CHAPTER 7

Synthesis, Properties, and Biomedical Application of Platinum and Palladium-based Nanoparticles

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ABSTRACT

Metals have been utilized in medicine for a very long time, since different processed metals, such as gold, silver, mercury lead, copper, etc., were used to treat various disease conditions. In antiquity, both platinum (Pt) and palladium (Pd) also been used to cure a number of diseases. Recently, Pt and Pd considered as a crucial ingredient in many medications, especially those that are used to treat cancer. For instance, chemotherapy for cancer included the use of substances containing Pt, such as cisplatin, oxaliplatin, and carboplatin. Similarly, Pd has an indispensable role in the treatment of cancer and other disorders. Pt and Pd are utilized in the medical industry for a wide range of purposes, namely, construction of medical implants and devices, due to their remarkable qualities, including biocompatibility, inertness within the body, durability, electroconductivity, high corrosion resistance, oxidation resistance, fine machinability, radiopaque properties, and radiopacity. Moreover, Pt and Pd have special qualities that make them the ideal materials for building compact, durable structures that can resist extreme stress without breaking or deforming. Therefore, research is increasingly concentrating on creating novel PtNPs and PdNPs with distinctive optical, electronic, and biomedical properties that can be used in various biomedical applications.

Metals in Medicine, Volume 1: Metals for Tissue Engineering and Pharmaceutical Applications.
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