



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Soil-Analytical Exchange

REFERENCE MATERIAL

ISE sample 835



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 835 of Gleysol, from Latvia, is prepared for the WEPAL proficiency programs. The sample has been used in 3 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	4
2024	1	2
2021	4	1



Consensus Values ISE 835



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	24.9	1.78	7.1	47	24.8	1.04	0.324	1.30
Ba	mg/kg	306	27.5	9.0	38	309	14.1	5.59	1.83
Ca	g/kg	3.20	0.369	11.5	48	3.22	0.198	0.067	2.08
Co	mg/kg	1.59	0.402	25.3	26	1.60	0.219	0.098	6.21
Cr	mg/kg	24.8	7.24	29.2	49	25.9	4.11	1.29	5.21
Fe	g/kg	6.34	0.644	10.1	55	6.40	0.390	0.108	1.71
K	mg/kg	15350	1079	7.0	59	15206	504	176	1.14
Mg	mg/kg	1081	198	18.3	47	1090	98.0	36.1	3.34
Mn	mg/kg	151	24.1	15.9	51	149	11.0	4.22	2.79
Na	mg/kg	4072	382	9.4	39	4017	237	76.4	1.88
P	mg/kg	771	90.6	11.8	47	786	57.9	16.5	2.14
Pb	mg/kg	13.2	2.37	17.9	45	13.2	1.20	0.441	3.34
Rb	mg/kg	44.9	2.59	5.8	28	45.1	1.19	0.613	1.37
Si	g/kg	398	14.1	3.6	41	398	5.59	2.76	0.694
Sr	mg/kg	66.2	7.41	11.2	36	66.8	4.20	1.54	2.33
Y	mg/kg	12.7	1.89	14.8	21	12.8	0.800	0.515	4.05
Zn	mg/kg	15.3	4.14	27.1	51	15.6	2.87	0.724	4.75
Zr	mg/kg	379	40.9	10.8	29	375	31.0	9.48	2.50
C-elementary	g/kg	22.4	1.52	6.8	98	22.4	0.980	0.192	0.859
Tl	mg/kg	0.300	0.022	7.4	12	0.300	0.011	0.008	2.67
V	mg/kg	17.2	3.36	19.5	41	17.1	2.10	0.655	3.81
Ti	mg/kg	1779	182	10.2	40	1787	96.9	35.9	2.02
N - elementary	g/kg	1.74	0.147	8.5	155	1.74	0.080	0.015	0.851
Ce	mg/kg	31.9	7.19	22.5	21	32.4	4.39	1.96	6.14
Th	mg/kg	5.11	0.407	8.0	16	5.09	0.174	0.127	2.49
Hg	µg/kg	34.3	3.94	11.5	42	34.3	2.22	0.759	2.21

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	5.53	1.32	24.0	33	5.45	0.901	0.288	5.21
As	mg/kg	1.77	0.318	17.9	28	1.81	0.240	0.075	4.24
Ba	mg/kg	16.4	3.33	20.3	31	16.2	1.84	0.747	4.55
Ca	g/kg	1.26	0.195	15.5	44	1.25	0.118	0.037	2.92
Co	mg/kg	1.08	0.145	13.4	33	1.10	0.100	0.032	2.91
Cr	mg/kg	12.2	2.50	20.5	61	12.3	1.46	0.400	3.28
Cu	mg/kg	3.30	0.516	15.6	58	3.35	0.348	0.085	2.56
Fe	g/kg	4.38	0.868	19.8	43	4.41	0.510	0.165	3.78



