

Simultaneous Differential Scanning Calorimetry and Thermogravimetric Analysis of Portland Cement As a Function of Age

Anton Trník^{C, S}, Lenka Scheinherrová and Robert Černý

*Department of Materials Engineering and Chemistry, Czech Technical University in Prague, Prague, Czech
Republic
anton.trnik@fsv.cvut.cz*

We study the hydration and pozzolanic reactions of ordinary Portland cement as a function of age, using the differential scanning calorimetry and thermogravimetry. The measurements are done for 1, 2, 7, 28, 90, and 180 days cured samples in order to monitor the rate of hydration. The investigation is performed in the temperature range from 25 °C to 1000 °C with a heating rate 5 °C/min in an argon atmosphere. The temperature, enthalpy, and mass change during the decomposition of calcium silicate hydrate gels, portlandite, and calcite are determined, and the changes in the portlandite amount are estimated in dependence on the time of hydration. In addition, the peaks due to the formation of ettringite are found.