ZA3000

Analysis of Cr in River Water (Electrothermal Method)

INTRODUCTION: Chromium is rarely found in natural water. However, as hexavalent chromium is highly toxic, the environmental standard for the chromium is specified (NMT 0.05 mg/L). By using the twin injection function, newly installed to ZA3000 series instruments, total chromium in river water was analyzed. There are two sample injection ports on the twin cuvette (Pyro D HR) and a large volume can be injected while the drying time for the analysis can be set at the same as that for a conventional cuvette (Pyro C HR). The data shown below indicates that chromium in river water at a ng/L level can be detected without concentration.

INSTRUMENT CONDITIONS

Element	:	Cr
Instrument	:	ZA3000
Atomization	:	GA
Wavelength	:	359.3 nm
Lamp Current	:	7.5 mA
Slit Width	:	1.3 nm
Cuvette	:	Pyro D HR

MEASUREMENT PARAMETERS

Meas. Mode	:	Working Curve
Signal Mode	:	BKG Corrected
Curve Order	:	Linear
Calculation	:	Peak Height
Time Constant	:	0.1 sec
Temp. Control	:	ON

GA AUTOSAMPLER

Sample Volume : 60 μL
Addition : Speed : 4

MATRIX MODIFIER

Matrix Modifier
: 100 mg/L Pd+Mg

Volume : 20 μL Order : After

TEMPERATURE PROGRAM

Stage	Initial/Final Temperature (°C)	Heating/Keeping (sec)	Gas Flow Rate (mL/min)	Gas
1 Drying	80 / 140	40 / 0	200	Normal
2 Incineration	700 / 700	20 / 0	200	Normal
3 Atomization	2600 / 2600	0 / 3	0	Normal
4 Cleaning	2800 / 2800	0 / 4	200	Normal

NOTE

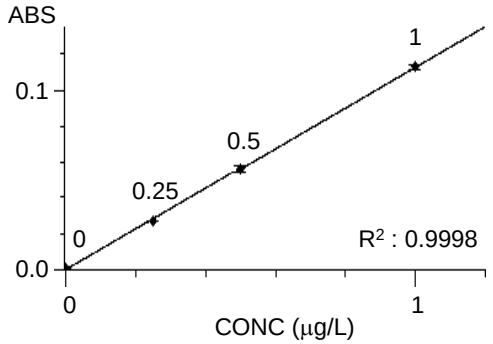
Pyro D HR, a cuvette specially designed for twin injection, was used for the measurement.

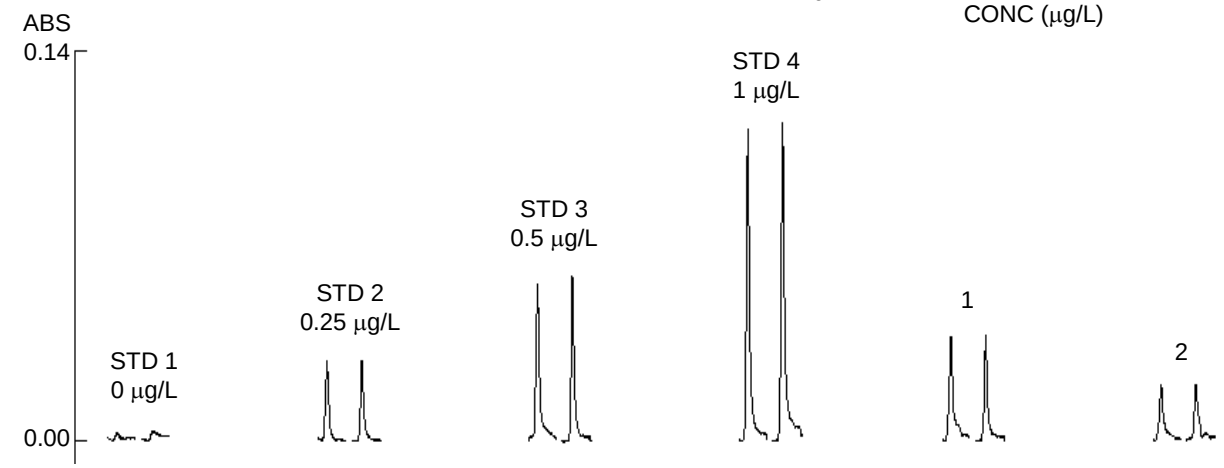
Sample 1: SLRS-4 River Water Reference Material for Trace Metals

Sample 2: River water certified reference material (without addition) JSAC 0301-3

	CONC (μg/L)	Mean ABS	SD	RSD	REF
STD 1	0.000	0.0012	0.0003	25.00 %	0.0280
STD 2	0.250	0.0269	0.0001	0.37 %	0.0315
STD 3	0.500	0.0563	0.0021	3.73 %	0.0335
STD 4	1.000	0.1129	0.0014	1.24 %	0.0215
1	0.327	0.0369	0.0002	0.54 %	0.0138
2	0.167	0.0189	0.0004	2.12 %	0.0443

Certified value of SLRS-4 0.33±0.02 μg/L
Certified value of JSAC 0301-3 0.16±0.01 μg/L





KEY WORDS

Environmental Analysis Related, Environmental Water, Clean Water, Environmental Chemistry, River Water, Chromium, Cr, Flameless, Graphite Furnace, AA, ZA3000, GA, Pyro D HR, Environment

Atomic Absorption Photometer (AA)

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