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## EVALUATION OF COMPOSITION, STRUCTURE, AND PROPERTIES ON ALKALI TREATED SUGARCANE BAGASSE FIBER

**Juliana Anggono<sup>1,a)</sup>, András Bartos<sup>2,3</sup>, Dávid Kun<sup>2,3</sup>, Felycia Edi Soetaredjo<sup>4</sup>, János Móczó<sup>2,3</sup>, Antoni<sup>5</sup>, Hariyati Purwaningsih<sup>6</sup>, and Béla Pukánszky<sup>2,3</sup>**

<sup>1</sup>Department of Mechanical Engineering, Petra Christian University, Jalan Siwalankerto 121-131, Surabaya 60236, Indonesia, email:<sup>a)</sup> julianaa@petra.ac.id

<sup>2</sup>Department of Physical Chemistry and Materials Science, Budapest University of Technology and Economics, Műegyetem rkp. 3., Budapest 1111, Hungary

<sup>3</sup>Institute of Materials and Environmental Chemistry, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary

<sup>4</sup>Department of Chemical Engineering, Widya Mandala Surabaya Catholic University, Jalan Kalijudan 37, Surabaya 60114, Indonesia

<sup>5</sup>Department of Civil Engineering, Petra Christian University, Jalan Siwalankerto 121-131, Surabaya 60236, Indonesia

<sup>6</sup>Department of Materials and Metallurgical Engineering, Sepuluh Nopember Institute of Technology, Surabaya 60111, Indonesia

This work reported the study on the effect of alkali treatment using NaOH solutions of different concentration (0-40 wt.%) of sugarcane bagasse fibers on their composition, structure and properties. The results evidenced that treatment modifies the composition, structure and properties of the fibers. The content of hemicellulose and lignin reduce, while cellulose content turns through a maximum as a function of NaOH concentration. A small change in crystallinity was identified and microfibril angle (MFA) remained constant thus structural effects and especially MFA were not the main reasons for altering the properties. The stiffness of the fibers shows a slight maximum at around 2-4 wt.% NaOH content, while a much more pronounced strength found at around 5-8 wt.%. Direct correlation between structure and mechanical properties was not found, indicating that composition is more essential in the determination of properties than structure. The optimum concentration of the treating solution is around 5 wt% NaOH content, if the time of treatment is fixed at 1 hour.

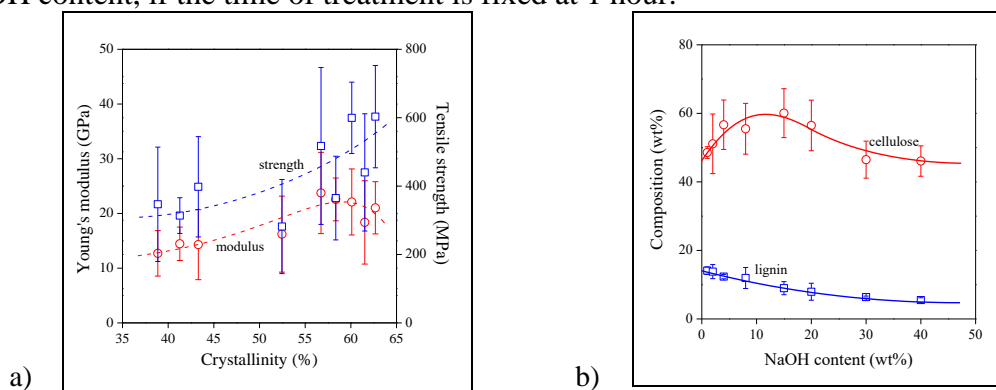
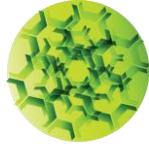


Figure 1 Weak correlation between the mechanical properties of bagasse fibers and crystallinity. Symbols: (○) Young's modulus, (□) tensile strength and b) Effect of the NaOH concentration on the composition of sugarcane bagasse fibers. Treatment time: 1 h. Symbols: (○) cellulose, (□) lignin content.

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