



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Soil-Analytical Exchange

REFERENCE MATERIAL

ISE sample 870



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.

Please note: Most WEPAL-QUASIMEME reference materials are found to be stable over the long term (>10 years) for most determinand/matrix combinations. There are a few exceptions known to us as being less stable over the long term. These are organotins in sediment (MS6), ASP in shellfish (BT7), some PAHs and PCBs in sediment (SETOC) and N-NH₄ (as N) in clay soils (ISE).

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 ISE samples are dried at 40°C and milled to pass a 0.5 mm sieve.

This ISE sample 870 of Clay from river basin, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 5 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
2025	3	3
2021	4	4
2018	2	4
2015	4	1
2013	1	1



Consensus Values ISE 870



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	63.8	2.55	4.0	110	63.8	1.44	0.304	0.476
As	mg/kg	17.2	1.69	9.8	100	17.3	1.05	0.211	1.23
Ba	mg/kg	439	32.8	7.5	102	441	20.8	4.07	0.926
Br	mg/kg	6.77	0.722	10.7	60	6.87	0.470	0.116	1.72
Ca	g/kg	7.83	0.524	6.7	115	7.88	0.280	0.061	0.780
Cd	mg/kg	0.527	0.084	15.9	51	0.540	0.050	0.015	2.78
Co	mg/kg	14.6	1.61	11.0	100	14.5	0.900	0.201	1.38
Cr	mg/kg	96.6	10.3	10.7	127	95.7	6.66	1.14	1.18
Cu	mg/kg	23.9	2.94	12.3	103	24.0	1.90	0.362	1.52
Fe	g/kg	33.3	1.34	4.0	139	33.2	0.805	0.142	0.427
Ga	mg/kg	15.7	2.06	13.1	63	15.9	1.40	0.324	2.07
K	mg/kg	19322	785	4.1	133	19250	469	85.1	0.441
Li	mg/kg	61.0	6.91	11.3	17	62.5	4.90	2.10	3.44
Mg	mg/kg	7256	440	6.1	108	7268	241	52.9	0.729
Mn	mg/kg	1257	81.3	6.5	132	1257	49.5	8.85	0.703
Na	mg/kg	6289	351	5.6	111	6289	213	41.6	0.661
Ni	mg/kg	43.6	3.86	8.8	105	43.7	2.10	0.471	1.08
P	mg/kg	963	64.4	6.7	96	960	39.0	8.21	0.853
Pb	mg/kg	38.1	3.30	8.6	101	38.1	2.04	0.410	1.08
Rb	mg/kg	112	4.63	4.1	88	113	3.30	0.617	0.549
S	mg/kg	262	48.2	18.4	76	260	30.1	6.91	2.64
Si	g/kg	323	11.0	3.4	79	323	6.53	1.54	0.478
Sn	mg/kg	4.19	0.602	14.4	42	4.30	0.325	0.116	2.77
Sr	mg/kg	95.1	6.58	6.9	88	94.6	4.21	0.877	0.922
Y	mg/kg	30.0	1.78	5.9	60	30.1	1.05	0.287	0.955
Zn	mg/kg	101	8.37	8.3	131	101	5.00	0.915	0.901
Zr	mg/kg	247	14.9	6.0	73	248	9.00	2.18	0.882
C-elementary	g/kg	14.9	0.698	4.7	132	15.0	0.499	0.076	0.509
Sb	mg/kg	1.18	0.125	10.6	47	1.19	0.070	0.023	1.93
Be	mg/kg	2.33	0.360	15.5	26	2.32	0.210	0.088	3.79
Tl	mg/kg	0.730	0.080	11.0	20	0.744	0.060	0.022	3.07
V	mg/kg	92.5	5.61	6.1	97	92.6	3.60	0.712	0.770
Ti	mg/kg	4126	223	5.4	104	4131	141	27.3	0.662
N - elementary	g/kg	1.55	0.119	7.6	239	1.55	0.080	0.010	0.618
Ce	mg/kg	75.0	7.12	9.5	74	75.1	4.96	1.03	1.38
La	mg/kg	37.4	2.67	7.1	72	37.7	1.47	0.394	1.05
Nb	mg/kg	15.4	1.22	7.9	51	15.3	0.700	0.213	1.38



