



POLYMER SELECTION

- We were able to synthesize 5 candidate materials with potentially suitable combinations of algae content and mechanical properties.
- Polyesters, polyurethanes and polyamides were considered, and polyamides were selected based on potential algae content, processing time and processing cost.
- From these candidates, PA 6.9 was identified as our most suitable polymer to scale. This is our preferred option based on synthesis conditions/time and cost.

MONOMER SYNTHESIS



- We were able to find a scalable route for the synthesis of algae-based azelaic acid in good yields. The azelaic acid (monomer) could be isolated in high purity with scalable methods, while minimizing the product loss during the process.
- Next step is to synthesize of algae-based PA 6.9 in 3-5 kilogram quantities that will enable us to spin it into a yarn and produce a textile which can be evaluated for its suitability for use in various applications in the textile industry.



DEVELOPMENT OF SPINNING AND TEXTURISING PARAMETERS FOR POLYAMIDE 6.9 & RECYCLABILITY ANALYSIS

Biobased PA 6.9 has now been spun in a yarn fineness that is suitable for both footwear and apparel applications. The team is also exploring the suitability of the material for other applications. Recyclability analysis is also performed to get a first understanding of the end-of-life scenarios for the material.



ALGAE BIOMASS PRODUCTION SCALE UP & LCA

Focusing on process optimisation to increase final Fatty Acid accumulation alongside developing an ultra-compact modular reactor solution to help understand the potential scalability of the technology. An LCA is being performed to understand the key carbon impact hotspots and potential improvement areas.



WORKSHOPS TO UNDERSTAND CONSUMER PERCEPTIONS OF ALGAE-BASED PRODUCTS

Consumers generally perceive algae as a material very positively and a potential sustainable feedstock. Consumers are generally willing to buy textile products made of algae and are interested in the production process as well as the sustainability score of this kind of material. The learnings from consumer workshops are being incorporated into a demonstrator concept.

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