Consensus Values ISE 835



Method: Acid extractable (So-called totals)									(cont.)
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mg	mg/kg	613	128	20.8	42	614	90.7	24.6	4.01
Mn	mg/kg	73.9	17.5	23.7	48	76.4	11.2	3.16	4.27
N	g/kg	1.69	0.196	11.6	72	1.70	0.120	0.029	1.71
Ni	mg/kg	3.43	0.697	20.3	47	3.37	0.373	0.127	3.71
P	mg/kg	705	87.7	12.4	58	706	58.3	14.4	2.04
Pb	mg/kg	6.93	0.786	11.3	58	6.94	0.448	0.129	1.86
S	mg/kg	235	26.3	11.2	37	235	14.6	5.40	2.30
Sr	mg/kg	12.5	1.93	15.4	11	12.5	1.10	0.729	5.82
Zn	mg/kg	11.2	2.01	17.9	59	11.1	1.16	0.327	2.92
V	mg/kg	9.12	1.77	19.4	31	9.18	1.06	0.398	4.36
Be	mg/kg	0.131	0.018	14.1	13	0.130	0.012	0.006	4.88

Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	5.36	0.718	13.4	61	5.40	0.427	0.115	2.14
As	mg/kg	1.70	0.332	19.5	60	1.70	0.186	0.054	3.15
Ba	mg/kg	16.8	1.98	11.8	24	16.9	1.16	0.506	3.01
Be	mg/kg	0.160	0.012	7.5	16	0.159	0.010	0.004	2.34
Ca	g/kg	1.25	0.147	11.7	56	1.26	0.080	0.025	1.96
Cd	mg/kg	0.057	0.017	29.9	49	0.060	0.010	0.003	5.33
Co	mg/kg	1.11	0.193	17.4	55	1.13	0.130	0.033	2.93
Cr	mg/kg	11.9	2.14	18.0	90	11.9	1.20	0.282	2.37
Cu	mg/kg	3.42	0.657	19.2	80	3.47	0.370	0.092	2.68
Fe	g/kg	4.37	0.422	9.7	63	4.37	0.256	0.066	1.52
K	mg/kg	532	142	26.7	54	546	70.3	24.2	4.55
Mg	mg/kg	630	79.9	12.7	57	633	56.3	13.2	2.10
Mn	mg/kg	71.6	8.78	12.3	73	73.2	5.90	1.28	1.80
Mo	mg/kg	0.468	0.067	14.3	33	0.480	0.039	0.015	3.10
Ni	mg/kg	3.53	0.556	15.8	78	3.50	0.330	0.079	2.23
P	mg/kg	719	54.1	7.5	50	721	34.8	9.56	1.33
Pb	mg/kg	7.03	0.903	12.9	89	7.02	0.551	0.120	1.70
S	mg/kg	222	18.8	8.5	38	219	9.75	3.82	1.72
Sr	mg/kg	13.3	1.73	13.0	14	13.4	0.772	0.578	4.36
U	mg/kg	0.536	0.053	9.8	9	0.522	0.029	0.022	4.08
V	mg/kg	9.77	1.10	11.3	36	9.71	0.600	0.230	2.35
Zn	mg/kg	11.5	1.46	12.7	85	11.5	0.920	0.198	1.72

Method: Extraction with boiling 2M HNO3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cd	mg/kg	0.056	0.010	18.4	37	0.059	0.007	0.002	3.78
Co	mg/kg	0.839	0.071	8.5	39	0.842	0.045	0.014	1.69
Cr	mg/kg	6.08	0.574	9.4	51	6.07	0.360	0.100	1.65
Cu	mg/kg	3.11	0.302	9.7	50	3.09	0.183	0.053	1.72
Hg	µg/kg	30.4	6.15	20.2	38	30.3	3.34	1.25	4.10
Mo	mg/kg	0.178	0.034	18.8	30	0.183	0.017	0.008	4.29
Ni	mg/kg	2.04	0.214	10.5	44	2.06	0.150	0.040	1.97
Pb	mg/kg	6.41	0.711	11.1	53	6.39	0.440	0.122	1.91
Tl	mg/kg	0.039	0.005	13.0	10	0.040	0.003	0.002	5.13
Zn	mg/kg	9.38	1.13	12.0	50	9.41	0.594	0.200	2.13

