

Supporting information

Phosphorus and Nitrogen Co-Doped Reduced Graphene Oxide as Superior Electrode Nanomaterials for Supercapacitors

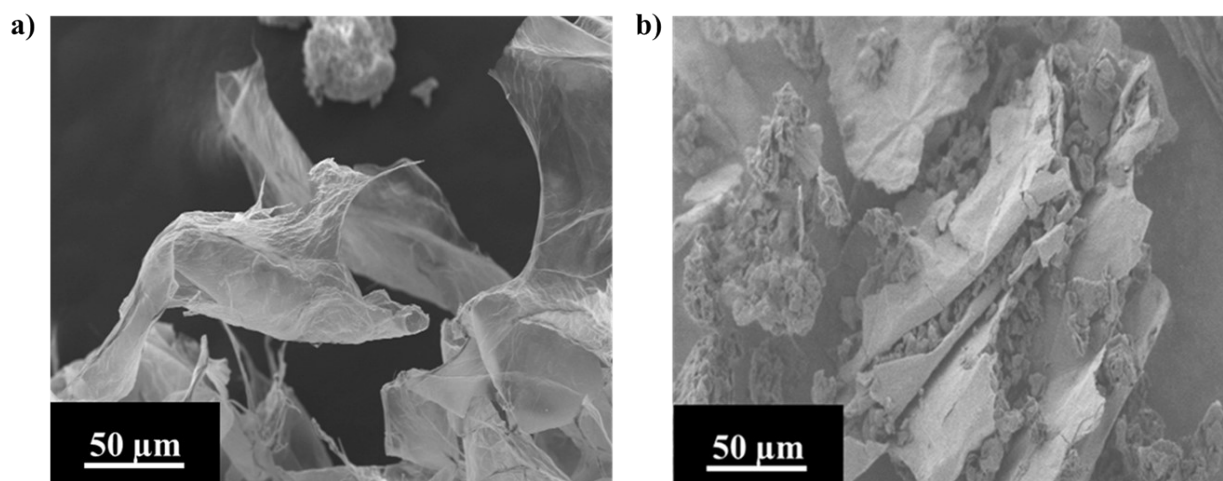
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Synthesis of reduced graphene oxide (rGO)

Graphene oxide (GO) was synthesized following a modified Hummer's method, as reported by our group using natural graphite as raw material ¹⁻³⁻³. Reduced graphene oxide (rGO) was prepared by ultrasonication for 1h of the GO powder (100 mg) in deionised water (100 mL) to achieve a concentration of (1 mg mL⁻¹). Then, the GO suspension was transferred to a 100 mL Teflon-lined autoclave and hydrothermally treated at 200 °C for



24 h. the obtained product was further pyrolyzing under the same annealing processes.

Figure S1. SEM images of (a) GO and (b) FGO.

Table S1: Element content of P, N-rGO measured from XPS analysis

Sample	C (at.%)	O (at.%)	P (at.%)	N (at.%)
PN-rGO	81.2	12	2.3	4.5

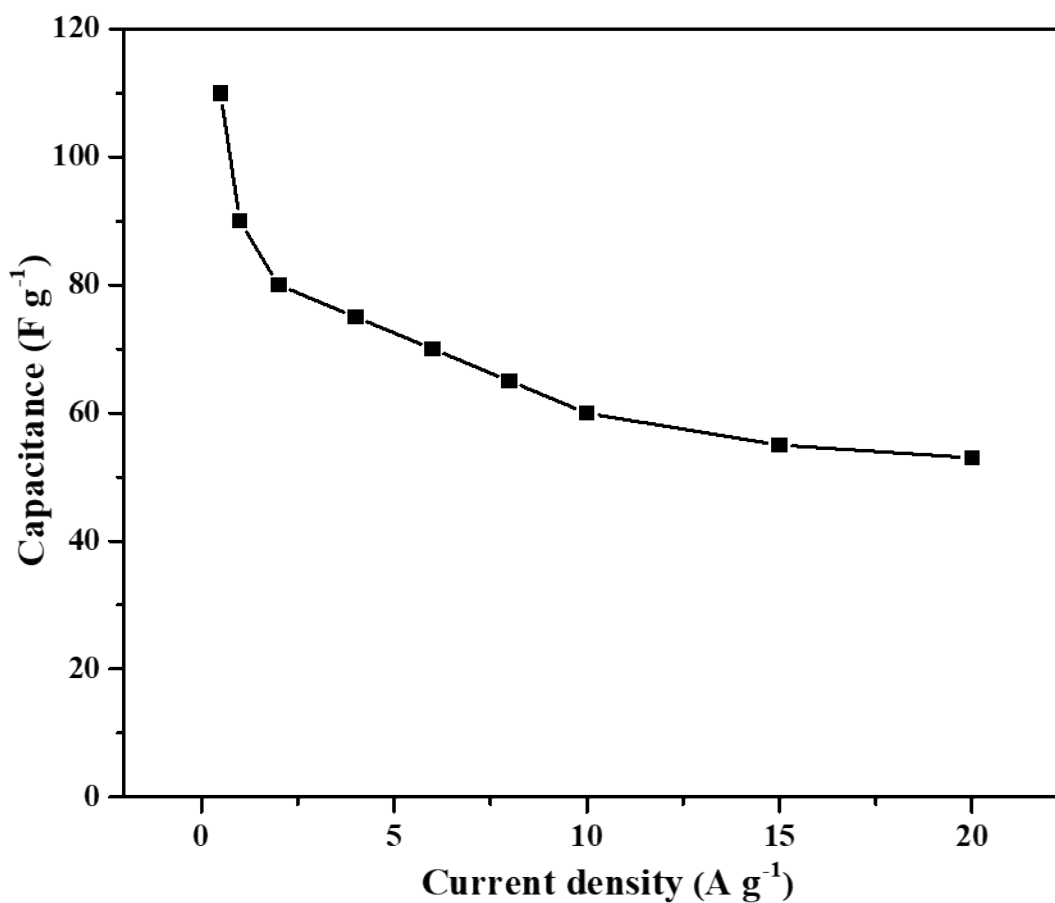


Figure S2. Specific capacitances of rGO at different current densities

References

1. K. Rhili, S. Chergui, A. S. ElDouhaibi and M. Siaj, *ACS omega*, 2021, **6**, 6252-6260.
2. S. Chergui, K. Rhili, S. Poorahong and M. Siaj, *Membranes*, 2020, **10**, 229.
3. P. Brisebois, R. Izquierdo and M. Siaj, *Nanomaterials*, 2020, **10**, 1255.