ABSTRAK

Piroksikam merupakan salah satu *antiinflamasi nonsteroid (AINS)* yang digunakan untuk terapi penyakit inflamasi sendi seperti *rheumatoid arthritis*, *osteoarthritis*. Tablet *Fast Disintegrating Tablet* (FDT) piroksikam dikembangkan untuk membantu geriatrik yang mengalami kesulitan dalam menelan obat untuk memberikan efek yang cepat. Penelitian ini bertujuan untuk memperoleh formula optimum dan konsentrasi optimal sediaan FDT piroksikam dengan *croscarmellose sodium* dan *sodium starch glycolate* secara *simplex lattice design*.

Penelitian ini dilakukan dengan *simplex lattice design* dengan faktor optimasi perbandingan *croscarmellose sodium* dan *sodium starch glycolate*, sehingga didapatkan 3 rancangan formula yaitu F1 *sodium starch glycolate* 100%, F2 *sodium starch glycolate* 50% : *croscarmellose sodium* 50%, dan F3 *croscarmellose sodium* 100%. Setiap formula dilakukan uji sifat fisik tablet meliputi uji kekerasan, uji kerapuhan, uji waktu hancur, uji waktu pembasahan, dan uji rasio absorbsi air. Data yang terdistribusi normal dibandingkan berdasarkan teori dan dilakukan analisis statistik menggunakan *two-way* ANOVA sedangkan data yang tidak terdistribusi normal dilakukan pengujian alternatif yaitu uji *Wilcoxon* dengan IBM SPSS *Statistics* 27.

Hasil penelitian ini menunjukkan interaksi *croscarmellose sodium* dan *sodium starch glycolate* berpengaruh terhadap sifat fisik tablet. Karakter sifat fisik yang dihasilkan berdasarkan pedekatan *simplex lattice design* dengan *Design Expert* versi 13 meliputi kekerasan tablet 2,227 kp, kerapuhan tablet 0,9%, waktu hancur tablet 14,771 detik, waktu pembasahan 36,290 detik, dan rasio absorbsi air pada tablet 2,720% dengan nilai *desirability* 0,548. Diperoleh formula optimum yaitu pada formula 1. Pendekatan secara *simplex lattice design* dengan *Design Expert* versi 13 menunjukkan konsentrasi optimal *croscarmellose sodium* dan *sodium starch glycolate* yaitu sebesar 1,9068% : 98,0932%.

Kata kunci: piroksikam, *fast disintegrating tablet*, *croscarmellose sodium*, *sodium starch glycolate*, *simplex lattice design*.

ABSTRACT

Piroxicam is a non-steroidal anti-inflammatory drug (NSAID) that is used to treat inflammatory joint diseases such as rheumatoid arthritis and osteoarthritis. Piroxicam Fast Disintegrating Tablets (FDT) tablets were developed to help geriatrics who have difficulty swallowing drugs to give them a quick effect. This study uses a simplex lattice design to obtain the optimum formula composition of piroxicam FDT with croscarmellose sodium and sodium starch glycolate.

This research was conducted using a simplex lattice design with an optimization factor for the comparison of croscarmellose sodium and sodium starch glycolate so that 3 formula designs were obtained, namely F1 sodium starch glycolate 100%, F2 sodium starch glycolate 50% : croscarmellose sodium 50%, and F3 croscarmellose sodium 100%. Each formula was tested for the physical properties of tablets including hardness test, settlement test, disintegration time test, wetting time test, and air absorption ratio test. Data that were normally distributed were compared based on theory and statistical analysis was performed using two-way ANOVA while data that was not normally distributed was tested using an alternative test, namely the Wilcoxon test with IBM SPSS Statistics 27.

The results of this study showed that the interaction of croscarmellose sodium and sodium starch glycolate had an effect on the physical properties of the tablets. The resulting physical properties based on the simplex lattice design approach with Design Expert version 13 include tablet hardness of 2,227 kp, tablet friability of 0.9%, tablet disintegration time of 14,771 seconds, wetting time of 36,290 seconds, and the ratio of water absorption in tablets is 2,720% with a desirability value of 0.548. The optimum formula is obtained in formula 1. The simplex lattice design approach with Design Expert version 13 shows the optimal concentration of croscarmellose sodium and sodium starch glycolate, namely 1.9068% : 98.0932%.

Keywords: *piroxicam, fast disintegrating tablets, croscarmellose sodium, sodium starch glycolate, simplex lattice design.*