

Green-composites: Ecofriendly and Sustainability

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In present scenario, terms like “eco-friendly” and “sustainability” have become important criteria to develop any products whether they are household or industrial. It has become an essential norm that research and development efforts to be directed towards using more ecofriendly and sustainable materials instead of using fossil based non-biodegradable and non-renewable materials. So, ecofriendly and sustainable materials are considered for new products development due to their advantageous attributes contributing environmental, social and economic benefits. Examples of naturally available sustainable materials are bamboo; wood; hemp; wool; linen; straw; clay, stone, sand; beeswax; and coconut, which are abundantly available, light weight, and also fully biodegradable. From these ecofriendly and sustainable materials, our industries can produce the required quantity of green products without damage to environment.

“Green-composite” is a completely ecofriendly and sustainable composite which is made by bio-based materials. In this composite, both matrix and reinforcement are completely biodegradable and which are from renewable sources. Usually biodegradable polymers are the matrix materials used in green-composites, which are derived from plant, animal and bacterial sources. Examples for biodegradable polymers

are Natural rubber, Soy protein, Chitin and chitosan, Starch, Hydrogel and Aerogel, Gelatin, bioepoxy, Polylactic acid (PLA), Poly (3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV), Polycaprolactone (PCL), Poly(vinyl alcohol (PVA), Polybutylene adipate-co-terephthalate (PBAT), Polyhydroxybutyrate (PHB). Zein, Polyethylene terephthalate (PET), Pristine polycarbonate, etc. Natural fibers are used as reinforcement material in green-composites. Most commonly used fibers are kapok, cotton, coir, jute, kenaf, kudzu, linden, sisal, hemp, banana, pineapple, oil palm, alpaca, bison, sheep, angora, etc. Green composites are widely used in various applications such as automotive, aerospace, construction and building materials, household products, electronic and biomedical applications, packaging industries, etc. Presently, government as well as private funding agencies are providing considerable amount of funds for the development of ecofriendly and sustainable products. Therefore, green composites, made by using biofibres and biopolymers, have become a hot topic for researchers, academics and scientists to create new ideas in development of efficient green-composites as viable alternative materials to non-sustainable glass and carbon fibre reinforced composites for various applications.



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