Method: Extraction with 0.01M CaCl2 1:10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
K	mg/kg	29.2	2.77	9.5	22	29.8	1.39	0.738	2.52
Mg	mg/kg	75.5	5.23	6.9	15	75.0	2.99	1.69	2.23
Mn	mg/kg	6.25	0.461	7.4	12	6.30	0.280	0.166	2.66
N - NO3 (as N)	mg/kg	15.3	1.36	8.9	26	15.6	1.02	0.334	2.18
Na	mg/kg	3.17	0.489	15.4	14	3.25	0.305	0.163	5.16

Method: Soil characteristics

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
pH - H2O	...	5.82	0.212	3.6	271	5.82	0.130	0.016	0.277
pH - KCl	...	5.02	0.142	2.8	126	5.01	0.085	0.016	0.314
pH - CaCl2	...	5.17	0.099	1.9	85	5.18	0.070	0.013	0.259
Fraction < 2 µm	%	4.23	1.74	41.2	86	4.35	1.08	0.235	5.56
EC-SC (ISO 11265)	mS/m	5.94	1.23	20.6	111	5.90	0.814	0.145	2.45
Fraction < 63 µm	%	30.8	4.42	14.4	56	31.1	3.05	0.739	2.40
Fraction > 63 µm	%	69.0	3.95	5.7	53	68.9	2.50	0.678	0.983
Org.matter (L.O.I.)	%	4.49	0.311	6.9	117	4.49	0.196	0.036	0.801
TC=Total C (org.+inorg.)	g/kg	22.2	1.57	7.0	127	22.2	0.960	0.174	0.782
TOC=Total Org. C	g/kg	21.9	2.12	9.6	156	21.8	1.20	0.212	0.965
C - org others (W&B a.o.)	g/kg	21.3	2.95	13.8	129	21.2	1.93	0.325	1.52

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Moisture-content	%	1.06	0.171	16.1	133	1.07	0.110	0.019	1.74
delta 13C	‰ V-PDB	-28.3	0.118	0.4	11	-28.3	0.090	0.045	0.158



Consensus Values ISE 835



Method: Other determinations									(cont.)
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
delta 15N	‰ Air	6.48	0.357	5.5	11	6.51	0.120	0.135	2.08
Method: Fluoride (Swiss standard procedure)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
F - Total	mg/kg	105	7.15	6.8	9	105	3.00	2.98	2.83
Method: Pot. CEC using 1M NH ₄ -acetate at pH=7									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	7.29	1.59	21.9	86	7.36	1.12	0.215	2.95
K	cmol+/kg	0.127	0.028	22.4	148	0.128	0.018	0.003	2.30
Mg	cmol+/kg	0.724	0.101	13.9	147	0.740	0.060	0.010	1.43
Ca	cmol+/kg	3.28	0.685	20.9	138	3.33	0.415	0.073	2.22
Method: Pot. CEC using 1M NH ₄ Cl (BZE)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
K	cmol+/kg	0.141	0.010	7.3	9	0.145	0.012	0.004	3.03
Mg	cmol+/kg	0.735	0.108	14.7	9	0.790	0.112	0.045	6.11
Ca	cmol+/kg	3.28	0.379	11.6	9	3.34	0.420	0.158	4.81
Method: Act. CEC using cobaltihexamine (AFNOR NFX 31 130)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	3.55	0.819	23.1	25	3.55	0.439	0.205	5.77
K	cmol+/kg	0.096	0.016	16.8	19	0.100	0.010	0.005	4.82
Ca	cmol+/kg	2.75	0.210	7.6	21	2.80	0.110	0.057	2.08
Mg	cmol+/kg	0.654	0.089	13.7	21	0.666	0.046	0.024	3.73
Method: Mehlich-3									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ca	mg/kg	750	79.2	10.6	52	746	49.2	13.7	1.83
Cu	mg/kg	0.885	0.210	23.7	51	0.900	0.110	0.037	4.15
Fe	mg/kg	362	60.5	16.7	63	355	39.1	9.52	2.63
K	mg/kg	51.4	7.38	14.4	52	50.0	4.69	1.28	2.49
Mg	mg/kg	96.9	8.44	8.7	54	96.2	5.29	1.44	1.48
Mn	mg/kg	16.5	3.79	23.0	64	16.6	2.31	0.592	3.60
P	mg/kg	235	35.1	14.9	73	235	22.5	5.13	2.19
Zn	mg/kg	1.46	0.286	19.6	56	1.48	0.192	0.048	3.27
Al	mg/kg	1519	142	9.4	32	1497	81.3	31.5	2.07



