

## Graphene Augmented Nanofibers and their Versatile Applications

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**Abstract.** Both business and research communities provide considerable funding in development of novel materials added by graphene or graphene-like structures as well as devices based on these materials as graphene offers the unique properties, which can be exploited in nowadays industry. In this review, the different applications of tailored hybrid structures of nanofibers covered by multi-layered defective graphene are demonstrated alongside with the bottom-up approach to fabricate such kind of structures. The main attention is paid onto nanostructural modifications of carbon layers encapsulating alumina nanofibers to ensure wide possible applications of the designed nanostructures. The materials has shown potential uses as reinforcements for multifunctional electro-conductive ceramics, electrochemical conversion, highly sensitive sensing, and as substrates for bio-applications. The general synthetic rules towards graphene deposition and the guidance and inspiration on the trends for the specific choice of structures towards applications of interest are demonstrated in this paper.

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