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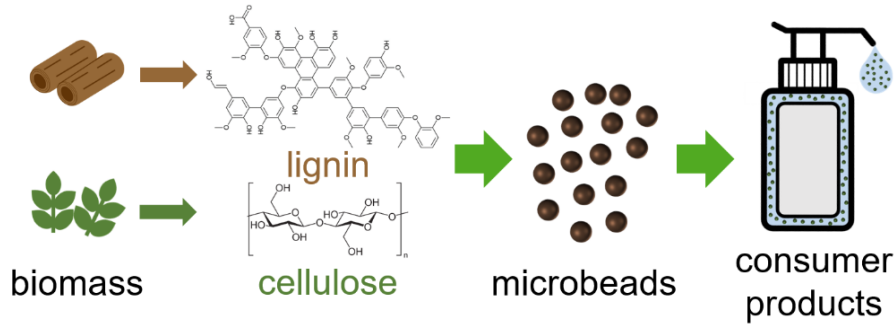
Biomass microbeads for personal care consumer products

Biodegradable microbeads made from unmodified biomass for use in personal care products and cosmetics.



IP Status: US Patent Pending; Application number US20240254321A1

Applications

- Replacing microplastic exfoliants in personal care and cosmetic products
- Thickness and bulking agent
- Passive adsorbent material for wastewater pollutants

Technology Overview

Plastic microbeads, typically composed of non-degradable synthetic polymers like polyethylene and polypropylene, are used as exfoliants and rheological modifiers in personal care and cosmetic products (PCCPs) to improve viscosity, bulking, film formation, and abrasion. These microbeads significantly contribute to microplastic pollution as they cannot be readily collected for recycling as they directly enter the water waste stream upon use. Limited sustainable alternatives to plastic microbeads with the desired properties relevant to the PCCP industry currently exist.

Researchers at the University of Minnesota have developed new biodegradable microbeads from cheap and abundant waste biomass. The microbeads are prepared from a mixture of cellulose and Kraft lignin in a surfactant-free batch emulsion method. These microbeads meet the standards of shape, size, and stiffness required to be of interest as exfoliants and rheological modifiers in personal care products and contain no common allergens. Biocompatible and biodegradable microbeads sourced from biomass provide a sustainable alternative to plastic microbeads sourced from synthetic polymers.

Phase of Development

TRL: 3-4

Technology ID

2023-005

Category

Engineering & Physical Sciences/Chemicals
Engineering & Physical Sciences/Materials
Engineering & Physical Sciences/Processes
Engineering & Physical Sciences/Sustainable Technology

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Proof of concept demonstrated in small-scale laboratory synthesis. Scale up trials are ongoing.

Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

Please contact our office to share your business' needs and learn more.

Researchers

- **Michelle Calabrese, PhD** Assistant Professor, Department of Chemical Engineering and Materials Science
- **Ben Robertson** Graduate Student, Department of Chemical Engineering and Materials Science

References

1. Robertson, B., Hoover, L., Rott, G., Quan, M., Calabrese, M.(July 28 2023) , https://doi.org/10.1007/s10570-023-05393-4, https://link.springer.com/article/10.1007/s10570-023-05393-4