



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

### Procedure of obtainment of polyethyleneterephthalate-hexamethylenediamino-peroxidase

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#### Abstract

The invention relates to a process for obtaining the enzymatically labeled polyester polyethylene terephthalate-hexamethylenediamino-peroxidase used in studies on enzymatic stability covalently linked to solid phases, studies required in obtaining enzymatic dosing biosensors.

The process consists in:

- chemically activating the polyethylene terephthalate polyester as tapes,
- the tapes are then treated for activating the carboxy groups from the polymer surface,
- afterwards, for covalent coupling, the tapes are immersed into a solution of hexamethylenediamine-peroxidase prepared separately, the reaction is maintained for 12 h at a temperature of 4 degrees C,
- the resulting product, polyethyleneterephthalate-hexamethylenediamino-peroxidase, is stored at a temperature of -20 degrees C in order to be subsequently used in studies necessary in obtaining enzymatic dosing biosensors.

#### Technology stage

The obtained product, polyethyleneterephthalate-hexamethylenediamino-peroxidase, was tested in terms of specific enzymatic activity.

#### Applications

The obtained product can be used in:

- obtaining enzymatic dosing biosensors;
- the field of laboratory analyzes.

#### Derwent Class Codes:

**A23** - Polyamides; polyesters. (including polycarbonates, polyesteramides); alkyds; other unsaturated polymers.)

**A89** - Photographic, laboratory equipment, optical - including electrophotographic, thermographic uses

**B04** - Natural products and polymers. Including testing of body fluids (other than blood typing or cell counting), pharmaceuticals or veterinary compounds of unknown structure, testing of microorganisms for pathogenicity, testing of chemicals for mutagenicity or human toxicity and fermentative production of DNA or RNA. General compositions.

**D16** - Fermentation industry - including fermentation equipment, brewing, yeast production, production of pharmaceuticals and other chemicals by fermentation, microbiology, production of vaccines and antibodies, cell and tissue culture and genetic engineering.

#### Advantages

- the polyester product enzymatically labeled with peroxidase has a high specific enzymatic activity, unaltered compared to the native enzyme, the immobilization process lasts only 3-5 hours compared to other enzymes immobilized on PET support;
- the enzyme is not in direct contact with organic solvents which may decrease the specific enzymatic activity or may partially denature it to obtain the enzymatic derivative to be covalently coupled to the solid phase;
- the stages of obtaining the final product are simple and do not involve complex procedures that require a large number of work steps;
- short duration of obtaining the final product.

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