

EMEP – 32nd intercomparison of analytical methods

Laboratory 1, Federal Environmental Agency, Vienna (UBA) (Austria)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.585	0.59	0.573	0.086	0.134	S
G2		1.73	1.716	1.703	0.077	0.348	S
G3		0.902	0.912	0.897	0.043	0.117	S
G4		1.8	1.883	1.875	0.086	-0.867	S
G1	NH ₄ ⁺	0.132	0.134	0.136	0.021	-0.201	S
G2		0.366	0.374	0.38	0.032	-0.422	S
G3		0.185	0.187	0.194	0.02	-0.431	S
G4		0.384	0.401	0.41	0.034	-0.748	S
G1	NO ₃ ⁻	0.203	0.214	0.21	0.01	-0.664	S
G2		0.682	0.695	0.685	0.023	-0.119	S
G3		0.322	0.335	0.331	0.012	-0.73	S
G4		0.77	0.78	0.775	0.038	-0.13	S
G1	Na ⁺	0.142	0.147	0.136	0.014	0.399	S
G2		0.556	0.562	0.543	0.03	0.431	S
G3		0.288	0.293	0.281	0.019	0.356	S
G4		0.613	0.623	0.606	0.029	0.248	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.11	0.116	0.128	0.083	-0.221	S
G2		0.417	0.425	0.407	0.028	0.353	S
G3		0.226	0.232	0.219	0.027	0.246	S
G4		0.45	0.463	0.439	0.037	0.296	S
G1	Ca ²⁺	0.086	0.089	0.094	0.017	-0.476	S
G2		0.234	0.23	0.226	0.022	0.363	S
G3		0.113	0.115	0.113	0.023	0.01	S
G4		0.244	0.255	0.248	0.03	-0.12	S
G1	K ⁺	0.095	0.102	0.098	0.021	-0.118	S
G2		0.402	0.407	0.403	0.034	-0.041	S
G3		0.161	0.17	0.161	0.021	-0.018	S
G4		0.481	0.509	0.504	0.039	-0.58	S
G1	pH	-999	4.7	4.748	0.08		B
G2		-999	4.13	4.172	0.049		B
G3		-999	4.4	4.432	0.049		B
G4		-999	4.1	4.135	0.049		B
G1	Cond	-999	14.22	13.076	1.105		B
G2		-999	45.91	42.56	2.449		B
G3		-999	24.33	22.893	1.303		B
G4		-999	50.43	46.62	2.748		B

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✕ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your result deviates less than $\pm 10\%$ of the expected value for SO_4^{2-} and NO_3^- , less than $\pm 15\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and less than ± 0.1 pH-units for pH

Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 3, Czech Hydrometeorological Institute, Praha (Czech Republic)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.585	0.59	0.573	0.086	0.134	S
G2		1.72	1.716	1.703	0.077	0.219	S
G3		0.904	0.912	0.897	0.043	0.164	S
G4		1.886	1.883	1.875	0.086	0.131	S
G1	NH ₄ ⁺	0.137	0.134	0.136	0.021	0.035	S
G2		0.392	0.374	0.38	0.032	0.385	S
G3		0.18	0.187	0.194	0.02	-0.675	S
G4		0.422	0.401	0.41	0.034	0.359	S
G1	NO ₃ ⁻	0.213	0.214	0.21	0.01	0.349	S
G2		0.687	0.695	0.685	0.023	0.098	S
G3		0.334	0.335	0.331	0.012	0.241	S
G4		0.775	0.78	0.775	0.038	0.001	S
G1	Na ⁺	0.148	0.147	0.136	0.014	0.829	S
G2		0.555	0.562	0.543	0.03	0.398	S
G3		0.295	0.293	0.281	0.019	0.72	S
G4		0.622	0.623	0.606	0.029	0.555	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.113	0.116	0.128	0.083	-0.185	S
G2		0.414	0.425	0.407	0.028	0.245	S
G3		0.222	0.232	0.219	0.027	0.098	S
G4		0.454	0.463	0.439	0.037	0.405	S
G1	Ca ²⁺	0.087	0.089	0.094	0.017	-0.405	S
G2		0.242	0.23	0.226	0.022	0.72	S
G3		0.11	0.115	0.113	0.023	-0.119	S
G4		0.255	0.255	0.248	0.03	0.247	S
G1	K ⁺	0.105	0.102	0.098	0.021	0.349	S
G2		0.431	0.407	0.403	0.034	0.802	S
G3		0.178	0.17	0.161	0.021	0.803	S
G4		0.533	0.509	0.504	0.039	0.741	S
G1	pH	4.757	4.7	4.748	0.08	0.111	S
G2		4.214	4.13	4.172	0.049	0.856	S
G3		4.465	4.4	4.432	0.049	0.682	S
G4		4.167	4.1	4.135	0.049	0.657	S
G1	Cond	13.18	14.22	13.076	1.105	0.094	S
G2		42.65	45.91	42.56	2.449	0.037	S
G3		23.27	24.33	22.893	1.303	0.29	S
G4		48.16	50.43	46.62	2.748	0.56	S

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Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 32nd intercomparison of analytical methods

Laboratory 4, Aarhus University, Department of Environmental Science (Denmark)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.571	0.59	0.573	0.086	-0.028	S
G2		1.696	1.716	1.703	0.077	-0.091	S
G3		0.885	0.912	0.897	0.043	-0.281	S
G4		1.858	1.883	1.875	0.086	-0.194	S
G1	NH ₄ ⁺	0.141	0.134	0.136	0.021	0.224	S
G2		0.386	0.374	0.38	0.032	0.199	S
G3		0.199	0.187	0.194	0.02	0.254	S
G4		0.408	0.401	0.41	0.034	-0.049	S
G1	NO ₃ ⁻	0.201	0.214	0.21	0.01	-0.866	S
G2		0.66	0.695	0.685	0.023	-1.072	S
G3		0.312	0.335	0.331	0.012	-1.539	S
G4		0.741	0.78	0.775	0.038	-0.891	S
G1	Na ⁺	0.14	0.147	0.136	0.014	0.256	S
G2		0.54	0.562	0.543	0.03	-0.1	S
G3		0.28	0.293	0.281	0.019	-0.061	S
G4		0.61	0.623	0.606	0.029	0.145	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.101	0.116	0.128	0.083	-0.329	S
G2		0.383	0.425	0.407	0.028	-0.869	S
G3		0.207	0.232	0.219	0.027	-0.457	S
G4		0.415	0.463	0.439	0.037	-0.658	S
G1	Ca ²⁺	-999	0.089	0.094	0.017		B
G2		-999	0.23	0.226	0.022		B
G3		-999	0.115	0.113	0.023		B
G4		-999	0.255	0.248	0.03		B
G1	K ⁺	0.11	0.102	0.098	0.021	0.587	S
G2		0.41	0.407	0.403	0.034	0.192	S
G3		0.18	0.17	0.161	0.021	0.9	S
G4		0.52	0.509	0.504	0.039	0.411	S
G1	pH	4.73	4.7	4.748	0.08	-0.224	S
G2		4.17	4.13	4.172	0.049	-0.04	S
G3		4.43	4.4	4.432	0.049	-0.036	S
G4		4.13	4.1	4.135	0.049	-0.093	S
G1	Cond	-999	14.22	13.076	1.105		B
G2		-999	45.91	42.56	2.449		B
G3		-999	24.33	22.893	1.303		B
G4		-999	50.43	46.62	2.748		B

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EMEP – 32nd intercomparison of analytical methods

Laboratory 5, Finnish Meteorological Institute. Air Quality Department (Finland)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.594	0.59	0.573	0.086	0.238	S
G2		1.7	1.716	1.703	0.077	-0.04	S
G3		0.906	0.912	0.897	0.043	0.211	S
G4		1.86	1.883	1.875	0.086	-0.171	S
G1	NH ₄ ⁺	0.13	0.134	0.136	0.021	-0.295	S
G2		0.373	0.374	0.38	0.032	-0.205	S
G3		0.187	0.187	0.194	0.02	-0.333	S
G4		0.399	0.401	0.41	0.034	-0.311	S
G1	NO ₃ ⁻	0.217	0.214	0.21	0.01	0.753	S
G2		0.7	0.695	0.685	0.023	0.661	S
G3		0.338	0.335	0.331	0.012	0.565	S
G4		0.792	0.78	0.775	0.038	0.446	S
G1	Na ⁺	0.146	0.147	0.136	0.014	0.686	S
G2		0.565	0.562	0.543	0.03	0.73	S
G3		0.295	0.293	0.281	0.019	0.72	S
G4		0.628	0.623	0.606	0.029	0.76	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.118	0.116	0.128	0.083	-0.125	S
G2		0.419	0.425	0.407	0.028	0.425	S
G3		0.234	0.232	0.219	0.027	0.543	S
G4		0.461	0.463	0.439	0.037	0.596	S
G1	Ca ²⁺	0.09	0.089	0.094	0.017	-0.228	S
G2		0.232	0.23	0.226	0.022	0.274	S
G3		0.118	0.115	0.113	0.023	0.226	S
G4		0.255	0.255	0.248	0.03	0.247	S
G1	K ⁺	0.102	0.102	0.098	0.021	0.206	S
G2		0.434	0.407	0.403	0.034	0.889	S
G3		0.175	0.17	0.161	0.021	0.658	S
G4		0.532	0.509	0.504	0.039	0.716	S
G1	pH	4.7	4.7	4.748	0.08	-0.597	S
G2		4.14	4.13	4.172	0.049	-0.651	S
G3		4.41	4.4	4.432	0.049	-0.446	S
G4		4.1	4.1	4.135	0.049	-0.7	S
G1	Cond	13.9	14.22	13.076	1.105	0.745	S
G2		44.7	45.91	42.56	2.449	0.874	S
G3		24	24.33	22.893	1.303	0.85	S
G4		49.1	50.43	46.62	2.748	0.902	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 6, SGS Multilab (France)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.589	0.59	0.573	0.086	0.18	S
G2		1.713	1.716	1.703	0.077	0.128	S
G3		0.908	0.912	0.897	0.043	0.258	S
G4		1.882	1.883	1.875	0.086	0.085	S
G1	NH ₄ ⁺	0.116	0.134	0.136	0.021	-0.956	S
G2		0.274	0.374	0.38	0.032	-3.278	U
G3		0.155	0.187	0.194	0.02	-1.898	Q
G4		0.291	0.401	0.41	0.034	-3.458	U
G1	NO ₃ ⁻	0.207	0.214	0.21	0.01	-0.259	S
G2		0.68	0.695	0.685	0.023	-0.206	S
G3		0.328	0.335	0.331	0.012	-0.244	S
G4		0.769	0.78	0.775	0.038	-0.157	S
G1	Na ⁺	0.127	0.147	0.136	0.014	-0.676	S
G2		0.494	0.562	0.543	0.03	-1.628	S
G3		0.257	0.293	0.281	0.019	-1.258	S
G4		0.553	0.623	0.606	0.029	-1.804	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.108	0.116	0.128	0.083	-0.245	S
G2		0.411	0.425	0.407	0.028	0.137	S
G3		0.221	0.232	0.219	0.027	0.061	S
G4		0.453	0.463	0.439	0.037	0.378	S
G1	Ca ²⁺	0.078	0.089	0.094	0.017	-0.936	S
G2		0.212	0.23	0.226	0.022	-0.619	S
G3		0.101	0.115	0.113	0.023	-0.507	S
G4		0.239	0.255	0.248	0.03	-0.287	S
G1	K ⁺	0.095	0.102	0.098	0.021	-0.127	S
G2		0.389	0.407	0.403	0.034	-0.419	S
G3		0.16	0.17	0.161	0.021	-0.067	S
G4		0.486	0.509	0.504	0.039	-0.453	S
G1	pH	4.68	4.7	4.748	0.08	-0.846	S
G2		4.15	4.13	4.172	0.049	-0.447	S
G3		4.37	4.4	4.432	0.049	-1.267	S
G4		4.13	4.1	4.135	0.049	-0.093	S
G1	Cond	13.37	14.22	13.076	1.105	0.266	S
G2		43.8	45.91	42.56	2.449	0.507	S
G3		23.37	24.33	22.893	1.303	0.366	S
G4		48.2	50.43	46.62	2.748	0.575	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

