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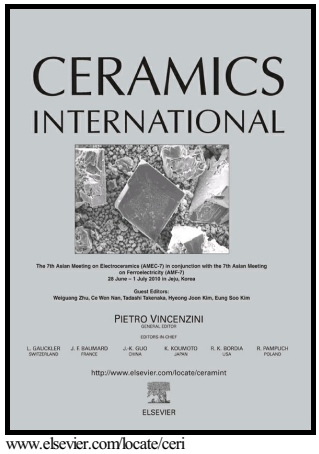

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Abstract:

High-density magnesia was fabricated using vacuum compaction molding, and effects of forming pressure and sintering temperature on bulk density, apparent porosity, diameter shrinkage ratio, volume shrinkage ratio, pore size distribution, cold compressive strength, and thermal shock resistance of the magnesia samples were investigated. There were two ranges of pore distribution in samples that were formed via conventional compaction molding, and these ranges were about 350-2058 nm and 6037-60527 nm. It was considered that the range of larger pores mainly influenced the densification of magnesia. Using vacuum compaction molding, large size pores were removed, and high-density magnesia (with a density greater than 3.40 $g \cdot cm^{-3}$) was easily prepared when forming pressure was higher than 200 MPa and sintering temperature was higher than 1600 °C. Magnesia samples prepared via vacuum compaction molding showed better performance compared to that of samples prepared via conventional compaction molding.

Keywords: Magnesia; Magnesite; Vacuum compaction molding; Conventional compaction molding; Sintering