Supplementary material

Defluoridation using hydroxyapatite implanted lanthanum organic frameworks based bio-hybrid beads

Antonysamy Jeyaseelan[a], Ilango Aswin Kumar[b], Mu. Naushad[c], Natrayasamy Viswanathan[a*]

[a]Department of Chemistry, Anna University, University College of Engineering - Dindigul, Reddiyarchatram, Dindigul - 624 622, Tamilnadu, India.

[b]Faculty of Civil Engineering, Department of Landscape and Water Conservation, Czech Technical University in Prague, Thakurova 7, 166 29, Prague 6, Czech Republic.

[c]Department of Chemistry, College of Science, King Saud University, P.O. Box 2455, Riyadh-11451, Saudi Arabia.

[*] Corresponding author. Tel.: +91-451-2554066; fax: +91-451-2554066.

E-mail address: drnviswanathan@gmail.com (N.Viswanathan)

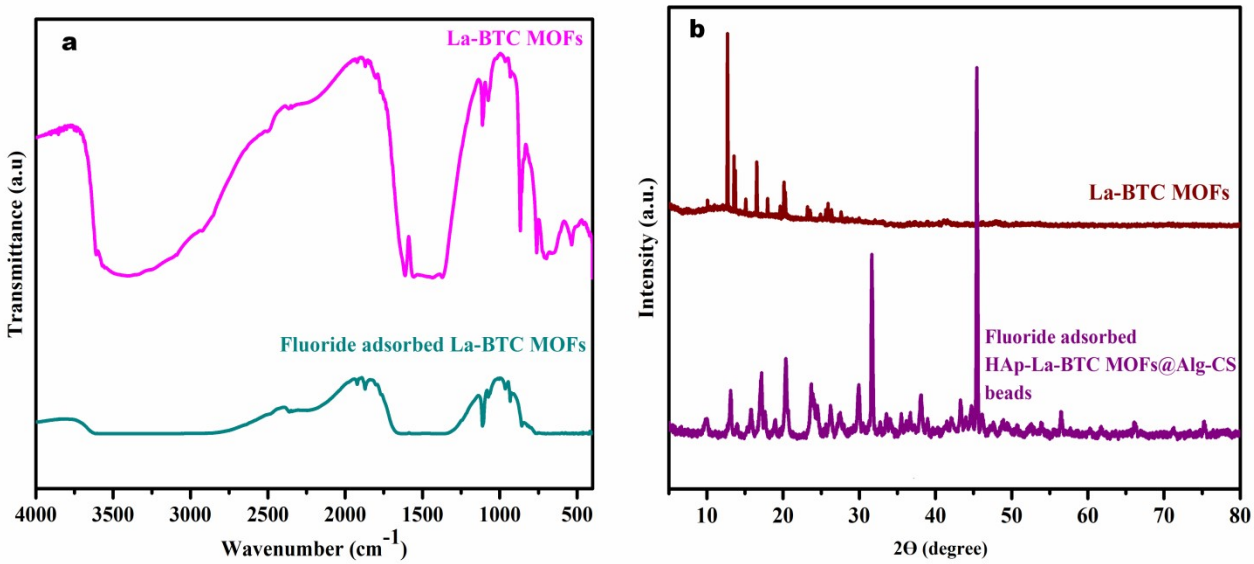

Fig. S1. FTIR spectra of (a) La-BTC MOFs and fluoride La-BTC MOFs**;** (b) XRD spectra of La-BTC MOFs and fluoride adsorbed HAp-La-BTC MOFs@Alg-CS beads**.**

