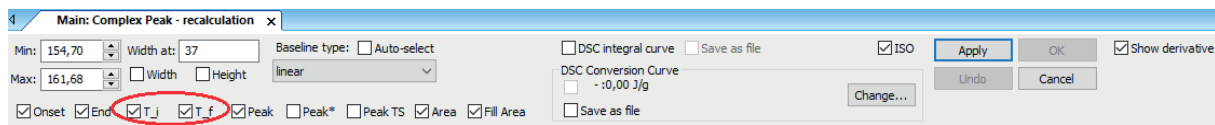# SOFTWARE **INNOVATION**

First Deviation Points of a Complex Peak (DSC)

Dr. Alexander Schindler

The international standard ISO 11357-3 [1] describes the "peak initiation temperature T_i and end temperature T_f at which the peak … begins to deviate from the relatively straight baseline". The evaluation of these temperatures, T_i and T_f – which are different from the well-known extrapolated onset and extrapolated end temperatures (see below) – is available in *Proteus®* Analysis version 9.0 and higher.

T_i and T_f, which may be called "First Deviation Points", are among the possible results of a Complex Peak evaluation of a DSC peak, as it is shown in the evaluation dialogue (see figure 1). All evaluation results checked are calculated automatically by *Proteus®* Analysis and displayed.

The result of the Complex Peak evaluation, in this example a DSC melting peak of indium, can be seen in figure 2.

1   Complex Peak evaluation dialogue in *Proteus®* Analysis. The choice of the First Deviation Points, T_i and T_f, are highlighted in red.
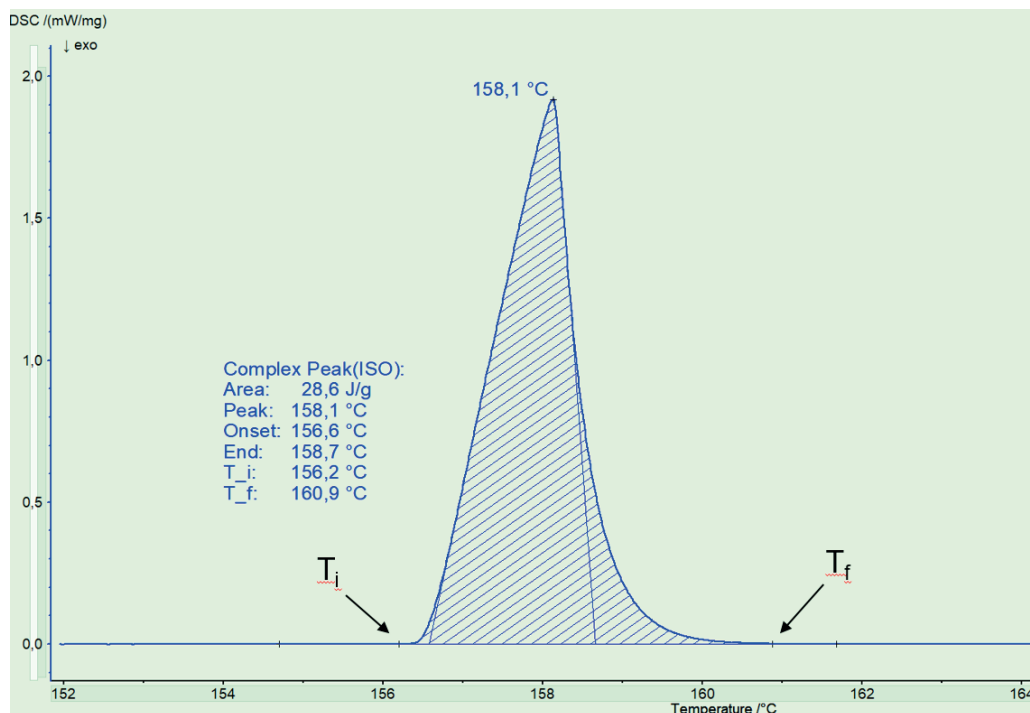

2   Complex Peak evaluation of an Indium melting peak including T_i and T_f.

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The temperature T_i is below the (extrapolated) onset temperature and T_f is above the (extrapolated) end temperature. Both temperatures, T_i and T_f, mark the first significant deviation points of the DSC curve from the baseline of the Complex Peak.

