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Nanocellulose: From fundamentals to advanced materials

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Over the past decade, Nanocellulose has been proven to be one of the most prominent green materials of modern times. This renewable nanofiber has been used in wide range of applications from flexible packaging to advanced bio-scaffolds for tissue regeneration. The use of these renewable materials is important in future technologies. Nanocellulose have been the subject of decades of research due to their versatility and particularly their use in actuators, sensors, energy storage, space structure, membrane, packaging, automotive, and biomedical applications. Besides, Nanocellulose have found extensive application in smart hybrid systems, as nanocellulose can both contribute to the optical, thermal and mechanical properties of the system and bear stimuli-responsive surface modifications. In this presentation, we explain the outline of current development in this particular field, including the isolation, characterization, behaviour, and various applications of Nanocellulose reinforced polymer nanocomposites. The recent research on nanocellulose-containing smart hybrid systems will also be covered, with attention given to the fabrication methodologies that have been utilized. Besides that, we hope to impart the audience with some of the excitement that currently surrounds nanocellulose research, which ascends from the renewable source nature of the nanofiber, their fascinating, morphological, mechanical, chemical and physical properties, and the a variety of applications that can be developed from these nanomaterials. Besides that, the unique application of nanocellulose in shape memory polymers and self-healing nanocomposites will be deliberated.

Keywords: Nanocellulose, Nanocomposite.

Biography

R.A. Ilyas is a senior lecturer in School of Chemical and Energy Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, Malaysia. He received his Diploma in Forestry at Universiti Putra Malaysia, Bintulu Campus (UPMKB) and Sarawak, Malaysia from Mei 2009 to April 2012. In 2012, he was awarded the Public Service Department (JPA) scholarship to pursue his Bachelor's Degree (BSc) in Chemical Engineering at University Putra Malaysia (UPM). Upon completing his BSc. programme in 2016, he was again awarded the Graduate Research Fellowship (GRF) by the Universiti Putra Malaysia (UPM) to undertake a PhD degree in the field of Biocomposite Technology & Design at Institute of Tropical Forestry and Forest Products (INTROP) UPM. R.A. Ilyas was the recipient of MVP Doctor of Philosophy Gold Medal Award UPM 2019, for Best PhD Thesis and Top Student Award.

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