# PREPARATION OF BIODEGRADABLE MATERIALS BY REACTIVE EXTRUSION

I. Moura[1*], A. V. Machado[1], F. M. Duarte[1], G. Botelho[2], R. Nogueira[3]

[1]IPC – Instituto de Polímeros e Compósitos, University of Minho, 4800-058 Guimarães, Portugal
[2]Centro de Química, University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal
[3] Centro de Engenharia Biológica, University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal
* corresponding author: isabelm@dep.uminho.pt

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## Abstract

During the last decades, the use of polymeric materials has grown progressively and now, these materials are one of the most attractive categories of materials. This success is mainly related to their low cost, good properties, aesthetic qualities and resistance to physical ageing and biological attacks. However, the degrading resistance of synthetic polymers, especially in such applications where they are used for a short period of time before becoming waste, the growing environmental awareness and the new environmental regulations are forcing the industries to seek for more ecologically friendly materials for their products. The most desirable long-term solution to this problem is the use of biodegradable plastics, which undergo controlled biodegradation through the action of living organisms, the most environmentally compatible pathway for degradation [1].

Most biodegradable polymers have good properties comparable to many petroleum-based plastics and readily biodegradable, having the potentiality to compete with commodity plastics. However, their relative poor physical properties, such as high brittleness, moisture sensitivity, low heat distortion temperature, difficult their processability, restricting their use in a wide-range of applications [2]. The long-term properties of renewable materials are also very important especially if the products are not single use applications. Therefore new approaches to develop usable biodegradable materials are a subject of increasing research interest [1, 3].

The objective of this work is to prepare biodegradable polymeric materials based on blends of a synthetic and biodegradable polymer. Thus, blends of polyethylene, polylactic acid and poly (ε-caprolactone) with and without compatibilizer were prepared in a co-rotating twin-screw extruder. Morphology, rheological and mechanical properties characterization were performed. $CO_2$ measurements were carried out to monitor the biodegradability of the several materials.

The results obtained show that both properties and degradability of the various blends depend on the composition and on the combination of the synthetic/biodegradable system.

## References

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