

Supplementary data

Filter prepared from Janus-like graphene oxide nanosheets with heterogeneous nanochannels for highly efficient dye removal

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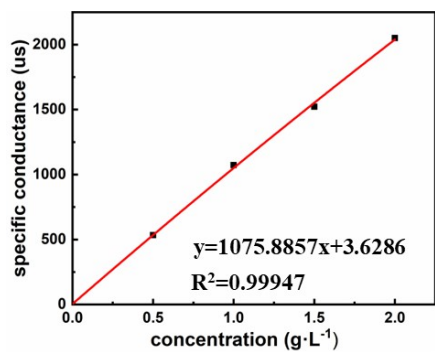
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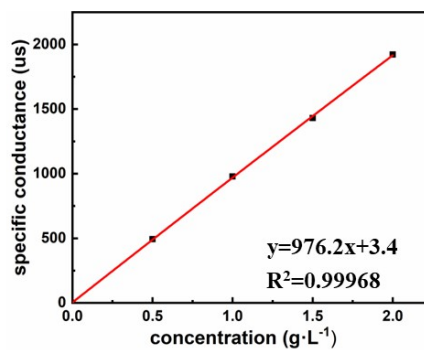
⁺ Equal contribution to this work

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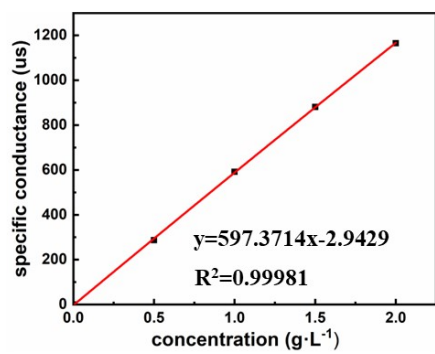
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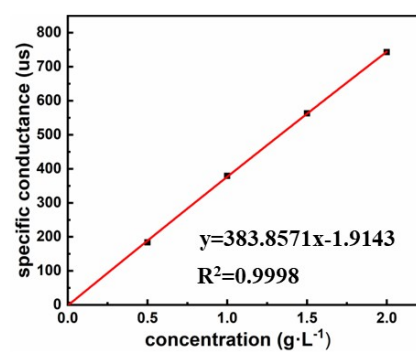
NaCl



Na₂SO₄



MgCl₂



MgSO₄

Fig. S1. Standard curves of different salt concentrations and conductivity.

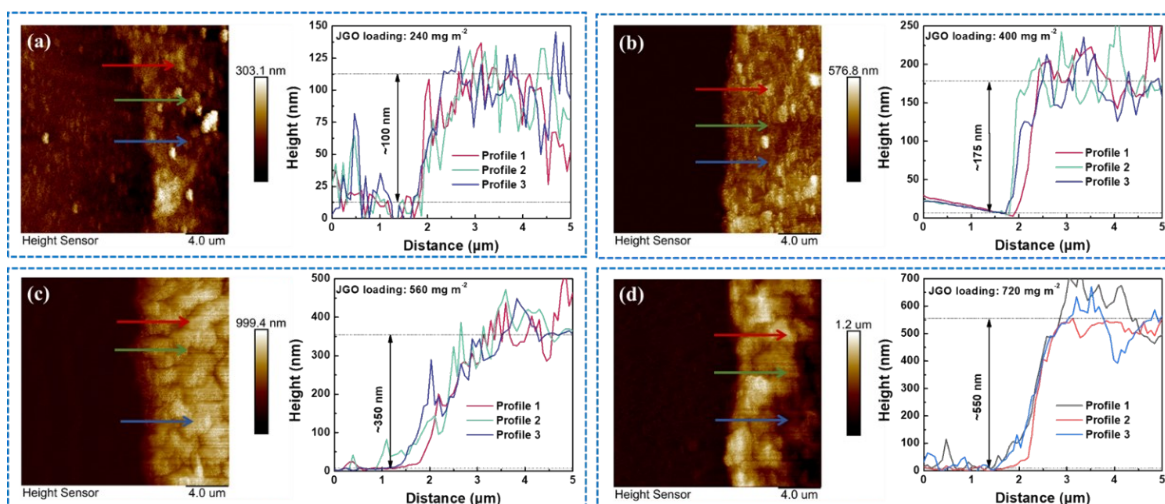


Fig. S2. Membrane thickness under different JGO loads.

