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Research Article

Electrochemical Sensing System Utilizing Simazine-Imprinted Polymer Receptor for the Detection of Simazine in Tap Water

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Abstract

A simazine sensing system, composed of column packed with a molecularly imprinted polymer (Sim-MIP) and an electrochemical analyzer, was scaled down in order to easily determine the concentration of simazine, an environmentally restricted chemical, in tap water. In order to enhance the detection limit, the ratio of the eluent (dilution rate) in the electrolyte was optimized to 10%. A new in-house built column size with $\varnothing=1.5$ mm was prepared, and 3 mg of Sim-MIP particles was packed in the column. During the sensing process, 90% of the simazine loaded to the column was collected by elution. The reductive current of simazine was determined up to $1-10$ μM . Solid phase extraction through the Sim-MIP column enabled simazine to be selectively detected from a mixed aqueous solution containing structural analogues in the range of $10-40$ nM. Whether the concentration of simazine in tap water had reached environmentally restricted levels ($10-40$ nM) was determined within 1 hour using this system.

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