Consensus Values ISE 835

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	0.491	0.153	31.2	46	0.500	0.095	0.028	5.74
Fe	mg/kg	113	23.8	21.0	56	111	14.0	3.98	3.51
Zn	mg/kg	0.802	0.251	31.3	48	0.823	0.178	0.045	5.64

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
N - NO ₃ (as N)	mg/kg	15.0	2.60	17.4	44	14.7	1.60	0.490	3.27

Method: Phosphorus and related analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P - Olsen (as P)	mg/kg	49.3	12.0	24.4	99	49.2	7.12	1.51	3.06
P - AL (as P)	mg/kg	150	20.6	13.8	31	154	11.4	4.62	3.09

Method: UK Soil Methods

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P – NaHCO ₃ (1/20)	mg/l	53.2	6.73	12.6	36	53.0	4.25	1.40	2.63
K - NH ₄ NO ₃ (1/5)	mg/l	59.5	6.92	11.6	41	59.4	4.30	1.35	2.27
Mg - NH ₄ NO ₃ (1/5)	mg/l	104	13.7	13.2	40	102	8.15	2.72	2.61
pH - H ₂ O (2/5)	...	5.78	0.104	1.8	39	5.78	0.070	0.021	0.359

Method: PEP-Ammoniumacetate-EDTA extraction

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
AAE10-Mg	mg/kg	88.3	7.03	8.0	10	88.3	5.69	2.78	3.15
AAE10-K	mg/kg	49.9	2.11	4.2	10	49.8	1.08	0.832	1.67

Method: PEP-Test measurements

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
pH-H ₂ O	...	5.92	0.128	2.2	11	5.93	0.060	0.048	0.816

Method: PEP-Physical parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
C-org	%	1.89	0.082	4.4	9	1.90	0.042	0.034	1.81
Humus	%	3.25	0.118	3.6	8	3.26	0.053	0.052	1.61



Indicative Values ISE 835



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	2.21	1.11	50.2	31	2.45	0.650	0.250	11.3
Br	mg/kg	4.78	1.09	22.9	20	4.95	0.750	0.306	6.40
Cd	mg/kg	0.082	0.062	74.7	18	0.086	0.038	0.018	22.0
Cu	mg/kg	4.04	1.72	42.7	40	4.29	0.862	0.341	8.44
Ga	mg/kg	5.80	1.47	25.4	24	6.00	1.00	0.376	6.49
I	mg/kg	2.51	0.924	36.8	4	2.56	0.445	0.578	23.0
Li	mg/kg	5.76	0.524	9.1	5	5.80	0.280	0.293	5.08
Mo	mg/kg	0.644	0.555	86.2	18	0.637	0.218	0.163	25.4
Ni	mg/kg	4.70	2.57	54.7	45	4.84	1.24	0.479	10.2
S	mg/kg	215	78.1	36.3	44	222	48.0	14.7	6.84
Se	mg/kg	0.848	0.714	84.2	9	1.20	0.600	0.297	35.1
Sn	mg/kg	0.938	0.375	40.0	11	1.00	0.238	0.141	15.1
Sb	mg/kg	0.212	0.072	33.7	9	0.220	0.044	0.030	14.1
Be	mg/kg	0.492	0.070	14.2	4	0.502	0.030	0.044	8.85
La	mg/kg	15.1	3.30	21.9	19	15.0	2.71	0.946	6.28
Nb	mg/kg	6.62	1.99	30.1	17	6.10	1.60	0.604	9.12
Nd	mg/kg	13.4	2.87	21.4	12	13.8	2.05	1.04	7.71
Sc	mg/kg	3.31	1.31	39.6	14	3.12	0.885	0.438	13.2
U	mg/kg	1.25	0.504	40.4	16	1.30	0.253	0.157	12.6
Cs	mg/kg	0.621	0.308	49.5	5	0.881	0.201	0.172	27.7
W	mg/kg	1.32	0.840	63.7	6	1.75	0.450	0.429	32.5

