

ผลของแรงดกวัตต์ต่อการแตกตัวของยาเม็ดที่ประกอบด้วย

สารช่วยแตกตัวที่มีกลไกต่างกัน



นาย จักรี ทองเปล่งศรี

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาดำเนินการตามหลักสูตรปริญญาเภสัชศาสตรมหาบัณฑิต

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EFFECT OF COMPRESSIONAL FORCE ON DISINTEGRATION OF TABLETS
CONTAINING DISINTEGRANTS OF DIFFERENT MECHANISMS



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จักรี ทองเปล่งศรี : ผลของแรงตอกอัดต่อการแตกตัวของยาเม็ดที่ประกอบด้วย สารช่วย
แตกตัวที่มีกลไกต่างกัน (EFFECT OF COMPRESSIONAL FORCE ON DISINTEGRATION OF
TABLETS CONTAINING DISINTEGRANTS OF DIFFERENT MECHANISMS) อ.ที่ปรึกษา :
อ.ศิริศักดิ์ คำรังพิศุทธิกุล และ ผศ.ดร.กาญจน์พิมล ฤทธิเดช, 191 หน้า.

การศึกษาทดลองผลของแรงตอกอัดต่อการแตกตัวของยาเม็ดที่เตรียมจาก dicalcium
phosphate dihydrate และ α -lactose monohydrate ซึ่งประกอบด้วยสารช่วยแตกตัวที่มีกลไก
ต่างกัน 4 ชนิดและในปริมาณที่ต่างกัน คือ sodium starch glycolate, cross linked
polyvinylpyrrolidone, microcrystalline cellulose และ corn starch หลังจากที่ถูกตอก
ด้วยแรงตอกอัดที่ต่างกัน 4 ระดับคือ 1200, 1800, 2400 และ 3000 ปอนด์กิโลปาร์เม็นผลโดย
การหาเวลาที่ใช้ในการแตกตัว การดูดน้ำและการดูดความชื้น

จากผลการทดลองพบว่าแรงตอกอัดมีผลต่อการแตกตัวของยาเม็ดที่เตรียมขึ้นเป็น 2 ลักษณะคือ
ลักษณะแรกเวลาที่ใช้ในการแตกตัวลดลงเมื่อแรงตอกอัดเพิ่มขึ้น กรณีนี้จะเกิดกับยาเม็ดที่เตรียมจาก
dicalcium phosphate dihydrate และ α -lactose monohydrate ที่มี cross linked
polyvinylpyrrolidone และ corn starch เป็นสารช่วยแตกตัว และยาเม็ดที่เตรียมจาก
 α -lactose monohydrate ที่มี sodium starch glycolate เป็นสารช่วยแตกตัวอีกลักษณะหนึ่ง
เวลาที่ใช้ในการแตกตัวเพิ่มขึ้นเมื่อแรงตอกอัดเพิ่มขึ้น กรณีนี้จะเกิดขึ้นกับยาเม็ดที่เตรียมจาก dicalcium
phosphate dihydrate ที่มี microcrystalline cellulose เป็นสารช่วยแตกตัวและยาเม็ดที่
เตรียมจาก dicalcium phosphate dihydrate ที่มี sodium starch glycolate เป็นสารช่วย
แตกตัวซึ่งผลที่ได้สามารถอธิบายได้โดยอาศัยกลไกการดูดน้ำที่ต่างกันของยาเม็ด

จากสมการของ Washburn ซึ่งใช้อธิบายการดูดน้ำเข้ายาเม็ดก็พบว่ามียุปัจจัยอยู่ 3 ประการที่มี
ผลต่อการการแตกตัวของยาเม็ดที่ประกอบด้วยสารช่วยแตกตัวที่มีกลไกต่างกันคือ ความหนืดของของเหลวที่
ซึมเข้าในยาเม็ด ขนาดและจำนวนของช่องว่างในยาเม็ดและสภาวะผิวหน้าของยาเม็ด

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

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ลายมือชื่ออาจารย์ที่ปรึกษา
0

CHAKRI THONGPLENGSRE : EFFECT OF COMPRESSIONAL FORCE ON DISINTEGRATION OF TABLETS CONTAINING DISINTEGRANTS OF DIFFERENT MECHANISMS. THESIS ADVISOR : LECTURER SIRISAK DUMRONGPISUDTHIGUL AND ASSIST. PROF. GARNPIMOL C. RITTHIDEJ, 191 PP.

The effect of compressional force on the disintegration time of tablets prepared from dicalcium phosphate dihydrate and α -lactose monohydrate containing four disintegrants of differing disintegration mechanisms, sodium starch glycolate, cross linked polyvinylpyrrolidone, microcrystalline cellulose and corn starch in varying percentage were studied. Tablets were compressed with instrumented single punch machine at four different forces 1200, 1800, 2400 and 3000 pounds and evaluated for disintegration time, water penetration and moisture sorption.

The results show that the effect of compressional force on disintegration time can be revealed into two types of disintegration behavior. The first type, disintegration time decreased with an increase in compressional force of tablets prepared from dicalcium phosphate dihydrate and α -lactose monohydrate containing cross linked polyvinylpyrrolidone and corn starch and tablets prepared from α -lactose monohydrate containing sodium starch glycolate. The second type, disintegration time increased with an increase in compressional force of tablets prepared from dicalcium phosphate dihydrate and α -lactose monohydrate containing microcrystalline cellulose and tablets prepared from dicalcium phosphate dihydrate tablets containing sodium starch glycolate. These results are discussed in terms of the differing mechanisms where these substances act during water penetration.

Application of Washburn's equation to water penetration can provide a quality profile of disintegration that involved viscosity, pore size, surface condition.

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ลายมือชื่อนิติ ศกน. นวอนฉน
ลายมือชื่ออาจารย์ที่ปรึกษา D.C. Ritthidij



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ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

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

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