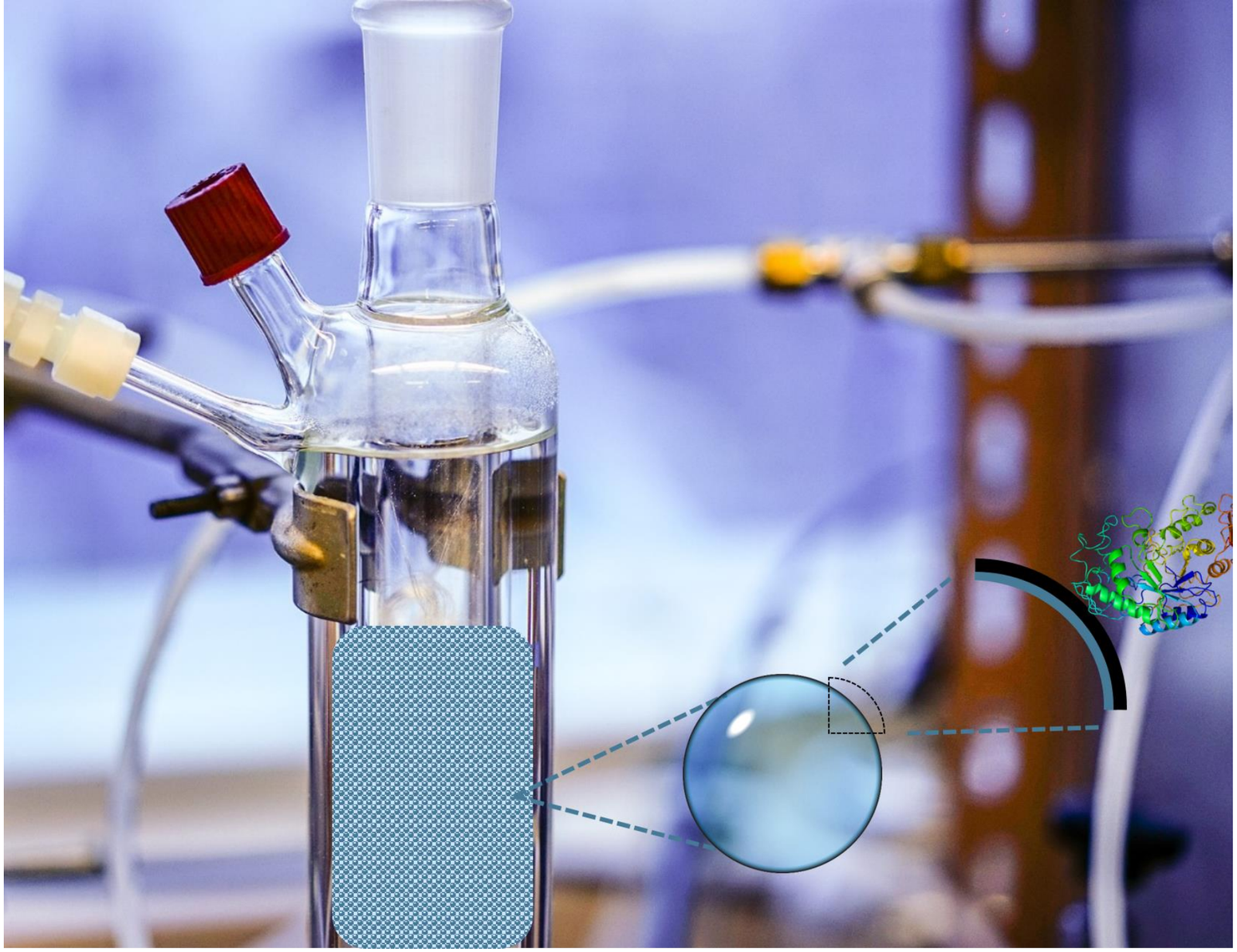

INNOVUS

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Facile Immobilization of Enzymes

Innovative enzyme-polymer conjugate, which retains catalytic activity of the immobilized enzyme and is inherently resistant to leaching

Innovus Technology Transfer (PTY) Ltd is Stellenbosch University's wholly-owned technology transfer company. Contact Anita Nel, Innovus Chief Executive Officer, on (021) 808 3826 or send an email to ajnel@sun.ac.za for more information.

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BRIEF DESCRIPTION

Immobilized enzymes have an advantage over free enzymes in solution in that they can be used repeatedly and easily removed from the reaction mixture after completion. However, in certain cases the immobilization substrate or support may have a significant negative influence on the catalytic activity of the immobilized enzymes. Researchers at Stellenbosch University have developed an innovative enzyme-polymer conjugate, which retains catalytic activity of the immobilized enzyme. The enzyme-polymer conjugate may be used as a recognition element in biosensors, as a robust bio catalytic agent in a biotechnological process, or for protecting a surface from biofouling.

TECHNICAL DESCRIPTION

The invention relates to an enzyme-polymer conjugate comprising a styrene maleic anhydride (SMA) polymeric substrate and having one or more hydrolase enzymes, such as amylase, protease and/or galactosidase, immobilized thereon via a covalent bond. The enzyme-polymer compound can be spun into nanofibers for the production of membranes or it may be formed into a textile, a coating formulation, a nanoparticle, a microparticle, a solid bead or an extruded sheet.

UNIQUE CHARACTERISTICS

- Can be provided in various forms such as a resin, slurry, solution, suspension, electrospun membrane, fibres, microbeads etc.
- Commercially available base polymer
- Easily mass produced

TARGET MARKET

- Food and beverage
- Chemical, petrochemical and biodiesel production
- Pharmaceutical and biopharmaceutical manufacturing
- Water and wastewater membrane treatment
- Biosensors
- Antimicrobial stents
- Bioremediation
- Manufacturers of polymeric resin catalysts
- Packaging

Stellenbosch University is interested in licensing and/or co-development and commercialization of this technology.

VALUE PROPOSITION

Easy separation of enzymes from the product
Retained activity of immobilized enzyme after immobilisation and repeated use
Cost benefits:

- Recovery and recycling of enzymes allowing for the repeated use of expensive enzymes.
- Easily mass produced using a simple chemical modification of a commercially available base polymer.

No leaching of enzyme
Co-immobilization of enzymes can allow for cascade reactions to be carried out in the same reactor allowing optimization of process operations.

PRINCIPLE RESEARCHERS

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Cost effective enzyme immobilization that retains activity and overcomes leaching

INNOVATION STATUS

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