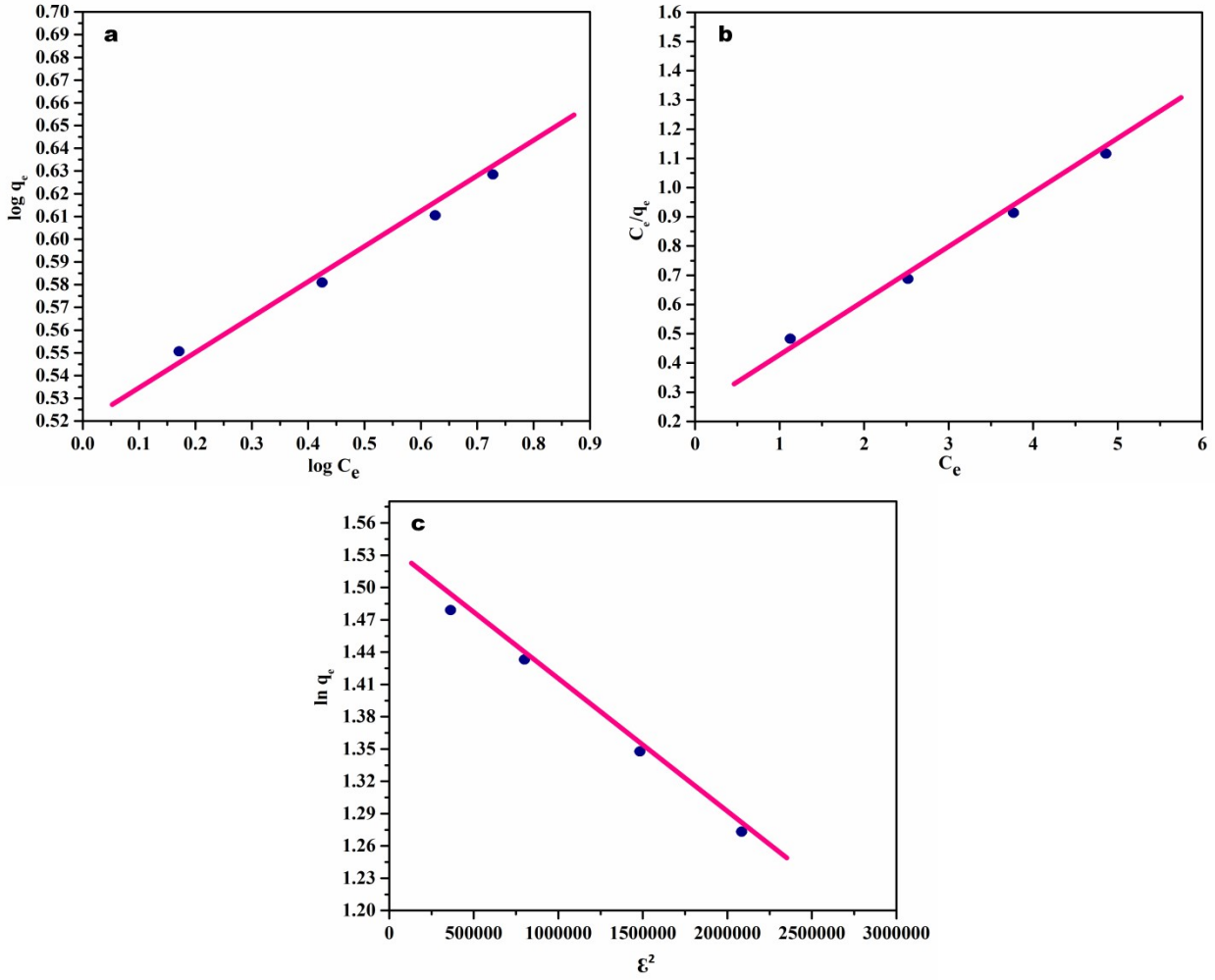

Fig. S2. The linear plots of (a) Fruendlich; (b) Langmuir and (c) Dubinin-Raduskevich; adsorption isotherm models of HAp-La-BTC MOFs@Alg-CS beads for fluoride adsorption at 303K.

