



Biopolymer Upcycling

Plastic waste has reached epidemic proportions, with millions of tons of non-degradable materials accumulating in our oceans, landscapes, and ecosystems. Each year, an estimated 300 million tons of plastic are produced globally, and a staggering portion of this waste – over 90% – is not effectively recycled. Current recycling methods, primarily mechanical and incineration, fail to provide sustainable solutions. It's high time for a better solution ...

BACKGROUND

Plastic pollution represents one of the most pressing environmental challenges of our time, exacerbated by the alarming accumulation of non-degradable, fossil-derived plastics in ecosystems. Existing recycling strategies are limited. Mechanical recycling often results in downcycling, limiting the usability of recycled materials, while incineration contributes to environmental pollution without addressing the core issue of plastic waste management.

Recent advancements in chemical recycling, including pyrolysis, attempt to convert plastics primarily into gaseous products at high temperature. However, these methods suffer from high energy demands, substantial side-product formation, and poor selectivity towards valuable chemical intermediates, ultimately leading to elevated production costs.

TECHNOLOGY

acib's is offering a new approach focusing on the development of efficient catalytic deconstruction of plastic waste, enabling the processing of single-type and mixed plastic streams under optimized conditions. By employing alternative solvents and/or heterogeneous catalysts, we can overcome the structural recalcitrance of plastic materials, enhancing their degradation and valorization.

Moreover, our technology allows bio-based building blocks to be copolymerized with depolymerization products derived from plastic waste. This approach not only allows for the creation of novel polymers with improved properties but also enhances their biodegradability. By integrating renewable material waste streams, we aspire to develop polymers that are amenable to biological degradation, ultimately offering attractive end-of-life options for plastics that align with circular economy principles.

OFFER

Partner with acib to be at the forefront of addressing one of the most pressing environmental challenges of our time. Let's pave the way for innovative solutions that benefit both industry and society. Together, we can turn plastic waste into valuable resources and promote a more sustainable future. IP generated in a project with acib can be fully transferred to you as our industrial partner.

EXPERTS

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DEVELOPMENT STATUS:

Technology Readiness Level 2
(technology concept formulated)

KEYWORDS

- Plastic upcycling
- Circular Economy
- Sustainable Materials
- Renewable Resources
- Green Chemistry
- Closed-Loop Recycling
- Bio-Based Building Blocks
- Eco-Friendly Technologies

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