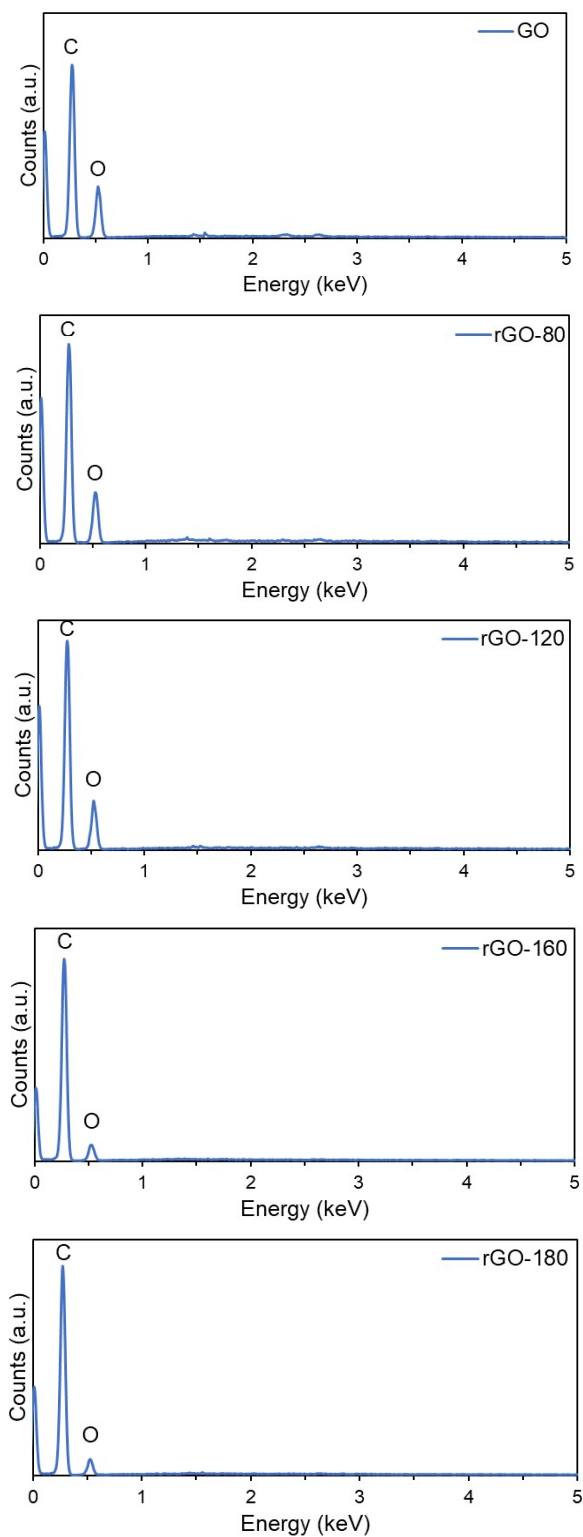
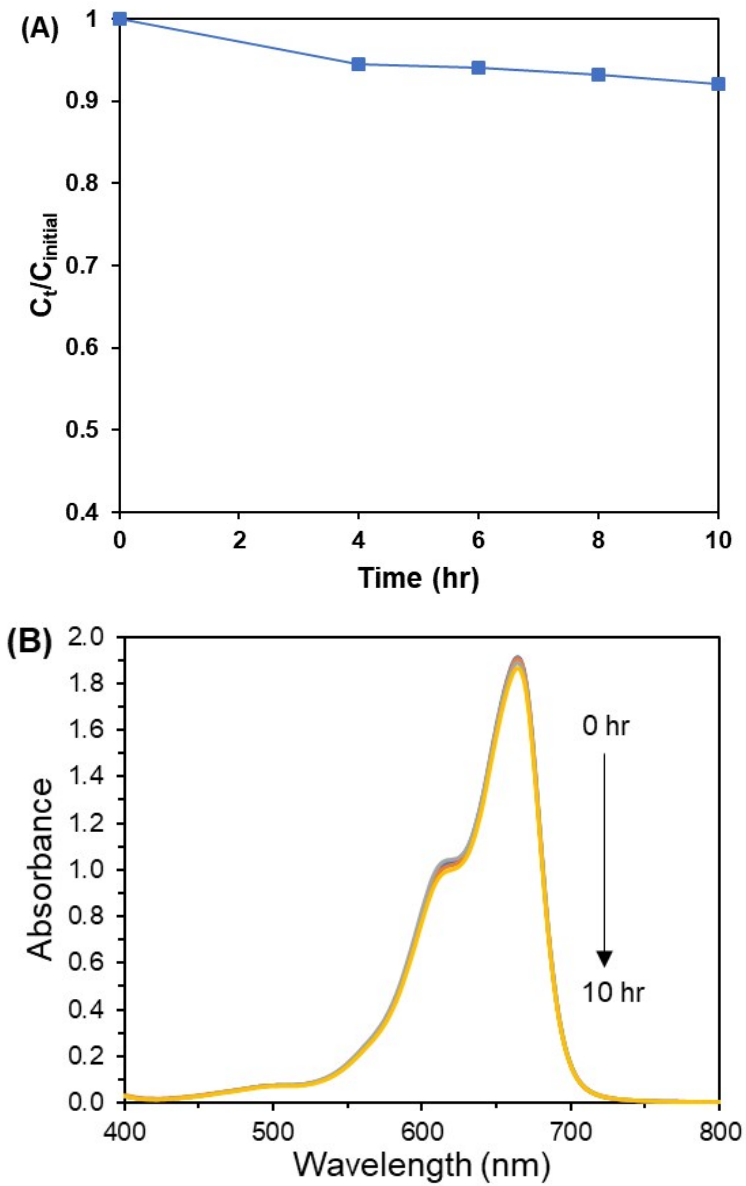


