ELECTROCHEMICAL MAGNETO IMMUNOSENSING

A NOVEL STRATEGY FOR THE DETECTION OF PESTICIDES RESIDUES

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ABSTRACT

A novel electrochemical immunosensing strategy for the detection of atrazine based on magnetic beads is presented. Different coupling strategies for the modification of the magnetic beads with the specific anti-atrazine antibody have been developed. The immunological reaction for the detection of atrazine performed on the magnetic bead is based on a direct competitive assay using a peroxidase (HRP) tracer as the enzymatic label. After the immunochemical reactions, the modified magnetic beads can be easily captured by a magneto sensor made of graphite-epoxy composite (m-GEC) which is also used as the transducer for the electrochemical immunosensing. The electrochemical detection is thus achieved through a suitable substrate and mediator for the enzyme HRP. The electrochemical approach is also compared with a novel magneto ELISA based on optical detection. The performance of the electrochemical immunosensing strategy based on magnetic beads was successfully evaluated using spiked real orange juice samples. The detection limit for atrazine using the competitive electrochemical magneto immunosensing strategy with anti-atrazine specific antibody covalent coupled with tosyl-activated magnetic beads was found to be 6 X 10^{-3} µg L^{-1} (0.027 nmol L^{-1}). This strategy offers great promise for rapid, simple, cost-effective and *on-site* analysis of biological, food and environmental samples.