

Applications of Inorganic Nanoparticles in Edible Food Packaging Materials

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ABSTRACT

The packaging materials play an important role on the conservation, distribution and marketing of foodstuff. Now day's researchers have been trying to replace the traditional packaging materials by edible packaging materials like polysaccharides, proteins and lipids. But the mechanical strength, barrier properties, water vapour permeability, gas permeability, optical properties of edible film or coatings are relatively poorer than traditional packaging materials. Nano technology plays an important role to overcome these disadvantages. The barrier properties of edible films/ coatings can be improved by using numerous nano dispersed platelets per micron of coating thickness. Again some of the edible nano particles have antimicrobial and antifungal properties and incorporation of such nanoparticles improves the antimicrobial or antifungal properties of the film. Various nanoparticles are oxygen scavengers which can alter the gas permeability of the film. Besides these light sensitiveness, the nanoparticles could be used as leakage indicator in the films. Silver in its nano form was used in edible packaging materials like Cellulose acetate, Cellulose hydroxypropyl ethylcellulose, Chitosan, Sodium alginate, Calcium-alginate etc to enhance various properties of the edible films/coatings like Antimicrobial, Antifungal, mechanical strength, barrier properties, water vapor permeability, optical properties. ZnO and Cu in nano form were used in packaging materials like Chitosan which increased the antibacterial property and lowers the water vapor permeability of the Chitosan film. TiO₂ in nano form is incorporated Whey Protein film which significantly increases the tensile properties and moisture barrier properties of the film.