

**PREPARATION OF COCONUT OIL-INCORPORATED
NATURAL RUBBER/PLURONIC/CHITIN WHISKER NANOCOMPOSITE
FILM FOR WOUND TREATMENT**

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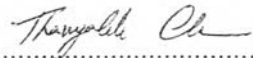
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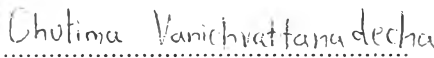

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ABSTRACT

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Supaporn Hansapaiboon: Preparation of Coconut Oil-incorporated Natural Rubber/Pluronic/Chitin Whisker Nanocomposite Film for Wound Treatment

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The appearance of a scar after wound healing can be a major medical problem. Accordingly, new dressings for scar prevention/reduction are still being developed. In this study, natural rubber was used as a matrix to provide pressure to a wound in order to prevent collagen over-production, a cause of scar formation. Chitin whisker acted as a nanofiller and provided strength to the matrix. Pluronic has been reported to improve blood flow to a wound, resulting in less scar formation. Furthermore, pluronic is an amphiphilic molecule that can self-assemble to form micelles in an aqueous solution. Coconut oil as a skin recovery enhancing agent was incorporated into the bionanocomposite via the micelle formation of pluronic by varying the ratio of pluronic to the oil. Chitin whisker content was varied to be 2.5%wt, 5%wt and 10%wt. It was found that the stability of coconut oil/pluronic emulsion increased with increasing the ratios of pluronic. The effects of coconut oil and chitin whisker content on tensile strength and elongation at break of the bionanocomposite sheets were evaluated. The dispersion of chitin whisker and coconut oil in the bionanocomposite sheets was investigated by scanning electron microscope. The diffusion of coconut oil from the bionanocomposite sheets was examined with modified Franz diffusion cells.

บทคัดย่อ

สุภาพร ھرรรยาไพบูลย์ : การเตรียมน้ำมันมะพร้าวรวมเข้าด้วยกันกับฟิล์มเชิงประกอบ
ยางธรรมชาติ/พลูโรนิก/เส้นใยไคตินระดับนาโน สำหรับการรักษาบาดแผล (Preparation of
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หน้า

แผลเป็นที่ปรากฏให้เห็นหลังจากการรักษาบาดแผลเป็นปัญหาที่สำคัญ ดังนั้นวัสดุปิด
แผลสำหรับการป้องกันหรือการลดรอยแผลเป็นยังคงถูกพัฒนา ในงานวิจัยนี้ยางธรรมชาติได้ถูกนำ
มาเป็นส่วนประกอบหลักเพื่อให้แรงกดต่อบาดแผลเพื่อที่จะป้องกันการสร้างที่มากเกินไปของคอล
ลาเจน ซึ่งเป็นสาเหตุของการเกิดรอยแผลเป็น เส้นใยไคตินทำหน้าที่เป็นสารเติมระดับนาโนและ
เสริมความแข็งแรงให้กับส่วนประกอบหลัก พลูโรนิกมีคุณสมบัติในการเพิ่มการไหลของเลือดไป
ยังบาดแผล ส่งผลให้การเกิดแผลเป็นน้อยลง นอกจากนี้พลูโรนิกเป็นแอมฟิฟิลิกโมเลกุลซึ่งสามารถ
เกิดไมเซลล์ได้ด้วยตัวเอง น้ำมันมะพร้าวเป็นสารช่วยบำรุงผิวหนังจะถูกรวมเข้าไว้ในวัสดุเชิง
ประกอบนี้ผ่านการสร้างไมเซลล์ของพลูโรนิก โดยสัดส่วนของพลูโรนิกและน้ำมันมะพร้าวที่แตก
ต่างกัน ปริมาณของเส้นใยไคตินถูกใช้แตกต่างกันที่ 2.5% 5% และ 10% ศึกษาได้ว่า ความเสถียร
ของน้ำมันมะพร้าว/พลูโรนิก อิมัลชัน เพิ่มขึ้นเมื่อสัดส่วนของพลูโรนิกมากขึ้น อีกทั้งยังได้วิเคราะห์
ผลของปริมาณน้ำมันมะพร้าวและเส้นใยไคตินต่อความต้านทานแรงดึงและการยึดตัว ณ จุดที่ขาด
ของวัสดุเชิงประกอบ และ การกระจายตัวของน้ำมันมะพร้าวและเส้นใยไคตินในวัสดุเชิงประกอบ
การแพร่ของน้ำมันมะพร้าวจากวัสดุเชิงประกอบนี้ถูกวิเคราะห์โดยโมดิฟายด์ฟรานซ์ดีฟิวชันเซลล์

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