

Eco-Friendly Nanoparticle Synthesis: A Green Chemistry Approach

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Abstract: Nanotechnology and biomedical sciences offer a vast potential for research and medical applications at the molecular and cellular levels. In recent years, biosynthesis of nanoparticles has gained significant attention as an eco-friendly and cost-effective alternative to conventional chemical and physical methods. The use of plant-mediated synthesis in nanoparticle production represents a sustainable approach, bridging the gap between nanotechnology and green chemistry. This method enables the synthesis of nanoparticles under ambient conditions, at neutral pH, and with minimal environmental impact.

Plants, often referred to as nature's "chemical factories," provide an efficient and sustainable platform for nanoparticle synthesis. They require minimal maintenance and offer a wide range of bioactive compounds that facilitate nanoparticle formation. This study explores the evolution of nanotechnology, the properties of nanoparticles, diverse synthesis strategies, and the comparative advantages and limitations of different approaches. Additionally, it highlights the broad spectrum of applications that green-synthesized nanoparticles can offer in various fields..

Keywords: Green Synthesis, Nanoparticles, Sustainable Approach, Eco-friendly, Plant-Mediated Synthesis

