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Recent advances in polylactic acid based blends, composites and nanocomposites for packaging and barrier applications

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Development of biodegradable materials is highly in demand as large and rapid usage of plastic materials results million tons of plastic wastes in the landfill sites each year globally. It takes a long time for conventional plastics to degrade, leading to severe ecological problems too. The production capacities of biodegradable plastics, such as polylactic acid (PLA), polyhydroxyalkanoates, and starch blends, are also growing steadily, nearly doubling from 0.7 million metric tons in 2014 to well over 1.2 million metric tons by 2019. PLA, for its good compatibility and biodegradability, is preferred by people from all sectors. Also, PLA is a low energy consumption product, about 30-50% lower in energy consumption than the petroleum-based polymers. PLA as the most widely used, the lowest price of bioplastic in industrialization, in the aspect of practicality, is the biodegradable material that has the largest scope to replace the position of the petroleum based plastics on the current scenario of oil scarcity. The production cost of PLA is also approaching the cost of traditional plastic, and with the strong expansion of market applications, will get soon recognized globally. PLA based nanocomposites are widely used today in various applications. The review article aims to target on the topical progresses in the synthesis and characterization of PLA blends, PLA composites and PLA nanocomposites with different materials. Moreover, this article is a unique collection of vital information about PLA based blends and composites for drug delivery, packaging and barrier applications in a single platform.

Biography

Dr. Kartikey Verma is working as professor in Indian Institute of Technology, Roorkee, India. His research interest is on advanced materials, biomaterials, Nanotechnology.

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