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<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 8, Umweltbundesamt, Langen (Germany)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.623	0.59	0.573	0.086	0.573	S
G2		1.707	1.716	1.703	0.077	0.051	S
G3		0.904	0.912	0.897	0.043	0.164	S
G4		1.873	1.883	1.875	0.086	-0.02	S
G1	NH ₄ ⁺	0.119	0.134	0.136	0.021	-0.814	S
G2		0.365	0.374	0.38	0.032	-0.453	S
G3		0.175	0.187	0.194	0.02	-0.92	S
G4		0.394	0.401	0.41	0.034	-0.457	S
G1	NO ₃ ⁻	0.212	0.214	0.21	0.01	0.247	S
G2		0.676	0.695	0.685	0.023	-0.379	S
G3		0.345	0.335	0.331	0.012	1.131	S
G4		0.765	0.78	0.775	0.038	-0.262	S
G1	Na ⁺	0.124	0.147	0.136	0.014	-0.891	Q
G2		0.537	0.562	0.543	0.03	-0.2	S
G3		0.268	0.293	0.281	0.019	-0.686	S
G4		0.6	0.623	0.606	0.029	-0.197	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.113	0.116	0.128	0.083	-0.185	S
G2		0.403	0.425	0.407	0.028	-0.15	S
G3		0.216	0.232	0.219	0.027	-0.124	S
G4		0.441	0.463	0.439	0.037	0.051	S
G1	Ca ²⁺	0.06	0.089	0.094	0.017	-1.998	U
G2		0.198	0.23	0.226	0.022	-1.243	S
G3		0.081	0.115	0.113	0.023	-1.37	U
G4		0.224	0.255	0.248	0.03	-0.787	S
G1	K ⁺	0.09	0.102	0.098	0.021	-0.365	S
G2		0.384	0.407	0.403	0.034	-0.564	S
G3		0.156	0.17	0.161	0.021	-0.26	S
G4		0.478	0.509	0.504	0.039	-0.656	S
G1	pH	4.74	4.7	4.748	0.08	-0.1	S
G2		4.18	4.13	4.172	0.049	0.164	S
G3		4.44	4.4	4.432	0.049	0.169	S
G4		4.15	4.1	4.135	0.049	0.312	S
G1	Cond	13.9	14.22	13.076	1.105	0.745	S
G2		43.4	45.91	42.56	2.449	0.343	S
G3		23.4	24.33	22.893	1.303	0.389	S
G4		47.6	50.43	46.62	2.748	0.356	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 10, Institute for Atmospheric Physics (Hungary)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.609	0.59	0.573	0.086	0.411	S
G2		1.774	1.716	1.703	0.077	0.916	S
G3		0.935	0.912	0.897	0.043	0.89	S
G4		1.952	1.883	1.875	0.086	0.897	S
G1	NH ₄ ⁺	0.126	0.134	0.136	0.021	-0.484	S
G2		0.371	0.374	0.38	0.032	-0.267	S
G3		0.182	0.187	0.194	0.02	-0.578	S
G4		0.398	0.401	0.41	0.034	-0.34	S
G1	NO ₃ ⁻	0.207	0.214	0.21	0.01	-0.259	S
G2		0.685	0.695	0.685	0.023	0.011	S
G3		0.327	0.335	0.331	0.012	-0.325	S
G4		0.783	0.78	0.775	0.038	0.21	S
G1	Na ⁺	0.134	0.147	0.136	0.014	-0.174	S
G2		0.512	0.562	0.543	0.03	-1.03	S
G3		0.26	0.293	0.281	0.019	-1.102	S
G4		0.567	0.623	0.606	0.029	-1.325	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.125	0.116	0.128	0.083	-0.041	S
G2		0.428	0.425	0.407	0.028	0.748	S
G3		0.245	0.232	0.219	0.027	0.95	S
G4		0.437	0.463	0.439	0.037	-0.058	S
G1	Ca ²⁺	0.085	0.089	0.094	0.017	-0.523	S
G2		0.232	0.23	0.226	0.022	0.274	S
G3		0.122	0.115	0.113	0.023	0.398	S
G4		0.251	0.255	0.248	0.03	0.113	S
G1	K ⁺	0.11	0.102	0.098	0.021	0.587	S
G2		0.453	0.407	0.403	0.034	1.441	S
G3		0.184	0.17	0.161	0.021	1.093	S
G4		0.537	0.509	0.504	0.039	0.843	S
G1	pH	4.05	4.7	4.748	0.08	-8.675	U
G2		4.02	4.13	4.172	0.049	-3.096	Q
G3		4.4	4.4	4.432	0.049	-0.651	S
G4		4.11	4.1	4.135	0.049	-0.498	S
G1	Cond	13.4	14.22	13.076	1.105	0.293	S
G2		43.2	45.91	42.56	2.449	0.262	S
G3		23	24.33	22.893	1.303	0.082	S
G4		47.6	50.43	46.62	2.748	0.356	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 12, Met. Eirann, Dublin (Ireland)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.61	0.59	0.573	0.086	0.423	S
G2		1.76	1.716	1.703	0.077	0.735	S
G3		0.94	0.912	0.897	0.043	1.008	S
G4		1.92	1.883	1.875	0.086	0.526	S
G1	NH ₄ ⁺	0.12	0.134	0.136	0.021	-0.767	S
G2		0.38	0.374	0.38	0.032	0.013	S
G3		0.18	0.187	0.194	0.02	-0.675	S
G4		0.41	0.401	0.41	0.034	0.009	S
G1	NO ₃ ⁻	0.21	0.214	0.21	0.01	0.045	S
G2		0.69	0.695	0.685	0.023	0.228	S
G3		0.33	0.335	0.331	0.012	-0.083	S
G4		0.77	0.78	0.775	0.038	-0.13	S
G1	Na ⁺	0.12	0.147	0.136	0.014	-1.178	Q
G2		0.5	0.562	0.543	0.03	-1.429	S
G3		0.25	0.293	0.281	0.019	-1.623	S
G4		0.56	0.623	0.606	0.029	-1.564	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.11	0.116	0.128	0.083	-0.221	S
G2		0.4	0.425	0.407	0.028	-0.258	S
G3		0.21	0.232	0.219	0.027	-0.346	S
G4		0.43	0.463	0.439	0.037	-0.249	S
G1	Ca ²⁺	0.08	0.089	0.094	0.017	-0.818	S
G2		0.2	0.23	0.226	0.022	-1.154	S
G3		0.1	0.115	0.113	0.023	-0.55	S
G4		0.22	0.255	0.248	0.03	-0.921	S
G1	K ⁺	-999	0.102	0.098	0.021		B
G2		-999	0.407	0.403	0.034		B
G3		-999	0.17	0.161	0.021		B
G4		-999	0.509	0.504	0.039		B
G1	pH	4.7	4.7	4.748	0.08	-0.597	S
G2		4.17	4.13	4.172	0.049	-0.04	S
G3		4.44	4.4	4.432	0.049	0.169	S
G4		4.13	4.1	4.135	0.049	-0.093	S
G1	Cond	13.3	14.22	13.076	1.105	0.202	S
G2		43.6	45.91	42.56	2.449	0.425	S
G3		23.3	24.33	22.893	1.303	0.313	S
G4		47.7	50.43	46.62	2.748	0.393	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 13, C.N.R. Istituto Inquinamento Atmosferico (Italy)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.599	0.59	0.573	0.086	0.295	S
G2		1.69	1.716	1.703	0.077	-0.169	S
G3		0.933	0.912	0.897	0.043	0.844	S
G4		1.848	1.883	1.875	0.086	-0.31	S
G1	NH ₄ ⁺	0.144	0.134	0.136	0.021	0.365	S
G2		0.404	0.374	0.38	0.032	0.758	S
G3		0.207	0.187	0.194	0.02	0.645	S
G4		0.447	0.401	0.41	0.034	1.088	S
G1	NO ₃ ⁻	0.224	0.214	0.21	0.01	1.462	S
G2		0.735	0.695	0.685	0.023	2.177	S
G3		0.359	0.335	0.331	0.012	2.264	S
G4		0.85	0.78	0.775	0.038	1.966	S
G1	Na ⁺	0.133	0.147	0.136	0.014	-0.246	S
G2		0.56	0.562	0.543	0.03	0.564	S
G3		0.285	0.293	0.281	0.019	0.2	S
G4		0.635	0.623	0.606	0.029	1	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.122	0.116	0.128	0.083	-0.077	S
G2		0.439	0.425	0.407	0.028	1.144	S
G3		0.24	0.232	0.219	0.027	0.765	S
G4		0.473	0.463	0.439	0.037	0.923	S
G1	Ca ²⁺	0.119	0.089	0.094	0.017	1.483	U
G2		0.226	0.23	0.226	0.022	0.006	S
G3		0.135	0.115	0.113	0.023	0.959	Q
G4		0.259	0.255	0.248	0.03	0.38	S
G1	K ⁺	0.096	0.102	0.098	0.021	-0.079	S
G2		0.419	0.407	0.403	0.034	0.453	S
G3		0.165	0.17	0.161	0.021	0.175	S
G4		0.542	0.509	0.504	0.039	0.97	S
G1	pH	5.08	4.7	4.748	0.08	4.126	U
G2		4.22	4.13	4.172	0.049	0.978	S
G3		4.91	4.4	4.432	0.049	9.809	U
G4		4.25	4.1	4.135	0.049	2.338	Q
G1	Cond	11.8	14.22	13.076	1.105	-1.155	Q
G2		41.7	45.91	42.56	2.449	-0.351	S
G3		17.1	24.33	22.893	1.303	-4.445	U
G4		44.8	50.43	46.62	2.748	-0.662	S

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S – Satisfactory: Your result deviates less than $\pm 10\%$ of the expected value for SO_4^{2-} and NO_3^- , less than $\pm 15\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and less than ± 0.1 pH-units for pH

Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 15, Norwegian Institute for Air Research NILU (Norway)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.57	0.59	0.573	0.086	-0.04	S
G2		1.72	1.716	1.703	0.077	0.219	S
G3		0.92	0.912	0.897	0.043	0.539	S
G4		1.89	1.883	1.875	0.086	0.178	S
G1	NH ₄ ⁺	0.133	0.134	0.136	0.021	-0.154	S
G2		0.395	0.374	0.38	0.032	0.478	S
G3		0.194	0.187	0.194	0.02	0.009	S
G4		0.417	0.401	0.41	0.034	0.213	S
G1	NO ₃ ⁻	0.22	0.214	0.21	0.01	1.057	S
G2		0.72	0.695	0.685	0.023	1.527	S
G3		0.35	0.335	0.331	0.012	1.536	S
G4		0.81	0.78	0.775	0.038	0.918	S
G1	Na ⁺	0.141	0.147	0.136	0.014	0.328	S
G2		0.561	0.562	0.543	0.03	0.597	S
G3		0.283	0.293	0.281	0.019	0.096	S
G4		0.623	0.623	0.606	0.029	0.59	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.115	0.116	0.128	0.083	-0.161	S
G2		0.422	0.425	0.407	0.028	0.533	S
G3		0.23	0.232	0.219	0.027	0.395	S
G4		0.459	0.463	0.439	0.037	0.542	S
G1	Ca ²⁺	0.094	0.089	0.094	0.017	0.008	S
G2		0.225	0.23	0.226	0.022	-0.038	S
G3		0.113	0.115	0.113	0.023	0.01	S
G4		0.245	0.255	0.248	0.03	-0.087	S
G1	K ⁺	0.104	0.102	0.098	0.021	0.301	S
G2		0.417	0.407	0.403	0.034	0.395	S
G3		0.166	0.17	0.161	0.021	0.223	S
G4		0.504	0.509	0.504	0.039	0.004	S
G1	pH	4.72	4.7	4.748	0.08	-0.349	S
G2		4.18	4.13	4.172	0.049	0.164	S
G3		4.44	4.4	4.432	0.049	0.169	S
G4		4.15	4.1	4.135	0.049	0.312	S
G1	Cond	13.4	14.22	13.076	1.105	0.293	S
G2		44.3	45.91	42.56	2.449	0.711	S
G3		23.7	24.33	22.893	1.303	0.62	S
G4		48.6	50.43	46.62	2.748	0.72	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 16, Institute of Meteorology and Water Management, Warsaw (Poland)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.58	0.59	0.573	0.086	0.076	S
G2		1.654	1.716	1.703	0.077	-0.634	S
G3		0.877	0.912	0.897	0.043	-0.469	S
G4		1.819	1.883	1.875	0.086	-0.646	S
G1	NH ₄ ⁺	0.377	0.134	0.136	0.021	11.361	U
G2		0.669	0.374	0.38	0.032	8.986	U
G3		0.43	0.187	0.194	0.02	11.547	U
G4		0.727	0.401	0.41	0.034	9.247	U
G1	NO ₃ ⁻	0.213	0.214	0.21	0.01	0.349	S
G2		0.663	0.695	0.685	0.023	-0.942	S
G3		0.322	0.335	0.331	0.012	-0.73	S
G4		0.751	0.78	0.775	0.038	-0.628	S
G1	Na ⁺	0.15	0.147	0.136	0.014	0.973	S
G2		0.556	0.562	0.543	0.03	0.431	S
G3		0.3	0.293	0.281	0.019	0.981	S
G4		0.613	0.623	0.606	0.029	0.248	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.131	0.116	0.128	0.083	0.031	S
G2		0.416	0.425	0.407	0.028	0.317	S
G3		0.241	0.232	0.219	0.027	0.802	S
G4		0.456	0.463	0.439	0.037	0.46	S
G1	Ca ²⁺	0.088	0.089	0.094	0.017	-0.346	S
G2		0.231	0.23	0.226	0.022	0.229	S
G3		0.117	0.115	0.113	0.023	0.183	S
G4		0.268	0.255	0.248	0.03	0.68	S
G1	K ⁺	0.104	0.102	0.098	0.021	0.301	S
G2		0.415	0.407	0.403	0.034	0.337	S
G3		0.169	0.17	0.161	0.021	0.368	S
G4		0.526	0.509	0.504	0.039	0.563	S
G1	pH	4.77	4.7	4.748	0.08	0.273	S
G2		4.14	4.13	4.172	0.049	-0.651	S
G3		4.46	4.4	4.432	0.049	0.579	S
G4		4.1	4.1	4.135	0.049	-0.7	S
G1	Cond	13.4	14.22	13.076	1.105	0.293	S
G2		43.3	45.91	42.56	2.449	0.302	S
G3		23	24.33	22.893	1.303	0.082	S
G4		47.6	50.43	46.62	2.748	0.356	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 18, National Environment Protection Agency (Romania)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.604	0.59	0.573	0.086	0.353	S
G2		1.729	1.716	1.703	0.077	0.335	S
G3		0.921	0.912	0.897	0.043	0.562	S
G4		1.898	1.883	1.875	0.086	0.271	S
G1	NH ₄ ⁺	-999	0.134	0.136	0.021		B
G2		-999	0.374	0.38	0.032		B
G3		-999	0.187	0.194	0.02		B
G4		-999	0.401	0.41	0.034		B
G1	NO ₃ ⁻	0.211	0.214	0.21	0.01	0.146	S
G2		0.681	0.695	0.685	0.023	-0.162	S
G3		0.342	0.335	0.331	0.012	0.888	S
G4		0.766	0.78	0.775	0.038	-0.235	S
G1	Na ⁺	-999	0.147	0.136	0.014		B
G2		-999	0.562	0.543	0.03		B
G3		-999	0.293	0.281	0.019		B
G4		-999	0.623	0.606	0.029		B
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.116	0.116	0.128	0.083	-0.149	S
G2		0.419	0.425	0.407	0.028	0.425	S
G3		0.228	0.232	0.219	0.027	0.321	S
G4		0.456	0.463	0.439	0.037	0.46	S
G1	Ca ²⁺	-999	0.089	0.094	0.017		B
G2		-999	0.23	0.226	0.022		B
G3		-999	0.115	0.113	0.023		B
G4		-999	0.255	0.248	0.03		B
G1	K ⁺	-999	0.102	0.098	0.021		B
G2		-999	0.407	0.403	0.034		B
G3		-999	0.17	0.161	0.021		B
G4		-999	0.509	0.504	0.039		B
G1	pH	-999	4.7	4.748	0.08		B
G2		-999	4.13	4.172	0.049		B
G3		-999	4.4	4.432	0.049		B
G4		-999	4.1	4.135	0.049		B
G1	Cond	-999	14.22	13.076	1.105		B
G2		-999	45.91	42.56	2.449		B
G3		-999	24.33	22.893	1.303		B
G4		-999	50.43	46.62	2.748		B

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EMEP – 32nd intercomparison of analytical methods

Laboratory 19, Centro Nacional de Sanidad Ambiental (Spain)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.6	0.59	0.574	0.086	0.306	S
G2		1.61	1.716	1.703	0.077	-1.21	S
G3		0.89	0.912	0.897	0.042	-0.163	S
G4		1.75	1.883	1.874	0.085	-1.457	S
G1	NH ₄ ⁺	0.16	0.134	0.136	0.021	1.124	Q
G2		0.407	0.374	0.38	0.032	0.859	S
G3		0.215	0.187	0.194	0.02	1.041	S
G4		0.421	0.401	0.41	0.034	0.335	S
G1	NO ₃ ⁻	0.22	0.214	0.21	0.01	1.048	S
G2		0.66	0.695	0.685	0.023	-1.087	S
G3		0.33	0.335	0.331	0.012	-0.092	S
G4		0.73	0.78	0.775	0.038	-1.192	S
G1	Na ⁺	0.13	0.147	0.137	0.014	-0.476	S
G2		0.57	0.562	0.543	0.03	0.886	S
G3		0.3	0.293	0.281	0.019	0.974	S
G4		0.64	0.623	0.608	0.027	1.164	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	< 0.300	0.116	0.128	0.083		B
G2		0.4	0.425	0.407	0.028	-0.271	S
G3		< 0.300	0.232	0.22	0.027		B
G4		0.44	0.463	0.44	0.036	0.013	S
G1	Ca ²⁺	< 0.100	0.089	0.094	0.017		B
G2		0.2	0.23	0.226	0.022	-1.167	S
G3		< 0.100	0.115	0.113	0.023	-2.735	U
G4		0.22	0.255	0.248	0.03	-0.933	S
G1	K ⁺	0.11	0.102	0.098	0.021	0.589	S
G2		0.38	0.407	0.404	0.034	-0.692	S
G3		0.14	0.17	0.162	0.021	-1.049	Q
G4		0.47	0.509	0.504	0.039	-0.874	S
G1	pH	4.86	4.7	4.747	0.08	1.412	Q
G2		4.18	4.13	4.172	0.049	0.166	S
G3		4.47	4.4	4.432	0.048	0.789	S
G4		4.13	4.1	4.135	0.049	-0.096	S
G1	Cond	11.8	14.22	13.09	1.099	-1.174	Q
G2		40.2	45.91	42.568	2.426	-0.976	S
G3		21.4	24.33	22.991	1.122	-1.417	S
G4		44.6	50.43	46.63	2.722	-0.746	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 20, Swedish Environmental Research Institute IVL, Gothenburg (Sweden)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.593	0.59	0.574	0.086	0.224	S
G2		1.69	1.716	1.703	0.077	-0.167	S
G3		0.891	0.912	0.897	0.042	-0.139	S
G4		1.86	1.883	1.874	0.085	-0.169	S
G1	NH ₄ ⁺	0.143	0.134	0.136	0.021	0.315	S
G2		0.379	0.374	0.38	0.032	-0.018	S
G3		0.198	0.187	0.194	0.02	0.203	S
G4		0.406	0.401	0.41	0.034	-0.106	S
G1	NO ₃ ⁻	0.217	0.214	0.21	0.01	0.743	S
G2		0.695	0.695	0.685	0.023	0.44	S
G3		0.337	0.335	0.331	0.012	0.479	S
G4		0.784	0.78	0.775	0.038	0.234	S
G1	Na ⁺	0.146	0.147	0.137	0.014	0.677	S
G2		0.565	0.562	0.543	0.03	0.719	S
G3		0.294	0.293	0.281	0.019	0.659	S
G4		0.629	0.623	0.608	0.027	0.758	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.116	0.116	0.128	0.083	-0.147	S
G2		0.426	0.425	0.407	0.028	0.668	S
G3		0.232	0.232	0.22	0.027	0.464	S
G4		0.462	0.463	0.44	0.036	0.616	S
G1	Ca ²⁺	0.092	0.089	0.094	0.017	-0.109	S
G2		0.228	0.23	0.226	0.022	0.095	S
G3		0.115	0.115	0.113	0.023	0.095	S
G4		0.252	0.255	0.248	0.03	0.145	S
G1	K ⁺	0.101	0.102	0.098	0.021	0.157	S
G2		0.413	0.407	0.404	0.034	0.276	S
G3		0.168	0.17	0.162	0.021	0.317	S
G4		0.519	0.509	0.504	0.039	0.381	S
G1	pH	4.72	4.7	4.747	0.08	-0.345	S
G2		4.17	4.13	4.172	0.049	-0.04	S
G3		4.44	4.4	4.432	0.048	0.167	S
G4		4.14	4.1	4.135	0.049	0.109	S
G1	Cond	13.8	14.22	13.09	1.099	0.646	S
G2		43	45.91	42.568	2.426	0.178	S
G3		23.2	24.33	22.991	1.122	0.187	S
G4		47.1	50.43	46.63	2.722	0.173	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

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EMEP – 32nd intercomparison of analytical methods

