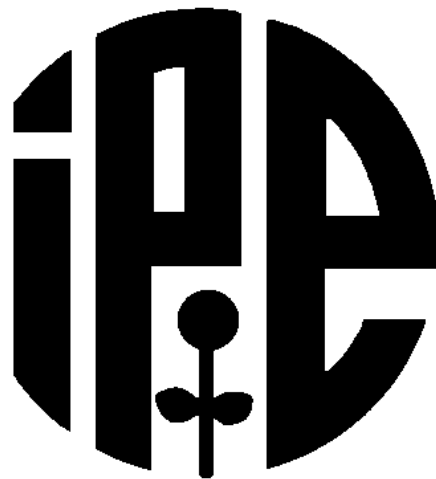




**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 176



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 mean and standard deviation are calculated using all reported data when at least 8 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into three sections: Consensus Values, Indicative Values and Values for Information. The division is made on the reliability of the data. Consensus Values are based on at least 16 results while the coefficient of variation is smaller than 25 %. Indicative Values are based on at least 8 and less than 16 results or a coefficient of variation between 25 % and 50 %. Other values, based on more than 2 and less than 8 results or a coefficient of variation higher than 50 %, are given for information only.

In the sections with Consensus Values and Indicative Values the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median and MAD (Median of Absolute Deviation) and the uncertainty in the consensus values. The confidence limits (at 95 % probability) are calculated for these determinands.

In the section with Information Values the following parameters are given: median, MAD and number of results. For determinands which have at least 5 results reported as smaller than (<) the median of these 'smaller than results' is calculated. In some cases this median of '<' values is much smaller than median and mean of the indicative values. This may be caused by a too optimistic (too low) value for the detection limit reported by a (small) majority of participating laboratories who report '<' -values.

All values, expressed on a weight basis (kg or %), are reported in oven dry (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 176 of Reed / Phragmites communis from Netherlands is prepared for the WEPAL proficiency programs. The sample is 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
2006	3	4



Consensus Values IPE 176



Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
As	µg/kg	2630	187	7.1	25	2610	133	47	2555	-	2709
Ca	g/kg	4.16	0.300	7.2	115	4.13	0.210	0.035	4.11	-	4.22
Cd	µg/kg	160	19.6	12.2	40	161	13.5	3.9	154	-	166
Cl (as Cl)	g/kg	7.54	0.319	4.2	25	7.47	0.230	0.080	7.41	-	7.67
Co	µg/kg	2360	216	9.2	28	2340	149	51	2278	-	2446
Cu	mg/kg	9.97	0.986	9.9	116	9.90	0.670	0.114	9.79	-	10.15
Fe	mg/kg	6410	779	12.2	112	6340	546	92	6266	-	6558
Hg	µg/kg	37.9	2.92	7.7	30	38.1	2.05	0.67	36.8	-	39.0
K	g/kg	13.0	1.19	9.1	122	13.0	0.80	0.13	12.80	-	13.22
Mg	g/kg	1.68	0.209	12.4	121	1.68	0.145	0.024	1.64	-	1.72
Mn	mg/kg	113	9.1	8.0	119	112	6.3	1.0	111.6	-	114.9
Mo	µg/kg	1200	247	20.5	34	1170	167	53	1117	-	1290
N - Kjeldahl (as N)	g/kg	7.79	0.521	6.7	83	7.80	0.370	0.071	7.68	-	7.90
Na	mg/kg	1700	135	7.9	82	1720	96	19	1674	-	1733
Ni	µg/kg	7860	823	10.5	44	7810	600	155	7613	-	8114
P (as P)	g/kg	1.28	0.111	8.7	125	1.30	0.080	0.012	1.26	-	1.30
Pb	µg/kg	8240	1215	14.8	49	8330	851	217	7888	-	8585
S (as S)	g/kg	2.36	0.179	7.6	72	2.36	0.122	0.026	2.32	-	2.41
Zn	mg/kg	40.2	3.14	7.8	121	40.0	2.20	0.36	39.6	-	40.7

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
C - elementary	g/kg	332	16.7	5.0	32	332	11.8	3.7	326	-	338
N - elementary	g/kg	8.04	0.719	8.9	47	7.94	0.506	0.131	7.83	-	8.25



Indicative Values IPE 176

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
B	mg/kg	9.41	3.954	42.0	80	9.93	2.850	0.553	8.53	-	10.3
Ba	mg/kg	50.8	8.30	16.3	14	51.9	6.10	2.77	46.1	-	55.6
Be	µg/kg	330	67.0	20.3	9	336	46.0	27.9	279	-	381
Cr	µg/kg	11300	3210	28.4	41	11300	2160	630	10270	-	12290
Sr	mg/kg	21.5	2.41	11.2	14	22.3	1.75	0.81	20.1	-	22.8
V	µg/kg	11900	2760	23.1	11	11900	1820	1040	10090	-	13750

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Al	mg/kg	6150	1636	26.6	24	5880	1150	418	5470	-	6840

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Total ash	g/kg	303	18.6	6.2	8	300	13.5	8.2	288	-	318



Informative Values IPE 176



Method: Inorganic Chemical Composition

Element	Unit	Median	MAD	N
Bi	µg/kg	159	12.0	5
I	µg/kg	959	108.5	4
Li	µg/kg	9480	1045	4
N - NH4 (as N)	mg/kg	206	30.0	5
N - NO3 (as N)	mg/kg	10.36	5.740	8
Rb	µg/kg	21000	130	3
Sb	µg/kg	62.3	17.10	5
Se	µg/kg	139	6.0	6
Sn	µg/kg	490	58.0	3
SO4 (as SO4)	g/kg	2.83	0.165	4

Method: Real totals

Element	Unit	Median	MAD	N
Al	mg/kg	8270	4357	9

Method: Acid extractable (So-called totals)

Element	Unit	Median	MAD	N
Si	mg/kg	620	619.4	3

Method: Nutritional values

Element	Unit	Median	MAD	N
Crude fibre	g/kg	206	8.6	5