Preparation and adsorption properties of vanillic acid imprinted polymers by using supercritical fluid technology

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Molecular imprinting technique has received much attention for one of the potential methods to create molecular recognition sites having high selectivity to the target molecule into polymeric materials. In this study, we synthesize vanillic acid (VA) imprinted polymers (VA-IPs) by using supercritical fluid technology in carbon dioxide (CO_2). To prepare VA-IPs, methyl methacrylate (MMA) is used as a third monomer, methacrylic acid (MAA) a functional monomer, and ethylene glycol dimethacrylate (EGDMA) as a crosslinking agent. The VA as the template was removed through the method of Soxhlet extraction, and the removal ratio was about 95–99%. The adsorption properties of VA-IPs were evaluated by adsorption kinetics, the binding isotherms, Scatchard analysis, the adsorption of materials with structures similar to templates, high performance liquid chromatography (HPLC) analysis, the selectivity factor (a), and the imprinting-induced promotion of binding (IPB). The results of the evaluation indicate that the prepared VA-IPs have high separation abilities and selectivity.