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	2.53	2.12	83.9	18	3.23	1.19	0.625	24.7
Cd	mg/kg	0.063	0.019	30.0	31	0.068	0.018	0.004	6.73
K	mg/kg	500	244	48.8	41	500	157	47.6	9.52
Li	mg/kg	3.10	0.659	21.2	10	3.23	0.450	0.260	8.39
Mo	mg/kg	0.433	0.140	32.3	13	0.435	0.085	0.048	11.2
Na	mg/kg	35.5	22.6	63.9	30	36.1	16.0	5.17	14.6
Se	mg/kg	0.160	0.157	98.2	10	0.209	0.104	0.062	38.8
Sn	mg/kg	0.497	0.282	56.8	8	0.564	0.149	0.125	25.1
Y	mg/kg	4.00	0.311	7.8	4	4.10	0.165	0.195	4.86
Sb	mg/kg	0.121	0.042	34.7	8	0.135	0.025	0.019	15.3
Tl	mg/kg	0.098	0.026	26.3	6	0.100	0.011	0.013	13.4
Ti	mg/kg	92.5	20.9	22.6	12	91.7	10.7	7.56	8.17
Ce	mg/kg	24.2	5.32	22.0	4	24.8	2.65	3.33	13.7



Indicative Values ISE 835

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
La	mg/kg	13.5	0.514	3.8	4	13.4	0.250	0.321	2.38
Sc	mg/kg	0.769	0.044	5.7	4	0.781	0.024	0.027	3.57
U	mg/kg	0.599	0.226	37.7	5	0.590	0.130	0.126	21.1
Hg	µg/kg	33.6	9.35	27.8	29	34.0	6.60	2.17	6.45

(cont.)

Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	4.33	2.38	54.9	20	4.59	1.48	0.664	15.3
Hg	µg/kg	34.8	10.5	30.3	25	36.5	6.54	2.63	7.57
Li	mg/kg	3.37	0.951	28.2	12	3.61	0.571	0.343	10.2
Na	mg/kg	35.3	20.5	58.0	29	38.3	13.4	4.75	13.5
Sb	mg/kg	0.098	0.042	42.6	10	0.118	0.027	0.016	16.8
Se	mg/kg	0.184	0.184	99.9	15	0.290	0.171	0.059	32.2
Sn	mg/kg	0.395	0.118	29.8	8	0.412	0.057	0.052	13.2
Ti	mg/kg	125	58.0	46.4	16	139	37.4	18.1	14.5
Tl	mg/kg	0.064	0.015	23.0	13	0.065	0.008	0.005	7.96

Method: Extraction with 0.1M NaNO3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Zn	µg/kg	26.3	3.91	14.8	6	27.3	2.16	1.99	7.57

