J Material Sci Eng 2017, 6:6(Suppl)
DOI: 10.4172/2169-0022-C1-077



## Graphene- an advanced nanomaterial

**T.Theivasanth**
Kalasalingam University, India

This work mainly deals with an advanced nanomaterial,"low cost graphene"- its synthesis, characterization and applications. Discovery of this carbon material plays key roles in nano-science and technology. Many literatures are describing that this material is the thinnest, lightest, strongest, extremely flexible and almost transparent material. It has many attractive / intrinsic properties like mechanical, thermal, electrical, acoustical etc. But, its higher price acts as the main barrier which prevents its usages at various levels of industries particularly mass level applications like paints, cements & concrete works. Production of this material at very low cost price will be helpful to utilise the entire extra-ordinary properties material properly.

This lecture also discusses about the characterization of graphene using various tools like XRD, SEM, FT-Raman, UV-Vis and FT-IR. Characters like crystal structure analysis, morphology analysis - 2D nature, number of layer calculation, graphene plasmonics, optical transparency and Pauli blocking in interband region are explored from these tools. The number of layers influences the magnetic properties of graphene. If the number of layers is less, enormous magnetization emerges from graphene. Controlling of magnetism in graphene will be helpful in the development of sensors and spintronics. VSM analysis is a useful tool to differentiate the graphene from diamagnetic material graphite.

Applications of graphene are myriad. Metallic impurities absence and 2D nature of graphene makes it suitable and preferable material for micro/nano fabrication. Incorporation of small quantity of graphene fillers into polymer creates novel nano-composites with improved structural and functional properties for utilisations in applications ranging from transportation, biomedical systems, sensors, electrodes for solar cells and electromagnetic interference.

It is also discussed about the lubrication and high thermal conducting properties of graphene. It cools tiny electron devices more efficiently than copper and other thermal conductors. Nano size, high specific surface area to volume ratio, catalytic properties of graphene exchanges the heat between water and air quickly. Graphene coated copper facilitates heat exchange / heat transfer enhancement between water and air. Hence, it can be utilized in air-cooler.

Keywords: graphene, nanofiller, lubrication, thermal conductivity

ttheivasanthi@gmail.com