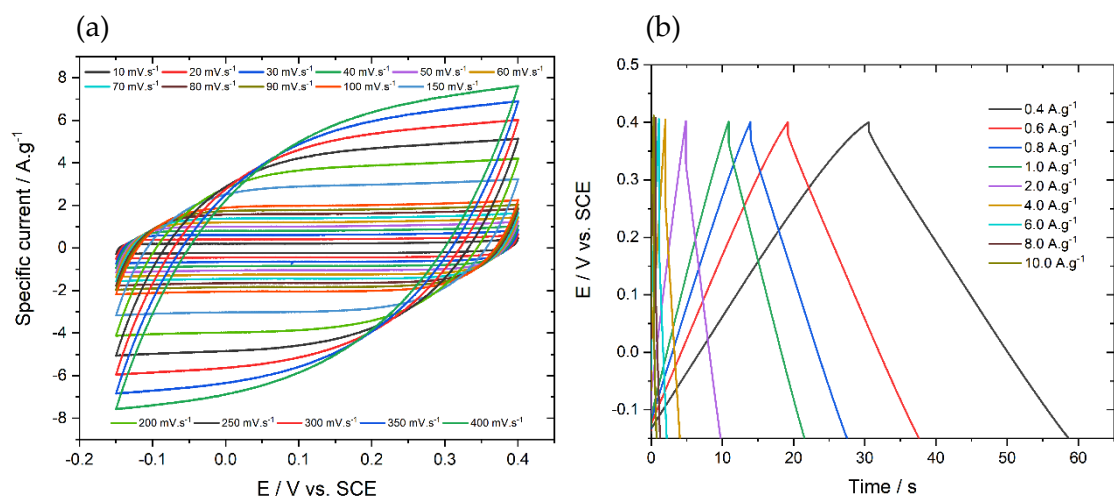
**Figure S1.** S<sub>3</sub>N<sub>3</sub>-GF (25:75): a) cyclic voltammetry at different scan rates ranging from 10 mV.s<sup>-1</sup> to 400 mV.s<sup>-1</sup>. Potential window from -0.15 V to 1.0 V vs. SCE (1 M Na<sub>2</sub>SO<sub>4</sub>) electrolytes; b) galvanostatic charge–discharge at different applied specific currents from 0.4 to 10 A.g<sup>-1</sup> in 1 M Na<sub>2</sub>SO<sub>4</sub> electrolyte.

The S<sub>3</sub>N<sub>2</sub>-GF (25:75) results are presented in Figure S2. The cyclic voltammetry and charge–discharge responses are plotted in Figure S2 (a), and (b) for 1 M Na<sub>2</sub>SO<sub>4</sub> (0.0 V to 1.0 V vs. SCE), respectively.