Method: Extraction with 0.01M CaCl2 1:10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Co	µg/kg	22.8	8.76	38.4	6	26.2	3.99	4.47	19.6
Cu	µg/kg	10.1	1.82	18.1	5	10.9	0.900	1.02	10.1
Fe	mg/kg	4.73	1.35	28.6	12	4.90	0.760	0.489	10.3
N - NH4 (as N)	mg/kg	4.21	1.27	30.1	26	4.30	0.815	0.311	7.38
P	mg/kg	0.389	0.158	40.7	20	0.415	0.120	0.044	11.4
SO4	mg/kg	14.4	5.35	37.2	8	15.2	4.00	2.37	16.4
Zn	µg/kg	169	29.9	17.7	11	166	14.0	11.3	6.68
Ni	µg/kg	21.3	5.20	24.4	4	22.5	2.75	3.25	15.2

Method: Soil characteristics

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
TIC=Tot.Inorg C(as CaCO3)	%	0.246	0.332	134.7	46	0.324	0.255	0.061	24.8
Fraction < 16 µm	%	11.7	3.79	32.5	29	12.5	2.77	0.880	7.53



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Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B - Hot water	mg/kg	0.289	0.110	38.3	36	0.305	0.068	0.023	7.97

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	cmol+/kg	0.039	0.034	86.7	110	0.044	0.026	0.004	10.3

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	16.8	2.02	12.1	7	17.6	2.07	0.957	5.70

Method: Pot. CEC using 1M NH4Cl (BZE)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	cmol+/kg	0.025	0.018	73.5	9	0.031	0.011	0.008	30.6
Al	cmol+/kg	0.159	0.086	54.1	6	0.154	0.056	0.044	27.6
Mn	cmol+/kg	0.060	0.011	18.2	6	0.057	0.005	0.006	9.28
Fe	cmol+/kg	0.059	0.029	48.5	6	0.058	0.012	0.015	24.7

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	5.63	1.60	28.4	6	5.45	1.12	0.817	14.5
Na	cmol+/kg	0.026	0.015	57.1	6	0.030	0.011	0.008	29.1
K	cmol+/kg	0.135	0.081	59.9	8	0.135	0.040	0.036	26.5
Mg	cmol+/kg	0.724	0.136	18.8	9	0.720	0.077	0.057	7.82
Ca	cmol+/kg	3.28	0.747	22.8	9	3.56	0.516	0.311	9.48

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	cmol+/kg	0.017	0.010	60.4	13	0.020	0.007	0.004	20.9
Al	cmol+/kg	0.100	0.020	20.2	10	0.100	0.012	0.008	7.99
Fe	cmol+/kg	0.007	0.004	60.3	6	0.007	0.003	0.002	30.8
Mn	cmol+/kg	0.011	0.002	17.1	7	0.011	0.001	0.001	8.10

Method: Mehlich-3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	0.282	0.178	63.1	29	0.280	0.122	0.041	14.7
Na	mg/kg	6.42	3.99	62.1	34	6.60	2.59	0.855	13.3
Cr	mg/kg	0.442	0.159	35.9	5	0.500	0.080	0.089	20.1



Indicative Values ISE 835



Method: Mehlich-3

(cont.)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Pb	mg/kg	1.81	0.433	23.9	6	1.93	0.237	0.221	12.2
Co	mg/kg	0.098	0.020	20.4	6	0.095	0.012	0.010	10.4

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
N - NO ₃ (as N)	mg/kg	13.0	3.12	23.9	5	13.0	2.00	1.75	13.4

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. %
Mn	mg/kg	8.39	3.42	40.7	50	8.64	2.55	0.604	7.20

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
N - NH ₄ (as N)	mg/kg	6.53	2.47	37.8	35	6.48	1.44	0.521	7.98

Method: Phosphorus and related analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P - Bray (as P)	mg/kg	178	76.9	43.1	68	170	58.4	11.7	6.54
Al - Ox	mg/kg	2079	83.9	4.0	6	2084	70.2	42.8	2.06
Fe - Ox	mg/kg	1811	157	8.7	6	1819	94.0	80.2	4.43
P - Ox	mg/kg	555	13.2	2.4	6	554	8.50	6.75	1.22
P - w (as P)	mg/l soil	6.85	1.39	20.3	8	6.94	0.960	0.615	8.98

