

EXHIBIT A



J. Crew



YOUR CLOSET WILL THANK YOU.

SHOP NOW

spectrometer

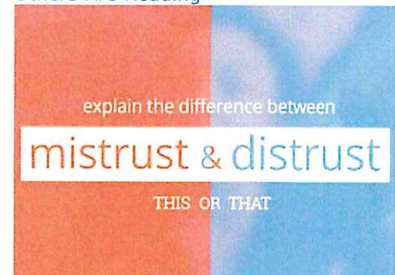
[spek-trom-i-ter]

Examples Word Origin

NOUN *Optics.*

- 1. an optical device for measuring wavelengths, deviation of refracted rays, and angles between faces of a prism, especially an instrument (**prism spectrometer**) consisting of a slit through which light passes, a collimator, a prism that deviates the light, and a telescope through which the deviated light is viewed and examined.

Others Are Reading



We're about to solve one of the great mysteries of the English language. Are you ready?

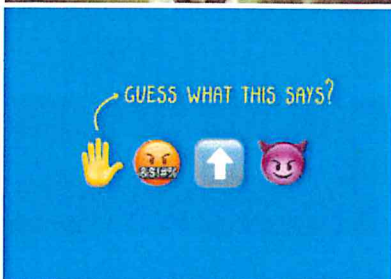


Avoid these words. Seriously.

Explore Dictionary.com

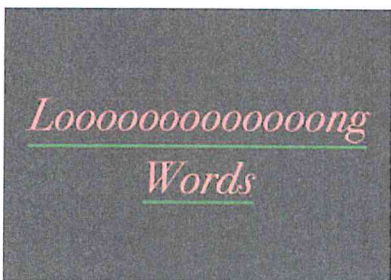


Weather Words You Need to Know



Can You Translate These Famous Phrases From

Emoji?



These Are the Longest Words in English



These Are the Saddest Phrases in English

Origin of spectrometer

First recorded in 1870–75; **spectro-** + **-meter**

Related forms **spec-tro-met-ric** [spek-tr uh-me -trik] / ,spek trə mē trik/ , adjective **spec-trom-e-try** , noun

Dictionary.com Unabridged Based on the Random House Unabridged Dictionary, © Random House, Inc. 2018

Examples from the Web for spectrometer

Historical Examples of spectrometer

- This spectrometer detects and measures gamma rays and sorts them according to their energy.

The Atomic Fingerprint

Bernard Keisch

- The spectrometer is characterized by high data rates and many events per burst.

On-Line Data-Acquisition Systems in Nuclear Physics, 1969

H. W. Fulbright et al.



Word of the Day

bewhiskered



Words We Get Wrong: How Many of These Can You Say?



Did You Know Real People Write the Dictionary?

WORDS YOU SHOULD KNOW

Petrichor

Syzygy

Wanderlust



Nearby words for spectrometer

1. spectrography
2. spectroheliogram
3. spectroheliograph
4. spectrohelioscope
5. spectrology
6. spectrometer
7. spectrometry
8. spectromicroscope
9. spectrophotoelectric
10. spectrophotometer
11. spectrophotometric analysis

British Dictionary definitions for spectrometer

spectrometer

noun

1. any instrument for producing a spectrum, esp one in which wavelength, energy, intensity, etc, can be measured See also [mass spectrometer](#)

Derived Forms *spectrometric* (,spektrəʊ'mɛtrɪk), adjective *spectrometry* , noun
Collins English Dictionary - Complete & Unabridged 2012 Digital Edition © William Collins Sons & Co. Ltd. 1979, 1986 © HarperCollins Publishers 1998, 2000, 2003, 2005, 2006, 2007, 2009, 2012

spectrometer in Medicine

spectrometer

(spɛk-trəm'ɪ-tər)

n.

1. A spectroscope equipped with scales for measuring wavelengths or indexes of refraction.

Related forms *spec'tro•met'ric* (-trə-mět' rɪk) adj.
The American Heritage® Stedman's Medical Dictionary Copyright © 2002, 2001, 1995 by Houghton Mifflin Company. Published by Houghton Mifflin Company.

spectrometer in Science

spectrometer

EXHIBIT B



SPECTRO **ARCOS**

ICP-OES ANALYZERS

When
results
matter



SPECTRO **ARCOS**

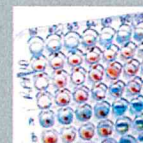
For the most demanding elemental analyses in industry and research



The new ARCOS analyzer represents a new pinnacle of productivity and performance for inductively coupled plasma optical emission spectrometers. It's a worthy successor to previous industry-leading ARCOS models — as well as the capstone to more than 30 years of SPECTRO experience in producing the world's leading ICP-OES instruments.

