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ที่พื้นผิวของอะลูมิเนียมไฮดรอกไซด์เจล จากแหล่งผลิตต่าง ๆ



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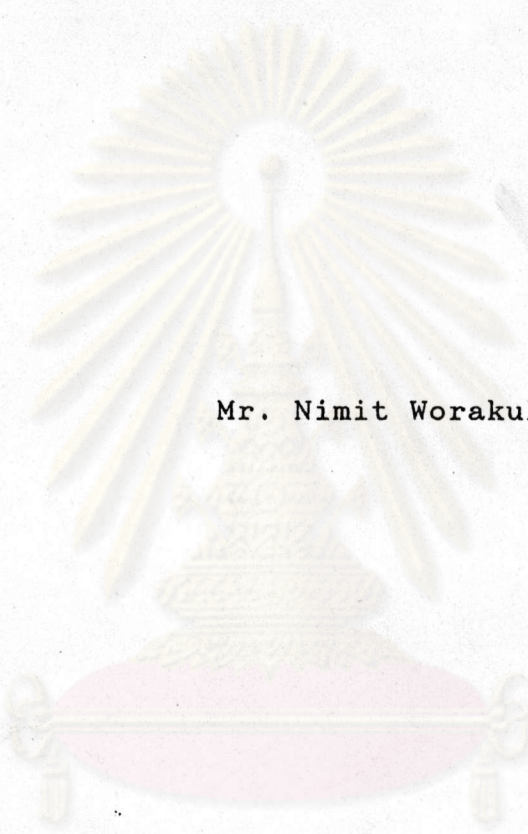
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COMPARATIVE EVALUATION OF PHYSICOCHEMICAL
PROPERTIES AND SURFACE ADSORPTION OF ALUMINUM
HYDROXIDE GEL FROM VARIOUS SOURCES



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พิมพ์ต้นฉบับบทคัดย่อ ให้นักนิพนธ์ภายในวารสารนี้เพียงฉบับเดียว

นิมิตร วรกุล : การประเมินผลเปรียบเทียบคุณสมบัติทางฟิสิกส์-เคมี และการดูดซับที่พื้นผิวของ อะลูมิเนียมไฮดรอกไซด์เจล จากแหล่งผลิตต่างๆ (COMPARATIVE EVALUATION OF PHYSICO-CHEMICAL PROPERTIES AND SURFACE ADSORPTION OF ALUMINUM HYDROXIDE GEL FROM VARIOUS SOURCES) อ.ที่ปรึกษา : ศศ.ดร.ไกรสิทธิ์ อัมพรายน, 150 หน้า ISBN 974-573-709-4

การศึกษาความคงตัวของอะลูมิเนียมไฮดรอกไซด์เจล จากแหล่งผลิตต่างๆ และกระบวนการผลิตที่แตกต่างกัน โดยเปรียบเทียบคุณสมบัติทางฟิสิกส์-เคมี การศึกษาคุณสมบัติทางฟิสิกส์โดยใช้ transmission electron microscope, IR spectroscopy, x-ray diffraction และพีเอช จากผลการทดลองพบว่า เจล 1,3-7 เมื่อเริ่มต้นเป็น aluminum hydroxycarbonate ในรูปอสัณฐาน ส่วนเจล 2 จะอยู่ในลักษณะของ dawsonite (sodium aluminum hydroxycarbonate) สำหรับคุณสมบัติทางเคมีของ เจลทั้งหมดจะประเมินผลโดยใช้วิธี preliminary antacid test, acid neutralizing capacity test, reaction velocity test, hydroxide to aluminum ratio และ Point of Zero Charge

ผลในระหว่างเก็บรักษาของเจลทั้งหมดที่อุณหภูมิห้อง และ 45°C แสดงให้เห็นแนวโน้มของการเปลี่ยนแปลงจากรูปอสัณฐานไปเป็นรูปผลึก ลำดับความคงตัวที่อุณหภูมิห้องมีดังต่อไปนี้ เจล 1 > เจล 6 > เจล 5 > เจล 7 > เจล 2 > เจล 3 > เจล 4 ส่วนที่ 45°C เจล 1 > เจล 2 > เจล 6 > เจล 4 > เจล 3 > เจล 5 > เจล 7

