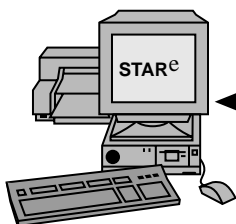


# DOS File Import

This software option makes it possible to read experimental data from an external source into the STAR<sup>e</sup>

Base Software, where they can be manipulated. This is desirable, for instance, when coupled measurement techniques such as thermogravimetry/mass spectrometry (TG-MS) are used. The measurement results from various instruments can thus be evaluated with one and the same software package and displayed graphically.

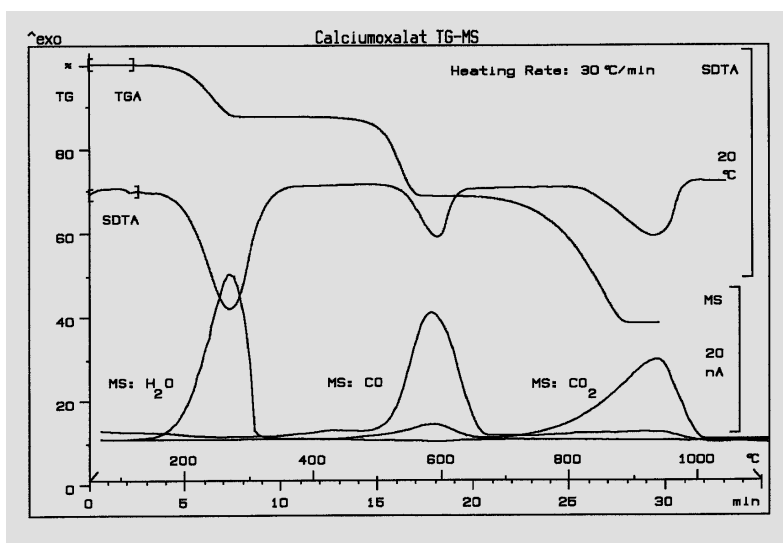
You can also convert your TA72 GraphWare files to a format which enables them to be read in and thus exploit the wide range of benefits offered by the STAR<sup>e</sup> Base Software.



The data to be read in must be stored on a DOS diskette as ASCII files. They can be read from the diskette into the evaluation window of the STAR<sup>e</sup> Base Software and then saved.

At present we can offer you several data formats. These include the TA72 GraphWare, Balzers MS and TA89 data. Others are in preparation. If you wish to read in other formats, we will be pleased to help you find a suitable solution.

The simplest way to proceed in such a case is to convert your data format to one of the formats which can be read in at present. Practically all data can be read into the STAR<sup>e</sup> Base Software in this manner.

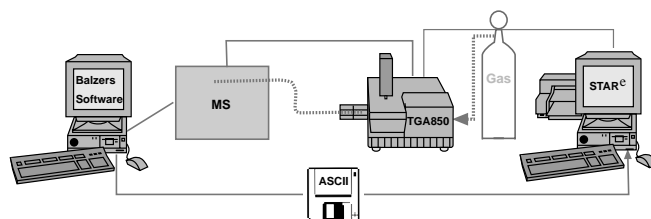


## Mass spectrometry

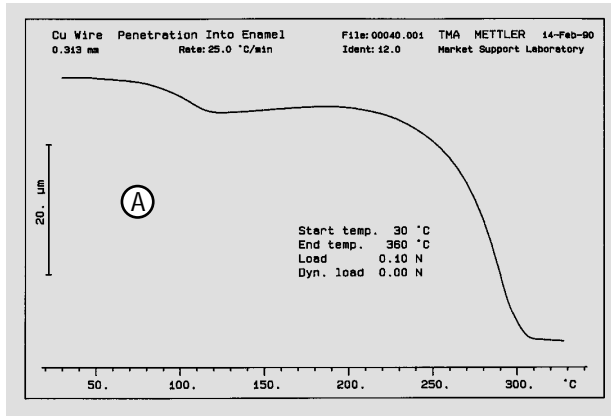
The field of thermogravimetry is exactly the type of field in which coupling with mass spectrometry is highly appropriate. In addition to the weight changes of a sample, information on the type and amount of the evolved gases can be provided.

The illustration opposite shows the thermal decomposition of calcium oxalate which, as the TGA curve shows, proceeds in three steps. To obtain additional information on the evolved gases, a mass spectrometer (Balzers MS) was coupled with the TGA. The MS data were stored in ASCII format and read into the STAR<sup>e</sup> Base Software.

Together with the TGA curve, the three ion currents measured simultaneously on the MS-Cube can be shown in graphical form. This allows rapid identification of the reaction progress. The individual weight steps correspond to the release of water of crystallization, carbon monoxide (with formation of calcium carbonate) and finally carbon dioxide.

