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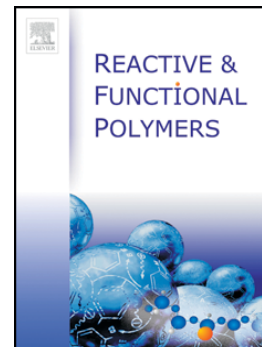
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Application of magnetic molecularly imprinted polymers in the detection of malachite green in fish samples

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Abstract

Magnetic molecularly imprinted polymers (MMIPs) synthesized through suspension polymerization were used as the adsorbent for the detection of malachite green (MG) in fish samples. The morphological, thermal and magnetic properties of the MMIPs were characterized. The influence of polymerization condition on the absorption capacity of the MMIPs for MG was explored. The results gave the optimum polymerization condition as follows: using MG (0.25 mmol) as template, methacrylic acid (1 mmol) as monomer, ethylene dimethacrylate (5 mmol) as cross linker, 2,2'-Azobis(2-methylpropionitrile) (100 mg) as initiator, Fe₃O₄ (100 mg) as magnetic nuclei, PVA (1%) as dispersant. Under the optimum condition the apparent maximum adsorption capacity of MMIPs is 5693 $\mu\text{g}\cdot\text{g}^{-1}$ with dissociation constant being 23.5 $\text{mg}\cdot\text{L}^{-1}$. The MMIPs also have strong magnetic responses to an external magnet, which enable the rapid separation from the sample solution. The MMIPs were employed for the detection of MG residue in fish samples combined with HPLC. The recoveries of spiked MG in fish samples ranged from 82.7% to 111% with RSD in the range of 2.0% ~ 12.8%. The MMIPs can remain 90% of the original adsorption capacity even used for 5 times. Thus, the prepared MMIPs can be applied to the sample pretreatment for

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