Supplementary Information

Well-dispersive graphene-polydopamine-Pd hybrid with enhanced catalytic performance

Jian-Xin Ma, Honglei Yang, Shuwen Li, Ren Ren, Jing Li, Xueyao Zhang and Jiantai Ma*

State Key Laboratory of Applied Organic Chemistry, College of Chemistry and Chemical Engineering, Lanzhou University, Lanzhou, Gansu 730000, P. R. China.

E-mail: majiantai@lzu.edu.cn; Fax: +86-931-8912582; Tel: +86-931-8912577

GPDA and polydopamine were characterized with Fourier-transform infrared (FTIR) spectrophotometer (Nicolet NEXUS 670 FTIR), as we can see in the Fig.s1 The pure graphene showed only a few weak absorption at 1615 cm^{-1} from aromatic rings and 3420 cm^{-1} from -OH group [1]. While polydopamine gave the same absorption at 1615 cm^{-1} and 3420 cm^{-1} that comes from a catechol group [2]. That indicates the similarity between graphene and PDA. Furthermore the Graphene-polydopamine hybrid mainly presented the absorption feature of polydopamine, indicating the graphene was successfully functionalized by polydopamine.
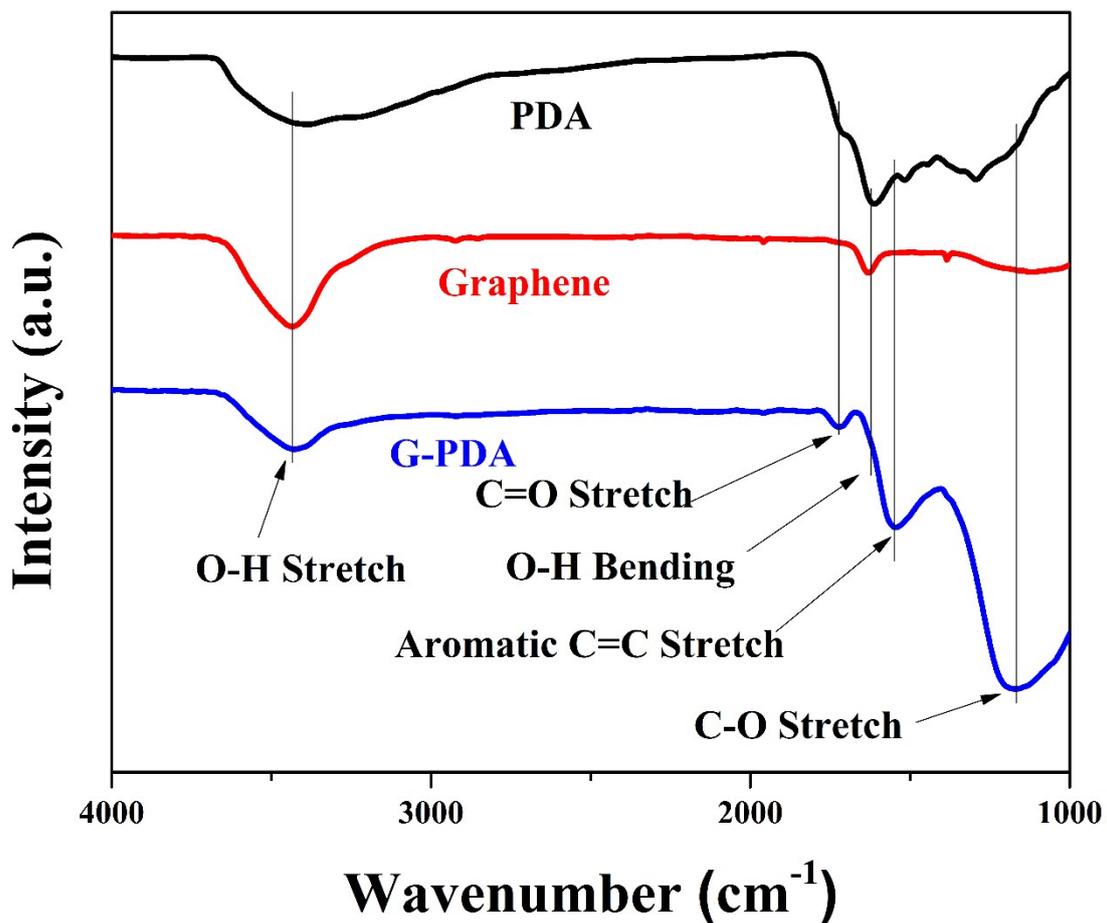
Fig.s1 FTIR of PDA, graphene and GPDA.
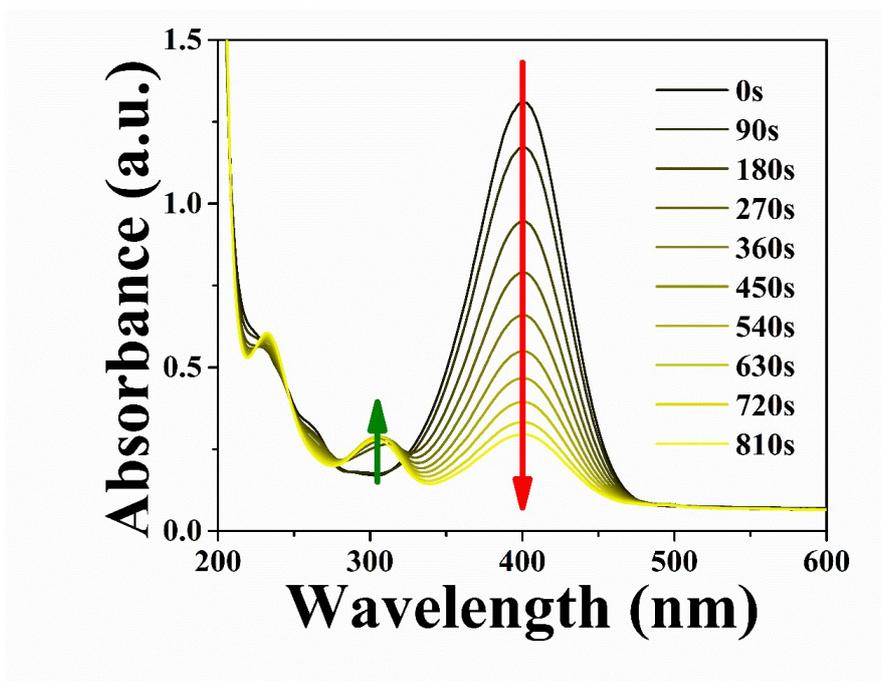
Fig.s2 UV-visible absorption spectra of the reduction of 4-NP catalysed by GP
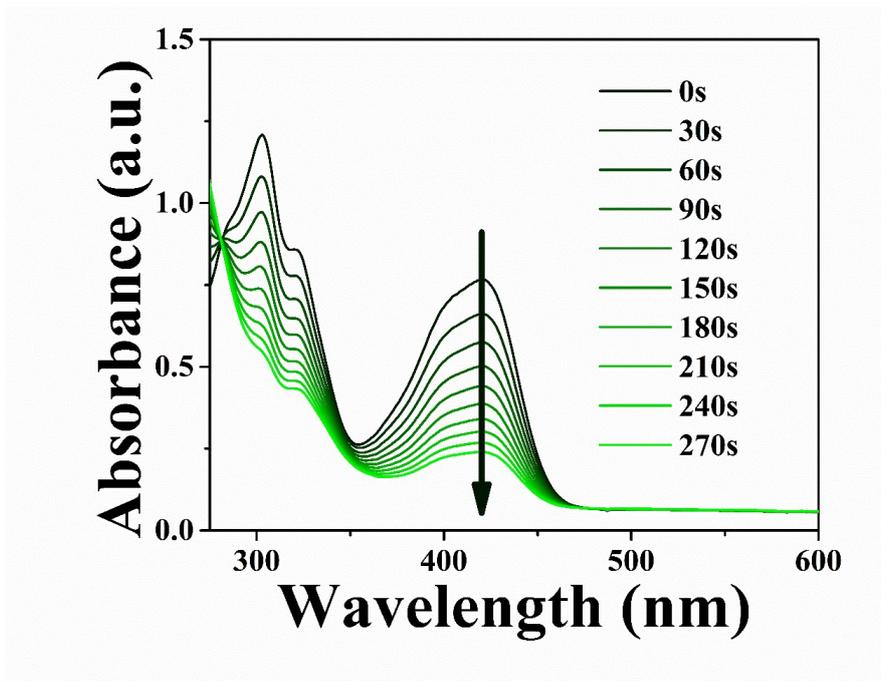
Fig.s3 UV-visible absorption spectra of the reduction of $K_3[Fe(CN)_6]$ catalysed by GP

Table s1 Summary of the constants for the catalytic reductions

Metals in catalyst	Substance	k (s^{-1})	Catalyst dosing after conversion	k^* (s^{-1}g^{-1})	Reference
Pd-Ni	4-NP	2.04×10^{-2}	0.4 mg	51.0	[3]
Pd	4-NP	6.58×10^{-2}	2 mg	32.9	[4]
Pd	4-NP	3.17×10^{-4}	4.6 µg	68.9	[5]
Pd	4-NP	8.83×10^{-3}	-	-	[6]
Au	4-NP	2.1×10^{-3}	6 mg	0.35	[7]
Au	4-NP	6.06×10^{-2}	6 mg	10.1	[8]
Au	4-NP	3.9×10^{-2}	1 mg	39	[9]
Cu	MB	6.55×10^{-3}	25 µg	262.0	[10]
Cu	RhB	1.35×10^{-2}	25 µg	540.0	[10]

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