Mohamed Ansari M Nainar, J Biotechnol Biomater 2018, Volume 8
DOI: 10.4172/2155-952X-C1-087

Mohamed Ansari M Nainar

Universiti Tenaga Nasional, Malaysia

Natural/Synthetic hybrid biocomposites: Sustainable materials

Due to environment and sustainability issues, biocomposites have encountered remarkable interest in the last two decades. Also, due to the expanding waste management concerns, natural fibres composites have drawn the attention of many researchers in this field. Hybrid polymer composites have embedded a series of natural and synthetic fibers. Each one has intrinsic characteristics that, when combined to a polymer matrix, achieve a high performance and/or sustainable material [1]. One of the major concern in the composite characteristics is the bonding between the reinforcements and the matrix [2]. Even though numbers of composite materials with synthetic fibres such as glass fibres, rayon, nylon etc. and metallic fibres have been used as reinforcing agent but natural fibres have uniqueness among them because of its extraordinary properties such as biodegradability with significant strength and stiffness [3-5]. The purpose of this talk is to bring awareness among the scientist and researchers on introducing a cost effective and cleaner method of improving the chemical interaction between the natural fibres and the polymer matrix through hybridization techniques and minimize the water absorption problems that usually occur in pure natural fibre based polymer composites. To improve on the properties of natural fiber composites and/or overcome some of their limitations such as moisture absorption, thermal stability, brittleness and surface quality, the concept of hybridization of fibre reinforced composites was used in this study. Jute fibre (JF)/Carbon fibre (CF) and Jute fibre (JF)/Kevlar fibre (KF) hybrid epoxy composites were prepared using Vacuum Press Infusion (VPI) method. Tensile, flexural and impact tests were performed as per the ASTM standard methods. The hybrid composites showed improvement in mechanical properties and reduced water absorption characteristics compared to Jute/epoxy composites. Energy absorption characteristics have shown considerable improvement compared to pure epoxy and Jute/Epoxy biocomposites as shown in Figure 1 (a) – (d).

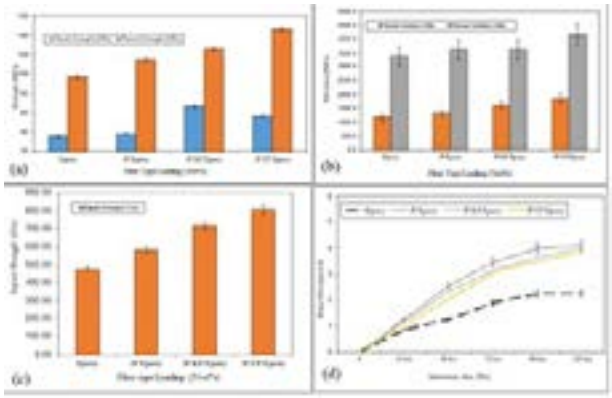

Figure 1: (a) Tensile and flexural strength of hybrid epoxy composites
(b) Tensile and flexural modulus of epoxy composites
(c) Izod impact strength of hybrid epoxy composites
(d) Water absorption of hybrid epoxy composites

References

1. Layth Mohammed, M.N.M. Ansari, Grace Pua, Mohammad Jawaid, and M. Saiful Islam (2015) A Review on Natural Fiber Reinforced Polymer Composite and Its Applications. International Journal of Polymer Science.
2. Wendy Rodriguez-Castellanos and Denis Rodrigue. (2016) Ch15. Production and Characterization of Hybrid Polymer Composites Based on Natural Fibers. "Composites from Renewable and Sustainable Materials", book edited by Matheus Poletto, ISBN 978-953-51-2794-9, Print ISBN 978-953-51-2793-2, Published: November 30, 2016.
3. Daniela de França da Silva Freitas, Sibele P. Cestari, Luis C. Mendes (2017) Ch7. Natural and synthetic fillers for reaching high performance and sustainable hybrid polymer composites. Hybrid Polymer Composite Materials, WP. 157-171.
4. Z.F.Albahash, M.N.M.Ansari (2017) Investigation on energy absorption of natural and hybrid fiber under axial static crushing. Composites Science and Technology.
5. M.N.M.Ansari, Z.F.Albahash (2018) Energy absorption of Jute/Kevlar Hybrid Epoxy Composite. International Conference on Advancement in Polymeric Materials (APM 2018). CIPET, LARPM Bhubaeshwar, India. Feb 2-4, 2018.

Biography

Dr. Mohamed Ansari M Nainar is currently working as Associate Professor of Mechanical Engineering, College of Engineering, Universiti Tenaga Nasional, Malaysia since 2010. He obtained his Ph.D in Polymer Engineering from Universiti Sains Malaysia (USM), Engineering Campus, Malaysia (2009). Dr. Ansari has more than 20 years of teaching, research and industrial experience and has co-authored publications of over 50 research articles in refereed technical journals, 1 book chapter and 1 book to his credit. He has supervised 3 PhD thesis, 15 Master's thesis and 60 undergraduate final year project thesis. Currently, Dr. Ansari serves as a Technical Program Review Committee for Tech Connect World Innovation Conference - USA, since 2012. He is also working as technical reviewer for many reputed journals. He has delivered Invited lectures in many reputed organizations.

ansari@uniten.edu.my

Notes: