

INTISARI

ZULMI, M.U., 2017, PENGARUH SISTEM NANOKOMPOSIT NA-MONTMORILLONIT TERPILAR KITOSAN BOBOT MOLEKUL SEDANG TERHADAP FOTOSTABILITAS NIFEDIPIN, SKRIPSI, FAKULTAS FARMASI, UNIVERSITAS SETIA BUDI, SURAKARTA.

Nifedipin mudah terdegradasi ketika terpapar oleh sinar ultraviolet (uv) menjadi derivat nitrosofenilpiridin dan nitrofenilpiridin. Sistem nanokomposit Na-montmorillonit (Na-MMT) terpilari kitosan bobot molekul sedang merupakan sistem nano enkapsulasi nifedipin dalam basal spacing Na-MMT. Penelitian ini bertujuan mengetahui pengaruh interkalasi kitosan terhadap sistem Na-montmorillonit terpilari kitosan bobot molekul sedang terhadap kinetika fotostabilitas nifedipin.

Nifedipin, nanokomposit Na-montmorillonit dengan variasi interkalasi kitosan 2%, 3%, dan 4%, dipaparkan pada sinar uv pada 254 nm. Setiap interval waktu tertentu sampel diambil dan dianalisa secara kromatografi cair kinerja tinggi. Penentuan kinetika degradasi menggunakan grafik model orde nol, orde satu, orde dua, dan berdasarkan nilai koefisien determinasi (R^2) dan root mean square error (RMSE). Hasil dibandingkan secara statistik dengan uji ANOVA menggunakan taraf kepercayaan 95%.

Sistem nanokomposit meningkatkan fotostabilitas nifedipin. Degradasi nifedipin sebesar 40%, nifedipin sistem nanokomposit 15-30%. Nifedipin memiliki kinetika orde satu, nilai R^2 0,974 dan RMSE 1,079. Nifedipin sistem nanokomposit kinetika orde dua, nilai R^2 0,961 dan RMSE 0,057. Sistem nanokomposit merubah kinetika orde reaksi nifedipin.

Kata kunci : Nifedipin, Sistem nanokomposit, Kinetika dan orde reaksi, Fotostabilitas.

ABSTRACT

ZULMI, M.U., 2017, THE INFLUENCE OF NANOCOMPOSITE NA-MONTMORILLONITE SEPARATED MOLECULAR WEIGHT SYSTEMS LOOKS ON PHOTOSTABILITY NIFEDIPIN, THESIS, FACULTY OF PHARMACY, SETIA BUDI UNIVERSIT, SURAKARTA.

Nifedipine is easily degraded when exposed to ultraviolet (uv) rays into nitrophenylpyridine and nitrophenylpyridine derivatives. The nanocomposite of nifedipine in a medium molecular weight chitosan intercalated Na-montmorillonite (Nif-MMWC-Na-MMT) system is a nifedipine nano-encapsulation system in the basal spacing of Na-MMT. The objective of this research was to determine the effect of chitosan concentration in the nanocomposite of Nif-MMWC-Na-MMT system on nifedipine photo-stability kinetics.

Nifedipine and nanocomposites of Nif-MMWC-Na-MMT with chitosan variation of 2%, 3%, and 4%, respectively, exposed to uv rays at 254 nm. Each time interval of a sample was withdrawn during 2 hours and analyzed by a high performance liquid chromatography. The determination of degradation kinetics using a fitting model of zero order, first order, and second order model it was depended on the goodness of fit i.e. coefficient of determination and root mean square error. Results were compared statistically with ANOVA using 95% confidence level.

The nanocomposite system successfully enhanced the nifedipine photo-stability. Nifedipine lost 40% of its concentration mean while nanocomposite systems degraded 15-30% of nifedipine during the exposure. Nifedipine followed the first-order kinetics, although nanocomposite systems followed the second-order kinetics. The nanocomposite system altered a kinetics order on the nifedipine degradation.

Keywords: Nifedipine, Nanocomposite System, Kinetics and reaction order, Photo-stability.