

Graphene from sugar – a sweet protocol

Scientists from the Centre for Nano and Soft Matter Sciences, Bengaluru, an autonomous institution under the Department of Science & Technology, Government of India have synthesised reduce graphene oxide (rGO) by the combustion of table-sugar.

The group led by Prof. C. N. R. Rao consisting of Dr. P. Chithaiah from CeNS and Prof. G. U. Kulkarni from JNCASR, Bengaluru has developed a rapid and simple route for the synthesis of rGO by the combustion of table-sugar. This method being single-step and reproducible is advantageous compared to the reported protocols used presently. Further, the synthesis doesn't involve any metal catalysts, expensive reagents, solvents, hazardous chemicals, and, most importantly, it has the ability to produce graphene oxide in large quantities at rapid rates.

Graphene, a one-atom-thick, two-dimensional sheet of sp^2 hybridized carbon atoms is known as a wonder material, as it is stronger than diamond, conducts better than copper along with many other interesting properties. However, the production of graphene in large scale has many challenges to address.

Till date, methods like chemical vapor deposition, arc discharge, aerosol pyrolysis, mechanical exfoliation, solvothermal, hydrothermal synthesis, laser reduction of graphite oxide have been developed to prepare graphene (reduce graphene oxide, rGO). All these methods either involve hazardous chemicals, high temperatures, and inert atmosphere making them expensive and thus becoming irrelevant for bulk scale applications.

The team believes that the process developed may have a significant impact on various products, including batteries. Their work has been published in the 'Beilstein Journal of Nanotechnology.'

