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Characterization of Poly(vinyl) Alcohol Based Aerogel Assisted by Cellulose Nanocrystal

Nasrudin, Raimi Fariz^a ; [Samat, Noorasikin^a](#); [Engliman, Nurul Sakinah^b](#) [Save all to author list](#)^a Department of Manufacturing and Materials Engineering, International Islamic University Malaysia (IIUM), Jalan Gombak, Kuala Lumpur, 53100, Malaysia^b Department of Biochemical-Biotechnology Engineering, International Islamic University Malaysia (IIUM), Jalan Gombak, Kuala Lumpur, 53100, Malaysia[Full text options](#) [Export](#) [Abstract](#)[Author keywords](#)[Indexed keywords](#)[SciVal Topics](#)[Metrics](#)[Funding details](#)**Abstract**

A versatile and economic synthetic material is successfully prepared using a low-cost polyvinyl alcohol (PVA) and renewable cellulose nanocrystal (CNC) obtained from oil palm biomass through freeze-drying process. The PVA-based aerogels were incorporated with the CNC and glutaraldehyde (GA) which acted as nanofiller and crosslinker, respectively. The properties of fabricated hybrid aerogel samples were measured, and analyzed using compression testing, scanning electron microscope (SEM)

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and Barrett-Joyner-Halenda (BJH). The presence of CNC and GA crosslinkers have improved the compressive strength of PVA aerogel. The SEM analysis revealed that both materials affects the pore structures in term of its morphology, size and volume. The results of pore volume and volume is supported with the BJH results. © 2023, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.


Author keywords

Cellulose nanocrystal (CNC); Crosslinking; Glutaraldehyde (GA); Hybrid aerogel; Poly(vinyl alcohol (PVA)

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