

สารลดแรงตึงผิวจากกรดไขมันของน้ำมันถั่วเหลือง



นายชัยน้อย ชาญชัยสมภพ

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จุฬาลงกรณ์มหาวิทยาลัย

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SURFACTANT FROM SOYBEAN OIL FATTY ACIDS



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ในงานวิจัยนี้ได้สังเคราะห์สารลดแรงตึงผิวจากกรดไขมันของน้ำมันถั่วเหลือง การสังเคราะห์มี 3 ขั้นตอนคือ เอสเทอร์ฟิเคชัน, อีพอกซิเดชัน, และซัลโฟเนชัน ได้ผลิตภัณฑ์ที่มีชื่อเรียกว่า " ซัลโฟเนตเดคมิลเอสเทอร์ของน้ำมันถั่วเหลือง" (SSME) ผลผลิต 91.3 เปอร์เซ็นต์

สารลดแรงตึงผิวที่ทำการสังเคราะห์ได้นี้ หรือสารลดแรงตึงผิวที่สังเคราะห์ได้ที่มีน้ำมันวัตถุเป็นส่วนผสม สามารถนำมาใช้เป็นสารแพลลิกเคอร์ซึ่งใช้ในกระบวนการแพลลิกเคอร์ในอุตสาหกรรมการผลิตหนัง ในการทดลองนี้ได้นำหนังฟอกที่ได้หล่อลื่นเส้นใยด้วย SSME มาทดสอบความทนทานต่อแรงดึง โดยเปรียบเทียบกับซัลโฟเนตเดคมิลเอสเทอร์ที่ผลิตจากอุตสาหกรรม (CSO), ซัลโฟเนตเดคมิลเอสเทอร์ของน้ำมันถั่วเหลืองซึ่งผลิตโดยใช้วิธีเดียวกับที่ใช้ในอุตสาหกรรม (SSME) และซัลโฟเนตเดคมิลเอสเทอร์ของน้ำมันถั่วเหลืองซึ่งเติมสารลดแรงตึงผิว "เทอร์จิทอล เอ็นพี-9" 5 เปอร์เซ็นต์ (SSME+5 % NP-9) พบว่าเมื่อใช้ SSME จะทำให้หนังมีความทนทานต่อแรงดึงสูงสุดแต่ความอ่อนนุ่มน้อยกว่าเมื่อใช้ CSO และ SSME + 5 % NP-9

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In this research, the surfactants were prepared from soybean oil fatty acids. The preparations were carried out by three steps which were esterification, epoxidation, and sulfonation. The product obtained from the sulfonated soybean oil methyl ester was called SSME, and yielded 91.3 %.

The synthetic surfactants and/or the combinations of the synthetic surfactant with raw oil were used as the fatliquors in fatliquoring process in the leather industry. In this experiment, tensile strength of tanned leather, which was fatliquored with SSME, was determined by comparing with commercial sulfonated oil (CSO), sulfonated soybean oil methyl ester prepared by commercial procedure (SSME*), sulfonated soybean oil methyl ester+5 % tergitol NP-9 surfactant (SSME+5 % NP-9). The results showed that SSME produced the greatest tensile strength, but its softness was less than CSO and SSME + 5 % NP-9.

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ABBREVIATIONS

SOFA	=	Soybean oil fatty acids
SOME	=	Soybean oil methyl ester.
ESME	=	Epoxidized soybean oil methyl ester.
SSME	=	Sulfonated soybean oil methyl ester.
SSME*	=	Sulfonated soybean oil methyl ester . preparing by commercial procedure
CSO	=	Commercial sulfonated oil
O/W	=	oil in water emulsion
w/w	=	weight by weight
N	=	normality
ml	=	millilitre
mm	=	millimetre
g	=	gram
g/cm ³	=	gram per cubic centimetre
g/l	=	gram per litre
min.	=	minute
in./min.	=	inch per minute
ppm	=	part per million
%	=	percent
°C	=	Celcius degree
cSt	=	Centistoke unit
cm ⁻¹	=	Wavenumber unit