

การตัดแปรผ้าฝ้ายด้วยสารประกอบแคตไอออนิกรีแอคทีฟในการฟอก
เพื่อเพิ่มการรับสีย้อมรีแอคทีฟ

นางสาวพุลลิสรี รัตนนิมกุล



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
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ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

MODIFICATION OF COTTON FABRIC WITH CATIONIC REACTIVE COMPOUNDS
IN BLEACHING TO IMPROVE REACTIVE DYEABILITY

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สารดัดแปรสมบัติการดูดติดสีรีแอคทีฟของผ้าฝ้าย 3-amino-2-hydroxyl-propyltrimethylammonium(3,5)-dichlorotriazine ได้ถูกสังเคราะห์และนำมาวิเคราะห์โครงสร้างโดยใช้เทคนิคทางสเปกโทรสโกปี หลังจากนั้นนำสารดัดแปรไปผึ่งกลบนผ้าฝ้ายในกระบวนการฟอกขาวผ้า ฝ้ายที่ผ่านการดัดแปรแล้วได้นำมาวิเคราะห์หาเปอร์เซ็นต์ธาตุไนโตรเจนและทดสอบความขาวของผ้า เปรอร์เซ็นต์ธาตุไนโตรเจนในผ้าฝ้ายดัดแปรจะเพิ่มขึ้นตามปริมาณความเข้มข้นของสารดัดแปรที่ใช้ ในขณะที่ความขาวของผ้าจะลดลงเล็กน้อยแสดงว่าสามารถผึ่งสารดัดแปรไปพร้อมกับการทำฟอกขาวผ้าได้และประสิทธิภาพการฟอกขาวของสารไฮโดรเจนเปอร์ออกไซด์ในขณะที่มีสารดัดแปรอยู่ด้วยลดลงเล็กน้อย

ผลการย้อมผ้าฝ้ายดัดแปรด้วยสีรีแอคทีฟในภาวะไร้ออกซิเจน ทำให้ผ้าฝ้ายมีการติดสีสูงขึ้นตามปริมาณของสารดัดแปรที่ใช้ และสูงกว่าผ้าฝ้ายที่ไม่ได้ผ่านการดัดแปร ทั้งนี้เนื่องจากประจุบวกที่อยู่บนสารดัดแปรซึ่งจะดึงดูดประจุลบของสีรีแอคทีฟได้ดี และจากผลการย้อมทำให้สรุปได้ว่าสมบัติการย้อมผ้าฝ้ายที่ผ่านการดัดแปรจะขึ้นกับประสิทธิภาพในการยึดติดของสารดัดแปรบนเส้นใยเซลลูโลสในขั้นตอนการดัดแปร

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PULSIRI RATTANANIYOMKUL : MODIFICATION OF COTTON FABRIC WITH CATIONIC REACTIVE COMPOUNDS IN BLEACHING TO IMPROVE REACTIVE DYEABILITY. THESIS ADVISOR : ASSIST.PROF.KAWEE SRIKULKIT, Ph.D., 92 PAGES, ISBN 974-03-0384-6.

The reactive dyeability modifying agent of cotton fabric, 3-amino-2-hydroxyl-propyltrimethylammonium(3,5)-dichlorotriazine, was prepared. Spectroscopic technique (^1H NMR) was employed to characterize the chemical structure of the modifying agent. After that, the modifying agent was applied onto scoured cotton during bleaching process, aiming at modifying dyeability of the fiber using single-bath. The nitrogen content of modified cotton fabric was analysed by an elemental analyzer and whiteness was also evaluated. The results showed that nitrogen content in modified cotton fabric increased with an increase in the amount of the modifying agent concentration whereas whiteness index slightly decreased. Based on the finding results, it was possible that the dyeability modification and bleaching could be carried out in single bath process with a slight decrease in the performance of hydrogen peroxide.

The dye uptake and color strength of dyed modified fabric were markedly increased with an increase in the concentration of the modifying agent. In addition, those properties obtained from modified cotton fabric were higher than that obtained from the dyeing from unmodified cotton fabric. This was attributed to the presence of the cationic groups of the modifying agent that played a crucial role in attracting the anionic dyes from the dye-bath. The finding results tended to suggest that the dyeing properties of modified fabric were exactly dependent on the efficiency of the modifying agent fixation on cellulose during concurrent modifying and bleaching of cotton.

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