Nano-cellulose: A near substitute for plastic

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Abstract:

Plastics are available at a lower cost and are easy to reuse and re-shape. The high usability of plastics has increased the amount of plastic waste in the environment. Regardless of their high usability, plastics have a hazardous impact on the environment and human beings. The particles of plastic can take millions of years to degrade. The massive disposal of plastic waste has polluted land and oceans. Other materials available in the market, such as papers and jute materials are decomposable, but their usability is not as good as plastics. At this point, there is a quest to find a bio-degradable substitute for plastics. Recent advances in Nano particles have significantly developed highly useful materials. Nano-cellulose is the next miracle material with all the properties of plastic, but it is easily degradable. Nano-cellulose is created from wood and comprises Nano sized cellulose fibrils, which is completely natural. Nano-cellulose can also be used for many other purposes, such as beauty, food preservation, antibacterial coatings, electronic displays, mechanically reinforced polymer composites, tissue scaffolds, drug delivery, energy storage, sensors, etc. Scientists have named Nano-cellulose a pseudo-plastic, but the commercial deployment of Nano-cellulose is still not common. There are many challenges in the commercialization of Nano-cellulose, just like plastics. One of the many challenges is that the development of Nano-cellulose takes lots of time and resources, resulting in a higher cost to the end user. The conclusion is that the research community is still trying to develop a pocket-friendly way of developing Nano-cellulose in order to support its commercial deployment. Next development in this line is amalgamation of Nano plastics with other materials to deliver a product like plastic with similar mechanical properties in an affordable cost to the end user. An example of this is bioplastics, when mixed with Nano-particles can give 100% degradable material with much better sustainability and packaging properties.

Biography:

Dr. Sandeep Singh Sengar is a Lecturer in Computer Science at Cardiff Metropolitan University, United Kingdom. He also holds the position of cluster leader for Computer Vision/Image Processing at this place. Before joining this position, he worked as a Postdoctoral Research Fellow at the Machine Learning Section of the Computer Science Department, University of Copenhagen, Denmark (a ranked #1 university in Denmark). He completed his Ph.D. degree in Computer Vision at the Department of Computer Science and Engineering from the Indian Institute of Technology (ISM), Dhanbad, India, and an M. Tech. degree from Motilal Nehru National Institute of Technology, Allahabad, India. Dr. Sengar's broader research interests include Machine/Deep Learning, Computer Vision, Image/Video Processing, and its applications. He is an Editorial Board Member of the International Journal of Imaging Systems and Technology. He is a Reviewer of several reputed International Transactions, Journals, and conferences. He has also served as a Technical Program Committee member in many reputed International Conferences. He has organized several special sessions and given keynote presentations at International Conferences. In addition to these, he has also given many expert talks in reputed organizations.

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