Consensus Values ISE 870



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Nd	mg/kg	34.2	3.87	11.3	56	34.3	2.66	0.647	1.89
Sc	mg/kg	11.6	0.921	8.0	53	11.6	0.561	0.158	1.37
Th	mg/kg	11.5	1.02	8.9	68	11.5	0.655	0.155	1.35
U	mg/kg	2.93	0.390	13.3	54	3.00	0.230	0.066	2.27
Cs	mg/kg	9.25	1.30	14.0	50	9.30	0.705	0.230	2.48
W	mg/kg	2.80	0.728	26.0	34	2.85	0.380	0.156	5.56
Hg	µg/kg	54.2	5.42	10.0	69	54.7	3.70	0.815	1.50

(cont.)

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	27.4	7.07	25.8	56	28.1	4.05	1.18	4.30
As	mg/kg	14.0	1.80	12.9	94	13.9	1.20	0.232	1.66
Ba	mg/kg	181	19.3	10.7	63	182	11.9	3.05	1.69
Ca	g/kg	6.65	0.557	8.4	76	6.65	0.359	0.080	1.20
Cd	mg/kg	0.497	0.096	19.3	110	0.510	0.059	0.011	2.30
Co	mg/kg	12.7	1.06	8.4	106	12.6	0.698	0.129	1.02
Cr	mg/kg	51.2	8.66	16.9	120	51.4	5.10	0.988	1.93
Cu	mg/kg	21.3	2.07	9.7	137	21.4	1.35	0.221	1.03
Fe	g/kg	29.8	3.40	11.4	80	29.5	2.05	0.476	1.60
Mg	mg/kg	5836	659	11.3	73	5791	414	96.5	1.65
Mn	mg/kg	1218	110	9.1	92	1222	74.3	14.4	1.18
Mo	mg/kg	0.687	0.181	26.3	43	0.740	0.092	0.034	5.01
N	g/kg	1.51	0.164	10.9	135	1.51	0.090	0.018	1.17
Ni	mg/kg	37.1	3.30	8.9	114	37.2	2.22	0.387	1.04
P	mg/kg	861	87.2	10.1	102	856	55.5	10.8	1.25
Pb	mg/kg	31.6	3.90	12.3	126	31.5	2.52	0.434	1.37
S	mg/kg	237	28.2	11.9	59	239	15.4	4.59	1.94
Sn	mg/kg	2.61	0.591	22.6	50	2.60	0.360	0.104	4.00
Sr	mg/kg	31.4	6.07	19.3	23	32.4	4.40	1.58	5.03
Zn	mg/kg	91.9	8.90	9.7	136	91.8	5.82	0.954	1.04
V	mg/kg	53.5	9.44	17.6	66	54.1	7.15	1.45	2.71
Be	mg/kg	1.49	0.245	16.4	52	1.49	0.170	0.042	2.84
U	mg/kg	0.962	0.139	14.5	9	1.01	0.071	0.058	6.03
Hg	µg/kg	56.9	10.4	18.2	65	56.8	5.52	1.61	2.83



