

Molecularly imprinted polymers for selective separation of carbamazepine as a pharmaceutically active compound in aqueous solution by using supercritical fluid technology

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In this study, molecularly imprinted polymers (MIPs) were synthesized by using supercritical fluid technology in carbon dioxide (CO₂). MIPs were prepared with methacrylic acid (MAA) as a functional monomer, carbamazepine (CMZ) as a template, and ethylene glycol dimethacrylate (EGDMA) as a crosslinker. The binding characteristics of MIPs for CMZ were evaluated using equilibrium binding experiments. The adsorption ability in aqueous solution of the MIPs was also investigated by HPLC analysis, measuring the adsorbed amounts for template and its structural analogue, the selectivity factor (α), and the imprinting-induced promotion of binding (IPB). The results of the evaluation analysis revealed that prepared MIPs have high separation abilities and selectivity. The molecular recognition properties with polymerization methods were also investigated. The results revealed that the MIPs prepared using supercritical fluid technology was more efficient to selectively separate and detect for the template than other methods.