SHIMADZU

Application News

Inductively Coupled Plasma Atomic Emission Spectrometry

Analysis of Plants – 1

■ Description

The multi-type ICPE-9000 ICP emission spectrometer was used to perform quantitative analysis of brown rice. Table 1 shows the quantitation results. The results obtained for many elements matched the certified values, including that for the trace element cadmium. Fig. 1 and 2 show the spectral profile and the calibration curve of cadmium, respectively.

■ Sample

Powdered brown rice standard

NIES No.10-a, -b, -c

■ Pretreatment

Add nitric acid to 0.4 g of sample, and digest the sample using a high-pressure microwave digester. After letting the sample cool, adjust the volume to 20 mL, and use this as the analytical sample.

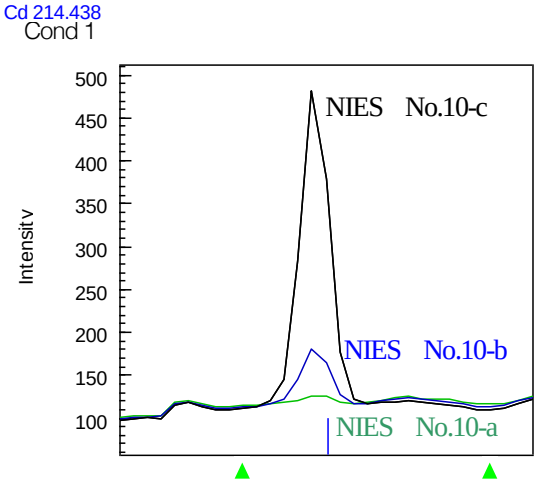
■ Analytical Conditions

Instrument	**:**	**ICPE-9000**
Radio Frequency Power	:	1.2 (kW)
Plasma Gas	:	10 (L/min)
Auxiliary Gas	:	0.6 (L/min)
Carrier Gas	:	0.8 (L/min)
Sample Introduction	:	Coaxial Nebulizer
Sample Aspiration	:	1.0 (mL/min)
Misting Chamber	:	Cyclone Chamber
Attached Instruments	:	Mini Torch
View Direction	:	Axial/Radial

Table 1: Quantitation Results of Brown Rice Standard (μg/g)

Element	NIES No.10-a		NIES No.10-b		NIES No.10-c	
	Quantitation Value	Certified Value	Quantitation Value	Certified Value	Quantitation Value	Certified Value
Al	2.9	(3)	2.0	(2)	1.8	(1.5)
Ca	95	93±3	77	78±3	94	95±2
Cd	0.02	0.023±0.003	0.30	0.32±0.02	1.80	1.82±0.06
Cu	3.4	3.5±0.3	3.2	3.3±0.2	4.2	4.1±0.3
Cr	0.07	(0.07)	0.19	(0.22)	0.09	(0.08)
Fe	12.1	12.7±0.7	12.6	13.4±0.9	10.7	11.4±0.8
K	2770	2800±80	2550	2450±100	2760	2750±100
Mn	33.4	34.7±1.8	30.5	31.5±1.6	38.5	40.1±2.0
Mo	0.34	0.35±0.05	0.44	0.42±0.05	1.55	1.6±0.1
P	3440	3400±70	3130	3150±60	3330	3350±80
Zn	24.6	25.2±0.8	22.8	22.3±0.9	22.6	23.1±0.8

*Values in parentheses are reference values



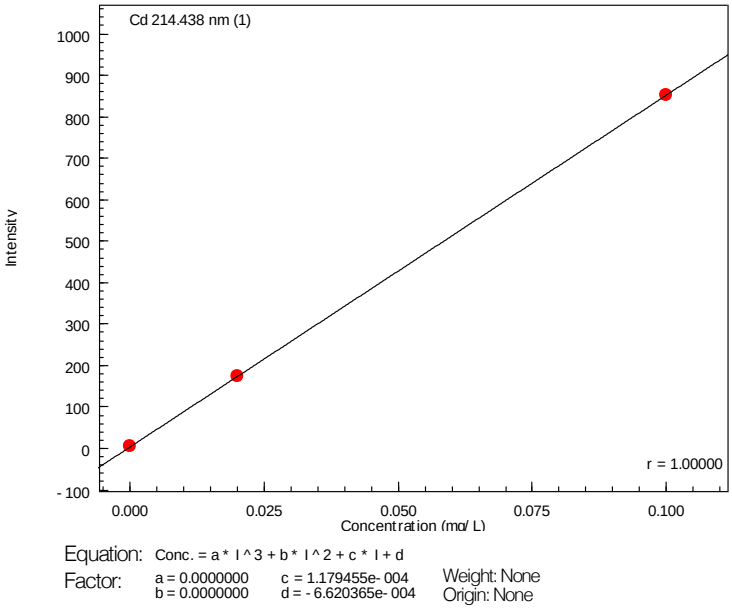


Figure 2: Calibration Curve

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