* SPECTRO ARCOS excels in industrial and academic applications for the most advanced elemental analysis of metals, chemicals, petrochemicals, and other materials. Its unique new MultiView plasma interface option provides truly uncompromising axial-view and radial-view plasma observation in a single instrument. Its innovative, exclusive solid-state generator offers the industry's highest power in an energy-efficient, future-proof package.

Its design ensures exceptionally low operating costs over a long, reliable service life. It packs a modern, ergonomic chassis with proven features such as no-purge UV-PLUS sealed gas purification technology, no-external-cooling OPI-Air interface, simplified sample introduction, and easy accessibility for service and maintenance. Its new software offers unequalled ease, speed, and traceability. And SPECTRO ARCOS delivers unmatched performance, without any need for added techniques or instruments.



SPECTRO **ARCOS** advantages: analysis without compromise

Revolutionary resolution and sensitivity

SPECTRO ARCOS provides exceptionally high continuous optical resolution over the widest spectral range. This enables easy separation of neighboring lines in line-rich spectra, minimizes spectral interferences, simplifies method development, and improves accuracy. In addition, via direct light paths and other advantages, the system offers the best sensitivity in its class, especially in the VUV/UV range — critical for sub-ppm analyses in metals or in material science applications.

Highest speed

With its fully simultaneous performance, the system can complete a single analysis in as little as 30 seconds. That makes it the fastest in its class. From the simplest sample to the most challenging, SPECTRO ARCOS delivers better analyses at high speed. Result: the user analyzes more samples in less time.

Lowest cost of ownership

SPECTRO ARCOS combines ultra-high performance with an intense focus on long-term cost savings. Examples: patented air-cooled technology eliminates an external chiller with its continuing energy expenses and possible early-replacement costs. And compared to conventional constant-purge designs, its sealed optical system typically saves thousands of dollars annually in gas consumption alone.

Best-in-class stability

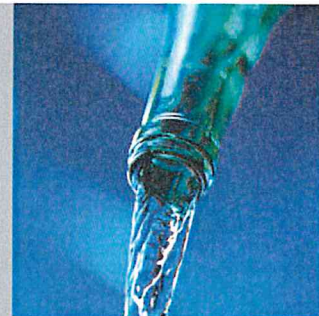
Thanks to its uniquely sealed, thermally stabilized optics and extremely robust generator, SPECTRO ARCOS demonstrates superior stability over time. The instrument avoids measurement drift, minimizing reruns and maximizing throughput in process or production control.

Unparalleled ease of use

Every aspect of the system is built for maximum operator safety and ease of use. For example, the plasma torch's bayonet coupling is self-aligning, eliminating the need for optimization after re-installation. The software is simple, intuitive, speedy, and fully traceable. Plus connection points and components allow easy front or side access for service and maintenance.

Unique flexibility

The system is designed to provide the fastest and most accurate measurement of any sample typically encountered in industrial or research analysis. MultiView gives users the flexibility to choose axial or radial plasma observation according to their desired application profile.



Innovative technologies for spectacular performance

The new SPECTRO ARCOS breaks ground with the introduction of a bold new approach to the heart of any ICP-OES instrument: its plasma viewing interface.

Truly axial, truly radial, truly radical: introducing MultiView

SPECTRO ARCOS revolutionizes spectrometer design with its optional new periscope-free MultiView mechanism. This lets an operator literally “turn” a radial-view instrument into an axial-view device, or vice-versa, in 90 seconds or less!

Consider a user utilizing a MultiView-equipped SPECTRO ARCOS in radial-view mode to analyze major concentrations, who now needs axial view to analyze sub-ppm trace elements in metal matrices. With the few simple steps shown below, the user can access dedicated plasma view performance — without compromises.



