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(57) Abstract :

ABSTRACT ECO-RESPONSIVE BIODEGRADABLE PAPER-LIKE FABRIC WITH DYNAMIC TEXTURE The invention relates to biodegradable paper-like textiles and methods for their fabrication. A fermented cellulose core is produced by fermenting plant cellulose under controlled conditions using a Kombucha SCOBY, while an outer layer comprising algae fiber yarns coated with a chitosan binder is laminated to the core. The composite is further enhanced by forming a micro-embossed surface through heat pressing at 80°C under 5 psi, followed by an electrostatic nano-coating of positively charged cellulose particles. Subsequent treatment with a pH-sensitive dye derived from food waste and segmentation into interlocking panels via CAD-guided laser cutting yields an eco-responsive textile with adaptive texture and modular assembly benefits.

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