

Supporting Information

Reduced Graphene Oxide-Immobilized Tris(bipyridine)ruthenium(II) Complex for Efficient Visible-Light-Driven Reductive Dehalogenation Reaction

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Table S1. Elemental analysis of rGO and NaSO₃-rGO samples

Sample	C (mmol/g)	H (mmol/g)	O (mmol/g)	S (mmol/g)
rGO	57.5	10.5	18.2	/
NaSO ₃ -rGO	56.6	10.3	18.2	0.920

Table S2. The optimization of Ru(II) complex loading for Ru(bpy)₃-rGO catalyst^a

Entry	Solvent	Temperature (°C)	Ru loading (mmol/g)
1	H ₂ O	25	0.0943
2	H ₂ O	80	0.210
3	H ₂ O	80	0.251 ^b
4	EtOH	25	0.0354
5	EtOH	80	0.0701
6	/	/	0.193 ^c

^a Reaction conditions: molar ratio (Ru : S) = 3 : 1, 200 mg Ru(bpy)₃Cl₂·6H₂O, t = 24 h. ^b Molar ratio (Ru : S) = 1.5 : 1

^c after fifth recycle.

Table S3. Catalytic performances of Ru(bpy)₃-resin catalyzed visible light-mediated reductive dehalogenation reactions^a

Catalyst	Hantzsch ester (equiv.)	iPr ₂ NEt (equiv.)	Time (h)	Yield (%)
2.5 mol% Ru(bpy) ₃ -resin	1.1	2	6	35.0
2.5 mol% Ru(bpy) ₃ -resin	1.1	3	6	50.5
2.5 mol% Ru(bpy) ₃ -resin	2.2	2	6	68.2
2.5 mol% Ru(bpy) ₃ -resin	2.2	3	6	71.5
3.5 mol% Ru(bpy) ₃ -resin	2.2	3	6	70.0
2.5 mol% Ru(bpy) ₃ -resin	2.2	4	6	73.8
2.5 mol% Ru(bpy) ₃ -resin ^b	2.2	3	6	78.0

^aReaction conditions: a certain amount of Ru(II) catalyst, 2.0 mmol 2-Bromoacetophenone, 1.5 ml DMF, a 50 W fluorescent lamp (450 nm), T = 25°C. ^b Basified Ru(bpy)₃-resin that treated with 1 mol/L NaOH aqueous solution.

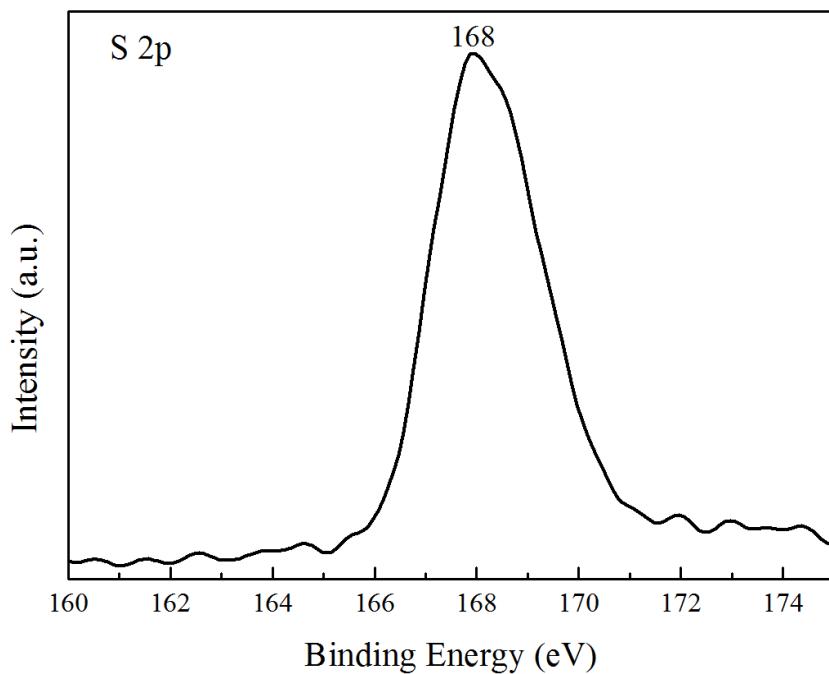


Figure S1. S 2p XPS spectra of PhSO₃Na-rGO sample.

