# Pengaruh metode loading obat terhadap mekanisme disolusi amoksisilin trihidrat terenkapsulasi pada hidrogel kitosan-poli (n-vinilpirrolidon) full-ipn sebagai matriks sistem pengantar obat mengapung = Effect of drug loading method on drug dissolution mechanism of amoxicillin trihydrate encapsulated in chitosan-poly (n-vinylpyrrolidone) full-ipn hydrogel as a floating drug delivery system matrices

Ahmad Ichsan Baihaqi, author



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Abstrak

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Amoksisilin trihidrat perlu dienkapsulasi pada sediaan yang termodifikasi untuk meningkatkan bioavailabilitasnya. Pada penelitian ini, studi pengaruh metode loading obat terhadap mekanisme disolusi obat pada hidrogel kitosan-poli N-vinilpirrolidon full-IPN dengan agen pembentuk pori CaCO3 telah berhasil dilakukan. Nilai efisiensi enkapsulasi in situ dan post loading berturut-turut sebesar 93 dan 75 . Sedangkan, nilai disolusinya sebesar 94 dan 98 berturut-turut untuk in situ loading dan post loading. Data uji disolusi dimasukkan ke dalam model orde-nol, orde-satu, Higuchi dan Korsmeyer-Peppas untuk mengetahui kinetika dan mekanisme disolusinya. Metode in situ loading mengikuti model orde-satu R2 = 0,9772 , sedangkan metode post loading mengikuti model Higuchi R2 = 0,9880 . Pada model Korsmeyer-Peppas, didapatkan mekanisme disolusi in situ loading berupa difusi Fickian n = 0,4024 , sedangkan post loading berupa gabungan difusi dan erosi n = 0,5532 . Pada hasil mikroskop optik terlihat bahwa permukaan hidrogel saat sebelum dan sesudah uji disolusi pada kedua metode loading menunjukkan perubahan menjadi lebih kasar. Pada hasil SEM terlihat bahwa bagian permukaan dan melintang dari hidrogel dengan metode post loading terbentuk pori dan saluran pori, baik sebelum dan sesudah uji disolusi. Sedangkan, dengan metode in situ loading pada bagian mendatar dan melintang terlihat pori dan saluran pori hanya setelah dilakukan uji disolusi.
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ABSTRACT<br>
Amoxicillin trihydrate needs to be encapsulated with a modified matrice to increase its bioavailability. In this study, the effect of drug loading methods on drug dissolution mechanism from chitosan poly N vinylpirrolidone hydrogel with CaCO3 as the pore forming agent has been studied. It was found that the encapsulation efficiency of in situ and post loading methods were 93 and 75 , respectively. The dissolution values were 94 and 98 , respectively for in situ and post loading. The dissolution test data was incorporated into zero order, first order, Higuchi and Korsmeyer Peppas models to determine the kinetic and the mechanism of the drug dissolutions. The in situ loading method followed first order model R2 0,9772 , while the post loading method followed Higuchi model R2 0,9880 . Based on Korsmeyer Peppas model, the dissolution mechanism of in situ loading was Fickian diffusion n 0,4024 , while post loading was a combination of diffusion and erosion n 0,5532 . In the optical microscope images, the hydrogel surface at the time before and after the dissolution test, on both loading methods, shows a change, it becomes rougher. In the SEM images showed that the surface and cross section of the the post loading method formed pores and pore channels, both before and after the dissolution test. Meanwhile, on the surface and the cross section

of in situ loading method has pores and pore channels only after dissolution test.