Supplementary information

Hydrous TiO_2@polypyrrole hybrid nanocomposite as an efficient selective scavenger for defluoridation of drinking water

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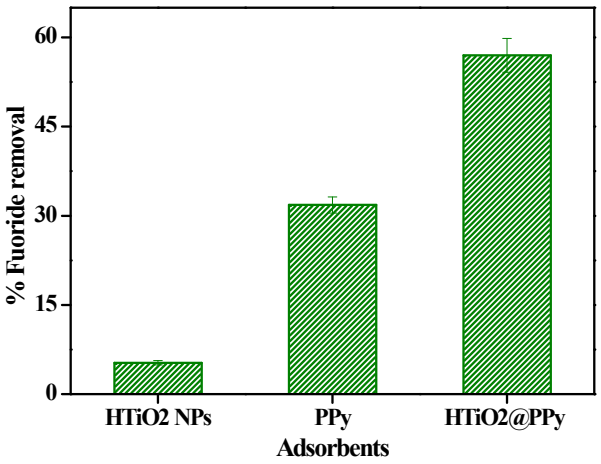

Fig. S1. Percentage F^- removal obtained using $HTiO_2$ NPs, PPy and as-synthesized $HTiO_2$@PPy for initial F^- concentration 30 mg/L; pH = 6.5 (±0.2); T = 25 (±0.1) ºC and contact time 24 h.

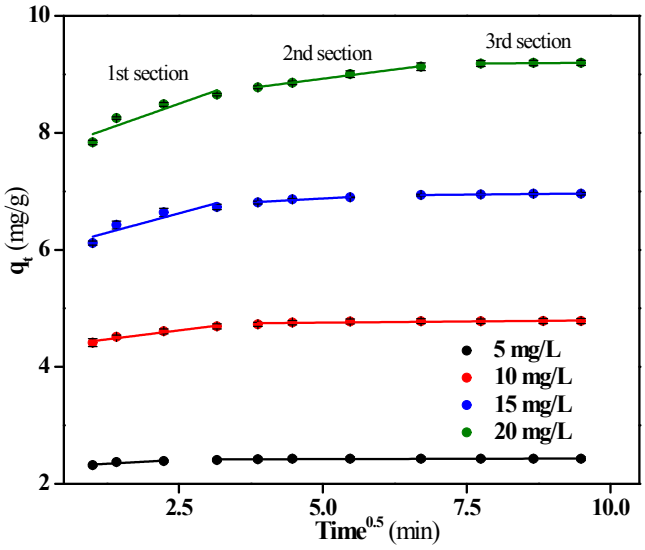

Fig. S2. Intraparticle diffusion mode fit of kinetic data for F^- adsorption by $HTiO_2$@PPy at different initial concentrations.

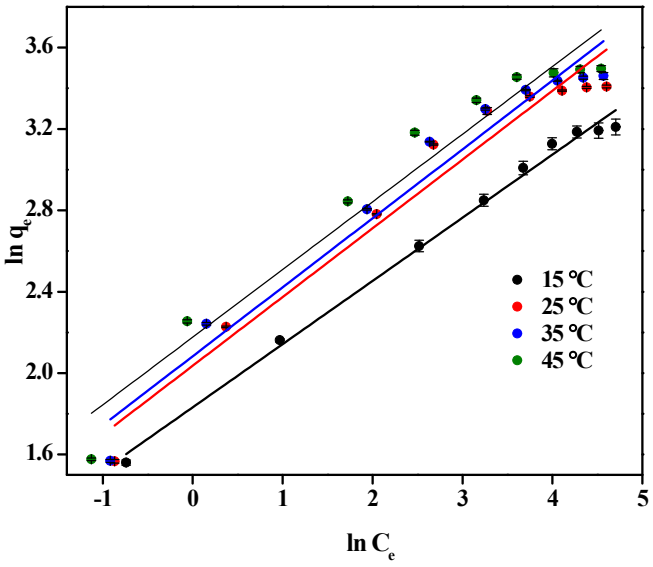

Fig. S3. F^- adsorption isotherm data fit with Freundlich model

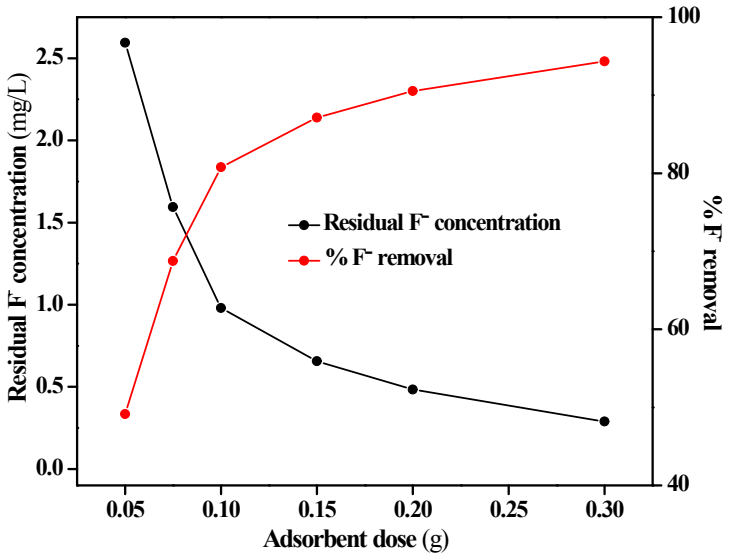

Fig. S4. Effect of adsorbent dosage on % F^- removal conducted using simulated real field ground water with initial F^- concentration 5.1 mg/L; pH = 7.4; T = 25 (±0.1) ºC and contact time 24 h.

