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Comprehensive review on nanocellulose: Recent developments, challenges and future prospects

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研究领域	林产化工
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语种	英语
标题	Comprehensive review on nanocellulose: Recent developments, challenges and future prospects
来源期刊	Journal of the Mechanical Behavior of Biomedical Materials
期	第244期
发表时间	20200528
关键词	Nanocellulose; Biotechnology; Commercialisation; Toxicity;
摘要	Cellulose constitutes most of a plant's cell wall, and it is the most abundant renewable polymer source on our planet. Given the hierarchical structure of cellulose, nanocellulose has gained considerable attention as a nano-reinforcement for polymer matrices in various industries (medical and healthcare, oil and gas, packaging, paper and board, composites, printed and flexible electronics, textiles, filtration, rheology modifiers, 3D printing, aerogels and coating films). Herein, nanocellulose is considered as a sustainable nanomaterial due to its substantial strength, low density, excellent mechanical performance and biocompatibility. Indeed, nanocellulose exists in several forms, including bacterial cellulose, nanocrystalline cellulose and nanofibrillated cellulose, which results in biodegradable and environmentally friendly bionanocomposites with remarkably improved material properties. This paper reviews the recent advances in production, physicochemical properties, and structural characterization of nanocelluloses. It also summarises recent developments in several multifunctional applications of nanocellulose with an emphasis on bionanocomposite properties. Besides, various challenges associated with commercialisation and economic aspects of nanocellulose for current and future markets are also discussed inclusively.
服务人员	尚玮姣
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