

# Trace Metals in Water Samples Using the Agilent 5000 Series ICP-OES Systems

## Consumable workflow ordering guide for EPA 200.7 methods

Water quality has a direct impact on the health of all ecosystems, therefore environmental monitoring of water is often subject to strict legislation. ICP-OES is a well-established technique that is used as a workhorse in many environmental labs including those labs where US Environmental Protection Agency (EPA) methods are run, especially the 200.7 method—Determination of Metals and Trace Elements in Water, Solids and Biosolids by ICP-AES<sup>(1)</sup>. With many hundreds of samples per day to process, many environmental laboratories are constantly looking to improve productivity and reduce operating costs, while maintaining instrument robustness, ease-of-use and analytical performance.

### Agilent 5000 Series Synchronous Vertical Dual View (SVDV) ICP-OES improves sample throughput

The current 5900 SVDV ICP-OES captures both axial and radial views in a single reading. This capability leads to faster analysis times and up to 50% less argon consumption for EPA 200.7 compliant analysis compared with conventional Dual View (DV) instruments. This high speed analysis meets the demands of typical environmental testing laboratories who may be processing large numbers of samples and wanting reduced operating costs.

The EPA 200.7 method requires internal standard correction (10 mg/L of yttrium and lutetium) be used to correct for matrix effects. The MDLs measured using the Agilent 5900 ICP-OES during fast analysis of water samples according to method 200.7 are shown in Table 1<sup>(2)</sup>.

**Table 1.** MDLs per EPA method 200.7, n=6 (three runs on two instruments). Units: µg/L.

Element	MDL	Element	MDL	Element	MDL	Element	MDL
Ag 328.068	0.3	Co 228.615	0.5	Na 589.592	8.2	Sr 421.552	0.02
Al 396.152	0.9	Cr 205.560	0.2	Ni 231.604	0.4	Ti 334.941	0.1
As 188.980	2.1	Cu 324.754	0.5	P 213.618	3.1	Tl 190.794	2.1
B 249.772	0.3	Fe 259.940	0.2	Pb 220.353	1.5	V 292.401	0.4
Ba 493.408	0.1	K 766.491	41.9	S 180.669	6.4	Zn 213.857	0.2
Be 313.042	0.03	Li 670.783	0.3	Sb 217.582	2.7	Zr 343.823	0.2
Ca 315.887	0.7	Mg 279.078	2.0	Se 196.026	3.4		
Cd 226.502	0.09	Mn 257.610	0.06	Si 250.690	1.0		
Ce 418.659	2.3	Mo 202.032	0.3	Sn 189.925	0.8		

All elements in each sample were determined in only 57 seconds, reducing argon use per sample and maximizing revenue.



## Easy selection and ordering information

This guide recommends the typical Agilent supplies required by labs completing this analysis, so you can find what you're looking for quickly. Click the MyList\* links in the header below to add items to your "Favorite Products" list at the Agilent online store. Then, enter the quantities for the products you need. Your list will remain under "Favorite Products" for your use with future orders.

MyList of EPA 200.7 Standards	
5190-9418	Quality Control Standard, QCstd-27, 100 mL
5190-8599	ICS interference A for EPA 200.7, 5 mg/mL, 500 mL
5190-9408	ICV/CCV quality control standard
5190-8555	Yttrium (Y) – internal standard, 1000 µg/mL, 100 mL
5190-8517	Scandium (Sc) – Internal standard, 1000 µg/mL, 100 mL
5190-8479	Lutetium (Lu) – Internal standard, 1000 µg/mL, 100 mL
5190-8477	Lithium (Li) – Single element standard 1000 µg/mL, 100 mL
MyList of Filtration Supplies	
5190-5268	Captiva Econofilter, polypropylene housing, polytetrafluoroethylene (PTFE) membrane, 25 mm diameter, 0.45 µm pore size, 1000/pk
5190-5103	Captiva Disposable Syringe, 20 mL, Polypropylene, 100/pk
MyList of 5000 Series ICP-OES Supplies for EPA 200.7	
9910124100	ICP internal standard kit, no 2. orange/white tubing
3710034400	Sample peristaltic pump tubing white/white, 12/pk
3710034600	Drain peristaltic pump tubing blue/blue, 12/pk
G8010-60256	Double-pass glass cyclonic spray chamber
G8010-60255	Seaspray concentric glass nebulizer for 5000 series ICP-OES
G8010-60236	Easy-fit dual-view semi-demountable torch with 1.8 mm id injector
00000001600L	16.5 mL polypropylene sample test tubes, 17 mm o.d. 1000/case
190065200	50 mL polypropylene centrifuge sample tubes, 29 mm o.d., 500/pk

*\* First time using "MyList"? You will be asked to enter your email address for account verification. If you have an existing Agilent account, you will be able to log in. If you don't have a registered Agilent account, you will need to [register for one](#). This feature is valid only in countries that are e-commerce enabled. All items can also be ordered through your regular sales and distributor channels.*

### References:

1. Ultra-fast ICP-OES determination of trace elements in water, as per US EPA 200.7 Agilent publication [5991-4821EN](#)
2. The Fastest and Smartest Way to Analyze Water Samples by ICP-OES using the Agilent 5900 SVDV ICP-OES for quick and reliable US EPA method 200.7 compliant analysis Agilent publication [5994-1520EN](#)

[www.agilent.com](http://www.agilent.com)

DE44349.0187384259

This information is subject to change without notice.

© Agilent Technologies, Inc. 2021  
Printed in the USA, June 17, 2021  
5994-3626EN