UNIVERSITÀ
DEGLI STUDI DI TRIESTE
Dipartimento di Scienze Chimiche e Farmaceutiche

AVVISO DI SEMINARIO

"Chemical Manipulation of Graphene Layers"

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Applications of graphene centres on its excellent mechanical, electrical, thermal and optical properties, as well as on its very high specific surface area, and our ability to influence these properties through chemical functionalization. In this direction, a versatile and scalable approach to produce new materials composed of graphene and chemically modified graphene is the use of colloidal suspensions. However, a challenging issue to address graphene manipulation is related to its chemical nature and their reactivity. Importantly, graphene morphology differs from that of carbon nanotubes (CNTs) and fullerenes in the absence of curvature which mixes some sp^3 character into the sp^2 hydridization. In CNTs and fullerenes, this curvature has been put in relation with the reactivity: the stronger the curvature, the higher the reactivity. In graphene instead, the sheet edges are considered the most reactive sites. An interesting reaction to test on graphene is the 1,3-dipolar cycloaddition of azomethine ylides because this reaction has been extensively used for the chemical modification of CNTs and fullerenes with applications in different fields such as solar energy conversion and biosensors. We recently performed two well-established organic reactions (1,3-dipolar cycloaddition and amide-condensation reactions) on graphene sheets. Our results identify exfoliated graphene as a considerably more reactive structure than graphite and hence open the possibility to control the functionalization for use as a scaffold in the construction of organized composite nanomaterials. Some of our recent work will be presented.

Il Direttore del DSCF
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