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槲皮素-铝配位分子印迹聚合物的制备及其结合特性研究\*

Preparation of quercetin-Al (III) complex molecularly imprinted polymer and its binding characteristics

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中文摘要:

目的 制备槲皮素-Al(III)配位分子印迹聚合物, 并且对其特性进行研究, 为分子印迹技术和生物识别过程及机理的进一步理解奠定基础。方法 以 $\alpha$ -甲基丙烯酸为功能单体、槲皮素-Al(III)配合物为模板分子在甲醇中合成金属配位键的印迹聚合物, 并且通过紫外光谱、红外光谱、透视电镜分析及吸附试验对聚合物进行了表征及性能的研究。结果 紫外光谱表明, 槲皮素、Al(III)与 $\alpha$ -甲基丙烯酸发生了三元配位作用, 槲皮素-Al(III)模板印迹聚合物对槲皮素-Al(III)的配合物表现出明显的吸附选择性和特异性。结论 本文以 $\alpha$ -甲基丙烯酸为功能单体、槲皮素-Al(III)配合物为模板分子在甲醇中成功合成了金属配位键的印迹聚合物, 制备的槲皮素-Al(III)金属配位印迹聚合物对槲皮素-Al(III)配合物具有特异的识别作用, 在分离、检测样品中的槲皮素方面具有较好的应用前景。

英文摘要:

OBJECTIVE To synthesize molecularly imprinting polymer(MIP) for quercetin-Al(III) complex by using molecular imprinting technique(MIT), and study the characterisation of it. METHODS: A molecularly imprinted polymer(MIP) with special molecule recognition properties of quercetin-aluminum was prepared by thermal

polymerization in which quercetin- aluminum as template molecule,  $\alpha$ -methacrylic acid (MAA) as functional monomer and ethylene glycol dimethacrylate (EGDMA) as the crosslinker. RESULTS: The interaction between quercetin and Al(III) was investigated by UV-Vis spectroscopy, which indicated the interaction among quercetin, Al (III) and  $\alpha$ -methacrylic acid. The effect of solvent on the morphology and network structure of complex molecularly imprinted polymer and its binding capacity were studied by transmission electron microscopy and equilibrium binding experiments. It turned out that binding capacity was greatly influenced by solvent amount. CONCLUSION: Systematic study on recognition properties of imprinted polymer was carried out and effect of different anions and cations on binding capacities of complex molecularly imprinted polymer was investigated. It was found that complex molecularly imprinted polymer showed good binding characteristics to quercetin in the presence of Al(III) .

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