Consensus Values ISE 870



Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	27.1	4.76	17.5	83	27.0	2.98	0.653	2.40
As	mg/kg	14.5	1.23	8.5	104	14.6	0.730	0.151	1.04
Ba	mg/kg	192	20.5	10.7	45	194	13.0	3.82	1.99
Be	mg/kg	1.59	0.154	9.7	42	1.59	0.100	0.030	1.87
Ca	g/kg	6.64	0.373	5.6	86	6.61	0.227	0.050	0.757
Cd	mg/kg	0.522	0.072	13.8	127	0.523	0.047	0.008	1.53
Co	mg/kg	13.2	1.06	8.0	101	13.1	0.600	0.132	0.997
Cr	mg/kg	52.7	6.87	13.0	137	53.0	4.10	0.733	1.39
Cu	mg/kg	22.1	2.01	9.1	141	22.0	1.27	0.212	0.957
Fe	g/kg	29.8	2.23	7.5	94	29.8	1.45	0.288	0.967
Hg	µg/kg	57.6	8.62	14.9	56	58.1	4.88	1.44	2.50
K	mg/kg	4749	1007	21.2	83	4833	662	138	2.91
Li	mg/kg	39.3	7.98	20.3	25	39.3	5.80	2.00	5.08
Mg	mg/kg	5872	528	9.0	86	5823	332	71.1	1.21
Mn	mg/kg	1223	81.2	6.6	102	1220	50.0	10.1	0.822
Mo	mg/kg	0.773	0.177	22.9	60	0.769	0.104	0.029	3.69
Na	mg/kg	148	39.2	26.5	64	149	24.0	6.12	4.14
Ni	mg/kg	38.8	3.01	7.8	138	38.7	1.97	0.321	0.826
P	mg/kg	859	50.6	5.9	85	856	35.0	6.85	0.798
Pb	mg/kg	32.9	3.36	10.2	139	33.0	2.14	0.357	1.08
S	mg/kg	238	23.4	9.8	65	240	13.0	3.63	1.52
Sb	mg/kg	0.720	0.127	17.7	31	0.714	0.074	0.029	3.96
Sn	mg/kg	2.58	0.434	16.8	33	2.60	0.255	0.095	3.66
Sr	mg/kg	34.4	4.16	12.1	35	34.1	2.20	0.879	2.55
U	mg/kg	0.997	0.078	7.8	17	0.990	0.055	0.024	2.37
V	mg/kg	55.3	5.33	9.6	63	55.4	3.19	0.839	1.52
Zn	mg/kg	94.5	5.94	6.3	137	93.9	3.60	0.634	0.671

Method: Extraction with boiling 2M HNO3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cd	mg/kg	0.523	0.049	9.3	79	0.524	0.028	0.007	1.31
Co	mg/kg	11.9	0.820	6.9	77	12.0	0.518	0.117	0.980
Cr	mg/kg	31.3	2.76	8.8	87	31.3	1.70	0.369	1.18
Cu	mg/kg	20.2	1.41	7.0	86	20.3	0.846	0.190	0.939
Hg	µg/kg	52.2	5.04	9.6	65	52.3	2.71	0.781	1.49
Ni	mg/kg	31.0	1.89	6.1	87	31.0	1.10	0.253	0.816
Pb	mg/kg	32.9	2.21	6.7	86	32.7	1.32	0.298	0.903



Consensus Values ISE 870



Method: Extraction with boiling 2M HNO₃

(cont.)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Tl	mg/kg	0.090	0.013	14.9	24	0.091	0.008	0.003	3.80
Zn	mg/kg	81.3	5.70	7.0	87	81.5	3.62	0.764	0.939

Method: Extraction with 0.1M NaNO₃

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cu	µg/kg	85.2	10.7	12.5	30	85.6	6.53	2.43	2.85
Ni	µg/kg	29.9	3.50	11.7	26	29.6	2.50	0.859	2.87

Method: Extraction with 0.01M CaCl₂ 1:10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cu	µg/kg	97.6	16.1	16.5	12	97.5	9.00	5.80	5.95
K	mg/kg	71.2	6.33	8.9	30	71.1	3.65	1.45	2.03
Mg	mg/kg	110	7.52	6.8	22	110	3.55	2.01	1.82
Mn	mg/kg	7.94	0.818	10.3	12	7.90	0.467	0.295	3.72
N - NH ₄ (as N)	mg/kg	7.52	2.32	30.9	40	7.69	1.38	0.459	6.11
N - NO ₃ (as N)	mg/kg	35.2	2.29	6.5	39	35.1	1.28	0.459	1.30
Na	mg/kg	24.5	1.56	6.4	17	24.5	1.12	0.473	1.93
P	mg/kg	2.48	0.494	19.9	30	2.44	0.266	0.113	4.55

