

Document details

[< Back to results](#) | 1 of 1
[Export](#)
[Download](#)
[Print](#)
[E-mail](#)
[Save to PDF](#)
[Add to List](#)
[More... >](#)
[View at Publisher](#)

IOP Conference Series: Materials Science and Engineering

Volume 200, Issue 1, 2018, Article number 012032

International Conference on Advances in Manufacturing and Materials Engineering 2017, ICAMME 2017; International Islamic University Malaysia (IIUM), Gombak Campus Kuala Lumpur; Malaysia; 8 August 2017 through 9 August 2017; Code 134404

Effect of coupling agent on durian skin fibre nanocomposite reinforced polypropylene (Conference Paper) [\(Open Access\)](#)

Siti Nur E'Zzati, M.A. [✉](#), Anuar, H., Siti Munirah Salimah, A.R.

Department of Manufacturing and Materials Engineering, International Islamic University Malaysia (IIUM), Jalan Gombak, Kuala Lumpur, 53100, Malaysia

Abstract

[View references \(19\)](#)

This paper reports on the development of a composite-based natural fiber to reduce the reliance on petroleum-based product in order to amplify environmental awareness. The production of Durian Skin Nanofiber (DSNF) was conducted using biological fermentation method via *rhizopus oryzae* in order to obtain the nano dimension of the particle size. Polypropylene (PP) and DSNF were produced using Haake internal mixer via melt blending technique. The significant effect of maleic anhydride grafted polypropylene (MAPP) on the properties of PP/DSNF nanocomposite was investigated to study its mechanical properties which are tensile strength and thermal stability using thermogravimetric (TGA) and differential scanning analysis (DSC). The tensile property of PP nanocomposites increased from 33 MPa to 38 MPa with the presence of MAPP. The addition of MAPP also increased the thermal stability of PP/DSNF nanocomposite where the char residue increased by 52%. Besides that, the thermal degradation of PP/DSNF and PP/DSNF-MAPP were higher than PP where they exerted higher amount of weight loss at an elevated temperature. The percentage of crystallinity, %Xc, of PP nanocomposites improved with the addition of MAPP by 35% based on the differential scanning calorimetry (DSC) result. The SEM analysis showed that the PP/DSNF-MAPP exerts ductile fracture while PP/DSNF exerts brittle fracture. © Published under licence by IOP Publishing Ltd.

SciVal Topic Prominence ⓘ

Topic: Natural fibers | Fibers | natural fibre

Prominence percentile: 99.671



Reaxys Database Information

[View Compounds](#)

Indexed keywords

Engineering controlled terms:

Blending Brittle fracture Coupling agents Differential scanning calorimetry
Ductile fracture Fracture Manufacture Nanocomposites Particle size
Reinforced plastics Tensile strength Thermodynamic stability Thermogravimetric analysis

Engineering uncontrolled terms

Differential scanning analysis Elevated temperature Environmental awareness
Haake internal mixers Maleic anhydride grafted polypropylene Petroleum based products
PP nanocomposite Thermo-gravimetric

Metrics ⓘ

0 Citations in Scopus

0 Field-Weighted Citation Impact



PlumX Metrics

Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

Cited by 0 documents

Inform me when this document is cited in Scopus:

[Set citation alert >](#)[Set citation feed >](#)

Related documents

Environmental degradation of durian skin nanofibre biocomposite

Mohd Apandi, S.N.E. , Anuar, H. , Rashid, S.M.S.A. (2018) *IIUM Engineering Journal*

Characterization of durian rinds fiber (*Durio zubinthinus*, murr) from North Sumatera

Lubis, R. , Saragih, S.W. , Wirjosentono, B. (2018) *AIP Conference Proceedings*

Carbohydrate derived co-poly(lactide) as compatibiliser for bacterial cellulose reinforced polylactide nanocomposites

Lee, K.-Y. , Montrikittiphant, T. , Tang, M. (2013) *ICCM International Conferences on Composite Materials*

View all related documents based on references

Funding details

Funding sponsor	Funding number	Acronym
Ministry of Higher Education, Malaysia		MOHE
International Islamic University Malaysia		IIUM

Funding text

This work was financially supported by the Fundamental Research Grant Scheme (FRGS14-108-0349) from the Ministry of Education Malaysia. The authors would like to thank International Islamic University Malaysia for the research facilities in making this study a success.

ISSN: 17578981

Source Type: Conference Proceeding

Original language: English

DOI: 10.1088/1757-899X/290/1/012032

Document Type: Conference Paper

Sponsors:

Publisher: Institute of Physics Publishing

References (19)

[View in search results format >](#)

All [Export](#) [Print](#) [E-mail](#) [Save to PDF](#) [Create bibliography](#)

- 1 Cheung, H.-y., Ho, M.-p., Lau, K.-t., Cardona, F., Hui, D.
Natural fibre-reinforced composites for bioengineering and environmental engineering applications

(2009) *Composites Part B: Engineering*, 40 (7), pp. 655-663. Cited 311 times.
doi: 10.1016/j.compositesb.2009.04.014

[View at Publisher](#)

- 2 Anuar, H., Zuraida, A.
Improvement in mechanical properties of reinforced thermoplastic elastomer composite with kenaf bast fibre

(2011) *Composites Part B: Engineering*, 42 (3), pp. 462-465. Cited 94 times.
doi: 10.1016/j.compositesb.2010.12.013

[View at Publisher](#)

- 3 Prasad, P., Kochhar, A.
(2014) *Journal of Environmental Science, Toxicology and Food Technology*, 5, pp. 1-7.