

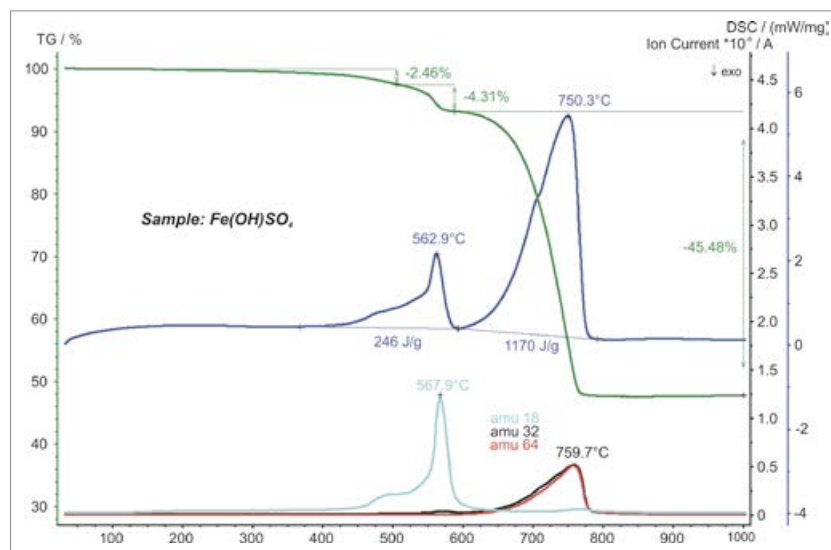
APPLICATION SHEET

INORGANICS – RESEARCH/CERAMICS/CHEMISTRY

DECOMPOSITION OF IRON HYDROXIDE SULFATE

Iron hydroxide sulfate $\text{Fe}(\text{OH})\text{SO}_4$ is a possible precursor material for the synthesis of iron oxide particles. Iron oxide particles can, for example, be used as a pigment for classic paint colors such as sienna and umber. Iron oxide particles are nowadays also used as a magnetic storage

medium. So called ferrofluids contain superparamagnetic iron oxide nanoparticles which can serve as a contrast medium in MRT. The viscosity of ferrofluids depends on the magnetic field which leads to an application in adaptive dampers.



Instrument

STA 449 **F1** Jupiter® – Aëolos®

Test Conditions

Temperature range	RT ... 1000°C
Heating/cooling rates	20 K/min
Atmosphere	N_2 (70 ml/min)
Sample mass	30.58 mg
Crucible	Pt
Sensor	TG-DSC type S

Results

The STA-MS measurement exhibits a two-step release of H_2O with mass number 18 below 600°C and the release of SO_2 and O_2 with mass numbers 64 and 32 between 600°C and 800°C. The final product is Fe_2O_3 (hematite). The corresponding massloss steps of 2.5%, 4.3% and 45.5% are accompanied by endothermic effects with entire enthalpies of 246 J/g and 1170 J/g.