

Self-Assembly of Carbon Nanohorn Oxide

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Abstract

Carbon allotropes and derivatives show novel behavior in a framework of promising technologies [1-4]. In this context that *nanohorn*, attracted attention as an alternative to graphene or carbon nanotubes, because of the prospective to trap molecules on their cone structure, free-metal synthesis, and their biocompatibility [5]. A modification of the nanohorn surface provides linkage points in order to engineer advanced composite materials possessing specific properties. A suitable strategy consists in oxidizing the nanohorn, where the oxygen domains coordinate the aggregation of each unit. Our work issues the effect of self-assembly of nanohorn oxide [6]. So far, carbon nanohorn oxide changes from spherical (100nm) to a layered compact aggregate (20 μm). Archived behavior suggests a context where the oxygen domains are limited to hydroxyl, carbonyl and alkoxy groups which coordinate the assembly process. The oxidation of the nanohorn surface was carried out proposing a novel synthetic method, comprising few steps at low temperature 30°C. This study sets the basic knowledge to open suitable paths for the fabrication of advanced materials taking advantage of the self-assembly character. A prospective of the nanohorn oxide is focused on the use in conductive inks or in mixtures paste for 3D printing.

References

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Figures