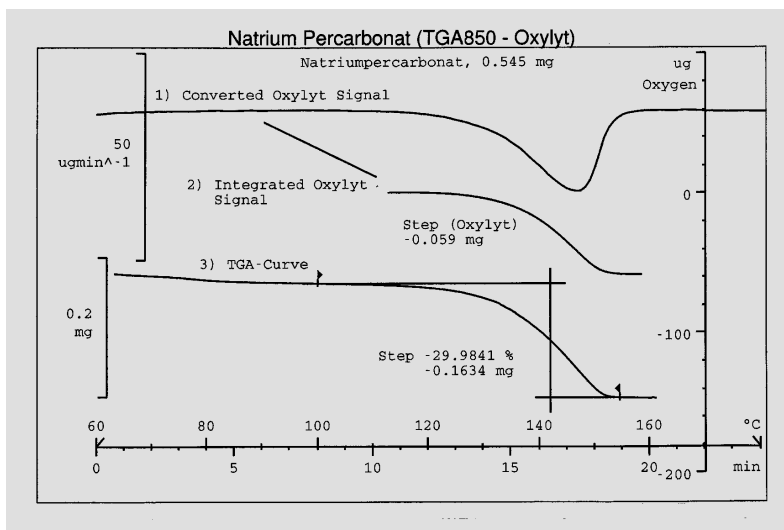
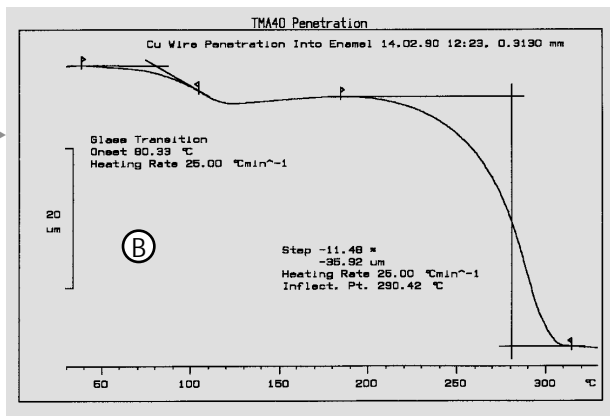


## Application example



### TA72 GraphWare

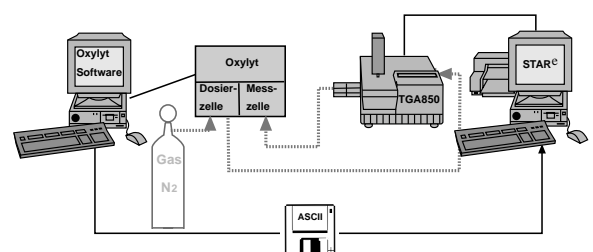
If you as a TA72 GraphWare user also wish to manipulate your experimental data with the new STAR<sup>®</sup> Base Software, you can convert these via "DOS file import". The illustration shows the results of a penetration measurement with the TMA40, which were stored in the GraphWare as file 000040.001 (A). Following conversion and import, this file is now stored in the STAR<sup>®</sup> Base Software database (B). The specific information of the measurement is naturally retained. The curve can thus be evaluated like an original STAR<sup>®</sup> Base Software curve.



### Oxylyt

Solid electrolyte coulometry (Oxylyt measuring instrument from the Sensotech company) can be used to measure changes in the oxygen concentration down to the ng range. This is thus an ideal supplement for thermogravimetry as in addition to the TGA curve changes in the oxygen concentration can be measured during a reaction. Superposition of the two curves also simplifies the interpretation here. Moreover, this instrument can also be used to adjust the oxygen concentration, an important factor if measurements have to be performed under a defined atmosphere. The example shows the thermal

decomposition of sodium percarbonate measured with the TGA. With the aid of the Oxylyt solid electrolyte measuring system, the oxygen concentration in the TGA measuring cell furnace was recorded simultaneously and the data imported as an ASCII file. The decomposition of the percarbonate to oxygen and water leads to a single weight step of 0.1632 mg in the TGA measurement (3). The additional measurement of the oxygen concentration (2), which is calculated from the original measurement (1), shows a loss of around only 0.0590 mg. This corresponds to the results expected from the stoichiometry ( $2 \text{Na}_2\text{CO}_3 \cdot 3 \text{H}_2\text{O}_2 \rightarrow 2 \text{Na}_2\text{CO}_3 + 3 \text{H}_2\text{O} + \frac{3}{2} \text{O}_2$ ).



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