**Abstract**

Nanotechnology improves the strengths of many materials and devices, as well as enhances their efficiencies by improving their electrical, mechanical, optical and magnetic properties. It is very much essential to understand the risks of using nanomaterials and choosing the right, less toxic materials (i.e) graphene which makes huge impacts on the environment. Graphene (G), an allotrope of carbon, possesses many superior physical and chemical properties, such as high electronic and thermal conductivity, huge mechanical strength, vast surface area and ready chemical functionalization that justify its nickname as miracle material and make it highly attractive for numerous applications. Graphene based materials are found to bring better solutions to the current industrial challenges related to energy generation and storage applications. Intensive research is focused on tailoring their structures, properties and surface activities of these exciting miracle materials. The synthesis of graphene based composites that contain wide range of active constituents such as transition metals, metal oxides and conducting polymers that tailors the properties of these materials which are best suited for various technological applications such as remediation of environmental pollution, renewable energy production, electronic and optoelectronic devices, chemical sensors and bio applications.