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natural fiber based composites have an extreme potential to functionalize waterproof fire retardant antibacterial property uv protection capability insulation property self cleaning performances and so on with different nanoparticles tio 2 rgo sio 2 zno and carbon nanotube which could dominate research and application areas in beyond natural fibres carbon fibres are examples of ultrastrong and tough materials that exhibit exceptional modulus and strength per unit mass that places them in a special parametric space our review reveals that the incorporation of inorganic nanoparticles into a natural fiber reinforced polymer composite improved mechanical and tribological properties it is also enhanced thermal stability and flame retardancy and reduced the water absorption capacity of biocomposites based on the understanding of natural fibers at the molecular and atomic levels the application of nano engineering to nfcs can take the form of introducing nanophases to develop natural fiber nanocomposites or manipulating the nanoscale structure of natural fibers or matrices natural fiber as a reinforcement and bio polymer matrix with nano fillers are widely used in material industries to develop the bio nanocomposites these bio composite are replacing the synthetic plastics and various harmful gasses and environmental toxicity natural fiber reinforced composites nfrcs containing nanoparticles nps are characterized by their eco friendly nature reduced water absorption and enhanced mechanical properties they are used in the construction transportation aerospace and other consumer products this study introduces natural fibers used as reinforcement in biodegradable composites in detail then general information and treatment methods of thermoset and thermoplastic green composites are presented providing a good foundation for everyone interested in these topics a variety of artificial spinning methods have been applied to produce regenerated silk fibers however how to spin regenerated silk fibers that retain the advantages of natural silks in when nanosheets of clay are used the toughness of the resulting nanocomposite can reach 36 7 3 0 megajoules per cubic metre which is 20 4 times higher than that of natural nacre meanwhile an attempt has been made to develop novel polymer based nano composite material reinforced with natural fibre synthetic fillers at both micro and nano levels with increased performance in terms of mechanical properties nanocomposites are solid materials that have multiple phase domains and at least one of these domains has a nanoscale structure the materials can have novel chemical and physical properties natural fiber is often used as a filler to strengthen bioplastic s mechanical and barrier properties here we propose a way to modify the surfaces of natural fibers by utilizing bacteria acetobacter xylinum to deposit nanosized bacterial cellulose around natural fibers which enhances their adhesion to renewable polymers this chapter reviews the performance and effects of nanomaterials as a filler or reinforcement agent on physical and mechanical properties of natural fiber reinforced composites natural fibers are replacing synthetic fibers as reinforcement in polymer composites due to their non toxicity non corrosiveness high strength low density low cost renewability biodegradability and therefore positive impact on the environment khalil et al 2008 azwa et al 2013 natural fiber composites nfcs are biobased composites with a natural fiber reinforcement and matrix a study by faruk et al faruk et al 2012 claims that these natural fibers can come from a range of sources including plants such as hemp jute flax sisal kenaf and bamboo and animals silk and wool here we propose a way to modify the surfaces of natural fibers by utilizing bacteria acetobacter xylinum to deposit nanosized bacterial cellulose around natural fibers which enhances their adhesion to renewable polymers this paper describes the process of modifying large quantities of natural fibers with bacterial cellulose through their nanofibrillated cellulose nfc refers to cellulose fibers that have been fibrillated to achieve agglomerates of cellulose microfibril units nfcs have nanoscale less than 100 nm diameter and typical length of several micrometers in this work we present a series of nanocomposites for fused filament fabrication fff based on polycaprolactone pcl and chitin nanocrystals chncs the chncs were synthesized by acid hydrolysis using hcl or lactic acid la the approach using la an organic acid makes the chncs synthesis more sustainable and modifies their surface with lactate groups increasing their compatibility natural fibers for composites natural fibers are gaining prominence as eco friendly alternatives for reinforcing composite materials offering renewable and biodegradable options

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