

ABSTRAK

MIKROSTRUKTUR DAN KONDUKTIVITAS LISTRIK *CORDIERITE* BERBASIS SILIKA SEKAM PADI DENGAN PENAMBAHAN MAGNESIUM OKSIDA (0, 20, 25, DAN 30%)

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MIRAWATI

Telah dilakukan sintesis dan karakterisasi *cordierite* berbasis silika sekam padi dengan penambahan magnesium oksida (MgO) sebanyak 0, 20, 25, dan 30%. Pembuatan *cordierite* menggunakan silika sekam padi, MgO, dan Al₂O₃. Silika diekstraksi dengan metode alkalis menggunakan larutan NaOH 1,5% dan HNO₃ 10%. *Cordierite* disintesis melalui metode padatan dengan suhu sintering 1250°C. Hasil analisis *Scanning Electron Microscopy* (SEM) menunjukkan adanya bentuk yang tidak beraturan dan penggumpalan pada sampel. Hasil analisis *Energy Dispersive Spectroscopy* (EDS) mengkonfirmasi adanya unsur-unsur penyusun *cordierite* dan pengotor. Nilai konduktivitas listrik semakin menurun seiring dengan penambahan persentase MgO. Pada penelitian ini diperoleh nilai konduktivitas listrik antara $3,15 \times 10^{-7}$ - $1,27 \times 10^{-8}$ S/cm dan termasuk bahan isolator. Uji fisis menunjukkan bahwa penambahan MgO mengurangi densitas dan menambah porositas sampel.

Kata Kunci: *Cordierite*, konduktivitas listrik, MgO, SEM, silika sekam padi.

ABSTRACT

MICROSTRUCTURE AND ELECTRIC CONDUCTIVITY OF CORDIERITE BASED RICE HUSK SILICA WITH THE ADDITION OF MAGNESIUM OXIDE (0, 20, 25, DAN 30%).

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Synthesis and characterization of cordierite-based rice husk silica has been conducted by magnesium oxide (MgO) 0, 20, 25, and 30%. Preparation of cordierite used silica rice husk, MgO, and Al₂O₃. Silica were extracted by alkalis method using 1,5% NaOH solution and 10% HNO₃. Cordierite was synthesized by the solid state method and sintered at 1250°C. The result of analysed Scanning Electron Microscopy (SEM) showed that irregular morphology and agglomeration of sample. The result of analysed Energy Dispersive Spectroscopy (EDS) confirmed that presence of cordierite constituents and several impurities. The electrical conductivity value decreases due to the addition of MgO percentage. In this research the electrical conductivity values were obtained between $3,15 \times 10^{-7}$ – $1,27 \times 10^{-8}$ S/cm, and it is included as insulator. Physical testing results showed that the addition of MgO reduced density and increased porosity of sample.

Key words: Cordierite, electrical conductivity, MgO, SEM, rice husk silica.