PREPARASI SISTEM PENGHANTAR OBAT AMOKSISILIN BERBASIS NANOKRISTAL SELULOSA BAKTERI

SKRIPSI

diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Sains
dalam bidang Kimia

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ABSTRAK

Amoksisilin merupakan antibiotik yang paling umum digunakan melalui pemberian oral untuk pengobatan berbagai infeksi. Tablet amoksisilin konvensional memiliki waktu paruh dan waktu kontak yang singkat dengan tempat kerja obat sehingga memiliki efikasi terapeutik yang rendah. Penggunaan sistem penghantar obat (*Drug Delivery System*) untuk menargetkan obat ke bagian tubuh dalam waktu dan jumlah tertentu dapat menjadi pilihan untuk memecahkan kasus ini. Nanokristal selulosa bakteri merupakan polimer berbasis nanoteknologi biokompatibel dan biodegradabel, yang memiliki potensi besar sebagai sistem penghantar obat. Penelitian ini dilakukan untuk mengetahui kemampuan adsorpsi nanokristal selulosa bakteri terhadap amoksisilin dan menganalisa pelepasan obat amoksisilin. Penelitian ini meliputi preparasi amoksisilin, uji kinerja nanokristal selulosa bakteri sebagai sistem penghantar obat Amoksisilin, dan uji pelepasan obat amoksisilin. Pada penelitian ini diperoleh kapasitas dan efisiensi adsorpsi amoksisilin sebesar 5,5742 mg/g dan 61,60%, masing-masing pada konsentrasi 60 mg/L. Analisis FTIR memperlihatkan spektrum BCNC telah mengadsorp amoksisilin, ditandai dengan adanya pergeseran pita serapan gugus OH dan adanya puncak serapan khas amoksisilin pada bilangan gelombang 1018 cm^{-1} dan 559 cm^{-1}, berturut-turut menunjukkan adanya vibrasi C-N dan C-S. Hasil uji pelepasan obat amoksisilin pada simulasi cairan lambung mencapai 59,64% setelah 300 menit dan pada kondisi yang sama, pelepasan obat pada simulasi pH usus mencapai 51,30%.

Kata Kunci : Amoksisilin, BCNC, Adsorpsi, Pelepasan Obat

ABSTRACT

Amoxicillin is the most commonly used antibiotic by oral administration for the treatment of various infections. Conventional amoxicillin tablets have a short half-life and short contact time with the drug site of action, they have low therapeutic efficacy. The use of a drug delivery system to target drugs to parts of the body in a certain time and amount can be an option to solve this problem. Bacterial cellulose nanocrystals are polymers based on biocompatible and biodegradable nanotechnology, which have great potential as drug delivery systems. This research was conducted to determine the adsorption ability of bacterial cellulose nanocrystals of amoxicillin and to analyze the drug amoxicillin. This research includes preparation of amoxicillin, performance test of bacterial cellulose nanocrystal as a drug delivery system of Amoxicillin, and analyze release of amoxicillin. In this study, the capacity and efficiency adsorption of amoxicillin was 5.5742 mg/g and 61.60%, respectively at a concentration of 60 mg/L. FTIR analysis of the spectrum of BCNC has absorbed amoxicillin, characterized by the presence of a with a shift in the absorption band of the OH group and the typical absorption peak of amoxicillin at wave numbers 1018 cm^{-1} and 559 cm^{-1}, indicating the presence of C-N and C-S vibrations, respectively. The results of release amoxicillin in gastric fluid simulation reached 59.64% after 300 minutes and under the same conditions, the experimental drug in the simulated intestinal pH reached 51.30%.

Keywords: Amoxicillin, BCNC, Adsorption, Drug Release

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