Since a Complex Peak evaluation can be created manually, but also applying DSC *AutoEvaluation*, temperatures T_i and T_f can also be selected among other evaluation results available in the DSC *AutoEvaluation* Settings (see figure 3).
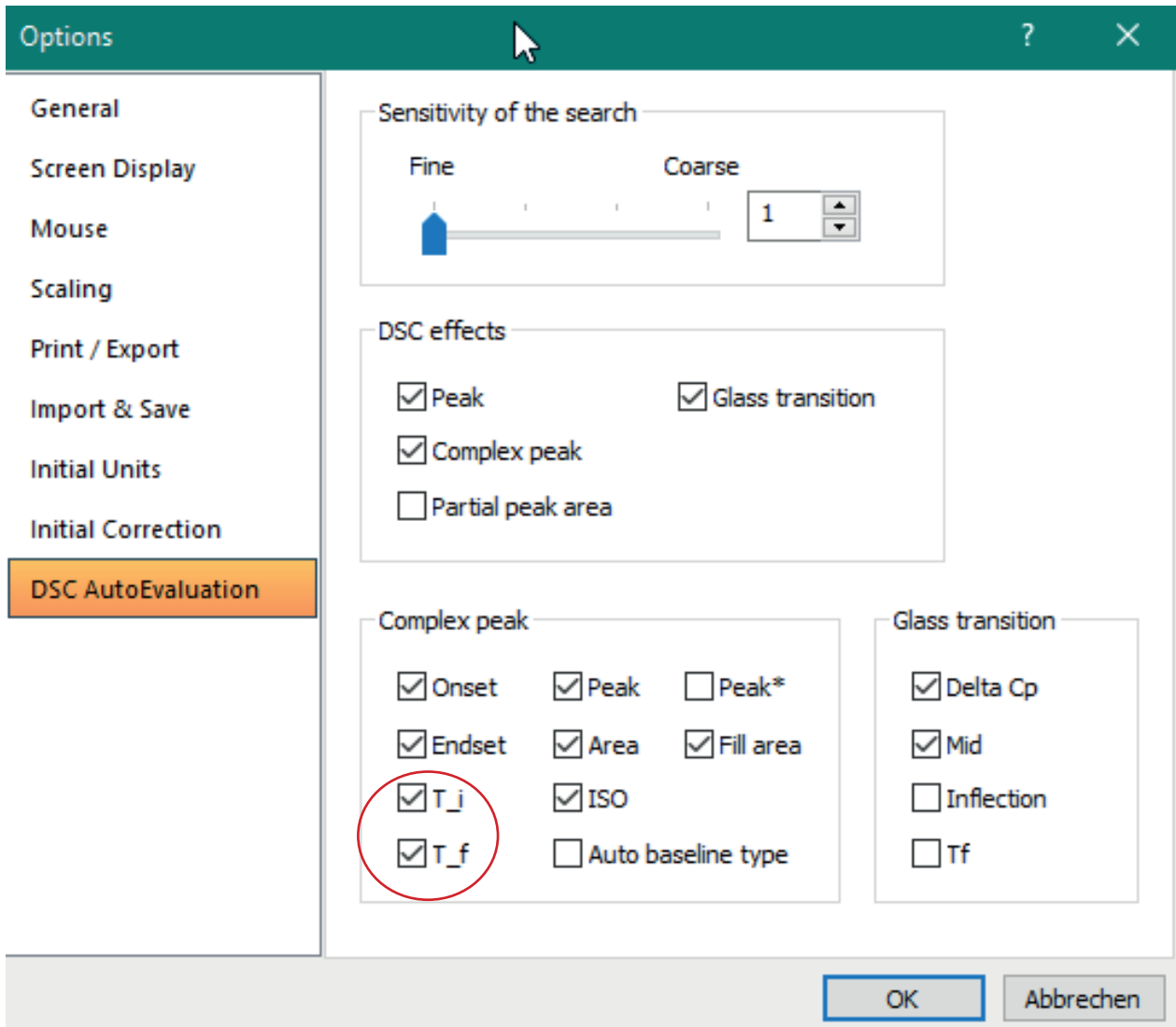
3 Settings of DSC *AutoEvaluation* in *Proteus*® Analysis (in menu Evaluation/AutoEvaluation/Settings). The choice of the First Deviation Points, T_i and T_f, is highlighted in red.

[1] International Standard ISO 11357-3, 2018-3, Plastics – Differential scanning calorimetry (DSC), Part 3: Determination of temperature and enthalpy of melting and crystallization.

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