ซอร์บิโตนมีผลช่วยเพิ่มความคงตัวของอะลูมิเนียมไฮดรอกไซด์เจลให้ดีขึ้น แต่จะมีผลให้ความเร็วในการทำปฏิกิริยาลดลง ดังนั้นความเข้มข้นของซอร์บิโตนที่จะใช้ต้องมีปริมาณเหมาะสม สำหรับการศึกษาดูดซับสารอนอมที่พื้นผิว พบว่า เอสเทอร์ของพาราเบน จะถูกดูดซับน้อยลงเมื่อพีเอชของอะลูมิเนียมไฮดรอกไซด์ที่แขวนตะกอนมีค่าเพิ่มขึ้น ส่วนการดูดซับ chlorhexidine gluconate จะให้ผลตรงกันข้าม



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ลายมือชื่ออาจารย์ที่ปรึกษาร่วม

พิมพ์ต้นฉบับบทคัดย่อ วิทยานิพนธ์ภายในกรอบสี่เหลี่ยมนี้เพียงแผ่นเดียว

NIMIT WORAKUL : COMPARATIVE EVALUATION OF PHYSICOCHEMICAL PROPERTIES AND SURFACE ADSORPTION OF ALUMINUM HYDROXIDE GEL FROM VARIOUS SOURCES
THESIS ADVISOR : ASSIS. PROF. KAISRI UMPRAYN, Ph.D., 150 pp. ISBN 974-578-709-4

The stability of aluminum hydroxide gel from various sources and processes were studied by comparing the physicochemical properties. The physical properties were determined by transmission electron microscope, IR spectroscopy, X-ray diffraction and pH measurement. These results showed that, at initial condition, gels 1, 3-7 and gel 2 were amorphous aluminum hydroxycarbonate and dawsonite (sodium aluminum hydroxycarbonate), respectively. The chemical properties of all gels were also evaluated by mean of preliminary antacid test, acid neutralizing capacity test, reaction velocity test, hydroxide to aluminum ratio and Point of Zero Charge.

During aging at ambient temperature and at 45 °C, the results indicated that morphology of all gels had tendency to change from amorphous form to crystalline form. At ambient temperature the order of changing was Gel 1 > Gel 6 > Gel 5 > Gel 7 > Gel 2 > Gel 3 > Gel 4. In the case of aging at 45 °C the order was Gel 1 > Gel 2 > Gel 6 > Gel 4 > Gel 3 > Gel 5 > Gel 7.

Sorbitol showed stabilizing effect however the decrease in reaction velocity was observed. So that, the optimum concentration of sorbitol could be employed. For surface adsorption studies, the adsorption of esters of parabens were decreased as the pH of the suspension increased. In contrast, the reverse effect was found for the case of chlorhexidine gluconate.

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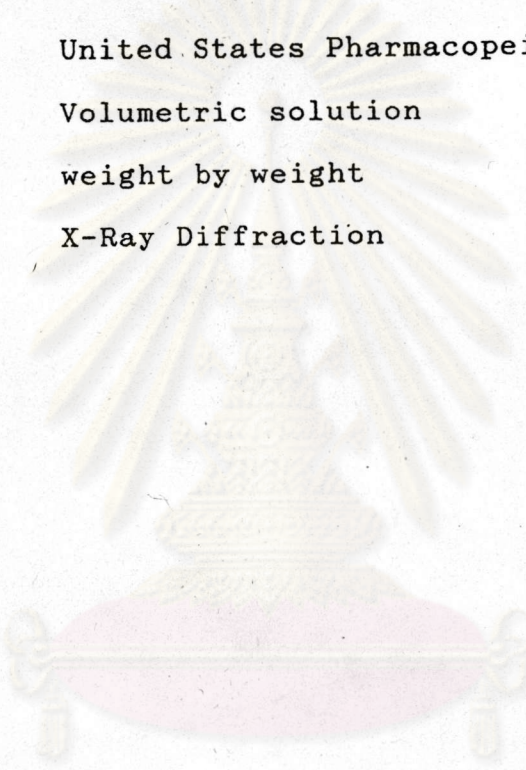
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ABBREVIATIONS

A°	Angstrom
°C	degree celsius
cm	centimeter
cps	cycle per second
g	gram
GMP	Good Manufacturing Practice
HPLC	High Performance Liquid Chromatography
i.e.	For example
IR	Infrared
Ka	dissociation constant
kV	kilovolt
ln	natural logarithm
log	logarithm
M	Molarity
mamp	milliamperere
mEq	milliequivalence
mg	milligram
min	minute
ml	milliliter
mm	millimeter
um	micrometer
N	Normality
OTC	Over The Counter
PZC	Point of Zero Charge

ABBREVIATIONS (cont.)

rpm	revolution per minute
r^2	coefficient of determination
TS	Test solution
USP	United States Pharmacopeia
VS	Volumetric solution
w/w	weight by weight
XRD	X-Ray Diffraction



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