Laboratory 21, Swiss Federal Laboratories for Materials Testing EMPA (Switzerland)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.591	0.59	0.573	0.086	0.203	S
G2		1.726	1.716	1.703	0.077	0.296	S
G3		0.912	0.912	0.897	0.043	0.351	S
G4		1.902	1.883	1.875	0.086	0.317	S
G1	NH ₄ ⁺	0.134	0.134	0.136	0.021	-0.106	S
G2		0.38	0.374	0.38	0.032	0.013	S
G3		0.202	0.187	0.194	0.02	0.4	S
G4		0.408	0.401	0.41	0.034	-0.049	S
G1	NO ₃ ⁻	0.209	0.214	0.21	0.01	-0.056	S
G2		0.698	0.695	0.685	0.023	0.574	S
G3		0.333	0.335	0.331	0.012	0.16	S
G4		0.784	0.78	0.775	0.038	0.236	S
G1	Na ⁺	0.138	0.147	0.136	0.014	0.113	S
G2		0.546	0.562	0.543	0.03	0.099	S
G3		0.283	0.293	0.281	0.019	0.096	S
G4		0.61	0.623	0.606	0.029	0.145	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.111	0.116	0.128	0.083	-0.209	S
G2		0.412	0.425	0.407	0.028	0.173	S
G3		0.222	0.232	0.219	0.027	0.098	S
G4		0.45	0.463	0.439	0.037	0.296	S
G1	Ca ²⁺	0.085	0.089	0.094	0.017	-0.523	S
G2		0.206	0.23	0.226	0.022	-0.886	S
G3		0.104	0.115	0.113	0.023	-0.378	S
G4		0.223	0.255	0.248	0.03	-0.821	S
G1	K ⁺	0.098	0.102	0.098	0.021	0.016	S
G2		0.438	0.407	0.403	0.034	1.005	S
G3		0.173	0.17	0.161	0.021	0.561	S
G4		0.55	0.509	0.504	0.039	1.173	S
G1	pH	4.72	4.7	4.748	0.08	-0.349	S
G2		4.19	4.13	4.172	0.049	0.367	S
G3		4.44	4.4	4.432	0.049	0.169	S
G4		4.14	4.1	4.135	0.049	0.11	S
G1	Cond	13.32	14.22	13.076	1.105	0.22	S
G2		43.37	45.91	42.56	2.449	0.331	S
G3		23.43	24.33	22.893	1.303	0.412	S
G4		47.86	50.43	46.62	2.748	0.451	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 22, Institute of Global Climate and Ecology (Russian Federation)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.606	0.59	0.573	0.086	0.376	S
G2		1.895	1.716	1.703	0.077	2.479	Q
G3		0.981	0.912	0.897	0.043	1.968	S
G4		2.119	1.883	1.875	0.086	2.836	Q
G1	NH ₄ ⁺	0.121	0.134	0.136	0.021	-0.72	S
G2		0.353	0.374	0.38	0.032	-0.826	S
G3		0.201	0.187	0.194	0.02	0.351	S
G4		0.376	0.401	0.41	0.034	-0.981	S
G1	NO ₃ ⁻	0.221	0.214	0.21	0.01	1.158	S
G2		0.745	0.695	0.685	0.023	2.61	S
G3		0.348	0.335	0.331	0.012	1.374	S
G4		0.843	0.78	0.775	0.038	1.783	S
G1	Na ⁺	0.195	0.147	0.136	0.014	4.199	U
G2		0.492	0.562	0.543	0.03	-1.694	S
G3		0.255	0.293	0.281	0.019	-1.363	S
G4		0.565	0.623	0.606	0.029	-1.393	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.257	0.116	0.128	0.083	1.542	U
G2		0.427	0.425	0.407	0.028	0.712	S
G3		0.225	0.232	0.219	0.027	0.209	S
G4		0.49	0.463	0.439	0.037	1.386	S
G1	Ca ²⁺	0.133	0.089	0.094	0.017	2.309	U
G2		0.209	0.23	0.226	0.022	-0.753	S
G3		0.122	0.115	0.113	0.023	0.398	S
G4		0.217	0.255	0.248	0.03	-1.021	S
G1	K ⁺	0.166	0.102	0.098	0.021	3.251	U
G2		0.409	0.407	0.403	0.034	0.163	S
G3		0.165	0.17	0.161	0.021	0.175	S
G4		0.508	0.509	0.504	0.039	0.106	S
G1	pH	4.74	4.7	4.748	0.08	-0.1	S
G2		4.43	4.13	4.172	0.049	5.256	U
G3		4.68	4.4	4.432	0.049	5.092	U
G4		4.28	4.1	4.135	0.049	2.946	Q
G1	Cond	10.2	14.22	13.076	1.105	-2.602	U
G2		34.6	45.91	42.56	2.449	-3.25	Q
G3		18.3	24.33	22.893	1.303	-3.524	Q
G4		38.2	50.43	46.62	2.748	-3.064	Q

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EMEP – 32nd intercomparison of analytical methods

Laboratory 23, Ricardo-AEA Limited (United Kingdom)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.572	0.59	0.573	0.086	-0.023	S
G2		1.651	1.716	1.703	0.077	-0.666	S
G3		0.867	0.912	0.897	0.043	-0.703	S
G4		1.814	1.883	1.875	0.086	-0.704	S
G1	NH ₄ ⁺	0.146	0.134	0.136	0.021	0.483	S
G2		0.381	0.374	0.38	0.032	0.044	S
G3		0.204	0.187	0.194	0.02	0.498	S
G4		0.411	0.401	0.41	0.034	0.053	S
G1	NO ₃ ⁻	0.206	0.214	0.21	0.01	-0.309	S
G2		0.684	0.695	0.685	0.023	-0.011	S
G3		0.325	0.335	0.331	0.012	-0.487	S
G4		0.774	0.78	0.775	0.038	-0.026	S
G1	Na ⁺	0.116	0.147	0.136	0.014	-1.5	Q
G2		0.537	0.562	0.543	0.03	-0.2	S
G3		0.271	0.293	0.281	0.019	-0.529	S
G4		0.607	0.623	0.606	0.029	0.043	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.102	0.116	0.128	0.083	-0.323	S
G2		0.403	0.425	0.407	0.028	-0.15	S
G3		0.21	0.232	0.219	0.027	-0.346	S
G4		0.443	0.463	0.439	0.037	0.092	S
G1	Ca ²⁺	0.075	0.089	0.094	0.017	-1.113	Q
G2		0.213	0.23	0.226	0.022	-0.552	S
G3		0.1	0.115	0.113	0.023	-0.55	S
G4		0.235	0.255	0.248	0.03	-0.404	S
G1	K ⁺	0.098	0.102	0.098	0.021	-0.008	S
G2		0.401	0.407	0.403	0.034	-0.07	S
G3		0.165	0.17	0.161	0.021	0.175	S
G4		0.505	0.509	0.504	0.039	0.03	S
G1	pH	4.59	4.7	4.748	0.08	-1.964	Q
G2		4.09	4.13	4.172	0.049	-1.67	S
G3		4.335	4.4	4.432	0.049	-1.985	S
G4		4.065	4.1	4.135	0.049	-1.409	S
G1	Cond	12.485	14.22	13.076	1.105	-0.535	S
G2		41.8	45.91	42.56	2.449	-0.31	S
G3		23	24.33	22.893	1.303	0.082	S
G4		47.75	50.43	46.62	2.748	0.411	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 24, Serbian Environmental Protection Agency (Serbia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.606	0.59	0.573	0.086	0.376	S
G2		1.722	1.716	1.703	0.077	0.244	S
G3		0.904	0.912	0.897	0.043	0.164	S
G4		1.951	1.883	1.875	0.086	0.886	S
G1	NH ₄ ⁺	0.128	0.134	0.136	0.021	-0.39	S
G2		0.381	0.374	0.38	0.032	0.044	S
G3		0.187	0.187	0.194	0.02	-0.333	S
G4		0.399	0.401	0.41	0.034	-0.311	S
G1	NO ₃ ⁻	0.221	0.214	0.21	0.01	1.158	S
G2		0.715	0.695	0.685	0.023	1.311	S
G3		0.337	0.335	0.331	0.012	0.484	S
G4		0.803	0.78	0.775	0.038	0.734	S
G1	Na ⁺	0.119	0.147	0.136	0.014	-1.249	Q
G2		0.56	0.562	0.543	0.03	0.564	S
G3		0.285	0.293	0.281	0.019	0.2	S
G4		0.624	0.623	0.606	0.029	0.624	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.108	0.116	0.128	0.083	-0.245	S
G2		0.425	0.425	0.407	0.028	0.641	S
G3		0.225	0.232	0.219	0.027	0.209	S
G4		0.465	0.463	0.439	0.037	0.705	S
G1	Ca ²⁺	0.104	0.089	0.094	0.017	0.598	Q
G2		0.2	0.23	0.226	0.022	-1.154	S
G3		0.11	0.115	0.113	0.023	-0.119	S
G4		0.24	0.255	0.248	0.03	-0.254	S
G1	K ⁺	0.111	0.102	0.098	0.021	0.634	S
G2		0.44	0.407	0.403	0.034	1.063	S
G3		0.169	0.17	0.161	0.021	0.368	S
G4		0.52	0.509	0.504	0.039	0.411	S
G1	pH	-999	4.7	4.748	0.08		B
G2		-999	4.13	4.172	0.049		B
G3		-999	4.4	4.432	0.049		B
G4		-999	4.1	4.135	0.049		B
G1	Cond	13.66	14.22	13.076	1.105	0.528	S
G2		43.7	45.91	42.56	2.449	0.466	S
G3		23.68	24.33	22.893	1.303	0.604	S
G4		48.2	50.43	46.62	2.748	0.575	S

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✕ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your result deviates less than $\pm 10\%$ of the expected value for SO_4^{2-} and NO_3^- , less than $\pm 15\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and less than ± 0.1 pH-units for pH

Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

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<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 26, Environment Canada, Ontario (Canada)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.585	0.59	0.573	0.086	0.134	S
G2		1.701	1.716	1.703	0.077	-0.027	S
G3		0.899	0.912	0.897	0.043	0.047	S
G4		1.867	1.883	1.875	0.086	-0.089	S
G1	NH ₄ ⁺	0.132	0.134	0.136	0.021	-0.201	S
G2		0.373	0.374	0.38	0.032	-0.205	S
G3		0.188	0.187	0.194	0.02	-0.284	S
G4		0.401	0.401	0.41	0.034	-0.253	S
G1	NO ₃ ⁻	0.212	0.214	0.21	0.01	0.247	S
G2		0.687	0.695	0.685	0.023	0.098	S
G3		0.334	0.335	0.331	0.012	0.241	S
G4		0.775	0.78	0.775	0.038	0.001	S
G1	Na ⁺	0.147	0.147	0.136	0.014	0.758	S
G2		0.568	0.562	0.543	0.03	0.829	S
G3		0.295	0.293	0.281	0.019	0.72	S
G4		0.627	0.623	0.606	0.029	0.726	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.111	0.116	0.128	0.083	-0.209	S
G2		0.422	0.425	0.407	0.028	0.533	S
G3		0.228	0.232	0.219	0.027	0.321	S
G4		0.458	0.463	0.439	0.037	0.514	S
G1	Ca ²⁺	0.09	0.089	0.094	0.017	-0.228	S
G2		0.231	0.23	0.226	0.022	0.229	S
G3		0.117	0.115	0.113	0.023	0.183	S
G4		0.261	0.255	0.248	0.03	0.447	S
G1	K ⁺	0.103	0.102	0.098	0.021	0.254	S
G2		0.415	0.407	0.403	0.034	0.337	S
G3		0.173	0.17	0.161	0.021	0.561	S
G4		0.522	0.509	0.504	0.039	0.462	S
G1	pH	4.78	4.7	4.748	0.08	0.397	S
G2		4.2	4.13	4.172	0.049	0.571	S
G3		4.47	4.4	4.432	0.049	0.784	S
G4		4.16	4.1	4.135	0.049	0.515	S
G1	Cond	-999	14.22	13.076	1.105		B
G2		-999	45.91	42.56	2.449		B
G3		-999	24.33	22.893	1.303		B
G4		-999	50.43	46.62	2.748		B

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B – Blank: You reported either no value or the detection limit

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EMEP – 32nd intercomparison of analytical methods

