Supplementary Materials for

Removal of Arsenic(III) from Aqueous Solution Using Metal Organic Framework-Graphene Oxide Nanocomposite

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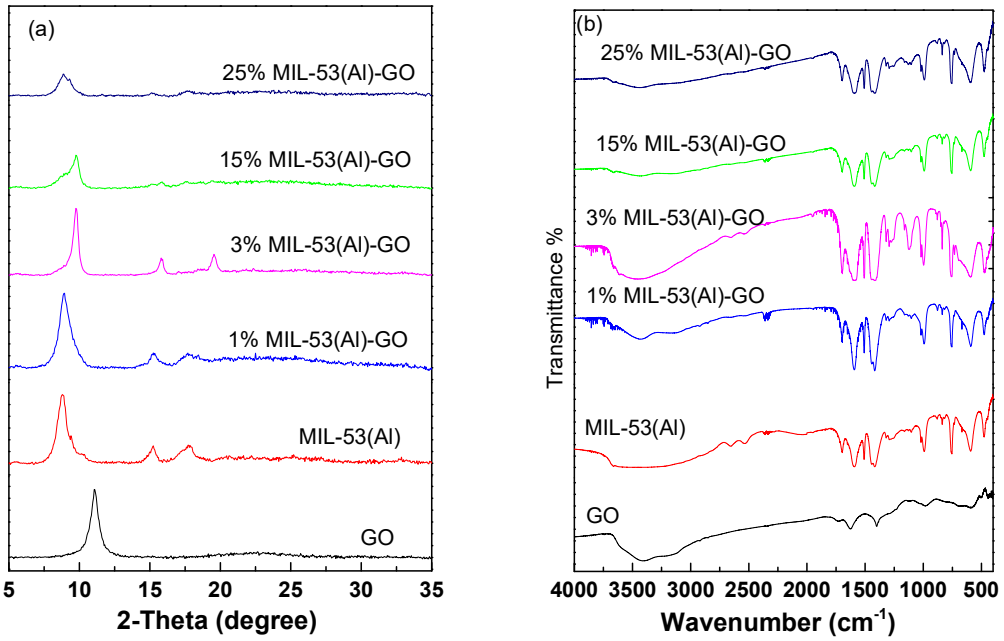

Figure S1 (a) XRD patterns and (b) FT-IR spectra of MIL-53(Al), GO, and MIL-53(Al)-GO nanocomposites.

