

## عنوان مقاله:

Stretching Poly (lactic acid) extruded films at different drawing speeds and temperatures

## محل انتشار:

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## خلاصه مقاله:

Poly (lactic acid), PLA, is a commercially available biodegradable and bio-based polymer which is accepted as a potential to replace conventional polymers in packaging applications. Oriented PLA films are obtained through stretching at temperatures above its glass transition. The present study evaluates the effects of temperature and drawing speed during stretching on the tensile behavior and surface morphology of PLA films. Increasing the drawing speed (from ۱ to ۳۰ mm/s) enhances the strain hardening behavior. Conversely, there is a noticeable reduction in strain hardening as stretching temperature increases from ۷۰ °C to ۸۰ °C. However, stretching at ۹۰ °C eliminates, thoroughly, the strain hardening behavior. The surface morphology of PLA films observed by scanning electron microscopy (SEM) reveals no crystalline structures on the film surface of PLA films stretched at lower temperature (۷۰ °C). The SEM image of PLA film stretched at higher temperature (۹۰ °C) indicates formation of crystalline lamellae which is attributed to cold crystallization during stretching.

## کلمات کلیدی:

PLA; cast film; tensile properties; surface morphology

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