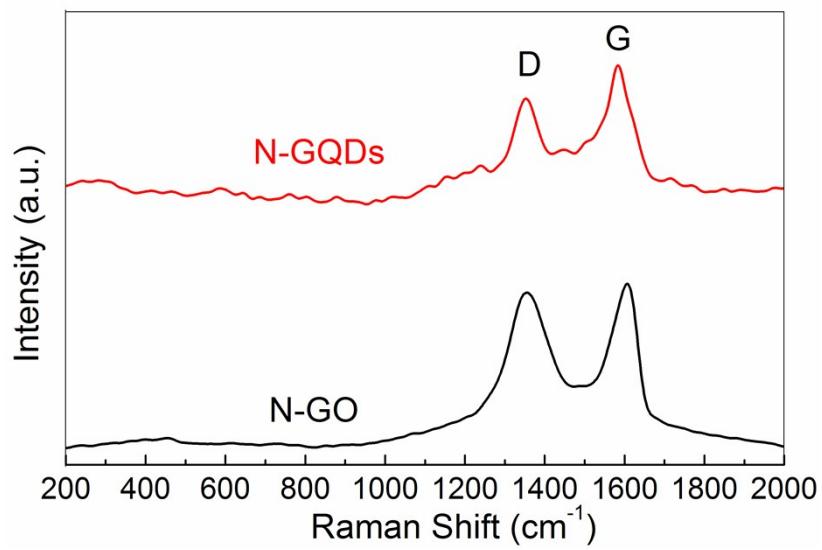


## Electronic Supplementary Information

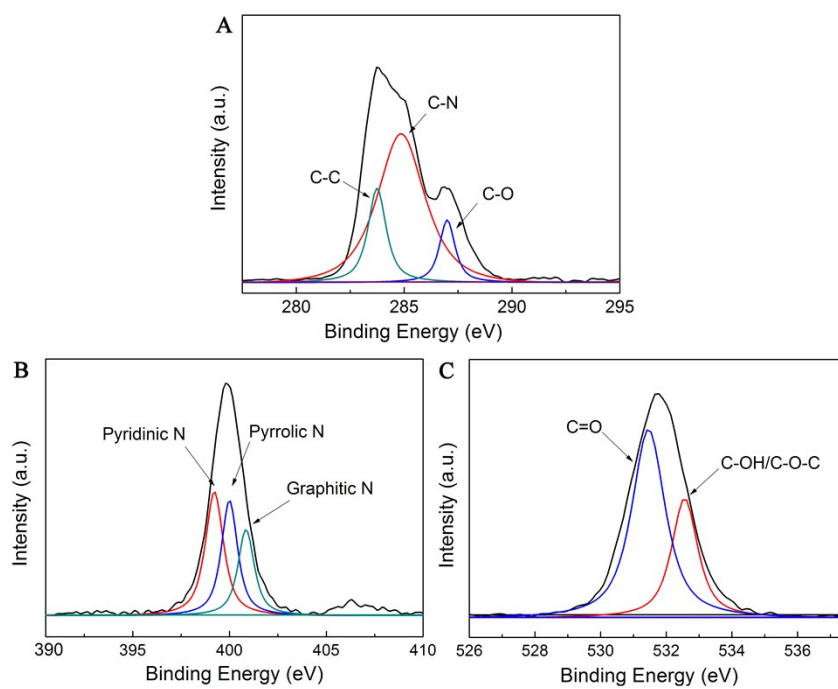
### The carbonization of polyethyleneimine: facile fabrication of N-doped graphene oxide and graphene quantum dots

**Table S1** Elemental analysis results of PEI, the obtained N-GQDs and N-GO.

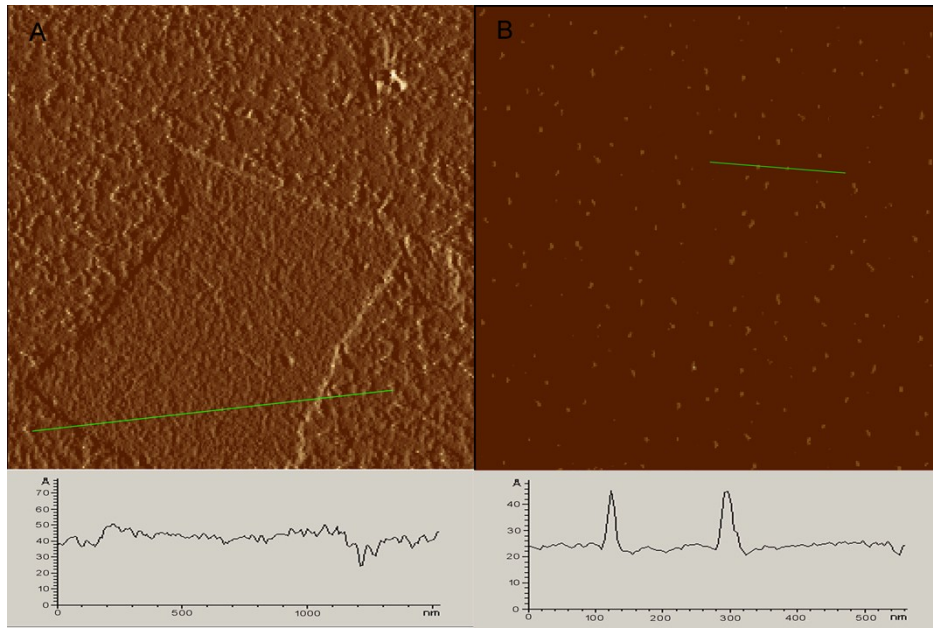
	C (wt%)	N (wt%)	H (wt%)	O (wt%,calculated )
PEI	38.74	44.59	16.67	
N-GQDs	49.60	20.85	5.27	24.28
N-GO	54.94	19.72	3.21	22.13



**Fig. S1** Raman spectra of N-GO and N-GQDs.



**Fig. S2** High-resolution XPS spectra of N-GO (A) C 1s, (B) N 1s and (C) O 1s.



**Fig. S3** AFM images of N-GO (A) and N-GQDs (B).

**Table S2** The comparison of different quantum yield of GQDs prepared by bottom-up method.

Precursor	Synthetic method	Quantum yield (%)	Application	References
poly(ethylene glycol) /saccharide	Microwave	3.1	–	[1]
Candle soot	HNO <sub>3</sub> oxidation	7.8	Bioimaging	[2]
Citrate	carbonized	3	–	[3]
Ionic liquids	Microwave	5.1	Quercetin sensing	[4]
Hair fibre	H <sub>2</sub> SO <sub>4</sub> treatment	11.1	Bioimaging	[5]
Grass	Hydrothermal treatment	6.2	Cu <sup>2+</sup> sensing	[6]
polyethyleneimine	carbonized	13.5	Bioimaging	This work

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