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PAPER

Temperature based adsorption studies of Cr(VI) using p-toluidine formaldehyde resin coated silica material

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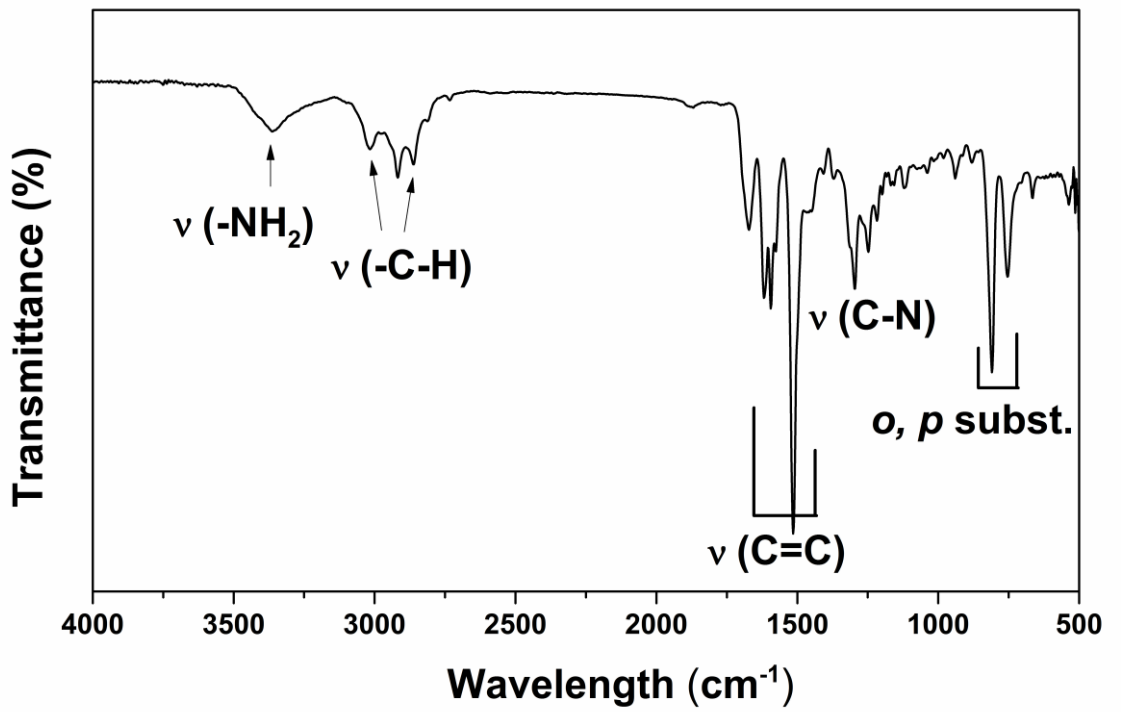

Fig. S1 FT-IR spectra of p-toluidine formaldehyde resin (PTFR).

