

Enzymatic recycling of textiles, Project EnzyDegTex

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Textile recycling is becoming ever more important with the mounting waste of the fast fashion industry. In the region of North-West Europe, approx. 4.7 million tons of used textiles are currently collected annually [Cir20]. Less than one percent of those textiles are recycled, although up to 26% of EU27's textile waste could be recycled by 2030 [BFG+17], [HJL+22].

Of the many problems sustainable textiles have to tackle, there are three most notably. These are: first the mixed materials commonly found in textiles and their separation, second: replacing fossil based carbon sources with renewable ones and third: reducing the impact of leaked polymers by making them biodegradable. The separation requires specified methods for the respective target polymer, that have the least possible impact on non-target polymers in the mixture. On the one hand this enables the purest separated products, on the other hand it does not impact the next processes in the recycling cascade of non-target polymers. Here the selectivity of enzymes can be of great value. To even increase the versatility of this carbon source we can use genetically modified microorganisms to convert the degradation products to biodegradable polymers or basic chemicals.

In our Presentation we will show how enzymes can be used in the textile industry for recycling with some up to date examples of their applications and some ongoing research. This will include examples from industry, literature and our own research.

[Cir20]	Circle Economy: Recycled post-consumer textiles an industry perspective, 2020, URL: https://assets.website-files.com/5d26d80e8836af2d12ed1269/5e692cf7428ef844455f6bec_20200128_Fibersort_3.2_report_297x210mm.pdf Zugriff am 17.07.2023
[BFG+17]	Ellen MacArthur Foundation: Balmond, L.; Fuchs, L.; Gillet C.; Hermann, S.; Morlet, A.; Op-somer, R: A New Textiles Economy: Redesigning Fashion's Future. 2017, URL: https://www.ellenmacarthurfoundation.org/publications/a-new-textiles-economy-redesigning-fashions-future Zugriff am 17.07.2023
[HJL+22]	McKinsey Apparel, Fashion & Luxury Group Hedrich, S.; Janmark, J.; Langguth, N.; Magnus, K.H.; Strand, M.; Scaling textile recycling in Europe—turning waste into value 2022, URL: https://www.mckinsey.com/~/_media/mckinsey/industries/retail/our%20insights/scaling%20textile%20recycling%20in%20europe%20turning%20waste%20in

	<p>to%20value/scaling%20textile%20recycling%20in%20europe%20turning%20waste%20into%20value.pdf, Zugriff am 17.07.2023</p>
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