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Patent Search

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Abstract:

The present disclosure relates to compositions and methods for environmentally sustainable materials, and provides a BioDegradable Plastic Bag configured to produce long chains of glucose polysaccharides that undergo gelatinization when combined with water and heated, whereby starch granules absorb water, swell, and form a viscous matrix. The BioDegradable Plastic Bag includes a corn starch (102), a distilled water (104), a glycerin plasticizer (106), and a vinegar acid catalyst (108). The corn starch (102) provides long chains of glucose polysaccharides that undergo gelatinization in response to combination with the distilled water (104) and heat application, thereby forming a primary polymer matrix of the biodegradable plastic sheet. This configuration achieves formation of a flexible starch polymer film (120) that decomposes naturally in microbial action, providing a practical alternative to conventional petroleum-based plastic bags.

Complete Specification

Description: TECHNICAL FIELD

[001] The present invention relates to the field of biodegradable polymers and environmentally sustainable materials, and more particularly to a BioDegradable Pla derived from corn starch, configured as an alternative to conventional petroleum-based plastic bags for use in packaging and everyday household applications.

BACKGROUND

[002] The field of biodegradable polymers and environmentally sustainable materials has seen significant development in recent years. Synthetic plastic materials h come to occupy a central role in modern commerce and domestic life owing to their low production costs, mechanical durability, and functional flexibility. Conventic plastic products are typically manufactured from petroleum-derived feedstocks, which impart high structural stability and resistance to degradation. Such materials widely employed in packaging, retail, food service, and general household use, making them pervasive across virtually every sector of human activity.

[003] However, the very durability that renders petroleum-derived plastics commercially attractive also constitutes a serious environmental liability. Conventional sy plastic products may persist in the natural environment for several hundred years without undergoing meaningful decomposition. During this extended residence p such materials contribute substantially to soil pollution and water pollution, and may pose direct harm to wildlife through ingestion, entanglement, and habitat degradation. The accumulation of non-biodegradable plastic waste in landfills, water bodies, and open environments has become a growing global concern that exi disposal and recycling infrastructure has not fully addressed.

[004] Biopolymer-based alternatives to petroleum-derived plastics have attracted increasing research attention as a potential means of reducing environmental pla burden. Materials derived from renewable agricultural sources, such as polysaccharide-rich crops, offer the prospect of natural decomposition through microbial ac

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