

SC11

Thermal Analysis and Evolved Gas Analysis (EGA)

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Well-established coupling techniques such as TG-FTIR and STA-MS enable identification of gases that are evolved during thermal analysis experiments. Via heated transfer lines the released gases are fast and effectively transported to the connected spectroscopic equipment. Additional information can be obtained by simultaneous connection of a thermobalance to both FTIR spectroscopy and MS.

Up to now mainly thermobalances and STA equipments were coupled to FTIR or MS. The interest was therefore focused on characterization of decomposition products.

Polymorphism and investigation of phase transitions are of special interest in the field of pharmaceutical and food research. The most common thermoanalytical method Differential Scanning Calorimetry (DSC) is the perfect analytical tool to cover these tasks but could not be connected with gas analysis so far.

The gas-tight setup of the NETZSCH DSC 204 F1 now enables for the first time the combination of DSC-FTIR, DSC-MS or DSC-FTIR-MS. The contribution presents results of several measurements carried out under standard DSC conditions but simultaneously coupled to FTIR as shown in the figure below.

Fig. 1:
DSC-FTIR results of citric acid monohydrate. 3-dimensional and temperature-dependent presentation of all IR spectra. The DSC data are depicted at the rear plain.

