



sercon
innovators in isotopes

Thermalox TOC-TN

The modern alternative to COD and TKN



Features and Benefits of Thermalox TOC/TN

SUPERIOR DETECTORS

The key feature of the Thermalox instruments is the improved performance of the proprietary detector technologies. NDIR and Chemiluminescent detectors used to measure, respectively, the CO₂ and NOx gases. This gives many advantages...

IMPROVED LOD'S

Improved LOD's without having to employ long analysis times and complicated procedures to measure low concentration samples.

EXTENDED CATALYST LIFE

Extended catalyst life as smaller aliquot volumes are enabled.

COMPLETE OXIDATION

Even difficult to oxidise materials and particulate oxidise very completely and quickly because the quantum of material being oxidised in each measurement is small.

LOW RUNNING COSTS

Consumables and running costs are reduced - smaller vials - less frequent catalyst changes - less catalyst needed

LESS SAMPLE REQUIRED

Smaller sample vials can be used as the volume of sample needed for analysis is much reduced.

SMALLER VIAL RACKS - SMALLER FOOTPRINT ON LAB BENCH

Smaller sample vials mean the vial racks are smaller and can be mounted within the footprint of the instrument and not alongside it.

REPRESENTATIVE SUB-SAMPLING

Having remotely mounted samplers, which many vendors employ, gives them problems transporting the particulate fraction of the sample along the tubing; meaning the aliquot is not a representative sub-sample of what's in the vial.

EASIER AGITATION

Smaller vials mean agitation is simple and quick without needing to employ magnetic stirrers that need cleaning and managing.

QUICKER, COMPLETE SPARGING FOR NPOC

Smaller vials mean acid sparging to remove carbonate is quick and reliable. If the vial volume is 10% of a competitor's, the sparge time is 10% as well. This is significant - with a high carbonate sample we will take us no more than 90 seconds to sparge; competitors can take 10-15 minutes to sparge one vial!

NB some vendors in order to reduce sparge time keep measuring the carbonate during sparging to check it has gone. This is sold as a feature, but it is actually to cover a deficiency.

LOW SWEPT VOLUMES - FASTER MEASUREMENTS

The geometry of the combustion tube has a low dead volume, is rapidly swept to produce good peak shapes; use the minimum of carrier but efficiently oxidises carbon bound

into molecules to CO₂ and is large enough to handle aliquot volumes up to 400ul, but not so large that long measuring times are needed. Frequently manufacturers go for larger combustion tubes to improve catalyst longevity at the expense of analysis times (the larger the swept volumes, the longer it takes to complete a measurement).

AUTO-DILUTION OF OVERRANGE SAMPLES

We use an XYZ sampler with a precision syringe pump. This means overrange samples can be readily diluted by the syringe pump. For example if the aliquot is 100ul and it overranges, the next time we simply inject 20ul of sample along with another 80ul of UP water - there is no need to ask the sampler to find a vial space to mix a diluted sample which is time consuming and occupies space.

TN_b - VACUUM CHEMILUMINESCENCE

For TN our detector uses the vacuum chemiluminescence principle measuring the light produced by the reaction of NO and O₃. Doing this under vacuum makes the reaction much more sensitive - and this method is not employed by most mainstream manufacturers of Total Nitrogen instruments.
100% Recovery on TN Species

TN_b - 100% RECOVERY

"Recovery" efficiency is a key issue with TN and was not well understood when combustion systems started to replace Kjeldahl nitrogen methods. The three chemical groups (NO₃/2, NH₄ and organicN) can oxidise imperfectly to NO₂/NO if the combustion is not carried out correctly. With the Thermalox analyser, because the NOx detector is so sensitive, small aliquots are used to ensure 100% recovery of each N families of substances.

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