

## Section: Nanocomposites and nanomaterials

### Graphene: Quo Vadis?

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Carbon-based nanomaterials possess extraordinary properties that make them unique among these new materials [1]. Thus, they have found numerous applications in various areas. Carbon nanomaterials are a diverse collection that includes zero-dimensional (0D) fullerenes, one-dimensional (1D) carbon nanotubes, two-dimensional (2D) graphene [2], and three-dimensional (3D) encapsulates.

Here we present graphene, a one-atomic-layer thick material made of carbon atoms arranged in a honeycomb structure. Its fascinating properties ignited enormous interdisciplinary interest and paved the way to numerous applications.

The preparation of graphene remains, however, challenging. Main methods reported so far are either costly or unfriendly to environment.

Here we present a novel approach to obtain graphene-related material using a combustion synthesis route which is simple, fast (below 1 s), economical and environmentally friendly. Direct reduction of gaseous carbon oxides (CO, CO<sub>2</sub>, at pressure within 0,1-7 Bar) with Mg powder yields, after purification, carbonaceous matter containing few-layered graphene.

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2. Novoselov K.S, Geim A.K., Morozov S.V., Jiang D., Zhang Y., Dubonos S.V., Grigorieva I.V., Firsov A.A.. *Electric field effect in atomically thin carbon films* // Science.-2004.-**306**,-P. 666-669.