

Measuring of Organic Components in Fiberglass

Using the TOC-5000A Solid Sample TOC Analysis System

Even though we do not come into visual contact with them, printed circuit boards equipped with IC and LSI - the hearts of electric equipment - are true pillars of our society as they are an integral part of our lives being used in a variety of electric and electronic products. On the whole, such printed circuit boards are made of fiberglass impregnated with thermosetting resins such as phenol resin, epoxy resin, polyimide (PI). However, as organic components affect the mechanical features such as strength and hardness and electric conductivity, ultra-efficient supervision is required to prevent poor product quality.

Purpose

To measure the amounts of organic components in fiberglass with the Shimadzu Total Organic Carbon Analysis System TOC-5000A - a solid sample TOC analysis system.

Measuring Conditions

Measuring is performed under the following conditions for two fiberglass samples.

Analysis system: Solid sample TOC analysis system; TOC-5000A + SSM-5000A

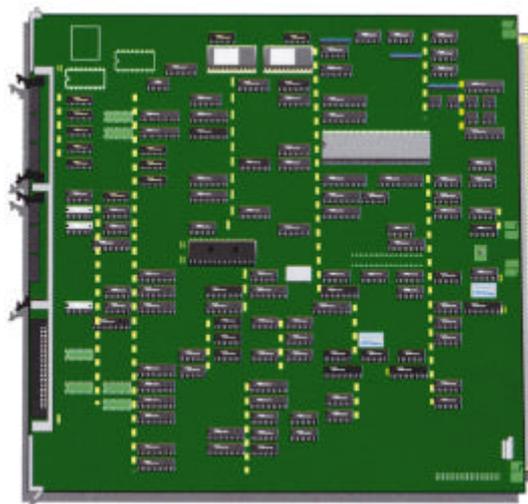
Analytes: TC, IC, TOC

Results

The results are as follows.

S ample	TC value (ppmC)	IC value (ppmC)	TOC value (ppmC)
Sample 1	382.5	0	382,5
Sample 2	284.4	0	284.4

The measured peaks of both samples are shown on the next page in figures 1 and 2 for TC and figures 3 and 4 for IC. In the case of the IC values for both samples, even if they are measured with the highest sensitivity range in the standard specifications of the analysis system, the peak area is zero, which can be ignored in comparison with the TC values. Regarding either sample, sufficient quantitative accuracy in practical use is acquired to enable clear understanding of what is happening to carbon in glass cloth.



Benefits

The following can be achieved using the solid sample TOC analysis system.

1. A great number of samples can be analyzed as measuring is fast.
2. Highly accurate measuring is possible.
3. Operation is easy.
4. Measurement of the total contamination including unforeseen particles is possible.

TOC measuring enables easy management of quality controls that have been difficult to manage up to now due to analysis methods

which were time consuming and high cost.

Application in Other Fields

The application range of the TOC-5000A solid sample TOC analysis system, covers a wide variety of sample analysis including water samples, each type of inorganic sample, soil, sludge, ore, and highly concentrated slurry. The following gives some analysis examples.

- Measuring the amount of surface-active agent in non-woven fabric
- Study of the removal method for CO2 from ceramic samples
- Contamination evaluation of alumina substrates

Features of the Solid Sample TOC Analysis System

- Detects all organic matter.
- Sample weighing errors and errors due to carbon deviation in samples are minimized as samples with a maximum weight of 1 g and carbon with a maximum weight of 30 mg can be measured.
- Inorganic bodies of carbon (carbonates) in solid samples can be easily measured.
- Water samples with a vast amount of suspended matter can be placed in a scruple vessel and measured.

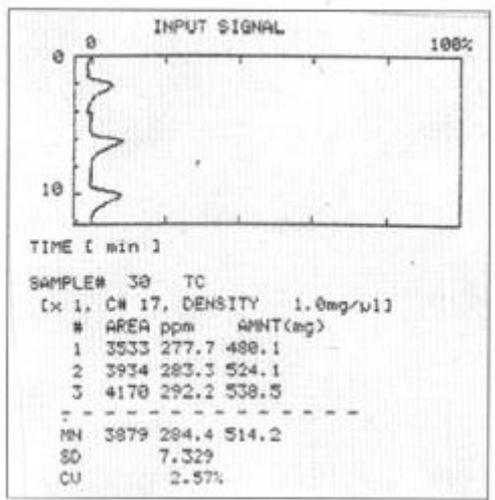


Fig. 2 Sample 2 (TC)

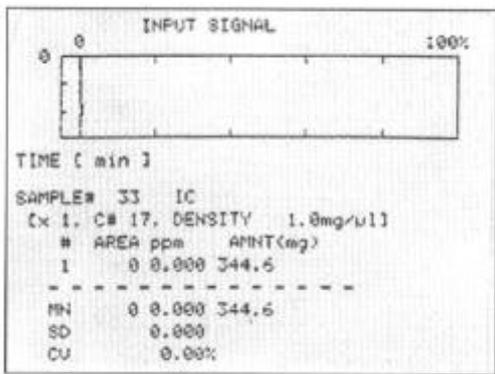


Fig.3 Sample 1 (IC)

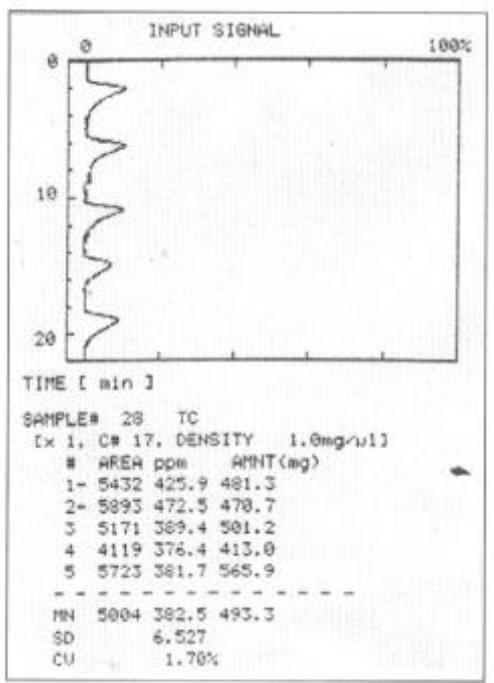


Fig.1 Sample 1 (TC)

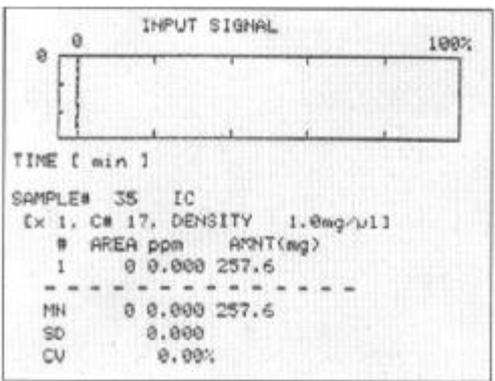


Fig.4 Sample 2 (IC)



Shimadzu Total Organic Carbon Analyzer TOC-5000A Solid Sample TOC Analysis system