

## **ABSTRAK**

### **STRUKTUR MIKRO DAN KONDUKTIVITAS LISTRIK KERAMIK CORDIERITE DENGAN PENAMBAHAN MAGNESIUM OKSIDA (0, 10, 15 wt%) BERBASIS SILIKA SEKAM PADI**

**Oleh**

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Penelitian dilakukan untuk mengetahui pengaruh penambahan magnesium oksida terhadap mikrostruktur dan konduktivitas listrik keramik cordierite yang dibuat dari bahan magnesium oksida, alumina dan silika yang diekstrak dari sekam padi dengan metode sol-gel. Penambahan magnesium oksida terhadap cordierite sebanyak 0, 10, dan 15wt% dan disintering pada suhu 1250°C selama 3 jam. Mikrostruktur sampel dianalisis dengan Scanning Electron Microscopy/Energy Dispersive Spectroscopy (SEM/EDS), sedangkan konduktivitas listrik dianalisis menggunakan LCR meter, serta dilakukan uji fisis meliputi densitas, porositas dan penyusutan. Hasil penelitian menunjukkan bahwa seiring dengan penambahan MgO, densitas dan penyusutan menurun sedangkan porositas meningkat. Hasil analisis SEM menunjukkan mikrostruktur sampel dengan penambahan MgO menunjukkan banyak pori-pori dan adanya aglomerasi. Nilai konduktivitas menurun dengan penambahan 10 dan 15% MgO untuk pengukuran pada frekuensi 0.1 Hz – 1KHz.

Kata Kunci: Cordierite, konduktivitas listrik, magnesium oksida, mikrostruktur, sekam padi.

## **ABSTRACT**

### **MICROSTRUCTURE AND ELECTRICAL CONDUCTIVITY OF CORDIERITE CERAMIC DERIVED FROM RICE HUSK SILICA WITH ADDITION OF MAGNESIUM OXIDE (0, 10, 15 wt%)**

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This study was carried out to investigate the effect of magnesium oxide addition on the microstructure and electrical conductivity of cordierite, prepared from magnesium oxide, alumina, and silica extracted from rice husk by sol-gel method. For this purpose, the samples were prepared with magnesium oxide addition of 0, 10, and 15 wt% to the cordierite and subsequently sintered at 1250°C for 3 hours. Microstructure of samples was analyzed by Scanning Electron Microscopy/Energy Dispersive Spectroscopy (SEM / EDS), while the electrical conductivity was analyzed using LCR meter. Other characteristics investigated are density, porosity and shrinkage. The results showed that addition of MgO led to decrease density and shrinkage, while porosity increased. SEM analysis revealed the existence of pores and agglomerates on the surface. It was also found that the conductivity values decreased with the addition of 10 and 15% MgO for measurements at frequency of 0.1 Hz to 1.0 KHz.

**Keywords:** Cordierite, electrical conductivity, magnesium oxide, microstructure, rice husk.