

High quality Graphene by efficient Graphite exfoliation in liquid phase

CSIC has developed a new method of preparation of Graphene by means of Graphite exfoliation in liquid phase, employing Deep Eutectic Solvents (DES). The main advantages presented by this method are the simplicity of the process, since only by shaking a mixture of graphite with DES gets a homogenous dispersion of Graphene, and the high quality of the Graphene obtained, since no stage of the process involves a chemical transformation.

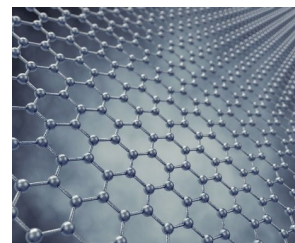
We are looking for a company interested in Patent Licensing

Description of the offer

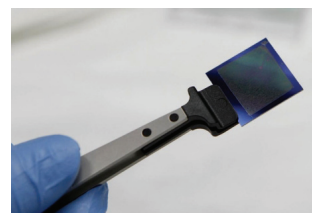
Graphene, a two-dimensional molecular structure of one atom thick, is one of the most thin, flexible, and strong materials with higher conductivity ever known. Its potential application in different technology areas, such as the telecommunications industry, the production of chips or the pharmaceutical industry, is conditioned by the availability of both physical and chemical methods for its obtaining.

During the last years, different methods for obtaining Graphene have been described, which include micro mechanical exfoliation, Chemical Vapor Deposition (CVD), epitaxial growth on insulating surfaces, and chemical processing of Graphite oxide, which involves oxidation and exfoliation of graphite and its subsequent reduction. All these methods have drawbacks associated with reproducibility, drastic conditions of preparation or low quality of retrieved Graphene.

It has developed an effective method for the preparation of high quality Graphene, through exfoliation of Graphite in liquid phase using DES, a new generation of ionic solvents prepared using mixtures of compounds that form a eutectic with lower melting point than the individual components. DES have emerged as "a green" alternative to conventional solvents.



The exceptional properties of Graphene do have many potential applications of high technology



The new method of exfoliation allows to obtain efficiently high quality Graphene

Innovative aspects and advantages

- The new method allows obtaining high quality Graphene practically free from defects, since it is not subject at any time to some kind of chemical treatment or transformation.
- The new method is a highly efficient process from the performance of the retrieved Graphene point of view. Graphene can be isolated by filtration, sedimentation or centrifugation techniques, and DES can be recycled for later use.
- The main advantages of DES are its low cost, the simplicity of its preparation (mix components and shake for a short period of time), low toxicity and high biodegradability of the components.
- The new method is potentially compatible with the preparation of polymeric composite materials including Graphene in its structure, due to the capacity of DES to disperse homogeneously a large numbers of polymers forms, something essential to obtain composite materials of high quality.

Patent Status

Priority patent application filed (with international effect)

For further information, please contact

Dr. Luis Miguel Lozano, PhD

Institute of General Organic Chemistry

Deputy Vice-Presidency for Knowledge Transfer of CSIC

Tel.: + 34 – 91 562 29 00

E-mail: transfer@iqog.csic.es

