

การกำจัดการประกอบปรอทและอาร์เซนิกออกจากไฮโดรคาร์บอนเหลว
โดยการดูดซับบนตัวดูดซับนิกเกิลคอปเปอร์



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**REMOVAL OF MERCURY AND ARSENIC COMPOUNDS FROM LIQUID
HYDROCARBON BY ADSORPTION ON Ni-Cu ADSORBENTS**

Mr. PICHAN TANTICHAIPAKORN

**A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Engineering in Chemical Engineering**

Department of Chemical Engineering

Graduate School

Chulalongkorn University

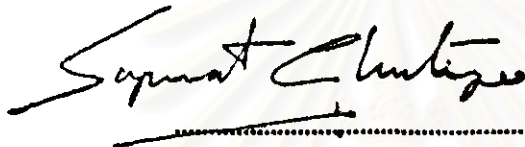
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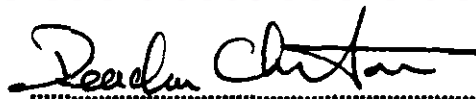
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พิมพ์ฉบับบกทศโดยวิทยาลัยอาชีวศึกษาในกรอบสี่เหลี่ยมนี้เพียงแผ่นเดียว

พินิจ ดันดิชัยปกรณ : การกำจัดสารประกอบของปรอทและอาร์เซนิกออกจากไฮโดรคาร์บอนเหลว
โดยการดูดซับบนตัวดูดซับนิกเกิลคอปเปอร์ (REMOVAL OF MERCURY AND ARSENIC
COMPOUNDS FROM LIQUID HYDROCARBON BY ADSORPTION ON Ni-Cu
ADSORBANTS) อ.ที่ปรึกษา : ดร.เจดศักดิ์ ไชยคุณา , 113 หน้า. ISBN 974-639-760-5

การวิจัยครั้งนี้ เป็นการศึกษาการกำจัดสารประกอบของอาร์เซนิกและปรอทจากไฮโดรคาร์บอนเหลวบน
ตัวดูดซับ ทำการทดลองที่ความดันบรรยากาศ และ อุณหภูมิ 30 50 และ 70 องศาเซลเซียส ใช้เมอคิวริกคลอไรด์และ
อาร์เซนิกออกไซด์เป็นตัวแทนสารประกอบปรอทและอาร์เซนิกในรูปของโลหะอินทรีย์และไฮโดรฟิโนลเมอคิวรีและ
ฟิโนลอาร์ซีนออกไซด์เป็นตัวแทนสารประกอบปรอทและอาร์เซนิกในรูปของโลหะอินทรีย์ สารประกอบของปรอททั้งสอง
ชนิดถูกละลายในโทลูอินซึ่งเป็นสารตั้งต้นเป็นตัวแทนของไฮโดรคาร์บอนเหลวโดยความเข้มข้นเริ่มต้นของปรอทคือ
1 ส่วนในล้านส่วนและความเข้มข้นเริ่มต้นของอาร์เซนิกเท่ากับ 10 ส่วนในล้านส่วนตัวดูดซับที่ใช้คือใช้ อะลูมินา นิกเกิล
ออกไซด์บนอะลูมินา คอปเปอร์ออกไซด์บนอะลูมินา และ นิกเกิลคอปเปอร์บนอะลูมินา

ผลที่ได้แสดงว่าประสิทธิภาพการดูดซับของสารประกอบของปรอทและอาร์เซนิกขึ้นกับอุณหภูมิ
ประสิทธิภาพในการดูดซับสารประกอบของปรอทและอาร์เซนิกเพิ่มขึ้นตามลำดับดังนี้ ตัวดูดซับคอปเปอร์ > ตัวดูดซับ
นิกเกิล > ตัวดูดซับอะลูมินา โดยตัวดูดซับสามารถดูดซับเมอคิวริกคลอไรด์ได้ดีกว่าไฮโดรฟิโนลเมอคิวรี โดยพบว่า
ฟิโนลอาร์ซีนออกไซด์จะดูดซับบนตัวดูดซับคอปเปอร์ก่อนตัวเป็นคอปเปอร์อาร์เซไนต์

สถาบันวิทยบริการ
จุฬาลงกรณ์มหาวิทยาลัย

ภาควิชา วิศวกรรมเคมี
สาขาวิชา วิศวกรรมเคมี
ปีการศึกษา 2541

ลายมือชื่อนิสิต
ลายมือชื่ออาจารย์ที่ปรึกษา
ลายมือชื่ออาจารย์ที่ปรึกษาร่วม

8971208621 MAJOR CHEMICAL ENGINEERING DEPARTMENT

KEY WORD: ARSENIC COMPOUNDS/ MERCURY COMPOUNDS/ ADSORPTION

PICHAN TANTICHAIPAKORN: REMOVAL OF MERCURY AND ARSENIC COMPOUNDS FROM LIQUID HYDROCARBON BY ADSORPTION ON Ni-Cu ADSORBENTS.

THESIS ADVISOR: JIRDSAK TSCHAIKUNA, Ph.D. 113 pp. ISBN 974-639-760-5.

Removal of arsenic and mercury compounds from liquid hydrocarbon was investigated.

The experiments were conducted at atmospheric pressure and at temperatures of 30°C, 50°C and 70°C. Mercuric chloride, diphenylmercury, arsenic oxide and phenylarsine oxide are used to represent ionic mercury, organic mercury, ionic arsenic and organic arsenic. Arsenic and mercury compounds were dissolved in toluene to obtain solutions containing 10 ppm of arsenic and 1 ppm of mercury. The adsorbents were alumina, NiO/Al₂O₃, CuO/Al₂O₃ and Ni-Cu/Al₂O₃ prepared dry impregnation techniques.

The results showed that removal of arsenic and mercury compounds depended on temperature. Adsorption efficiency of adsorbents for removal of both mercury and arsenic compounds increases in the following order: copper > nickel > alumina. Mercuric chloride can be removed more efficiency than diphenylmercury. Phenylarsine oxide is adsorbed on copper and formed copper arsenide (Cu₂As).

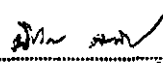
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ลายมือชื่อนิสิต..... 

ลายมือชื่ออาจารย์ที่ปรึกษา..... 

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