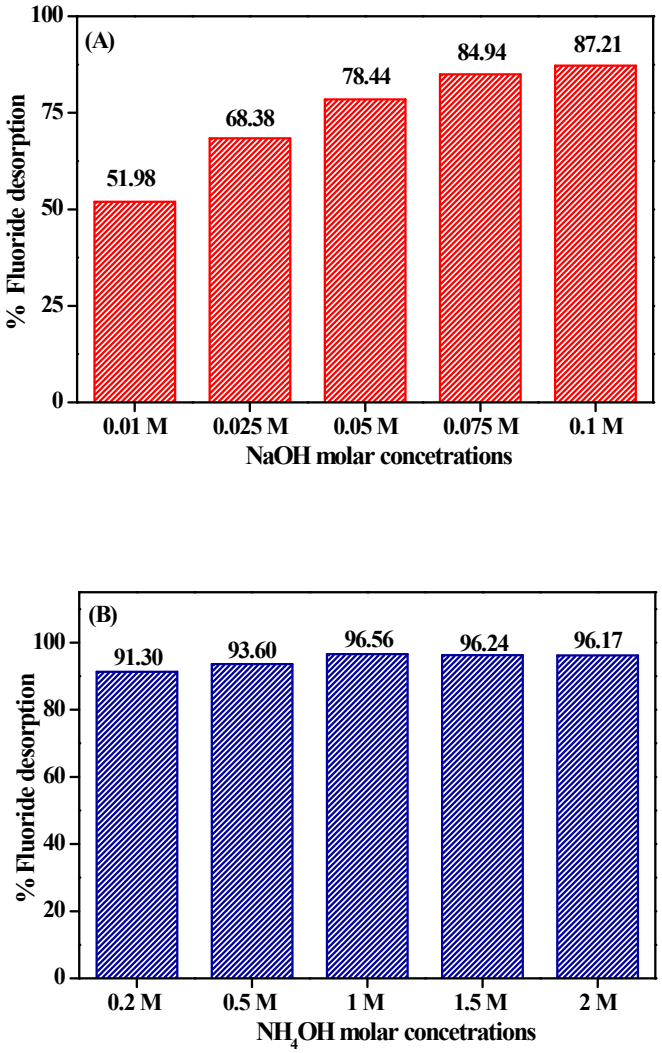

Fig. S5. Percentage desorption obtained using (A) sodium hydroxide (NaOH) and (B) ammonium hydroxide (NH_4OH).

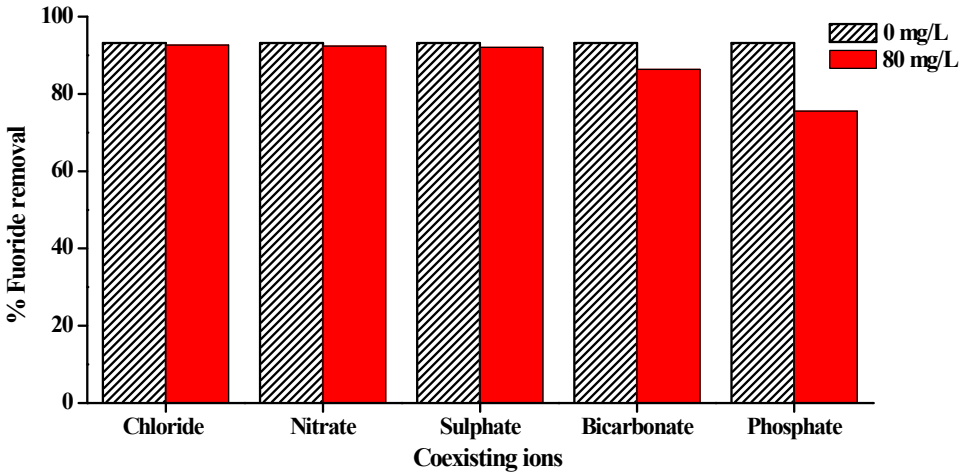

Fig. S6. Effect of coexisting ions on the fluoride removal efficiency of $HTiO_2$@PPy at the concentration of 80 mg/L.

Table S1
Comparison of kinetic parameters of F^- sorption by $HTiO_2$@PPy with other adsorbents.

Adsorbents	Initial concentration (mg/L)	Equilibrium time	Rate constant k_2(g/mg.min)	References
Crystalline TiO_2	5	na	2.17	[48]
γ-AlOOH@CS magnetic NPs	12	40 min	0.043	[49]
PPy/chitosan composite	10	30 min	na	[18]
Chitosan/montemorillonite/ZrO_2	10	60 min	0.151	[51]
Polypyrrole	10	na	1.75	[17]
Sulfate doped Fe_3O_4/Al_2O_3 NPs	11	na	19.91	[49]
PPy/HSnO nanocomposites	10	30 min	0.19	[21]
PPy/alumina composite	10	20 min	1.7	[19]
Zr-alginate beads	20	20 h	1.28×10^{-3}	[52]
$HTiO_2$@PPy	10	10 min	2.25	Present work