

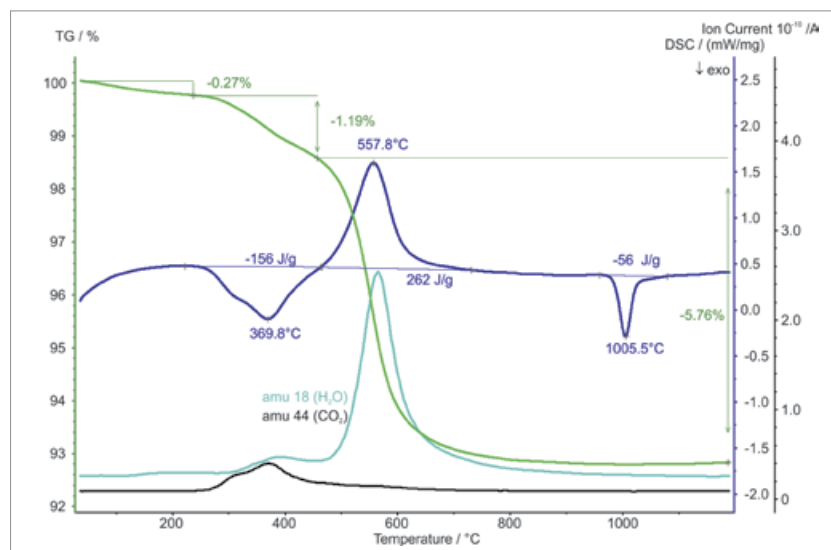
# APPLICATION SHEET

CERAMICS – CERAMIC INDUSTRY

## PORCELAIN RAW MATERIAL

Porcelain which is often called the white gold consists basically of kaolin, feldspar and quartz in well defined ratios. Tableware, glazed tiles and electrical isolators are the most popular forms of appearance of porcelain. It can also be used as a high tech coating of, e.g., engine cylinders. Porcelain was invented already in the year 620 in

China and was brought to Europe around 1300 by Marco Polo. It took until 1708 before the first porcelain could be produced in Europe, too. Porcelain is a classical application field of thermal analysis since the raw materials can be characterized and the burning process of the porcelain can be simulated.



### Instrument

STA 449 **F3** Jupiter® – QMS 403 Aëolos®

### Test Conditions

Temperature range	RT ... 1200°C
Heating/cooling rates	20 K/min
Atmosphere	synthetic air (70 ml/min)
Sample mass	37.14 mg
Crucible	Pt
Sensor	TG-DSC type S

### Results

The STA measurement on porcelain raw material shows three mass-loss steps: below approx. 250°C, the evaporation of humidity occurred and at temperatures between 250°C and 450°C, the burn-up of organic binder was observed which released an energy of 156 J/g. The dehydration of kaolin occurred above 450°C which required 262 J/g. The mass spectrometer signals for mass numbers 18 and 44 reflect the corresponding evolution of H<sub>2</sub>O and CO<sub>2</sub>. The exothermic effect detected at 1006°C with an enthalpy of -56 J/g is due to a solid-solid reaction in the kaolin content.