

INTISARI

Kokas merupakan produk yang sangat penting bagi pabrik pengolahan mineral logam di Indonesia. Salah satu bahan baku alternatif kokas yang baik dan tidak mencemari lingkungan ialah cangkang kelapa sawit (CKS). Penelitian ini mencoba untuk melakukan kajian pembuatan kokas dari cangkang kelapa sawit dengan cara mencari variasi temperatur karbonisasi, campuran bahan, dan campuran perekat yang optimal.

Penelitian dilakukan dalam skala laboratorium. Cangkang kelapa sawit dan batubara dikarbonisasi pada variasi temperatur 450°C; 550°C; dan 650°C kemudian dihaluskan dan diayak dengan ukuran 35 mesh. Cangkang kelapa sawit dan batubara yang sudah menjadi serbuk arang kemudian ditimbang sesuai dengan rasio komposisi campuran serbuk dan perekat yaitu 40 g. Setelah itu kokas dicetak dengan tekanan kempa sebesar 100 kg/cm². Hasil cetakan berupa kokas berbentuk silinder berdiameter 40 mm. Selanjutnya kokas dianalisis kadar air, kadar abu, kadar zat terbang, kadar karbon terikat, nilai kalor, kuat tekanan, kerapatan, porositas dan SEM (*Scanning Electron Microscope*).

Hasil penelitian menunjukkan bahwa kokas cangkang kelapa sawit yang optimal pada produksi variasi temperatur 550°C; campuran perekat kanji 7,5%; dan tekanan kempa 100 kg/cm² menghasilkan nilai kadar air 5,34%; kadar abu 5,81%; kadar zat terbang 18,77%; kadar karbon terikat 71,08%; nilai kalor 7125,86 kal/g; kerapatan 0,78; porositas 0,04; dan kuat tekan 72,56 kg/cm². Disamping itu analisis kelayakan ekonomi menunjukkan ROI 37,34%; POT 2,1 tahun; BEP 57,47%; SDP 25,61% dan DCFRR sebesar 50,9%.

Kata kunci : Cangkang kelapa sawit, Carbonisasi, Kuat tekanan, Kokas, Analisis ekonomi.

ABSTRACT

Coke is a very important product for metal mineral processing plant in Indonesia. One alternative raw materials of coke which good and does not pollute the environment is palm kernel shells. This research tries to do a study of the making of Coke from kernel palm shells by way of seeking the variation of temperature carbonization, mix the ingredients, and mix the adhesive that is optimal.

The research was conducted in a laboratory scale. Palm kernel shells and coal carbonized at various temperatures of 450°C, 550°C and 650°C then crushed and sieved to 35 mesh. Palm kernel shells and coal has become charcoal powder is then weighed according to composition ratio of the mixture of powder and adhesive that is 40 g. After that, the coke formed with a pressure of 100 kg/cm², cylindrical and diameter 40 mm. Further analysing the coke moisture content, ash content, volatile matter content, fixed carbon content, calorific value, compressive strength, density, porosity and SEM (Scanning Electron Microscope).

The results showed that coke from palm kernel shells are optimal for the production with various temperatures 550°C; 7,5% starch adhesive mixtures, and felt the pressure of 100 kg/cm² water content 5,34%, ash content of 5,81% ; volatile matter content of 18,77%; 71,08% fixed carbon, heat value of 7125,86 cal /g; 0,78 density, porosity of 0,04; and a strength of 72,56 kg/cm². Economic analysis showed ROI (*Percent Return of Investment*) 37,34%; POT (*Pay Out Time*) 2,1 years; BEP (*Break Even Point*) 57,47%; SDP (*Shut Down Point*) 25,61% and DCFRR (*Discounted Cash Flow Rate of Return*) of 50,9%.

Keywords: Palm kernel shells, Carbonized, Compressive strength, Coke, Economic analysis.