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Research Article

Processing and properties of dense cordierite ceramics obtained through solid-state reaction and pressure-less sintering

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ABSTRACT

powder mixtures mechanically activated in a high-energy planetary mill, shaped by uniaxial (20 MPa) and cold isostatic pressing (1000 MPa). The pressure-less sintering of these specimens was performed at 1350°C for 1 h. High relative density over 95% of the theoretical value was obtained through solid-state reaction and pressure-less sintering of powder activated for 40 min, and for the first time reported in the literature. Phase composition and microstructures of sintered samples were determined by XRD and SEM, coupled with EDS mapping. The real part of the complex relative permittivity of the samples was measured at 200 MHz. The loss tangent of all samples was below the resolution of the measurement setup. A strong correlation between the relative permittivity and the density agrees with previously published data.

KEYWORDS: Mechanical activation, sintering, electrical properties, cordierite, TeO_2

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