

Synthesis and Applications of Chitosan-Coated Bimetallic Nanocomposites: A Short Review

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ABSTRACT:

Chitosan (CS) is the second most abundant organic polymer, receiving numerous applications due to its unique properties like biodegradability, non-toxicity, mucoadhesive, hemocompatibility, antimicrobial, anticancer activity, and antioxidant activity. Likewise, chitosan-coated bimetallic nanoparticles have fascinated huge attention as compared to monometallic nanoparticles due to their enhanced properties. In this review, we reviewed the preparation methods, applications, and recent advances in chitosan-supported bimetallic nanoparticles.

Keywords: Chitosan, bimetallic, chemical reduction, catalytic activity.

1. INTRODUCTION

Nanotechnology typically represents the economic impact of the formation and enhancement of substances having morphological features similar to those of atoms and large molecules holding one or more dimensions under the nanometer scale. In recent years, the continuous availability of novel procedures in favor of nanoparticle fabrication has naturally resulted in tremendous growth in nanoscience and technologies. The synthesis of polymer-coated bi or multi-metallic nanocomposites shows enhanced properties when compared to uncoated materials. The polymers used may be organic or inorganic. Chitosan is an organic polymer that occurs in nature, possessing valuable qualities like biocompatible, flexible, high charge density, biodegradable and non-toxic[1]. Because of these unique properties, chitosan is widely used in textiles, medicine, food, agriculture, paper, cosmetics, and sewage treatment. Chitosan is a commercially available copolymer of glucosamine and N-acetyl glucosamine obtained by deacetylation of chitin with sodium hydroxide, as shown in Figure 1. It is insoluble in an aqueous solution[2]. Chitosan also has antimicrobial, wound healing, and hemostatic activity, making chitosan-based composites extremely useful in the field of biomedical applications. In addition, it is also employed in agriculture as

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