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Nanocellulose Incorporated Polyvinyl Alcohol Hydrogel

Authors : Rosli Mohd Yunus, Zianor Azrina Zianon Abdin, Mohammad Dalour Hossen Beg, Ridzuan Ramli

Abstract : Recently, nanocrystalline cellulose (NCC) has gained considerable interest as a promising biomaterial due to their outstanding properties such as high surface area, high mechanical properties, hydrophilicity, biocompatibility and biodegradability. The NCC also has good stability in water which is compatible for mixing of water based polymer solution or emulsions with NCC. Oil palm empty fruit bunch (EFB) contained different amount of lignocellulosic materials such as lignin, hemicellulose and cellulose. Cellulose is the most significant materials that can be extracted from EFB as nanocrystalline cellulose (NCC). In this work the nanocrystalline cellulose were produced through acid hydrolysis together with ultrasound technique. The morphology of NCC was characterized by TEM, thermal behavior has been studied with DSC, TGA analysis. Structural properties were illustrated X-Ray diffraction as well as FTIR. The hydrogel was produced using polyvinyl alcohol (PVA) with different concentration of NCC. The hydrogel composite was characterized by swelling ratio, crosslinking density, mechanical properties and morphology.

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