**Table S1.** Adsorption and photocatalytic degradation of MB dye by rGO.

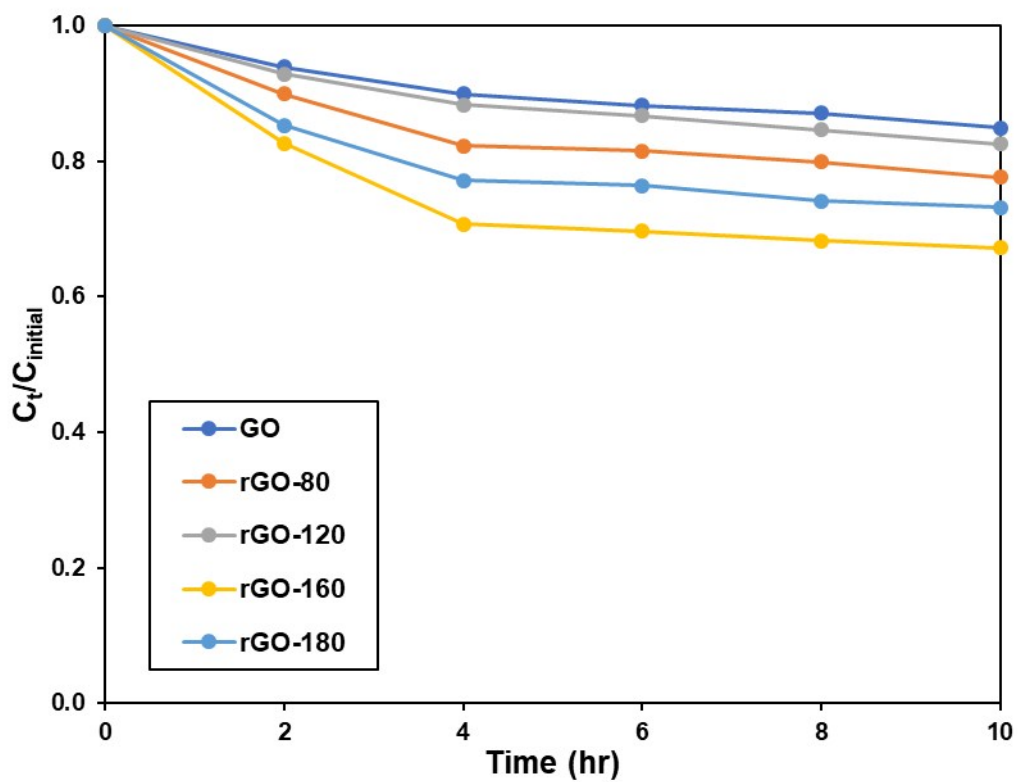
Synthesis Method	Experimental conditions	Performance	Residual [MB] (ppm)	Ref.
Chemical reduction with hydrazine	rGO: 1 mg [MB]: 1.3 ppm Light: 100 W Hg lamp	10% adsorbed and degraded at the same time in 90 min	1.2	1
Electrochemical exfoliation from graphite electrode	rGO: 60 mg [MB]: 350 ppm Light: 15 W UV lamp	40% degraded in 90 min after adsorption in 4 hr	N/A	2
Chemical reduction with hydrazine	rGO: 50 mg [MB]: 15000 ppm Light: 100 W UV lamp	7% degraded in 100 min after adsorption of 12% in 20 min	12276	3
Chemical reduction with hydrazine	rGO: 20 mg [MB]: 3.2 ppm Light: Sunlight	8% degraded in 180 min after adsorption of 50% in 60 min	1.5	4
Microwave irradiation	rGO: 10 mg [MB]: 10 ppm Light: 250 W Hg lamp	19% degraded in 150 min after adsorption of 1% in 30 min	8	5
Photochemical reduction	rGO: 10 mg [MB]: 10 ppm Light: UV lamp	35% adsorbed and degraded at the same time in 120 min	6.5	6
Photochemical reduction	rGO: 10 mg [MB]: 10 ppm Light: 300 W Xe lamp	30% adsorbed and degraded at the same time in 120 min	7	6
Green reduction without toxic reductant	rGO: 60 mg [MB]: 50 ppm Light: 95 W UV lamp (x 2)	99% degraded in 6 hr after adsorption of 87% in 4 hr	0.1	This work



