Graphene Coatings

The Real Deal

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Title:

Graphene Coatings: The Real Deal

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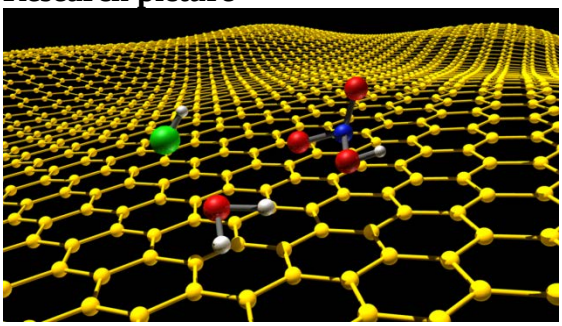
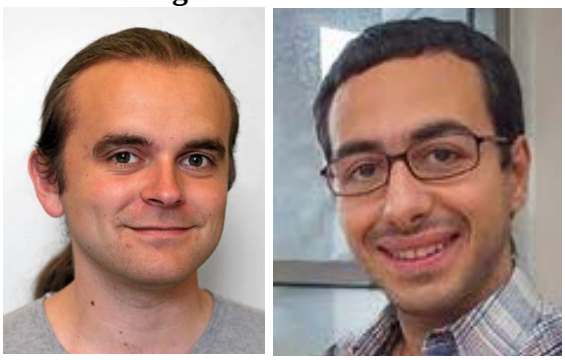
Research picture



Abstract

Owing to its remarkable electrical and mechanical properties, graphene has been attracting tremendous interest in materials science. In particular, its chemical stability and impermeability make it a promising protective membrane. However, recent investigations reveal that single layer graphene cannot be used as a barrier in the long run, due to galvanic corrosion phenomena arising when oxygen or water penetrate through graphene cracks or domain boundaries. Here, we overcome this issue by using a multilayered (ML) graphene coating. Our lab- as well as industrial-scale tests demonstrate that ML graphene can effectively protect Ni in harsh environments, even after long term exposure. This is made possible by the presence of a high number of graphene layers, which can efficiently mask the cracks and domain boundaries defects found in individual layers of graphene. Our findings thus show that graphene can still be a relevant candidate for thin coatings.

Portrait image



Mini-CV

Adam C. Stoot is a PhD student in the Nanocarbon group at the department of Nanotechnology, Technical University of Denmark. He is primarily interested in the mechanical properties of graphene and other 2D material for protective purposes. He received his B.Sc. degree in physics and nanotechnology (2010) and his M.Sc. in physics and nanotechnology (2013), both at the Technical University of Denmark.

Luca Camilli is a postdoctoral researcher in the Nanocarbon group at the department of Nanotechnology, Technical University of Denmark. His research interests are mainly focused on controlled synthesis of 2D materials, such as graphene and hexagonal boron nitride. He received

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