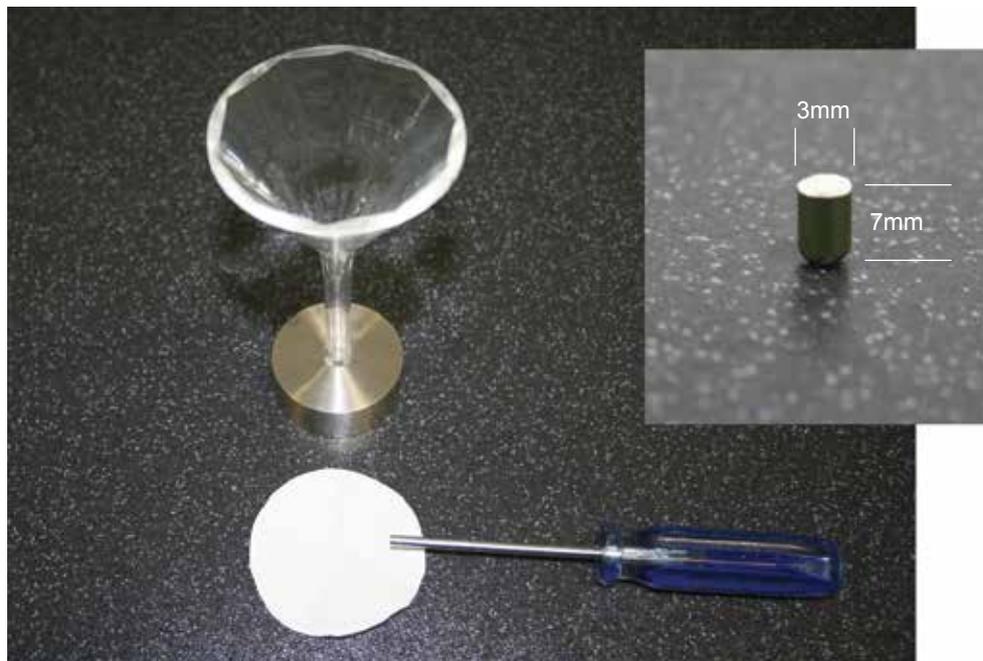




Application Note 52

Environmental Analysis: Determination of Carbon, Hydrogen & Nitrogen (CHN) In Filtered Samples

The technology for easy, direct automated elemental analysis of material retained on filters used in water filtration and air monitoring applications is now available for the Exeter Analytical Model 440 Elemental Analyser. Direct determination of total CHN retained on a filter is a sensitive, precise and cost-effective method that can be applied across a wide range of applications.



APPLICATIONS

- Analysis of working environment atmosphere for particulates
- Analysis of river water particulates
- Flue stack monitoring
- Oceanographic monitoring e.g. Phytoplankton

METHODOLOGY

Exeter Analytical has developed a method to analyse filter samples used in water or air monitoring without the need to weigh the filter sample. This is achieved by passing a known amount of air or water through the filter sample. The results from the CE440 Elemental analyser are expressed as micrograms of C, H and N. If you then know the amount of air or water passed over the filter the final result can be expressed as x micrograms per litre of air or water.

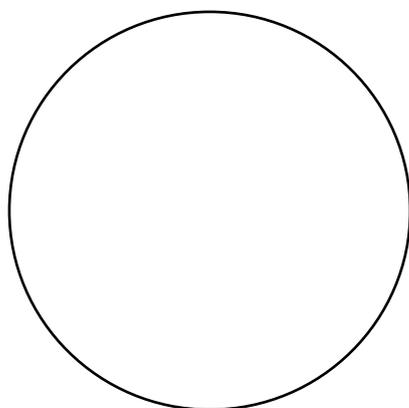
Benefits of the Model 440 methodology

- Horizontal furnace design facilitates easy sample residue removal between each run. With no residue build up in combustion tube results are more precise.
- Filters of up to 50mm diameter can be run with no sub-sampling. This results in enhanced data accuracy and improved sample throughput.
- Minimal consumables use i.e. no tin capsules

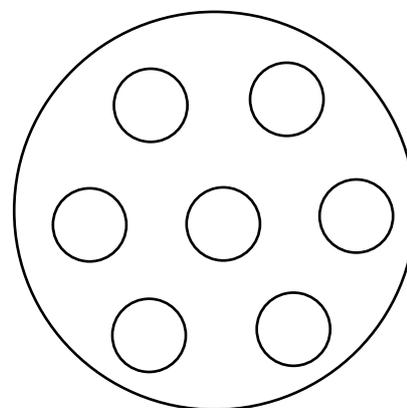
Benefits of whole filter analysis

The Model 440 with its unique horizontal furnace can analyse up to a 50mm filter in one analysis. A vertical furnace design analyser would typically sub-sample the filter several times to try and acquire a representative sample due to residue build up problems.

Analysing a whole filter in one go is proven to give more accurate analytical data than sub-sampling and then adjusting final analysis figures with a correction factor.



Whole Filter



Filter after being sub-sampled

Each of the small circles in the sub-sampled filter represents a separate analysis. After the analysis the final result would need to be corrected to take into account the whole of the filter. The sub-sampling method also assumes even distribution of deposited material over the surface of the filter, this is not always true. Using the Model 440 only one analysis (whole filter) is required - you do not have to weigh the sample or be concerned if you have representative data.

Conclusion

The Exeter Analytical Model 440 is able to analyse filter samples without the associated problems of residue build up as is experienced with vertical combustion CHN microanalytical systems. Time-savings gained from not having to weigh samples combined with improved data integrity and lower consumables costs are key reasons why the Exeter Analytical Model 440 Elemental Analyser is the number one choice for environmental filters analysis.

EAI

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