Laboratory 27, Illinois State Water Survey (United States of America)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.59	0.59	0.573	0.086	0.191	S
G2		1.7	1.716	1.703	0.077	-0.04	S
G3		0.902	0.912	0.897	0.043	0.117	S
G4		1.865	1.883	1.875	0.086	-0.112	S
G1	NH ₄ ⁺	0.135	0.134	0.136	0.021	-0.059	S
G2		0.375	0.374	0.38	0.032	-0.142	S
G3		0.189	0.187	0.194	0.02	-0.235	S
G4		0.41	0.401	0.41	0.034	0.009	S
G1	NO ₃ ⁻	0.211	0.214	0.21	0.01	0.146	S
G2		0.68	0.695	0.685	0.023	-0.206	S
G3		0.334	0.335	0.331	0.012	0.241	S
G4		0.77	0.78	0.775	0.038	-0.13	S
G1	Na ⁺	0.142	0.147	0.136	0.014	0.399	S
G2		0.54	0.562	0.543	0.03	-0.1	S
G3		0.288	0.293	0.281	0.019	0.356	S
G4		0.591	0.623	0.606	0.029	-0.504	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.11	0.116	0.128	0.083	-0.221	S
G2		0.423	0.425	0.407	0.028	0.569	S
G3		0.23	0.232	0.219	0.027	0.395	S
G4		0.462	0.463	0.439	0.037	0.623	S
G1	Ca ²⁺	0.084	0.089	0.094	0.017	-0.582	S
G2		0.215	0.23	0.226	0.022	-0.485	S
G3		0.109	0.115	0.113	0.023	-0.162	S
G4		0.238	0.255	0.248	0.03	-0.32	S
G1	K ⁺	0.099	0.102	0.098	0.021	0.063	S
G2		0.402	0.407	0.403	0.034	-0.041	S
G3		0.164	0.17	0.161	0.021	0.126	S
G4		0.507	0.509	0.504	0.039	0.08	S
G1	pH	4.7	4.7	4.748	0.08	-0.597	S
G2		4.19	4.13	4.172	0.049	0.367	S
G3		4.43	4.4	4.432	0.049	-0.036	S
G4		4.16	4.1	4.135	0.049	0.515	S
G1	Cond	13.5	14.22	13.076	1.105	0.383	S
G2		43.4	45.91	42.56	2.449	0.343	S
G3		23.5	24.33	22.893	1.303	0.466	S
G4		48.1	50.43	46.62	2.748	0.538	S

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U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

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EMEP – 32nd intercomparison of analytical methods

Laboratory 30, Joint Research Centre, Ispra (Italy)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.577	0.59	0.573	0.086	0.041	S
G2		1.772	1.716	1.703	0.077	0.89	S
G3		0.906	0.912	0.897	0.043	0.211	S
G4		1.954	1.883	1.875	0.086	0.921	S
G1	NH ₄ ⁺	0.126	0.134	0.136	0.021	-0.484	S
G2		0.376	0.374	0.38	0.032	-0.111	S
G3		0.193	0.187	0.194	0.02	-0.04	S
G4		0.409	0.401	0.41	0.034	-0.02	S
G1	NO ₃ ⁻	0.199	0.214	0.21	0.01	-1.068	S
G2		0.679	0.695	0.685	0.023	-0.249	S
G3		0.317	0.335	0.331	0.012	-1.135	S
G4		0.776	0.78	0.775	0.038	0.027	S
G1	Na ⁺	0.142	0.147	0.136	0.014	0.399	S
G2		0.554	0.562	0.543	0.03	0.364	S
G3		0.287	0.293	0.281	0.019	0.304	S
G4		0.615	0.623	0.606	0.029	0.316	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.121	0.116	0.128	0.083	-0.089	S
G2		0.437	0.425	0.407	0.028	1.072	S
G3		0.236	0.232	0.219	0.027	0.617	S
G4		0.474	0.463	0.439	0.037	0.95	S
G1	Ca ²⁺	0.095	0.089	0.094	0.017	0.067	S
G2		0.237	0.23	0.226	0.022	0.497	S
G3		0.118	0.115	0.113	0.023	0.226	S
G4		0.258	0.255	0.248	0.03	0.347	S
G1	K ⁺	0.07	0.102	0.098	0.021	-1.317	U
G2		0.35	0.407	0.403	0.034	-1.552	S
G3		0.132	0.17	0.161	0.021	-1.42	Q
G4		0.448	0.509	0.504	0.039	-1.418	S
G1	pH	4.73	4.7	4.748	0.08	-0.224	S
G2		4.07	4.13	4.172	0.049	-2.077	S
G3		4.36	4.4	4.432	0.049	-1.472	S
G4		4.03	4.1	4.135	0.049	-2.118	S
G1	Cond	14.2	14.22	13.076	1.105	1.016	S
G2		45.6	45.91	42.56	2.449	1.242	S
G3		22.8	24.33	22.893	1.303	-0.071	S
G4		49.8	50.43	46.62	2.748	1.157	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 31, Slovak Hydrometeorological Institute (Slovakia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.604	0.59	0.573	0.086	0.353	S
G2		1.772	1.716	1.703	0.077	0.89	S
G3		0.941	0.912	0.897	0.043	1.031	S
G4		1.938	1.883	1.875	0.086	0.735	S
G1	NH ₄ ⁺	0.087	0.134	0.136	0.021	-2.325	U
G2		0.369	0.374	0.38	0.032	-0.329	S
G3		0.158	0.187	0.194	0.02	-1.751	Q
G4		0.402	0.401	0.41	0.034	-0.224	S
G1	NO ₃ ⁻	0.204	0.214	0.21	0.01	-0.562	S
G2		0.675	0.695	0.685	0.023	-0.422	S
G3		0.326	0.335	0.331	0.012	-0.406	S
G4		0.082	0.78	0.775	0.038	-18.163	U
G1	Na ⁺	0.129	0.147	0.136	0.014	-0.533	S
G2		0.511	0.562	0.543	0.03	-1.063	S
G3		0.264	0.293	0.281	0.019	-0.894	S
G4		0.566	0.623	0.606	0.029	-1.359	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.111	0.116	0.128	0.083	-0.209	S
G2		0.385	0.425	0.407	0.028	-0.797	S
G3		0.212	0.232	0.219	0.027	-0.272	S
G4		0.413	0.463	0.439	0.037	-0.712	S
G1	Ca ²⁺	0.105	0.089	0.094	0.017	0.657	Q
G2		0.248	0.23	0.226	0.022	0.988	S
G3		0.125	0.115	0.113	0.023	0.527	S
G4		0.284	0.255	0.248	0.03	1.214	S
G1	K ⁺	0.074	0.102	0.098	0.021	-1.126	U
G2		0.373	0.407	0.403	0.034	-0.884	S
G3		0.136	0.17	0.161	0.021	-1.227	Q
G4		0.464	0.509	0.504	0.039	-1.012	S
G1	pH	4.759	4.7	4.748	0.08	0.136	S
G2		4.223	4.13	4.172	0.049	1.04	S
G3		4.466	4.4	4.432	0.049	0.702	S
G4		4.162	4.1	4.135	0.049	0.556	S
G1	Cond	13.24	14.22	13.076	1.105	0.148	S
G2		43.7	45.91	42.56	2.449	0.466	S
G3		23.6	24.33	22.893	1.303	0.543	S
G4		48.3	50.43	46.62	2.748	0.611	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

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EMEP – 32nd intercomparison of analytical methods

Laboratory 32, Atmospheric Pollution Research Laboratory, Institute of Physics, Vilnius (Lithuania)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.58	0.59	0.573	0.086	0.076	S
G2		1.704	1.716	1.703	0.077	0.012	S
G3		0.877	0.912	0.897	0.043	-0.469	S
G4		1.885	1.883	1.875	0.086	0.12	S
G1	NH ₄ ⁺	0.152	0.134	0.136	0.021	0.743	S
G2		0.392	0.374	0.38	0.032	0.385	S
G3		0.208	0.187	0.194	0.02	0.694	S
G4		0.472	0.401	0.41	0.034	1.816	Q
G1	NO ₃ ⁻	0.208	0.214	0.21	0.01	-0.157	S
G2		0.692	0.695	0.685	0.023	0.314	S
G3		0.331	0.335	0.331	0.012	-0.002	S
G4		0.777	0.78	0.775	0.038	0.053	S
G1	Na ⁺	0.14	0.147	0.136	0.014	0.256	S
G2		0.585	0.562	0.543	0.03	1.394	S
G3		0.3	0.293	0.281	0.019	0.981	S
G4		0.62	0.623	0.606	0.029	0.487	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.116	0.116	0.128	0.083	-0.149	S
G2		0.427	0.425	0.407	0.028	0.712	S
G3		0.241	0.232	0.219	0.027	0.802	S
G4		0.447	0.463	0.439	0.037	0.215	S
G1	Ca ²⁺	0.07	0.089	0.094	0.017	-1.408	Q
G2		0.12	0.23	0.226	0.022	-4.725	U
G3		0.07	0.115	0.113	0.023	-1.844	U
G4		0.1	0.255	0.248	0.03	-4.924	U
G1	K ⁺	0.105	0.102	0.098	0.021	0.349	S
G2		0.404	0.407	0.403	0.034	0.017	S
G3		0.165	0.17	0.161	0.021	0.175	S
G4		0.51	0.509	0.504	0.039	0.157	S
G1	pH	4.71	4.7	4.748	0.08	-0.473	S
G2		4.16	4.13	4.172	0.049	-0.244	S
G3		4.45	4.4	4.432	0.049	0.374	S
G4		4.14	4.1	4.135	0.049	0.11	S
G1	Cond	13.5	14.22	13.076	1.105	0.383	S
G2		43	45.91	42.56	2.449	0.18	S
G3		23.2	24.33	22.893	1.303	0.236	S
G4		47.8	50.43	46.62	2.748	0.429	S

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S – Satisfactory: Your result deviates less than $\pm 10\%$ of the expected value for SO_4^{2-} and NO_3^- , less than $\pm 15\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and less than ± 0.1 pH-units for pH

Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 33, Environmental Pollution Observ. Centre (Latvia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.591	0.59	0.573	0.086	0.203	S
G2		1.737	1.716	1.703	0.077	0.438	S
G3		0.906	0.912	0.897	0.043	0.211	S
G4		1.924	1.883	1.875	0.086	0.572	S
G1	NH ₄ ⁺	0.14	0.134	0.136	0.021	0.177	S
G2		0.402	0.374	0.38	0.032	0.696	S
G3		0.197	0.187	0.194	0.02	0.156	S
G4		0.436	0.401	0.41	0.034	0.767	S
G1	NO ₃ ⁻	0.229	0.214	0.21	0.01	1.968	S
G2		0.693	0.695	0.685	0.023	0.358	S
G3		0.339	0.335	0.331	0.012	0.646	S
G4		0.776	0.78	0.775	0.038	0.027	S
G1	Na ⁺	0.141	0.147	0.136	0.014	0.328	S
G2		0.466	0.562	0.543	0.03	-2.558	Q
G3		0.275	0.293	0.281	0.019	-0.321	S
G4		0.559	0.623	0.606	0.029	-1.598	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.097	0.116	0.128	0.083	-0.377	Q
G2		0.405	0.425	0.407	0.028	-0.078	S
G3		0.198	0.232	0.219	0.027	-0.791	S
G4		0.425	0.463	0.439	0.037	-0.385	S
G1	Ca ²⁺	0.088	0.089	0.094	0.017	-0.346	S
G2		0.204	0.23	0.226	0.022	-0.976	S
G3		0.109	0.115	0.113	0.023	-0.162	S
G4		0.224	0.255	0.248	0.03	-0.787	S
G1	K ⁺	0.101	0.102	0.098	0.021	0.158	S
G2		0.378	0.407	0.403	0.034	-0.738	S
G3		0.162	0.17	0.161	0.021	0.03	S
G4		0.461	0.509	0.504	0.039	-1.088	S
G1	pH	4.79	4.7	4.748	0.08	0.521	S
G2		4.21	4.13	4.172	0.049	0.775	S
G3		4.48	4.4	4.432	0.049	0.99	S
G4		4.15	4.1	4.135	0.049	0.312	S
G1	Cond	14.2	14.22	13.076	1.105	1.016	S
G2		43.8	45.91	42.56	2.449	0.507	S
G3		23.2	24.33	22.893	1.303	0.236	S
G4		48.3	50.43	46.62	2.748	0.611	S

