

Electronic Supplementary Information

Gold Nanoparticle Chitosan Composite Hydrogel Beads Shows Efficient Removal of Methyl Parathion from Waste Water

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Fig.S1: UV-Vis spectra of change in absorption intensity of 7 μM MP in the solution after equilibrating with GNP-Gel beads

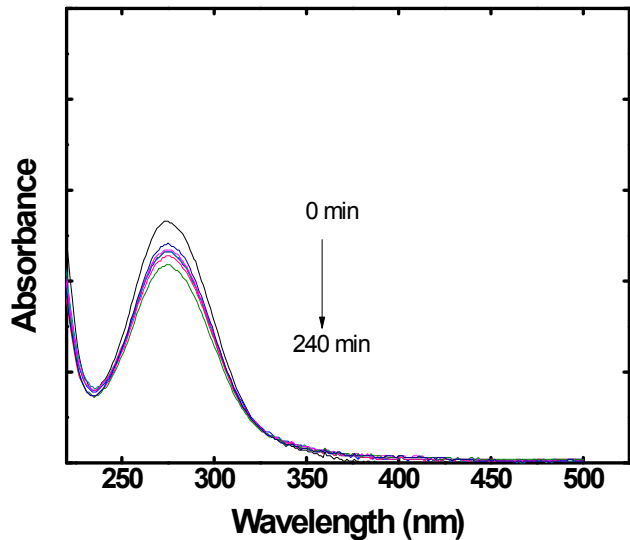


Fig.S2: Freundlich isotherm curve for the sorption of MP onto the (a) GNP-Gel and (b) blank gel beads

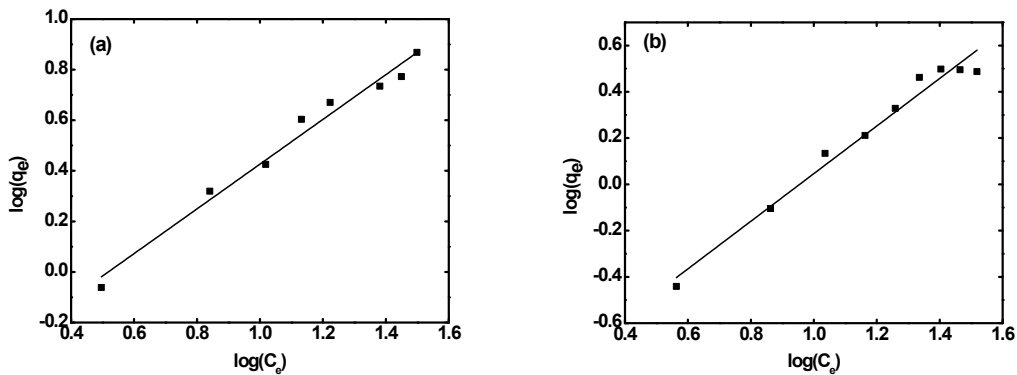


Fig.S3: Pseudo first-order kinetics curve for the sorption of MP onto the (a) GNP-Gel and (b) blank gel beads at different initial MP concentrations

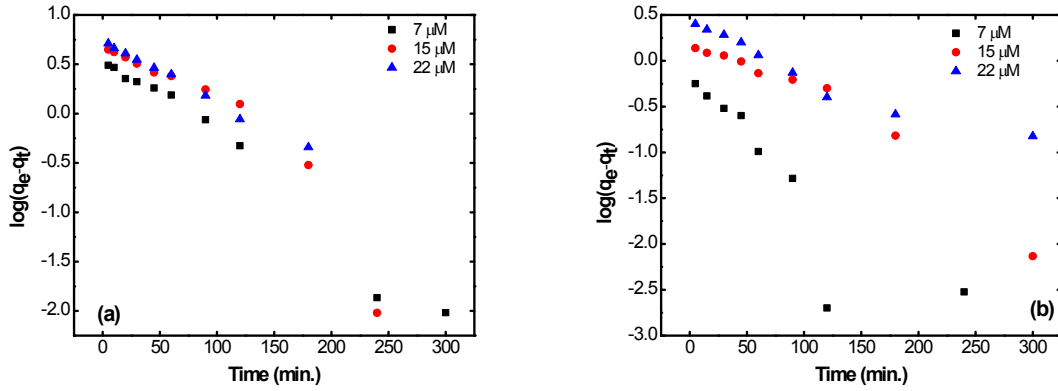


Fig. S4: Boyd's diffusion curve for the sorption of MP onto the (a) GNP Gel and (b) blank gel beads at different initial MP concentrations

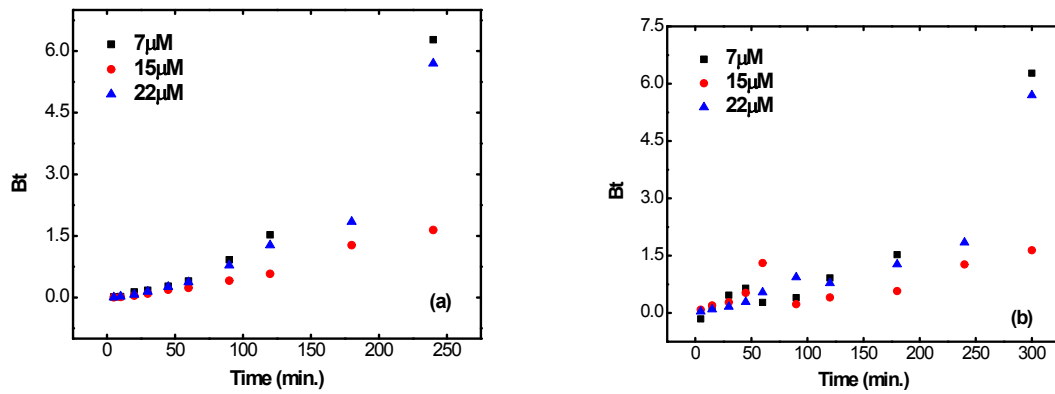


Table S1: Freundlich and Langmuir isotherm constants for MP sorption onto GNP Gel and blank gel beads at 293K

Isotherm	Sorption Parameters		
		GNP-Gel Beads	Blank-Gel Beads
Freundlich	K_F ($\mu\text{mole/g}$)	0.348	0.104
	n	1.131	1.011
	R^2	0.965	0.972
Langmuir	q_m ($\mu\text{mole /g}$)	58.642	11.491
	K_L (L/ μmole)	0.005	0.008
	R^2	0.994	0.992

Table S2: Kinetic parameters for the sorption of MP onto the blank-gel beads at different initial MP concentrations

Kinetic model	Parameters	C_o		
		7 (μM)	15 (μM)	22 (μM)
Pseudo 1 st order	k_1 (min^{-1})	0.025	0.017	0.010
	q_e ($\mu\text{mol g}^{-1}$)	0.477	2.115	2.218
	R^2	0.745	0.939	0.912
Pseudo 2 nd order	k_2 ($\mu\text{mol}^{-1} \text{min}^{-1}$)	0.064	0.008	0.007
	q_e ($\mu\text{mol g}^{-1}$)	0.667	2.05	3.46
	R^2	0.995	0.962	0.986
Intra-particle diffusion	K_{id} ($\mu\text{mol}^{-1} \text{mg}^{-1/2}$)	0.519	0.129	0.310
	I ($\mu\text{mol g}^{-1}$)	16.94	17.14	15.52
	R^2	0.085	0.911	0.892