Method: Soil characteristics

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
pH - H ₂ O	...	7.60	0.195	2.6	450	7.60	0.126	0.011	0.151
pH - KCl	...	6.96	0.171	2.5	207	6.96	0.110	0.015	0.214
pH - CaCl ₂	...	7.20	0.119	1.7	161	7.20	0.080	0.012	0.163
Fraction < 2 µm	%	32.5	4.62	14.2	150	32.0	3.00	0.472	1.45
EC-SC (ISO 11265)	mS/m	20.1	2.84	14.1	174	20.1	1.79	0.269	1.34
Fraction < 63 µm	%	84.3	3.02	3.6	95	84.0	2.00	0.388	0.460
Fraction > 63 µm	%	15.5	2.28	14.7	87	15.7	1.70	0.305	1.97
Org.matter (L.O.I.)	%	4.82	0.812	16.8	181	4.80	0.500	0.075	1.56
Fraction < 16 µm	%	59.0	7.26	12.3	52	58.3	4.40	1.26	2.13
TC=Total C (org.+inorg.)	g/kg	14.9	0.812	5.5	181	14.9	0.500	0.075	0.506
TOC=Total Org. C	g/kg	13.4	1.59	11.9	197	13.4	1.09	0.142	1.06
C - org others (W&B a.o.)	g/kg	11.9	1.84	15.4	228	12.0	1.16	0.152	1.28



Consensus Values ISE 870

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Moisture-content	%	3.55	0.472	13.3	183	3.56	0.314	0.044	1.23
delta 13C	‰ V-PDB	-25.9	0.332	1.3	19	-26.0	0.190	0.095	0.367
delta 15N	‰ Air	6.28	0.424	6.8	16	6.23	0.270	0.133	2.11

Method: Pot. CEC using 1M NH₄-acetate at pH=7

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	19.7	3.80	19.3	156	19.6	2.35	0.381	1.94
Na	cmol+/kg	0.140	0.043	30.9	203	0.143	0.024	0.004	2.71
K	cmol+/kg	0.636	0.088	13.8	257	0.635	0.055	0.007	1.08
Mg	cmol+/kg	1.59	0.242	15.2	249	1.60	0.150	0.019	1.20
Ca	cmol+/kg	22.5	4.30	19.2	236	22.4	2.66	0.350	1.56

Method: Pot. CEC using 1M or 0.1M BaCl₂-TEA at pH=8.1 (ISO 13536 OR BZE)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	24.7	3.12	12.6	21	24.7	1.70	0.850	3.43
Mg	cmol+/kg	1.51	0.221	14.7	13	1.54	0.140	0.077	5.08
Ca	cmol+/kg	20.9	2.06	9.9	13	20.8	1.33	0.714	3.43

Method: Pot. CEC using 1M NH₄Cl (BZE)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	29.8	3.06	10.3	9	29.4	2.40	1.28	4.29
K	cmol+/kg	0.660	0.052	7.9	18	0.650	0.033	0.015	2.34
Mg	cmol+/kg	1.75	0.233	13.4	19	1.75	0.160	0.067	3.83

Method: Act. CEC using 0.01M BaCl₂ (ISO 11260)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	23.7	2.19	9.3	9	23.8	1.64	0.914	3.86

