Multiplelabs
Turnkey Laboratories Solutions

Analytical®
Technologies Limited

LIBS:3500

LIBS ELEMENTAL ANALYZER

EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

Analytical Technologies Limited

An ISO 9001 Certified Company

www.analyticalgroup.net

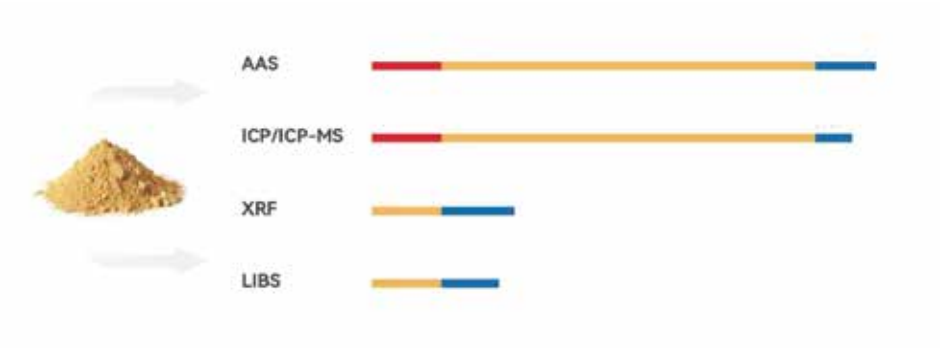
Product introduction

LIBS 3500 series are desktop laser-induced breakdown spectrometers (LIBS) newly launched by Analytical Technologies Limited based on its spectrum technology accumulation for 20 years. Products are able to directly analyze the solid powder tablet or block samples, which can be accurately quantitated within 1s in the fastest mode. Products are applicable to the rapid analysis of various chemical components in diversified fields, such as alloy materials, ores, lithium battery materials, industrial silicon, refractory materials and chemical salts.

Product features

Direct analysis of non-metal powder and metal oxide powder, with data generated in seconds

LIBS 3500 series LIBS elemental analyzers, suitable for analyzing the solid-state samples, and directly analyzing the samples not requiring conductivity and the metal, metal oxide and non-metal samples. Powder samples are only tableted instead of chemical digestion, avoiding the introduction of errors, which is a new choice for direct analysis of solid-state samples.

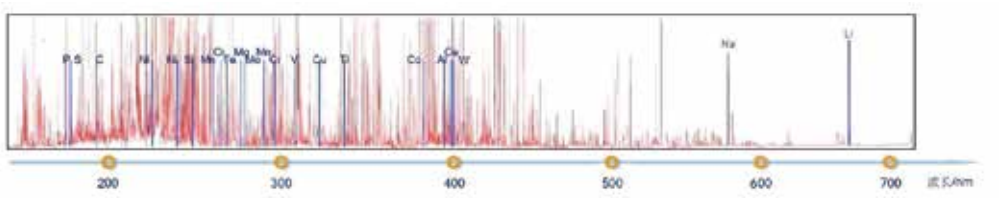


Total element analysis, filling in the gap of light element analysis of solid samples

Sensitive response to the light and heavy elements without distinguishing the LIBS laser plasma. Most elements in the periodic table of elements are analyzable. Shortcomings of light element analysis by traditional techniques have been covered to a large extent, solving the difficulties of analyzing light elements in solid materials, and enabling the fast quantitative analysis of such light elements as Li, Be, B, C, Si, Mg and Na in samples

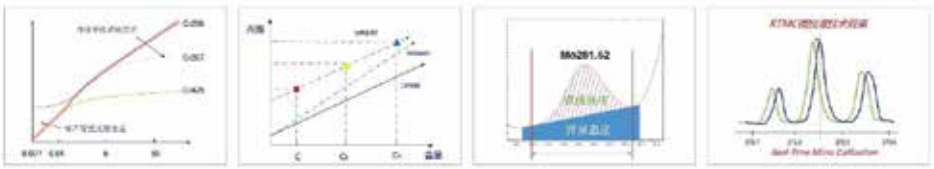
Full-spectrum acquisition and analysis, with abundant information of spectral lines

