

APPLICATION SHEET

Inorganics · Ceramics
STA 449 **F1** Jupiter / QMS 402 *Aëolos Quadro*

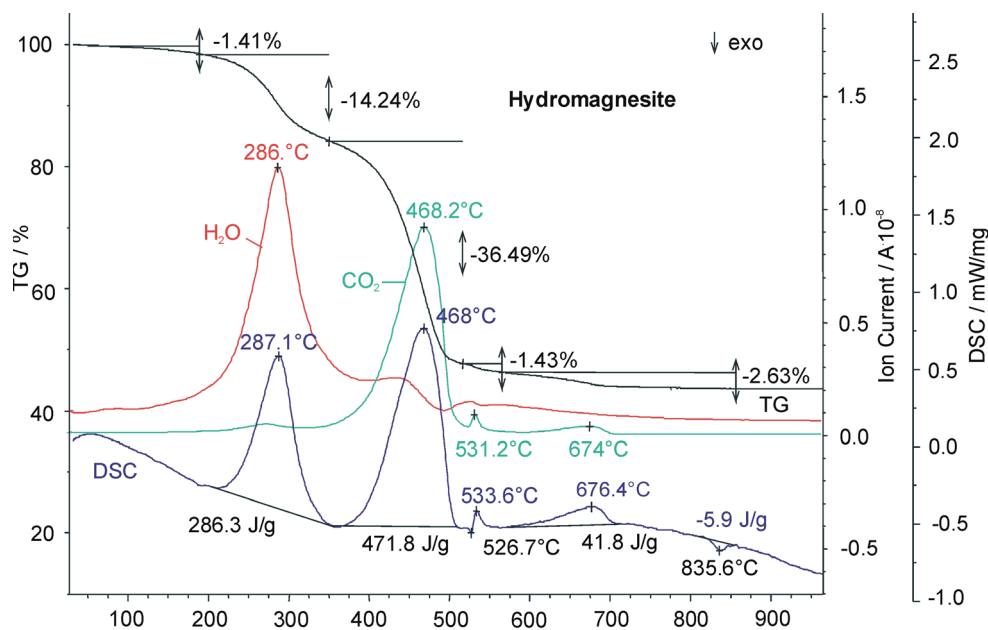
Hydromagnesite

Introduction

Flame retardant materials have been used to reduce the flammability and combustibility of plastics. They are mixed into the plastic material and should, of course, not influence the mechanical and chemical properties of the plastics in a negative way. The burning mechanism can be influenced physically (cooling, protective layer, dilution) or chemically (reaction with the gases produced) depending on the flame retardant material. The protective mechanism

of some inorganic compounds like antimony oxide, aluminium hydroxide, zinc borate, etc., is based on forming of a flame retardant coating or consuming of energy by separation of CO_2 and/or H_2O . The advantage of this kind of inorganic flame retardants is also less smoke emission.

Hydromagnesite is used as a flame retardant filler material, for example, in PVC compounds, PP, PBT etc. The chemical formula is $\text{Mg}_5(\text{CO}_3)_4(\text{OH})_2 \cdot 4\text{H}_2\text{O}$. It is found as a mineral deposit, for example, in British Columbia, Canada.



Test Conditions

Temperature range: RT .. 1000°C
Heating/cooling rates: 10 K/min
Atmosphere: Air at 80 ml/min
Sample mass: 26 mg
Crucible: Pt/RH
Sensor: TGA-DSC type S

Test Results

The flame retardant process of hydromagnesite is based on the following effects: During the thermal decomposition of hydromagnesite, high amounts of water and CO_2 are released. During the combustion of plastics filled with this substance, these gases displace the oxygen and prevent burning. Also energy is consumed for the decomposition of the hydromagnesite depriving heat from the burning process.