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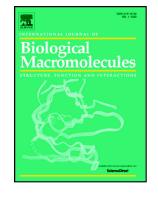
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Synthesis of Varisized Chitosan-Selenium Nanocomposites through

Heating Treatment and Evaluation of Their Antioxidant Properties

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Abstract: We reported an innovative approach to the synthesis of varisized chitosan-selenium

(CS-Se) nanocomposites, which for the first time used CS both as a reductant and stabilizer to

synthesize CS-Se nanocomposites. By manipulating the temperature, the well-dispersed CS-Se

nanocomposites were synthesized via a simple one pot reaction with the size ranging from 83 to

208 nm before being characterized by TEM, DLS, UV-vis, FTIR, XRD and TG analyses. The

results showed that SeO₃²⁻ was reduced to a stable SeNPs colloid at a comparatively high

temperature and the amino group and part of hydroxyl group of CS were conjugated to the surface

of SeNPs. Besides, DPPH, ABTS⁺⁺, hydroxyl radical, metal ion chelating and reducing power

assays were carried out to investigate the antioxidant activities of CS-Se nanocomposites, which

proved to be concentration-dependent, size-dependent and exhibited good antioxidant activity. The

results suggested that CS-Se nanocomposites might be considered as a more appropriate

selenium-adding form to achieve antioxidative goals in food.

Keywords: CS-Se nanocomposites; Reaction Temperature; Antioxidant

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