

Reference Collection in Materials Science and Materials Engineering

Advanced of Starch-Based Bioplastics

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The potential of starch-based plastics is well-known and well-researched. In recent years, starch-based materials have been used in both commercial and industrial applications to develop biodegradable and sustainable products and address the negative impacts caused by synthetic plastic products. Synthetic plastics are derived from petroleum-based resources and are non-biodegradable, causing plastic waste pollution. Starch-based bioplastics are selected as an alternative to synthetic plastics due to their availability, renewability, sustainability, biocompatibility, and biodegradability. The conversion of starch into thermoplastic starch (TPS) will be discussed in this study. In addition, the development of starch-based bioplastics using different processing techniques such as melt extrusion, injection molding, compression molding, blown film extruder as well as 3D and 4Dprinting will be also discussed. The market analysis of starch and starch-based materials, their properties, and applications, as well as prospects to determine if starch-based bioplastics are economically and practically feasible, will be thoroughly discussed.