

SOL-GEL BASED IMMUNOCHEMICAL MONITORING OF ENVIRONMENTAL CONTAMINANTS

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A novel technology, based on the entrapment of antibodies in a ceramic SiO₂ sol-gel matrix has been developed. The technology was applied to entrap antibodies for use as pesticide and pollutants sensors and immunoaffinity purification devices. Two systems have been studied: (i) sol-gel entrapped anti-atrazine monoclonal antibodies; and (ii) sol-gel entrapped anti-dinitrophenyl polyclonal antibodies and immunoglobulins. The entrapped antibodies, casted in columns, retained their ability to bind free antigen from aqueous solutions in a dose dependent manner with binding capacities similar to those in solution, did not leach out of the matrix, exhibited high stability at room temperature and enabled elution of analytes at recoveries that reached 85-95%. In general, the assay was highly reproducible with low non-specific adsorption. The development of the sol-gel based immunoaffinity method for purification, concentration and monitoring of a variety of residues from different sources will be presented.