



mcl-PHAs: Eco-Friendly Elastic Polymers

Did you know that tire abrasion and washing of synthetic textiles are main contributors to microplastic pollution in the environment? There is an urgent need for bio-based and fully biodegradable alternatives. However, some features have been challenging to replace, such as the elasticity of some plastics. Discover how acib has found a solution that can also help combat climate change ...

BACKGROUND

Medium-chain length polyhydroxyalkanoates (mcl-PHAs) are very special biopolymers and not at all brittle like the common polyhydroxybutyrate (PHB), but elastic and flexible. Due to their chain structure and molecular arrangement mcl-PHA is able to withstand bending and stretching, while featuring tensile strength and durability. mcl-PHA is a natural polymer, fully biodegradable and compostable. Thus, it offers a sustainable alternative in areas where elasticity is crucial. It could replace non-biodegradable elastane aka spandex/lycra in clothing, it could replace latex or nitrile disposable gloves, it could be used for tires to avoid microplastic tire abrasion and in could be used in many other applications from elastic adhesives, coatings, sealants, bandages, filaments for 3D-printing, etc.

TECHNOLOGY

acib has developed a technology to produce such mcl-PHAs from CO₂ with a highly automated lab process, allowing to valorize CO₂-rich off-gases for the most sustainable bioplastics. mcl-PHAs produced in that way are UV-stable, able to withstand higher temperatures, show good resistance to moisture and are – of course – flexibly elastic!

OFFER

acib offers an exclusive opportunity to develop mcl-PHAs based biopolymers featuring characteristics required for your planned purpose(s). We offer to scale up mcl-PHA production from our lab-scale gas fermentation process to a pilot/demo plant, ensuring a seamless transition to industrial-scale production. Intellectual property (IP) generated during the collaboration can be transferred to you, our investor/industrial partner. acib has 30+ years of experience and has worked successfully with >250 industry partners. By collaborating with acib, you can be the first to enter the market with highly sustainable and biodegradable mcl-PHAs-derived products!

RELEVANT PUBLICATIONS:

<https://www.mdpi.com/2073-4360/15/12/2593>
<https://www.mdpi.com/2311-5637/9/7/619>
<https://www.mdpi.com/2306-5354/9/5/204>

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DEVELOPMENT STATUS:

TRL 3 (experimental proof-of-concept) for mcl-PHAs

TRL 4 (technology validated in lab) for PHB (and PHBV) production from CO₂

KEYWORDS:

Biopolymer
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