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Treatment to Improve Formability of Palm Leaf Materials for Foodware Manufacturing

An NaOH treatment that dramatically increases formability of palm-leaf sheets, enabling scalable, lower-force manufacture of compostable foodware.

In hopes of replacing single-use plastics in food-ware and packaging, many industries see palm leaf materials as a more environmentally friendly alternative. Researchers at Purdue University have developed a treatment to improve the formability of palm leaf materials in the production of foodware. The caustic soda (NaOH) used for the treatment is already widely used in food production and is designated as safe for general use in food by the FDA. Compared to competing hydration approaches, Purdue's method resulted in material that could withstand 50% more strain while requiring a 70% reduction in forming force. This technology can be integrated into foodware production processes and could expand the footprint of palm-leaf materials.

Advantages:

- Requires less forming force

- Offers greater stretch in the forming of foodware

- Made using safe, widely available materials

Applications:

- Foodware from palm-leaf materials

- Manufacturing

- Sustainable single-use packaging

Technology Validation:

This technology has been validated through production and testing of foodware made from areca palm leaf materials. Results showed formability (measured via strain) improved by 9x compared to dry material or by 50%

Technology ID

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Category

Chemicals & Advanced Materials/Green & Bio-Based Chemistry

Chemicals & Advanced Materials/Materials Processing & Manufacturing Technologies

Further information

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compared to state-of-practice hydration treatments.

Related Publications:

Mohanty, D.P., Mann, J.B., Udupa, A. et al. Improving formability of palm leaf materials for foodware manufacturing using sodium hydroxide treatment. MRS Communications 12, 1235â€“1243 (2022). https://doi.org/10.1557/s43579-022-00300-7

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Provisional-Patent, 2023-04-13, United States

Utility Patent, 2024-04-11, United States

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