

ABSTRAK

PENGARUH SUHU KALSINASI TERHADAP KARAKTERISTIK KOMPOSIT MgO-SiO₂ BERBASIS SILIKA SEKAM PADI

Oleh

VININDIA KUSUMA

Komposit MgO-SiO₂ disintesis dari larutan MgNO₃.6H₂O dan silika sekam padi. Hasil analisis SEM pada suhu 700°C menunjukkan terbentuknya gumpalan (*cluster*) yang berukuran tidak sama dan memiliki ukuran pori yang cukup besar sedangkan pada suhu 800°C dan 900°C menunjukkan terbentuknya butiran kristal MgO dan berukuran tidak sama. Adanya peningkatan suhu kalsinasi morfologi permukaan mengalami perubahan, diantaranya pori-pori, ukuran maupun bentuk butiran yang terdistribusi pada permukaan. Hasil EDS memperlihatkan senyawa oksigen, potasium, sulfur, karbon, silikon dan magnesium. Hasil karakterisasi XRD menunjukkan pada suhu kalsinasi 700°C terbentuk fasa *silicon oxide* dan *magnesium silika*. Sedangkan pada suhu kalsinasi 800°C dan 900°C terbentuk fasa *crystalite*, *periclase*, *forsterite* dan *potassium*, dimana dengan meningkatnya suhu kalsinasi semakin besar derajat kristalinitas bahan. Hasil karakterisasi luas permukaan menunjukkan komposit MgO-SiO₂ pada suhu kalsinasi 700°C hasil adsorpsi yaitu = 141 nm dan desorpsi = 30,813 nm sedangkan pada suhu kalsinasi 800°C hasil absorpsi diperoleh diameter pori = 7,669 nm dan desorpsi = 3,812 nm, sehingga sampel komposit MgO-SiO₂ berukuran mesopori. Berdasarkan hasil uji aktivitas yang meliputi konversi sampel dengan perbandingan 1:1 dan suhu kalsinasi 800°C memiliki nilai tertinggi yaitu 90,7% dan viskositas terendah yaitu 11,7672 mm²/s. Hasil GCMS menghasilkan senyawa utama metil laurat, metil miristat dan metil palmitat sebagai komponen biodiesel yang dihasilkan dari minyak kelapa.

Kata kunci: Komposit, MgO-SiO₂, Silika, Sekam padi.

ABSTRACT

THE EFFECT OF CALCINATION TEMPERATURE ON CHARACTERISTICS MgO-SiO₂ COMPOSITE BASED ON RICE HUSK SILICA

By

VININDIA KUSUMA

MgO-SiO₂ composites were synthesized from solution MgNO₃.6H₂O and rice husk silica. SEM analysis results at a temperature of 700°C showed the formation of a clot (cluster) did not the same size and have a large enough pore size while at a temperature of 800°C and 900°C showed the formation of crystalline grains of MgO and did not the same size. An increase in the calcination temperature of the surface morphology changed, such as pores, grain size and shape were distributed on the surface. The EDS results showed oxygen compounds, potassium, sulfur, carbon, silicon and magnesium. XRD characterization results indicated the calcination temperature of 700°C phase formed silicon oxide and magnesium silica. Whereas at 800°C and 900°C calcination temperature phase formed cristobalite, periclase, forsterite and potassium, which with increasing calcination temperature the degree of crystallinity of the material was greater. Characterization results showed the surface area composite MgO-SiO₂, the calcination temperature at 700°C was resulted adsorption = 141 nm and desorption = 30.813 nm, while the calcination temperature at 800°C absorption results obtained pore diameter = 7.669 nm and desorption = 3.812 nm, so the MgO-SiO₂ composite sample size mesoporous. Based on the results of activity test with a sample that includes the conversion ratio of 1:1 and calcination temperature of 800°C has the highest value of 90.7% and a low viscosity of 11.7672 mm²/s. GCMS results produced major compounds methyl laurate, methyl myristate and methyl palmitate as a component of biodiesel produced from palm oil.

Key words: Composite, MgO-SiO₂, Silica, Rice husk.