

INTISARI

FEBRIANI, T.W., 2014, OPTIMASI PROPORSI KOMBINASI MATRIKS KARBOPOL 940P DAN HIDROKSI PROPIL METIL SELULOSA K15M PADA SEDIAAN TABLET *SUSTAINED RELEASE* KAPTOPRIL SECARA *SIMPLEX LATTICE DESIGN*, SKRIPSI, FAKULTAS FARMASI, UNIVERISTAS SETIA BUDI, SURAKARTA.

Kaptopril merupakan obat hipertensi yang mempunyai $t_{1/2}$ pendek yaitu 2 – 3 jam, sehingga perlu dibuat dalam suatu bentuk sediaan tablet *sustained release* agar diperoleh konsentrasi efektif. Penggunaan matriks karbopol 940P dan HPMC K15M sebagai matriks pada sediaan tablet *sustained release* kaptopril dengan metode pembuatan tablet secara granulasi basah dimaksudkan untuk memperlambat pelepasan obat. Perbandingan proporsi dari kedua matriks ini kemudian dicari formula optimumnya untuk mendapatkan tablet *sustained release* yang memenuhi persyaratan serta mengikuti pelepasan obat menurut kinetika orde nol.

Interaksi antara matriks karbopol 940P dan HPMC K15M meningkatkan waktu alir dan kekerasan, serta menurunkan nilai kerapuhan dan pelepasan obat. Formula optimum tablet *sustained release* kaptopril dapat diperoleh dari persamaan *simplex lattice design* berdasarkan parameter waktu alir, kerapuhan, Q_{60} , Q_{360} , dan DE_{360} . Berdasarkan program *software Design Expert versi 8.0.6.1* formula optimum pada penelitian ini diperoleh pada formula dengan kombinasi 30,25 mg karbopol 940P dan 39,75 mg HPMC K15M.

Kinetika pelepasan obat pada formula optimum yang didapatkan dianalisis dengan menggunakan profil pelepasan menurut kinetika orde nol, orde satu, dan model Higuchi, diperoleh nilai koefisien korelasi masing – masing sebesar 0,9566, 0,8821, dan 0,9929. Hasil yang diperoleh menyimpulkan bahwa pelepasan obat formula optimum mengikuti kinetika orde nol dan profil pelepasan obat mengikuti mekanisme difusi.

Kata kunci: kaptopril, karbopol 940P, HPMC K15M, *Design Expert*.

ABSTRACT

FEBRIANI, T.W., 2014, OPTIMIZATION OF PROPORTION AND COMBINED MATRIX OF CARBOPOL 940P AND HYDROXY PROPYL METHYL CELLULOSE K15M ON CAPTOPRIL *SUSTAINED RELEASE* TABLET BY *SIMPLEX LATTICE DESIGN*, THESIS, FACULTY OF PHARMACY, SETIA BUDI UNIVERSITY, SURAKARTA.

Captopril is a hypertension drug that has a short $t_{1/2}$ i.e. 2-3 hours, so it needs to be made in a sustained release tablet dosage form in order to obtain an effective concentration. The use of matrix carbopol 940P and HPMC K15M as a matrix on captopril sustained release tablet dosage method is wet granulation tableting intended to slow drug release. Comparison of the proportions of the two matrices are then used to find the optimum formula for getting sustained release tablets which meet the requirements and follow the drug release according to zero order kinetics.

Interaction between matrix carbopol 940P and HPMC K15M improved flow time and hardness, and lowering the value of the friability and drug release. Optimum formula of captopril sustained release tablets could be obtained from equation of simplex lattice design based on flow time parameters, friability, Q_{60} , Q_{360} , and DE_{360} . According to Design Expert software program version 8.0.6.1 optimum formula in this study were obtained on a formula with a combination of carbopol 940P 30.25 mg and 39.75 mg HPMC K15M.

Kinetics of drug release at the optimum formula obtained were analyzed using zero-order kinetics, first order, and Higuchi models, obtained correlation coefficient of each 0.9566, 0.8821, and 0.9929. The results concluded that the optimum formula of drug release followed zero order kinetics and drug release profile followed the diffusion mechanism.

Keywords: captopril, carbopol 940P, HPMC K15M, *Design Expert*.