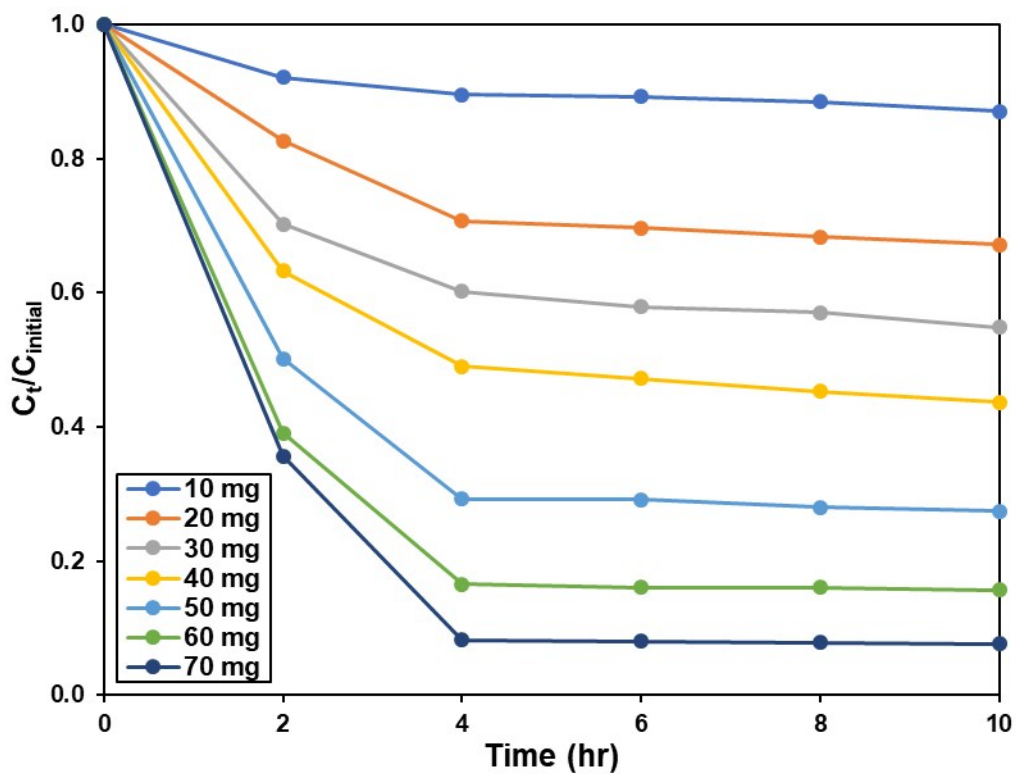
**Fig. S1** EDX elemental analysis of GO, rGO-80, rGO-120, rGO-160 and rGO-180.



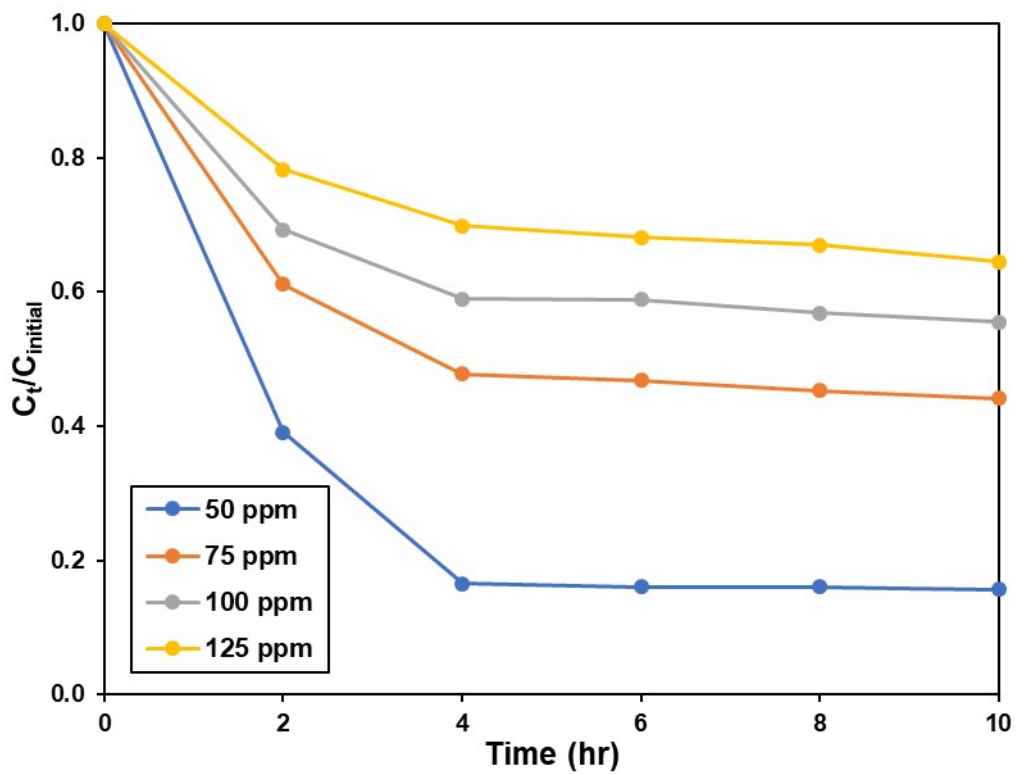
**Fig. S2 (A)** Removal of MB dye in the absence of photocatalyst **(B)** Time-dependent UV-Vis absorption spectra of MB dye in the absence of photocatalyst ( $[MB] = 50$  ppm; light intensity =  $60 \text{ W}\cdot\text{m}^{-2}$ ; pH = 6).