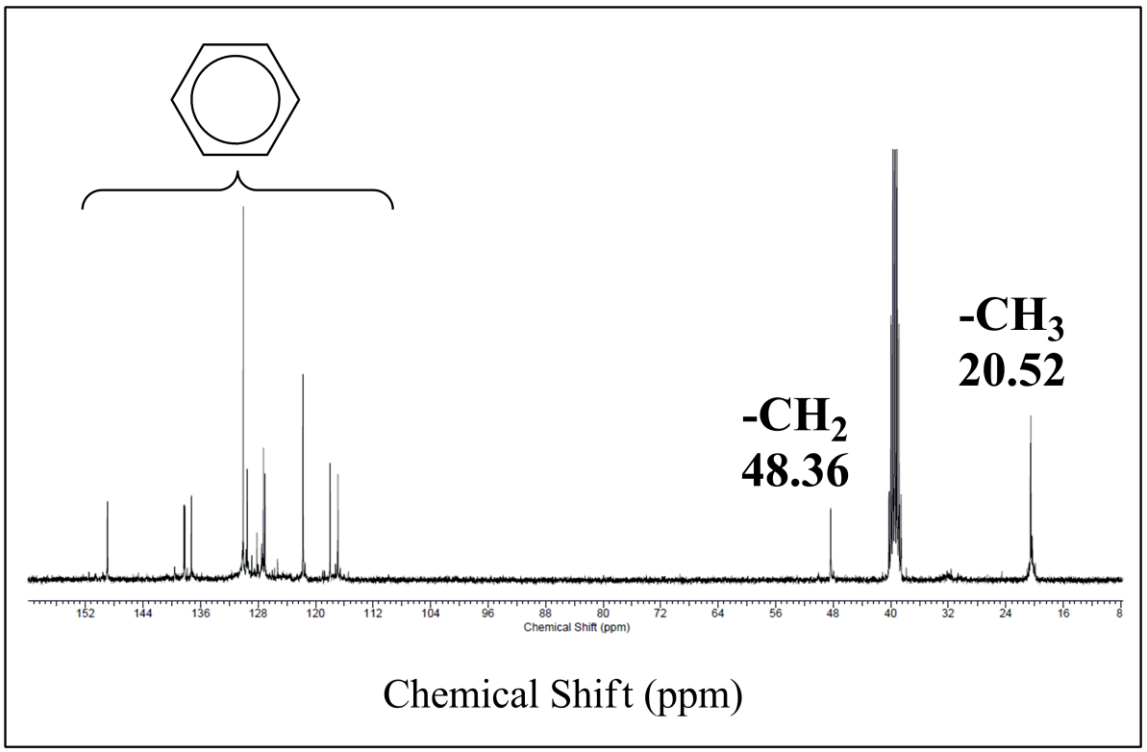

Fig. S2 ^{13}C NMR spectra of p-toluidine formaldehyde resin (PTFR).

