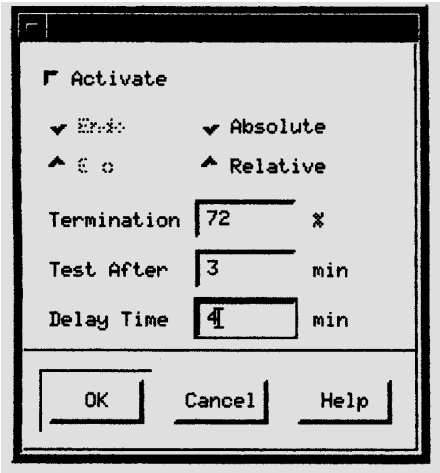
Conditional Experiment Termination

This software option is the right tool for all cases where the experimental time has to be kept as short as possible. It enables you to terminate a measurement automatically when the measured value exceeds a previously defined limit. You thus save unnecessary measurement time if only one particular effect has to be detected. You can also terminate a reaction at any stage to avoid intermediates or, with high exothermicity, protect the sensor.

- Shortens the measurement time
- Preserves the measuring cell

A termination criterion can be defined for each segment and can be used for DSC, TGA or TMA measurements. As such a termination criterion comprises the following parameters, individual adaptation to your particular application problem is possible.



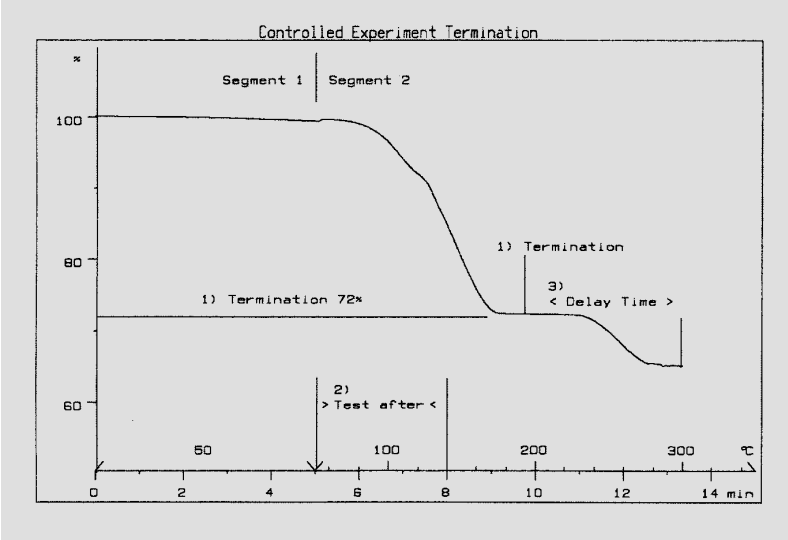
Entry window for the termination criterion

– absolute or relative measured value (1)
DSC (mW or W/g) • TGA (mg or %) • TMA (mm or %)

– exothermic or endothermic effect

– test after = time between segment start and activation of the termination criterion (2)

– delay time = time which should elapse before measurements are discontinued after the termination criterion has been met (3)



Sketch of the termination criterion

The sketch opposite uses a thermogravimetric measurement comprising several segments to describe the meaning of the particular termination criteria, which here refer to the second segment. The criteria are simply linked in the method.

