



www.ifin.ro

Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering

Immunochemical technique for dosing the pesticide 3,6-dichloro-2-methoxy-benzoic acid in environment samples

Patent Number: RO125452/27.11.2008

Abstract

The invention relates to a technique for dosing of the pesticide 3,6-dichloro-2-methoxy-benzoic acid (dicamba) from environmental samples that uses microimmunosorbents based on silicon dioxide where the immune component is covalently coupled.

The pesticide **3,6 dichloro-2-methoxybenzoic acid** (dicamba) is used in annual or perennial weed control development that may contaminate cereal crop production leading to their losses, protection of cereals, fruit (citrus, apples, pears, peaches etc) and in applications in the field of aquatic weed control in canals, reservoirs. Should be monitored because its presence in food products can produce toxic effects on ingestion, inhalation or dermal exposure in human organism and animals and teratogenic effects (malformations). Symptoms of poisoning with dicamba: loss of appetite (anorexia), vomiting, muscle weakness, effects on the heart and central nervous system (depression), cyanosis of skin, muscle spasms, irritant and corrosive can cause severe affections or permanent effects of eye. Dicamba affect plants as a result of absorption from soil by plant roots and its half-life in soil is between 1 and 6 weeks. It has high solubility in water and easily contaminate groundwater sources and through absorption in plants lead on possible contamination of crops, fruits and food.

ELISA (Enzyme Linked Immunosorbent Assay) is an immunochemical technique that uses antibodies, enzymatic markers and other reagents to analyze contaminant substances from alimentary food samples (immunoassay that use antibodies to measure the concentration of an analyte having a high sensitivity to determine nanograms (10^{-9} g),

picogram (10^{-12} g) or femtograms (10^{-15} g) of contaminants from biological samples.

Technology stage

The obtained product can be used in ELISA immunochemical technique for dosing the dicamba pesticide from environmental samples and it was validated in this technique.

Applications

- ELISA kits for detection of the pesticide 3,6-dichloro-2-methoxybenzoic acid (dicamba) from alimentary and environmental samples which leads to increased quality of life through use of uncontaminated food;
- Environmental protection: quantitative analysis of pesticide contaminants from environmental factors (soil, water).

Advantages

- Using microimmunosorbents of silicon dioxide the antibody anti 3,6-dichloro-2-methoxy-benzoic acid is covalently coupled to silicon dioxide microspheres surface;
- The solid phase has a large area of 10-100 cm^2 due to the microimmunosorbent compared with the limited surface of an well from ELISA plate of 1 cm^2 ;
- Immune reaction of components are made in solution's volume compared with slow reaction at the inner surface of the ELISA well.

Contact

Dan D. ENACHE
Tel.: 0040214042303
Fax: 0040214574210
Email: dan.enache@nipne.ro