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Phytochemical Process for the Functionalization of Materials with Metal Nanoparticles: Current Trends and Future Perspectives(Review)

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Abstract

The bioreduction process, that utilizes the plant extracts, have been explored extensively as a green chemical route for the synthesis of metal nanoparticles due to their eco-friendly protocol as well as versatility in the selection of various plant resources. Recent advances in this plant extract mediated biological process are the fabrication of functional nanostructures. Bioreduction mechanism catalyzes the combining process of metal nanoparticles with other kind of materials including metal, metal oxides, cellulosic, zeolite and carbon nanomaterials. Integrating metal nanoparticles with various materials offers new functional properties and improves their performance comparing to their pristine counterpart. In this review, plant-based biochemical substances, which influence the metal ion into metal and their controlled nucleation on the surface of other kinds of materials are highlighted, and the future prospect of this bio-based synthesis of functional nanostructures are discussed. © 2018 Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim

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