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Conference Abstract

A NEW METHOD FOR LARGE SCALE GRAPHENE PRODUCTION

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Dr. Aamir Minhas Khan has completed his MSc and M.Phil degrees in Physics from Quaid-i-Azam University Pakistan and Ph.D degree in 2015 in Material Physics and Chemistry from Wuhan University of Technology, China with specialization in redox super capacitors his Ph.D studies were funded by China-Scholarship Council (CSC). He has published 10 research articles in high impact factor journals of the world including Nature Communications, Nano Letters, Advanced Materials and Advanced Energy Materials and his research work has been cited more than 900 times in different research articles and has been presented in different international conferences. He has been awarded Gold medal by Hazrat Khalifatul Masih (May Allah be his helper) in 2017 for achieving Ph.D, outstanding article award of Wuhan University of Technology in 2014, nominated as outstanding CSC scholar of the city Wuhan 2014. His name has been listed in top 20 young physicist of Pakistan twice and Approved-PhD-supervisor list of Pakistan. Previously he has served at the positions of Lecturer and assistant professor in a university of Pakistan with 5 years of teaching as well as research experience and currently doing postdoctoral research in York University Toronto and working in discovering interesting properties of Graphene material generated by lase

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Competing Interest
The authors declare no competing interests.

Additional information is available at the end of the article.

Abstract

"All praise belongs to Allah, the Maker of the heavens and the earth, Who employs the angels as messengers, having wings, two, three, and four. He adds to His creation whatever He pleases; for Allah has power over all things." (35:2)

Hazrat Khalifatul Masih IV said the meaning of “wings of angels” does not mean real wings but its valences of different elements. Chemical property of every element changes as its valence electron makes a bond with the neighbours. Graphene is one allotrope of carbon material whose 4 valence electrons help in forming an interesting structure as well as properties.

This material offers a range of applications in industry owing to its chemical as well as physical stability, biocompatibility and high electrical as well as thermal conductivity with a large surface area. Graphene can be used for making electron field emitters, hydrogen storage, transparent conductive films, organic photovoltaic cells, field effect transistors, ultrasensitive sensors, supercapacitors and batteries. Industrial scale production of graphene is a challenge because of the involved chemical methods which exploit many chemicals in the environment that are harmful to human beings, and multiple steps that make the process lengthy. Especially, when there involves patterned graphene, required for a device preparation, synthesis becomes extremely difficult to control the process at a very small scale. Recently developed technique of patterned graphene generation on commercially available Polyimide (PI) tape by CO 2 infrared laser irradiation under ambient air conditions has solved the problem. This method follows photochemical and photothermal transition of different polymer materials by flashing laser pulses with a precision that is hard to achieve using other methods. This laser process has stimulated fundamental research on transformation process on the surface of polymer materials. We report fundamental study of laser interaction with polymer substrate and furthermore report within same localized laser engraved graphene area variation in different types of graphene that exhibits change in conductivity of the whole engraved graphene.

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