NEW METHOD OF SYNTHESIS OF MUCIC ACID USING OZONE

CONTEXT

Mucic acid, produced by the oxidation of galactose or galacturonic acid, is a biodegradable complex used in detergent, cosmetic, and pharmaceutical product formulations. Two production methods exist: one is chemical, based on nitric acid, which produces polluting by-products and offers limited yield, while the other is electrochemical, which, although less polluting, is slow, energy-intensive, and requires complex purification. The electrochemical variant involving bromine exacerbates these disadvantages, with significant industrial and environmental impacts..

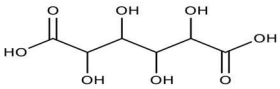
INVENTION

A new method for the synthesis of mucic acid uses ozone to oxidize aqueous solutions of galacturonic acid, galactose, or polysaccharides containing galactose or galacturonic acid units. The process, based on two ozonation phases at different concentrations, yields mucic acid crystals with purity exceeding 99%, without the use of organic solvents or catalysts. This approach, conducted at room temperature and under moderate pressure, aligns with green chemistry principles through the use of bio-sourced raw materials (e.g., pectins).

COMPETITIVE AVANTAGES

•**High Product Purity**: This process yields mucic acid crystals with purity exceeding 99%, without requiring repeated purification steps, which is a challenge in classical processes.
•**Environmental Respect**: Unlike the use of nitric acid, which generates toxic fumes and harmful by-products, the ozone method does not employ polluting reagents, promoting better compliance with environmental standards.
•**Absence of Solvents and Catalysts**: This process does not involve organic solvents or catalysts, reducing costs and simplifying post-treatment operations.
•**Energy Savings**: Conducted at room temperature and under moderate pressure, this process is less energy-intensive than traditional electrochemical methods, which require specific electrodes and complex management.
•**Green Chemistry**: The use of bio-sourced raw materials, such as plant-derived pectins, aligns this process with sustainable chemistry, meeting the growing demand for ecological solutions.

These characteristics make ozone synthesis an innovative and competitive method, suited to current requirements for sustainability and industrial efficiency.



APPLICATIONS

Pharmaceutical and cosmetic formulations
Bio-sourced food additives
Metal chelating agents
Biochemical research

MARKETS

The mucic acid market has experienced strong growth and is expected to continue developing significantly in the coming years

Source : Vérified Market Research, 2024, Global mucic acid market

INTELLECTUAL PROPERTY

Patent family EP2831028 (Belgium, Switzerland, Germany, Spain, France, Italy, Luxembourg, Netherlands)

STADE DE DÉVELOPPEMENT TRL 8/9

PARTNERSHIP

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

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