

Kasidis Soonthrapirakkool 2010: Design of Experiments for a Biodegradation Study using Microorganism of Bioplastics Prepared from Rice Starch/Low Density Polyethylene Blend. Master of Engineering (Industrial Engineering), Major Field: Industrial Engineering, Department of Industrial Engineering. Thesis Advisor: Mr. Chuckaphun Aramphongphun, Ph.D. 113 pages.

This research work studies a biodegradation of bioplastics prepared by blending rice starch and low density Polyethylene (LDPE) in the percentage ratio of 70/30 and 100/0 by weight. The biodegradation of the bioplastics was tested by using the pure culture of bacterias such as *Bacillus cereus* and *Bacillus subtilis* and the pure culture of molds such as *Trichoderma longibrachiatum* and *Trichoderma harzianum*. These microorganisms are major groups commonly found in soil. To test the biodegradation, an elemental analysis of the reduced carbon and weight loss of the bioplastics were monitored at 10, 20, and 30 days.

According to the analysis of 2^3 Full Factorial Experiments using Analysis of Variance (ANOVA), it was found that (1) the microorganism could degrade the bioplastic with 100% rice starch better than that with 70% rice starch, (2) *Trichoderma* sp. could degrade the bioplastics better than *Bacillus* sp. and (3) single specie of the microorganism had better biodegradation than dual species of the microorganism.

Student's signature

Thesis Advisor's signature