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Optimization of soaking time for graphitization of oil palm trunk waste

Abstract

Synthetic graphite was synthesized from oil palm trunk chip in controlled heating condition or pyrolysis process. The soaking time was varied in the range of 2.5 hours, 3 hours, and 3.5 hours. While the heating rate and heating temperature was constant at 20 °/min and 500°C accordingly. After heat treatment process, the samples were characterized by X-Ray Diffraction (XRD) and analyzed using X'Pert Highscore Plus software. Synthetic graphite phase was analyzed by XRD and it was further supported by Fourier Transform Infrared (FTIR) Spectroscopy analysis to verify existence of functional group. The morphological study was carried out by using Scanning Electron Microscope (SEM). Based on the analysis, it was confirmed that synthetic graphite was successfully synthesized at 3hours soaking time with 500 °C and 20 °/min heating rate. Synthetic graphite was observed in the form of amorphous carbon based on the XRD diffraction pattern that match with the reference code of 00-041-1487.