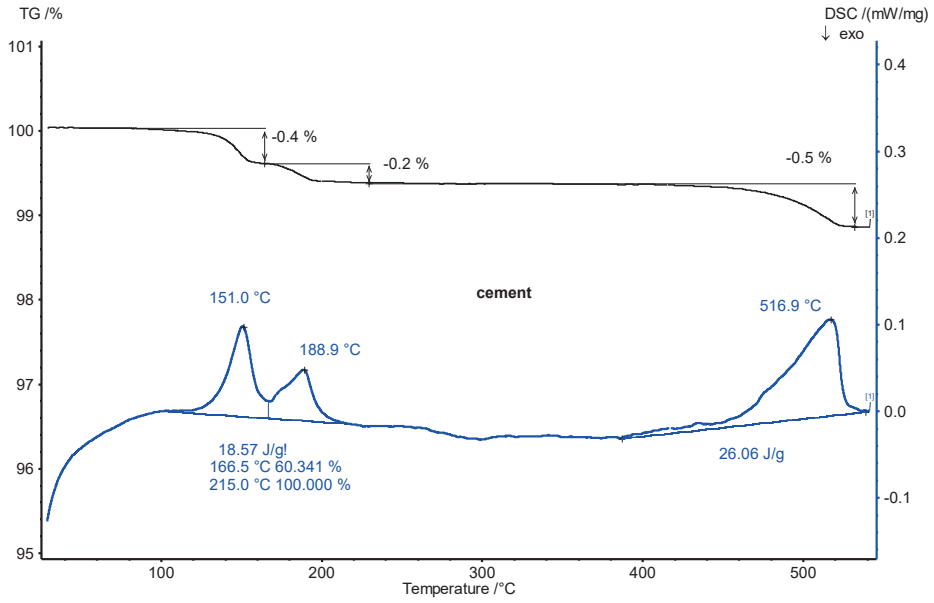
APPLICATION**SHEET**

Inorganics · Building Materials
ST 449 ***F1*** *Jupiter®*

Cement / Gypsum

Introduction

Portland cement is the most common type of cement. It consists of a mixture of oxides of calcium, silicon and aluminium. The main phases are tricalcium silicate (C_3S), dicalcium silicate (C_2S), tricalcium aluminate (C_3A) and a ferrite phase C_4AF. Portland cement is produced by heating limestone with clay and/or sand up to about 1480°C. To the resulting clinker, 4-5% gypsum is mixed and then grinded and milled to a fine grain size. The additives gypsum, anhydrite etc. influence the setting time of the cement.



Test Conditions

Temperature range:	RT ... 550°C
Heating rate:	10 K/min
Atmosphere:	Air (50 ml/min)
Sample mass:	39.5 mg
Crucible:	Al with 50 µm hole
Sensor:	TGA-DSC type S

Test Results

The separation and quantification of calcium sulfate dihydrate (DH) and hemihydrate (HH) in cement samples is only possible when a certain water vapor pressure over the sample can be created. A possibility is to use closed aluminum crucibles with a small pinhole of about 40 to 50 µm. From the TGA curve, the DH amount can be calculated to 2.5% and the HH amount to 1.8%. The TGA step (0.5%) starting at about 420°C is due to the decomposition of $Ca(OH)_2$ (content approx. 2.2%).

NGB · Application Sheet 043 · E · 0621 · Technical specifications are subject to change.

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