

**สมบัติการเปล่งแสงฟลูออเรสเซนซ์ของ
พอลิ[4-กอโร-2-(4'-ไวโนลฟีนิล)-5-ฟีนิลออกซาโซล-โค-ธำไทริน]**

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**FLUORESCENCE EMISSION PROPERTIES OF
POLY[4-CHLORO-2-(4'-VINYLPHENYL)-5-PHENYLOXAZOLE-
CO-STYRENE]**




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4-คลอโร-2-(4'-เอทิลฟีนิล)-5-ฟีนิลออกซาโซล สามารถเตรียมได้ถึงร้อยละ 68 จากปฏิกิริยาระหว่างพารา-เอทิลเบนซัลดีไฮด์ และเบนโซอิลไฮยาไนด์ในสารละลายอีเทอร์ที่ต้มด้วยแก๊สไฮโดรเจนคลอไรด์ โบรมิเนชันของสารดังกล่าวโดยเอ็น-โบรมโม่คซิ นิมีค แล้วทำดีไฮโดรโบรมิเนชันโดยใช้โปแตสเซียมไฮดรอกไซด์ ในเอทานอล จะได้ 4-คลอโร-2-(4'-ไวนิลฟีนิล)-5-ฟีนิลออกซาโซล ซึ่งใช้เป็นสารชนิดเลเซอร์ที่มีประสิทธิภาพ

ได้สังเคราะห์พอลิ [4-คลอโร-2-(4'-ไวนิลฟีนิล)-5-ฟีนิลออกซาโซล-โค-สไตรีน] ที่มีสัดส่วนมอนอเมอร์ต่างๆกัน โดยใช้วิธีวัลต์พอลิเมอไรเซชันที่อุณหภูมิ 70 องศาเซลเซียส และมีเอไอบีเอ็นเป็นตัวเริ่มต้นปฏิกิริยา ได้ตรวจสอบสมบัติของฟิล์มของโคพอลิเมอร์และสารละลายของโคพอลิเมอร์ในไดคลอโรมีเทนที่มีความเข้มข้นต่างๆกัน โดยใช้เทคนิควิเคราะห์การดูดกลืนแสงและการเปล่งแสงฟลูออเรสเซนซ์ พบว่าหมู่ฟีนิลในพอลิสไตรีนสามารถถ่ายเทพลังงานไปยังส่วนของออกซาโซลในสายโซ่พอลิเมอร์ และสามารถตรวจสอบการเกิดเอ็กไซเมอร์ในโคพอลิเมอร์ฟิล์มซึ่งแปรผันกับความเข้มข้นของไดฟีนิลออกซาโซล นอกจากนี้ยังหาค่าฟลูออเรสเซนซ์ควอนตัมยิลด์ของโคพอลิเมอร์ในไดคลอโรมีเทน

ภาควิชา
สาขาวิชา

ลายมือชื่อนิสิต
ลายมือชื่ออาจารย์ที่ปรึกษา
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม

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ATHINEE VIYAKARN : FLUORESCENCE EMISSION PROPERTIES OF
POLY[4-CHLORO-2-(4'-VINYLPHENYL)-5-PHENYLOXAZOLE-CO-
STYRENE]

THESIS ADVISOR : ASSOC. PROF. SUPAWAN TANTAYANON, Ph.D.
THESIS COADVISOR : PROF. JAMES W. PAVLIK, Ph.D., ASSIST. PROF.
PRAPAIPIT CHAMSUKSAI TERNAI, Ph.D. 109 pp. ISBN 974-639-427-4.

The reaction between *p*-ethylbenzaldehyde and benzoyl cyanide in an ethereal solution and saturated with hydrogen chloride gas gave 4-chloro-2-(4'-ethylphenyl)-5-phenyloxazole in 68% yield. Its bromination by *N*-bromosuccinimide followed by dehydrobromination with potassium hydroxide in ethanol gave 4-chloro-2-(4'-vinylphenyl)-5-phenyloxazole as an effective scintillator.

Poly[4-chloro-2-(4'-vinylphenyl)-5-phenyloxazole-co-styrene] with different mol ratios were synthesized using bulk polymerization at 70 °C. AIBN was used as the initiator. The copolymer films and its various solutions in dichloromethane with various concentration have been characterized by absorption and fluorescence emission spectroscopy. It is found that the phenyl chromophores of polystyrene transfer excitation energy to the oxazole moiety in the region in which they strongly absorb. The excimer formation of the copolymer films has been monitored as a function of mol percent of diphenyloxazole content. The fluorescence quantum yields of the copolymer solutions in air and in degassed solution at the excitation wavelength of 260 nm were investigated.

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สาขาวิชา.....

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ลายมือชื่อผู้พิมพ์.....

ลายมือชื่ออาจารย์ที่ปรึกษา.....

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สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

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