- Tens of thousands of spectral sensitive lines in the band range are obtained at one time, while multi-element analysis is realized
- The same element can be matched with different spectral sensitive lines based on its content, expanding the dynamic range
- It is beneficial for the implementation of spectral processing algorithms for qualitative judgment and semi-quantitative analysis of unknown materials
- It can be adopted in teaching, so that learners will intuitively understand the characteristic spectra of elements in depth



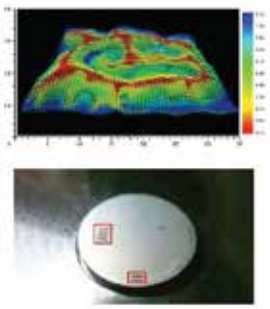
Mature spectral processing algorithm

Spectral features of the laser-induced breakdown spectroscopy are similar to those of the mature atomic emission spectrum products of Analytical Technologies Limited, such as inductively coupled plasma emission spectrometers and spark direct reading spectrometers, and mature algorithms have been developed. Such mature algorithms as spectral drift correction, spectral filtering, spectral background deduction, spectral interference deduction, spectral base deduction and multispectral variable matrix calculation have been continuously used for LIBS 3500, facilitating the accurate analysis by instruments.



Scan imaging of element distribution areas (Mapping)

Sample surface is fast scanned by laser at a speed of 10m/s to obtain the element content distribution diagram. Element distribution trend is observable qualitatively. After an area is selected, its content is displayed quantificationally, with synchronous display of multiple elements.
With small ablation area on the sample surface by laser plasma, the minimum displacement pixel precision of imaged surface reaches 50um, and the steps are adjustable in a single-pixel way.
Sample images are clearly observed by an industrial camera, and micron-level strike areas of laser plasma are guided accurately, assisting users in quickly locating the tiny areas with heterogeneous materials for quantitative analysis.