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cd	mg/kg	0.047	0.007	14.0	4	0.049	0.004	0.004	8.76
Co	mg/kg	0.235	0.047	19.9	4	0.248	0.025	0.029	12.5
Cr	mg/kg	2.26	0.386	17.1	4	2.35	0.205	0.241	10.7
Cu	mg/kg	1.94	0.955	49.3	8	2.00	0.455	0.422	21.8
Ni	mg/kg	0.502	0.120	24.0	4	0.499	0.055	0.075	15.0
Pb	mg/kg	4.15	0.915	22.1	4	4.38	0.480	0.572	13.8
Zn	mg/kg	2.47	0.523	21.2	8	2.57	0.380	0.231	9.35
Fe	g/kg	0.822	0.126	15.3	7	0.846	0.074	0.059	7.22
K	mg/kg	62.1	11.8	19.0	6	62.6	6.13	6.04	9.72
Mg	mg/kg	109	15.9	14.6	7	114	10.1	7.51	6.90
Mn	mg/kg	36.2	7.07	19.6	8	37.1	4.16	3.13	8.65
P	mg/kg	331	101	30.7	6	353	64.9	51.8	15.7

Indicative Values ISE 835

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

(cont.)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	mg/kg	6.86	4.07	59.4	5	7.70	2.35	2.28	33.2
S	mg/kg	21.5	6.57	30.6	5	24.0	4.40	3.67	17.1
Ca	g/kg	1.04	0.083	8.0	7	1.04	0.059	0.039	3.76

Method: PEP-Ammoniumacetate-EDTA extraction

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
AAE10-Ca	mg/kg	804	148	18.4	10	782	76.4	58.5	7.28
AAE10-P	mg/kg	64.2	10.3	16.1	9	65.7	6.90	4.30	6.70

Method: PEP-Water extraction

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
H2O10-Mg	mg/kg	10.9	0.399	3.7	7	11.0	0.200	0.189	1.72
H2O10-K	mg/kg	16.4	1.51	9.2	7	16.5	0.960	0.713	4.35
H2O10-P	mg/kg	3.90	0.232	6.0	7	3.93	0.120	0.110	2.82

Method: PEP-Test measurements

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CO2-K	K-test	1.58	0.187	11.8	7	1.61	0.090	0.088	5.57
CO2-P	P-test	5.65	0.993	17.6	7	5.42	0.620	0.469	8.31
CC-Mg	Mg-test	7.49	0.328	4.4	7	7.50	0.188	0.155	2.07
pH-CC	...	5.21	0.044	0.8	4	5.21	0.020	0.028	0.530

Method: PEP-Physical parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ton (clay)	%	7.80	1.40	17.9	7	7.95	0.551	0.660	8.46
Schluff (silt)	%	16.1	2.29	14.2	7	16.3	1.30	1.08	6.72
Sand	%	72.6	0.557	0.8	6	72.6	0.225	0.284	0.392
TOC_400	%	1.93	0.218	11.3	7	1.94	0.120	0.103	5.33

Method: PEP-Cation Exchange Capacity

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ca	cmol+/kg	3.28	1.48	45.1	4	3.16	0.848	0.924	28.2
Mg	cmol+/kg	0.723	0.010	1.3	4	0.720	0.005	0.006	0.821
K	cmol+/kg	0.117	0.044	37.6	4	0.120	0.021	0.028	23.5
H	cmol+/kg	10.3	0.370	3.6	4	10.2	0.204	0.231	2.25
KAK	cmol+/kg	14.4	1.76	12.2	4	14.2	0.974	1.10	7.63
S-Wert	cmol+/kg	4.13	1.35	32.6	4	4.02	0.775	0.842	20.4



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Method: PEP-Cation Exchange Capacity									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	(cont.) Rel.Uncert. %
BAS	%	28.4	6.25	22.0	4	27.9	3.62	3.91	13.8