

Nanobiocomposites with Graphene: Design and Perspectives

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Nanobiocomposites have been found to be interesting materials for many applications and also the bottom-up approach for their preparation has received special attention in a series of studies [1-3]. Novel approaches for the synthesis of interesting nanobiocomposites can be designed and developed by using the concept of supramolecularity and other principles. The peculiarity of graphene in view of the dimensionality of the different carbon allotropes such as fullerenes and carbon nanotubes and their specific properties is highlighted. When employing nanosized building blocks in conjunction with other components such as biopolymers, these concepts can be translated into reality and new classes of nanobiocomposites can be fabricated.

These fundamentally novel concepts are presented both as synthetic methods and in the context of their applications with regard to graphene and its derivatives. The relevance of hydrophobicity and the dispersion in different media are also covered in light of the different preparation methods as well as targeted applications. Several model systems with graphene and biopolymers as well as nanoparticles have been studied and examples of their interaction products based on different types of reactions and syntheses are given. The novel nanobiocomposites are expected to have an application potential in many areas such as the biomedical and electronic areas. Recent promising application examples are discussed and the perspectives of the graphene-based nanobiocomposites are analyzed.

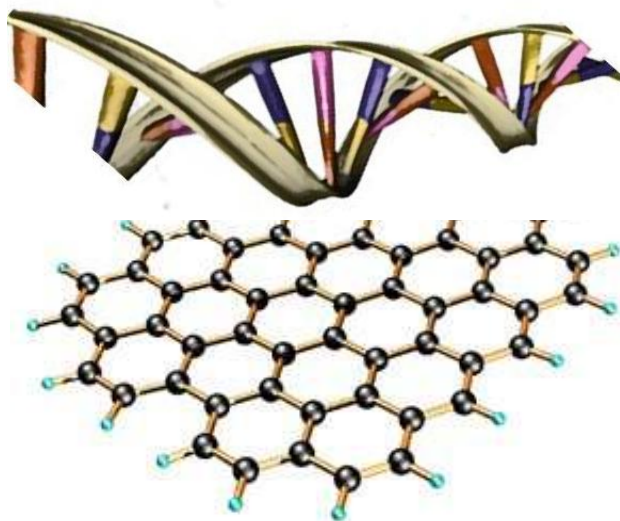


Figure 1. Schematic of a nanobiocomposite of DNA and graphene

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References

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