

CEEC-TACI

BOOK OF ABSTRACTS

Editors:

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**1st Central and Eastern European Conference
on Thermal Analysis and Calorimetry
7-10 September 2011
Craiova, Romania**

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Dehydration kinetics investigation of refractory concrete during sintering using DTA method

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The base mix refractory concrete is corundum based, containing corundum as refractory aggregate and CAC as hydraulic binder, with spinel as an additive. The authors investigated the dehydration reactions which occur from the moment when water is added (at the beginning of components mixing), to the moment when installed refractory concrete lining is put into the service. Sintering process kinetic of low-cement content refractory concrete was investigated by means of differential thermal analysis (DTA) at three different heating rates (10, 20 and 30 °C/min). Thus, temperature was increased from 20 to 1100 °C. Activation energy during sintering process was determined by Kissinger method. Obtained values of activation energies were: 90.576 kJ/mol; 140.972 kJ/mol and 148.447 kJ/mol for T₁, T₂ and T₃, respectively.