

Chitosan-Based Adsorbents for Wastewater Treatment

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Chitosan is a natural amino polymer. It is eco-friendly, biocompatible, biodegradable, cost-effective, easily available and has high potential to be utilized as an adsorbent. Because of their excellent chelating power, chitosan-based adsorbents have a very high ability to bind pollutants present in contaminated water and wastewater.

Keyword: Wastewater Treatment, Adsorbent, Chitosan, Adsorption Capacity of Chitosan, Heavy Metal Removal from Wastewater, Dye Removal from Wastewater, Chitosan-Based Nanocomposites, Removal of Arsenicals from Wastewater, Surfactants for Chitosan, Surfactants for Biomaterials

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Summary:

Chitosan is a natural amino polymer. It is eco-friendly, biocompatible, biodegradable, cost-effective, easily available and has high potential to be utilized as an adsorbent. Because of their excellent chelating power, chitosan-based adsorbents have a very high ability to tightly bind the pollutants present in contaminated water and wastewater. Different heavy metals and toxic dyes can be effectively removed.

Chapter 1 deals with the chemical, physical, physicochemical and mechanical properties of chitosan and chitosan-based materials. Adsorption data on the removal of heavy metals and different dyes have been compiled. Chapter 2 covers the utilization of chitosan and its derivatives for the adsorptive removal of mercury from water and wastewater. Chapter 3 describes novel chitosan-based nanocomposites for dye removal applications. Chapter 4 discusses the effect of different chitosan modifications on its structure and specific surface area. Chapter 5 covers the applications of chitin and chitosan-based adsorbents for the removal of natural dyes from wastewater. Chapter 6 highlights the adsorptive treatment of textile effluents using chemically modified chitosan as adsorbents. Chapter 7 reviews the applications of chitosan-based adsorbents for the removal of arsenicals. Chapter 8 centers on the adsorption capacity enhancement of chitosan by chemical modification. Chapter 9 focuses on the smart use of surfactants for the modification of chitosan and some other biomaterials and their subsequent use for the removal contaminants from aqueous solutions. Chapter 10 reviews the use of chitosan-based nanocomposites as adsorbents for the removal of dyes from wastewater. Chapter 11 describes the preparation of uniformly distributed platinum nanoparticles decorated with graphene oxide-chitosan by employing a microwave-assisted method. The nanocomposite can be used for the removal of dye from aqueous solution.

