World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:18, No:05, 2024

Status of Bio-Graphene Extraction from Biomass: A Review

Authors : Simon Peter Wafula, Ziporah Nakabazzi Kitooke

Abstract : Graphene is a carbon allotrope made of a two-dimensional shape. This material has got a number of materials researchers' interest due to its properties that are special compared to ordinary material. Graphene is thought to enhance a number of material properties in the manufacturing, energy, and construction industries. Many studies consider graphene to be a wonder material, just like plastic in the 21st century. This shows how much should be invested in graphene research. This review highlights the status of graphene extracted from various biomass sources together with their appropriate extraction techniques, including the pretreatment methods for a better product. The functional groups and structure of graphene extracted using several common methods of synthesis are in this paper as well. The review explores methods like chemical vapor deposition (CVD), hydrothermal, chemical exfoliation method, liquid exfoliation, and Hummers. Comparative analysis of the various extraction techniques gives an insight into each of their advantages, challenges, and potential scalability. The review also highlights the pretreatment process for biomass before carbonation for better quality of bio-graphene. The various graphene modes, as well as their applications, are in this study. Recommendations for future research for improving the efficiency and sustainability of bio-graphene are highlighted.

Keywords : exfoliation, nanomaterials, biochar, large-scale, two-dimension
Conference Title : ICMSE 2024 : International Conference on Materials Science and Engineering
Conference Location : Honolulu, United States
Conference Dates : May 02-03, 2024