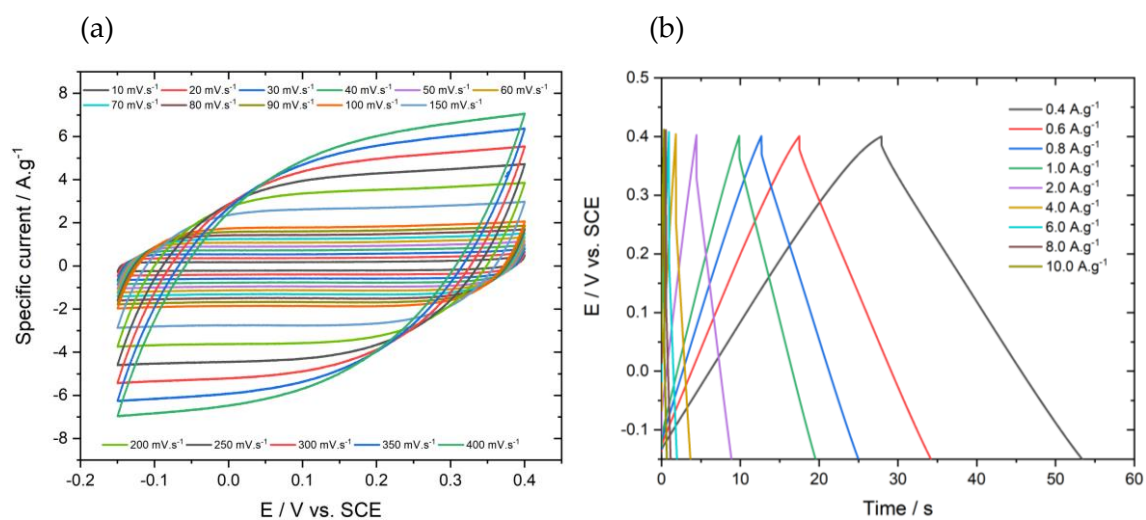


**Figure S2.** S<sub>3</sub>N<sub>2</sub>-GF (25:75): a) cyclic voltammetry at different scan rates ranging from 10 mV.s<sup>-1</sup> to 400 mV.s<sup>-1</sup>. Potential window from 0.0 V to 1.0 V vs. SCE in 1 M Na<sub>2</sub>SO<sub>4</sub> electrolyte; b) galvanostatic charge-discharge at different applied specific currents from 0.4 to 10 A.g<sup>-1</sup> in 1 M Na<sub>2</sub>SO<sub>4</sub> electrolytes.

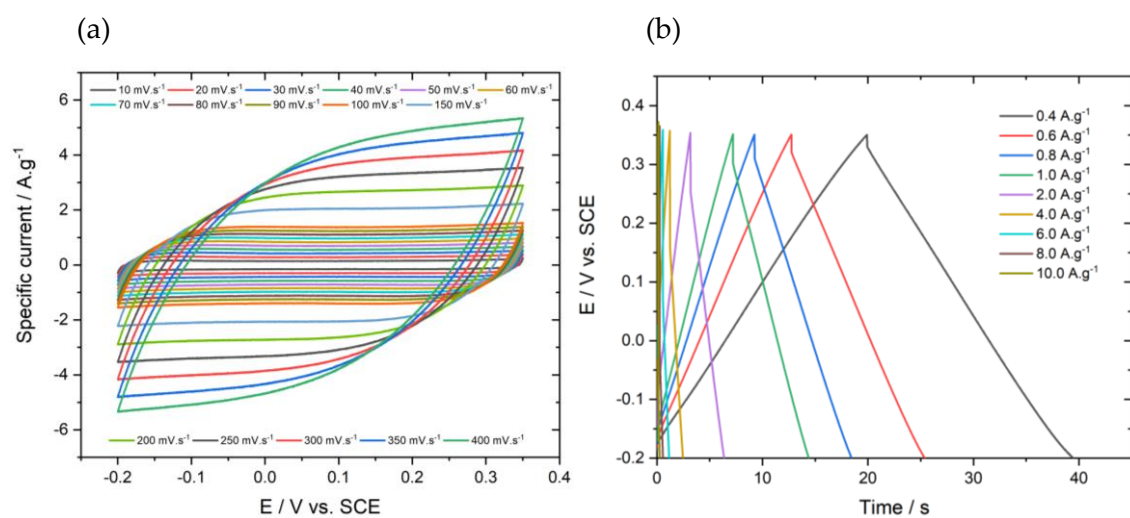
### 1 M KOH electrolyte



**Figure S3.** SN<sub>6</sub>-GF (25:75): a) cyclic voltammetry at different scan rates ranging from 10 mV.s<sup>-1</sup> to 400 mV.s<sup>-1</sup>. Potential window from -0.15 V to 0.4 V vs. SCE in 1 M KOH electrolyte; b) galvanostatic charge-discharge at different applied specific currents from 0.4 to 10 A.g<sup>-1</sup> in 1 M KOH electrolyte.



**Figure S4.** S<sub>3</sub>N<sub>3</sub>-GF (25:75): a) cyclic voltammetry at different scan rates ranging from 10 mV.s<sup>-1</sup> to 400 mV.s<sup>-1</sup>. Potential window from -0.15 V to 0.4 V vs. SCE in 1 M KOH electrolyte; b) galvanostatic charge-discharge at different applied specific currents from 0.4 to 10 A.g<sup>-1</sup> in 1 M KOH electrolyte.



**Figure S5.** S<sub>3</sub>N<sub>2</sub>-GF (25:75): a) cyclic voltammetry at different scan rates ranging from 10 mV.s<sup>-1</sup> to 400 mV.s<sup>-1</sup>. Potential window from -0.15 V to 0.4 V vs. SCE in 1 M KOH electrolyte; b) galvanostatic charge-discharge at different applied specific currents from 0.4 to 10 A.g<sup>-1</sup> in 1 M KOH electrolyte.