

GBC OptiMass 8000

ICP Time-of-Flight Mass Spectrometer



**Simultaneous full mass spectrum
and fast transient analysis**

**The new OptiMass 8000
from GBC draws
together a long
tradition of excellence
in design and
engineering, new
approaches to
elemental mass
spectroscopy and ten
years of development to
revolutionize the
performance of ICP-MS**

*The new GBC OptiMass 8000
ICP Time-of-Flight Mass Spectrometer*

*Simultaneous measurement and fast data collection
speed allows high sample throughput and fast
transient analysis*

This new benchtop ICP-MS incorporates an orthogonal acceleration time-of-flight mass spectrometer (oaTOFMS) offering the advantages of high speed and simultaneous mass determination without any compromise in mass range, sensitivity or precision.

This leading edge technology, incorporating a new high speed data acquisition system, produces a single full mass spectra in 30 μ s, i.e., more than 30,000 full mass spectra per second.

High Sample Throughput at Detection Limit Levels

The OptiMass 8000 not only provides high speed spectral acquisition, but does so without any compromise in overall sensitivity—ppt detection limits can be achieved on all masses in less than 10 seconds. This inherent speed allows higher sample throughput using conventional sample introduction systems and typically achieves a sampling speed of 120 samples per hour with all mass channels measured. This not only improves the productivity of your laboratory but also reduces the operating costs of the instrument.

Minimize Sample Consumption

True multi-element micro-sample volume analysis is now a reality without any compromise in the detection limit or precision of the result. The OptiMass 8000 can provide true multi-element capability while minimizing sample consumption by simply using micro-flow or flow-injection techniques. This approach can also be used for analysis of solutions containing relatively high levels of dissolved solids, increasing the time between maintenance of sampler and skimmer cones and the ion optics interface, which reduces instrument downtime.

Improved Precision for Isotopic Ratios and Internal Standardization

The simultaneous sampling of the OptiMass 8000 improves ratio measurement precision and the effectiveness of internal standardization which until now has been limited by the sequential scanning nature of the mass analyzer. As all ions are sampled at the same time from the plasma with a time of flight mass spectrometer, low frequency noise which arises from the plasma and sample introduction system is completely eliminated. This means that ratio precisions of less than 0.1% can be routinely achieved for any number of isotopic pairs from the same acquisition.

Multi-element Transients and Sampling Flexibility

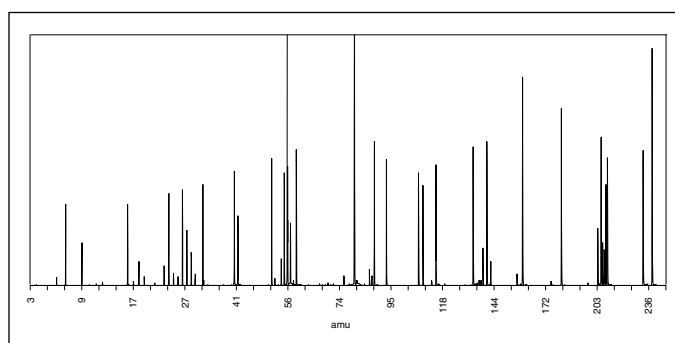
The high speed data collection rate enables transient signals to be sampled 30,000 times per second, and fifty integrated full mass spectra to be displayed per second. Scanning mass analyzers require a compromise between elemental coverage, detection limits and precision. There are no such compromises with the OptiMass 8000, making possible a wide range of multi-element applications such as single-shot laser ablation for enhanced spatial resolution, reduced sample volumes with flow injection analysis and speciation studies utilizing techniques such as gas or liquid chromatography.

Powerful Software for Windows® 95

The OptiMass 8000 software interface is logically organized into modules for simplified central control of all instrument functions. Designed for ease-of-use and flexibility, the software uses a combination of easily recognizable icons, simple-to-edit menus and a notebook style layout to keep you in control and organized.

All instrument parameters are under complete computer control, which allows automated optimization of system parameters. Stored method parameters ensure fast and reproducible instrument set-up.

The Windows® 95 platform offers advantages of speed, power, compatibility with third-party software and true 32-bit pre-emptive multitasking.



Full mass spectrum for a 20-element sample.

Specifications

DESCRIPTION

Benchtop Inductively Coupled Plasma orthogonal acceleration Time-of-Flight Mass Spectrometer (ICP-oeTOFMS), controlled by an external computer using Windows® 95 based software.

RF GENERATOR

Solid state 27.12 MHz generator • Computer controlled from 500 W to 1500 W with auto tuning • Auto-start from switch or keyboard.

SAMPLE INTRODUCTION

Nebulizer and Spray Chamber

Concentric glass nebulizer with thermostatted glass cyclonic or double pass spray chamber.

Torch

Low flow, low power, single piece quartz torch.

Torch Adjustment

Computer control of torch movement (x-y-z) for optimal analytical positioning relative to the ion sampler interface.

Argon Flows

Individual gas flows under computer control • Mass flow regulation on all gas lines.