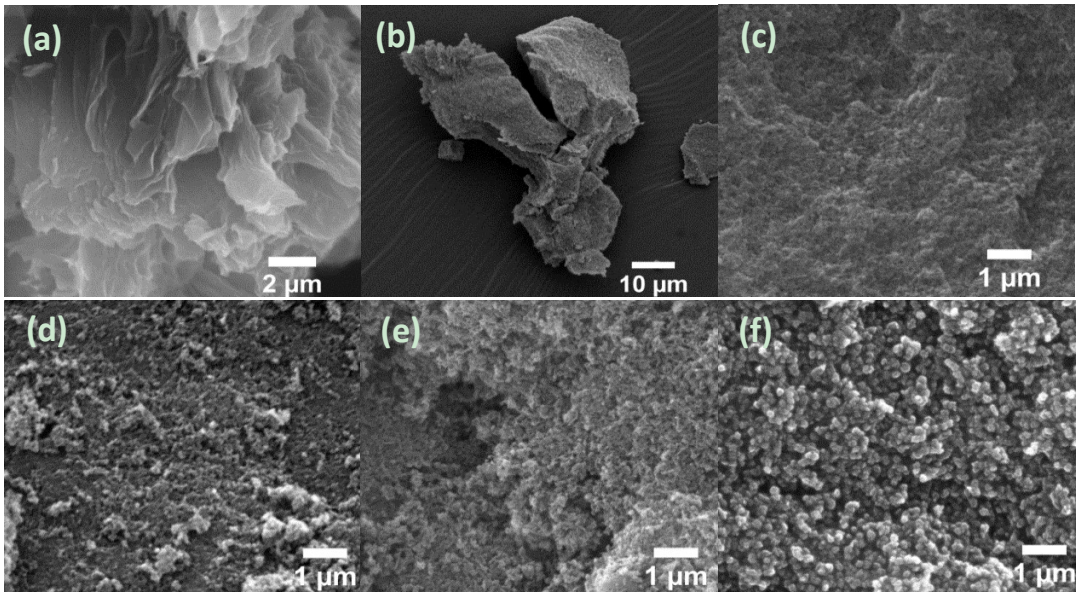

Figure S2 SEM images of (a) GO, (b, c) MIL-53(Al), (d) 3% MIL-53(Al)-GO, (e) 15% MIL-53(Al)-GO, and (f) 25% MIL-53(Al)-GO.

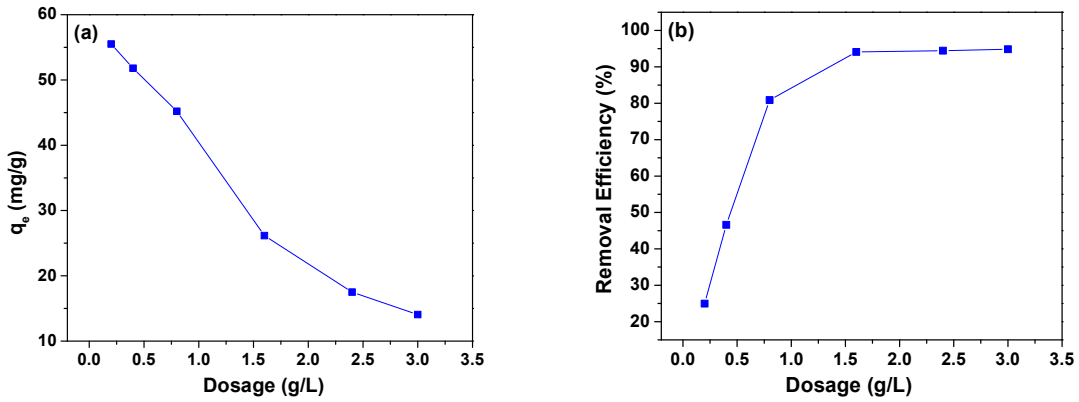

Figure S3 The effect of 3% MIL-53(Al)-GO dosage on (a) the equilibrium adsorption capacity and (b) removal efficiency of As(III) ions (C_0 = 50 mg/L, pH = 6.1, and T = 298 K).

Table S1 List of some typical adsorbents for adsorbing As(III) under ambient pressure (q_{max} = maximum adsorption capacity).

Adsorbent	Optimum pH	Temperature (° C)	Adsorbent Dosage (g/L)	Surface Area (m^2/g)	q_{max} (mg/g)	Ref.
Copper-impregnated coconut husk carbon	6.5	30	2.0	206	20.35	[1]
Amorphous iron hydroxide	6.0-8.0	-	1.6	-	28.0	[2]
Granular titanium dioxide	7.0	-	1.0	250.7	32.4	[3]
Iron-modified activated carbon	7.6-8.0	20-23	0.1-20	723	38.8	[4]
Fe_2O_3 nanoparticles	7.0	-	0.06	178.48	46.06	[5]
Gamma-Fe_2O_3 nanoparticles derived from MIL-100(Fe)	-	25	-	1800	62.9	[6]
3% MIL-53(Al)-GO	6.1	25	0.4	1147	64.97	This work

Table S2 Thermodynamic parameters for As(III) adsorption on GO, MIL-53(Al), and 3% MIL-53(Al)-GO nanocomposite.

Adsorbent	T (K)	K_0	ΔG^0(kJ/mol)	ΔS^0(J/K.mol)	ΔH^0(kJ/mol)	R^2
GO	298	0.12	5.25	-89	-21.35	0.953
	308	0.10	5.90			
	318	0.70	7.03			
MIL-53(Al)	298	1.49	-0.99	33	8.91	0.985
	308	1.63	-1.25			
	318	1.86	-1.64			
3% MIL-53(Al)-GO	298	3.92	-3.38	13	0.49	0.996
	308	3.95	-3.52			
	318	3.96	-3.64			

References

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