CONVERSION OF POLYOLEFINS TO LIGHT OLEFINS WITH BASE-METAL HETEROGENOUS CATALYSTS

Tech ID: 33508 / UC Case 2024-108-0

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OTHER INFORMATION

CATEGORIZED AS

» **Energy**

» Other

» **Materials & Chemicals**

» Chemicals

» Other

» Polymers

RELATED CASES

2024-108-0

PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Published Application	WO2026/011187	01/08/2026	2024-108

BRIEF DESCRIPTION

The disposal and recycling of polyolefins (like polyethylene and polypropylene) present a significant environmental and economic challenge, as current recycling methods are often costly and energy-intensive, or result in lower-value products. UC Berkeley researchers have developed innovative methods for converting polyolefins into valuable light olefins such as propylene and isobutylene. This innovation uses base-metal heterogeneous catalysts to convert polyethylene into propylene and a C3 to C30 alkene, and to convert polypropylene into a high-yield mixture of propylene and isobutylene. A key advantage of this method is the ability to achieve high conversion yields at significantly lower reaction temperatures compared to existing technologies, offering a more efficient and sustainable route to upcycle plastic waste into high-demand chemical feedstocks.

SUGGESTED USES

● Production of high-value chemical building blocks (propylene, isobutylene) from waste plastics (polyethylene, polypropylene) for use in the chemical industry.

● Sustainable, lower-carbon alternative for the chemical industry to source propylene and isobutylene, which are typically derived from fossil fuels.

● Integration into plastic recycling infrastructure to convert difficult-to-recycle polyolefin streams into usable feedstocks.

ADVANTAGES

● High yield conversion of polyolefins to desirable light olefins (propylene, isobutylene).

● Operation at lower reaction temperatures than existing thermal or catalytic methods, resulting in reduced energy costs.

● Utilization of base-metal heterogeneous catalysts, which are typically less expensive and more readily available than precious-metal catalysts.

● Offers a chemically distinct and superior approach to upcycling polyolefin plastic waste.

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Ruthenium-Catalyzed Selective Oxidation Of Polyethylenes
- Dehydrogenation And Isomerizing Ethenolysis Of Polyethylene

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