Itaconic Acid

BIOREFINING PROCESS SOURCE

Fermentation of 6-carbon sugars & starches, fermentation of lignocellulosic biomass

DESCRIPTION

Itaconic acid is used in the production of synthetic latexes to improve emulsion stability and adhesion. The paper-coating and carpet-backing industries are primary users of the acid. Some other itaconic acid derivatives are used in medicine, cosmetics, lubricants, and herbicides. Use of itaconic acid has been limited by the high costs of production from petroleum.

Itaconic acid can be fermented from starch derived glucose and sucrose,[1] but fermentation from xylose offers potential for a lower cost route and expanded use in plastics and paints in the housing and automotive sectors.[2]

REPRESENTATIVE BIOBASED PRODUCT OPPORTUNITIES

BIOBASED PRODUCT	CLASSIFICATIONS	MARKET OPPORTUNITY	MARKET SIZE
Itaconic Acid Derivatives	Plastics, Paints	With lower-cost production processes, itaconic acid could compete with methyl methacrylate (MMA) and other acrylates.[2] Poly-methyl methacrylate is a clear plastic, used as a shatterproof replacement for glass (Plexiglass, Lucite), and in acrylic paints.	Markets for acrylate and MMA are 1.5 billion pounds per year, at a market price of $0.48 to $0.56 per pound.[2]
Itaconic Acid Derivatives	Adhesives	Itaconic acid derivatives could compete in the pressure-sensitive adhesives (PSA) market and other applications.[2]	Markets for PSA are 300 million pounds per year, at a market price of $2.00 to $4.00 per pound.[2]

REFERENCES

[1] Brown, Robert C. 2003. Biorenewable Resources Engineering New Products from Agriculture. Iowa State Press, Ames IA.

[2] Energetics Incorporated. 2003. Industrial Bioproducts: Today and Tomorrow. U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Office of the Biomass Program, Washington, D.C.