SHIMADZU

Application News

Inductively Coupled Plasma Atomic Emission Spectrometry

Analysis of Aquatic Vegetation

■ Description

The ICPE-9000 was used to perform quantitative analysis of aquatic vegetation (chlorella, sargassum). Table 1 shows the quantitation results, and Fig. 1 and 2 show the spectral profiles. Nearly all of the elements agree with the certified values in the obtained results.

■ Sample

Powdered chlorella standard NIES No.3
Powdered sargassum standard NIES No. 9

■ Pretreatment

Perform heat-digestion after adding nitric acid, hydrochloric acid and a small amount of hydrofluoric acid to 1 g of each of the samples. After letting the sample cool, adjust the volume to 25 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 Aquatic Vegetation (μg/g)

Sample	Chlorella		Sargassum	
Element	Quantitation Value	Certified Value	Quantitation Value	Certified Value
Al	129		210	(215)
As	1		121	128
Ba	14.0		19.7	
Ca	4740	4900±300	12900	13400±500
Cd	0.02		0.16	0.15
Cr	0.97		0.18	(0.2)
Cu	3.2	3.5±0.3	4.7	4.9±0.2
Fe	1855	1850±100	182	187±6
K	12200	12400±600	59500	60900±2000
Mg	3210	3300±200	6320	6500±300
Mn	65.5	69±5	20.5	21.2±1.0
Ni	0.85		1.15	
P	17700	(17000)	2540	(2600)
Pb	0.5	(0.6)	1.2	1.35±0.05
Sr	39.5	40	0.109	0.101
V	0.75		1.11	1
Zn	19.5	20.5±1.0	16.0	15.6±1.2

