

〈総 説〉

生分解性ポリマーおよびその高性能化・高機能化

Biodegradable Polymers and Improvements of Their Performance and High Functionalization

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Abstract

Biodegradation process of polymers is first explained and then some typical biodegradable polymers such as poly(lactic acid), bacterial polyester, etc. are reviewed in terms of their chemical structures, mechanical properties, and some potential applications. For some polymers, changes in the mechanical properties and nano structures are also described. Furthermore, poly(ethylene terephthalate) (PET) degradable bacteria with its degradation mechanism is selected as a recent noticeable topics. Finally, improvements of performance and high functionalization of biodegradable polymers are mentioned. The improvement of mechanical properties, increasing of the melting temperature of crystals, acceleration of crystallization, increasing crystallinity etc. are targeted in order to improve performance of such properties. Additionally, appropriate deterioration of too-high hydrophilicity is mentioned, as well as modification of the chemical structure of the side-chain group of bacterial polyesters performed by the biological transformation of bacteria. As for the high functionalization, a switchable biodegradation function is introduced as an example. Since robustness of a polymeric material is required during its use, the biodegradation is unfavored. However, once the material is thrown away into an environment, the biodegradation is requested to start immediately upon wasting an environment. Such mechanism is referred to as switching biodegradation, and some trials are reviewed.

キーワード : ポリマーの生分解プロセス、生分解性開始スイッチ機能、ポリ乳酸、バクテリアポリエステル、ポリエチレンテレフタレート分解菌

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