附件四、技術說明表

銻觸媒用於乳酸酯化反應

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市場及需求:

本研發製程是透過乳酸與乙醇的酯化反應生產乳酸乙酯。乳酸乙酯是一種綠色溶劑，依純度可分為工業級、食品級、藥妝級、電子級。工業級的乳酸乙酯可以當作去油劑、染料與塗料、黏著劑的溶劑等；食品級則是當作調味劑、保存劑等；藥妝級的用在有機合成藥物的溶劑以及香水中的香料成分；電子級的可作為光阻的洗滌劑、溶劑，以及邊緣膠去除劑。本案發明之銻觸媒可大幅降低連續式反應蒸餾系統生產乳酸乙酯的操作成本。

技術摘要(含成果):

本技術開發的銻觸媒具有非常高的熔點，且不溶於水，具有更好的熱穩定性與在水中的穩定性。

實驗中，於燒瓶中加入乳酸和乙醇，並添加銻觸媒粉末，加熱反應。反應完利用離心分離觸媒，再由氣相層析搭配火焰離子偵測器分析得到產率。由實驗結果得知，銻觸媒用於乳酸酯化反應的乳酸乙酯產率高於商用觸媒—Amberlyst 15。

優勢:

銻觸媒之熱穩定性及反應性佳，價格相較工業常用之酯化觸媒—Amberlyst 15低，並於水相中穩定性高。

競爭產品:

Amberlyst 15

專利現況:

(1)本技術無相關專利。
(2)本研究團隊在異相觸媒以及生物質轉化領域已具有數十年研究經驗。

聯絡方式(請不用填):

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Antimony-based catalyst for lactic acid esterification

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Experience:

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https://fnmkevinwu.wordpress.com/

Market Needs:

The process produces ethyl lactate through the esterification reaction of lactic acid and ethanol. Ethyl lactate is a green solvent, which can be divided into industrial grade, food grade, cosmeceutical grade, and electronic grade according to the order of purity. Industrial grade ethyl lactate can be used as a solvent for degreasing agents, dyes and paints, adhesives, etc.; food grade is used as a flavoring agent, preservative, etc.; cosmeceutical grade is used as a solvent for organic synthetic drugs and perfumes fragrance ingredients; electronic grade can be used as a photoresist detergent, solvent, and edge glue remover. The antimony catalyst invented in this case can significantly reduce the operating cost of producing ethyl lactate in a continuous reactive distillation system.

Our Technology:

The antimony catalyst developed by this technology has a very high melting point, is insoluble in water, and has better thermal stability and stability in water.

In the experiment, lactic acid and ethanol were added to a flask, and antimony catalyst powder was added. The mixture was then heated, and after the reaction, the catalyst was separated by centrifugation. The yield was obtained by analyzing the product using gas chromatography with a flame ionization detector. The results showed that the ethyl lactate yield obtained from the antimony catalyst used in the esterification of lactate was higher than that obtained from the commercial catalyst, Amberlyst 15.

Strength:

Antimony catalyst has high thermal stability and reactivity, and its price is lower than Amberlyst 15, an esterification catalyst commonly used in industry, and it has high stability in water phase.

Competing Products:

Amberlyst 15

Intellectual Properties:

(1) There is no related patent for this technology.
(2) Our research team has decades of research experience in the field of heterogeneous catalysts and biomass conversion.

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