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Selective recognition of perfluorooctanoic acid with a novel molecularly imprinted silica matrix

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In recent years, perfluorinated compounds (PFCs) have received worldwide concern due to their environmental persistence and potential biological effect. A recent survey for surface water in Northern China suggested that PFOA accounted for 52-70% of the total detected PFCs, much higher than that of the other PFCs. In this study, molecularly imprinted polymers (MIPs) were prepared by a modified sol-gel process for selective recognition of PFOA. 1H, 1H, 2H, 2H-Perfluorooctyltriethoxysilane (PFOTES) and 3-Aminopropyltriethoxysilane (APTES) was used as the binary functional monomers. The ratio of functional monomer and template molecule plays an important role on the selective recognition ability of MIPs. Increase of APTES or PFOTES could raise the binding amount of MIPs within a certain range, but the binding amount of NIPs for PFOA also increased, which reduced the imprinting factor (IF) of MIPs. Therefore, the optimal MIPs with maximum IF (1.92) and appropriate binding amount (76.9 mg g⁻¹) for PFOA were obtained when the amounts of PFOA, APTES, PFOTES and TEOS were 0.25, 0.3, 0.3, 5 mmol (\approx 1: 1.25: 1.25: 20) respectively. Furthermore, systemic studies in regard to MIPs are in progress for selectivity evaluation and real application in environmental, biological and foodstuff samples.

Biography

Yusun Zhou is pursuing on his doctorate in Tongji Medical College of Huazhong University of Science and Technology, China. His research is supervised by Professor Surong Mei and supported by several project funds. His research interest is to introduce molecular imprinting and molecular recognition in the field of environmental and biological science.

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