HORIBA
Scientific

High-Performance Affordable ICP-OES

JY 2000-2 ICP OPTICAL EMISSION SPECTROMETER

JY 2000-2

JOBIN YVON
Technology

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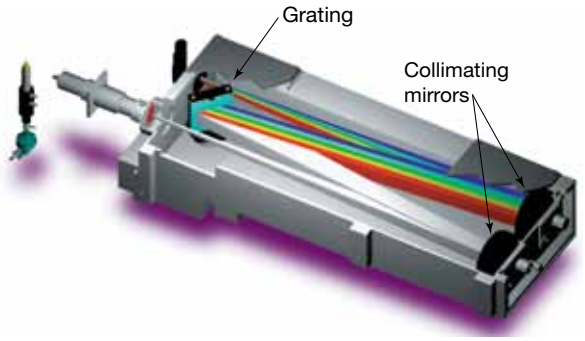
JY 2000-2 ICP Optical Emission Spectrometer

High-Performance ICP-OES at aff

The new JY 2000-2 delivers affordable high-performance and reliability that will increase the productivity of your laboratory. The modestly priced JY 2000-2 delivers performance better that competitive radial ICP spectrometers at far higher prices. The proven design has been updated to incorporate many innovative design features of the ULTIMA 2, resulting in the JY 2000-2.

Quality optics for quality analysis

At the heart of every HORIBA Scientific spectrometer are unique, quality optics. The size of the grating is a critical factor in the spectrometer that is often ignored. A large, 80 x 100 mm holographic grating provides increased luminosity and improved resolution.



The large surface area of the grating allows for collecting more light and the illumination of more grooves, thus improving resolution. The JY 2000-2 utilizes a classic Czerny-Turner design with only two reflective surfaces in addition to the grating.

This low number combined with the high light throughput provided by the large, holographic grating means that more signal is reaching the detector when compared to systems using up to as many as 10 to 13 reflective surfaces.

This increase in light efficiency results in improved signal-to-background ratios and thus, lowers detection limits and improves stability. A comparison of the JY 2000-2 radial detection limit (see table) with competitive radial detection limits confirms the difference quality optics make in the performance.

Typical Detection Limits in ppb at 3 sigma			
Element	Detection Limit	Element	Detection Limit
Al	1.5	Mg	0.06
As	5	Mn	0.3
B	2	Mo	1.0
Ba	0.2	Na	1.5
Be	0.2	Ni	0.7
Br	100	P	5
Ca	0.03	Pb	5
Cd	0.35	Sb	5
Cl	200	Se	5
Co	0.6	Sn	7
Cr	0.5	Te	7
Cu	0.6	Ti	0.45
Fe	0.5	Tl	3
Hg	5	V	1.5
K	5	Zn	0.3
Li	2		

Low-cost and high-performance

The JY 2000-2 Sequential ICP makes ICP OES an affordable alternative to analysts choosing an elemental analysis technique. The JY 2000-2 provides high-speed analysis with outstanding reproducibility, superior detection limits and accurate results, as well as very good optical resolution.

Grating selection is determined from the resolution requirements. The standard 2400 g/mm holographic, ion-etched grating is used for routine applications in matrices without high concentrations of interfering elements. It supplies full wavelength coverage from 160 – 800 nm. As an option this can be extended to 120 nm to include the analysis of the halogen elements. An alternate 4343 g/mm holographic, ion-etched grating is available for applications that require higher resolution.

NASA

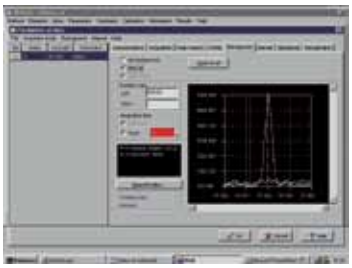
HORIBA Scientific RECEIVED THE PRESTIGIOUS
NASA EXCELLENCE AWARD

"In recognition of your holographic diffraction gratings for the 'Cosmic Origin Spectrograph' instrument that will enable a new generation of scientific exploration for the Hubble Space Telescope, the astronomers of the world and every person who looks to the sky in wonder."

Over 192 years of HORIBA Scientific optical experience provides the platform for NASA projects. This same quality is at the heart of every JY 2000-2.

ordable price

Far UV analysis



A blank and 50 ppm of 10% oil in Kerosene profiled at the second order line of 134.664 nm.

Determination of Cl at 134.664 nm and Br at 154.064 nm, as well as the use of alternative wavelengths is available when the JY 2000-2 is configured with the far UV kit. The kit includes a detector optimized for deep UV analysis and a modification of the optical interface. Elements such as Ga at 141.444 nm and Pb at 168.215 nm provide the capability of total analysis for samples previously requiring multiple analytical techniques.

