NEW METHOD OF SIMULTANEOUS SYNTHESIS OF AZELAIC ACID AND PELARGONIC ACID USING OZONE

CONTEXT

Azelaic acid and pelargonic acid are produced by the oxidation of unsaturated fatty acids, a chemical reaction of interest for the synthesis of organic diacids used in the production of polymers and cross-linking agents. The use of ozone as an oxidant is widespread but requires expensive catalysts and specific solvents, such as pelargonic acid, to mitigate the risks of explosion due to the exothermic nature of the reaction..

INVENTION

This invention relates to the use of ozone for the simultaneous synthesis of azelaic acid and pelargonic acid. A synthesis process using ozone achieves a high equimolar yield of azelaic acid (obtained in crystalline form) and pelargonic acid (obtained in liquid form) without the need for organic solvents or catalysts, and with moderate energy consumption

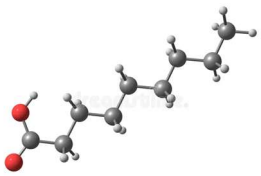
COMPETITIVE AVANTAGES

Economic Efficiency and Process Simplicity: The method does not require a chemical catalyst and uses water as a solvent, eliminating the need for pre-introduced pelargonic acid as a solvent, which reduces raw material costs and simplifies the implementation process.

Simultaneous and Natural Production of Both Acids: The process directly generates an equimolar mixture of azelaic acid and pelargonic acid, optimizing overall yield while eliminating additional steps required to produce these compounds separately.

Improved Safety and Sustainability: Precise temperature control, homogeneous dispersion, and secure removal of residual ozone minimize risks associated with exothermic reactions and enhance environmental sustainability through better management of by-products.

Flexibility and Product Quality: Crystallization and purification steps allow for the production of highly pure products, with customization possibilities according to industrial needs.

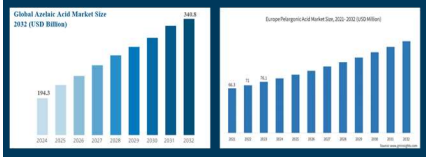


APPLICATIONS

Pelargonic Acid: Herbicides / Pharmaceutical Ingredient / Chemical Solvent
Azelaic Acid: Dermocosmetics / Anti-acne

MARKETS

The markets for azelaic acid and pelargonic acid, estimated at USD 194.3 million and USD 193.7 million respectively in 2024, are expected to grow at CAGRs exceeding 7% due to their numerous applications in agriculture, pharmaceuticals, and chemistry.



Sources : Global Market Insights / Business Research Insights

INTELLECTUAL PROPERTY

Patent family EP3280693 (Belgium, Switzerland, Germany, Spain, France, Italy, United Kingdom, Netherlands)

DEVELOPMENT STAGE
TRL 8/9

PARTNERSHIP

Seeking one or more industrial partners to exploit the patented invention (license or transfer)

UniLaSalle
Institut Polytechnique

Jean-Pierre GADONNA | 03 44 06 38 10 | jean-pierre.gadonna@unilasalle.fr