

832 KF Thermoprep

Thermal sample preparation
in Karl Fischer titration



The solution for difficult samples

The KF oven method

Many substances (e.g. plastics or inorganic salts) release their water only slowly or at high temperatures. They are therefore not suitable for a direct Karl Fischer titration. An additional problem is the low solubility of certain samples in alcohols. In these cases traditional methods recommend the use of toxic solvents to promote dissolution or alternatively extensive sample preparation procedures. Moreover, if the sample is introduced directly into the titration cell the latter can be strongly contaminated, which means that it is necessary to exchange the titration solution and clean the cell frequently. Finally, there are various substances (e.g. ascorbic acid) that undergo side reactions with the KF reagents, thus falsifying the result.

By using the KF oven method the above-mentioned problems can be avoided. The substance under investigation is heated in a tube oven and the released water is transferred by a carrier gas to the titration cell where it is determined by Karl Fischer titration. As only the water enters the KF cell and the sample itself does not come into contact with the KF reagent, this means that unwanted side reactions and matrix effects are eliminated.

A modern Karl Fischer oven

The new 832 KF Thermoprep has been developed from the conventional Karl Fischer drying oven. It is based on the same principle as the successful 774 Oven Sample Processor, but in contrast to this it is primarily intended for single determinations. The vial technique is applied, i.e. the samples are no longer introduced into the oven by means of a sample boat, but in their own tightly sealed vials. Combined with the refined methodology of the KF Thermoprep this brings decisive advantages:

- Strictly reproducible analysis conditions for all samples; this is shown by the considerably improved precision of the results.
- Manual sample preparation is reduced to a minimum.
- Considerable savings in time.
- No contamination of the oven by the sample; consequently there are no carryover and memory effects.
- Improved water release from the sample as the carrier gas does not just pass over the sample but directly through it.



The new 832 KF Thermoprep in combination with the 756 KF Coulometer.

A fully developed concept

Sophisticated construction

The 832 KF Thermoprep is a very compact instrument. Oven heating block, gas pump, flow meter and flow controller are all integrated, as are two drying flasks.

Easy sample preparation

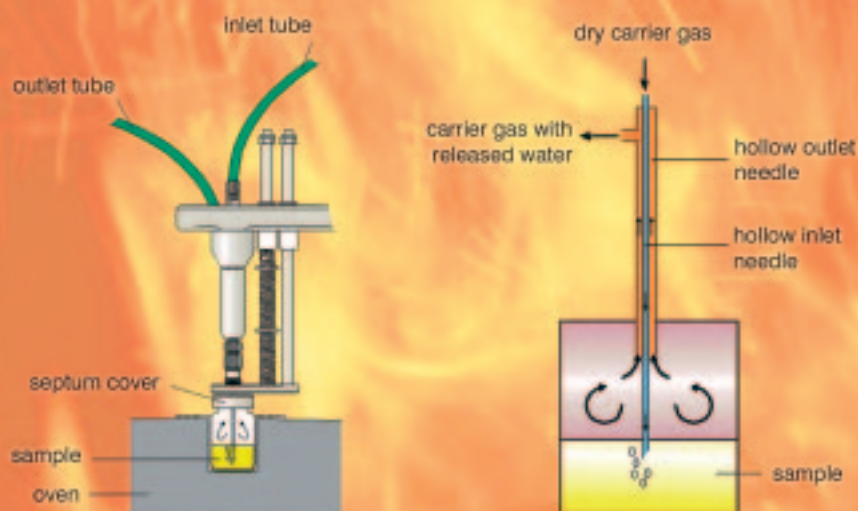
Sample preparation is straightforward and only consists of weighing the sample into the sample vial, which is then sealed using the crimping tool. The hermetic sealing of the vessels with PTFE-coated septa reliably prevents any interference by moisture uptake from the ambient air.

Refined methodology

The vessel containing the sample to be analyzed is positioned above the oven and lowered into the heating block. At the same time a double hollow needle pierces the septum of the sample vial. Via the inlet needle a stream of dry carrier gas (air or inert gas) is passed through the heated sample. The carrier gas, loaded with the released moisture, then flows through the outlet needle and the connected tube directly into the titration cell, where the Karl Fischer water determination takes place. Depending on the sample's water content, this determination can be carried out either volumetrically or, at the trace level, coulometrically.



In place of a KF coulometer a volumetric KF titrator can also be used for the water determination; the 758 KFD Titrino is shown here. In order to facilitate data storage and data reprocessing, with each KF Titrino and KF Coulometer you also receive the VESUV 3.0 Light Metrodata software free of charge.



Operational principle of the 832 KF Thermoprep: driving off the water by heating (left), detailed illustration of the double hollow needle (right).

Full flexibility

Accommodates sample vessels of different sizes

As an option, there is the possibility to modify the oven of the 832 KF Thermoprep such that you can use not only the Metrohm standard sample vials but also those used in your production plant.

Multiple application possibilities

In principle the 832 KF Thermoprep can be used for all samples that release water at elevated temperatures. However, it is particularly valuable when a direct volumetric or coulometric Karl Fischer titration is not possible. You can determine the water content of solids, be they powders or granules, liquids of different viscosities plus also pastes and fats. The 832 KF Thermoprep is particularly suitable for small numbers of samples. If, on the other hand, large sample series are to be analyzed, the 774 Oven Sample Processor is the ideal solution.

Take advantage of our know-how in the field of Karl Fischer titration. In the Internet, under www.metrohm.com, you will find our Application Notes as well as the list of all Metrohm Application Bulletins.



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Ion analysis

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Various sizes of sample vials can be used for analyses with the 832 KF Thermoprep.

Ordering information, options

2.832.0010 832 KF Thermoprep

Instrument for driving off the moisture of solid and liquid samples for subsequent coulometric or volumetric determination of the water content according to Karl Fischer. Temperature range 50 to 250 °C. Manual sample introduction, built-in air pump and two drying flasks as well as comprehensive accessories comprising 100 sample vials, 100 septum covers, 1 crimping tool.

Accessories, consumables and spare parts for 832 KF Thermoprep

6.1448.057	Septum, set of 100 items
6.2419.007	Sample vial 6 mL, set of 100 items
6.2811.000	Molecular sieve, 250 g
6.2816.080	Hollow outlet needle
6.2816.070	Hollow gas-inlet and injection needle