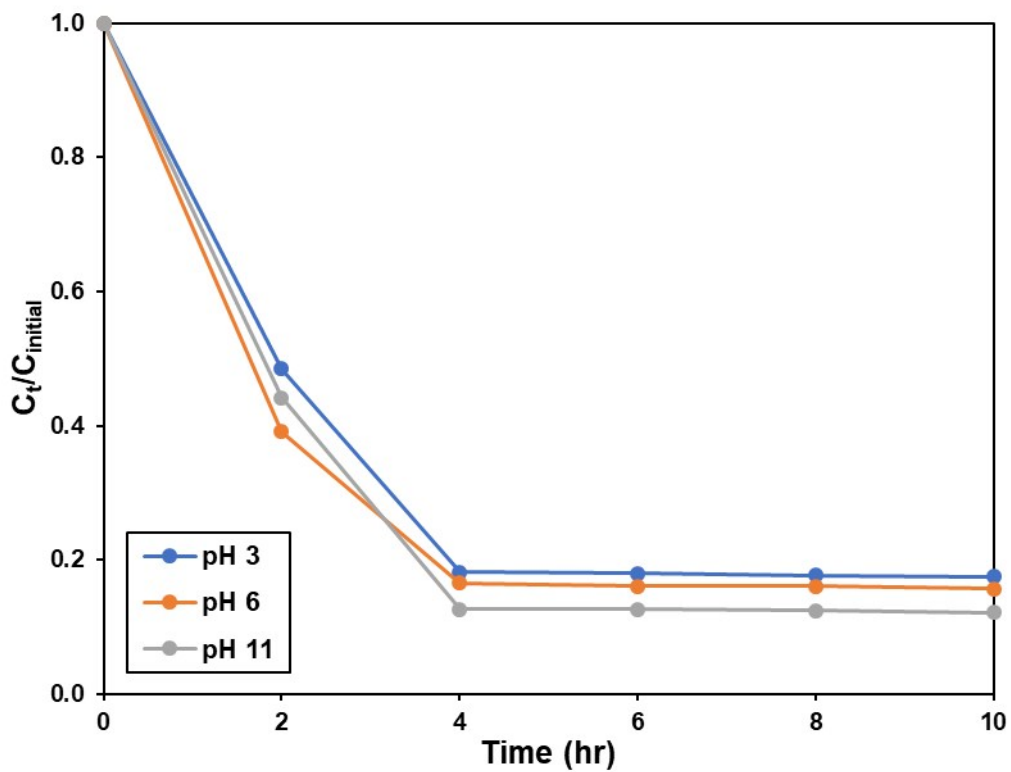
**Fig. S3** Dark adsorption of MB dye by GO, rGO-80, rGO-120, rGO-160 and rGO-180 (catalyst loading = 20 mg; [MB] = 50 ppm; light intensity =  $60 \text{ W}\cdot\text{m}^{-2}$ ; pH = 6).



