



# Research and application of graphene oxide based materials in stomatology



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## ABSTRACT

Graphene oxide sheet is the product of chemical oxidation and stripping of graphite powder. Graphene oxide is a single atomic layer arranged into a two-dimensional honeycomb lattice. Therefore, its structure spans the typical scale of general chemistry and material science. Graphene oxide can be regarded as a non-traditional soft material with the characteristics of polymer, colloid, film and amphoteric molecules.

has good biocompatibility. A large number of studies have proved that graphene oxide will not have adverse effects on cell proliferation in a limited concentration range. Besides, graphene oxide induces three-dimensional matrix adhesion of osteoblasts with high cell viability and provides a microenvironment similar to that in vivo, which can further explain the effect of graphene oxide on cell proliferation.

Recently, more and more studies have focused on the application of graphene oxide and its nano materials in the field of oral cavity. It has been reported that graphene oxide can induce osteogenic differentiation of mesenchymal stem cells and neural differentiation of dental pulp stem cells. Therefore, we believe that graphene oxide can be used as a biological scaffold in pulp regeneration therapy to promote pulp regeneration

However, there is still a lack of clinical research on graphene oxide as pulp regeneration treatment, which needs us to further explore its feasibility.

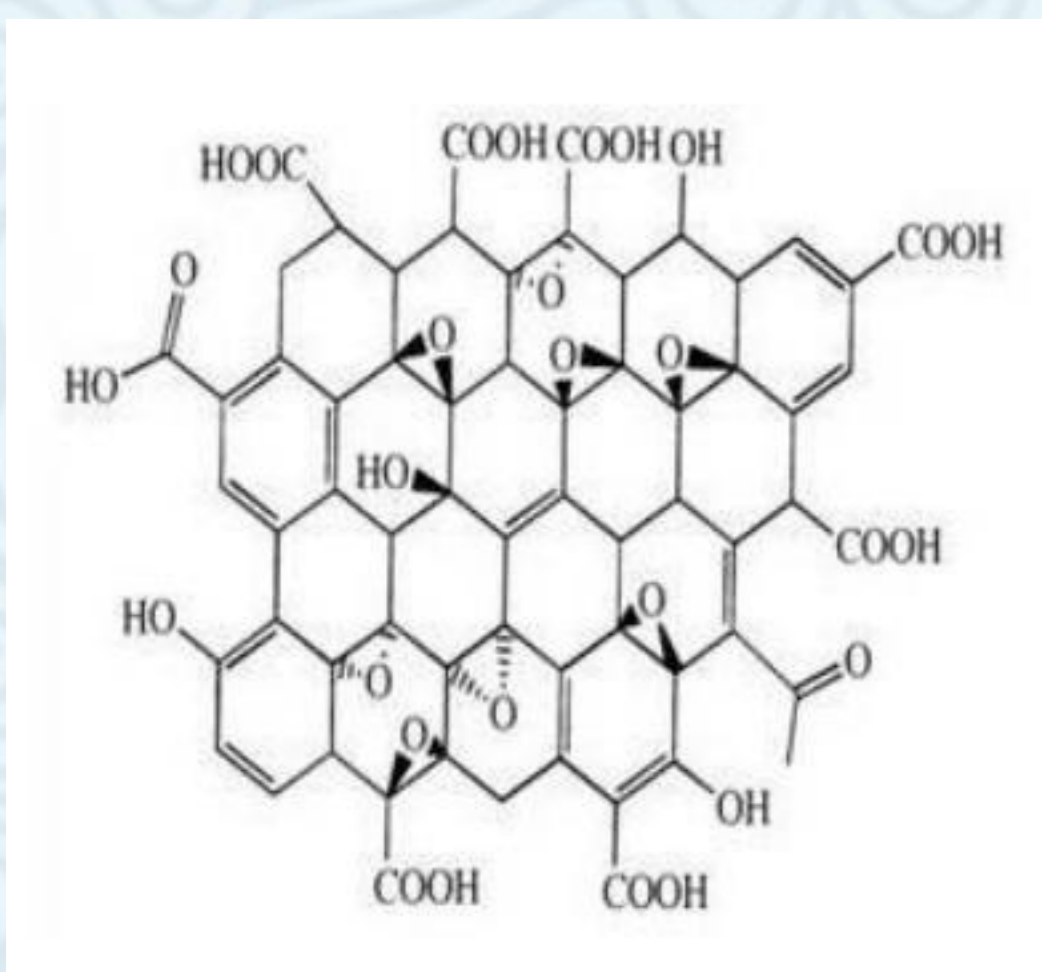


FIGURE1 Molecular structure of GO

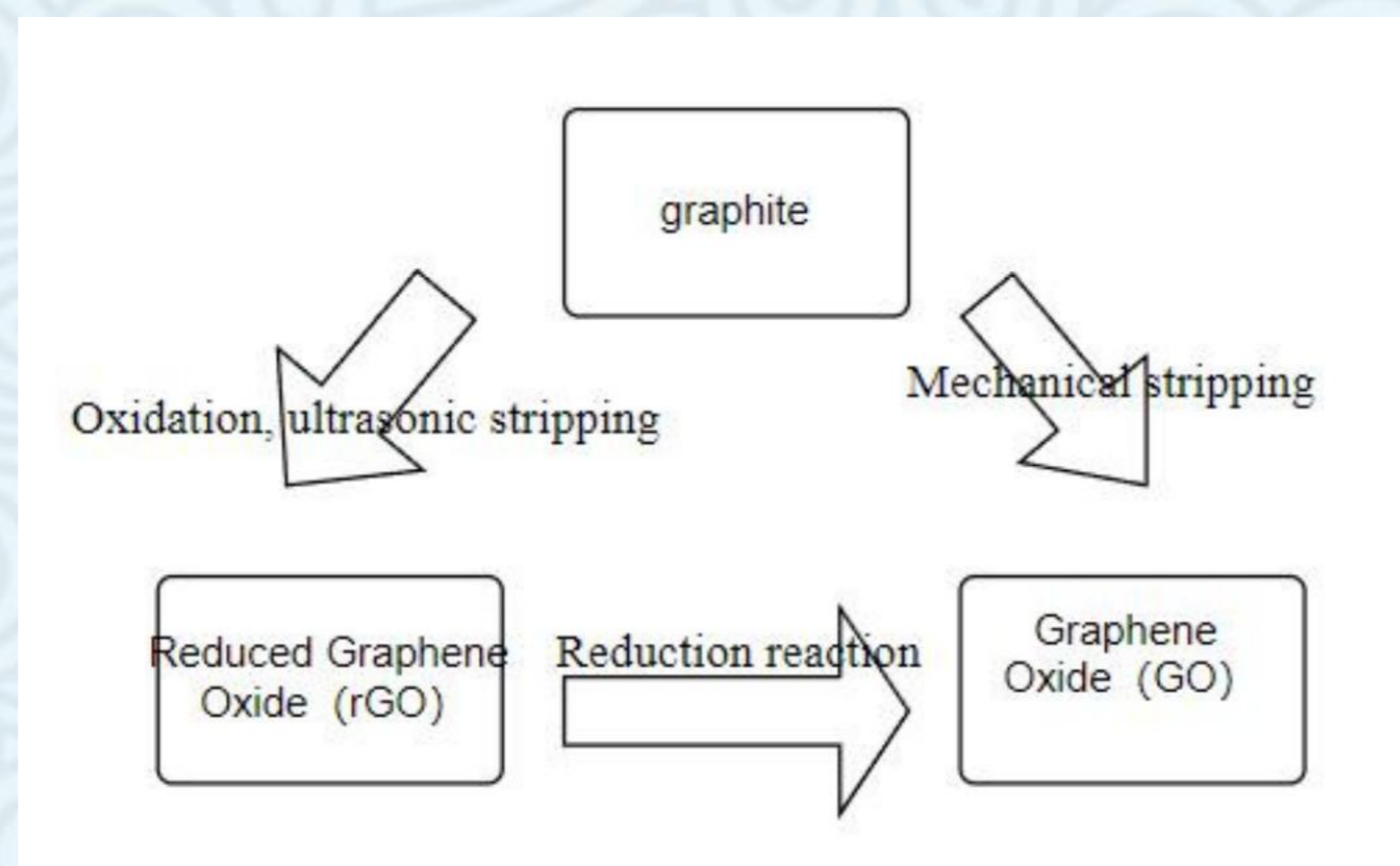


FIGURE2 Preparation of GO

The application of graphene and its series of nano materials, such as graphene oxide (GO) and reduced GO (RGO), provides various technical opportunities because they have excellent electrical, thermal, optical and mechanical properties.

Graphene and its derivatives have a wide range of practical applications, including Nano Electronics (such as transistors and sensors), antibacterial paper and many biomedical applications, such as drug delivery, imaging, treatment and cell protection.

In addition to its superior physical and chemical properties, graphene oxide

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