

Biocatalysts for the food, pharmaceutical and cosmetic industry made from used batteries

The CSIC has developed a system that use the black mass of the used batteries to synthesize biocatalysts with a great capacity to synthesize products widely used in the food, pharmaceutical and cosmetic industry, such as aromas and flavorings.

Companies interested in exploiting the technology under a patent license are sought.

An offer for Patent Licensing

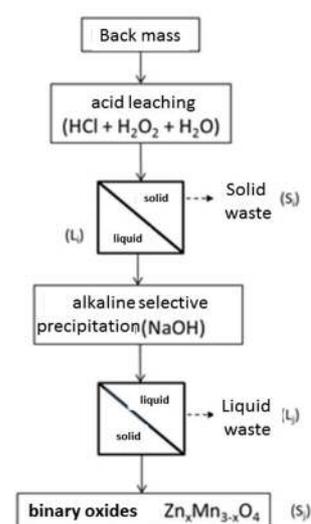
A recycled of battery that tastes and smells great

The short chain volatile fatty acid esters contribute to the natural aroma and flavor of fruits and vegetables and are widely used as additives in the pharmaceutical, cosmetic and food industries. Although they can be extracted from natural sources, the concentrations are very low. Therefore, for industrial purposes they are usually produced by chemical synthesis at high temperatures using non-selective catalysts.

The synthesis of esters by biocatalysis is a solution to the aforementioned problems, since the reactions are specific, selective, clean and develop under mild conditions, thus complying with European and American regulations for natural compounds.

The cost of enzymes (as glycoproteins) in these processes is high, so immobilization of enzymes on inorganic supports is essential to reduce the final costs, since they allow reuse it in numerous cycles and facilitate the separation of the product.

The present invention proposes the use of materials derived from the recycling of batteries (the black mass) as an inorganic, sustainable and low-cost support for the immobilization of glycoproteins.



Obtaining the binary oxide nanoparticles used as inorganic support to immobilize enzymes.

Main innovations and advantages

- No unwanted secondary products are generated that are usually produced in other conventional systems of production of aromas and flavorings at high temperatures and that require additional purification processes.
- It is a green and sustainable chemical process with a biological basis, which allows the use of a high-impact urban waste.
- The reactions are specific, selective, clean and develop under mild conditions
- Complies with European and American regulations for natural compounds.
- The expected annual growth rate of the global market for ester synthesis by biocatalysis is approximately 6.4% for 2016-2020.

Patent Status

Priority patent application filed

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