

NOVEL ELECTROSPUN SILICA FIBRES FROM SILATRANE



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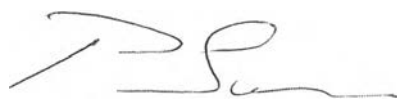
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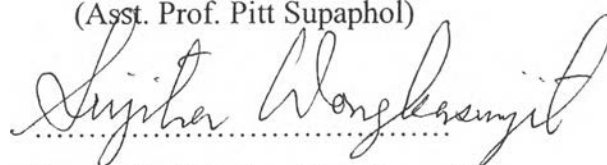
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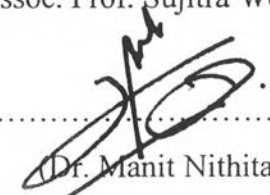
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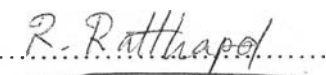
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ABSTRACT

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Thammasit Vongsetskul: Novel Electrospun Silica Fibres from Silatrane

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Very fine polyvinylalcohol/silatrane composite fibres were successfully prepared using an electrospinning process. These fine composite fibres were converted to silica fibres, with the aim of producing silica fibres having a high surface area to mass ratio. The effects of applied potential, silatrane concentration, and calcination temperature on the morphology of the resulting fibres were investigated. It was found that the number of conjoined fibres increased with increasing silatrane concentration and applied potential, while the morphology of the obtained silica fibres was hardly affected by changes in the calcination temperature. It was also found that the obtained silica fibres were amorphous with the diameter ranging between 250 and 600 nm, and the diameter was found to decrease with decreasing applied potential.

บทคัดย่อ

กรรมสิทธิ์ วงศ์เศรษฐสกุล : เส้นใยซิลิกาขนาดเล็กชนิดใหม่จากไซลาเทรน (Novel Electrospun Silica Fibres from Silatrane) อ. ที่ปรึกษา: ผศ. ดร. พิชญ์ ศุภผล และ รศ. ดร. สุจิตรา วงศ์เกษมจิตต์, 128 หน้า ISBN 123-123-123-2

เส้นใยเชิงประกอบระหว่างพอลิไวนิลแอลกอฮอล์กับไซลาเทรนถูกผลิตขึ้นโดยวิธีการปั่นเส้นใยแบบใช้ไฟฟ้าสถิตเป็นตัวขับเคลื่อน ต่อมาเส้นใยเหล่านี้ได้ถูกเปลี่ยนเป็นเส้นใยซิลิกา โดยมีจุดประสงค์ในการผลิตเส้นใยซิลิกาที่มีพื้นที่ผิวสัมผัสต่อมวลสูง จากการศึกษาพบว่าปริมาณศักย์ไฟฟ้า และความเข้มข้นของไซลาเทรนแปรผันตามตรงกับจำนวนเส้นใยที่ติดเข้าด้วยกัน ในขณะที่อุณหภูมิในการเผาเส้นใยเชิงประกอบแทบจะไม่มีผลต่อสัณฐานของเส้นใยซิลิกา จากกระบวนการเผาเส้นใยเชิงประกอบเป็นเส้นใยซิลิกานั้นพบว่าเส้นผ่านศูนย์กลางของเส้นใยมีค่าอยู่ในช่วง 250-600 นาโนเมตรและซิลิกาที่ได้มีวัฏภาคแบบอสัณฐาน

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