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Reference Intensity Ratio Semi-Quantitative Analysis of Cordierite-Mullite Synthesis by a Solid State Method

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Abstract : In this paper, attempt to synthesize designed cordierite-mullite system with various ratios was performed using a solid-state method. Alumina, quartz, magnesia, and talc were used as starting materials for the synthesis. Talc was added for two purposes; to assist the reaction progress and to be the Mg source. The raw materials were mixed and fired at 1350°C for 2 h and 1400°C for 2 and 4 h. The resulting phase compositions were analysed using the Reference Intensity Ratio (RIR) semi-quantitative analysis method. The highest amount of cordierite up to Cordierite phase 96% could be obtained at the firing scheme of 1400°C for 4 h in the C100-M0. Mullite could not be formed at the selected scheme if talc did not present so no pure mullite was observed in the selected firing regime. The highest amount of mullite co-existed with cordierite and other phases were 74%.

Keywords : RIR semi-quantitative analysis, cordierite-mullite system, solid state synthesis, X-Ray diffraction
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