CHROMATOGRAPHY:
WHAT’S NEW?

Frank Millard introduces the latest developments from the fast-moving chromatography sector

Chromatography products and services progress steadily according to need and available technology, neither of which stand still. A number of new products and services have recently joined the market.

Agilent Technologies has introduced a micro gas chromatograph. The new 990 Micro GC system is designed to monitor the safe distribution, calorific valuation and odorant level in natural gas to deliver lab-quality data whenever and wherever it is needed. The 990 Micro GC combines microfabrication and smart-connected digital technologies in a modular platform. The system’s plug-and-play architecture and smart-connected user assist functions make the product easy to install, use and troubleshoot, reducing the cost of ownership and improving productivity.

In June, the company introduced the newest member of its LC/MS portfolio at the American Society for Mass Spectrometry Conference (ASMS) in Atlanta, Georgia. The new InfinityLab LC/MSD iQ system incorporates ‘designed-in’ smart features, software, and hardware developed specifically for chemists and chromatographers.

The InfinityLab LC/MSD iQ features intelligent instrument health monitoring. Embedded sensors gather and display data, allowing a quick assessment of the system’s readiness, status and configuration. The instrument incorporates features such as a system suitability check that uses a test mixture designed to permit an overall assessment of the whole liquid chromatography-mass spectrometry (LC/MS) system before the collection of data. An early maintenance feedback feature enables lab managers to plan routine maintenance on the lab’s schedule resulting in a focus on overall productivity.
Earlier this year Agilent also announced two new gas chromatography systems that incorporate innovative and intelligent ‘self-aware’ predictive technology, expanding its suite of smart-connected GC instruments. The Agilent 8890 and 8860 GC systems extend the company's portfolio of robust analytical systems that incorporate innovative technology, expanding its suite of smart-connected GC instruments. The Agilent technology, expanding its suite of smart-connected GC instruments.

**HYDROGEN GAS SOLUTION**

Peak Scientific has introduced its latest hydrogen gas solution: Precision Hydrogen SL, its smallest and easiest to use hydrogen generator for GC-FID. Precision SL was launched in September. Designed to supply hydrogen to flame detectors for gas chromatography, it is extremely compact, with a total footprint measuring less than 20% of the size of the existing Precision models. Available in both 100cc and 200cc and in black and white. Precision Hydrogen SL produces hydrogen gas at 99.9995% purity. On June 3 the company unveiled its latest innovation at the 67th Annual ASMS Conference in Atlanta with the launch of the all-new MS Bench system. Developed exclusively for Sciex, Peak’s MS Bench SCI product line provides a modular workstation with integrated gas generation and a sound-dampening vacuum pump enclosure. MS Bench SCI is designed specifically for use with the current and latest mass spectrometers at Sciex (excluding IVD medical device instruments).

**PROBLEM-SOLVING PRODUCTS**

One problem Porvair Sciences addressed recently is solid phase extraction: it is releasing a new technology directed at the removal of phospholipids from samples prior to LCMS. This is being launched as Porvair Sciences Microlute PLR. The company has developed a method of producing a composite material that incorporates the frit from a traditional SPE system with the active chromatographic media to create a single plug. Therefore, the traditional SPE system of frit-media-frit is replaced with a single plug that contains the active media. While the media provides the same retention characteristics as the loose material, the composite method imparts a number of key benefits to the clear up of phospholipids.

Innovations from the company SRI included the H2-100 Hydrogen Generator. Many of the GCs the company ships now do not require any gas at all to operate because they are equipped with built-in hydrogen generators and air compressor. It makes GC quality hydrogen from distilled water and is perfect for labs that would prefer not to (or can’t) include hydrogen cylinders. In June SRI decided to discontinue the Model 420 GC. It will continue to provide support for its customers that use it. The company made the decision due to the development of the Model 310MM GC, which it has decided to be a much more viable choice for measuring cannabis for GC, which it has decided to be a much more viable choice for measuring cannabis.

**All-New GC**

In June Shimadzu released the Nexgen GC multidimensional gas chromatograph, which achieves miniaturisation and high-speed analysis with “plate column” technology and multi-deans switch. It is a next generation GC, making it easy to use multidimensional analysis suitable for complex components by installing two gas chromatographs in a small body. The Nexgen GC has an installation area of about 30% less compared with conventional models, and cuts analysis time by half. Furthermore, it improves analytical productivity through high speed and space saving.

Shimadzu also announced the release of the Nexera Ultra High-Performance Liquid Chromatograph series, incorporating artificial intelligence as Analytical Intelligence, allowing systems to detect and resolve issues automatically. The Nexera series makes lab management simple by integrating IoT and device networking, enabling users to easily review instrument status, optimise resource allocation, and achieve higher throughput.

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purge, equilibration, baseline checks and system suitability in advance, and be ready for analysis before they arrive at the lab. In addition, FlowPilot ramps up the flow rate gradually, reducing the possibility of damage to columns. The Nexera also has auto-diagnostics and auto-recovery capabilities that allow it to monitor pressure fluctuations to check for anomalies.

**OPTIMISING SYSTEMS**

Testa Analytical Solutions has now started offering optimised versions of its Differential Refractive Index (DRI) Detector under OEM contract to enhance the performance of both HPLC and GPC/SEC systems.

The company’s compact DRI Detector and DRI Detector Kits offer a wide range of options in terms of light source, electronics and firmware solutions. This means they can be readily adapted to fit the requirements of any third-party HPLC or GPC/SEC system. Operating from room temperature up to 80°C with high thermal stability, the DRI detector also offers excellent baseline stability and fast setting.

A new validated ion chromatography tandem mass spectrometry (IC-MS/MS) analytical workflow was launched by Thermo Scientific in November, designed to enable food testing laboratories to overcome the challenges associated with liquid chromatography tandem mass spectrometry (LC-MS/MS) analysis of polar anionic pesticides in complex sample matrices.

The Anionic Pesticides Explorer is a high-throughput, sample-to-result, IC-MS/MS-based analytical workflow, comprised of the Dionex Integrion High Performance Ion Chromatography system coupled with the TSQ Altis Triple Quadrupole MS, for the multi-residue detection, identification and quantification of anionic pesticides at low concentrations in complex food matrices.

Announced in March, Thermo Scientific’s Dioxin Analyser offers cost-effective determination of harmful contaminants as required by European regulation. A new workflow addresses the high cost and complexity faced by scientists testing food and animal feeds for low levels of dioxins and ‘dioxin-like’ polychlorinated biphenyls (dl-PCBs).

The analyser includes the Thermo Scientific Triple Quadrupole TSQ 9000 GC-MS/MS system equipped with an advanced ionisation source (AEI) designed for enhanced sensitivity, and a range of productivity tools to deliver reliable and cost-effective routine analyses.

Finally, Waters launched its Acquity Arc Bio System in 2018, which is described as a versatile, iron-free, bio-inert, quaternary liquid chromatograph specifically engineered to enable the efficient transfer and improvement of bioseparation analytical methods regardless of the LC platform on which the original method was developed.

The original system was launched in 2015. The company says that the Arc platform can create robust and reliable methods that can be transferred easily from lab-to-lab and from one LC instrument platform to another without compromising method integrity.