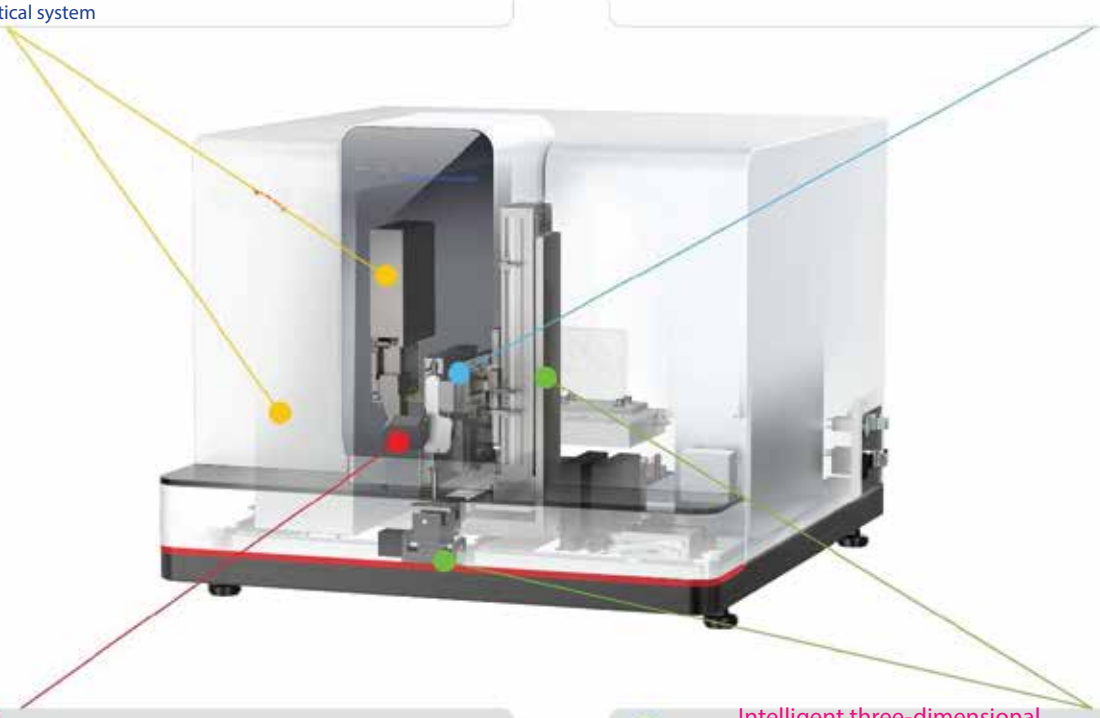


High-resolution spectrometer

The dedicated CT-structured optical system is provided with the excellent ultraviolet band element analysis performance such as C/P/S/N/As The classic Rowland circle optical system is featured by high resolution and wide band coverage Research-level COMS sensors are adopted, which have high sensitivity and better signal to noise ratio The dual optical system is designed with constant temperature, and the temperature control accuracy is up to ±0.1°C, guaranteeing the stability of optical system

Stable and efficient laser source design

High frequency output design allows more effective plasma spectral signals at the same time The all-solid -state laser is applied without wearing parts and consumable costs The precision temperature control superior to 0.1C guarantees the laser-produced plasma stability



Argon purging system

Argon purging technology effectively improves the plasma stability, reduces the optical substrate noise, and enhances analytical effects .Unique argon purging path design adequately guarantees the spectral transmission performance of ultraviolet elements

Intelligent three-dimensional displacement control system

Distribution of elements is intuitively presented based on multidimensional sample analysis, drawing of element distribution areas through the function of Mapping, and drawing of 3D element distribution effect through the function of scan imaging A HD camera is equipped, accurately locating the analysis areas Linear scanning extends the analysis scope, making results more representative

Perfect man-machine interactive system

With one-key analysis and simple operation,instrument state is monitored and hardware state is intuitively displayed, facilitating the instrument maintenance The processes of spectral acquisition and spectral processing are available, so that they are visible and operable, suitable for research and teaching

Mature method models

There are multiple mature method models, which enable the modeling at one time and can be used for a long time
In line with special application requirements, united method models are developed

Model	Application fields	Basic parameters
LIBS 3500	Applied to non-metal sample analysis	Mass of complete machine: 85KG Instrument dimensions: 900mm×750mm×600mm (L×W×H) Working temperature: 10°C-30°C Working humidity: 20%-80%RH Working voltage: 180VAC~260VAC/50HZ Optional argon protection mode Optional intelligent sample pre-processing and unmanned operating system
LIBS 3450	Applied to metal sample analysis	

Automatic mixer

Integrated automated pre-processing system

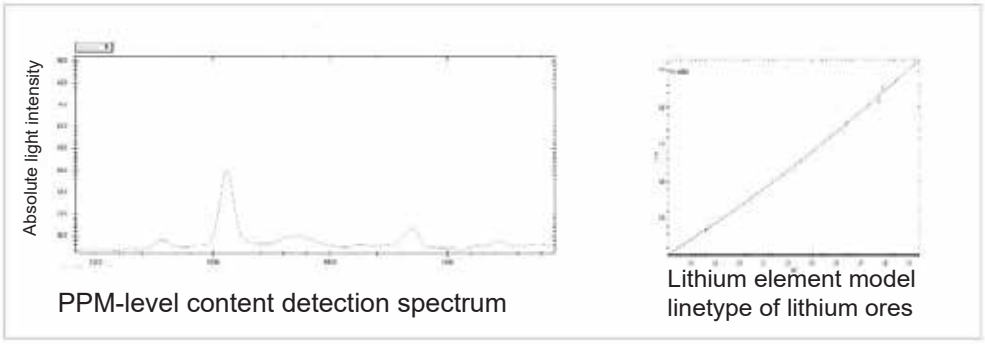
Multifunctional manipulator

Automatic sampling device

Application fields

Lithium ores

The Laser Induced Breakdown Spectroscopy is adopted for LIBS 3500, which will directly analyze the lithium ores and mineral powder, by directly polishing the block samples, tableting the power simply and completing the sample preparation within 5min. Compared with the traditional testing by chemical digestion, it is fast for testing and will accurately and quantificationally analyze the content of lithium oxide in lithium ores and the contents of other main elements.