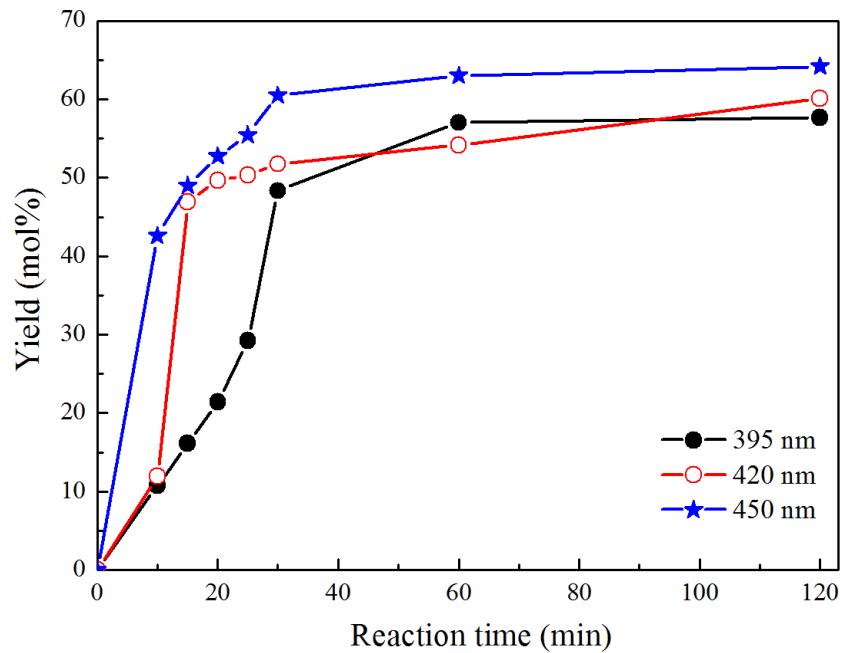


Figure S2. Catalytic performances of $\text{Ru}(\text{bpy})_3\text{-rGO}$ catalyzed visible light-mediated reductive dehalogenation reactions by using different monochromatic light wavenumber.

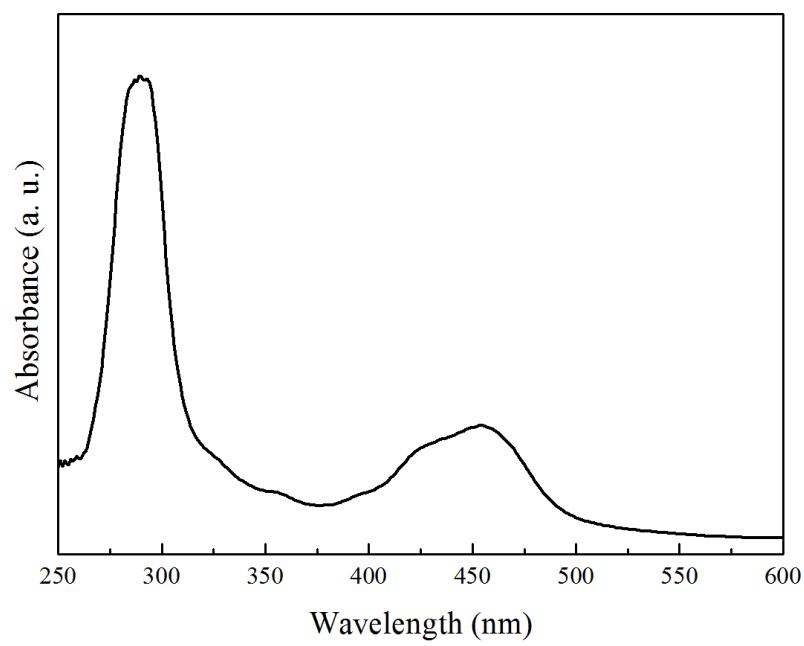


Figure S3. UV-vis spectrum of $\text{Ru}(\text{bpy})_3\text{Cl}_2 \cdot 6\text{H}_2\text{O}$ complex.

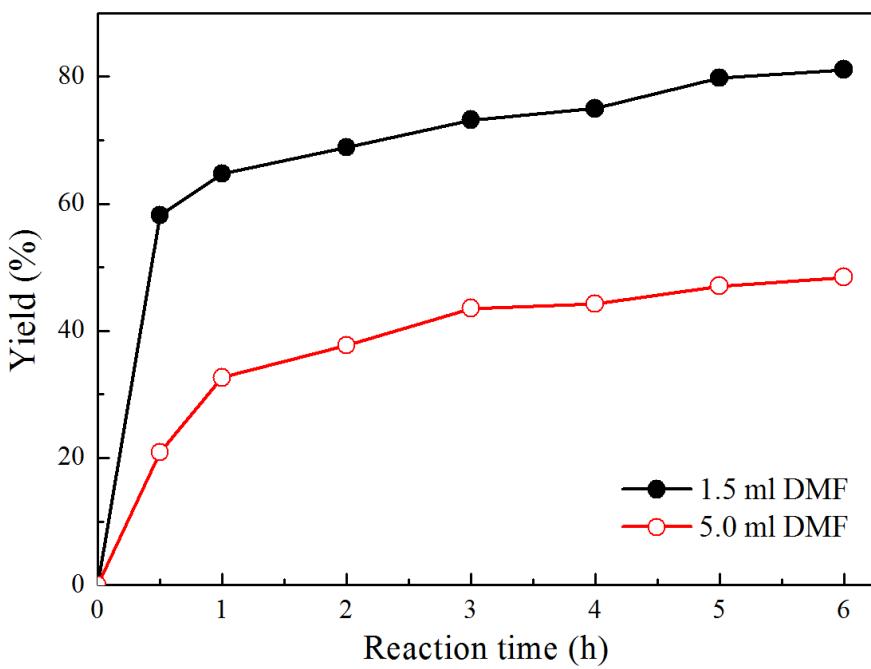


Figure S4. Catalytic performances of $\text{Ru}(\text{bpy})_3\text{-rGO}$ catalyzed visible light-mediated reductive dehalogenation reactions by using different DMF amount.