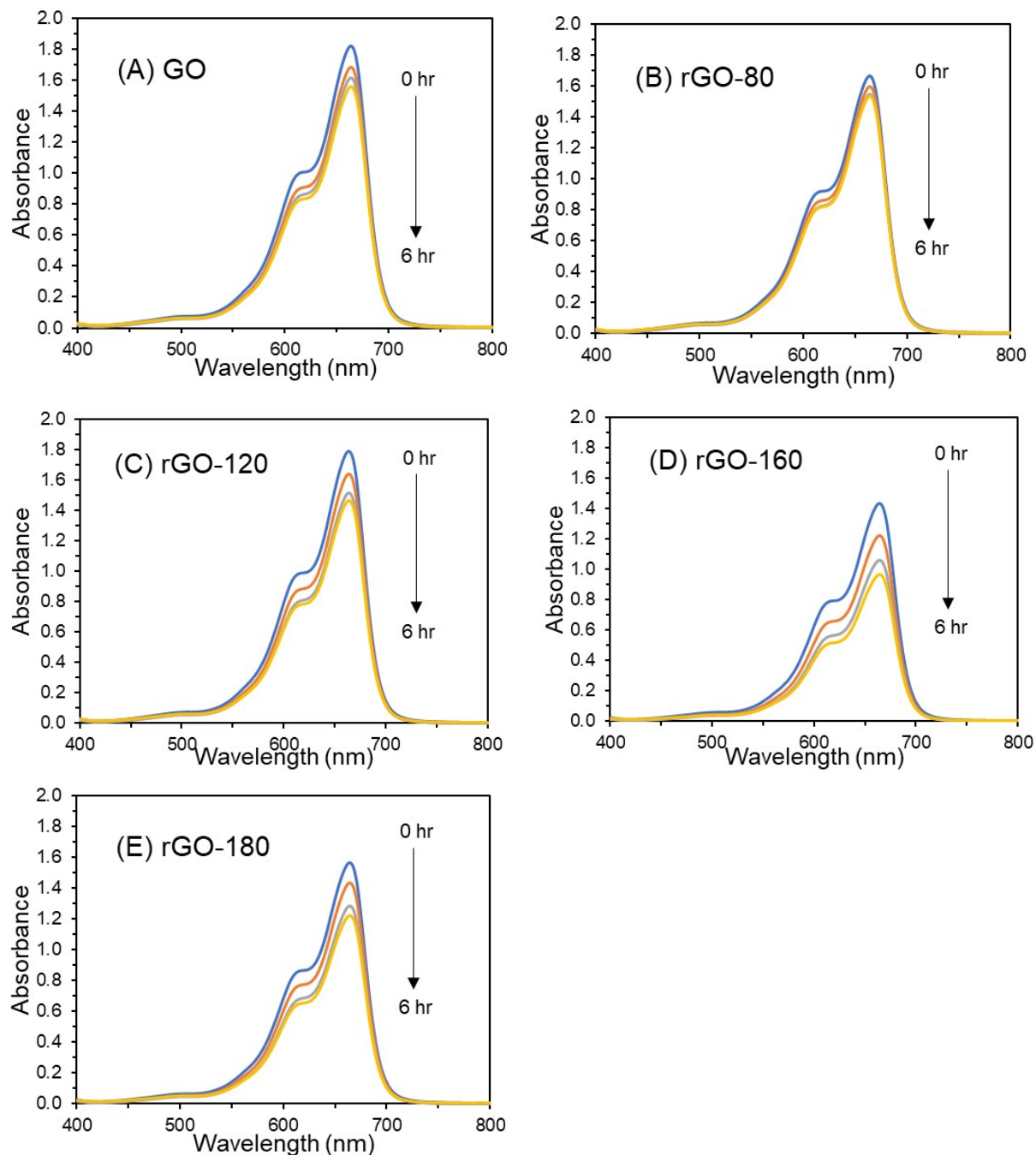
**Fig. S4** Dark adsorption of MB dye by 10 mg, 20 mg, 30 mg, 40 mg, 50 mg, 60 mg and 70 mg of rGO-160 ([MB] = 50 ppm; light intensity =  $60 \text{ W}\cdot\text{m}^{-2}$ ; pH = 6).



**Fig. S5** Dark adsorption of MB dye by rGO-160 in 50 ppm, 75 ppm, 100 ppm and 125 ppm of MB solution (catalyst loading = 60 mg; light intensity = 60 W·m<sup>-2</sup>; pH = 6).

