

## PO C 4

### Characterization of Thermal Stability by ADSC and TGA/FTIR on Drugs

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#### Abstract

Today Thermal Analysis is an established standard routine for investigation of the thermal behavior in pharmaceutical research as well as quality control. DSC gives only one summarized signal, which contains endothermic and exothermic events and heat capacity information. Temperature modulated DSC (ADSC), an extension to conventional DSC, allows for the separation of the response signal into heat capacity components, e.g. glass transition, and other non reversing effects, e.g. evaporation, over the small temperature interval of modulation. The current frontier in thermal analysis methods in pharmacy lies also in the application of combined techniques, e.g. TGA/FTIR-coupling. Chemical analysis of volatile products evolved during the TG experiment increases the usefulness of mass loss data.

It allows the assignment of evolved components, analyzed and identified by computer-assisted analysis into single components, to decomposition steps detected by TGA during one experiment. Furthermore, the analysis will lead to information on relative concentration as function of temperature. The efficiency of use DSC, ADSC and simultaneous TG/FTIR together on characterization of the thermal stability of a pharmaceutical formulation will be shown. Results will be discussed regarding the different behavior of the pure components and the formulation like interactions, melting and glass transition. Online TG/FTIR results on thermal decomposition of the formulation in the range up to 400 °C will be shown with regard to the identification of components and the characterization of the decomposition mechanism /1/. The separation of overlapping effects while heating up the sample will be discussed.

#### Literature:

/1/ B.Benzler. T.Nitschke, F.Hoffmann; GIT Laborfachzeitschrift 11/99 1201