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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 34, Ministry of Environment and Urbanisation (Turkey)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.027	0.59	0.573	0.086	-6.321	U
G2		0.863	1.716	1.703	0.077	-10.855	U
G3		0.437	0.912	0.897	0.043	-10.781	U
G4		0.986	1.883	1.875	0.086	-10.322	U
G1	NH ₄ ⁺	0.141	0.134	0.136	0.021	0.238	S
G2		0.402	0.374	0.38	0.032	0.696	S
G3		0.196	0.187	0.194	0.02	0.087	S
G4		0.427	0.401	0.41	0.034	0.513	S
G1	NO ₃ ⁻	0.205	0.214	0.21	0.01	-0.431	S
G2		0.708	0.695	0.685	0.023	1.003	S
G3		0.333	0.335	0.331	0.012	0.16	S
G4		0.831	0.78	0.775	0.038	1.466	S
G1	Na ⁺	0.151	0.147	0.136	0.014	1.023	S
G2		0.561	0.562	0.543	0.03	0.607	S
G3		0.301	0.293	0.281	0.019	1.017	S
G4		0.655	0.623	0.606	0.029	1.673	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.129	0.116	0.128	0.083	0.012	S
G2		0.397	0.425	0.407	0.028	-0.366	S
G3		0.22	0.232	0.219	0.027	0.021	S
G4		0.428	0.463	0.439	0.037	-0.306	S
G1	Ca ²⁺	0.091	0.089	0.094	0.017	-0.181	S
G2		0.24	0.23	0.226	0.022	0.653	S
G3		0.123	0.115	0.113	0.023	0.446	S
G4		0.275	0.255	0.248	0.03	0.927	S
G1	K ⁺	0.115	0.102	0.098	0.021	0.834	S
G2		0.451	0.407	0.403	0.034	1.371	S
G3		0.194	0.17	0.161	0.021	1.562	S
G4		0.595	0.509	0.504	0.039	2.326	Q
G1	pH	4.808	4.7	4.748	0.08	0.745	Q
G2		4.279	4.13	4.172	0.049	2.186	Q
G3		4.517	4.4	4.432	0.049	1.748	Q
G4		4.205	4.1	4.135	0.049	1.418	Q
G1	Cond	15.33	14.22	13.076	1.105	2.039	S
G2		71.93	45.91	42.56	2.449	11.993	U
G3		20.7	24.33	22.893	1.303	-1.682	S
G4		43.26	50.43	46.62	2.748	-1.223	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

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Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 32nd intercomparison of analytical methods

Laboratory 35, Meteorological and Hydrological Service of Croatia (Croatia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.563	0.59	0.573	0.086	-0.121	S
G2		1.83	1.716	1.703	0.077	1.639	S
G3		0.915	0.912	0.897	0.043	0.422	S
G4		2	1.883	1.875	0.086	1.455	S
G1	NH ₄ ⁺	0.135	0.134	0.136	0.021	-0.059	S
G2		0.371	0.374	0.38	0.032	-0.267	S
G3		0.186	0.187	0.194	0.02	-0.382	S
G4		0.409	0.401	0.41	0.034	-0.02	S
G1	NO ₃ ⁻	0.206	0.214	0.21	0.01	-0.36	S
G2		0.67	0.695	0.685	0.023	-0.639	S
G3		0.32	0.335	0.331	0.012	-0.892	S
G4		0.762	0.78	0.775	0.038	-0.34	S
G1	Na ⁺	0.147	0.147	0.136	0.014	0.758	S
G2		0.56	0.562	0.543	0.03	0.564	S
G3		0.293	0.293	0.281	0.019	0.616	S
G4		0.624	0.623	0.606	0.029	0.624	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.112	0.116	0.128	0.083	-0.197	S
G2		0.426	0.425	0.407	0.028	0.676	S
G3		0.233	0.232	0.219	0.027	0.506	S
G4		0.465	0.463	0.439	0.037	0.705	S
G1	Ca ²⁺	0.22	0.089	0.094	0.017	7.441	U
G2		0.39	0.23	0.226	0.022	7.326	U
G3		0.193	0.115	0.113	0.023	3.459	U
G4		0.431	0.255	0.248	0.03	6.118	U
G1	K ⁺	1.06	0.102	0.098	0.021	45.791	U
G2		0.419	0.407	0.403	0.034	0.453	S
G3		0.174	0.17	0.161	0.021	0.61	S
G4		0.52	0.509	0.504	0.039	0.411	S
G1	pH	4.7	4.7	4.748	0.08	-0.597	S
G2		4.14	4.13	4.172	0.049	-0.651	S
G3		4.39	4.4	4.432	0.049	-0.856	S
G4		4.09	4.1	4.135	0.049	-0.903	S
G1	Cond	13.3	14.22	13.076	1.105	0.202	S
G2		43.4	45.91	42.56	2.449	0.343	S
G3		23.2	24.33	22.893	1.303	0.236	S
G4		47.2	50.43	46.62	2.748	0.211	S

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B – Blank: You reported either no value or the detection limit

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EMEP – 32nd intercomparison of analytical methods

Laboratory 36, Hydrometeorological Institute of Slovenia (Slovenia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.58	0.59	0.573	0.086	0.076	S
G2		1.691	1.716	1.703	0.077	-0.156	S
G3		0.916	0.912	0.897	0.043	0.445	S
G4		1.905	1.883	1.875	0.086	0.352	S
G1	NH ₄ ⁺	-999	0.134	0.136	0.021		B
G2		-999	0.374	0.38	0.032		B
G3		-999	0.187	0.194	0.02		B
G4		-999	0.401	0.41	0.034		B
G1	NO ₃ ⁻	0.21	0.214	0.21	0.01	0.045	S
G2		0.696	0.695	0.685	0.023	0.488	S
G3		0.332	0.335	0.331	0.012	0.079	S
G4		0.792	0.78	0.775	0.038	0.446	S
G1	Na ⁺	-999	0.147	0.136	0.014		B
G2		-999	0.562	0.543	0.03		B
G3		-999	0.293	0.281	0.019		B
G4		-999	0.623	0.606	0.029		B
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.101	0.116	0.128	0.083	-0.329	S
G2		0.446	0.425	0.407	0.028	1.395	S
G3		0.211	0.232	0.219	0.027	-0.309	S
G4		0.463	0.463	0.439	0.037	0.651	S
G1	Ca ²⁺	-999	0.089	0.094	0.017		B
G2		-999	0.23	0.226	0.022		B
G3		-999	0.115	0.113	0.023		B
G4		-999	0.255	0.248	0.03		B
G1	K ⁺	-999	0.102	0.098	0.021		B
G2		-999	0.407	0.403	0.034		B
G3		-999	0.17	0.161	0.021		B
G4		-999	0.509	0.504	0.039		B
G1	pH	4.86	4.7	4.748	0.08	1.391	Q
G2		4.21	4.13	4.172	0.049	0.775	S
G3		4.46	4.4	4.432	0.049	0.579	S
G4		4.16	4.1	4.135	0.049	0.515	S
G1	Cond	12.3	14.22	13.076	1.105	-0.702	S
G2		42.1	45.91	42.56	2.449	-0.188	S
G3		23	24.33	22.893	1.303	0.082	S
G4		46.9	50.43	46.62	2.748	0.102	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

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EMEP – 32nd intercomparison of analytical methods

Laboratory 38, Estonian Environmental Research Centre, Tallinn (Estonia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.588	0.59	0.573	0.086	0.168	S
G2		1.721	1.716	1.703	0.077	0.231	S
G3		0.96	0.912	0.897	0.043	1.476	S
G4		1.91	1.883	1.875	0.086	0.41	S
G1	NH ₄ ⁺	0.152	0.134	0.136	0.021	0.743	S
G2		0.492	0.374	0.38	0.032	3.49	U
G3		0.218	0.187	0.194	0.02	1.183	Q
G4		0.475	0.401	0.41	0.034	1.903	Q
G1	NO ₃ ⁻	0.195	0.214	0.21	0.01	-1.473	S
G2		0.677	0.695	0.685	0.023	-0.335	S
G3		0.316	0.335	0.331	0.012	-1.215	S
G4		0.765	0.78	0.775	0.038	-0.262	S
G1	Na ⁺	0.123	0.147	0.136	0.014	-0.963	Q
G2		0.512	0.562	0.543	0.03	-1.03	S
G3		0.258	0.293	0.281	0.019	-1.206	S
G4		0.572	0.623	0.606	0.029	-1.154	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.104	0.116	0.128	0.083	-0.293	S
G2		0.398	0.425	0.407	0.028	-0.33	S
G3		0.227	0.232	0.219	0.027	0.283	S
G4		0.422	0.463	0.439	0.037	-0.467	S
G1	Ca ²⁺	0.137	0.089	0.094	0.017	2.545	U
G2		0.189	0.23	0.226	0.022	-1.645	Q
G3		0.111	0.115	0.113	0.023	-0.076	S
G4		0.17	0.255	0.248	0.03	-2.589	U
G1	K ⁺	0.074	0.102	0.098	0.021	-1.126	U
G2		0.369	0.407	0.403	0.034	-1	S
G3		0.135	0.17	0.161	0.021	-1.275	Q
G4		0.466	0.509	0.504	0.039	-0.961	S
G1	pH	4.8	4.7	4.748	0.08	0.646	S
G2		4.2	4.13	4.172	0.049	0.571	S
G3		4.7	4.4	4.432	0.049	5.502	U
G4		4.2	4.1	4.135	0.049	1.325	Q
G1	Cond	22.8	14.22	13.076	1.105	8.796	U
G2		46.4	45.91	42.56	2.449	1.568	S
G3		36.1	24.33	22.893	1.303	10.135	U
G4		41.3	50.43	46.62	2.748	-1.936	Q

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EMEP – 32nd intercomparison of analytical methods