Method: Act. CEC using 0.1M BaCl₂ (UNEP-UN/EC 91065A)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	22.8	1.80	7.9	12	22.7	1.25	0.651	2.85
Na	cmol+/kg	0.113	0.010	8.5	12	0.116	0.005	0.003	3.06
K	cmol+/kg	0.481	0.021	4.4	13	0.482	0.014	0.007	1.54
Ca	cmol+/kg	20.4	1.58	7.7	13	20.3	0.840	0.546	2.68
Mg	cmol+/kg	1.54	0.038	2.5	13	1.54	0.017	0.013	0.864
Mn	cmol+/kg	0.080	0.009	11.7	12	0.080	0.007	0.003	4.24

Method: Act. CEC using cobaltihexamine (AFNOR NFX 31 130)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	22.8	1.58	6.9	34	22.7	0.929	0.338	1.49
Na	cmol+/kg	0.125	0.014	10.9	29	0.126	0.006	0.003	2.53
K	cmol+/kg	0.660	0.071	10.8	30	0.665	0.033	0.016	2.47
Ca	cmol+/kg	21.4	1.47	6.9	31	21.5	0.824	0.330	1.54
Mg	cmol+/kg	1.65	0.158	9.6	31	1.66	0.074	0.035	2.14

Method: Mehlich-3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	0.874	0.200	22.9	47	0.890	0.130	0.036	4.17
Ca	mg/kg	4738	339	7.2	93	4700	199	44.0	0.929
Cu	mg/kg	5.55	0.740	13.3	90	5.55	0.450	0.098	1.76
Fe	mg/kg	336	56.8	16.9	90	329	33.9	7.48	2.22
K	mg/kg	245	20.4	8.3	95	245	13.0	2.62	1.07
Mg	mg/kg	227	22.7	10.0	94	226	15.2	2.93	1.29
Mn	mg/kg	254	35.9	14.1	90	256	21.8	4.73	1.86
Na	mg/kg	29.8	6.59	22.1	56	29.0	3.67	1.10	3.70
P	mg/kg	165	13.0	7.8	105	165	7.93	1.58	0.957
Zn	mg/kg	8.42	1.18	14.0	90	8.36	0.820	0.156	1.85
Al	mg/kg	684	87.5	12.8	55	677	60.3	14.7	2.15
Pb	mg/kg	8.13	0.870	10.7	10	7.92	0.627	0.344	4.23

Method: Extraction with 0.01M CaCl2 - 0.005M DTPA 1:10 (w/v)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cu	mg/kg	3.10	0.498	16.0	83	3.11	0.310	0.068	2.20
Fe	mg/kg	32.3	12.3	38.2	80	33.2	6.59	1.72	5.33
Mn	mg/kg	73.0	13.4	18.4	85	72.0	8.33	1.82	2.49
Zn	mg/kg	2.84	0.622	21.9	85	2.81	0.380	0.084	2.96

Method: Extraction with 1M KCl 1:10 (w/v)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
N - NH4 (as N)	mg/kg	19.3	5.63	29.2	50	19.3	3.32	0.995	5.16
N - NO3 (as N)	mg/kg	34.1	6.15	18.0	57	34.1	3.87	1.02	2.99

Method: Phosphorus and related analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P - Bray (as P)	mg/kg	108	48.3	44.8	119	112	32.8	5.54	5.14
P - Olsen (as P)	mg/kg	86.4	15.7	18.2	198	86.0	9.63	1.39	1.61

Method: Phosphorus and related analysis									(cont.)
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al - Ox	mg/kg	1068	123	11.5	18	1061	64.5	36.2	3.39
Fe - Ox	mg/kg	4198	627	14.9	18	4249	410	185	4.40
P - Ox	mg/kg	529	32.8	6.2	16	530	15.9	10.3	1.94
P - AL (as P)	mg/kg	222	19.6	8.8	40	226	11.0	3.87	1.74

Method: UK Soil Methods

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P – NaHCO ₃ (1/20)	mg/l	81.0	9.19	11.4	63	81.5	6.55	1.45	1.79
K - NH ₄ NO ₃ (1/5)	mg/l	243	21.7	9.0	67	242	16.0	3.32	1.37
Mg - NH ₄ NO ₃ (1/5)	mg/l	180	21.7	12.0	66	180	14.8	3.33	1.85
pH - H ₂ O (2/5)	...	7.59	0.147	1.9	71	7.60	0.100	0.022	0.287

