

INTISARI

Enkapsulasi Vitamin C dalam Kitosan–Pati/Asam Sitrat dan Studi Faktor–Faktor yang Mempengaruhi Sistem Pelepasannya

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Enkapsulasi vitamin C menggunakan kitosan–pati/asam sitrat telah dilakukan dengan metode gelasi ionik. Penelitian ini bertujuan untuk mengetahui kinetika pelepasan vitamin C yang terenkapsulasi dan faktor-faktor yang mempengaruhinya. Perubahan kimia, morfologi, dan ukuran dari material ini dikarakterisasi dengan FTIR dan TEM. Studi pelepasan *in vitro* dilakukan dengan cara mendispersikan material pada media PBS pH 7,4 serta akuabides selama 7 jam. Konsentrasi pelepasan vitamin C diukur dengan menggunakan spektrofotometer UV–VIS. Kinetika pelepasan vitamin C dikaji dengan model kinetika orde nol, orde satu, Higuchi, dan Korsmeyer–Peppas. Faktor–faktor yang mempengaruhi pelepasan vitamin C dipelajari menggunakan metode Taguchi.

Hasil karakterisasi FTIR menunjukkan bahwa terjadi pergeseran puncak serapan karakteristik dari kitosan. Hal ini menunjukkan adanya interaksi gugus fungsional kitosan dengan pati maupun asam sitrat. Analisis ukuran partikel dengan TEM menunjukkan bahwa material berbentuk agregat. Hasil studi pelepasan secara *in vitro* menunjukkan bahwa pada media PBS pH 7,4 produk dengan formula F_{1.1a} dan F_{1.3a} cenderung mengikuti model kinetika Korsmeyer–Peppas, sedangkan F_{1.2a} dan F_{1.4a} cenderung mengikuti model kinetika orde nol. Pada media akuabides, produk dengan formula F_{1.1b} dan F_{1.2b} cenderung mengikuti model kinetika orde nol, sedangkan F_{1.3b} dan F_{1.4b} cenderung mengikuti model kinetika orde satu. Faktor yang paling berpengaruh terhadap pelepasan vitamin C terenkapsulasi kitosan–pati/asam sitrat adalah faktor penaut silang asam sitrat.

Kata kunci: Enkapsulasi, vitamin C, kitosan, pati, asam sitrat.

ABSTRACT

Encapsulation of Vitamin C in Chitosan–Starch/Citric Acid and Study on the Factors Affecting Its Release System

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Encapsulation of vitamin C using chitosan–starch/citric acid has been synthesized using ionic gelation method. This study aims to determine release kinetics of encapsulated vitamin C and factors that affecting the release. Chemical changes, morphology and particle size of the materials were characterized by FTIR and TEM. In vitro release study was conducted by dispersing the material in the PBS pH 7,4 and aquabidest for 7 hours. The concentration of vitamin C was determined by UV–VIS spectrophotometer. The release kinetics of vitamin C were studied by zero order, first order, Higuchi and Korsmeyer–Peppas models. The factors that affect the release system of vitamin C were studied by Taguchi method.

The result of FTIR characterization showed that characteristic absorption peaks of chitosan were shifted. This indicates that there were interactions of functional groups of chitosan with starch and citric acid. Analysis of particle size by TEM showed that the material formed aggregates. The results of in vitro release study in PBS pH 7.4 showed that products with the formula F_{1.1a} and F_{1.3a} tend to follow Korsmeyer–Peppas kinetic model, while F_{1.2a} and F_{1.4a} tend to follow zero order kinetic model. In aquabidest, product of formula F_{1.1b} and F_{1.2b} tend to follow zero order kinetic model, while F_{1.3b} and F_{1.4b} tend to follow first order kinetic model. The factor that mostly influence the release of encapsulated vitamin C in chitosan–starch/citric acid was the cross linker of citric acid.

Keywords: encapsulation, vitamin C, starch, citric acid.