J Nanomed Nanotechnol 2014, 5:5
http://dx.doi.org/10.4172/2157-7439.S1.019

OMICS Group Conferences
Accelerating Scientific Discovery

4th International Conference on
Nanotek & Expo

December 01-03, 2014 DoubleTree by Hilton Hotel San Francisco Airport, USA

Influence of multilayer whey proteins on the surface of particles of ionic gelling alginate during simulation gastrointestinal tract

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The production of multilayer on the surface of alginate microparticles obtained by ionic gelation can improve the effect of protection and stability. The difficulty in applying the ionic gelation of microparticles as an enteric carrier of bioactive compounds is due to the high porosity of your matrix. The whey protein has been shown to be interesting materials for coating microparticles, because of their functional and nutritional properties, by allowing your protection when subjected to gastric fluids. The objective of this study was to evaluate the influence of multilayer protein whey in the stability of the microparticles during simulation gastrointestinal tract. Particles were produced by alginate gelling ion and the technique layer by layer was applied to the construction of multilayer, being the first and third layer of whey protein, and second layer of alginate. The particles were subjected to pH 2 and 7 containing proteolytic enzyme, during the simulation of the gastrointestinal tract. Protein solubility was determined and the morphology observed. The results showed a solubility of 30.49% of protein of the particle into the middle gastric simulation (pH 2, pepsin) after 2 hours incubation, without significant alterations in the morphology of the particles. The cumulative rate of solubility increased to 85.78% after 7 hours in simulated intestinal tract (pH 7, pancreatin). Practically all the protein (99.17%) of the particle was released at 24 hours. Microscopy optical particle revealed an apparent loss of the multilayer after 7 hours, though the particles of ionic gelation still remained partially intact after 24 hours of simulation.

Biography

G F Nogueirais a PhD student at the Faculty of Agricultural Engineering, State University of Campinas, completed Master's in Food and Nutrition from the Faculty of Food Engineering at the State University of Campinas and Degree in Nutrition.

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Size dependent and band gap properties of silicon nano-cluster when hydrogen is passivated on the surface

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The band gap properties of small Si quantum dots having 3 to 44 atoms per dots with and without hydrogen passivation on the surface is studied by a computer simulation using pseudo potential approach. A pseudo potential Hamiltonian and plane wave orthogonalized to the core level right from the start is used. The energy band gap, as a function of size increases more by hydrogen passivation than the unpassivated one. Thus both quantum confinement and hydrogen passivation determines the optical and the electrical properties of silicon quantum dots. It was observed that the change in the energy gap on passivation as a function of the dot size is more prominent for longer dots. This may be due to change in the number of hydrogen atoms on the surface, which has stronger effect near the gap states of the dot. Hydrogen passivation of the relaxed cluster eliminates most of the remnant dangling bonds but no appreciable effects on the defect states. The data for the gap energy with Zunger and others, which is very close to the earlier observation under linear mapping of the size with the number of atoms in the dot, was compared.

Biography

Ermias Atnafu got his MSc degree from Addis Ababa University, Ethiopia in Solid State Physics. He is a Lecturer at Debremarkos University, Debremarkos, Ethiopia.

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