Laboratory 39, Environmental Monitoring Laboratory, Institute of Environmental Protection (Poland)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.541	0.59	0.573	0.086	-0.375	S
G2		1.658	1.716	1.703	0.077	-0.582	S
G3		0.848	0.912	0.897	0.043	-1.148	S
G4		1.822	1.883	1.875	0.086	-0.612	S
G1	NH ₄ ⁺	0.152	0.134	0.136	0.021	0.743	S
G2		0.379	0.374	0.38	0.032	-0.018	S
G3		0.195	0.187	0.194	0.02	0.058	S
G4		0.409	0.401	0.41	0.034	-0.02	S
G1	NO ₃ ⁻	0.2	0.214	0.21	0.01	-0.967	S
G2		0.67	0.695	0.685	0.023	-0.639	S
G3		0.317	0.335	0.331	0.012	-1.135	S
G4		0.761	0.78	0.775	0.038	-0.366	S
G1	Na ⁺	0.126	0.147	0.136	0.014	-0.748	S
G2		0.543	0.562	0.543	0.03	-0.001	S
G3		0.269	0.293	0.281	0.019	-0.634	S
G4		0.614	0.623	0.606	0.029	0.282	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.107	0.116	0.128	0.083	-0.257	S
G2		0.402	0.425	0.407	0.028	-0.186	S
G3		0.214	0.232	0.219	0.027	-0.198	S
G4		0.426	0.463	0.439	0.037	-0.358	S
G1	Ca ²⁺	0.092	0.089	0.094	0.017	-0.11	S
G2		0.227	0.23	0.226	0.022	0.051	S
G3		0.075	0.115	0.113	0.023	-1.628	U
G4		0.166	0.255	0.248	0.03	-2.722	U
G1	K ⁺	0.101	0.102	0.098	0.021	0.158	S
G2		0.409	0.407	0.403	0.034	0.163	S
G3		0.167	0.17	0.161	0.021	0.271	S
G4		0.503	0.509	0.504	0.039	-0.021	S
G1	pH	-999	4.7	4.748	0.08		B
G2		-999	4.13	4.172	0.049		B
G3		-999	4.4	4.432	0.049		B
G4		-999	4.1	4.135	0.049		B
G1	Cond	-999	14.22	13.076	1.105		B
G2		-999	45.91	42.56	2.449		B
G3		-999	24.33	22.893	1.303		B
G4		-999	50.43	46.62	2.748		B

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EMEP – 32nd intercomparison of analytical methods

Laboratory 42, State Hydrometeorological Service, Chisnau (Moldova)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.472	0.59	0.573	0.086	-1.173	Q
G2		1.212	1.716	1.703	0.077	-6.343	U
G3		0.787	0.912	0.897	0.043	-2.578	Q
G4		1.416	1.883	1.875	0.086	-5.325	U
G1	NH ₄ ⁺	-999	0.134	0.136	0.021		B
G2		-999	0.374	0.38	0.032		B
G3		-999	0.187	0.194	0.02		B
G4		-999	0.401	0.41	0.034		B
G1	NO ₃ ⁻	0.308	0.214	0.21	0.01	9.964	U
G2		0.389	0.695	0.685	0.023	-12.811	U
G3		0.424	0.335	0.331	0.012	7.524	U
G4		0.61	0.78	0.775	0.038	-4.324	U
G1	Na ⁺	-999	0.147	0.136	0.014		B
G2		-999	0.562	0.543	0.03		B
G3		-999	0.293	0.281	0.019		B
G4		-999	0.623	0.606	0.029		B
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.676	0.116	0.128	0.083	6.566	U
G2		0.372	0.425	0.407	0.028	-1.264	S
G3		0.266	0.232	0.219	0.027	1.728	S
G4		0.384	0.463	0.439	0.037	-1.502	Q
G1	Ca ²⁺	-999	0.089	0.094	0.017		B
G2		-999	0.23	0.226	0.022		B
G3		-999	0.115	0.113	0.023		B
G4		-999	0.255	0.248	0.03		B
G1	K ⁺	-999	0.102	0.098	0.021		B
G2		-999	0.407	0.403	0.034		B
G3		-999	0.17	0.161	0.021		B
G4		-999	0.509	0.504	0.039		B
G1	pH	5.24	4.7	4.748	0.08	6.114	U
G2		4.29	4.13	4.172	0.049	2.404	Q
G3		4.45	4.4	4.432	0.049	0.374	S
G4		4.18	4.1	4.135	0.049	0.92	S
G1	Cond	18.2	14.22	13.076	1.105	4.635	U
G2		41.6	45.91	42.56	2.449	-0.392	S
G3		24.3	24.33	22.893	1.303	1.08	S
G4		44.1	50.43	46.62	2.748	-0.917	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 45, Environmental Impact Monitoring Center, Yerevan (Armenia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.592	0.59	0.573	0.086	0.214	S
G2		1.783	1.716	1.703	0.077	1.032	S
G3		0.933	0.912	0.897	0.043	0.844	S
G4		1.947	1.883	1.875	0.086	0.839	S
G1	NH ₄ ⁺	0.162	0.134	0.136	0.021	1.215	Q
G2		0.416	0.374	0.38	0.032	1.13	S
G3		0.214	0.187	0.194	0.02	0.987	S
G4		0.442	0.401	0.41	0.034	0.942	S
G1	NO ₃ ⁻	0.21	0.214	0.21	0.01	0.045	S
G2		0.699	0.695	0.685	0.023	0.617	S
G3		0.332	0.335	0.331	0.012	0.079	S
G4		0.782	0.78	0.775	0.038	0.184	S
G1	Na ⁺	0.182	0.147	0.136	0.014	3.267	Q
G2		0.612	0.562	0.543	0.03	2.29	S
G3		0.335	0.293	0.281	0.019	2.803	S
G4		0.645	0.623	0.606	0.029	1.342	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.105	0.116	0.128	0.083	-0.281	S
G2		0.415	0.425	0.407	0.028	0.281	S
G3		0.221	0.232	0.219	0.027	0.061	S
G4		0.448	0.463	0.439	0.037	0.242	S
G1	Ca ²⁺	0.11	0.089	0.094	0.017	0.952	Q
G2		0.255	0.23	0.226	0.022	1.301	S
G3		0.133	0.115	0.113	0.023	0.872	Q
G4		0.264	0.255	0.248	0.03	0.547	S
G1	K ⁺	0.129	0.102	0.098	0.021	1.491	U
G2		0.451	0.407	0.403	0.034	1.383	S
G3		0.188	0.17	0.161	0.021	1.286	S
G4		0.528	0.509	0.504	0.039	0.614	S
G1	pH	4.77	4.7	4.748	0.08	0.273	S
G2		4.17	4.13	4.172	0.049	-0.04	S
G3		4.42	4.4	4.432	0.049	-0.241	S
G4		4.12	4.1	4.135	0.049	-0.295	S
G1	Cond	13	14.22	13.076	1.105	-0.069	S
G2		41.4	45.91	42.56	2.449	-0.474	S
G3		22	24.33	22.893	1.303	-0.685	S
G4		45.1	50.43	46.62	2.748	-0.553	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 46, Diabla Gora Station (Poland)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	-999	0.59	0.573	0.086		B
G2		-999	1.716	1.703	0.077		B
G3		-999	0.912	0.897	0.043		B
G4		-999	1.883	1.875	0.086		B
G1	NH ₄ ⁺	-999	0.134	0.136	0.021		B
G2		-999	0.374	0.38	0.032		B
G3		-999	0.187	0.194	0.02		B
G4		-999	0.401	0.41	0.034		B
G1	NO ₃ ⁻	-999	0.214	0.21	0.01		B
G2		-999	0.695	0.685	0.023		B
G3		-999	0.335	0.331	0.012		B
G4		-999	0.78	0.775	0.038		B
G1	Na ⁺	-999	0.147	0.136	0.014		B
G2		-999	0.562	0.543	0.03		B
G3		-999	0.293	0.281	0.019		B
G4		-999	0.623	0.606	0.029		B
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	-999	0.116	0.128	0.083		B
G2		-999	0.425	0.407	0.028		B
G3		-999	0.232	0.219	0.027		B
G4		-999	0.463	0.439	0.037		B
G1	Ca ²⁺	-999	0.089	0.094	0.017		B
G2		-999	0.23	0.226	0.022		B
G3		-999	0.115	0.113	0.023		B
G4		-999	0.255	0.248	0.03		B
G1	K ⁺	-999	0.102	0.098	0.021		B
G2		-999	0.407	0.403	0.034		B
G3		-999	0.17	0.161	0.021		B
G4		-999	0.509	0.504	0.039		B
G1	pH	4.66	4.7	4.748	0.08	-1.094	S
G2		4.16	4.13	4.172	0.049	-0.244	S
G3		4.41	4.4	4.432	0.049	-0.446	S
G4		4.12	4.1	4.135	0.049	-0.295	S
G1	Cond	13.98	14.22	13.076	1.105	0.817	S
G2		42.85	45.91	42.56	2.449	0.119	S
G3		23.11	24.33	22.893	1.303	0.167	S
G4		47.35	50.43	46.62	2.748	0.265	S

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S – Satisfactory: Your result deviates less than $\pm 10\%$ of the expected value for SO_4^{2-} and NO_3^- , less than $\pm 15\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and less than ± 0.1 pH-units for pH

Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

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EMEP – 32nd intercomparison of analytical methods

Laboratory 48, Flemish Environment Agency (Belgium)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.528	0.59	0.573	0.086	-0.526	Q
G2		1.617	1.716	1.703	0.077	-1.112	S
G3		0.893	0.912	0.897	0.043	-0.094	S
G4		1.738	1.883	1.875	0.086	-1.587	S
G1	NH ₄ ⁺	0.132	0.134	0.136	0.021	-0.201	S
G2		0.368	0.374	0.38	0.032	-0.36	S
G3		0.187	0.187	0.194	0.02	-0.333	S
G4		0.387	0.401	0.41	0.034	-0.661	S
G1	NO ₃ ⁻	0.221	0.214	0.21	0.01	1.158	S
G2		0.7	0.695	0.685	0.023	0.661	S
G3		0.342	0.335	0.331	0.012	0.888	S
G4		0.77	0.78	0.775	0.038	-0.13	S
G1	Na ⁺	-999	0.147	0.136	0.014		B
G2		-999	0.562	0.543	0.03		B
G3		-999	0.293	0.281	0.019		B
G4		-999	0.623	0.606	0.029		B
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	< 0.124	0.116	0.128	0.083		B
G2		0.264	0.425	0.407	0.028	-5.145	U
G3		< 0.124	0.232	0.219	0.027	-5.828	U
G4		0.252	0.463	0.439	0.037	-5.1	U
G1	Ca ²⁺	-999	0.089	0.094	0.017		B
G2		-999	0.23	0.226	0.022		B
G3		-999	0.115	0.113	0.023		B
G4		-999	0.255	0.248	0.03		B
G1	K ⁺	-999	0.102	0.098	0.021		B
G2		-999	0.407	0.403	0.034		B
G3		-999	0.17	0.161	0.021		B
G4		-999	0.509	0.504	0.039		B
G1	pH	-999	4.7	4.748	0.08		B
G2		-999	4.13	4.172	0.049		B
G3		-999	4.4	4.432	0.049		B
G4		-999	4.1	4.135	0.049		B
G1	Cond	-999	14.22	13.076	1.105		B
G2		-999	45.91	42.56	2.449		B
G3		-999	24.33	22.893	1.303		B
G4		-999	50.43	46.62	2.748		B

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 32nd intercomparison of analytical methods

