# Exploring the Use of the Reactive Processing for Polylactic Acid

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**Abstract**

A reactive processing is generally used to develop new thermoplastic materials and tailor the properties of polymers including miscible blends and composites. The processing can be achieved through the fundamental understanding of the chemical reactions and the processing conditions. In most cases, the reactive processing is found in the melt processing of thermoplastic polymers. The major advantage of this process is that the chemical structures, compatibility, rheological, morphological and mechanical properties can be modified in a single step process. This approach is also useful when applying with biodegradable polyesters due to the thermal instability of such biopolymers. This work will focus on the reactive processing performed particularly with polylactic acid (PLA) and its blends. PLA is known to possess poor impact resistance and slow crystallization rate, which prevents it from being used in many engineering applications, including automotive and electrical industries. The reactive compounding of PLA with some soft polymers with the great improvement of its impact property will be demonstrated and discussed. The novel route of the reactive melt processing for improving the crystallization kinetics will also be introduced and discussed. Based on the findings, the fast crystallization of PLA can be achieved through the possible reactive grafting of the organic nucleating agent onto PLA.

**Keywords**: Reactive processing, Biodegradable plastics, Polylactic acid, Impact resistance, Crystallization rate