*Values in parentheses are reference values

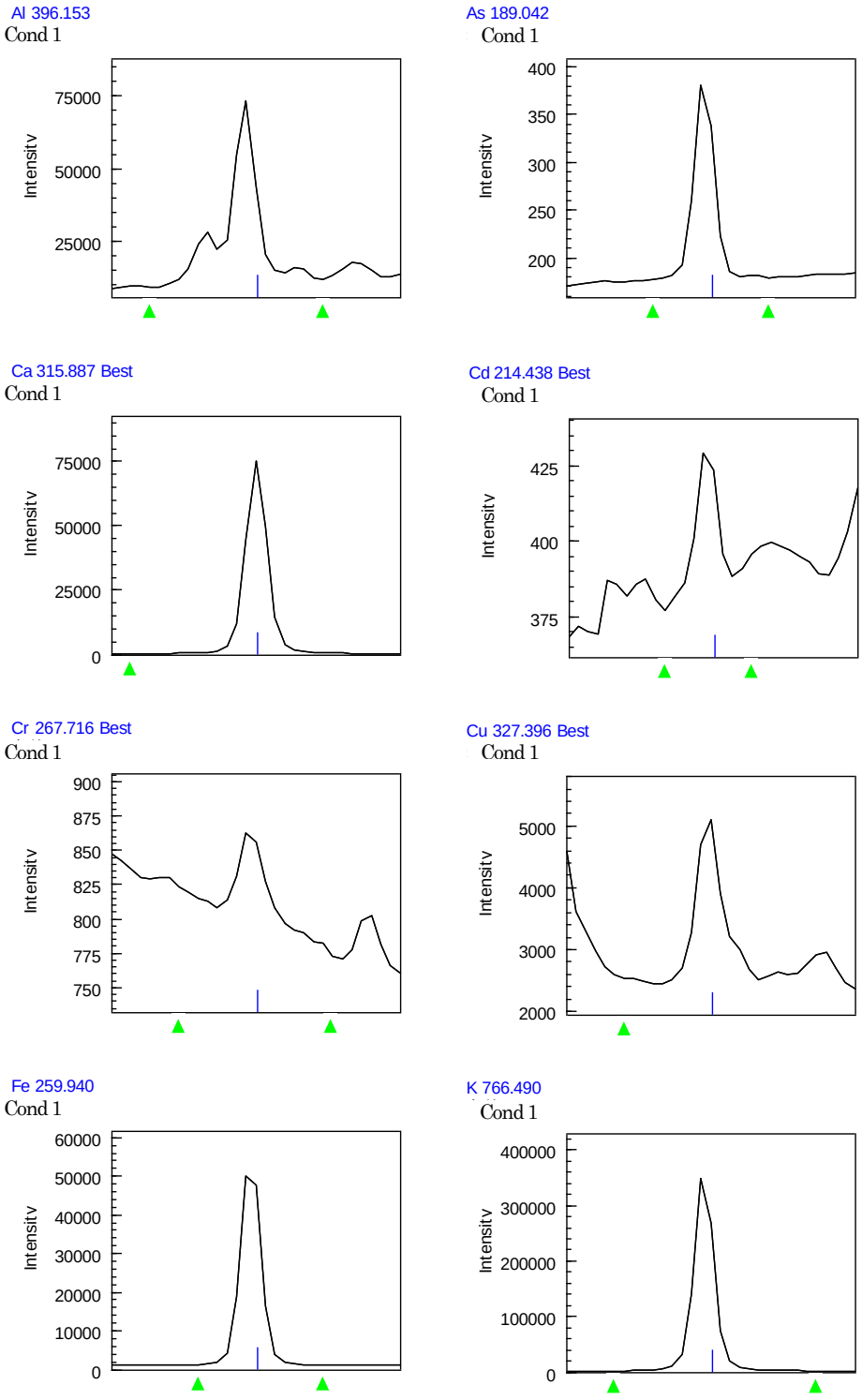

Figure 1: Spectral Profiles of Aquatic Vegetation (Sargassum)

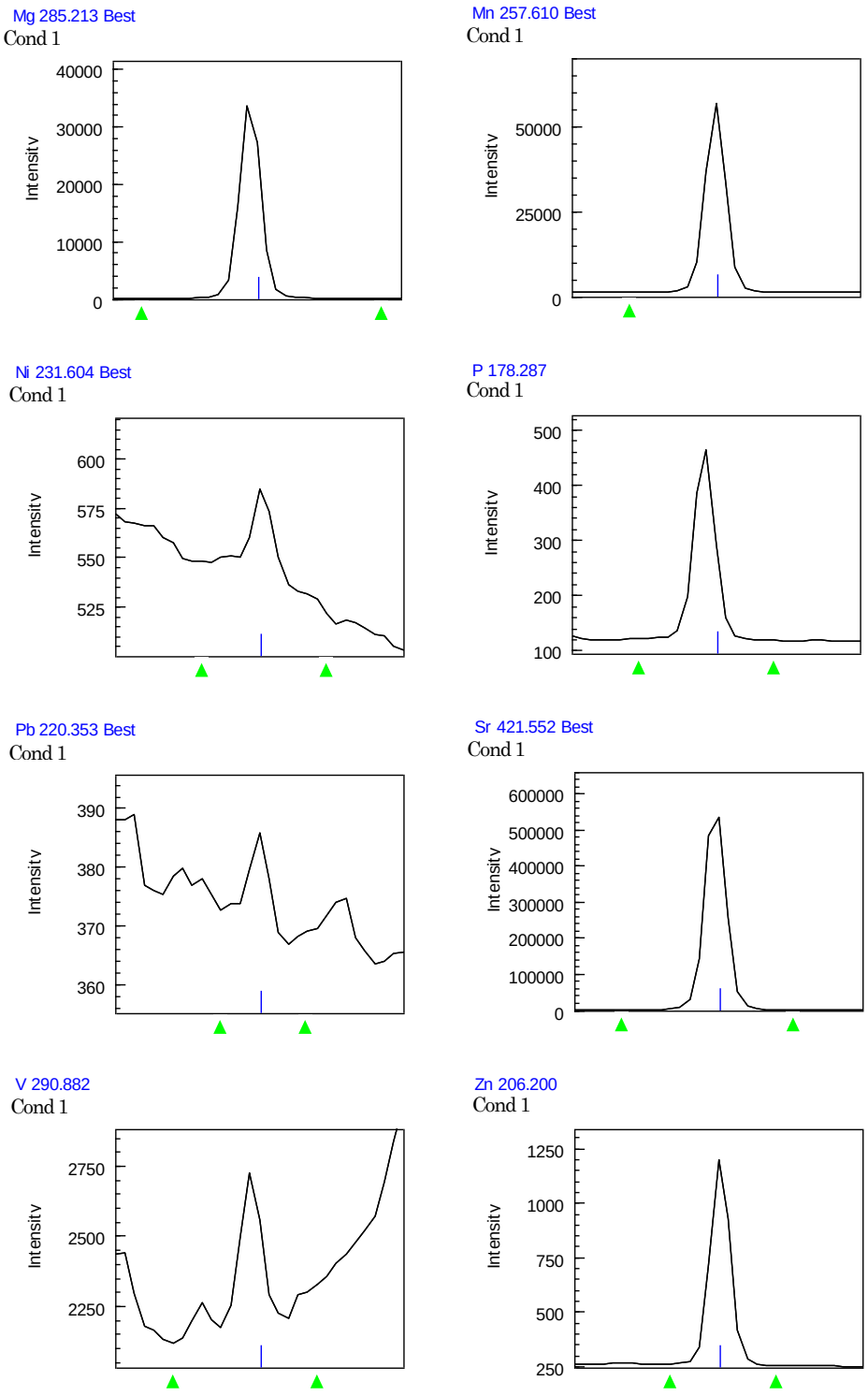

Figure 2: Spectral Profiles of Aquatic Vegetation (Sargassum)

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