**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 (C₃S), dicalcium silicate (C₂S), tricalcium aluminate (C₃A) and a ferrite phase C₄AF. 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 ground 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%).