

A Graphene-Melamine-Sponge for Efficient and Recyclable Dye Adsorption

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The same weight of raw melamine sponge and GMS were put in the MB solutions with 10 mg/L and 20mg/L, respectively. After 10 minutes, the color of the solution using raw melamine sponge maintained and that of using GMS turned to transparent. The results indicated that melamine sponge has negligible adsorption effect on the MB.

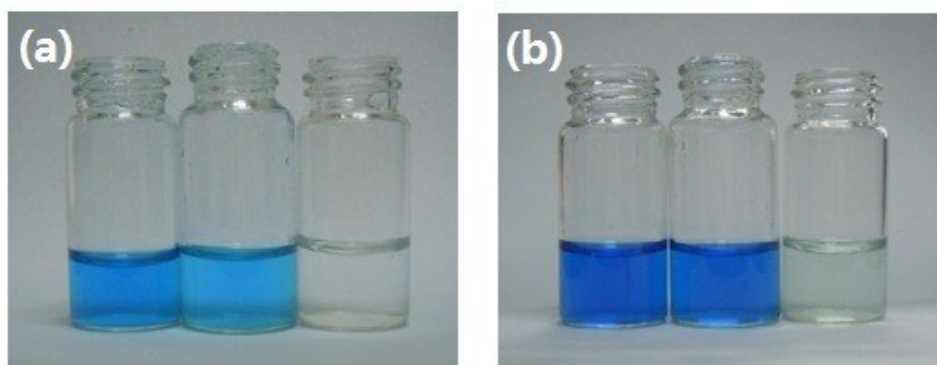


Fig S1. The color change after raw melamine sponge adsorption (middle) and GMS adsorption (right) compare to original MB solution (left) with 10 mg/L (a) and 20 mg/L (b).

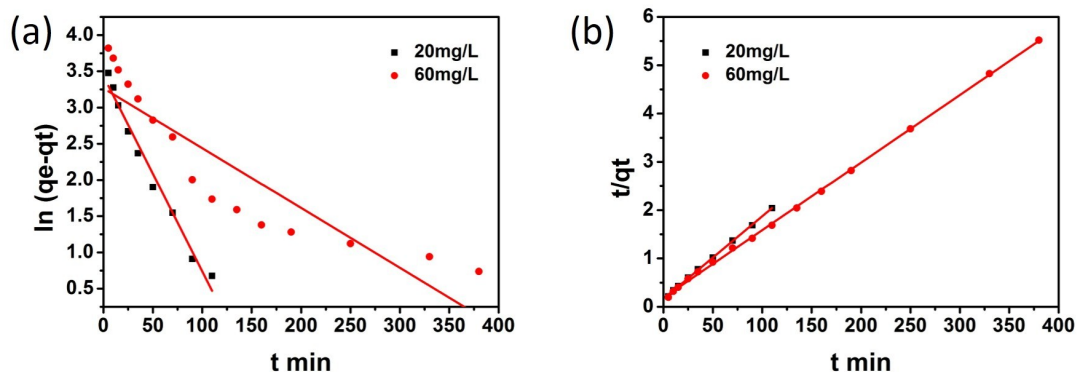


Fig S2. Pseudo-first-order (a) and pseudo-second-order (b) kinetic plots for the adsorption of OG.

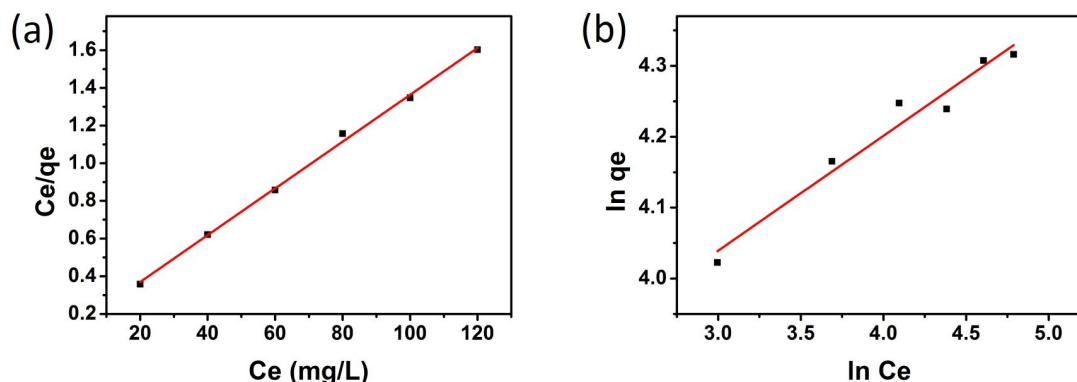


Fig S3. Isotherms of OG adsorption on the GMS: (a) Langmuir isotherm model; (b)

Freundlich isotherm model.

Table S1. Adsorption of MB under an open environment.

Sample	Amount s (g L ⁻¹)	Dye concentratio n	Time (min)	Reference
GMS	2	3.12 x 10 ⁻⁵ M	2	present work
3D RGO	0.6	2.67 x 10 ⁻⁵ M	90	[1]
Mg(OH) ₂ -RGO	2	2.0 x 10 ⁻⁵ M	200	[2]
Fe ₃ O ₄ -GO	1	6.25 x 10 ⁻⁵ M	30	[3]
GO	0.1	5.34 x 10 ⁻⁵ M	100	[4]
GO/PEI	10	2.67 x 10 ⁻⁵ M	240	[5]

Table S2. Kinetic parameters for adsorption of OG onto GMS.

Con (mg/L)	Pseudo-first-order model				Pseudo-second model			
	q _{e,exp}	k ₁	q _{e,cal}	R ²	q _{e,exp}	k ₂	q _{e,cal}	R ²
20	55.84	0.031	34.56	0.978	55.84	1.69×10 ⁻³	59.24	0.998
60	70.93	0.00826	26.19	0.811	70.93	1.04×10 ⁻³	71.47	0.999

Table S3 Isotherm parameters for adsorption of OG onto GMS

Models	Model parameters	
Langmuir isotherm	K _L	0.102
	R ²	0.997
	q _m	80.51
Freundlich isotherm	n	6.16
	R ²	0.953
	K _F	34.90

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