

## عنوان مقاله:

Physical properties and structural characteristics of clove essential oil encapsulated in chitosan Nanogel

## محل انتشار:

دومین کنفرانس بین المللی فناوری های نوین در علوم (سال: 1397)

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## خلاصه مقاله:

Syzygium aromaticum EO of the family Myrtaceae, commonly known as clove is an important aromatic herb. Clove contains several kinds of bioactive compositions and possesses highly effective antioxidant and antimicrobial functions. Its EO contains mainly phenylpropanoids, such as eugenol and its derivatives,  $\beta$ -caryophyllene, and  $\alpha$ -humulene organic compounds. Encapsulation of bioactive substances such as EOs is one of the most effective techniques for protection against degradation which not only prevents the adverse effects of environmental conditions, but extends the shelf life of the product and also enables a controlled release of active compound. The objectives of the present work were to prepare chitosan nanogel containing clove EO, and investigate the physical properties and structural characteristics of the nanogel. Encapsulation efficiency of clove in chitosan nanogel was  $82.4 \pm 1\%$ . The characteristic peaks appear in the spectra of EO-loaded chitosan nanoparticles at the same wave number indicating no modification or interaction between the OEO and chitosan nanoparticles. Chitosan nanoparticles possessed a mean diameter of 280.2 nm. Clove EO-loaded chitosan nanogel particles showed an average diameter of 295.8 nm. The size distribution was found to be 20.8 nm. Clove EO-loaded chitosan nanogel particles showed a negative zeta potential ( $-20.14$  mV) and this value for chitosan nanogel particles was  $+36.5$  mV. The chitosan nanoparticles showed a small exothermic peak with a narrow range from 69.5 to 96.2°C ( $T = 26.7^\circ\text{C}$ ). Electromicrographs of the nanocapsules (Fig. 4) indicated spherical structure, no cracks and formation of a continuous layer in the nanocapsules walls. Particles with diameters below 500 nm were detected, confirming the particle size values obtained in the dynamic light scattering analysis.

## کلمات کلیدی:

chitosan, clove, nanogel, structure

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