Method: PEP-Ammoniumacetate-EDTA extraction

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
AAE10-Ca	mg/kg	5586	239	4.3	10	5555	119	94.4	1.69
AAE10-Mg	mg/kg	217	12.2	5.6	10	216	5.85	4.81	2.21
AAE10-K	mg/kg	228	11.9	5.2	10	228	6.89	4.71	2.07
AAE10-P	mg/kg	168	8.02	4.8	9	168	5.31	3.34	1.99

Method: PEP-Test measurements

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
pH-H ₂ O	...	7.55	0.055	0.7	11	7.55	0.030	0.021	0.274

Method: PEP-Physical parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ton (clay)	%	33.4	2.91	8.7	8	34.1	1.10	1.29	3.84
Schluff (silt)	%	44.4	3.10	7.0	8	44.4	1.10	1.37	3.09
C-org	%	1.03	0.125	12.1	9	1.03	0.098	0.052	5.05
Humus	%	1.78	0.185	10.4	8	1.76	0.149	0.082	4.60



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Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
F	mg/kg	682	357	52.4	10	675	191	141	20.7
I	mg/kg	3.94	0.714	18.1	13	4.00	0.330	0.248	6.29
Mo	mg/kg	0.966	0.317	32.8	40	1.06	0.188	0.063	6.48
Se	mg/kg	0.933	0.991	106.2	16	1.71	0.912	0.310	33.2
Bi	mg/kg	0.876	1.86	212.5	8	2.00	1.59	0.823	93.9
Ge	mg/kg	1.45	0.876	60.6	11	1.75	0.450	0.330	22.8
Sm	mg/kg	5.22	2.46	47.1	4	5.10	1.11	1.54	29.4

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	12.7	13.3	105.1	30	14.1	10.8	3.04	24.0
Ga	mg/kg	8.73	0.578	6.6	5	8.86	0.211	0.323	3.70
K	mg/kg	4353	1877	43.1	70	4763	1395	280	6.44
Li	mg/kg	33.5	13.0	38.8	19	32.5	7.49	3.74	11.1
Na	mg/kg	156	80.8	51.9	55	166	57.3	13.6	8.75
Rb	mg/kg	45.8	30.5	66.6	6	51.4	17.2	15.6	34.0
Se	mg/kg	0.522	0.729	139.7	27	0.740	0.508	0.175	33.6
Y	mg/kg	15.2	1.31	8.6	7	15.2	0.692	0.620	4.09
Zr	mg/kg	13.1	1.88	14.4	5	13.4	0.908	1.05	8.03
Sb	mg/kg	0.789	0.421	53.3	35	0.780	0.240	0.089	11.3
Tl	mg/kg	0.358	0.190	53.0	14	0.399	0.149	0.063	17.7
Ag	mg/kg	0.121	0.048	39.6	10	0.133	0.033	0.019	15.7
Ti	mg/kg	274	136	49.6	16	275	90.4	42.5	15.5
Ce	mg/kg	48.8	11.3	23.2	6	50.1	5.73	5.78	11.8
La	mg/kg	21.7	5.15	23.8	8	22.7	3.33	2.28	10.5
Sc	mg/kg	5.86	0.667	11.4	4	6.02	0.355	0.417	7.12

Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ag	µg/kg	106	23.5	22.1	9	98.0	21.2	9.78	9.23
B	mg/kg	16.9	7.63	45.1	28	17.5	4.10	1.80	10.7
Bi	mg/kg	0.276	0.028	10.3	7	0.286	0.019	0.013	4.88
La	mg/kg	21.5	2.74	12.7	4	21.6	1.25	1.71	7.94
Rb	mg/kg	42.6	6.42	15.1	4	41.1	3.31	4.01	9.43
Sc	mg/kg	4.83	0.746	15.4	5	4.74	0.670	0.417	8.63
Se	mg/kg	0.303	0.129	42.5	39	0.339	0.094	0.026	8.51
Th	mg/kg	5.60	2.04	36.4	4	5.61	1.06	1.27	22.7



