

**DEVELOPMENT OF POLY(3-THIOPHENEACETIC ACID)/ZEOLITE Y  
AS A GAS SENSOR MATERIAL FOR AMMONIA**



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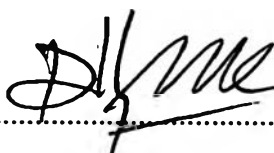
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## ABSTRACT

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Poly(3-thiopheneacetic acid) was synthesized and doped from an insulating state to a conducting state using perchloric acid. The electrical conductivity sensitivity towards ammonia is further improved by introducing Y zeolite into the doped Poly(3-thiopheneacetic acid) matrix. For the effect of zeolite content, the composite with 10 %v/v of Y zeolite has the highest electrical conductivity sensitivity ( $\Delta\sigma/\sigma_{N_2}$ ) values when exposed to  $NH_3$ . For the effect of Si/Al ratio, the electrical conductivity sensitivity ( $\Delta\sigma/\sigma_{N_2}$ ) increases with increasing Si/Al ratio. The highest electrical conductivity sensitivity of all composites is obtained with the doped Pth/Zeolite Y (Si/Al = 80) at the value of  $7.46 \pm 3.56 \times 10^2$ .

## บทคัดย่อ

ศันสนีย์ คนขยัน : การพัฒนาคอมโพสิตของพอลิไทโอฟีนอะเซติกแอซิดและซีโอไลต์เพื่อใช้เป็นวัสดุในการตรวจวัดก๊าซแอมโมเนีย (Development of Poly(3-thiopheneacetic acid)/Zeolite Y as a Gas Sensor Material for Ammonia) อ. ที่ปรึกษา : รศ. ดร. อนุวัฒน์ ศรีวัฒน์ 98 หน้า

พอลิไทโอฟีนอะเซติกแอซิดถูกสังเคราะห์และเพิ่มค่าความสามารถในการนำไฟฟ้าโดยกรดเปอร์คลอริก และเพื่อการพัฒนาความไวทางการนำไฟฟ้าเมื่อตรวจจับก๊าซแอมโมเนียสามารถทำได้โดยการนำซีโอไลต์วายเป็นส่วนผสมในเมทริกซ์ของพอลิไทโอฟีนอะเซติกแอซิด จากการศึกษาปัจจัยของปริมาณซีโอไลต์ พบว่าเมื่อทำการตรวจวัดในขณะที่มีก๊าซแอมโมเนีย คอมโพสิตที่มีปริมาณของซีโอไลต์วายเป็น 10 เปอร์เซ็นต์โดยปริมาตรมีค่าความไวทางการนำไฟฟ้าสูงสุด สำหรับปัจจัยของสัดส่วนซิลิกอนและอะลูมิเนียม พบว่าค่าความไวทางการนำไฟฟ้าเพิ่มขึ้นเมื่อสัดส่วนของซิลิกอนและอะลูมิเนียมเพิ่มขึ้น ดังนั้น คอมโพสิตที่มีสัดส่วนของซิลิกอนและอะลูมิเนียมเท่ากับ 80 จึงมีค่าความไวทางการนำไฟฟ้าสูงสุด ซึ่งมีค่าเท่ากับ  $7.46 \pm 3.56 \times 10^2$

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