Supplementary Materials for Manuscript:

Novel Magnetically Doped Epoxide Functional Cross-linked Poly(lauryl methacrylate) Composite Polymer Particles for Removal of As(III) from Aqueous Solution

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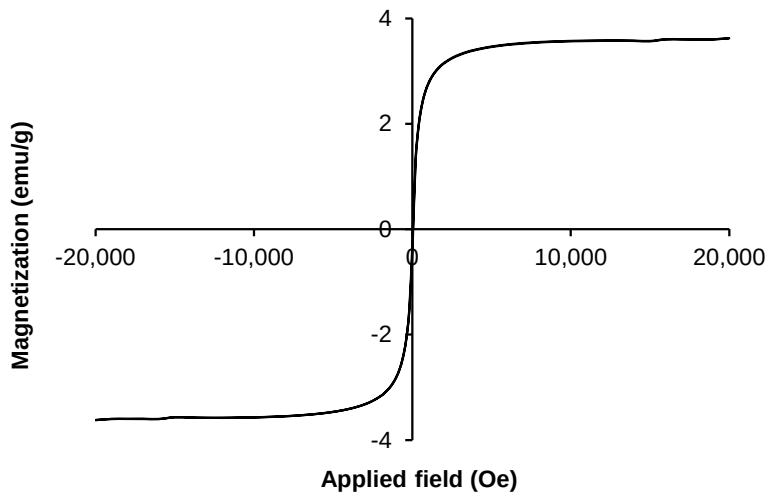

Figure S1. Magnetic hysteresis loops of P(LMA-DVB)/PGMA/Fe_3O_4 composite polymer particles at room temperature.

Figure S1 showed the magnetization curve of P(LMA-DVB)/PGMA/Fe_3O_4 composite polymer particles. The composite particles exhibited nearly zero coercivity and reversible magnetization behavior.

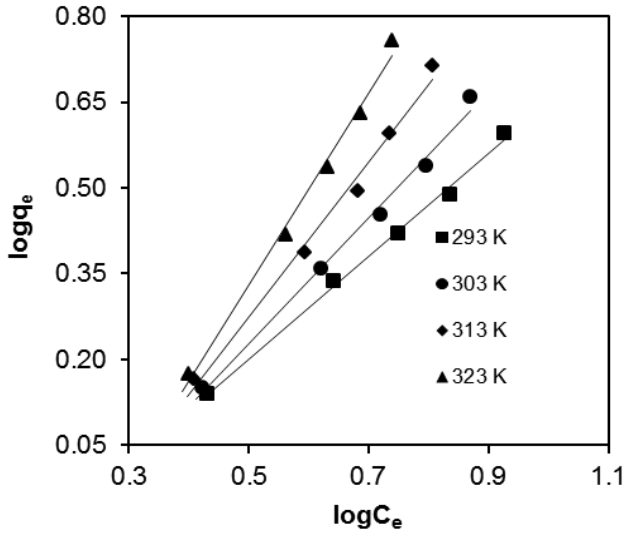

Figure S2. Freundlich isotherms of As(III) adsorption on P(LMA-DVB)/PGMA/Fe_3O_4 composite polymer particles at different temperatures. Conditions: Polymer solid, 0.05 g; total volume, 30 mL; pH 5.0; contact time, 180 min.

Freundlich isotherms representing the linear plots of $logq_e$ versus $logC_e$ at different temperatures are shown in Figure S2. The values of K_F and n determined from the intercept and the slope are in the range 0.31-0.56 and 0.5964-1.1100 respectively.

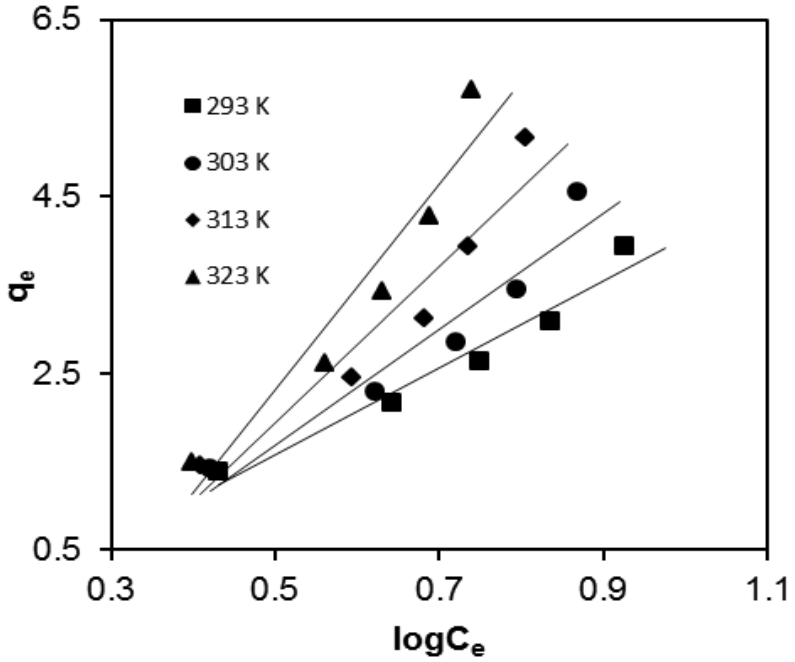

Figure S3. Temkin isotherms of As(III) adsorption on P(LMA-DVB)/PGMA/Fe_3O_4 composite polymer particles at different temperatures. Conditions: Polymer solid, 0.05 g; total volume, 30 mL; pH 5.0; contact time, 180 min.

