

**HUMIC ACID COATED ON POLYBENZOXAZINE XEROGEL
FOR COPPER ROMOVAL**

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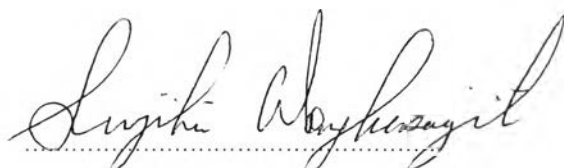


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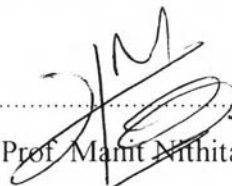
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ABSTRACT

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A polybenzoxazine xerogel was synthesized from bisphenol-A, formaldehyde, and aromatic diamine. FTIR, DSC, TGA, measurements were used to characterize the properties of the polybenzoxazine xerogel. SEM micrograph showed the interconnected structure of the organic xerogel derived from 25 wt% of polybenzoxazine. Humic acid 0.1 w% was coated on polybenzoxazine xerogel at room temperature via the layer-by-layer polyelectrolyte multilayer (PEM) surface modification method using poly(diallyldimethylammonium chloride) (PDADMAC) and poly(sodium 4-styrenesulfonate) (PSS) as primer coating for 4 layers. The PEM layers were investigated using UV-VIS measurements. The results showed that the absorbance of the prepared samples increased when the number of PEM layers increased. Finally, copper(II)acetate at pH7, was added to the coated xerogel to study the ability of humic acid to remove copper. The UV-VIS results indicated that copper was adsorbed on the humic surface. When the injection time of copper was increased, the absorbance of copper after the adsorption was decreased.

บทคัดย่อ

กนกพร วงศ์ไทย : การปรับปรุงผิวของพอลิเบนซอกซาซีนที่มีรูพรุนด้วยกรดฮิวมิกเพื่อใช้ในการกำจัดไอออนของโลหะทองแดง (Humic Acid Coated on Polybenzoxazine Xerogel for Copper Removal) อ.ที่ปรึกษา : ผู้ช่วยศาสตราจารย์ ดร. ธัญญลักษณ์ ฉายสุวรรณ, ดร. สเตฟาน เทียร์รี ดูบาส และ รองศาสตราจารย์ ดร. สุจิตรา วงศ์เกษมจิตต์ 51 หน้า

ในงานวิจัยนี้พอลิเบนซอกซาซีนสังเคราะห์จากสาร bisphenol-A, formaldehyde และ aromatic diamine เครื่องมือที่ใช้ตรวจวิเคราะห์คุณสมบัติของพอลิเบนซอกซาซีน ได้แก่ FTIR, DSC, TGA, และ SEM กรดฮิวมิกความเข้มข้นร้อยละ 0.1 โดยมวลถูกเคลือบลงบนพอลิเบนซอกซาซีนที่อุณหภูมิห้องโดยวิธีสร้างฟิล์มที่ละชั้นด้วยสารละลายที่มีขี้้ว ส่วนของชั้นแรกประกอบด้วยชั้นของสารละลาย poly(diallyldi methylammonium chloride) หรือ PDAD และ สารละลาย poly(sodium 4-styrenesulfonate) หรือ PSS ในการตรวจการเพิ่มขึ้นของชั้นฟิล์มสามารถตรวจโดยเครื่องวัดกลางดูดกลืนแสง (UV-Vis Spectroscopy) ผลลัพธ์แสดงให้เห็นว่าการเพิ่มขึ้นของจำนวนชั้นของสารละลายที่มีขี้้วจะส่งผลต่อการเพิ่มการดูดซึมของสารตัวอย่างที่เตรียมไว้ นอกจากนี้สารคอปเปอร์แอสีเตตที่มีค่าความเป็นกรดเบสเป็นกลางได้ใส่ลงในพอลิเบนซอกซาซีนที่เคลือบด้วยกรดฮิวมิก เพื่อศึกษาความสามารถในการกำจัดสารประกอบทองแดงของกรดฮิวมิก จากผลการศึกษาพบว่า สารประกอบทองแดงถูกดูดซับบนพื้นผิวของกรดฮิวมิก เมื่อเวลาการฉีดของทองแดงเพิ่มขึ้น ค่าการดูดซึมของสารประกอบทองแดงหลังจากการดูดซับลงบนพื้นผิวฮิวมิกจะลดลง

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