Electronic Supplementary Material (ESI) for Nanoscale.

Electronic Supplementary Information

Nitrogen and phosphorus dual-doped graphene as a metal-free high-efficiency electrocatalyst for triiodide reduction

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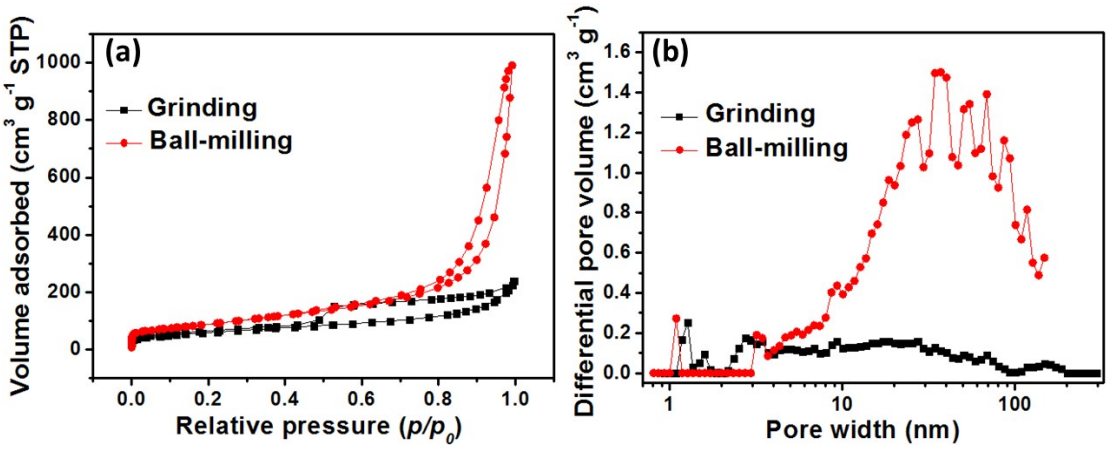

Fig. S1 Nitrogen adsorption/desorption isotherms (a) and pore-size distributions (b) of NPG by grinding directly and ball-milling process.

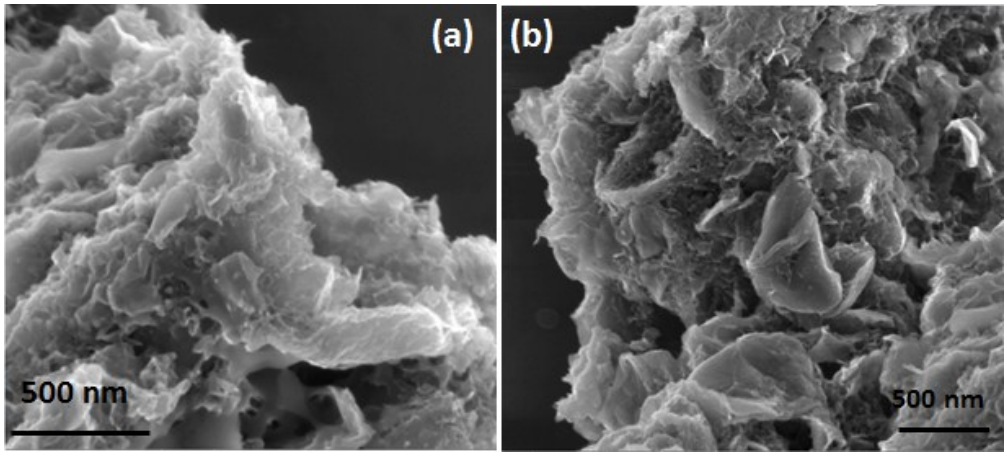

Fig. S2 FE-SEM images of NG (a) and PG (b)