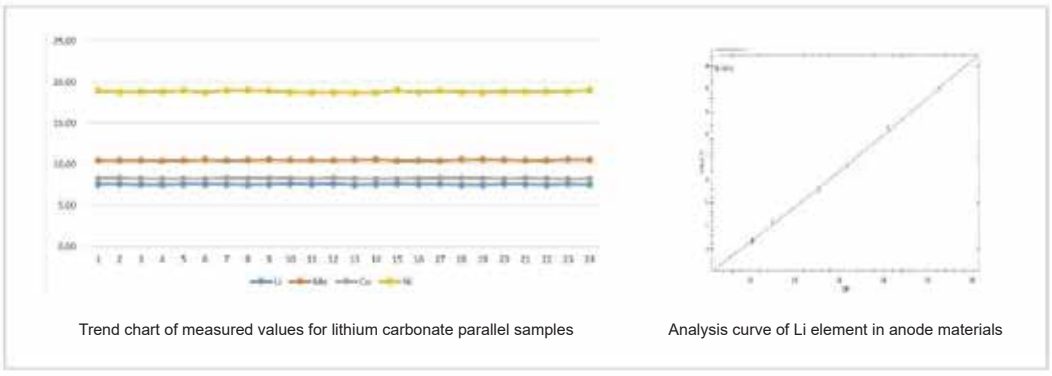


PPM-level content detection spectrum

Lithium element model linetype of lithium ores

Lithium anode materials

LIBS 3500 series LIBS elemental analyzers are applicable to the quantitative measurement of lithium sources and precursors during anode material production of power batteries. Compared with the detection with titration by traditional chemical method, the efficiency of a single analysis is increased by over 5 times, effectively assisting enterprises in reducing analysis costs and upgrading product quality

