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

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

#### PATENT STATUS

Patent Pending

# **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.

### CONTACT

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## **INVENTORS**

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### OTHER INFORMATION

#### **CATEGORIZED AS**

- » Energy
  - » Other
- » Materials & Chemicals
  - » Chemicals
  - >> Other
  - » Polymers

**RELATED CASES**2024-108-0

# ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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



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