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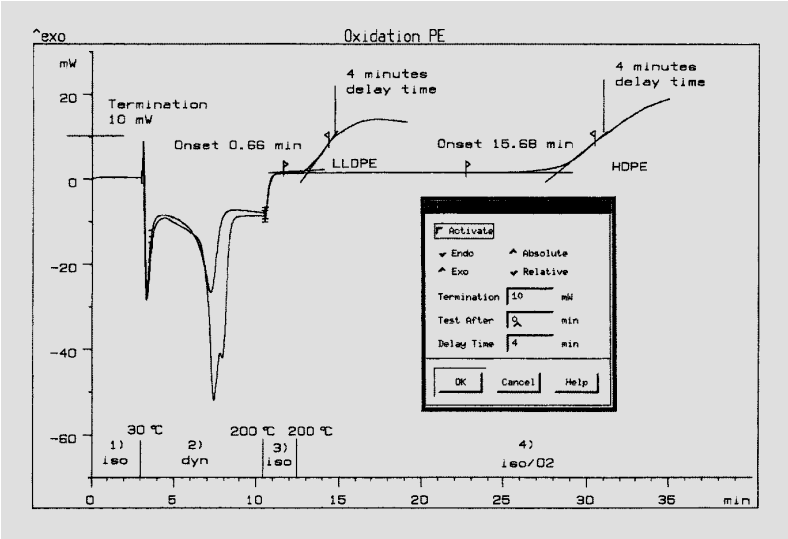
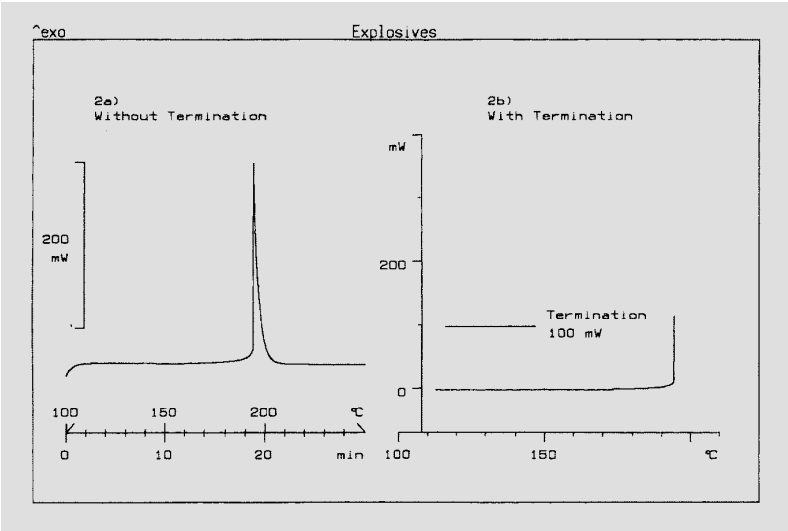
Application example

Comparison of two different polyethylenes

The oxidative stability of polyolefins is an important quality criterion that is measured by DSC in accordance with specified standards. For example, it allows predictions of the long term stability of a product. Measurements of the time or the temperature at the start of oxidation are performed at a specified temperature isothermally or also dynamically under oxygen. Depending on the composition and stabilizer, this OIT time (Oxidation Induction Time) can lie between a few seconds and several hours. However, as only the onset, namely the start of the oxidation need be detected, the measurement can be terminated immediately after this. This can be effected automatically with this software option to save valuable measurement time as there is no need to run the entire measurement program. Fig.1 shows the comparison of two polyethylenes, an HDPE and an LLDPE measured isothermally at 200 °C according to the OIT standard (standards: pr EN 728, ISO/TR 10837). The parameters shown in the graph were entered as the termination criterion.





Example of an explosive

The behavior of explosive materials is frequently investigated by DSC. As the reactions being observed are usually highly exothermic, the reaction can be ended prematurely when a certain limit value is reached. This feature can be used, for instance, to protect the measuring cell against destruction.
The example of the reaction of nitrocellulose shows how, in contrast to (2a), the measurement is terminated after the attainment of a limit value of 100 mW (2b).

The examples show that both measurements, which have been automatically terminated in accordance with the criteria, include the information required for their evaluation. Such termination criteria can be employed to save unnecessary measurement time; this can be put to good use immediately, particularly in conjunction with a sample changer.

Mettler-Toledo AG, Analytical
Postfach, CH-8603 Schwerzenbach,
Phone (01) 806 77 11, fax (01) 806 73 50
Internet: http://www.mt.com

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