## Ultrahigh rate capability supercapacitors based on tremella-like nitrogen and phosphorus co-doped graphene

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Fig .S1. SEM images of (a, b) 15 PNG, (c, d) 18PNG, (e, f) 25PNG and (g, h) 28PNG.



Fig .S2. SEM images of (a, b) 20PNG-1h, (c, d) 20PNG-3h, (e, f) 20PNG-5h.



Fig .S3. SEM images of (a, b) 20PNG-140, (c, d) 20PNG-180, (e, f) 20PNG-200.



**Fig** .**S4**. Electrochemical performance of the 15PNG, 18PNG, 25PNG and 28PNG electrodes measured in 6.0 M KOH solution. (a) GCD curves of different samples at a current density of 1 A g<sup>-1</sup>, (a) The curves of specific capacitance versus different current densities for four different materials.



Fig .S5. (a)(b) GCD curves of samples at a current density of 1 A  $g^{-1}$ , (c)(d) Nyquist plots of samples (The inset is the high frequency region of the Nyquist curves).

	Materials	Electrolyte	Current Density	Capacitance		
-	20PNG-1h	6 M KOH	1 A g <sup>-1</sup>	216 F g <sup>-1</sup>		
	20PNG-5h	6 M KOH	1 A g <sup>-1</sup>	294 F g <sup>-1</sup>		
	20PNG-140	6 M KOH	1 A g <sup>-1</sup>	210 F g <sup>-1</sup>		
	20PNG-200	6 M KOH	1 A g <sup>-1</sup>	287 F g <sup>-1</sup>		

Table .S1. Comparison of electrochemical propertie of different materials.



Fig .S6. GCD curves of 20PNG at different current densities in 1 M H<sub>2</sub>SO<sub>4</sub> solution.



Fig .S7. Cyclic performance of 20PNG//20PNG SSC for 10000 cycles at 5 A  $g^{-1}$  current density.