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Applications of TGA-MS-Coupling

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Thermoanalysis is part of the department Pharma Laboratory in Pharmaceutical development and performs thermoanalytical investigations on request of the departments of Pharmaceutical Development mainly.

Focus of the investigations may be processes, i.e.

- Characteristics of freezing/ thawing during lyophilisation

- Investigation of polymorphism on processing of the product

- Determination of crystallinity.

Investigations on products may contain

- Compatibility, active-excipient-interactions

- Melting characteristics of mixtures (miscibility, eutectics,...)

- Evaluation of inclusion complexes.

Thermal investigation on excipients are

- Thermal characterisation of excipients

- Comparison of excipients of different manufacturers Determination of volatiles (solvents via TG-MS for instance)

- Characterisation of polymers esp. primary packaging materials.

Readily available analytical methods are thermomicroscopy, DSC, TG, EGA via MS, besides NIR and Raman microscopy. Modern coupling techniques (TG-MS, TG-FTIR) deliver additional information on the evolved gas and enable us for instance to detect multiple or overlaying reactions that present just one thermogravimetric signal. Thus TG-MS adds to the classical TGA facilitating the interpretation of TG-signals. We routinely use the TG-MS to characterise emulsions qualitatively and quantitatively, to characterise solvates, and to investigate thermally induced degradation reactions.