Electrochemical sensor based on molecularly imprinted film for high sensitivity detection of clenbuterol prepared using sol-gel method

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The determination of clenbuterol is crucial for food safety and sport science. In this work, we use tetraethyl orthosilicate and (3-aminopropyl)triethoxysilane as cross-linking agents and functional monomers for the electrodeposition of SiO₂ films with the addition of clenbuterol. After the elution process, the prepared electrode can be used for the sensitive determination of clenbuterol due to the molecular imprinting effect. Under optimum conditions, results show that the current of clenbuterol decreases linearly in the range of 2 μ M to 0.1 mM, and the detection limit is 31 nM. The proposed electrochemical sensor also exhibits excellent stability and reproducibility, showing its high potential for use in sensing clenbuterol in food samples.

Keywords: Clenbuterol; Sol-gel; SiO₂; Electrodeposition; Molecular imprinting

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