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BOOK OF ABSTRACTS

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Reaction kinetics of mechanically activated cordierite based ceramics studied via DTA

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Cordierite, $2MgO{\cdot}2Al_2O_3{\cdot}5SiO_2$ (MAS), is a very attractive high-temperature ceramic material. In order to accelerate the process of sintering, 5.00 mass% MoO_3 was added to the starting mixtures. The mechanical activation of the starting mixtures was performed in a high energy ball mill in time intervals from 0 to 160 minutes. In following, starting mixtures were sintered at 1300 °C for 2h. In order to determine the changes in the particle size distribution, the mechanically treated powders were characterized by a laser light-scattering particle size analyzer. The phase composition of the starting mixtures and sintered samples was analyzed by the X-ray diffraction method. Differential thermal analyses (DTA) and thermo-gravimetric (TG) analysis were used in order to determine characteristic temperatures. Kissinger's equation was employed to calculate apparent activation energies of various processes that occur within the system while heating. Based on the obtained DTA results, it was established that mechanical activation along with MoO_3 additive, has influence on sintering temperature which was decreased for about 150 °C.