

ABSTRAK

SINTESIS DAN KARAKTERISASI WOLLASTONITE MENGGUNAKAN SILIKA ABU DAUN BAMBUN DAN MERETIX-MERETIX SHELL

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Wollastonite telah disintesis menggunakan limbah bio (daun bambu dan cangkang kerang tahu) dengan metode rekasi padatan. Penelitian ini dilakukan untuk mengetahui pengaruh variasi suhu kalsinasi 900 °C, 1000 °C dan 1100 °C terhadap sifat termal, fasa yang terbentuk, karakterisasi morfologi, dan gugus fungsi pada *wollastonite*. Karakterisasi yang digunakan yaitu *Differential Thermal Analysis-Thermogravimetric Analysis* (DTA-TGA), *X-Ray Diffraction* (XRD), *Scanning Electron Microscopy* (SEM) dan *Fourier Transform Infra-Red* (FTIR). Hasil analisa FTIR menunjukkan adanya *wollastonite* dari ketiga sampel yang dikonfirmasi dengan munculnya gugus Si-O-Ca pada setiap sampel. Pembentukan *wollastonite* juga diidentifikasi melalui hasil XRD yang menunjukkan adanya fasa β -CaSiO₃ dan fasa α -CaSiO₃ pada masing-masing sampel. Pembentukan fasa β -CaSiO₃ dan α -CaSiO₃ juga diidentifikasi dari hasil DTA-TGA. Selain itu, analisa DTA-TGA juga menunjukkan adanya penyusutan massa akibat terjadinya penguapan H₂O dan dekomposisi kalsium karbonat (CaCO₃) menjadi kalsium oksida (CaO) pada sampel *wollastonite*. Morfologi *wollastonite* diamati melalui SEM menunjukkan bentuk partikel *spheroid* (bulat) dengan ukuran butir rata-rata 0,28 μ m, 0,32 μ m dan 0,71 μ m pada sampel *wollastonite* suhu 900 °C, 1000 °C dan 1100 °C.

Kata kunci: *wollastonite*, daun bambu, *meretix-meretix shell*, reaksi padatan.

ABSTRACT

SYNTHESIS AND CHARACTERIZATION OF WOLLASTONITE PRODUCED FROM SiO₂ BAMBOO LEAF ASH AND MERETIX MERETIX SHELL

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Wollastonite has been synthesized from bio waste materials (bamboo leave ash and meretix meretix shell) by solid state reaction. The objective of this study to determine the effect of variations in calcination temperature of 900 °C, 1000 °C and 1100 °C on thermal properties, phase formation, morphological characterization, and functional groups in wollastonite. Samples were characterized by Differential Thermal Analysis-Thermogravimetric Analysis (DTA-TGA) to determine the thermal properties, X-Ray Diffraction (XRD) to determine the formed phase, Scanning Electron Microscopy (SEM) to determine the microstructure, and Fourier Transform Infra-Red (FTIR) to determine functional groups. The results of the FTIR analysis showed the presence of wollastonite from the three samples which confirmed the presence of Si-O-Ca groups from the samples. Wollastonite formation was also identified through XRD results which showed the presence of β -CaSiO₃ and α -CaSiO₃ in each sample. The formation of β -CaSiO₃ and α -CaSiO₃ phases was also identified from the DTA-TGA results. DTA-TGA analysis also showed a mass shrinkage due to the evaporation of H₂O and the decomposition of calcium carbonate (CaCO₃) into calcium oxide (CaO) in wollastonite samples. The morphology of wollastonite observed through SEM showed the shape of spheroidal particles (spherical) with an average grain size of 0.28 μ m, 0.32 μ m and 0.71 μ m in wollastonite samples at 900 °C, 1000 °C and 1100 °C.

Keywords: wollastonite, bamboo leave, *meretix-meretix* shell, solid state reaction.