

การสังเคราะห์คำศัพท์[4]อาร์อินสำหรับการแยกแอนไอออน

นายธีรภัทร์ ไรจน์สังจะกุล

ศูนย์วิทยทรัพยากร

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SYNTHESIS OF CALIX[4]ARENES FOR ANION SEPARATIONS



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พิมพ์ต้นฉบับบทคัดย่อวิทยานิพนธ์ภายในกรอบสี่เหลี่ยมนี้เพียงแผ่นเดียว

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สามารถเตรียมสารประกอบใหม่ 2 ตัว 25,27-[2,2'-[(1,9-(2,5,8-triammonium)nonylene)-2,2'-
diphenoxy]diphenyl]-*p*-*tert*-butylcalix[4]arene (5c) และ 25,27-[2,2'-[(1,9-(2,5,8-hexamethylammonium)
nonylene)-2,2'-diphenoxy]diphenyl]-*p*-*tert*-butylcalix[4]arene (7b) สารประกอบ (5c) เตรียมได้จากการ
ไฮโดรจีเนชันอนุพันธ์ซิฟเบส ด้วยโซเดียมโบโรไฮไดรด์ แล้วตามด้วยการเติมกรดไฮโดรคลอริก สามารถพิสูจน์
เอกลักษณ์ของ (5c) โดยเทคนิคทาง ¹H-NMR สเปกโตรสโกปี, แมสสเปกโตรเมตรี และ การวิเคราะห์
ปริมาณธาตุองค์ประกอบ สารประกอบ (7b) เป็นอนุพันธ์ของเมทิลแอมโมเนียมของ (5c) ซึ่งเตรียมได้โดย
การเมทิลเลทรูปเบสของ (5c) โดยการทำปฏิกิริยากับเมทิลไอโอดีนและไดเมทิลซัลเฟต สามารถพิสูจน์
เอกลักษณ์ของ (7b) โดยเทคนิคทาง ¹H-NMR สเปกโตรสโกปี และ แมสสเปกโตรเมตรี เมื่อนำสารประกอบ
(5c), อนุพันธ์แอมโมเนียมที่มีไนโตรเจน 3 อะตอม, (7a), อนุพันธ์เมทิลที่มีไนโตรเจน 2 อะตอม และ (7b),
อนุพันธ์เมทิลที่มีไนโตรเจน 3 อะตอม มาศึกษาการจับกับ ไนเตรทไอออน และ คาร์บอเนตไอออน โดย
เทคนิคทาง ¹H-NMR สเปกโตรสโกปี พบว่า สารประกอบทั้งสามจับกับ คาร์บอเนตไอออน ได้ดีกว่า ไนเตรท
ไอออน และ สารประกอบ (5c) สามารถจับได้ดีกว่า สารประกอบ (7a) และ (7b) โดยการจับเป็นแบบ 1 : 1
(LA) สารประกอบ (5c) แสดงการเลือกจดจำ คาร์บอเนตไอออนได้ดีกว่าไนเตรทไอออน

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

ภาควิชา ๕๕๖
สาขาวิชา ๕๕๖
ปีการศึกษา ๒๕๕๙

ลายมือชื่อนิสิต ธีรภัทร์ โรจน์สัจจะกุล
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Two novel compounds, 25,27-[2,2'-[(1,9-(2,5,8-triammonium)nonylene)-2,2'-diphenoxy]diethyl]-*p*-*tert*-butylcalix[4]arene (5c) and 25,27-[2,2'-[(1,9-(2,5,8-hexamethylammonium)nonylene)-2,2'-diphenoxy]diethyl]-*p*-*tert*-butylcalix[4]arene (7b) were synthesised. (5c) was synthesized by hydrogenation its Schiff base analog with sodium borohydride, followed by acidifying the product with hydrochloric acid to yield an ammonium derivative of *p*-*tert*-butylcalix[4]arene. The compound was characterized by ¹H-NMR spectroscopy, mass spectrometry and elemental analysis. (7b) was a methylammonium derivative of (5c), prepared by methylating the basic form of (5c) with methyl iodide and dimethyl sulfate and characterized by ¹H-NMR spectroscopy and mass spectrometry. Complexation studies with nitrate and carbonate ions by ¹H-NMR spectroscopy technique were performed on (5c) ammonium derivative of three nitrogen sites, (7a) methylated derivative of two nitrogen sites and (7b) methylated derivative of three nitrogen sites. In all cases, the extent of interaction of carbonate ion was greater than nitrate ion. The methylammonium derivatives (7a) and (7b) could bind the anions to a lesser extent than (5c). The complex was observed to be 1 : 1 type, LA. (5c) showed a recognition for carbonate over nitrate ion.

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ภาควิชา.....

สาขาวิชา.....

ปีการศึกษา..... ๒๕๖๕

ลายมือชื่อนิสิต.....

ลายมือชื่ออาจารย์ที่ปรึกษา.....

ลายมือชื่ออาจารย์ที่ปรึกษาร่วม.....

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Teerapat Rojsajakul

ศูนย์วิจัยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

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