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POROUS CARBON PELLETS FROM KOH TREATED SELF-ADHESIVE CARBON GRAINS FROM OIL PALM EMPTY FRUIT BUNCH: EFFECT OF KOH WEIGHT PERCENTAGES AND PELLETIZING COMPRESSION FORCE

Rus Mahayuni Abdul Rahman, Mohamad Deraman, Mohd Hafizuddin Jumali, Ramli Omar, Masliana Muslimin, Mazliza Mohtar and Astimar Abdul Aziz
School of Applied Physics, Faculty of Science and Technology
Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia

ABSTRACT

The pre-carbonized fibers of oil palm empty fruit bunch were ball milled to prodOmar, Masliana uce self-adhesive carbon grains (SACG). The SACG and SACG treated with KOH (1, 3 and 5% by weight) were compressed with various compression forces in order to produce green pellets with a dimension of 27 mm in diameter and 3 mm in thickness. Carbon pellets were produced from carbonization of green pellets (GP) up to 700^{o}C in a nitrogen atmosphere using a multi-steps heating profile. The carbon pellets were immersed in HCl (0.5 M) for 48 h and then neutralized with distilled water. It was found that the BET surface area of carbon pellets of 0% KOH unchanged with compression force whereas carbon pellets from the GP of 5% KOH compressed with 6, 8 and 10 x 10^3 kg forces have the BET surface area of 733, 399 and 361 m^2/g respectively. The BET surface area of the unwashed carbon pellet of 0% KOH (2.3904 m^2/g) was found to be 134 times smaller than that of the washed sample (321 m^2/g). It was observed that as the percentage of KOH increased from 0 to 5% the BET surface area of the carbon pellets increased remarkably from 321 to 399 m^2/g. Pore size analysis showed that the KOH treated carbons are mainly microporous. A SEM study of the KOH treated carbons showed increasing porous structures as the percentages of KOH increased and the compression forces decreased.

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