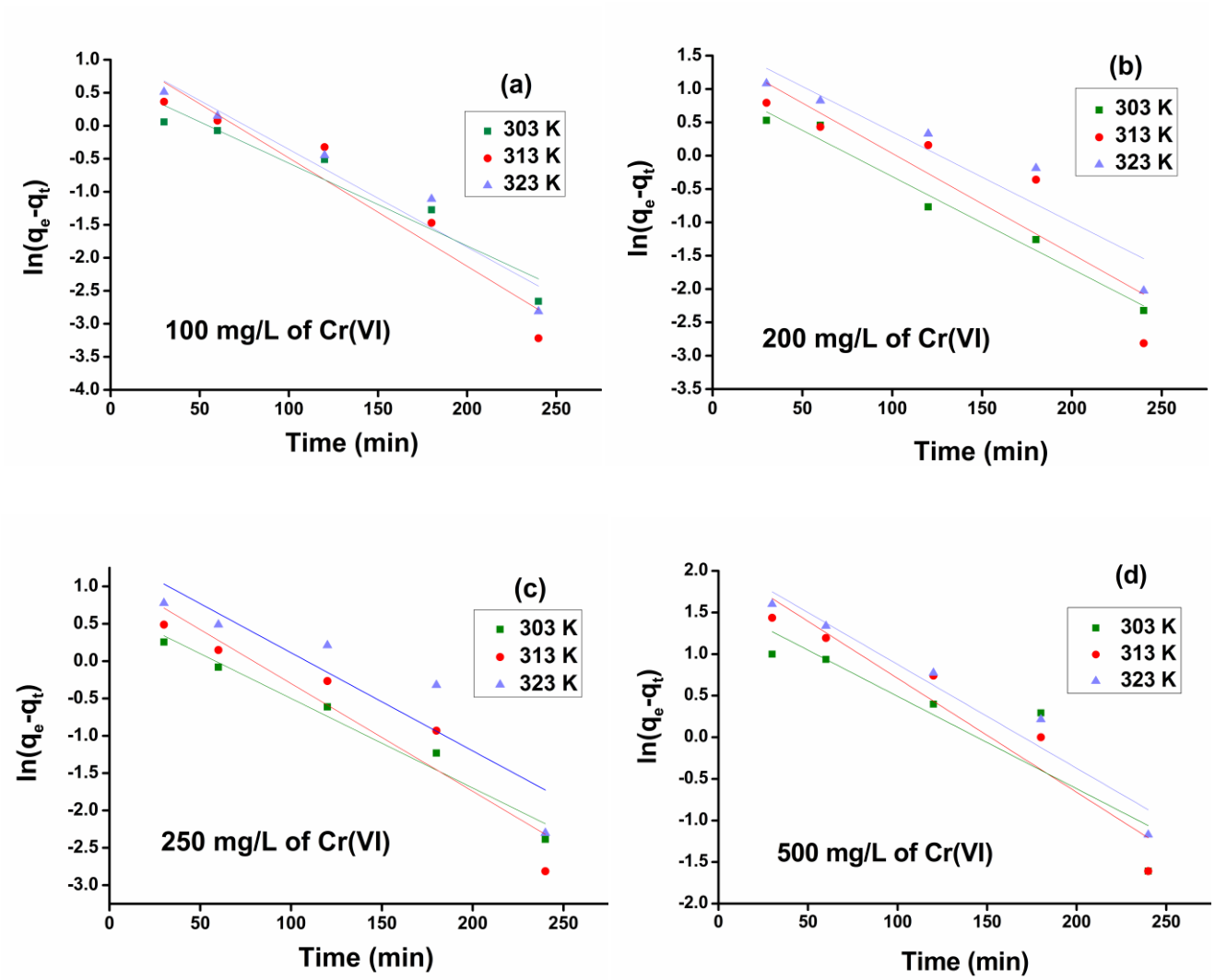

Fig. S3 Plots of pseudo first order kinetic model for the adsorption of Cr(VI) from various initial concentrations and temperatures.