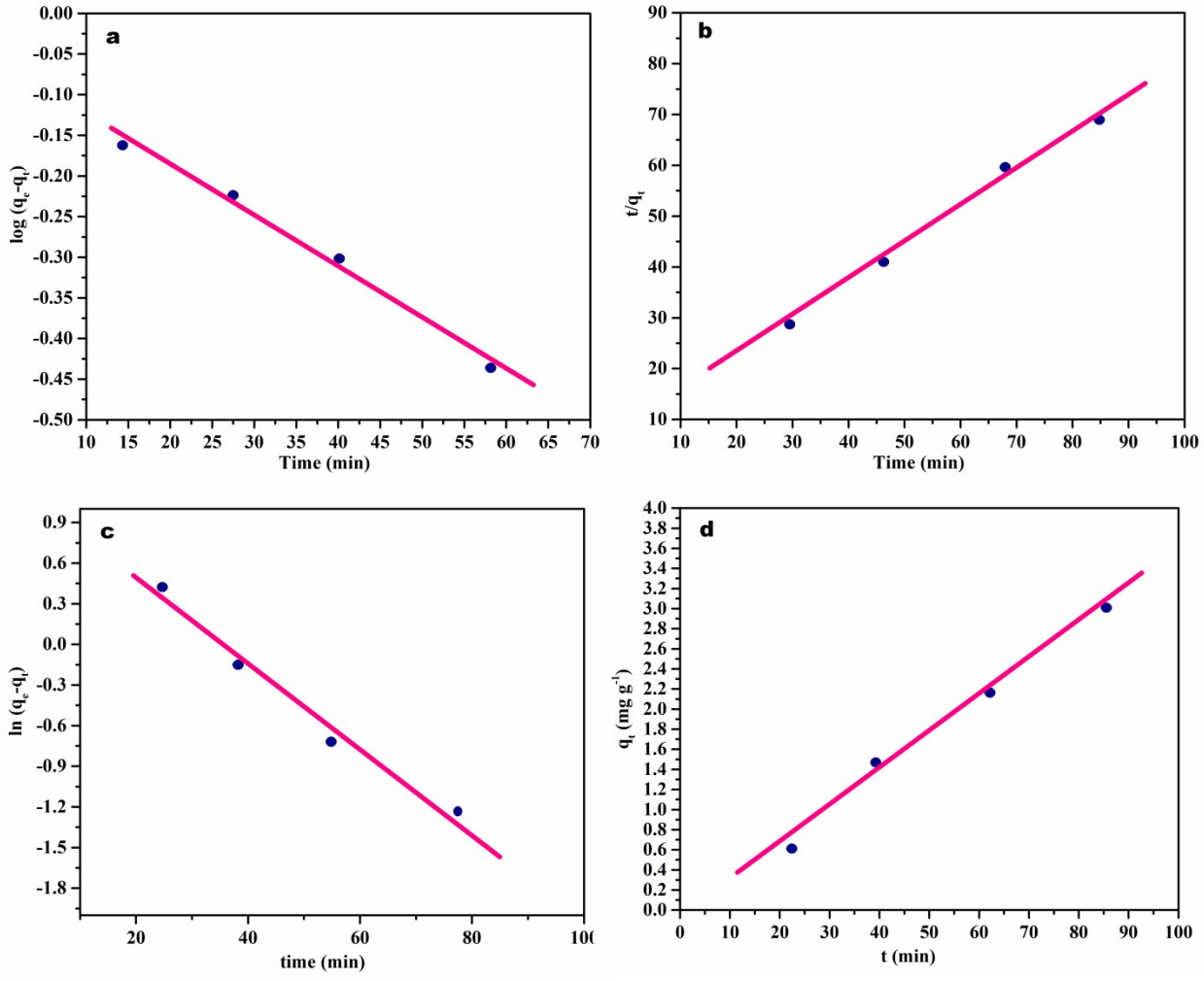

Fig. S3. Kinetic studies of (a) pseudo-first-order; (b) pseudo-second-order kinetic models; (c) particle diffusion and (d) intra particle diffusion model of HAp-La-BTC MOFs@Alg-CS beads for fluoride adsorption at 303K.

Table S1. Kinetic studies of HAp-La-BTC MOFs@Alg-CS beads for fluoride adsorption.

Kinetic models	Parameters	303 K				313 K				323 K			
		8 mg/L	10 mg/L	12 mg/L	14 mg/L	8 mg/L	10 mg/L	12 mg/L	14 mg/L	8 mg/L	10 mg/L	12 mg/L	14 mg/L
Pseudo-first-order	k_{ad} (min^{-1})	0.082	0.086	0.091	0.095	0.085	0.088	0.093	0.099	0.087	0.091	0.096	0.102
	r	0.837	0.842	0.849	0.855	0.840	0.845	0.853	0.861	0.843	0. 849	0.857	0.866
	sd	0.396	0.403	0.410	0.416	0.401	0.407	0.413	0.422	0.404	0.411	0.418	0.428
Pseudo-second-order	q_e (mg/g)	4.625	4.632	4.639	4.644	4.629	4.636	4.642	4.651	4.633	4.639	4.642	4.648
	k (g/mg min^{-1})	0.288	0.293	0.297	0.302	0.291	0.296	0.301	0.307	0.295	0.299	0.305	0.312
	h (mg/g min^{-1})	4.124	4.131	4.138	4.143	4.128	4.134	4.141	4.147	4.132	4.138	4.145	4.152
	r	0.911	0.917	0.924	0.931	0.914	0.921	0.928	0.934	0.919	0.924	0.931	0.939
	sd	0.146	0.154	0.162	0.170	0.152	0.161	0.169	0.174	0.157	0.164	0.172	0.178
Particle diffusion	k_p (min^{-1})	0.592	0.598	0.604	0.613	0.595	0.601	0.609	0.618	0.599	0.604	0.613	0.622
	r	0.845	0.852	0.858	0.864	0.851	0.857	0.862	0.871	0.855	0.861	0.868	0.876
	sd	0.348	0.356	0.363	0.371	0.353	0.361	0.369	0.377	0.358	0.364	0.372	0.483
Intra particle diffusion	k_i (mg/g $min^{0.5}$)	1.182	1.188	1.193	1.199	1.185	1.191	1.196	1.202	1.189	1.195	1.201	1.208
	r	0.932	0.938	0.946	0.955	0.937	0.942	0.951	0.959	0.941	0.946	0.954	0.962
	sd	0.122	0.128	0.134	0.139	0.125	0.131	0.137	0.142	0.129	0.133	0.141	0.148