

Effect of Additive on the Properties of Reaction Sintered MgO-Al₂O₃ Spinel

Aslı Çakır, Servet Turan

Magnesia-alumina spinels (MgAl₂O₄) are a group of common industrially used natural or synthetic minerals with interesting optical, thermal and mechanical properties. One of the main application of magnesia-alumina spinels are in the refractory industry mainly because of superior thermal shock resistance, thermomechanical properties and refractoriness. In the present research, densified MgAl₂O₄ sintered compacts prepared using a double stage firing process. Various types of additives like as AlCl₃, Kalgon PT and Kriyolit were used up to 3 wt.% to different spinel compositions. The additives were added separately prior to calcination. The raw materials were mixed, compacted under a uniaxial pressure of 25 MPa, calcination, milling, pressing and fired last time at 1700°C for 6 hours. The final sintered products were characterized in terms of densification, phase, quantitative elemental and microstructural analysis.

Keywords: Magnesium aluminate spinel, spinellisation, densification, sintering aid.