1) Simply remove radial torch and interface



2) Rotate load coil into desired horizontal orientation



3) Install axial torch and interface



4) Reconnect sample introduction system

“Dual” view: a question of compromise

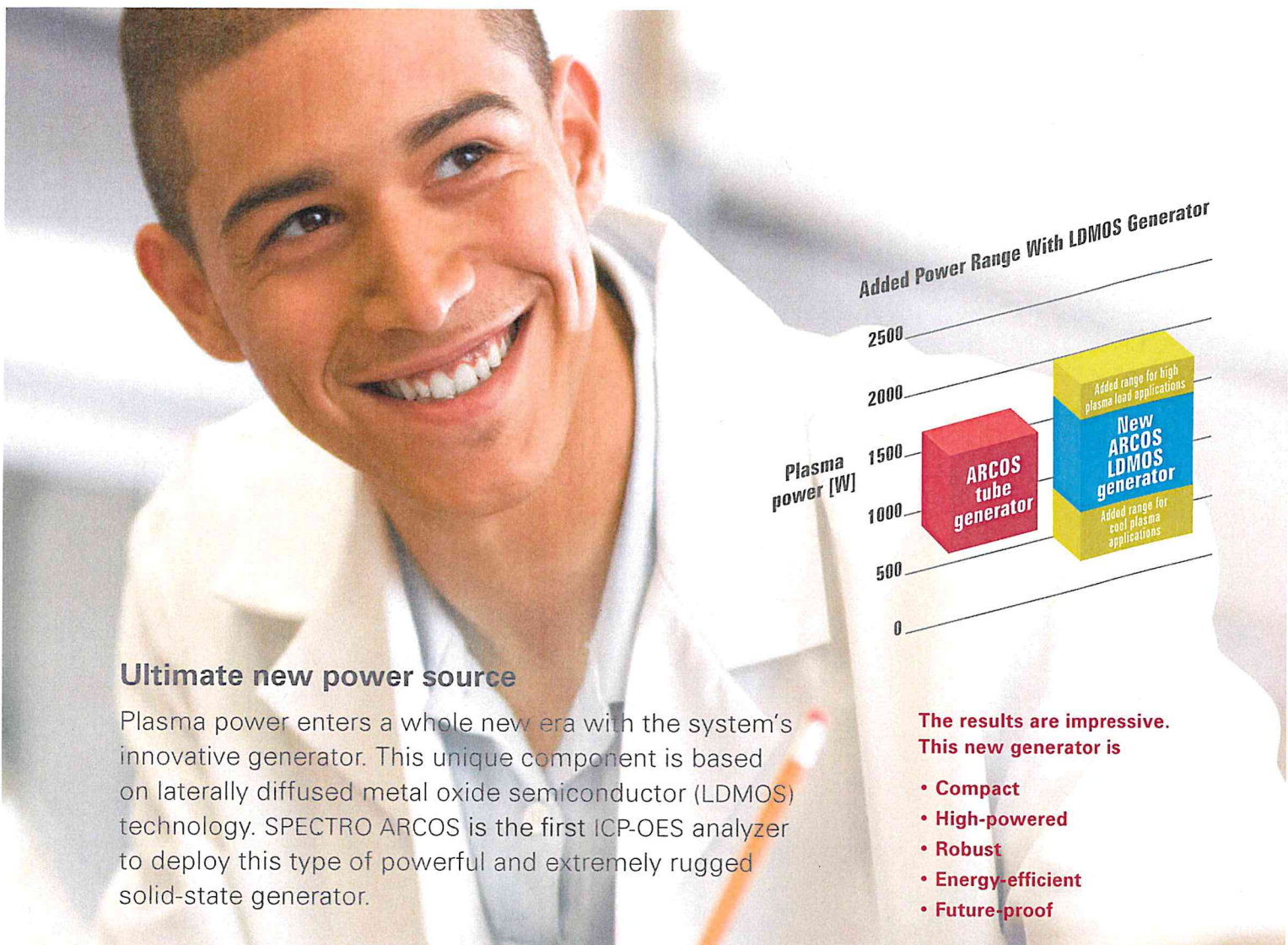
High-sensitivity axial plasma observation excels at trace analysis, whereas high-precision radial plasma observation is ideal for analyses requiring compatibility with high matrix loads, and for organic solutions. Until now, dual-view instruments have been the only choice when users require both.

Conventional dual-view designs privilege axial observation with a direct view, adding on radial-view capability via a small periscope.

