

Separation Times



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Agilent triple-quadrupole solution shines for emerging pollutants in water

By Phil Stremple

Agilent Environmental Industry Manager

The topic of pharmaceuticals in drinking water recently gained increased visibility when an Associated Press survey revealed that an assortment of drugs, including antidepressants, antibiotics, and birth control prescriptions, was detected in the municipal drinking water of 24 major metropolitan areas serving 41 million Americans. Agilent instrumentation has been at the forefront of this growing concern, and scientists recently demonstrated the excellent performance of the Agilent [6410 Triple Quadrupole LC/MS](#) for the analysis of pharmaceuticals in water.

Agilent solution meets requirements of EPA method

Pharmaceuticals and personal care products (PPCPs) are “emerging contaminants” that are unregulated but constitute a very active area of research for regulatory agencies, academic researchers, and larger water suppliers around the world. EPA Method 1694 is one of several methods that address PPCPs. This liquid chromatography/tandem mass spectrometry (LC/MS/MS) method encompasses more than 70 compounds in four groups.

Scientists have demonstrated that the Agilent [1200 Series LC system](#) and the Agilent [6410 Triple Quadrupole LC/MS](#) form an ideal solution for EPA Method 1694. When coupled with the appropriate Agilent ZORBAX columns (ZORBAX Eclipse Plus C18 for groups 1, 2, and 3 and ZORBAX Rx-SIL for group 4), separations that meet the method requirements are readily obtained, and the excellent sensitivity of the 6410 Triple Quad in multiple reaction monitoring (MRM) mode provides outstanding results. **Figure 1** shows a typical MRM chromatogram of group 1 compounds.

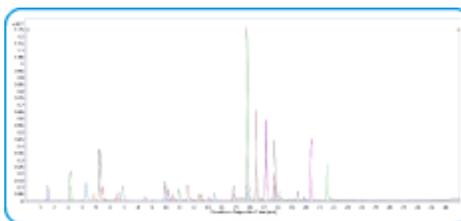


Figure 1. Extracted MRM chromatograms for the group 1 compounds with one transition per compound, as per EPA Method 1694. ([Click here](#) to see this image larger.)

The Agilent [MassHunter Workstation software](#) facilitates the method setup and data analysis. For quantitative analysis, the software provides a curve-fit assistant, automatic flagging of outliers, and other tools to speed analysis, calibration, and reporting. **Figure 2** shows the calibration curve for acetaminophen.

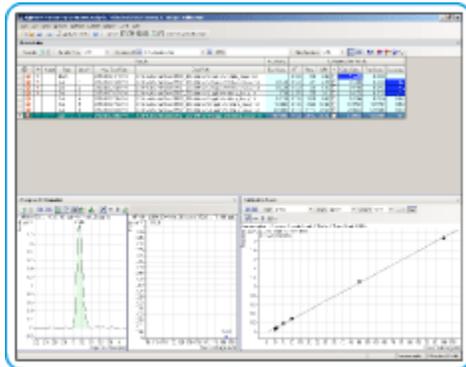


Figure 2. The calibration curve for acetaminophen in a wastewater matrix shows excellent linearity. ([Click here](#) to see this image larger.)

For researchers whose primary goal is to identify unknown or new emerging contaminant compounds, Agilent also has [LC/Time-of-Flight \(TOF\)](#) and [LC/Quadrupole-TOF \(Q-TOF\)](#) solutions with proven performance features in PPCP testing.

40-year history of commitment to environmental applications

Agilent has a long history of providing solutions to the [environmental industry](#). Our portfolio of solutions includes gas chromatography/mass spectrometry (GC/MS), LC/MS, and inductively coupled plasma ICP/MS. Together, they address a vast range of current problems from volatiles and semivolatiles to pesticides and metals in the environment.

These solutions are based on our close collaboration with regulatory agencies and researchers, as they seek to address the serious emerging threats to our health and environment. We provided products that contributed to the initial work in the area of pharmaceuticals, hormones, and other contaminants in water resources [[1](#)]. The Agilent [Environmental Compendium](#) [[2](#)] is evidence of our continued commitment to the environmental field, containing more than 100 Application Notes with solutions for water, soil and sediment, air, and material analysis.

For more information, review "[Agilent's 6410 LC/MS/MS Solution for EPA Method 1694: Pharmaceuticals and Personal Care Products in Water, Soil, Sediment, and Biosolids by HPLC/MS/MS](#)". If you are interested in use of the Agilent 6510 Q-TOF for analysis of PPCPs in water, download application note [5989-7339EN](#).

References

1. D.W. Kolpin, E.T. Furlong, M.T. Meyer, E.M. Thurman, S.D. Zaugg, L.B. Barber, and H.T. Buxton, *Environ. Sci. Technol.* **2002**, 36(6), 1202-1211.
2. *Solutions that meet your demands for speed, accuracy, productivity – Excellent choices for environmental applications*, Agilent [Environmental Compendium](#), **2008**.