



**WAGENINGEN EVALUATING PROGRAMS  
FOR ANALYTICAL LABORATORIES**

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**Certificate of Analysis**



**International Plant-Analytical Exchange**

**REFERENCE MATERIAL**

**IPE sample 976**

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## 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 976 of Pansy / *Herba violae tric. tot.* 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
1992	5	5



## Consensus Values IPE 976

### Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
B	mg/kg	23.3	3.57	15.3	60	23.5	2.55	0.58	22.4	-	24.2
Ca	g/kg	11.6	0.78	6.7	120	11.6	0.55	0.09	11.48	-	11.76
Cd	µg/kg	964	116.8	12.1	21	937	81.0	31.9	911	-	1017
Cl (as Cl)	g/kg	6.36	0.411	6.5	23	6.38	0.284	0.107	6.19	-	6.54
Cu	mg/kg	5.44	0.844	15.5	110	5.46	0.550	0.101	5.28	-	5.60
Fe	mg/kg	218	41.1	18.8	104	221	27.4	5.0	210	-	226
K	g/kg	51.9	3.39	6.5	122	51.9	2.28	0.38	51.2	-	52.5
Mg	g/kg	3.16	0.238	7.5	121	3.16	0.170	0.027	3.12	-	3.21
Mn	mg/kg	166	12.9	7.8	113	166	9.0	1.5	163.2	-	168.0
N - Kjeldahl (as N)	g/kg	23.0	1.08	4.7	102	23.1	0.73	0.13	22.83	-	23.25
N - NO3 (as N)	mg/kg	1340	59	4.4	21	1330	43	16	1315	-	1369
Na	mg/kg	1060	132	12.4	78	1060	90	19	1032	-	1092
P (as P)	g/kg	4.51	0.243	5.4	125	4.49	0.170	0.027	4.46	-	4.55
S (as S)	g/kg	2.39	0.220	9.2	39	2.40	0.154	0.044	2.32	-	2.46
Zn	mg/kg	193	16.0	8.3	110	192	11.3	1.9	189.9	-	195.9

### Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
N - elementary	g/kg	23.6	1.43	6.1	28	23.5	1.00	0.34	23.1	-	24.2



## Indicative Values IPE 976



### Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Co	µg/kg	82.9	27.42	33.1	8	91.5	20.00	12.12	60.5	-	105
Cr	µg/kg	665	208.1	31.3	12	680	131.0	75.1	534	-	796
Hg	µg/kg	20.3	9.59	47.2	8	22.0	7.00	4.24	12.5	-	28.1
Mo	µg/kg	2860	509	17.8	10	2820	356	201	2504	-	3221
Ni	µg/kg	531	229.1	43.1	12	622	173.0	82.7	387	-	675
Pb	µg/kg	1330	507	38.1	21	1330	361	138	1102	-	1563



## Informative Values IPE 976



### Method: Inorganic Chemical Composition

Element	Unit	Median	MAD	N
As	µg/kg	305	92.0	5
Ba	mg/kg	17.9	0.95	4
SO4 (as SO4)	g/kg	2.62	0.599	4
Sr	mg/kg	20.5	0.24	3