

**REMOVAL OF TRACE CONTAMINANTS FROM WASTEWATER BY
USING POLYBENZOXAZINE-BASED AEROGEL**



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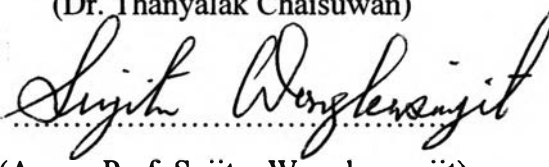
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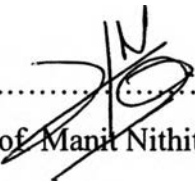
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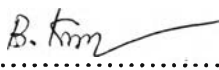

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ABSTRACT

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The removal of trace contaminants from wastewater by polybenzoxazine-based aerogel, a novel type of phenolic resin, was studied in batch experiments. The adsorption behavior of polybenzoxazine towards metals was also investigated by varying amount of adsorbent and type of metals. The results indicated that polybenzoxazine-based aerogel showed more than 80% removal of Cu(II), Fe(II), Pb(II) and Sn(IV) following order: Sn(IV) > Cu(II) > Fe(II) > Pb(II). It was found that the metal adsorption onto polybenzoxazine-based aerogel reached equilibrium in 12 hours. Furthermore, the adsorption behavior in mixed metals system, the adsorption isotherms and the feasibility of using polybenzoxazine-based aerogel as a polymeric ligand exchanger (PLE) were investigated.

บทคัดย่อ

สุภานัน เหลืองสุขฤกษ์ : การกำจัดสารปนเปื้อนจากน้ำเสียโดยใช้แอโรเจลที่เตรียมจากพอลิเบนซอกซาซีน (Removal of Trace Contaminants from Wastewater by Using Polybenzoxazine-based Aerogel) อ.ที่ปรึกษา : ดร.ธัญญลักษณ์ ฉาบสุวรรณ และ รองศาสตราจารย์ ดร.สุจิตรา วงศ์เกษมจิตต์ 47 หน้า

ในงานวิจัยนี้ได้ทำการศึกษาการแยกสิ่งปนเปื้อนออกจากน้ำเสียโดยใช้แอโรเจลที่เตรียมจากพอลิเบนซอกซาซีนซึ่งเป็นพอลิเมอร์ชนิดหนึ่งด้วยกระบวนการดูดซับแบบกะ โดยที่พฤติกรรมของกระบวนการดูดซับโลหะของแอโรเจลที่ทำจากพอลิเบนซอกซาซีนนั้น ศึกษาได้จากการปรับปริมาณตัวดูดซับและชนิดของโลหะ ซึ่งผลการทดลองแสดงให้เห็นว่าแอโรเจลที่ทำจากพอลิเบนซอกซาซีนสามารถดูดซับทองแดง เหล็ก ตะกั่ว และดีบุก ได้มากกว่า 80 เปอร์เซ็นต์ ในส่วนของแนวโน้มการดูดซับโลหะเป็นไปตามลำดับดังนี้ ดีบุก > ทองแดง > เหล็ก > ตะกั่ว และยังพบว่าปริมาณการดูดซับโลหะโดยใช้แอโรเจลที่ทำจากพอลิเบนซอกซาซีนขึ้นอยู่กับเวลาที่ใช้ในการดูดซับ นอกจากนี้ผู้ทำการทดลองยังได้ศึกษาไอโซเทอร์มของการดูดซับ พฤติกรรมการดูดซับโลหะในสารละลายโลหะผสม และความเป็นไปได้ของการใช้แอโรเจลที่ทำจากพอลิเบนซอกซาซีนเป็นตัวแลกเปลี่ยนลิแกนด์

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