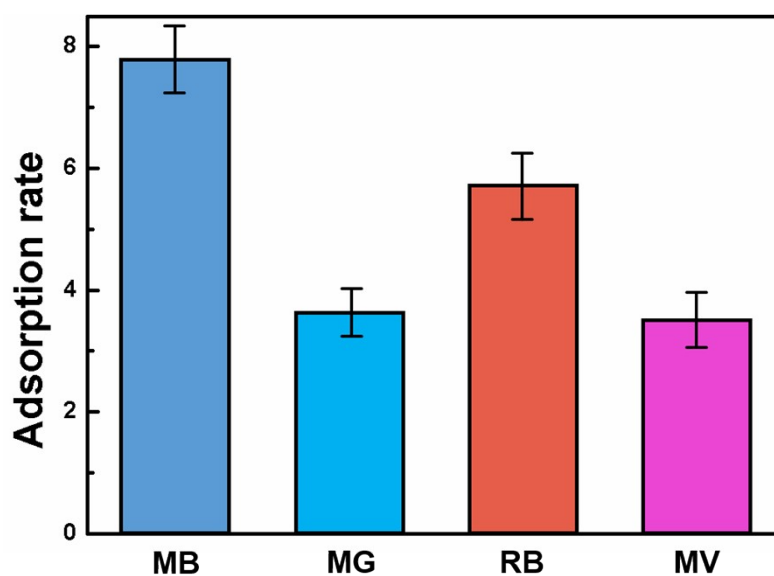


Fig. S3. Adsorption of different dyes by JGO filter.

Table S1. Rejection rate and Permeability of JGO filters for different types of dyes.

Type of dye	MW (g mol ⁻¹)	Size (nm)	Analyte charge	Permeability (L m ⁻² h ⁻¹ bar ⁻¹)	Rejection (%)
Rhodamine B	479.01	1.6×1.2	+	122±10	~97.7
Methyl Viologen	408.03	1.3×1.3	+	138±5	~99.9
Malachite Green	364.91	1.3×1.0	-	125±10	~99.9
Methylene Blue	327.33	1.3×0.5	+	110±8	~98.4

Table S2. Retention rate and flux of JGO filters for different types of inorganic salts.

Salt	MW (g mol ⁻¹)	Permeability (L m ⁻² h ⁻¹ bar ⁻¹)	Rejection (%)
NaCl	58.44	140±5	~7.85
Na ₂ SO ₄	142.04	139±10	~10.04
MgCl ₂	95.21	142±7	~10.39
MgSO ₄	120.37	137±5	~11.57

Table S3. Comparison of properties of JGO filters with other graphene filters.

References	Materials	Type of dye	Permeability (L m ⁻² h ⁻¹ bar ⁻¹)	Rejection (%)
This work	JGO	RB	850	~65.9
			262	~84.2
			132	~97.6
		MnB	118	~98.4
		MV	143	~99.9
10.1039/d0ta00804d	TNSC	RB	400	~20
10.1038/ncomms3979	NSC-GO	RB	279	~87
	GO	MV	71	~80
		MnB	71	~90
		RB	71	~72
10.1016/j.scib.2018.05.015	rGO	DY	48	~67
		MnB	56.3	~95.3
		RB	56.3	~98
10.1016/j.carbon.2018.01.062	GO	MB	20.23	~90.15
		EB	20.23	~98.68
10.1016/j.apsusc.2020.146308	brGO	MB	21.8	~99.2
10.1016/j.apsusc.2020.146308	GO	MB	27.6	~66
		Pararosaniline	53.7	~99.2
10.1021/es400571g	GO	MB	30	~95