

Abstract

Modifier for viscosity regulation and melt strength improvement in PLA Compounds

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Abstract: Polylactic Acid (PLA) has a linear molecule structure. Such a structure, which is typical for polyester, causes normally a low melt viscosity and low melt strength. So for film applications and foaming an improvement of Melt strength is necessary. The best structure for high melt strength is a long chain branched structure. There are two main possibilities to increase melt strength of a polymer:

1. Increasing of molecular weight
2. Creating a long chain branched structure

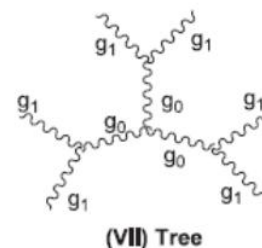
There are 4 possibilities to get a long chain branched PLA:

1. Using multifunctional monomers during polymerization
2. Using peroxides during extrusion
3. Preparation of grafted PLA with multifunctional monomers
4. Use of multifunctional oligomer blocs

In this talk we present some possibilities to improve melt strength of PLA following point 3 and 4.

The goal was to find a method, which allows the customer to use a common twin-screw extruder for modification of PLA.

Best results we got with a GMA grafted PLA. A dosage of 10 % additional to neat PLA showed very good results regarding improvement of melt strength. Maybe this is the right dosage for foaming. For other applications, a lower dosage is possible..



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