

new products

The descriptions of the new products

listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. For more information about a particular product, visit the website at the end of the product description.

Andreas Mandelis

Focus on analytical equipment and diagnostics

Quadrupole mass spectrometers

Hidden Analytical's new quadrupole mass spectrometers for ultrahigh-vacuum and extremely high-vacuum studies were evolved from the company's 3F-series. Quadrupole mean energy scanning for systems configured to analyze externally generated ions enables measurement and optimization of ion energy distribution for analysis of neutrals. The systems feature the Windows-MASoft Pro control program with multiparameter scanning. Ion detection is by fast pulse counting with the choice of positive-ion-only or combined positive- and negative-ion detection and continuous seven-decade scaling from 1 c/s to 1×10^7 c/s. Sampling rates exceed 500 measurements per second, with partial pressure detection down to 5×10^{-15} mbar and trace level detection to 5 ppb. Ionization sources may be chosen for varied applications, including molecular beam, laser ablation, thermal desorption, and general neutrals studies. *Hidden Analytical Limited, 420 Europa Boulevard, Warrington, WA5 7UN, UK, <http://www.hiddenanalytical.com>*

Surface metrology

Veeco Instruments has announced that its new ContourGT surface metrology product family of precision, noncontact, 3D optical surface profilers delivers up to 10 $\times$ capacity and throughput improvements over other systems that provide surface measurements and analyses. Based on the company's white light interferometry technology, the ContourGT features high-brightness dual-LED illumination and vertical res-

olution. With the new Vision64 operating and analysis software platform and an intuitive, modular user interface, the ContourGT family allows for greater measurement throughput and faster access to critical measurement data. The ContourGT is a tool for production quality assurance and control, for R&D in precision machining, and for manufacturing uses, including high-brightness LEDs, solar and ophthalmic applications, semiconductors, medical devices, and academic research. *Veeco Metrology Inc, 112 Robin Hill Road, Santa Barbara, CA 93117, <http://www.veeco.com>*

Bio-inert liquid-chromatography system

Agilent Technologies has designed the 1260 Infinity bio-inert quaternary liquid chromatography system to characterize and confirm large biomolecules, especially new biological entities and therapeutic monoclonal antibodies. The system features a completely inert, metal-free sample-flow path and a stainless-steel-free solvent delivery path to protect sample integrity and minimize unspecific surface interaction and corrosion. It tolerates a very wide pH range from 1 up to 14. According to the company, the standard detector and the 600-bar power range combine to provide the lowest detection limits and highest resolution per time for any bio-inert liquid-chromatography-based bioseparation system, from low-pressure methods to small-particle, high-pressure-column technology. *Agilent Technologies Inc, Life Sciences and Chemical Analysis Group, 5301 Stevens Creek Boulevard, Santa Clara, CA 95051-7201, <http://www.chem.agilent.com>*

Power amplifier for wireless broadband network

AR Modular RF has introduced a new solid-state power amplifier module for the wireless broadband network. The model KMS2010 is a 1.75- to 1.85-GHz, 52-dBm, solid-state linear power amplifier module. With a scalable gain of 57 dB, it requires a DC supply voltage of +28 V and is designed to meet most communication protocols, including orthogonal frequency-division multiplexing and NetPlus Router requirements. The module consists of a printed wiring assembly housed in a machined aluminum enclosure. Cooling require-

ments are defined by the system's over-heat shutdown limits. The amplifier is protected from thermal overload, excess power or voltage, and wrong voltage polarity. It has an internal isolator. *AR Modular RF, 11807 North Creek Parkway South, Suite 109, Bothell, WA 98011, <http://www.ar-worldwide.com>*

Bipolar operational amplifier

Kepco's new, high-current, 1-kW bipolar-operational amplifier model BOP 6-125MG enables the user to source or sink up to 125 A of current using 4-quadrant programmable voltage and current power supplies (+voltage, -voltage, +current, and -current). The unit can perform in current mode-voltage limit and in voltage mode-current limit. It generates a current-voltage rectangular characteristic (a square wave). Up to five units may be operated in parallel for a source-sink capability of up to 625 A at 0-6 V; as many as three units can be connected in series for up to 125 A at 0-18 V. A built-in arbitrary waveform function generator allows the BOP high-power models to produce sine, triangular, positive-ramp, negative-ramp (sawtooth), and square waveforms directly, without an external signal generator. The BOP series is suitable for medical imaging and other particle accelerator applications as well as solar cell test and characterization. *Kepco Inc, 131-38 Sanford Avenue, Flushing, NY 11355, <http://www.kepcopower.com>*