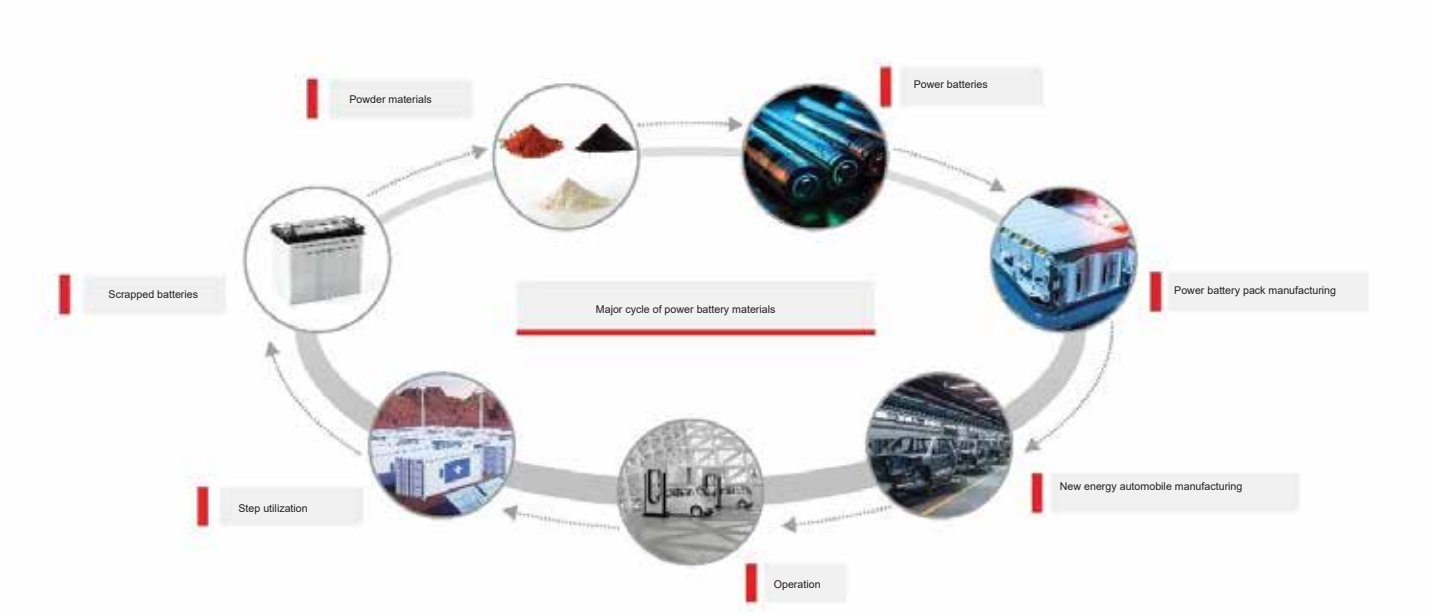


Trend chart of measured values for lithium carbonate parallel samples

Analysis curve of Li element in anode materials

Lithium battery recycling

Black powder shall be tested during the reutilization of lithium battery recycling resources, to determine the contents of key elements for black powder classification or pricing. LIBS 3500 is capable of fast measurement of such materials as lithium iron phosphate, lithium manganate, lithium cobalt oxides and ternary lithium, one-time analysis, and accurate quantification of multiple elements like Li, Ni, Co, Mn, Cu and A. It is the preferred solution for rapid black powder detection.