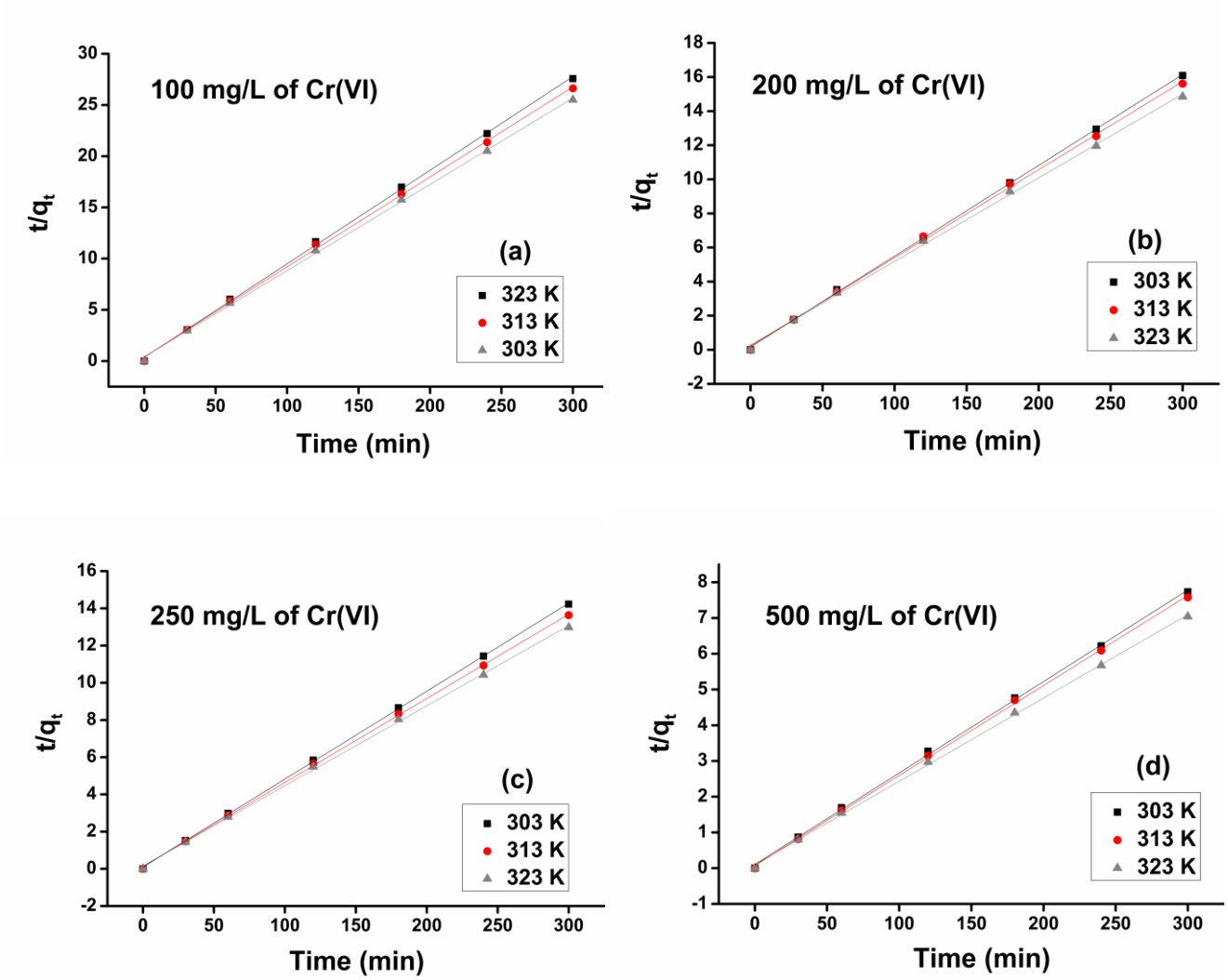

Fig. S4 Plots of pseudo second order kinetic model for the adsorption of Cr(VI) from various initial concentrations and temperatures.

Table S1 Comparison of the pseudo first and pseudo second order kinetic models for the adsorption of Cr(VI) at different initial concentrations and temperatures.

Initial Conc. (mg/L)	Temp. (K)	q_e(exp) (mg/g)	Pseudo-first order kinetic model			Pseudo-second order kinetic model		
			q_e(cal) (mg/g)	K_1 (min^{-1})	R^2	q_e(cal) (mg/g)	K_2 (g/mg min)	R^2
100	303	10.88	1.986	0.0120	0.927	10.98	0.0230	0.9999
	313	11.27	3.168	0.0160	0.926	11.49	0.0182	0.9999
	323	11.76	3.074	0.0140	0.940	11.9	0.0173	0.9999
200	303	18.64	2.013	0.0080	0.880	18.86	0.0170	0.9999
	313	19.21	3.14	0.0150	0.816	19.6	0.0115	0.9990
	323	20.2	4.165	0.0130	0.894	20.4	0.0086	0.9989
250	303	21.09	6.45	0.0120	0.9721	21.14	0.0235	0.9999
	313	22.0	4.688	0.0144	0.8996	22.12	0.0176	0.9998
	323	23.11	5.584	0.0131	0.8455	23.2	0.0117	0.9994
500	303	38.8	7.988	0.0130	0.923	40.0	0.0060	0.9999
	313	39.6	4.963	0.0110	0.808	41.67	0.0079	0.9998
	323	42.6	8.356	0.0120	0.948	43.47	0.0054	0.9990

Table S2 Operating parameters of the Ion chromatograph employed for the determination of Cr(VI) ion concentration before adsorption, after adsorption and desorption using PTFR coated silica adsorbent.

Eluent Used	Flow Rate (mL/min)	Ion Exchange Column	Detector	Injection Volume Loop (µL)	Max Pressure by Pump (MPa)	Run Time (min)	Retention Time for Cr(VI) (min)
15.0 mmol Na_2CO_3 + 5.0 mmol $NaHCO_3$	0.7	Metrosep A Supp 5 – 250/4 (250 x 4 mm) with Metrosep A Supp 4/5 Guard 4.0 precolumn	Conductivity detector 1 (883 Basic IC plus 1)	100	15.0	13.5	10.4