

Molecular imprinted materials PDA/Fe-MOFs/RGO for the selective and high removal of phenol

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ABSTRACT

Molecular imprinting technique is widely applied for molecular recognition in many fields is due to the creation of the recognition sites on a polymer scaffold. The creation of synthetic polymers can specifically recognise template molecules with considerable challenge and potentially rewarding objective. In this work, polydopamine (PDA)/Fe-metal organic framework (MOFs)/reduction graphene oxide (RGO) were prepared by the self-polymerization of dopamine (DA) under mild conditions on the Fe-MOFs/RGO surface. Scanning electron microscopy, Fourier transform infrared (FT-IR) analysis, and transmission electron microscopy were used for the characterization of PDA/Fe-MOFs/RGO. The optimum conditions for the selective and high removal of phenol were studied according to the effects of the dosage of PDA/Fe-MOFs/RGO, pH, initial phenol concentration, contact time and temperature. The results showed that PDA/Fe-MOFs/RGO had high adsorption capacity and good selectivity for the removal of phenol. The adsorption process of phenol onto PDA/Fe-MOFs/RGO was consistent with the pseudo-second-order kinetic model and contained both the surface adsorption and intraparticle diffusion.

Keywords: Metal organic framework; Graphene; Selective adsorption; Phenol; Surface imprinted polymers

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