Temkin linear plots shown in Figure S3 have been used to determine Temkin constants *a* and *b*. The values of correlation coefficients ((R^2) are close to unity irrespective of adsorption temperature indicating that the adsorption process can be explained by Temkin model as well.

Table S1. Adsorption Parameters for the Adsorption of As(III) on P(LMA-DVB)/PGMA/Fe_3O_4 Composite Polymer Particles.

Temperature (K)	Langmuir Isotherm					Freundlich Isotherm				Temkin Isotherm			
	q_m (mg g^{-1})	K_L $\times 10^{-2}$ (L mg^{-1})	$R_L \times 10^{-5}$	R^2	χ^2	n (g L^{-1})	K_F (mg g^{-1})	R^2	χ^2	a	b	R^2	χ^2
293	21.51	1.197761	5.57	0.9990	0.0031	1.11	0.56	0.998	0.0022	-0.90	4.94	0.979	0.0270
303	53.97	1.573998	4.24	0.9987	0.0056	0.9078	0.48	0.996	0.0063	-1.60	6.58	0.963	0.0709
313	62.04	5.964693	1.12	0.9991	0.0035	0.7356	0.39	0.995	0.0091	-2.47	8.84	0.957	0.1246
323	66.23	10.484403	0.64	0.9998	0.0006	0.5964	0.31	0.996	0.0075	-3.52	11.63	0.957	0.1486

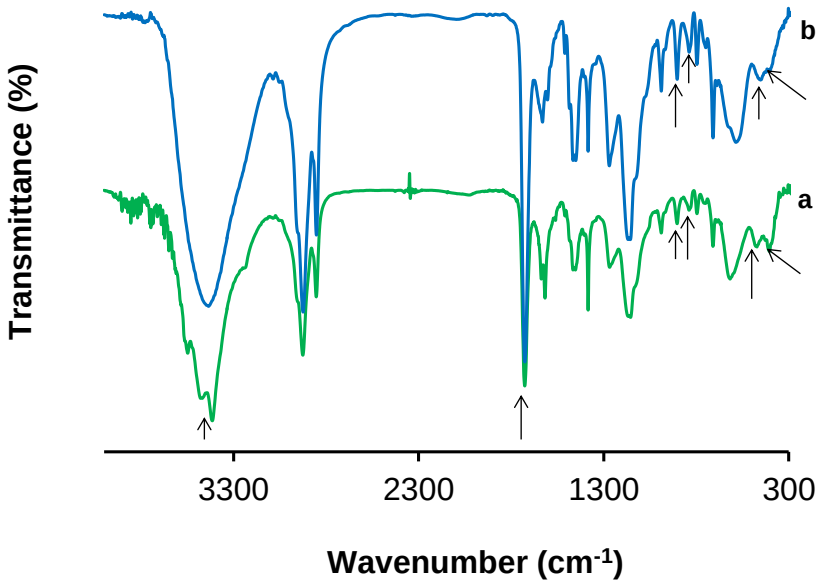

Figure S4. FTIR spectra of P(LMA-DVB)/PGMA/Fe_3O_4 composite polymer particles before (a) and after (b) As(III) adsorption.

Figure S4 shows the FTIR spectra of composite polymer particles before and after As(III) adsorption recorded in KBr pellets. As(III) adsorption was carried out by mixing 30 mL of 10 mg/L As(III) solution with 0.05 g composite particles maintained at pH 5.0 for 180 min. Prior to the recording of FTIR spectra the composite particles were dried at 50°C overnight.

Table S2. Comparative Table of Various Adsorbent Materials Used for Removing Arsenic Ions.

Adsorbent	**Ion**	**q_m (mg/g)**	**Reference**
Bimetal oxide magnetic nanomaterials	As(III) + As(V)	74–100	1
Waste tyre rubber modified with poly(3-acrylamidopropyl)trimethyl ammonium chloride	As(III) + As(V)	0.99	2
Fe(III)/La(III)-chitosan	As(III) + As(V)	109	3
Cross-linked polyallylamine (Sevelamer)	As(III)	86	4
Cross-linked polyallylamine (Sevelamer)	As(III)+ As(V)	84-118	4
Hybrid (polymeric/inorganic), fibrous sorbent, (FIBAN-As)	As(III)	75.67	5
Zirconium polyacrylamide (ZrPACM-43)	As(III)	41.48	6
Microporous spherical activated carbon, Calgon	As(III)	8	7
Functionalized diatom silica shells	As(III)	10.99	8
GFH (granular ferric hydroxide)	As(III)	8	9
Al-HDTMA-sericite, (AH)	As(III)	0.433	10
Fe(II) loaded and Fe(III) loaded apricot, stone-based ACs	As(III)	2.023	11
Fe_3O_4-Honeycomb briquette cinders	As(III)	1.566	12
Nanomagnetite-Zeolite composites	As(V)	5.1	13
β-FeOOH@GO-COOH	As(III)	77.5	14
δ-FeOOH nanoparticles	As(III)	40.0	15
Hydrous cerium oxide modified graphene (GNP-HCO)	As(V)	62.33	16
Magnetic FeNP/microfibrillated cellulose	As(V)	182	17
Zerovalent iron (NZVI) stabilized with starch and carboxymethyl cellulose	As(III)	12.2	18
Fe_3O_4 nanoparticles	As(III) + As(V)	3.7	19
P(LMA-DVB)/PGMA/Fe_3O_4	As(III)	66.23	Present Work

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