



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 164



Certificate of Analysis IPE 164

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 164 of Chrysanthemum / Chrysanthemum.l, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 2 periods (or rounds). The results on which the values in this report are based were taken from the periods given in the following table:

Year	Round	Number
2009	1	2
2005	2	1



Consensus Values IPE 164

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	29.7	2.99	10.1	177	29.7	2.00	0.281	0.949
Cu	mg/kg	7.72	0.664	8.6	246	7.75	0.385	0.053	0.686
Fe	mg/kg	225	22.9	10.2	238	224	14.9	1.85	0.823
Mn	mg/kg	44.3	2.96	6.7	254	44.4	1.75	0.232	0.524
Zn	mg/kg	59.6	3.55	6.0	257	59.5	2.30	0.277	0.465
As	µg/kg	311	40.0	12.9	50	310	23.5	7.07	2.27
Cd	µg/kg	305	23.1	7.6	100	304	14.5	2.89	0.946
Co	µg/kg	118	19.5	16.5	50	118	11.5	3.45	2.91
Cr	µg/kg	857	221	25.8	72	864	144	32.5	3.80
Hg	µg/kg	10.2	1.17	11.5	52	10.5	0.650	0.203	1.99
Li	µg/kg	403	36.5	9.1	11	400	18.4	13.8	3.42
Mo	µg/kg	2712	301	11.1	65	2730	205	46.6	1.72
Ni	µg/kg	746	132	17.7	78	750	83.4	18.7	2.50
Pb	µg/kg	1372	173	12.6	98	1361	102	21.8	1.59
Ba	mg/kg	3.26	0.476	14.6	30	3.29	0.276	0.109	3.33
V	µg/kg	409	59.8	14.6	21	409	34.5	16.3	3.99
Sr	mg/kg	30.4	2.38	7.9	30	30.5	1.71	0.544	1.79
Rb	µg/kg	5655	598	10.6	9	5677	367	249	4.41
Ca	g/kg	11.3	0.619	5.5	262	11.3	0.439	0.048	0.422
Cl (as Cl)	g/kg	4.78	0.371	7.8	60	4.82	0.207	0.060	1.25
K	g/kg	42.8	2.54	5.9	264	42.8	1.66	0.195	0.456
Mg	g/kg	2.73	0.161	5.9	265	2.72	0.097	0.012	0.452
N - Kjeldahl (as N)	g/kg	25.2	2.00	7.9	177	25.1	1.33	0.188	0.744
N - NO ₃ (as N)	mg/kg	9940	643	6.5	32	9876	349	142	1.43
Na	mg/kg	280	52.3	18.7	166	280	30.1	5.07	1.81
P (as P)	g/kg	4.03	0.210	5.2	260	4.02	0.132	0.016	0.405
S (as S)	g/kg	1.70	0.136	8.0	144	1.71	0.082	0.014	0.834

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
C - elementary	g/kg	423	8.51	2.0	54	424	5.00	1.45	0.342
N - elementary	g/kg	29.8	1.16	3.9	98	29.7	0.693	0.147	0.493

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	142	31.8	22.4	59	141	24.0	5.17	3.65



Consensus Values IPE 164

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Crude fibre	g/kg	337	45.3	13.5	9	330	19.7	18.9	5.61
Total ash	g/kg	131	8.70	6.6	20	131	6.00	2.43	1.86



Indicative Values IPE 164

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Br	mg/kg	26.4	0.376	1.4	4	26.4	0.200	0.235	0.892
I	µg/kg	173	95.9	55.4	8	172	52.4	42.4	24.5
Se	µg/kg	16.7	8.48	50.8	20	20.1	5.24	2.37	14.2
Bi	µg/kg	3.11	0.592	19.0	4	3.25	0.315	0.370	11.9
Sb	µg/kg	38.3	5.78	15.1	9	38.0	3.70	2.41	6.28
Sn	µg/kg	114	33.5	29.5	8	122	22.5	14.8	13.0
Ag	µg/kg	5.42	2.39	44.0	5	6.40	1.60	1.34	24.6
Be	µg/kg	7.37	2.84	38.5	10	8.22	2.02	1.12	15.2
N - NH4 (as N)	mg/kg	266	124	46.8	8	284	87.5	54.9	20.7
SO4 (as SO4)	g/kg	1.87	0.506	27.0	10	1.83	0.328	0.200	10.7

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	299	83.0	27.7	14	320	40.5	27.7	9.26

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
ADF-ash-free	g/kg	425	22.5	5.3	6	429	11.2	11.5	2.70
NDF-ash-free	g/kg	524	30.0	5.7	6	528	14.8	15.3	2.92
Total fat	g/kg	25.6	9.61	37.6	4	26.0	6.05	6.00	23.5