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Method: Aqua Regia (ISO 11466)									(cont.)
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ti	mg/kg	308	123	40.1	33	298	77.5	26.9	8.72
TI	mg/kg	0.306	0.084	27.3	22	0.308	0.041	0.022	7.29
Method: Extraction with boiling 2M HNO3									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mo	mg/kg	0.137	0.041	29.7	33	0.142	0.023	0.009	6.46
Method: Extraction with 0.01M CaCl2 1:10									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	µg/kg	152	34.8	22.9	12	157	24.4	12.5	8.27
Co	µg/kg	12.8	3.29	25.6	9	13.3	1.74	1.37	10.7
N total soluble	mg/kg	58.0	4.38	7.6	7	58.0	2.60	2.07	3.57
SO4	mg/kg	80.7	12.8	15.8	8	81.9	7.13	5.64	6.99
Method: Soil characteristics									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
TIC=Tot.Inorg C(as CaCO3)	%	0.841	0.762	90.5	114	1.00	0.649	0.089	10.6
Method: Other determinations									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B - Hot water	mg/kg	0.643	0.288	44.8	41	0.700	0.163	0.056	8.74
Method: Fluoride (Swiss standard procedure)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
F - Total	mg/kg	528	108	20.4	14	511	54.2	36.0	6.81
Method: Pot. CEC using 1M NH4-acetate at pH=7									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	cmol+/kg	0.026	0.009	36.4	4	0.029	0.005	0.006	22.8
Method: Pot. CEC using 1M or 0.1M BaCl2-TEA at pH=8.1 (ISO 13536 OR BZE)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	cmol+/kg	0.169	0.097	57.5	12	0.165	0.077	0.035	20.8
K	cmol+/kg	0.655	0.176	26.8	13	0.660	0.130	0.061	9.29

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Method: Pot. CEC using 1M NH₄Cl (BZE)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	cmol+/kg	0.126	0.036	29.0	17	0.130	0.020	0.011	8.79
Ca	cmol+/kg	22.5	4.96	22.0	19	21.7	3.10	1.42	6.32
Mn	cmol+/kg	0.110	0.060	54.5	14	0.108	0.036	0.020	18.2

Method: Act. CEC using 0.01M BaCl₂ (ISO 11260)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	cmol+/kg	0.144	0.083	57.3	8	0.136	0.065	0.037	25.3
K	cmol+/kg	0.787	0.127	16.2	10	0.780	0.085	0.050	6.40
Mg	cmol+/kg	1.76	0.292	16.6	10	1.72	0.139	0.116	6.56
Ca	cmol+/kg	22.5	6.04	26.9	10	23.3	2.80	2.39	10.6

Method: Act. CEC using cobaltihexamine (AFNOR NFX 31 130)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	cmol+/kg	0.009	0.009	97.2	8	0.010	0.006	0.004	42.9
Mn	cmol+/kg	0.069	0.015	21.2	10	0.070	0.009	0.006	8.40

Method: Mehlich-3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	0.646	0.206	31.8	5	0.688	0.108	0.115	17.8
Cd	mg/kg	0.273	0.048	17.4	7	0.274	0.033	0.022	8.24
Cr	mg/kg	0.441	0.250	56.7	9	0.470	0.184	0.104	23.6
Co	mg/kg	1.13	0.300	26.4	5	1.20	0.170	0.167	14.8

Method: Water soluble 1:10 (w/v) (EN-12457-4)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
F	mg/kg	17.7	8.70	49.2	5	16.0	4.80	4.87	27.5
Cl	mg/kg	16.7	5.43	32.5	6	16.5	4.80	2.77	16.6
N - NO ₃ (as N)	mg/kg	31.4	7.50	23.9	7	31.0	5.00	3.54	11.3

