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Investigation of interfacial compatibility of different biopolymers by compounding

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Abstract

Today, bioplastics are a sustainable alternative solution to problems such as exhaustion of fossil fuels and increasing environmental pollution. Poly (lactic acid) (PLA) that is a type of bio-based polymer with impressive properties such as biodegradability and processibility has found widespread applications in the area of single use materials, medical materials and film applications. However, PLA has disadvantages such as high brittleness and low impact strength. Compounding PLA with other polymers is recommended to improve PLA properties without compromising its biodegradability. In this project, PLA compounded with PBAT to overcome brittleness and low impact strength. The observed that the interfacial compatibility between PLA and PBAT is poor, so these polymers are immiscible. For this reason, compatibilizer is necessary in PLA/PBAT compounded. The mechanical properties such as tensile strength, izod impact strength, and tensile modulus are investigated. Izod impact strength of neat PLA increased 45% approximately and 64% with compatibilizer. This increase shows the enhancement of compatibilization with addition. While the tensile strength values of neat PLA and compound PLA were compared, it was observed that the tensile strength value decreased 25% as consequence of adding PBAT which affects as an impact modifier.

Biography

Binnaz Coskunkan started to work as a research and development specialist in Tisan Engineering Plastics since 2016. She graduated from chemical engineering in Yeditepe University. She had her PhD in chemical engineering in Yeditepe University with the title of her thesis Biological Activities of Levan-Based Polymers:In Silico Approach in 2017. Biopolymers are hers special interest therefore she started the project which includes developing bio-based compounds to be used in industry.

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