

Converting Mixed Plastic Waste to Liquid Transportation Fuels

A new integrated process efficiently and reliably transforms mixed plastic waste into high-yield, high-purity liquid transportation fuels, delivering 68-75% energy savings over existing industry methods.

Researchers at Purdue University have developed a new integrated continuous reaction and separation process (ITCS) for converting mixed plastic waste into liquid transportation fuels. Currently, recycling technologies are inadequate to meet the challenge resulting in an estimated 98% of products coming from non-recycled content. One of the most common types of plastic, polypropylene, can be converted into gasoline-like (about 80%) and diesel-like (about 20%) fractions through an optimized hydrothermal processing technique. The carbon number distribution of the fuels that are created from this ITCS process range from C4 to C25, and about 86-90% yield of these fuels is obtained with purity up to 95%. The total amount of energy savings from ITCS for plastic recycling is found to be 68-72% over current technology and a 72-75% energy savings is found over producing liquid fuels from crude oil.

Advantages

- Efficient
- Recycling capability
- Energy Savings
- Cost Effective
- Reliable

Applications

- Plastic Manufacturing
- Fuel Manufacturing
- Plastic Recycling

Technology ID

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Category

Chemicals & Advanced
Materials/Green & Bio-Based
Chemistry
GreenTech/Circular Economy &
Waste Reduction
Energy & Power Systems/Power
Generation
Chemicals & Advanced
Materials/Materials Processing &
Manufacturing Technologies

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Intellectual Property:

Provisional-Patent, 2020-07-09, United States | PCT-Patent, 2021-07-09, WO
| NATL-Patent, 2021-07-09, Europe | NATL-Patent, 2021-07-09, China |
NATL-Patent, 2021-07-09, Republic of Korea | NATL-Patent, 2021-07-09,
Saudi Arabia | NATL-Patent, 2021-07-09, India | NATL-Patent, 2021-07-09,
Singapore | NATL-Patent, 2021-07-09, Qatar | NATL-Patent, 2021-07-09,
Japan | NATL-Patent, 2023-01-06, United States | CON-Patent, 2025-10-31,
United States | NATL-Patent, N/A, United Arab Emirates

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Green Technology, liquid waste treatment, Materials and Manufacturing, oil,
Petrochemical Technology, Plastics, Polymers, Recycling, Reusable,
Sustainable Plastics