

Press Release

Analyzing & Testing
Business Unit

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Water Vapor Furnace Now a Viable Option for STA-Mass Spec

Simultaneous Thermal Analysis (STA) has an established place in thermal analysis laboratories. The STA-MS method combines the analytical potential of Thermogravimetry (TGA) with the measurement results of Differential Scanning Calorimetry (DSC) while simultaneously applying Mass Spectrometry (MS) in order to analyze the gases released. Classically, such thermoanalytical tests are primarily run in a dry atmosphere, and any water vapor released is immediately evacuated from the furnace along with the purge gas. This has made it impossible to study any reactions with water vapor which might subsequently occur.

Realistic Simulation of Technical Processes

In practice, considerable amounts of water vapor are often released during the combustion and gasification of organic fuels, which also affects the thermal behavior of the sample substances. Therefore, in order to replicate certain processes realistically, it is necessary to induce a humid atmosphere in the analytical chamber. To meet these needs, NETZSCH is now also offering a new water vapor furnace in combination with the tried-and-true STA-MS coupling.

Water Vapor Furnace – Temperatures up to 1250°C

In this new thermoanalytical system, water vapor – with or without a carrier gas – is transported from the water vapor generator to the STA sample chamber via a heated transfer line. Another transfer line, also heated, then leads from the gas outlet of the water vapor furnace to the QMS 403 C *Aëolos*[®] mass spectrometer. The coupled STA-MS combined with a water vapor furnace is a system capable of analyzing the sample's reaction with water vapor at temperatures up to 1250°C. The water vapor concentration can be set anywhere between 0 and 100%.

Areas of Application:

- Corrosion and scaling processes for steels
- Analysis of sintering processes in ceramic components
- Water gasification of petroleum cokes
- Analysis of inorganic construction materials, e.g. cement