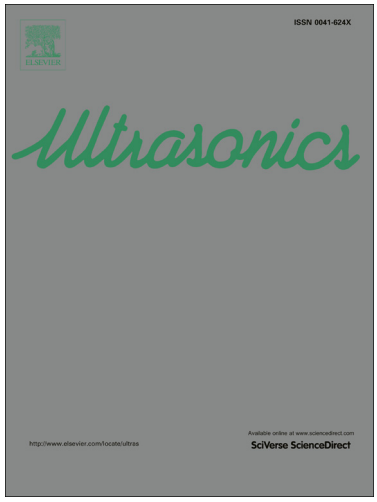

Measurement of Speed of Sound in Poly(Lactic Acid)-Clay Composite

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ABSTRACT: We measured longitudinal speed of sound for matrix[poly(lactic acid)]-additive(clay particles) composite rectangular-solid specimen prepared by injection molding. It was found that the speed of sound measured in the direction along the longer side of the specimen was the highest at the middle of the specimen. This trend corresponded with that for crystallinity determined through differential scanning calorimetry (DSC). A cross section view of the specimen parallel to its longer side showed that there was a transverse flow trace of resin in the vicinity of the injection gate while the flow trace along the direction of the longer side spread wider as getting far from the gate toward the middle of the specimen. The high crystallinity appeared in the middle of the specimen was inferred to come from the promotion of crystallization by molecular orientation induced with the above flow trace parallel to the direction along the longer side of the specimen.

Keywords: ultrasound; speed of sound; poly(lactic acid); composite; crystallinity; flow trace