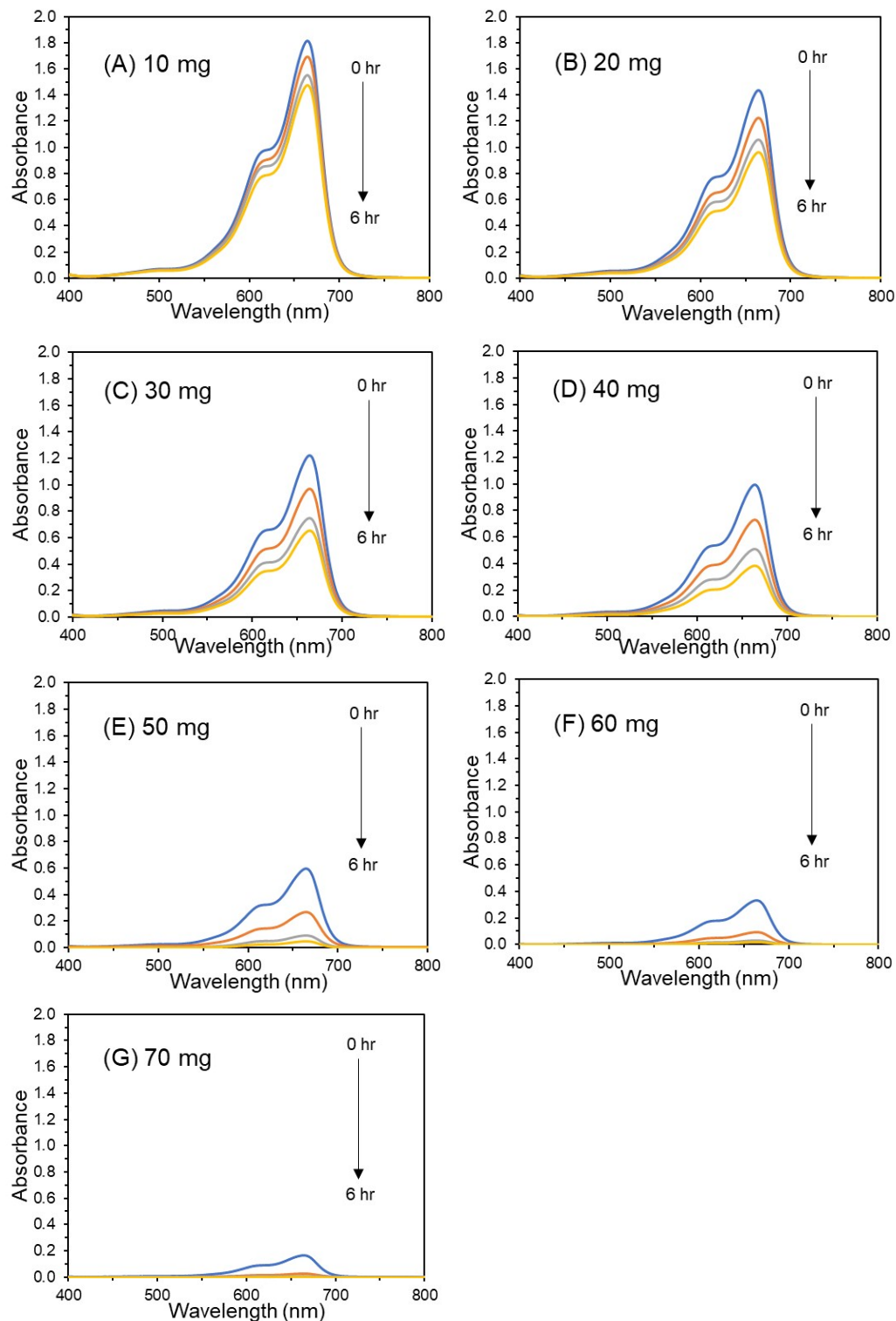


**Fig. S6** Dark adsorption of MB dye by rGO-160 at pH 3, 6 and 11 of MB solution (catalyst loading = 60 mg; [MB] = 50 ppm; light intensity =  $60 \text{ W}\cdot\text{m}^{-2}$ ).

