Coal Upgrading by Palm Acid Oil and Its Characteristics in The Form of Powder and Pellet

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Coal upgrading is using palm acid oil as a coating oil to upgrade the quality of the coal, especially low-rank coal which has high moisture content and low calorific value, such as brown coal. The objective of the study is to determine the characteristic of upgraded Indonesia's low-rank coal with 1%w/w of palm acid oil and the difference between coal powder and coal pellet. Through experiment, we investigated the calorific values, compressive strength, amount of moisture re-adsorbed, and low temperature oxidation. Upgraded coals which are dried coal, without and with palm acid oil, show higher calorific value than raw coal with 2,212 kcal/kg and 2,370 kcal/kg average differences. They also have more fixed carbon content and less moisture content than raw coal. Also, based on proximate analysis result, moisture content of coal pellet is lower than coal powder after moisture readsorption with almost 5%w/w differences and also has higher fixed carbon content. Compressive strength is affected by moisture content. The smaller moisture content, the greater its strength can be. Coal pellet can reduce the occurrence of chemical reaction better than coal powder during storage due to the small surface area.