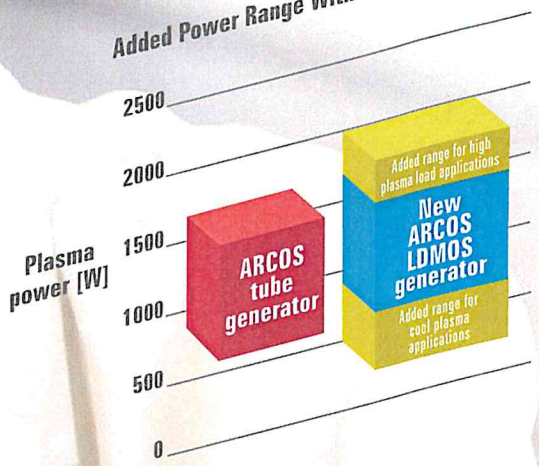
Unfortunately, this inherently compromises performance. In the radial view, light must encounter multiple mirrors, suffering up to 15% loss of light (and thus information) at every step;

plus, the periscope path cannot be effectively purged. Overall, sensitivity is affected particularly in the UV/VUV range, while stability and precision suffer in case of high matrix loads or organics.

In the end, no periscope-based design can provide the performance available with two dedicated single-view models.



Added Power Range With LDMOS Generator



Ultimate new power source

Plasma power enters a whole new era with the system's innovative generator. This unique component is based on laterally diffused metal oxide semiconductor (LDMOS) technology. SPECTRO ARCOS is the first ICP-OES analyzer to deploy this type of powerful and extremely rugged solid-state generator.

The results are impressive. This new generator is

- Compact
- High-powered
- Robust
- Energy-efficient
- Future-proof

Superior power

The generator delivers the highest plasma power available today, with a tested and proven range of 500 W to 2000 W. Combined with the system's exclusive optics, these serious power reserves enable previously impossible feats of analysis at the highest plasma loads.

For example, the SPECTRO ARCOS spectrometer can actually analyze volatile organic samples such as gasoline at room temperature!

Yet it's highly energy-efficient. Thanks to the unique SPECTRO ARCOS air-cooled design, the system operates without external cooling, thus achieving low running costs.

Unequaled agility

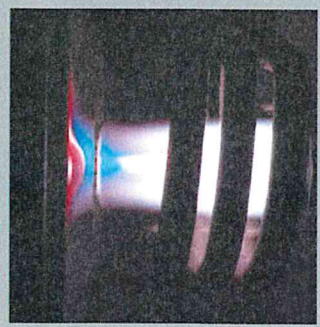
The generator exhibits high matrix compatibility. Samples can be analyzed in lower dilutions, which results in lower limits of detection.

Additional sample preparation is often not necessary, and specialized techniques such as cooled spray chambers are no longer required.

Longest lifetime

Finally, this generator is extremely robust and trouble-free. Its advanced design is completely short-circuit-proof.

In addition, with no parts subject to wear, the generator minimizes time and expense for maintenance or repair. It's designed to provide excellent uptime and the longest possible service life.



Proven solutions for superiority, simplicity, and savings

Highest-performance optical system [1]

The analyzer's innovative Optimized Rowland Circle Alignment (ORCA) optical technology utilizes few mirrors, providing a direct, high-luminance light path that minimizes light loss.

