

## Nanostructured surfaces

### Synthesis and smooth transfer of large area high quality CVD graphene

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Today graphene, with other 2D materials, is considered as an encouraging material that could be the foundation for future generations of low-power, faster, smaller and economic electronic devices [1, 2]. The route toward the commercial exploitation of graphene's unique properties hinges entirely on the development of adequate graphene growth and integration technologies, which is still a great challenge. The key to solving this challenge requires us to develop synthesis and transfer methods to employ in the fabrication and transfer of single layer graphene films with an optimal degree of control. Among various graphene synthesis approaches, chemical vapor deposition of graphene on low cost copper foil shows great promise for large scale applications. Here we report on the growth and transfer of uniform and continuous large-sized thin-films composed of mono- and multi-layered graphene. The foils were grown by chemical vapor deposition (CVD) on polycrystalline copper (Cu) foils at low pressure using ethanol and were transferred onto the destination substrates using a cyclododecane supporting layer. Structural and optical characterizations indicate that the graphene films are composed of single or few layers depending on the growth conditions and exhibit low defect density. The graphene films can be transferred to arbitrary substrates with the help of a green transfer method based on an organic molecule, cyclododecane.

1. Novoselov, K.S., Geim, A.K., Morozov, S.V., Jiang, D., Zhang, Y., Dubonos, S.V., Grigorieva, I.V., and Firsov, A.A. *Science*-2004.-**306**.-P.666.

2. Novoselov, K.S., Geim, A.K., Morozov, S.V., Jiang, D., Katsnelson, M.I., Grigorieva, I.V., Dubonos, S.V., and Firsov, A.A. *Nature*.-2005.- **438**.-P. 197.