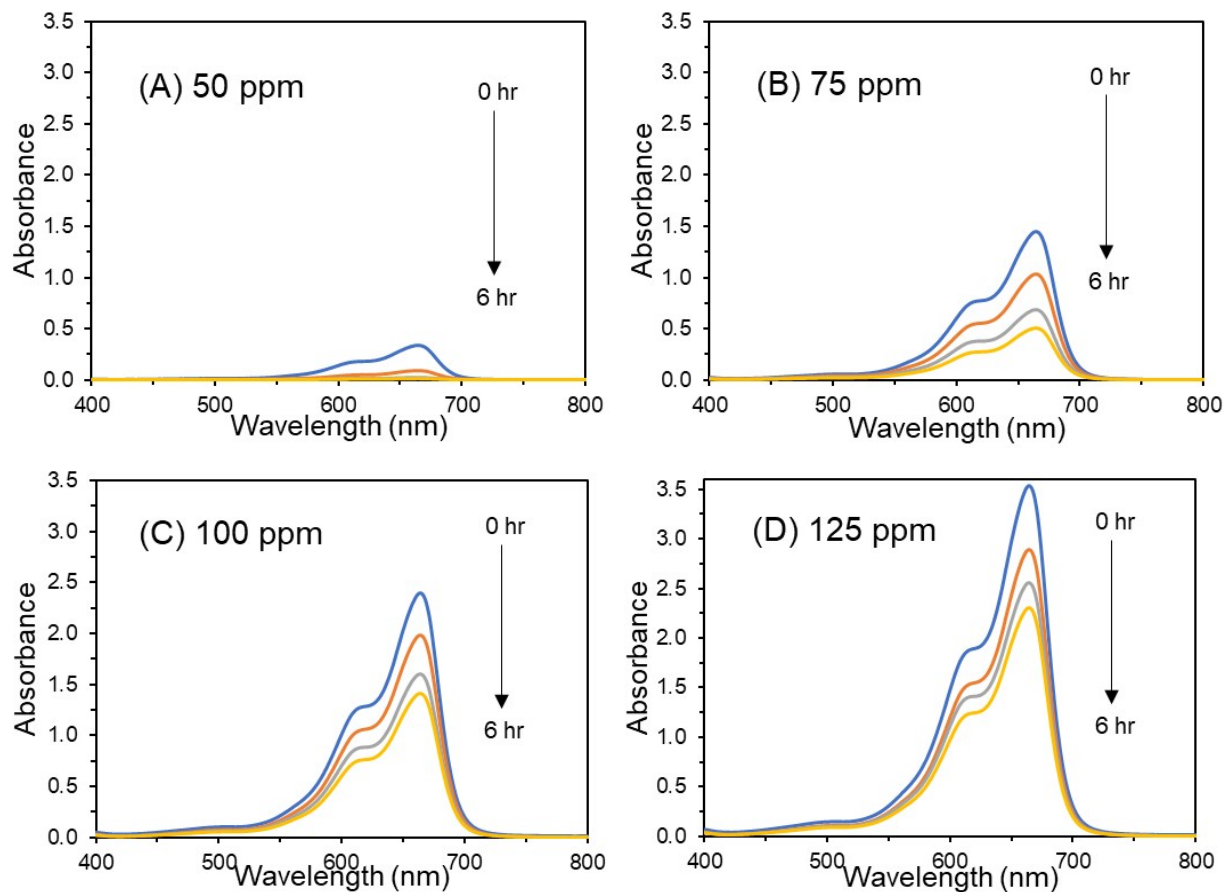


**Fig. S7** Time-dependent UV-Vis absorption spectra for the photocatalytic degradation of MB dye from time,  $t=0$  to  $t=6$ , by different photocatalysts, where (A) GO, (B) rGO-80, (C) rGO-120, (D) rGO-160, and (E) rGO-180. (catalyst loading = 20 mg; [MB] = 50 ppm; light intensity =  $60 \text{ W}\cdot\text{m}^{-2}$ ; pH = 6).

