

## Supplementary Information

### One-step synthesis of magnetic iron-aluminum oxide/graphene oxide nanoparticles as a selective adsorbent for fluoride removal from aqueous solution

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Table S1-The composition ratio of raw materials to prepare different kinds of adsorbents

GO (g/500mL H <sub>2</sub> O)	FeCl <sub>3</sub> ·6H <sub>2</sub> O (g)	FeCl <sub>2</sub> ·4H <sub>2</sub> O (g)	AlCl <sub>3</sub> ·6H <sub>2</sub> O (g)	FeCl <sub>3</sub> ·6H <sub>2</sub> O + FeCl <sub>2</sub> ·4H <sub>2</sub> O + AlCl <sub>3</sub> ·6H <sub>2</sub> O (g)	Fe <sup>3+</sup> :Fe <sup>2+</sup> :Al <sup>3+</sup> (molar ratio)	Sample No.
0.5	2.7967	1.3707	0.8327		1.5:1:0.5	1
	2.0979	1.0282	1.8739	5.0	1.5:1:1.5	2
	1.1991	0.5877	3.2132		1.5:1:4.5	3
	5.5934	2.7413	1.6653		1.5:1:0.5	4
	4.1959	2.0564	3.7477	10.0	1.5:1:1.5	5
	2.3983	1.1754	6.4263		1.5:1:4.5	6
	11.1868	5.4826	3.3306		1.5:1:0.5	7
	8.3918	4.1128	7.4955	20.0	1.5:1:1.5	8
	4.7965	2.3508	12.8527		1.5:1:4.5	9

Nine kinds of adsorbents (IAO/GO) with different composition ratio of raw materials were prepared in the preliminary experiments. The concentration of GO dispersion was used as 0.1g/100 mL H<sub>2</sub>O. Approximately 0.5 g of GO was added into 500 mL of deionized water and exfoliated by sonication for 2 h to obtain a uniform brown dispersion. The dispersion was centrifuged at 3000 rpm to remove the sediment. The supernatant was transferred into a 500 mL three-neck round bottom flask and then degassed with nitrogen gas for 30 min before use. The raw materials of FeCl<sub>3</sub>·6H<sub>2</sub>O, FeCl<sub>2</sub>·4H<sub>2</sub>O, and AlCl<sub>3</sub>·6H<sub>2</sub>O were sequentially added in the 500 mL GO solution. The molar ratio of Fe<sup>3+</sup>:Fe<sup>2+</sup> was fixed at 1.5:1 and the molar ratio of Fe<sup>3+</sup>:Al<sup>3+</sup> ranged as 3:1, 1:1 and 1:3. The mass ratio of raw materials (FeCl<sub>3</sub>·6H<sub>2</sub>O + FeCl<sub>2</sub>·4H<sub>2</sub>O + AlCl<sub>3</sub>·6H<sub>2</sub>O) and GO ranged as 10:1, 20:1 and 40:1. Among the nine adsorbents, Sample No. 3 had the highest capacity toward fluoride.