

# Effect of Steam-Alkaline coupled treatment on N36 cultivar pineapple leaf fibre for isolation of cellulose

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## ABSTRACT

Pineapple leaf is a waste product of pineapple cultivation which may leads to environmental issues. Pineapple leaf fibre (PALF) is an important natural fibre with high cellulose content that exhibits superior mechanical properties which is high specific strength and stiffness which may vary for each cultivar. Besides, isolation of cellulose from lignocellulosic fibre become more crucial. In this study, PALF of N36 cultivar has been selected for isolation of cellulose using steam-alkaline coupled treatment (SAC). In that order, concentration of NaOH (0.5 wt%, 1.0 wt%) and retention of steam treatment (30 min, 60 min) were varied for pulping and subsequently bleached with 3 wt% of NaClO<sub>2</sub>. The PALF and treated fibre were characterized using Scanning Electron Microscopy, Thermal Gravimetric Analysis, Fourier Transform Infrared Spectroscopy and Moisture analysis to study surface morphology, thermal stability, functional group and hydrophobicity respectively. Based on results, S60 A1 with 1 wt% NaOH and 60 min steam treatment exhibit excellent thermal stability and surface morphology, where the maximum degradation occur at 329.78°C which is 9% improvement compare to untreated PALF and loosen structure of fibre bundle with reduced diameter (4.720 μm). In addition, it removes major amount of amorphous region and enhance the hydrophobicity of fibre.

**KEYWORDS:** Pineapple leaf fibre; Steam; Alkaline; Cellulose

**DOI:** <https://doi.org/10.1016/j.matpr.2021.02.216>

## **ACKNOWLEDGEMENTS**

We would like to thank Universiti Malaysia Pahang for the financial assistance through the research grant PGRS2003129.