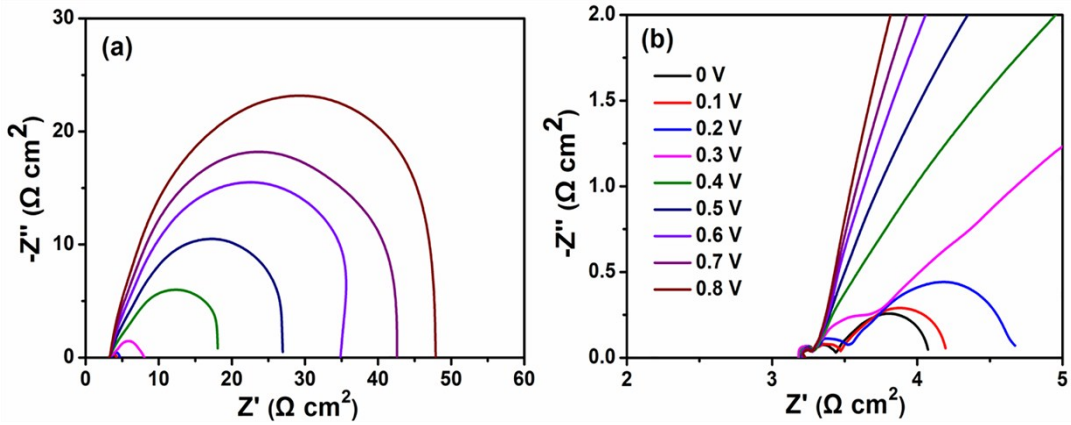

Fig. S3 (a) Impedance spectra for NPG symmetric cell at various applied biases. (b) An expansion of the high frequency region. The legend in (b) is for (a) as well.

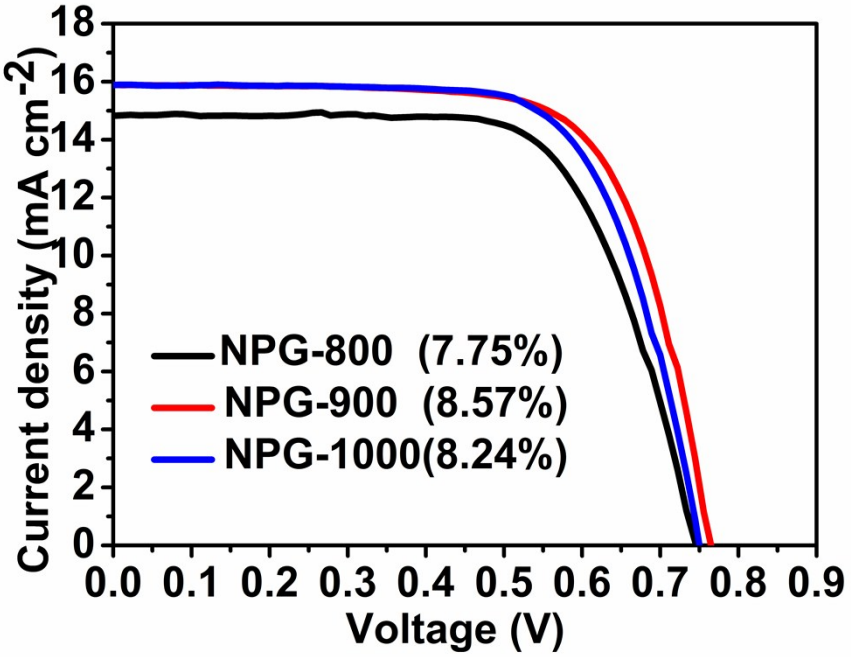

Fig. S4 *J-V* curves of a series of NPG CEs made at different annealing temperatures and their power conversion efficiency.

Table S1 Specific surface areas of the as-made samples

Samples	BET specific surface areas ($m^2 g^{-1}$)
NG	312
PG	314
NPG (ball-milling)	325
NPG (direct grinding)	213

Table S2 Elemental compositions of various samples derived from XPS.

	C (at. %)	O (at. %)	N (at. %)	P (at. %)
NG	87.78	9.37	2.85	—
PG	88.64	10.12	—	1.24
NPG	86.73	9.86	2.49	0.92

Table S3 Electrochemical parameters for various CEs.

Samples	E_{pp} (V)	J_{Ared} (mA cm^{-2})	R_s (Ω cm^2)	R_{ct} (Ω cm^2)	Z_N (Ω cm^2)
Pt	0.37	1.22	4.54	2.71	0.98
PG	0.23	2.32	2.11	0.30	0.80
NG	0.25	2.42	1.82	0.26	0.83
NPG	0.19	4.57	1.61	0.14	0.82