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Review Article

Nanoclay and nanofilms as barrier material to prevent spoilage and prevent oxygen absorption

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Abstract

Food packaging could be a multidisciplinary space that encompasses food science and engineering, biology, in addition as chemistry, and lit tremendous interest in maintaining the freshness and quality of foods and their raw materials from reaction and microorganism spoilage. With the advances within the packaging business, they may be designed as easy-to-open, resealable, active in addition as intelligent with the incorporation of sensory components whereas giving desired barrier properties against atomic number 8 and water vapour.

Keywords: Oxygen absorption, Non-biodegradable, Nanomaterials.

INTRODUCTION

Packaging of food is a necessary task in food industries. The largest challenge for the food business is to use improved and effective packaging material with perishable and antimicrobial potential (Uyar T et al., 2020). So as to accomplish this, varied perishable materials square measure presently in use. Among the biopolymers used for food packaging, starch-based films square measure preferred attributable to their abundance and perishable nature (Jogee PS et al., 2021). However, ancient starch films have some drawbacks like poor mechanical properties. Humans have evolved with oral exposure to dietary microparticles and nanoparticles as a standard incidence however the ever-growing exploitation of applied science is probably going to extend exposure more, each qualitatively and quantitatively. Moreover, in contrast to the case with respirable particles, comparatively very little is thought concerning channel intake and handling of nanoparticles (Jonathan J et al., 2010). Essential oils (EOs) have remained within the limelight of the scientific community due their skillfulness let alone shoppers increasing demand for natural, safe and effective health merchandise. Besides, their applications within the food, pharmaceutical, agricultural and textile industries amongst others have consolidated their quality (Jugreet BS et al., 2020). Currently, primarily non-biodegradable petroleumbased artificial polymers square measure used as packaging materials for foods, attributable to their availableness, low price and practicality. However, biodegradable/edible films is made up of polysaccharides, proteins and lipids

while not the environmental problems with petroleumbased polymers and with the extra advantage of being offered from renewable sources or as by-products or waste-products from the food and agriculture industries (Vicente AA et al., 2011). Potential applications of designed nanomaterials (ENM) in food have shown nice potential edges and enhancements over existing technologies. Several of the applications square measure still within the analysis and biological process stage and would need rigorous food safety testing and ultimately client acceptance. Packaging plays a vital operate in several sectors of the food business, in addition as in different areas like cosmetics, producing, physical science, and so on (Greiner R et al., 2015). Notwithstanding a product is to be transferred as bulk, it'll still need a instrumentation to facilitate its handling, transport, stacking, storage, and distribution. Packaging is additionally meant to shield its content from adverse environmental conditions, like rain, dust, excessive temperature, ratio, external odors, microorganisms, and pests. Potential applications of designed nanomaterials (ENM) in food have shown nice potential edges and enhancements over existing technologies. Several of the applications square measure still within the analysis and biological process stage and would need rigorous food safety testing and ultimately client acceptance. At intervals the ecu Union, that has taken active role in control ENM, nano/ size-specific provisions are enforced into many food-related directives and laws. Nanoparticles were initially explored for applications in drugs, primarily to be used in improved drug delivery, enhancing bioavailability, and formulating poorly soluble or poorly absorbed active ingredients.

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