Peristaltic Pump

Computer controlled dual-channel 12-roller pump, speed 0–50 rpm • Auto fast pump setting for rapid washout.

INTERFACE AND ION OPTICS

Easily removable three cone system • Water cooled interface • Cone access via motorized retraction of the torch • Gate valve allows cone extraction without breaking vacuum.

VACUUM SYSTEM

Conventional three-cone interface vacuum system with differential pumping utilizing maintenance-free turbomolecular pumps and rotary vane backing pump • Automatic sequencing and control • Interlocks to prevent damage to pumping system and high voltage elements in event of plasma failure. • Turbomolecular pumps protected from overload conditions.

MASS ANALYZER AND DETECTOR SYSTEM

Orthogonal acceleration time-of-flight mass spectrometer • Mass range of 3 to 260 amu. • More than 30,000 full spectra per second ion extraction speed • Automatic detector protection and user-selectable matrix ions elimination with SMARTGATE ion blanker • 400 MHz detection system sampling rate • Dual TDC/TR detection system with discrete dynode multiplier for extended dynamic range • Transient signal display rate of 50 integrated full mass spectra per second.

SOFTWARE

True multi-tasking Windows® 95 based operating software. • Modular design, with Method, Samples, Analysis, Instrument Control and Results modules accessible from any part of the software • External and isotope dilution calibration • Automatic correction for interferences and measurement with internal standards • Measurement of transient signals • Isotope ratio measurement • Password protection on methods and results. • Complete quality control protocols, including check samples, spike recoveries, calibration failure and QC limits • Unlimited number of samples in a run • Comprehensive report generation. • Context sensitive, hypertext Help • Complete computer control of instrument parameters • Auto-optimization of plasma parameters and auto-tuning of mass analyzer • Customizable instrument status display.



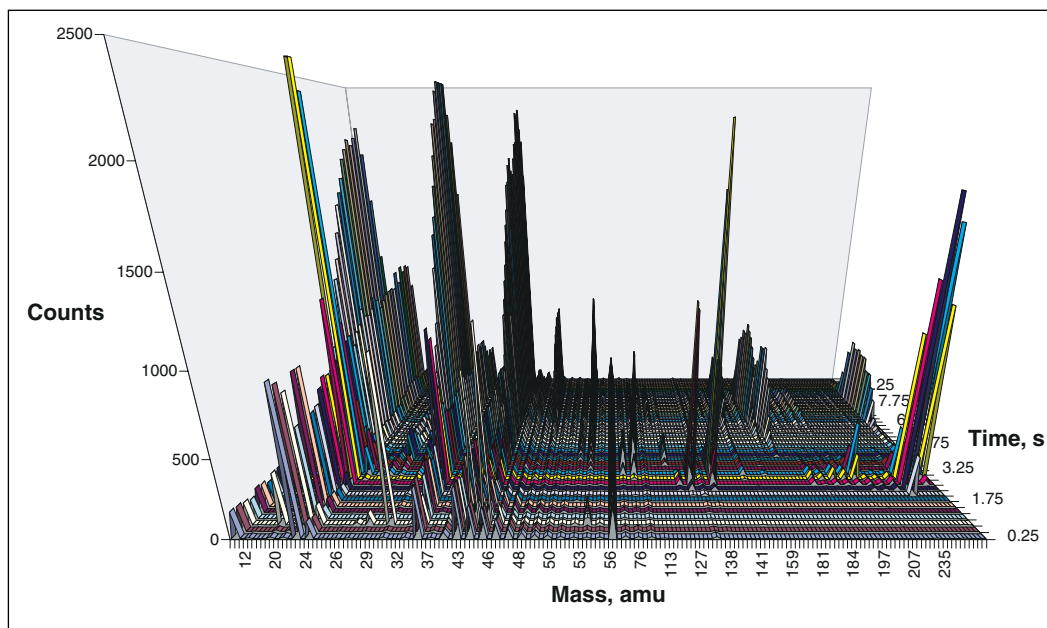
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GBC SCIENTIFIC EQUIPMENT

Manufacturer of world-class
instrumentation—
AA, UV-Vis, HPLC
ICP-OES and ICP-MS

12 Monterey Road
Dandenong, Victoria 3175
Australia
Telephone: 61 3 9213 3666
Facsimile: 61 3 9213 3677
email: gbc@gbcsce.com
Internet: www.gbcsce.com

39830 Ventura Drive
Arlington Heights, IL 60004
USA
Telephone (847) 506 1900
Toll Free 1800 445 1902
Facsimile: (847) 506 1901



Full elemental mass range, integrated data from an ETV sampling system coupled to the OptiMass 8000 using a multi-element sample, 5 ppb 10 μ L.

Electrical Requirements

200–240 V AC, 7 kVA, 20 A. 50/60 Hz

Dimensions

1200 x 820 x 600 (W x D x H, mm)

Weight

250 kg (300 kg packed)

ORDERING INFORMATION

GBC OptiMass 8000 ICP Time-of-Flight Mass Spectrometer
Part No. 99-2155-00