

Natural Rubber-Based Biodegradable Packaging

Cattaleeya Pattamaprom

¹ *Research Unit of Polymer Rheology and Processing, Department of Chemical Engineering, Thammasat University, Rangsit Campus, Pathumtani, Thailand.
email: cattalee@engr.tu.ac.th*

Abstract

Natural rubber from Para rubber trees (NR) is a very promising low-cost bio-elastomer. In the past, natural rubber has been used for various applications in rubber industries. Nowadays, NR is becoming even more attractive in a wider range of business sectors as a tool to minimize carbon tax from the tighter carbon emission regulation. In our group, researches have been carried out to expand the applications of NR to biodegradable plastic and packaging industries, such as single-use and short-life biodegradable packaging films, trash bags, active packages, injection-molded plastic containers, and film-coated papers. Furthermore, we have put efforts in lowering the cost of the biobased and biodegradable compounds by increasing the content of low-cost biobased materials without sacrificing too much of its mechanical properties. So far, the highest content that currently provide good film properties is 60 wt%. So far, it was found that the NR-based packages not only possess longer shelf life than neat PLA but could also decompose faster in home-compost environment. The results of biodegradability from a certified laboratory indicated that our NR-based packages passed the biodegradability and biodisintegration test and could be completely disintegrated within 22 days. For a scale-up study, the NR-based plastic compounds have a good potential for a larger-scale production.

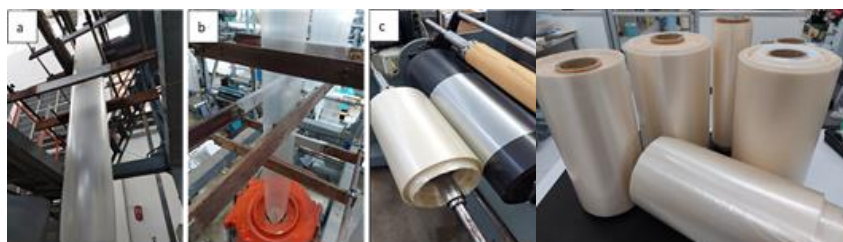


Figure 1. Pilot-scale film blowing process of biodegradable NR-based packaging films

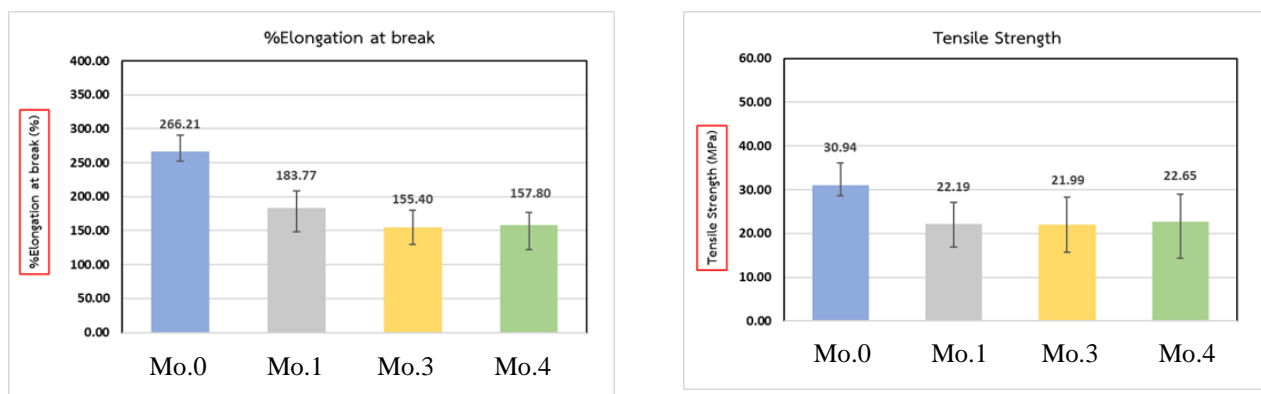


Figure 2. Shelf life of a biodegradable NR-based packaging film

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