Lab calibrator

Omega's new CL3001 calibrator is an accurate temperature, DC, and pressure calibrator for R&D, manufacturing, and calibration lab applications. The unit is simply designed and is described as easy to operate. Time-saving functions include the ability to save, recall, and automatically cycle through setpoints for each output range; the ability to enter user-definable resistance temperature detector curves; and a complete remote interface. The CL3001 includes an isolated measurement channel consisting of both 10- and 100-V DC voltage ranges and current range between 0 and 52 mA. The isolated measurement includes a 24-V voltage scale with accuracy of 0.005%. Using a programmable logic controller pressure module adaptor, the CL3001 will work with all Omega PCL pressure modules. *Omega Engineering Inc, One Omega Drive, Stamford, CT 06907-0047, <http://www.omega.com>*

Radionuclide search system

The Ortec Products Group of Ametek Advanced Measurement has released the first commercial mobile radionuclide search system that incorporates both high-purity germanium detectors and advanced software analysis technology for reliable, stand-off detection



of improvised nuclear or nuclear-dispersal devices. The Ortec Detective Mobile is a modular system for nuclear and radiological material detection, identification, and mapping. According to the company, it is superior to the current generation of mobile radionuclide search systems that rely on low-resolution scintillation detectors. The Detective Mobile system offers real-time radionuclide detection and identification through the use of Ortec

portable interchangeable detector modules to supply streams of data to a central computer for analysis. *Ortec Products Group, 801 South Illinois Avenue, Oak Ridge, TN 37831-0895, <http://www.ortec-online.com>*

Mass spectrometer with inductively coupled plasma

Spectro, a member of the Ametek Materials Analysis Division, has announced that its new MS model is the first fully simultaneous measuring mass spectrometer with inductively coupled plasma. Having a direct-charged detector with 4800 channels placed in the focal plane, the Spectro MS simultaneously records the entire elemental spectrum between lithium and uranium, with an average of 20 channels per isotope for every analysis. According to Spectro, users achieve an increased sample-throughput rate and much better precision and accuracy compared to using a sequential mass spectrometer. Each channel is divided into two separate detectors with different signal amplification; the configuration allows the Spectro MS to achieve a dynamic working range that allows the precise deter-

mination of even extreme isotope ratios. The new instrument's free-running 27.12-MHz plasma generator ensures extremely stable power coupling in the plasma. *Ametek Inc, 37 North Valley Road, Building 4, Paoli, PA 19301, <http://www.ametek.com>*

High-frequency lock-in amplifier

Zurich Instruments offers two new options for the HF2LI lock-in amplifier. The first, the HF2LI phase-locked loop, includes the addition of a programmable digital PLL. Suitable for fast atomic force microscopy (AFM), it has a frequency range of 1 Hz–50 MHz and a maximum bandwidth in excess of 100 kHz. Users can operate cantilevers at higher frequencies, increase scan speeds, and push detection limits. Legacy interfaces enable the HF2LI-PLL to replace lower performance PLLs in existing AFM setups. The HF2LI-MOD AM/FM modulation is the second new option. It allows for multimodal cantilever operation with direct demodulation of the measured AM and FM signals. This option is particularly useful for the precise measurement of AM and FM schemes when either the amplitude

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or the frequency is periodically changing. *Zurich Instruments AG, Technoparkstrasse 1, 8005 Zurich, Switzerland, <http://www.zhinst.com>*

Viscometer for chromatography system

Malvern Instruments has extended the applications for its Viscotek Triple Detector Array (TDA) multidetector platform for gel-permeation and size-exclusion chromatography (GPC/SEC) by including a new viscometer in the setup. The TDA maximizes the productivity of GPC/SEC analysis by simultaneously measuring absolute molecular weight, molecular size, and intrinsic viscosity. The new viscometer combines sensitivity with type 316 stainless steel transducer construction to provide chemical resistance as well as precise intrinsic viscosity and structural information for an expanded range of biomolecules and natural and synthetic polymers. There are few limitations in terms of salt content or pH on the chromatographic conditions that can be used, a significant benefit for protein analysis. The use of inert capillaries in the measuring flow path is advantageous for many biomolecule applications. *Malvern Instruments Inc, 117 Flanders Road, Westborough, MA 01581-1042, <http://www.malvern.com>*

