



Electro-thermal evaporator

KS 98 application

Supplementary equipment for ICP spectrometry

Program controller for the evaporation sequence

Simple operation

Electronic control of gas flow and mixing

Clear display

KEY WORDS

Direct elemental analysis of solids, electro-thermal evaporator for ICP spectrometer, analysis equipment

DESCRIPTION

The analysis of solid samples by means of electro-thermal evaporation is an excellent supplementary method when determining the elements in a dissolved or solubilized sample.

ICP spectrometry (inductively coupled plasma) offers advantages in all cases where dissolution of the sample involves a considerable effort, e.g. with mineral and ceramic samples, environmental samples such as sediment, sludge, dust, and also vegetable samples, etc. Furthermore, metallic samples can be analyzed quickly and simply by means of an electro-thermal evaporator.

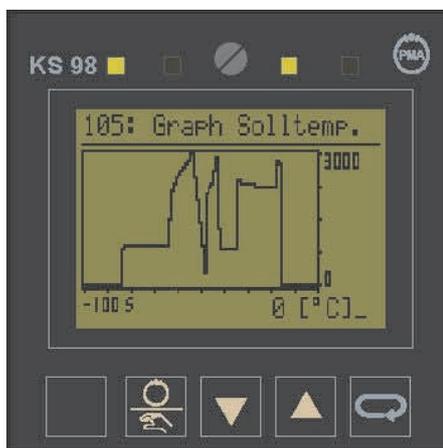
The main features of the ETV 4000 evaporator are:

- No cost and time-consuming dissolution of samples required.
- Increased detection sensitivity up to a factor of 100, because the dilution factor is eliminated, and practically 100% of the sample is contained in the plasma (as opposed to about 5% with dissolution analysis).
- Reduced risk of errors, because there is no contamination, adsorption, or evaporation etc. resulting from the dissolution process.

IMPLEMENTATION

Operating principle

Approx. 5-10 mg of the sample material are weighed into a graphite crucible, and are then heated in a graphite furnace under the programmed admission of gas. During the heating process, the metal ions are transformed into corresponding volatile halogenides.

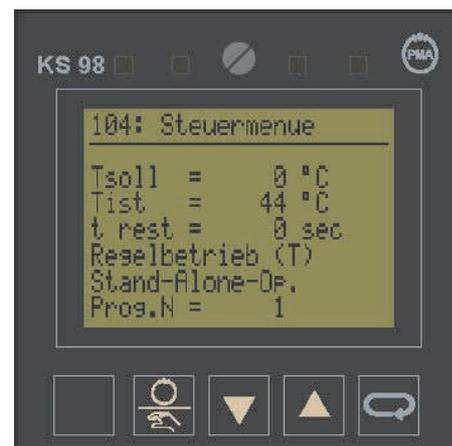


The exact and precisely reproducible temperatures allow a partially fractionated evaporation of the sample. The process stages drying, incineration, and evaporation of highly and less volatile components, and the evaporation of the matrix can be timed so that they occur sequentially during the same process. Operating temperatures lie in the range between room temperature and more than 3000°C.

Via a suitable pipe, the sample vapour is passed directly into the plasma, whereby the element-specific signals are integrated.

Compact equipment

The company „Spectral Systems“ in Fürstentfeldbruck has designed a compact tabletop unit. It contains the easily operated graphite furnace, a heavy-duty power supply for up to 400 A, the versatile multi-function unit KS 98 with the functions program control, sequencing, and fully graphic display.



If necessary, operating levels can be disabled to prevent inadvertent changes, so that every operator learns to use the equipment very quickly.



Operation of the KS 98 is particularly simple, whereby only three front-panel keys are needed to configure the sample-specific parameters for temperature, time, and sequence. A practically unlimited number of stages for temperature and time (resolution 1 second) can be stored. The number of stored programs is only limited by the memory capacity, but that is probably large enough for all requirements.

During analysis, the display can be switched to show either set-point and process temperature, program number and program step, or the momentary temperature/time curve as a graphic representation.

UNLIMITED VERSATILITY

The flexible configurability of the KS 98 enables the above application to be extended with pre-configured library functions such as programmer, controller, signal linearization, etc., or even „homemade“ partial Engineerings.

Furthermore, the KS 98 can handle the entire sequence program for an optional auto-sampler. With additional operating screens, for example 6-line text display, trend display, and bargraphs, the projecting engineer is able to increase the plant's operational functions. Moreover, by means of a user-specific menu structure, the transparency of the process data can be adapted precisely to individual requirements.

Spectral Systems P. Perzel
Augsburger Str.37
82256 Fürstenfeldbruck



PMA
Prozess- und Maschinen- Automation GmbH
P.O Box 31 02 29
D - 34058 Kassel
Tel.: +49 - 561 - 505 1307
Fax: +49 - 561 - 505 1710
E-mail: mailbox@pma-online.de
Internet: <http://www.pma-online.de>

Your local representative