Loading captopril tersalut hidrogel kitosan termodifikasi interpenetrating polymer network dan uji release in vitro = Loading captopril coated chitosan hydrogel modified interpenetrating polymer network and in vitro release test

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Abstrak

Hidrogel kitosan termodifikasi interpenetrating polymer network berhasil disintesis yaitu kitosan, kitosan terikat-silang, kitosan-poly N-vinyl-2-pyrrolidone semi-IPN dan kitosan-N-vinyl-2-pyrrolidone full-IPN. Hidrogel kitosan termodifikasi interpenetrating polymer network diloadingkan captopril. Metode loading obat ke dalam matriks hidrogel yaitu in situ and post loading. Konsentrasi obat yang terloading ke dalam matriks hidrogel divariasikan yaitu 12.5 mg; 25 mg; 37.5 mg and 50 mg. Loading obat dengan metode in situ loading dilakukan dengan menambahkan obat sebelum penambahan agen pengikat silang, sedangkan post loading dilakukan dengan mengimersikan hidrogel ke dalam larutan obat. hidrogel yang terloading obat disebut mikrokapsul. Efisiensi enkapsulasi ditentukan dengan mengimeriskan mikrokapsul ke dalam larutan buffer pH 7,4. Hidrogel dikarakterisasi dilakukan dengan penentuan derajat ikat-silang , rasio swelling , spketrofotometer FTIR dan mikroskop stereo. Derajat ikat-silang dari kitosan, kitosan terikat-silang, kitosan-poly N-vinyl-2-pyrrolidone semi-IPN dan kitosan-N-vinyl-2-pyrrolidone full-IPN adalah 51.62 , 54.65 , 70.15 dan 77.23 . rasio swelling dari kitosan, kitosan terikat-silang, kitosan-poly N-vinyl-2-pyrrolidone semi-IPN dan kitosan-N-vinyl-2-pyrrolidone full-IPN adalah 4412.88 , 2118.01 , 1748.65 dan 441,38 selama 1 jam. Konsentrasi optimum loading obat 12.5 mg and 25 mg. Hidrogel terloading obat disebut mikrokapsul. Pelepasan mikrokapsul captopril in situ and post loading selama 12 jam menunjukkan pelepasan lambat. Profil pelepasan obat pada pH 1,2 dari matriks hidrogel kitosan dan kitosan terikat-silang in situ loading secara difusi dan degradasi, sedangkan semi-IPN and full-IPN in situ loading secara difusi, pada pH 7,4 pelepasan obat mikrokapsul in situ loading secara difusi. Profil pelepasan obat dari mikrokaspul post loading pada pH 1,2 dan 7,4 terjadi secara difusi diikuti erosi matriks hidrogel.
<hr />Preparation chitosan interpenetrating polymer network modified hydrogels have been successfuly. It were chitosan, chitosan crosslinked, semi IPN chitosan poly N vinyl 2 pyrrolidone and full IPN chitosan N vinyl 2 pyrrolidone. These hydrogels were loaded by captropil. Captopril was loaded within hydrogel matrix using both in situ and post loading method. Concentration variation of drug loaded were 12.5 mg 25 mg 37.5 mg and 50 mg. At in situ loading, drug was loaded during synthesis of hydrogel before the addition of crosslinking agent, while at post loading method hydrogels were immersed into a drug solution. This hydrogels loaded captopril called microcapsul. Encapsulation efficiency was evaluated in pH 7.4 solution. Hydrogels characterization including crosslinking degree , swelling ratio , FTIR spectrophotometer and stereo microscope. Crosslinking degree of chitosan, chitosan crosslinked, semi IPN and full IPN hydrogels were found to be 51.62 , 54.65 , 70.15 and 77.23 respectively. Swelling ratio of chitosan, chitosan crosslinked, semi IPN and full IPN hydrogels were 4412.88 , 2118.01 , 1748.65 and 441,38 for 1 hour, respectively. The optimum drug concenration was 12.5 mg and 25 mg. Hydrogels loading drug called microcapsule. Release of captopril microcapsules by in situ and post loading shown that slow release for 12 hour. Profile of release drug from chitosan and chitosan crosslinked hydrogels by in situ loading at pH 1,2

through difussion and degradation, while semi IPN and full IPN hydrogels by in situ loading at pH 1,2 through difussion. At pH 7,4 of profile of release drug from microcapsules through difussion. Profile of release drug at pH 1,2 and 7,4 from microcapsules by post loading through difussion followed erotion.