

GREEN SYNTHESIS AND BIOMEDICAL APPLICATION OF TITANIUM OXIDE NANOPARTICLES

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Abstract

The study of nanotechnology is rapidly developing and has numerous potentials uses in many different disciplines. Nanoparticles (NPs) can be made by a number of different chemical and physical methods. Recently, green synthesis methods have been refined to be more user-friendly, long-lasting, and inexpensive. There has been a lot of focus on developing eco-friendly methods for synthesizing titanium dioxide nanoparticles (TiO₂ NPs) in the most recent three months. Biologically active compounds found in plants and microbes, for example, aid in the bio-reduction and capping procedures. In this overview, we will talk about how to make TiO₂ NPs biologically, as well as the various synthesis techniques and mechanistic viewpoints. TiO₂ NPs can be synthesized using a variety of naturally occurring reducing agents like proteins, enzymes, phytochemicals, and others. Photocatalysis and antimicrobial applications were also examined at length, as were the underlying physical mechanisms. Finally, we discuss the state of the art and future directions for research into physiologically mediated platforms based on TiO₂ nanostructures with potential industrial applications.

Keywords: Dyes photodegradation; green synthesis; photocatalysis; antimicrobial activity.



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