Method: Phosphorus and related analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P - w (as P)	mg/l soil	39.3	15.6	39.6	19	42.1	15.9	4.46	11.4

Method: Water soluble 1:10 (w/v) (Neth standard VPR C85-06)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cl	mg/kg	11.8	0.992	8.4	4	12.1	0.530	0.620	5.25



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Method: Extraction with dilute nitric acid (0.43 Mol/l) ISO 17586

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	0.954	0.234	24.6	4	1.02	0.125	0.146	15.4
Cd	mg/kg	0.353	0.065	18.5	4	0.370	0.035	0.041	11.6
Co	mg/kg	3.38	0.595	17.6	4	3.54	0.318	0.372	11.0
Cr	mg/kg	3.50	0.382	10.9	4	3.60	0.205	0.239	6.82
Cu	mg/kg	10.1	4.02	39.8	7	10.0	1.61	1.90	18.8
Ni	mg/kg	5.53	1.02	18.5	4	5.82	0.545	0.641	11.6
Pb	mg/kg	18.3	5.22	28.5	4	19.1	2.50	3.26	17.8
Zn	mg/kg	20.2	3.19	15.8	7	20.0	1.99	1.51	7.47
Fe	g/kg	1.93	0.325	16.9	6	2.03	0.155	0.166	8.61
K	mg/kg	281	73.2	26.0	5	302	46.8	40.9	14.5
Mg	mg/kg	507	97.6	19.2	6	512	52.1	49.8	9.82
Mn	mg/kg	548	43.4	7.9	7	554	23.5	20.5	3.74
P	mg/kg	314	86.6	27.5	5	347	46.9	48.4	15.4
Ca	g/kg	5.93	0.621	10.5	6	6.13	0.300	0.317	5.34

Method: PEP-Water extraction

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
H2O10-Mg	mg/kg	13.7	0.560	4.1	7	13.8	0.500	0.264	1.94
H2O10-K	mg/kg	26.8	0.875	3.3	7	26.7	0.510	0.413	1.55
H2O10-P	mg/kg	7.72	0.111	1.4	7	7.72	0.060	0.053	0.681

Method: PEP-Test measurements

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CO2-K	K-test	2.65	0.265	10.0	7	2.62	0.200	0.125	4.72
CO2-P	P-test	33.0	4.42	13.4	7	32.4	2.02	2.09	6.34
CC-Mg	Mg-test	11.8	0.754	6.4	7	11.9	0.340	0.356	3.03
CaCO3	%	0.457	0.093	20.2	6	0.456	0.050	0.047	10.3
pH-CC	...	7.08	0.058	0.8	4	7.08	0.035	0.036	0.508

Method: PEP-Physical parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Sand	%	19.1	2.19	11.5	7	19.6	1.40	1.03	5.43
TOC_400	%	1.000	0.125	12.5	7	0.990	0.120	0.059	5.93



Indicative Values ISE 870

Method: PEP-Cation Exchange Capacity

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ca	cmol+/kg	18.1	5.09	28.1	4	17.7	2.88	3.18	17.6
Mg	cmol+/kg	1.51	0.077	5.1	4	1.53	0.035	0.048	3.17
Na	cmol+/kg	0.104	0.023	22.5	4	0.111	0.013	0.015	14.1
K	cmol+/kg	0.667	0.230	34.6	4	0.675	0.108	0.144	21.6
H	cmol+/kg	3.28	0.235	7.1	4	3.26	0.110	0.147	4.47
KAK	cmol+/kg	23.8	5.44	22.9	4	23.4	3.13	3.40	14.3
S-Wert	cmol+/kg	20.4	5.19	25.4	4	20.0	2.88	3.25	15.9
BAS	%	86.5	4.53	5.2	4	86.5	2.44	2.83	3.27