Automated molecular diagnostic system

The BD MAX automated molecular diagnostic system and the BD MAX GBS assay are the first in a planned menu of infectious disease assays from BD Diagnostics. Designed for maximum lab efficiency and flexibility, the BD MAX system offers on-demand and batch testing to accommodate varying workloads. The open-architecture system enables users to develop their own fully automated assays. Since it does not require specialized training in molecular science or lab facilities, it can be operated by a lab technician. Concurrently processing different assays for up to 24 patient samples, it can produce results within 2.5 hours and provide on-demand processing of up to four samples in under 90 minutes. With its hands-off operation, the system allows technicians to perform other tasks during a run. *BD Diagnostic Systems, 7 Loveton Circle, Sparks, MD 21152, <http://www.bd.com>*

Optical strain gages

HBM has developed optical strain gages (SGs), which are said to offer several advantages compared to electrical ones. For example, they are suited to material tests of new fiber composites. Tests with up to 10 million load cycles with an alternating strain of $\pm 5000 \mu\text{m/m}$ are possible. The optical SGs are based on fiber Bragg gratings under the name K-OP type. Because the purely optical strain measurement does not require an electric signal, the gage can be used in explosive atmospheres, electromagnetic interferences, and high voltage applications. In addition, several optical SGs can be attached to a fiber for parallel measurements. Glass fiber lengths of several hundred meters can be tested. With the optical SGs the user receives a data sheet that includes the gage factor of each individual SG. *HBM Inc, 19 Bartlett Street, Marlborough, MA 01752, <http://www.hbm.com>*

Pulse traveling-wave tube amplifier

Applied Systems Engineering's new amplifier model 176L features 1.0–2.5 GHz, 2.0 kW, 6% duty cycle with 0.07–100 ms pulse width. High-efficiency, resonance-tuned, DC–DC converter power supplies have very fast loop response times so that output level variations are minimal, resulting in low-phase noise. The cathode, collector, and heater supplies are duty-cycle-regulated designs. The cathode and collector power supplies have very low ripple that produces spurious output signals $< -50 \text{ dBc}$. The four-line vacuum fluorescent display shows multiple pages of amplifier data. The front panel PC card cage contains plug-in PC boards with test points and controls. The modular design provides convenient access to all elements in the traveling-wave-tube amplifier. There is no exposed high voltage. Many modules are interchangeable between model 176 amplifiers, regardless of frequency. *Applied Systems Engi-*



neering Inc, 7510 Benbrook Parkway, Fort Worth, TX 76126, <http://www.applsys.com>

Raman hybrid analyzer

Kaiser's new RXN2 analyzer has the fluorescence rejection of an FT-Raman spectrometer with the ease of fiber-optic interfacing of a dispersive Raman analyzer. Using 1000-nm excitation is a compromise between fluorescence rejection and detection sensitivity. For non-Raman spectroscopists, the observation of any level of fluorescence background can lead to a desire to move to a different excitation wavelength. However, it is often possible to remove the background during a data analysis step and thus permit a residual spectrum of high enough signal-to-noise ratio for quantitative analysis. The most universal wavelength for petrochemical and pharmaceutical Raman applications is 785-nm excitation, but early stage "dirty" crystallization, biofuels, polyurethanes, heavy hydrocarbons, and some colorants and pigments exhibit fluorescence too intense for the application to be addressed with excitation at that level. For those applications the Raman RXN2 analyzer is an effective tool for in situ monitoring. *Kaiser Optical Systems Inc, 371 Parkland Plaza, Ann Arbor, MI 48103, <http://www.kosi.com>*

Benchtop sulfur micro-analyzer

Rigaku's new Micro-Z sulfur analyzer for low-level sulfur analysis is a self-contained, benchtop, wavelength-dispersive, x-ray fluorescence instrument. Coupled with the company's Petro-Pak application package, the Micro-Z performs sulfur dissolution analysis in petrochemicals. Its design includes peak and background measurement capabilities, which allow it to meet ASTM 2622-08 specifications. The company claims that the instrument is robust, delivers accurate and precise measurements, and exhibits good long-term reproducibility. Its built-in analysis protocol makes validation and quality control of the results seamless for QA personnel. When loaded with the Petro Pak, the analyzer covers sulfur concentrations from 0% to 5% mass in three ranges. It can measure sulfur in ultralow- and high-sulfur diesel, all classes of gasoline, jet fuel, residual fuel oil, bitumen, asphalt, and pet coke. *Rigaku Americas Corporation, 9009 New Trails Drive, The Woodlands, TX 77381-5209, <http://www.rigaku.com>* ■