Unique sample introduction

HORIBA Scientific utilizes a unique quick-release torch design and spacious sample compartment. Each individual, pre-aligned assembly features a completely demountable torch, a sheath gas attachment, a spray chamber and nebulizer optimized for your application. Kits are available for a variety of applications including aqueous, oils and other organics, high salt or dissolved solids, slurry and HF acid.

The JY 2000-2 offers complete automation with an optional autosampler, resulting in fast, unattended analysis. Additional sample introduction accessories are available to further extend the flexibility of the instrument. An ultrasonic nebulizer or hydride generator can decrease detection limits while spark ablation provides analysis of conductive solid samples.

The unique sheath gas feature originally patented by HORIBA Scientific, enhances performance and stability by providing a laminar flow of argon around the sample aerosol prior to the injector tube. This minimizes contact of the sample with the injector wall and eliminates crystallization at the injector tip. The injector's large 3 mm bore also contributes to the ability to handle high solids such as slurries, and serves to improve detection limits by increasing the residence time of atoms in the plasma. An optional argon humidifier provides moisture to the nebulization gas to minimize clogging of the nebulizer, which can occur with high dissolved solids.

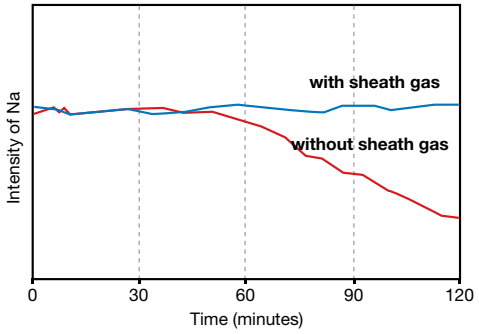
Stability for productivity

The JY 2000-2 is designed to provide a rapid start-up and excellent short and long-term stability. Stability and low detection limits in difficult matrices lead to an improvement in productivity for routine analysis. The 40.68 MHz solid state generator used in the JY 2000-2 allows the instrument to stabilize after ignition in less than 15 minutes. It offers frequency stabilization, automatic ignition of the ICP and reflected power regulation. A 12-roller, three channels peristaltic pump allows the nebulizer and spray chamber drain to be pumped to assure minimal pulsation and noise. Thermoregulation of the optics and wavelength referencing prior to each scan provide typical short term stability better than 0.9% and long term stability of less than 1.5% RSD over one hour. Addition of the optional simultaneous internal standard monochromator can improve stability and accuracy for demanding major element analysis.

Analyst™ software

The Analyst software provides step-by-step assistance in the creation of new methods. Powerful databases are provided on matrices and standards to assist the new or inexperienced user and speed up method development. All data is stored and the vast choice of export formats is ideal for LIMS, especially as Analyst can import data from LIMS systems to further automate data management. The reporting provides for audit trailing as required for 21 CFR Part 11 (FDA), including all current analytical conditions at the start and finish of the analysis. Using Analyst with the optional IMAGE provides full wavelength coverage in 2 minutes for quantitative and/or semi-quantitative analysis.

30% NaCl over two hours



Aspiration of 30% NaCl without the sheath gas shows a slow build-up of salt on the injector causing a decrease in intensity

Technical specifications

Generator	Radio frequency, solid-state 40.68 MHz, water cooled
Cooling system	GenCo water chiller for the generator and the coil
Exhaust	Direct exhaust connection for plasma compartment
Plasma	Fully demountable torch, 3 mm i.d; alumina injector, 12 L/min plasma gas, 0.2 L/min sheath gas
Sample introduction	Concentric glass nebulizer, cyclonic glass spray chamber, 3 channels peristaltic pump
Optical system	Thermo-regulated, 0.64 meter focal length, 2400 g/mm grating used in the 1st order with optical resolution <19 pm for 160-800 nm.
Wavelength range	160-800 nm (optional 120-800 nm with Far UV kit)
Detection	PMT detection with High Dynamic Detection system (HDD®)

Options

- Far UV kit for sensitive measurement of wavelengths down to 120 nm
- AS-500 Autosampler with rinse station
- Ar humidifier
- Micro / high dissolved solids / inert material / organic nebulizers
- Scott / HF resistant / cooled spray chambers
- Ultrasonic nebulizer
- CMA for simultaneous measurement of hydride forming elements and other elements
- Oxygen kit for organic samples
- Laser ablation system

Physical data

Refer to JY2000-2 Pre-Installation Manual for more details

Depth	698 mm
Width	1321 mm
Height	604 mm
Power	Single-phase, 220-240 V, 50/60 Hz, 4 kVA
Cooling water	2 to 3 L/min, 2 bar
Argon	99.995% purity
Nitrogen	160 to 190 nm, 99.999% purity 120 to 160 nm, 99.9995% purity
Exhaust	250 m^3/h
Environmental	20 to 80% humidity non-condensing, 18-24°C at ± 2°C

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