

Using 2-dimensional materials in a 3-dimensional world: graphene composites for batteries, filters and aerospace

Vincenzo Palermo

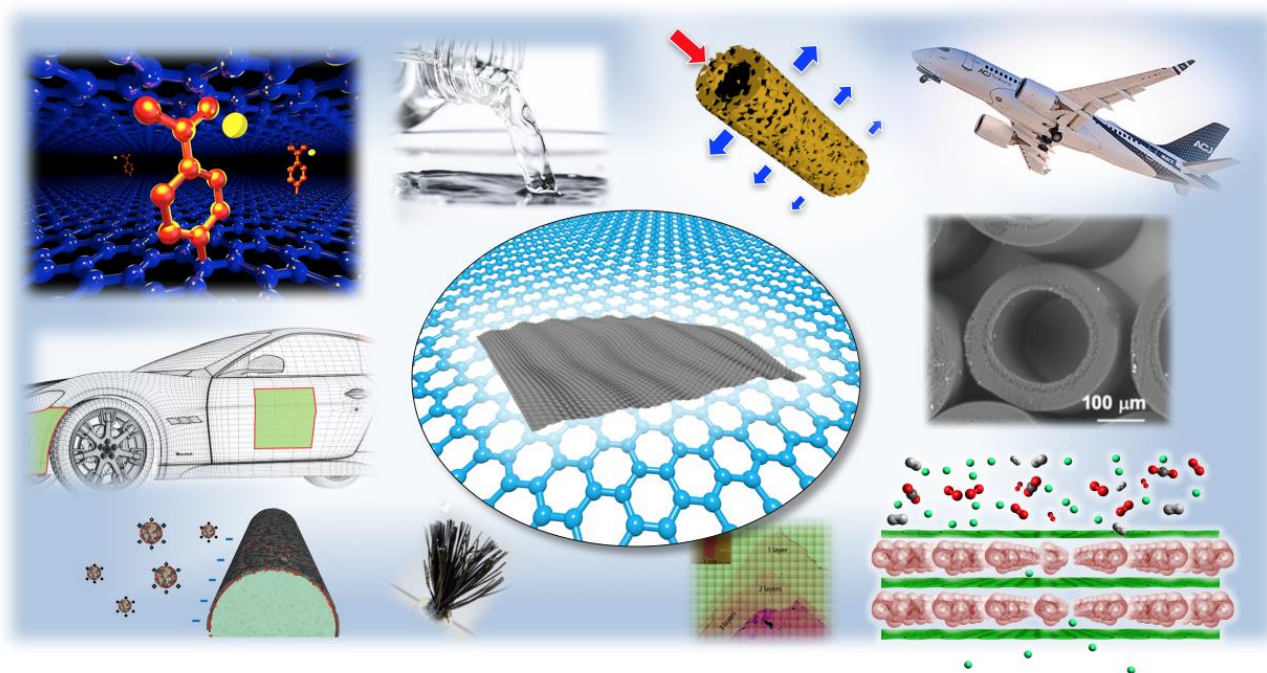
*Institute for Organic Synthesis and Photoreactivity (ISOF), National Research Council (CNR), Bologna, Italy.
Chalmers University of Technology, Göteborg, Sweden.*

vincenzo.palermo@isof.cnr.it

Graphene is currently produced in tons scale as nanosheets or multilayer flakes, to be mixed in polymer composites, mainly for structural reinforcement. Such composites typically contain random dispersions of graphene in a polymer matrix, thus taking advantage only in part of the peculiar properties of graphene and of its unique 2-dimensional structure.

The development of new composites, featuring a more refined hierarchical structure and a controlled processing of graphene, would allow to exploit its properties at best, enabling groundbreaking applications; in this talk, I will describe how we process 2-dimensional nanosheets of graphene and graphene oxide in complex 3-dimensional composites using surface chemistry, electrochemistry and conventional filtration.

In this way, we produced and tested nano-composite materials in the form of foams, coatings and fibers to be used in energy storage, aerospace and water purification.



References

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