

附件四、技術說明表



新型異相催化劑應用於合成環狀碳酸酯

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簡歷： (可列出相關連結，例如系所、研究室網頁)

國立台灣大學 化學系 教授 1994 年 ~

香港中文大學化學系 講師 1993 年 ~ 1994 年

市場及需求:

全世界對二氧化碳捕捉及再利用之發展議題極為重要，將二氧化碳與環氧化物合成出的環狀碳酸酯具有良好的經濟價值，並且可以被廣泛利用，是良好的二氧化碳再利用之方式。在工業界極大部分使用異相催化系統，因此開發出良好的催化劑課題極為重要。

技術摘要(含成果):

本發明提供兩種固態催化劑，其中一種為有機高分子，另一種為將有機高分子修飾在載體上，兩種催化劑皆有良好的催化效果，並且可重複使用八次以上（轉化率 >80% 以上）。

優勢:

以高轉換率、高回收次數之固態催化劑合成環狀碳酸酯。並透過簡單抽氣過濾及可使固體催化劑重複再利用。

競爭產品:

工業界已有傳統方法製作環狀碳酸酯。

專利現況:

列舉近年成果(2016 年中國大陸專利 CN105363490A 發表離子型高分子催化劑及其製備方法、2012 年中國大陸專利 CN101318949A 發表以固體離子液體催化劑(MCM-41, MCM-48)合成環狀碳酸酯)。同時全球相關專利有 2017 年美國專利 US20170088535A1 發表生成環狀碳酸酯之催化劑、2013 年歐洲專利 EP2664641A1 發表以分子塞金屬鹽作為催化劑進行生成環狀碳酸酯。

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Synthesis of cyclic carbonates from novel heterogeneous catalysts

PI : Prof. Man-Kit Leung

Department of chemistry, National Taiwan University.

Experience:

| | | |
|---|-----------|-------------|
| National Taiwan University, department of chemistry | Professor | 1994 ~ |
| The Chinese University of Hong Kong, department of chemistry | Lecturer | 1993 ~ 1994 |

Market Needs:

Nowadays, research of CO₂ capture and utilization are a big issue for the whole world. Cyclic carbonates which have more commercial value and widely applications are synthesized by epoxides and carbon dioxide. This is a good way to utilize CO₂. Using heterogeneous catalyst systems are widely used in industry, so developing efficient catalysts is important issues.

Our Technology:

This present invention provides two solid catalysts, one of which is an organic polymer, and the other one is to modify the organic polymer on a carrier. Both catalysts had efficient catalytic and recyclable that can reuse more than eight times with 80% conversions.

Strength:

Synthesized cyclic carbonates with high conversions and recyclable catalysts. To reuse catalyst only needed through simple suction filtration without complicated steps.

Competing Products:

The industry has traditional methods for making cyclic carbonate chemicals.

Intellectual Properties:

For example, CN105363490A (2016) : using ionic polymer as catalyst for making cyclic carbonate and CN101318949A (2012) : using MCM-41 and MCM-48 as based of solid catalyst for synthesis of cyclic carbonate; At the same time, global related patents include U.S. Patent US20170088535A1 (2017) : catalyst and methods for making cyclic carbonate ; and European Patent EP2664641A1 (2013) : making cyclic carbonate with zeolite-metal salt.

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