Structural and performance of chitosan-based polymer composites for electrical applications

17

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17.1 Introduction

The current research on composite systems structured at the nanoscale level has become a hot topic among scientists. These composite systems combine organic and inorganic materials, which is attractive because it allows for incorporating diverse functionalities and can result in new properties due to synergistic effects (Castro-Muñoz, 2020; Jeon & Baek, 2010). One common approach combines polymers and inorganic hosts of different chemical natures and topologies. Polymers have been widely used in the past century, but by adding carbon nanotubes (CNTs), the resulting composite materials can have improved mechanical, electrical, optical, and thermal properties (Nurazzi et al., 2021). This approach has been extensively investigated and has led to the development of many high-value applications, such as aerospace and energy, where high conductivity, strength, and thermal stability are required. Traditionally, polymers are large molecules of repeating subunits called monomers and have been recognized as insulating materials. They are versatile materials that can be modified or synthesized to achieve specific functions, which makes them useful in the fabrication of a wide range of applications. Their chemical and physical properties that can be tailored to specific applications, making them more relevant than that traditional materials in the assembly of electric devices.

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