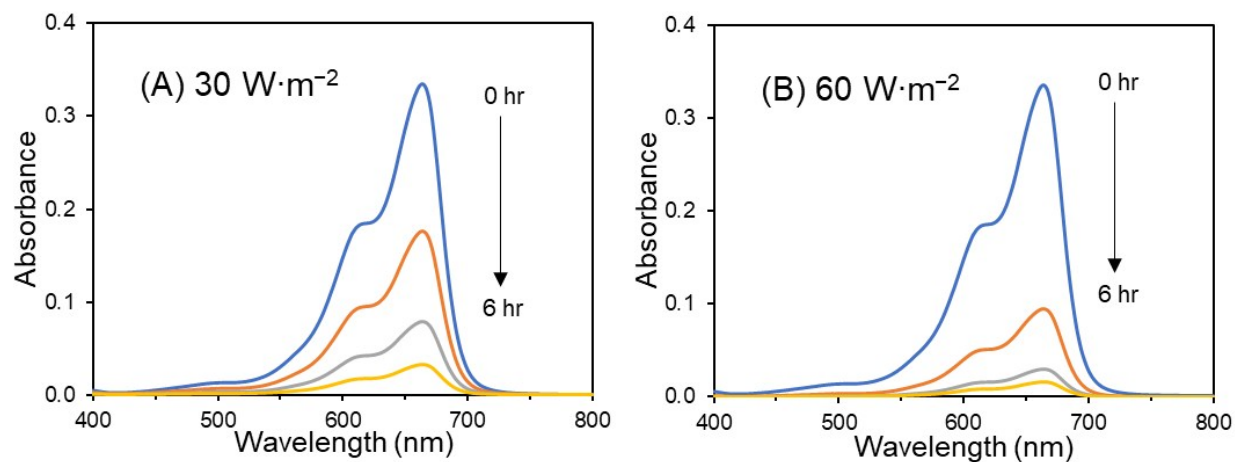




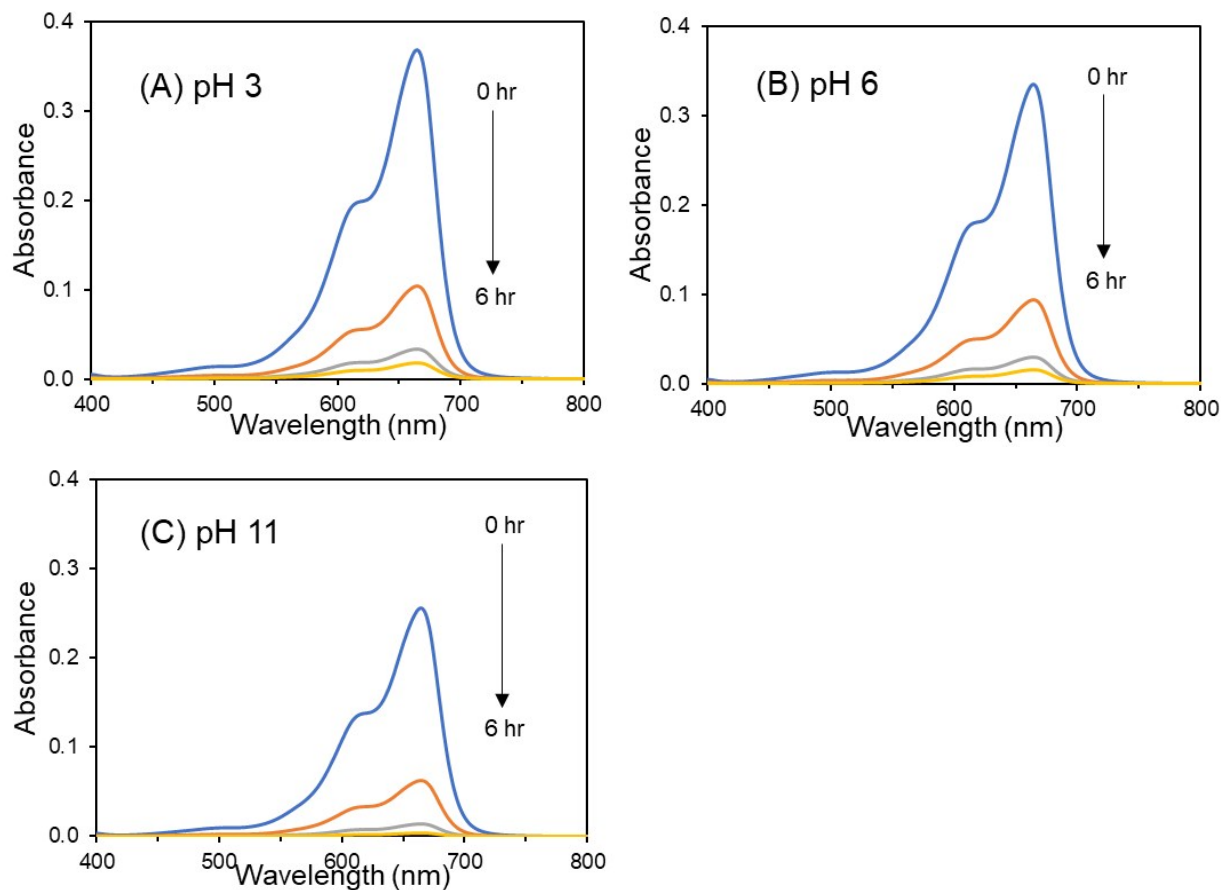
**Fig. S8** Time-dependent UV-Vis absorption spectra for the photocatalytic degradation of MB dye from time,  $t = 0$  to  $t = 6$ , by rGO-160 with different catalyst loading, where (A) 10 mg, (B) 20 mg, (C) 30 mg, (D) 40 mg, (E) 50 mg, (F) 60 mg, and (G) 70 mg. ( $[MB] = 50$  ppm; light intensity =  $60 \text{ W} \cdot \text{m}^{-2}$ ; pH = 6).



**Fig. S9** Time-dependent UV-Vis absorption spectra for the photocatalytic degradation of MB dye from time,  $t=0$  to  $t=6$ , by rGO-160 with different initial MB concentration, where (A) 50 ppm, (B) 75 ppm, (C) 100 ppm, and (D) 125 ppm. (catalyst loading = 60 mg; light intensity =  $60 \text{ W}\cdot\text{m}^{-2}$ ; pH = 6).



**Fig. S10** Time-dependent UV-Vis absorption spectra for the photocatalytic degradation of MB dye from time,  $t=0$  to  $t=6$ , by rGO-160 with different light intensity, where (A)  $30 \text{ W}\cdot\text{m}^{-2}$  and (B)  $60 \text{ W}\cdot\text{m}^{-2}$  (catalyst loading = 60 mg; [MB] = 50 ppm; pH = 6).



**Fig. S11** Time-dependent UV-Vis absorption spectra for the photocatalytic degradation of MB dye from time,  $t=0$  to  $t=6$ , by rGO-160 at different pH, where (A) pH 3, (B) pH 6, and (C) pH 11 (catalyst loading = 60 mg; [MB] = 50 ppm; light intensity =  $60 \text{ W}\cdot\text{m}^{-2}$ ).

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