ELTRA®
ELEMENTAL ANALYZERS

APPLICATIONS FOR

BATTERY TECHNOLOGY

- BASIC MATERIALS
- COMPONENTS
- ASSEMBLY
- RECYCLING

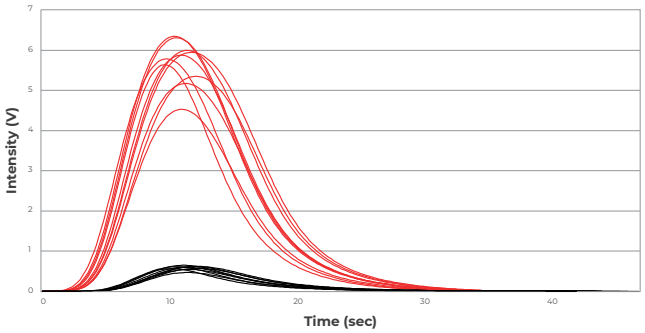
Eltra GmbH
Retsch-Allee 1-5 · 42781 Haan · Germany
Tel. +49 2104 2333-400 · Fax +49 2104 2333-499
info@eltra.com · www.eltra.com

part of VERDER scientific

ELEMENTAL ANALYSIS

NITROGEN & OXYGEN ANALYSIS OF SILICON NITRIDE

Lithium-based batteries can incorporate silicon nitride as part of an electrode. The nitrogen content is measured to indicate the purity of the silicon nitride, while the oxygen content is determined to evaluate electrical properties. The ELEMENTRAC ONH-p 2 is perfectly suited for precise measurements of both elements. The highly sensitive detectors used in ELTRA Elemental Analyzers accurately determine element concentrations ranging from low parts per million content to high percentages.



Measurement graph ELEMENTRAC ONH-p-2
The red curve shows the release of nitrogen, the black curve the release of oxygen.

ANALYSIS RESULTS

Silicon nitride (Si_3N_4) (reference material from BAM: ED 101)

Oxygen content: 2,06% +- 0,05 ; Nitrogen content: 43,54% +- 0,19

OXYGEN / NITROGEN / HYDROGEN ANALYZER ELEMENTRAC ONH-p 2

SHORT FACTS

- Wide range measurement of O/N/H for research and production control
- Inert gas fusion analyzer with TCD and IR detection

FIELD OF USE

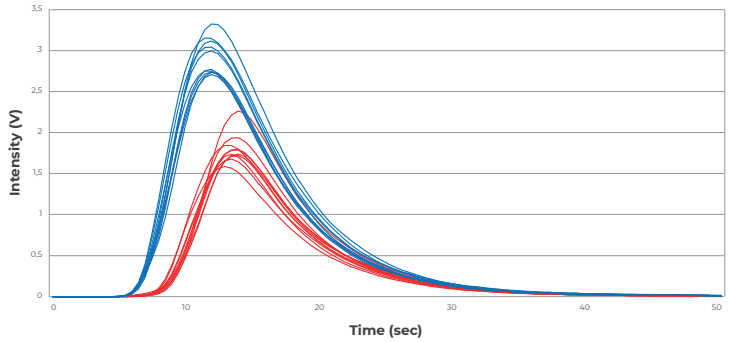
- Research

ELTRA

ELEMENTAL ANALYSIS

CARBON & SULFUR ANALYSIS OF LEAD COMPONENTS

Sulfur measurement by combustion analysis is used for final quality control of charged lead-based batteries. The electrodes consist of lead and lead oxide and need to be free of sulfur. The properties of the battery paste have an impact on the performance and life span of the battery and the contained lead sulfate determines its qualities. ELTRA's C/S analyzers provide rapid and reliable measurement of carbon and sulfur concentration from the low ppm range up to 100%.



Measuring graph ELEMENTRAC CS-i: $PbSO_4$ Measurement
The red curve shows the release of sulfur, the blue curve the release of carbon.

ANALYSIS RESULTS

Lead sulfate – Carbon content: 0,15 % +- 0,01 ; Sulfur content: 5,78 % +- 0,21

Lead carbonate – Carbon content: 3,23 % +- 0,07 ; Sulfur content: 1,15 % +- 0,04

CARBON / SULFUR ANALYZER ELEMENTRAC CS-i

SHORT FACTS

- Fast and reliable C/S analysis in all relevant battery components
- Compliant to all relevant standards like ASTM E 1019

FIELD OF USE

- Production

ELTRA

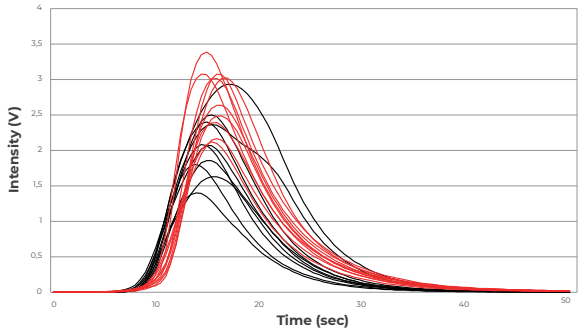
ELTRA®
ELEMENTAL ANALYZERS

ELEMENTAL ANALYSIS

C/S DETERMINATION IN BYPRODUCTS LIKE SLAG

The lead content of batteries can be recycled for use in new batteries in an environmentally friendly way. Lead is present as lead sulfate in exhausted batteries, and also in slags which are a byproduct of battery production and recycling. Sulfate can be precisely measured using ELTRA's C/S combustion analyzers, allowing fast and easy determination of the present lead.

CARBON / SULFUR ANALYZER ELEMENTRAC CS-i



Measuring graph ELEMENTRAC CS-i
The red curve shows the release of sulfur, the black curve the release of carbon.

ANALYSIS RESULTS (LEAD SLAG)

Carbon content: 9,7 +- 3,4 % ; Sulfur content: 10,9 +- 1,9 %

SHORT FACTS

- C/S measurement via combustion analysis with IR detection
- Wide C/S measuring range from ppm up to 100%

FIELD OF USE

- Quality Control

ELTRA