SINTESIS DAN KARAKTERISASI NANOPARTIKEL KITOSAN-TRIPOLIFOSFAT

SKRIPSI

Diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar Sarjana Sains

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UNIVERSITAS PENDIDIKAN INDONESIA

2019

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ABSTRAK

Penelitian ini bertujuan untuk mengetahui kondisi optimum sintesis dan karakteristik-nanopartikel kitosan-tripolifosfat. Tahapan penelitian yang dilakukan meliputi tahap optimasi, sintesis nanopartikel kitosan-tripolifosfat. melalui metode gelasi ionik berikut karakterisasinya melalui uji FTIR (*Fourier Transform Infrared Spectroscopy), X-Ray Difraction (XRD), Scanning Electron Microscopy-Energy Dispersive X-Ray* (SEM-EDX), dan spektrofotometer UV-Vis. Hasil penelitian menunjukkan bahwa kondisi optimum sintesis nanopartikel kitosan-tripolifosfat diperoleh pada konsentrasi optimum tripolifosfat 1% dan kitosan 1,5% dengan kecepatan pengadukan 700 rpm (randeman 43,33%). Nanopartikel kitosan-tripolifosfat (NPCS) mengalami penurunan ukuran partikel seiring dengan bertambahnya konsentrasi kitosan, dan memiliki ukuran rata-rata sekitar ±24,695-178,88 nm dengan keberadaan C, O, Na, dan P sebagai unsur penyusun berdasarkan SEM-EDX. Selain itu berdasarkan analisis spektra UV-Vis ukuran rata-rata NPCS yaitu 4,85 – 16,28 nm. Spektra FTIR mengkonfirmasi interaksi antara tripolifosfat berlangsung secara dominan antara gugus P-O dengan gugus amino kitosan. Penambahan konsentrasi kitosan menurunkan intensitas difraksi sinar-X nanopartikel kitosan-tripolifosfat.

Kata kunci : Kitosan, tripolifosfat, Nanopartikel kitosan-tripolifosfat, sintesis, karakterisasi

ABSTRACT

This study aims to determine the optimum conditions of synthesis and characteristics of chitosan-tripolyphosphate nanoparticles. Stages of research carried out include the optimization stage, the synthesis of chitosan-tripolyphosphate nanoparticles. through the ionic gelation method and its characteristics through the FTIR (Fourier Transform Infrared Spectroscopy) test, X-Ray Difraction (XRD), Scanning Electron Microscopy-Energy Dispersive X-Ray (SEM-EDX), and UV-Vis spectrophotometer. The results showed that the optimum conditions of chitosan-tripolyphosphate nanoparticle synthesis were obtained at optimum concentrations of 1% tripolyphosphate and 1.5% chitosan with a stirring speed of 700 rpm (randeman 43.33%). Chitosan-tripolyphosphate (NPCS) nanoparticles experienced a decrease in particle size with increasing chitosan concentration, and had an average size of about ±24,695-178.88 nm in the presence of C, O, Na, and P as constituent elements based on SEM-EDX. Also based on UV-Vis spectra analysis the average size of NPCS is 4.85 - 16.28 nm. The FTIR spectra confirm the interaction between the tripolyphosphate predominantly with the chitosan amine group. The addition of chitosan concentration decreases x-ray diffraction intensity in the chitosan-tripolyphosphate nanoparticle.

Keywords*: Chitosan, tripolyphosphate, chitosan-tripolyphosphate nanoparticles, synthesis, characterization*

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