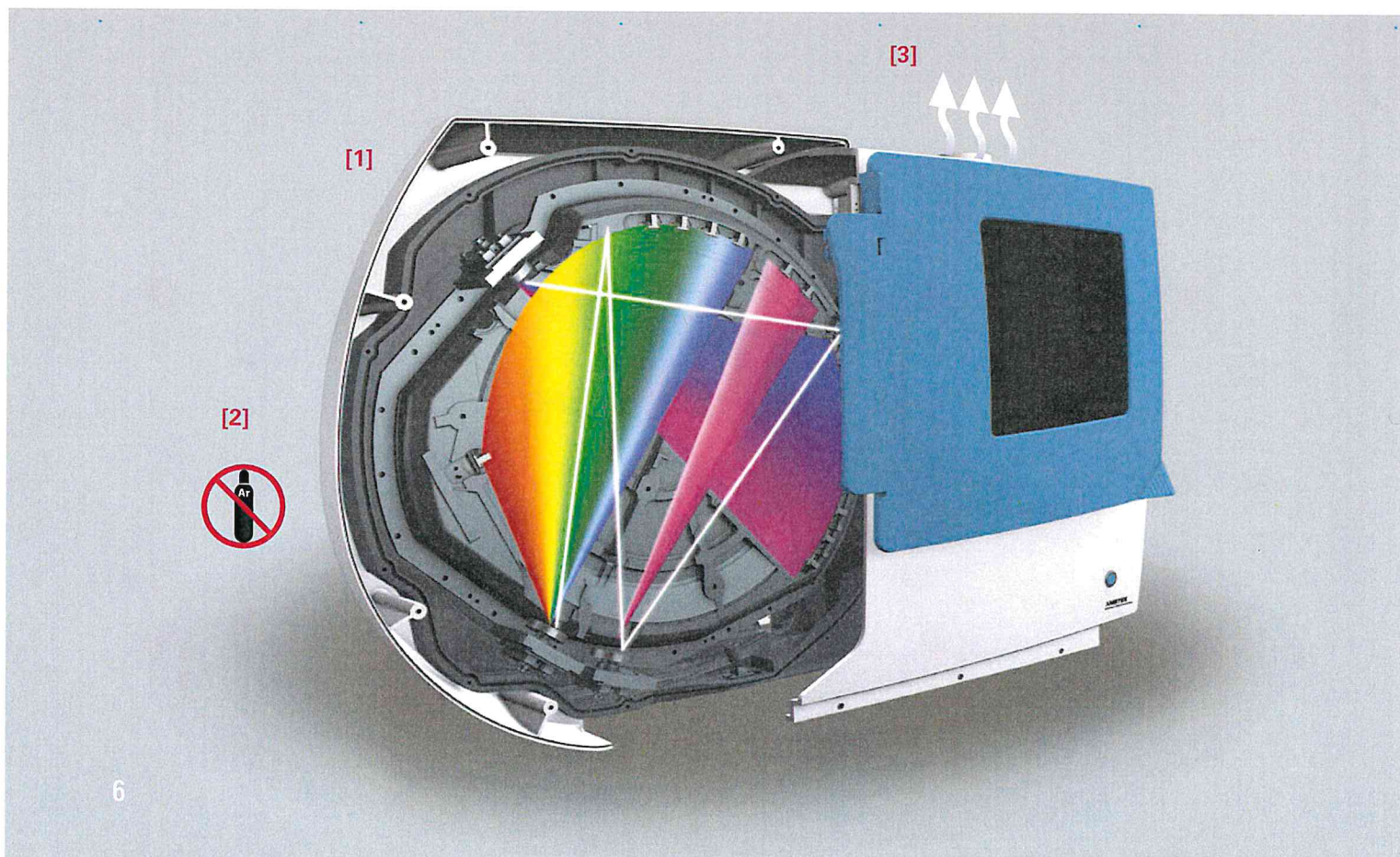
In addition, SPECTRO ARCOS delivers excellent, constant resolution over a wide spectral range. It's proven to provide the industry's best transparency in the spectral range below 180 nm. This simplifies method development, even in heavy metal matrices, and allows easier processing of line-rich spectra. Result: best-in-class measurement accuracy.

No expensive gas purging [2]

The UV-PLUS sealed optical system is permanently argon-filled, recirculating gas through a small cleaning cartridge good for at least 2 years of life. This eliminates the waste and expense (typically more than \$3000 per year) required by costly conventional designs, which must consume purge gas on a constant basis, and may also risk system contamination by purge gases. It also helps SPECTRO ARCOS achieve high stability and excellent low wavelength performance. So it provides stable analytical results immediately, without purge delays at startup.

No complicated, costly external cooling [3]

SPECTRO produces the only known completely air-cooled ICP-OES analyzer on the market. (All others are water-cooled.) Its unique, innovative OPI-AIR interface saves users from having to buy, install, power, and maintain an elaborate, expensive — and often short-lived — external cooling system.





Ergonomic benchtop design [4]

The system's modernized design fits on any standard laboratory bench, with polyurethane/aluminum construction that's resistant to chemicals and corrosion. Its layout includes thoughtful features such as ultra-short fluid paths. Users enjoy easy, safe accessibility to components from both sides and front for fast, convenient service or maintenance.

Easy, flexible sample introduction system [5]

The spectrometer's thermally insulated, illuminated compartment provides plenty of room to accommodate a large variety of sample introduction systems. Preadjusted setup makes for rapid startup, without the need for comprehensive optimization.

Easy interface / full traceability [6]

New SPECTRO ICP Analyzer Pro software, a total redesign for the latest SPECTRO ARCOS models, offers a greatly simplified, intuitive experience. Natural, streamlined workflows are backed by raw data processing speeds up to 1500X faster. Modules and plug-ins allow customization to each user's skills and needs. Inexperienced operators; labs processing huge amounts of data; challenging scope changes — this package handles them all with ease and speed.

The software's simple yet powerful audit trail functionality logs any changes, each result is stored with its method, version, calculations, user, and timestamp. Retrieval is rapid, audit trail entries were displayed in clear text. In addition, a user manager feature determines rights and restrictions for each user or auditor. Results: solid security and total traceability.

