



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 232



General Information

In this report an overview is given of analytical data for this sample collected in our proficiency testing program. The consensus values are calculated using a robust statistical model. With this NDA model, the mean and standard deviation are calculated using all reported data when at least 4 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into two sections: Consensus Values and Indicative Values. The division is made on the reliability of the data. Consensus Values are based on at least 8 results and a maximum relative uncertainty of 6.25%. Indicative Values are based on a maximum relative uncertainty of 35% and a minimum of 4 and maximum of 7 results, or a relative uncertainty greater than 6.25% when there are at least 8 results.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation), the uncertainty of the mean (consensus or indicative) value and the relative uncertainty.

All values, expressed on a weight basis (kg or %), are reported as oven-dried (105°C) material. Moisture is reported in the material as received.

Sample information

WEPAL reference materials are from natural sources only. There is no spiking, mixing or other alterations of the samples. For sample preparation, the IPE samples are dried at 70°C and milled to pass a 0.5 mm sieve.

This IPE sample 232 of Eucalyptus leaves/Eucalyptus globulus, from Australia, is prepared for the WEPAL proficiency programs. The sample has been used in 1 period (or round). The results on which the values in this report are based were taken from the period given in the following table:

Year	Round	Number
2016	3	3



Consensus Values IPE 232

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	33.8	3.09	9.1	82	33.2	2.13	0.426	1.26
Cu	mg/kg	6.30	0.783	12.4	108	6.25	0.516	0.094	1.49
Fe	mg/kg	70.6	8.59	12.2	107	70.6	5.70	1.04	1.47
Mn	mg/kg	324	29.8	9.2	110	323	20.0	3.55	1.10
Zn	mg/kg	14.7	1.61	10.9	107	14.8	0.920	0.194	1.32
As	µg/kg	54.1	9.22	17.0	17	53.7	5.20	2.80	5.16
Hg	µg/kg	62.0	5.19	8.4	12	62.0	3.09	1.87	3.02
Ni	µg/kg	2510	240	9.6	24	2525	155	61.2	2.44
Pb	µg/kg	213	44.2	20.7	28	216	21.4	10.4	4.90
Ba	mg/kg	13.9	0.480	3.4	13	14.0	0.400	0.166	1.19
Sr	mg/kg	36.1	1.71	4.7	13	36.0	1.25	0.591	1.64
Ca	g/kg	13.1	0.988	7.5	114	13.2	0.595	0.116	0.882
Cl (as Cl)	g/kg	4.51	0.336	7.4	18	4.53	0.236	0.099	2.19
K	g/kg	6.12	0.460	7.5	117	6.07	0.302	0.053	0.869
Mg	g/kg	1.66	0.104	6.3	116	1.66	0.063	0.012	0.728
N - Kjeldahl (as N)	g/kg	15.4	0.962	6.3	78	15.3	0.512	0.136	0.886
Na	mg/kg	2965	326	11.0	62	2948	193	51.8	1.75
P (as P)	g/kg	0.953	0.066	7.0	118	0.950	0.050	0.008	0.801
S (as S)	g/kg	1.15	0.103	8.9	64	1.16	0.060	0.016	1.40

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
C - elementary	g/kg	538	16.8	3.1	39	539	10.7	3.37	0.626
Al	mg/kg	109	17.8	16.3	13	113	8.90	6.18	5.66
N - elementary	g/kg	16.2	0.714	4.4	52	16.1	0.450	0.124	0.764

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	95.4	11.0	11.6	25	97.1	8.90	2.76	2.89

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Total ash	g/kg	54.0	3.45	6.4	13	53.1	2.41	1.20	2.22



Indicative Values IPE 232

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cd	µg/kg	14.7	4.31	29.3	23	15.5	2.40	1.12	7.64
Co	µg/kg	62.1	16.7	26.8	24	63.4	8.48	4.25	6.84
Cr	µg/kg	204	63.8	31.3	19	223	41.3	18.3	8.97
I	µg/kg	442	76.7	17.4	5	451	39.4	42.9	9.70
Li	µg/kg	545	61.7	11.3	7	557	52.5	29.1	5.35
Mo	µg/kg	22.4	18.3	81.8	16	22.9	11.7	5.72	25.5
Se	µg/kg	32.8	14.8	45.0	14	39.5	10.1	4.94	15.0
Sb	µg/kg	15.9	4.83	30.3	7	15.9	2.98	2.28	14.3
Sn	µg/kg	36.8	8.49	23.0	5	38.7	5.45	4.74	12.9
Ti	mg/kg	1.20	0.525	43.7	6	1.34	0.315	0.268	22.3
V	µg/kg	153	29.4	19.2	13	155	20.5	10.2	6.67
Be	µg/kg	73.7	23.9	32.5	7	74.6	12.8	11.3	15.3
Rb	µg/kg	22512	2842	12.6	4	22154	1284	1776	7.89
N - NO3 (as N)	mg/kg	19.2	10.1	52.6	4	18.0	4.75	6.31	32.9

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
delta 13C	‰ V-PDB	-30.6	0.510	1.7	6	-30.7	0.270	0.260	0.852

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Crude fibre	g/kg	151	70.5	46.8	6	147	28.8	36.0	23.9
ADF-ash-free	g/kg	356	15.0	4.2	5	357	8.58	8.40	2.36
NDF-ash-free	g/kg	394	46.6	11.8	5	399	27.5	26.1	6.61