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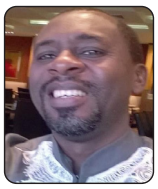
Abstract



Exploring the Tensile and Physical Properties of Polypropylene Biocomposites Filled with Carbonized Coconut Shell Particles

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Abstract:

The high cost and processing challenges associated with inorganic fillers have triggered the quest for alternative and less expensive filler materials from botanical resources such as waste coconut shells. The as prepared coconut shells were carbonized in an electrothermal oven at 200°C for 2 h and later pulverized and sieved into four particles sizes of 63µm, 150µm, 300µm, and 425µm. Furthermore, these carbonized fillers were used as reinforcing fillers in polypropylene matrix at varying filler contents of 0, 10, 20, 30, and 40 wt. %. Composite sheets of PP/CCSP were prepared by melt blending of polypropylene and the filler in an injection moulding machine. Our investigations showed that the addition of fillers was found to improve the yield strength, tensile strength, and tensile modulus of polypropylene as these tensile properties increased with increase in filler content. The elongation at break and modulus of resilience of the prepared composites were, however, observed to be inversely related with the filler content. Also, the investigation revealed that the specific gravity, flame propagation rate, water absorption and solvent uptake by PP/CCSP composites were found to increase with increase in the filler content. Therefore, the incorporation of CCSP into polypropylene increased the specific gravity, but reduced the flame resistance, moisture resistance, and solvent resistance of the polymer.

Biography:

Dr Henry Chinedu Obasi received his PhD in Polymer Science from Federal University of Technology, Owerri, Nigeria in 2013. He joined the university as a graduate assistant in 2005 and now serves as a senior lecturer in the Department of Polymer and Textile Engineering where he enjoys balancing his professional time between teaching and mentoring, nurturing scientists and engineers and as well working on scientific research projects. He did

his post-doctoral study at the Interdisciplinary Research Centre in Biomedical Materials, CIIT, Lahore, in 2015. His research interests cover biobased polymer composites, rubber blends, biomaterials for tissue engineering, antimicrobial polymer blends. He has published more than 40 research articles in the field of polymer science and engineering. He is a member of editorial board to some international journals. In his spare time, Dr. Obasi pleasures exploring the outdoors, listening to music, and spending time with his family, and friends.

Publication of speakers:

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3. Nonso, Okonkwo & Sn, Okonkwo & Nnorom, Onyekachi & Obasi, Henry & Onuegbu, Genevive & Chima Kenneth, Oguzie. (2019). Effect of Mordants on Sodium Hydroxide Extract of Whitfieldia Lateritia Plant Dyes.
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