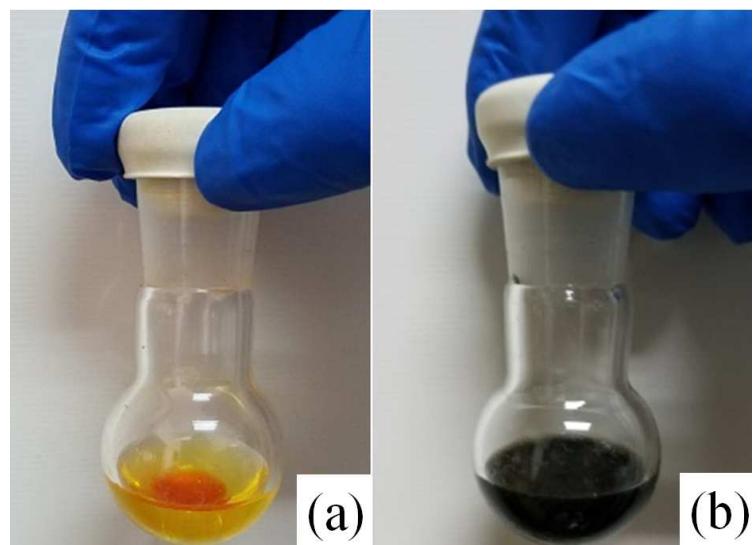


Figure S5. The picture of Ru(bpy)₃-resin (a) and Ru(bpy)₃-rGO (b) dispersed in DMF solvent after ultrasound for 10 minutes and the following static settlement for 1.0 h.

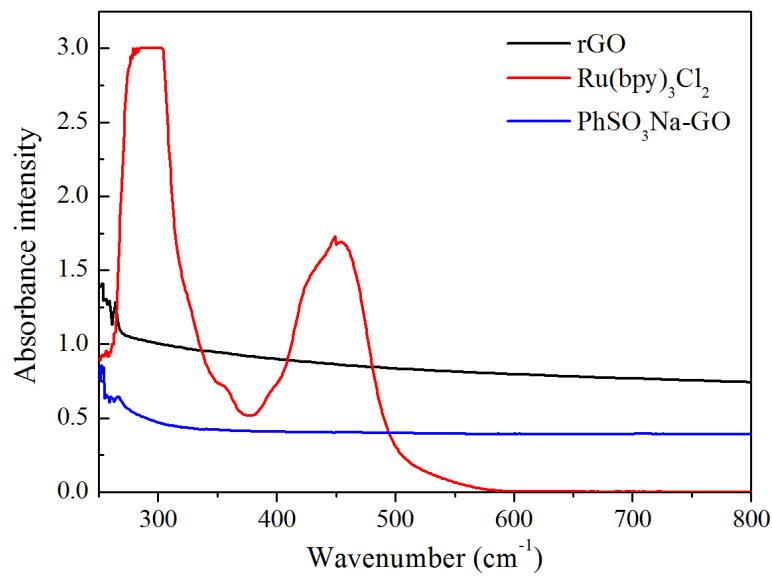


Figure S6. UV-Vis spectra of DMF solution of Ru(bpy)₃Cl₂•6H₂O, rGO and PhSO₃Na-rGO samples.

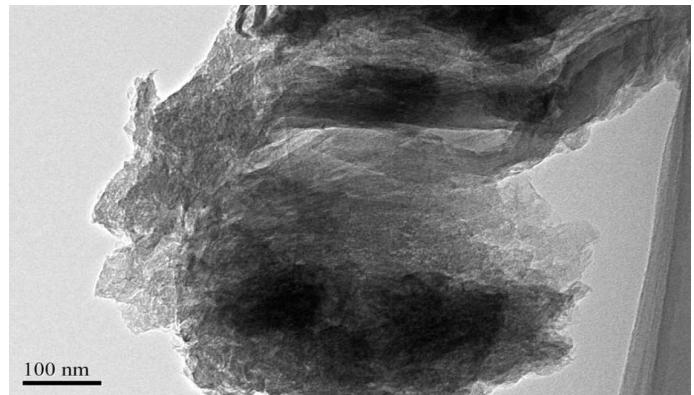


Figure s7. TEM image of the recycled Ru(bpy)₃-rGO catalyst.