

**PREPARATION AND CHARACTERIZATION OF
CM-CHITIN/NATURAL RUBBER BLENDS**



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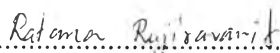
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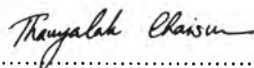
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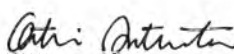
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ABSTRACT

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Carboxymethyl chitin (CM-chitin), a water-soluble derivative of chitin, has several interesting biological activities, leading to its potential use in biomedical field, such as wound dressing application. However, CM-chitin film is rigid and possesses poor mechanical properties. In order to improve flexibility of CM-chitin film, it was blended with natural rubber latex obtained from *Hevea brasiliensis* since natural rubber has high flexibility and elasticity. In this present study, CM-chitin/deproteinized natural rubber blend was prepared before being fabricated into film. The effect of the blend compositions on the chemical structure, morphology, thermal stability and mechanical properties of the blend films was determined by FT-IR, scanning electron microscope (SEM), thermogravimetric analyzer (TGA) and universal testing machine, respective. In addition to the blend compositions, the effects of crosslinking time with glutaraldehyde on the mechanical properties, degree of swelling and weight loss of crosslinked blend films were also investigated.

บทคัดย่อ

เศรษฐกิจ อุดม : การเตรียมและวิเคราะห์คุณสมบัติของวัสดุผสมคาร์บอกซีเมธิลไคติน/
ยางธรรมชาติ (Preparation and Characterization of CM-Chitin/Natural Rubber Blends)

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ปัจจุบันทั่วโลกให้ความสำคัญกับปัญหาสิ่งแวดล้อมเป็นอย่างมาก การคิดค้นและพัฒนาผลิตภัณฑ์ต่างๆ จึงต้องคำนึงถึงผลกระทบที่จะเกิดขึ้นต่อสิ่งแวดล้อม งานวิจัยนี้ได้นำแนวคิดนี้มาปฏิบัติ โดยเลือกใช้วัตถุดิบจากธรรมชาติ ได้แก่ คาร์บอกซีเมธิลไคติน (CM-Chitin) จากเปลือกกุ้งซึ่งถือเป็นของเสียจากอุตสาหกรรมอาหารทะเล และ ยางธรรมชาติ (Natural rubber) ที่หาได้ง่ายในประเทศไทย นำมาผลิตวัสดุผสมเพื่อใช้พัฒนาเป็นวัสดุปิดแผลที่มีประสิทธิภาพ โดยคาร์บอกซีเมธิลไคตินมีคุณสมบัติต่อการรักษาแผล โดยสามารถให้ความชุ่มชื้นแก่แผลซึ่งช่วยให้เซลล์เนื้อเยื่อเจริญเติบโตมาसानแผลได้เร็วขึ้น นอกจากนี้คาร์บอกซีเมธิลไคตินมีคุณสมบัติเข้ากับเซลล์มนุษย์ได้ดีอีกด้วย แต่ฟิล์มของคาร์บอกซีเมธิลไคตินไม่เหมาะที่จะนำมาใช้งานโดยตรงเพราะประสบปัญหาเรื่องความเปราะ ไม่ยืดหยุ่น งานวิจัยนี้จึงใช้ยางธรรมชาติเข้ามาผสมเพื่อปรับปรุงคุณสมบัติเชิงกลของฟิล์มคาร์บอกซีเมธิลไคติน รวมถึงการนำวัสดุผสมที่ได้มาทำการเชื่อมขวาง (Crosslinking) เพื่อให้สามารถนำไปใช้กับแผลในสภาวะที่มีของเหลวอยู่ได้ โดยวิเคราะห์โครงสร้างทางเคมี, สัณฐานวิทยา, คุณสมบัติเชิงกล และคุณสมบัติในการดูดซับน้ำ

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