ZA3000

Analysis of Ni in River Water (Electrothermal Method)

INTRODUCTION: By using the twin injection function, newly installed in the ZA3000 series instruments, nickel in river water was analyzed. By using the specially designed twin cuvette (Pyro D HR), a sample is injected into two different injection ports and thus, a large volume injection is possible. For the measurement, the drying time can be set at the same as that for a conventional cuvette (Pyro C HR). By a conventional instrument, it has been difficult to detect nickel at a level less than 1 μg/L. However, with the twin injection function, the detection without concentration is possible. The analysis result of SLRS-4, a river water certified reference material, was within the range of the certified value, indicating that the accurate analysis is possible.

INSTRUMENT CONDITIONS

Element	: Ni
Instrument	: ZA3000
Atomization	: GA
Wavelength	: 232.0 nm
Lamp Current	: 10.0 mA
Slit Width	: 0.2 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	1000 / 1000	20 / 0	200	Normal
3 Atomization	2700 / 2700	0 / 3	0	Normal
4 Cleaning	2800 / 2800	0 / 4	200	Normal

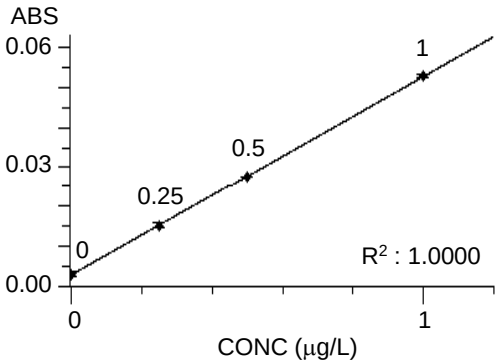
NOTE

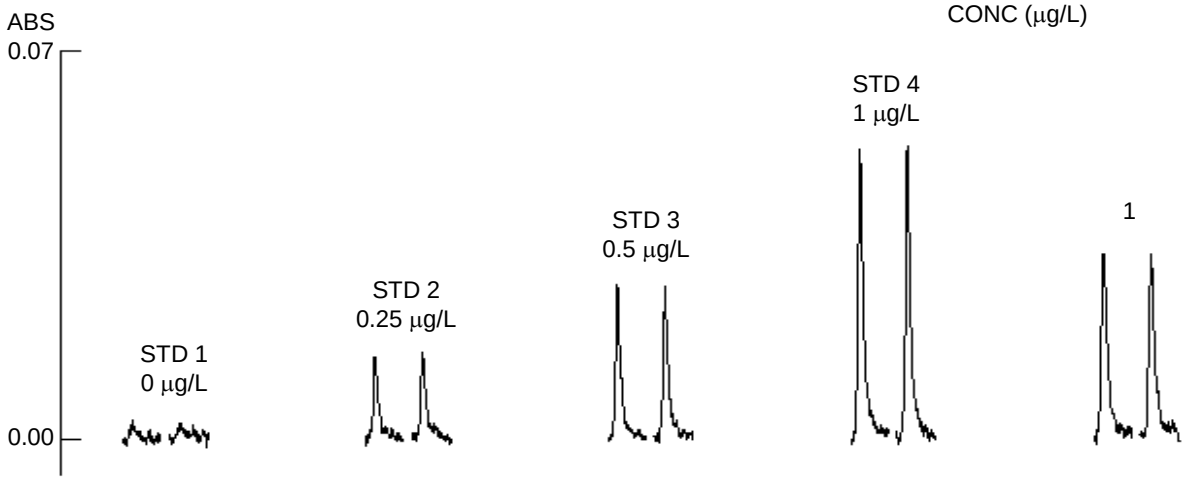
Pyro D HR, a cuvette specially designed for twin injection was used for the measurement.

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

	CONC (μg/L)	Mean ABS	SD	RSD	REF
STD 1	0.000	0.0031	0.0005	16.13 %	0.0472
STD 2	0.250	0.0152	0.0006	3.95 %	0.0446
STD 3	0.500	0.0277	0.0000	0.00 %	0.0431
STD 4	1.000	0.0528	0.0005	0.95 %	0.0415
1	0.613	0.0335	0.0001	0.30 %	0.0422

Certified value SLRS-4 0.67 ± 0.08 μg/L





KEY WORDS

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

Atomic Absorption Photometer (AA)

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