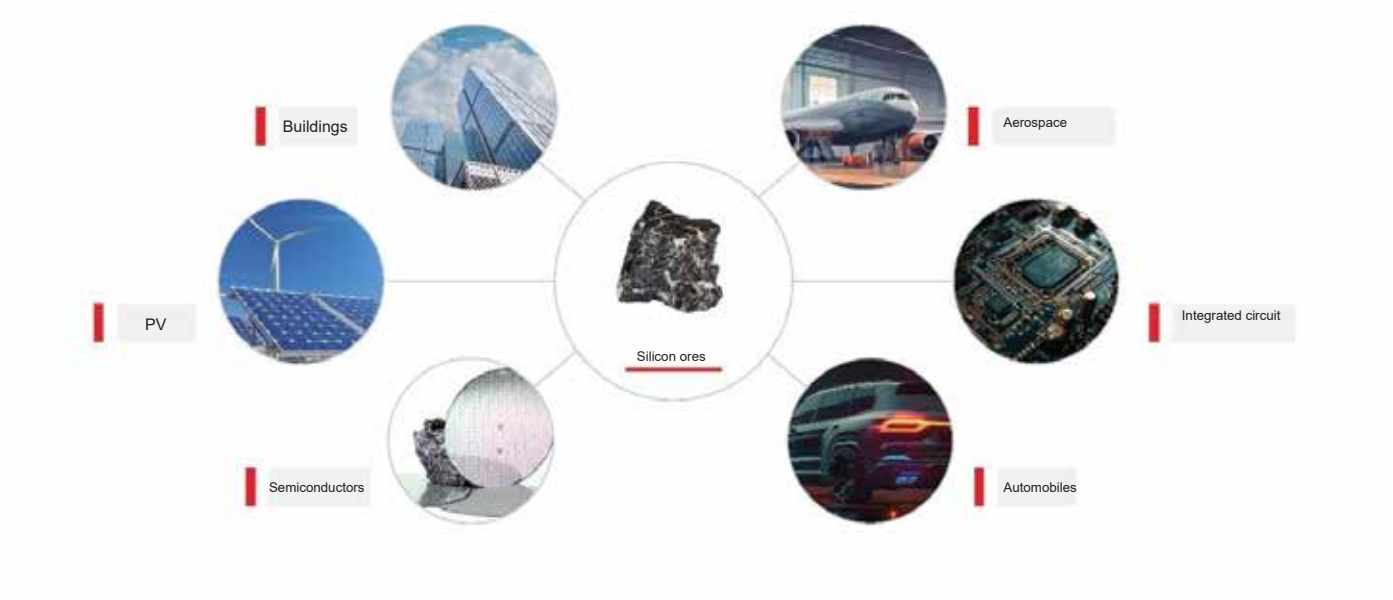


Beryllium ores

Toxic substances will be generated during the treatment of plating element compound and acid solution samples, posing hazards. LIBS 3500 series LIBS elemental analyzers are able to directly analyze the raw plating ores or ore powder, effectively avoiding the sample digestion, eliminating the hazards and the hidden dangers, and accurately and quickly determining the plating element content.

Industrial silicon

Industrial silicon products are mainly analyzed through digestion, and the sample preparation process is complex. LIBS 3500 can quantitatively analyze the contents of such elements as lithium, nickel, cobalt, manganese, copper and aluminum in industrial silicon samples in line with the standard (GB2881-91) implemented for industrial silicon products.



Analysis of metallic materials

LIBS 3500 series LIBS elemental analyzers are suitable for rapid quantitative analysis of alloy materials, and analysis of over ten matrices and more than 30 elements like iron, aluminum, copper, zinc, nickel, magnesium, lead, tin, titanium, cobalt and tungsten. The samples can be powder or bulk metals.

Features are as follows compared with the traditional spark direct reading spectrometer:

- Metal powder, oxide powder and non-conductive raw material powder are analyzable;
- Intermediate alloy materials difficult to be excited by spark direct reading spectrometer are analyzable;
- With fast analysis, the analyzer is suitable for the scenarios with a large number of samples.

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HPLC Servicing, Validation, Trainings and Preventive Maintenance :

HPLC Servicing :HPLC Servicing : We have team of service engineers who can attend to any make of HPLC promptly @the most affordable cost.

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Validations :Validations :We have protocols for carrying out periodic Validations as per GLP/GMP/USFDA norms.

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About Analytical Technologies

Analytical Technologies is synonymous for offering technologies for doing analysis and is the Fastest Growing Global Brand having presence in at least 96 countries across the global. Analytical Technologies Limited is an ISO:9001 Certified Company engaged in Designing, Manufaturing, Marketing & providing Services for the Analytical, Chromatography, Spectroscopy, Bio Technology, Bio Medical, Clinical Diagnostics, Material Science & General Laboratory Instrumentation. Analytical Technologies, India has across the Country operations with at least 4 Regional Offices, 6 Branch Offices & Service Centers. Distributors & Channel partners worldwide.

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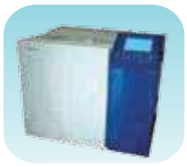

Optima Gas Chromatograph 2979 Plus

Flash Chromatograph

Atomic Absorption Spectrophotometer

Liquid Partical Counter

Optical Emission Spectrophotometer

DSC/TGA

Semi Auto Bio Chemistry Analyzer

HEMA 2062 Hematology Analyzer

Micro Plate Reader/Washer

URINOVA 2800 Urine Analyzer

Total Organic Carbon 3800

Fully Automated CLIA

NOVA-2100 Chemistry Analyzer

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TOC Analyzer

Laser Particle Size Analyzer

Ion Chromatograph

Water purification system

Regulatory compliances

Analytical® Technologies Limited

Corporate Social Responsibility

Analytical Foundation™

Analytical Foundation is a nonprofit organization (NGO) found for the purpose of:

1.Research & Innovation Scientist's awards/QC Professional Award : Quality life is possible by innovation only and the innovation is possible by research only, hence ANALYTICAL FOUNDATION is committed to identify such personallities for their contributions across various field of Science and Technology and awarding them yearly. To participate for award, send us your details of research / testing / publication at Info@analyticalfoundation.org

2. Improving quality of life by offering YOGA Training courses, Work shops/Seminars etc.

3. ANALYTICAL FOUNDATION aims to DETOXIFY human minds,souls and body by means of yoga, Meditation, Ayurveda, Health Care, Awards, Media, Events, Camps etc.

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