Laboratory 110, Thüringer Landesanstalt für Landwirtschaft TTL, Jena (Germany)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.58	0.59	0.573	0.086	0.076	S
G2		1.82	1.716	1.703	0.077	1.51	S
G3		0.97	0.912	0.897	0.043	1.71	S
G4		2.04	1.883	1.875	0.086	1.919	S
G1	NH ₄ ⁺	0.12	0.134	0.136	0.021	-0.767	S
G2		0.34	0.374	0.38	0.032	-1.229	S
G3		0.18	0.187	0.194	0.02	-0.675	S
G4		0.39	0.401	0.41	0.034	-0.573	S
G1	NO ₃ ⁻	0.19	0.214	0.21	0.01	-1.979	Q
G2		0.66	0.695	0.685	0.023	-1.072	S
G3		0.32	0.335	0.331	0.012	-0.892	S
G4		0.75	0.78	0.775	0.038	-0.655	S
G1	Na ⁺	0.12	0.147	0.136	0.014	-1.178	Q
G2		0.5	0.562	0.543	0.03	-1.429	S
G3		0.26	0.293	0.281	0.019	-1.102	S
G4		0.57	0.623	0.606	0.029	-1.222	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	< 0.200	0.116	0.128	0.083		B
G2		0.39	0.425	0.407	0.028	-0.617	S
G3		0.2	0.232	0.219	0.027	-0.717	S
G4		0.43	0.463	0.439	0.037	-0.249	S
G1	Ca ²⁺	0.08	0.089	0.094	0.017	-0.818	S
G2		0.21	0.23	0.226	0.022	-0.708	S
G3		0.1	0.115	0.113	0.023	-0.55	S
G4		0.24	0.255	0.248	0.03	-0.254	S
G1	K ⁺	< 0.100	0.102	0.098	0.021	-2.268	U
G2		0.36	0.407	0.403	0.034	-1.261	S
G3		0.12	0.17	0.161	0.021	-2	U
G4		0.44	0.509	0.504	0.039	-1.621	S
G1	pH	4.83	4.7	4.748	0.08	1.019	Q
G2		4.06	4.13	4.172	0.049	-2.281	S
G3		4.32	4.4	4.432	0.049	-2.292	S
G4		4.03	4.1	4.135	0.049	-2.118	S
G1	Cond	12.4	14.22	13.076	1.105	-0.612	S
G2		40.3	45.91	42.56	2.449	-0.923	S
G3		23.7	24.33	22.893	1.303	0.62	S
G4		45.3	50.43	46.62	2.748	-0.48	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

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EMEP – 32nd intercomparison of analytical methods

Laboratory 112, Niedersächsische Forstliche Versuchsanstalt NVF (Germany)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.58	0.59	0.573	0.086	0.076	S
G2		1.72	1.716	1.703	0.077	0.219	S
G3		0.9	0.912	0.897	0.043	0.07	S
G4		1.89	1.883	1.875	0.086	0.178	S
G1	NH ₄ ⁺	0.13	0.134	0.136	0.021	-0.295	S
G2		0.37	0.374	0.38	0.032	-0.298	S
G3		0.18	0.187	0.194	0.02	-0.675	S
G4		0.4	0.401	0.41	0.034	-0.282	S
G1	NO ₃ ⁻	0.2	0.214	0.21	0.01	-0.967	S
G2		0.67	0.695	0.685	0.023	-0.639	S
G3		0.32	0.335	0.331	0.012	-0.892	S
G4		0.75	0.78	0.775	0.038	-0.655	S
G1	Na ⁺	0.15	0.147	0.136	0.014	0.973	S
G2		0.56	0.562	0.543	0.03	0.564	S
G3		0.29	0.293	0.281	0.019	0.46	S
G4		0.62	0.623	0.606	0.029	0.487	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.11	0.116	0.128	0.083	-0.221	S
G2		0.43	0.425	0.407	0.028	0.82	S
G3		0.23	0.232	0.219	0.027	0.395	S
G4		0.47	0.463	0.439	0.037	0.841	S
G1	Ca ²⁺	0.08	0.089	0.094	0.017	-0.818	S
G2		0.21	0.23	0.226	0.022	-0.708	S
G3		0.11	0.115	0.113	0.023	-0.119	S
G4		0.23	0.255	0.248	0.03	-0.587	S
G1	K ⁺	0.1	0.102	0.098	0.021	0.111	S
G2		0.41	0.407	0.403	0.034	0.192	S
G3		0.17	0.17	0.161	0.021	0.416	S
G4		0.51	0.509	0.504	0.039	0.157	S
G1	pH	4.77	4.7	4.748	0.08	0.273	S
G2		4.18	4.13	4.172	0.049	0.164	S
G3		4.45	4.4	4.432	0.049	0.374	S
G4		4.14	4.1	4.135	0.049	0.11	S
G1	Cond	10.1	14.22	13.076	1.105	-2.692	U
G2		42.2	45.91	42.56	2.449	-0.147	S
G3		22.1	24.33	22.893	1.303	-0.608	S
G4		47	50.43	46.62	2.748	0.138	S

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B – Blank: You reported either no value or the detection limit

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EMEP – 32nd intercomparison of analytical methods

Laboratory 113, Fachhochschule Eberswalde (Germany)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.608	0.59	0.573	0.086	0.4	S
G2		1.675	1.716	1.703	0.077	-0.363	S
G3		0.854	0.912	0.897	0.043	-1.008	S
G4		1.832	1.883	1.875	0.086	-0.496	S
G1	NH ₄ ⁺	0.122	0.134	0.136	0.021	-0.673	S
G2		0.331	0.374	0.38	0.032	-1.509	S
G3		0.151	0.187	0.194	0.02	-2.093	Q
G4		0.34	0.401	0.41	0.034	-2.03	Q
G1	NO ₃ ⁻	0.18	0.214	0.21	0.01	-2.991	Q
G2		0.651	0.695	0.685	0.023	-1.462	S
G3		0.283	0.335	0.331	0.012	-3.886	Q
G4		0.741	0.78	0.775	0.038	-0.891	S
G1	Na ⁺	0.134	0.147	0.136	0.014	-0.174	S
G2		0.548	0.562	0.543	0.03	0.165	S
G3		0.281	0.293	0.281	0.019	-0.009	S
G4		0.607	0.623	0.606	0.029	0.043	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.122	0.116	0.128	0.083	-0.077	S
G2		0.404	0.425	0.407	0.028	-0.114	S
G3		0.216	0.232	0.219	0.027	-0.124	S
G4		0.439	0.463	0.439	0.037	-0.003	S
G1	Ca ²⁺	0.086	0.089	0.094	0.017	-0.464	S
G2		0.269	0.23	0.226	0.022	1.925	Q
G3		0.209	0.115	0.113	0.023	4.149	U
G4		0.289	0.255	0.248	0.03	1.381	S
G1	K ⁺	0.091	0.102	0.098	0.021	-0.317	S
G2		0.402	0.407	0.403	0.034	-0.041	S
G3		0.154	0.17	0.161	0.021	-0.357	S
G4		0.477	0.509	0.504	0.039	-0.682	S
G1	pH	5.06	4.7	4.748	0.08	3.877	U
G2		4.12	4.13	4.172	0.049	-1.059	S
G3		4.37	4.4	4.432	0.049	-1.267	S
G4		4.04	4.1	4.135	0.049	-1.916	S
G1	Cond	12.2	14.22	13.076	1.105	-0.793	S
G2		40.2	45.91	42.56	2.449	-0.964	S
G3		21.1	24.33	22.893	1.303	-1.376	S
G4		44.5	50.43	46.62	2.748	-0.771	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

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<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 114, C.N.R. Istituto Italiano di Idrobiologia (Italy)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.55	0.59	0.573	0.086	-0.271	S
G2		1.69	1.716	1.703	0.077	-0.169	S
G3		0.92	0.912	0.897	0.043	0.539	S
G4		1.89	1.883	1.875	0.086	0.178	S
G1	NH ₄ ⁺	0.13	0.134	0.136	0.021	-0.295	S
G2		0.37	0.374	0.38	0.032	-0.298	S
G3		0.19	0.187	0.194	0.02	-0.186	S
G4		0.4	0.401	0.41	0.034	-0.282	S
G1	NO ₃ ⁻	0.22	0.214	0.21	0.01	1.057	S
G2		0.7	0.695	0.685	0.023	0.661	S
G3		0.35	0.335	0.331	0.012	1.536	S
G4		0.8	0.78	0.775	0.038	0.656	S
G1	Na ⁺	0.14	0.147	0.136	0.014	0.256	S
G2		0.53	0.562	0.543	0.03	-0.432	S
G3		0.3	0.293	0.281	0.019	0.981	S
G4		0.58	0.623	0.606	0.029	-0.881	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.13	0.116	0.128	0.083	0.019	S
G2		0.43	0.425	0.407	0.028	0.82	S
G3		0.25	0.232	0.219	0.027	1.135	S
G4		0.47	0.463	0.439	0.037	0.841	S
G1	Ca ²⁺	0.19	0.089	0.094	0.017	5.671	U
G2		0.3	0.23	0.226	0.022	3.309	U
G3		0.2	0.115	0.113	0.023	3.761	U
G4		0.33	0.255	0.248	0.03	2.749	U
G1	K ⁺	0.09	0.102	0.098	0.021	-0.365	S
G2		0.38	0.407	0.403	0.034	-0.68	S
G3		0.16	0.17	0.161	0.021	-0.067	S
G4		0.5	0.509	0.504	0.039	-0.097	S
G1	pH	4.91	4.7	4.748	0.08	2.013	U
G2		4.22	4.13	4.172	0.049	0.978	S
G3		4.47	4.4	4.432	0.049	0.784	S
G4		4.17	4.1	4.135	0.049	0.718	S
G1	Cond	13	14.22	13.076	1.105	-0.069	S
G2		43.6	45.91	42.56	2.449	0.425	S
G3		23.7	24.33	22.893	1.303	0.62	S
G4		48	50.43	46.62	2.748	0.502	S

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Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 32nd intercomparison of analytical methods

Laboratory 115, Bayerische Landesanstalt f. Wald- und Forstwirtschaft (Germany)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.555	0.59	0.573	0.086	-0.213	S
G2		1.721	1.716	1.703	0.077	0.231	S
G3		0.891	0.912	0.897	0.043	-0.141	S
G4		1.916	1.883	1.875	0.086	0.48	S
G1	NH ₄ ⁺	0.127	0.134	0.136	0.021	-0.437	S
G2		0.347	0.374	0.38	0.032	-1.012	S
G3		0.173	0.187	0.194	0.02	-1.018	S
G4		0.376	0.401	0.41	0.034	-0.981	S
G1	NO ₃ ⁻	0.198	0.214	0.21	0.01	-1.17	S
G2		0.675	0.695	0.685	0.023	-0.422	S
G3		0.316	0.335	0.331	0.012	-1.215	S
G4		0.771	0.78	0.775	0.038	-0.104	S
G1	Na ⁺	0.149	0.147	0.136	0.014	0.901	S
G2		0.563	0.562	0.543	0.03	0.663	S
G3		0.296	0.293	0.281	0.019	0.772	S
G4		0.624	0.623	0.606	0.029	0.624	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.065	0.116	0.128	0.083	-0.76	U
G2		0.338	0.425	0.407	0.028	-2.486	Q
G3		0.164	0.232	0.219	0.027	-2.05	U
G4		0.37	0.463	0.439	0.037	-1.884	Q
G1	Ca ²⁺	< 0.100	0.089	0.094	0.017		B
G2		0.236	0.23	0.226	0.022	0.453	S
G3		0.109	0.115	0.113	0.023	-0.162	S
G4		0.256	0.255	0.248	0.03	0.28	S
G1	K ⁺	0.015	0.102	0.098	0.021	-3.934	U
G2		0.358	0.407	0.403	0.034	-1.319	S
G3		0.108	0.17	0.161	0.021	-2.58	U
G4		0.455	0.509	0.504	0.039	-1.24	S
G1	pH	4.76	4.7	4.748	0.08	0.149	S
G2		4.1	4.13	4.172	0.049	-1.466	S
G3		4.42	4.4	4.432	0.049	-0.241	S
G4		4.05	4.1	4.135	0.049	-1.713	S
G1	Cond	10.5	14.22	13.076	1.105	-2.33	U
G2		41.8	45.91	42.56	2.449	-0.31	S
G3		21.9	24.33	22.893	1.303	-0.762	S
G4		46	50.43	46.62	2.748	-0.226	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 116, Institute for Applied Plant Biology (Switzerland)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.579	0.59	0.573	0.086	0.066	S
G2		1.651	1.716	1.703	0.077	-0.678	S
G3		0.891	0.912	0.897	0.043	-0.141	S
G4		1.906	1.883	1.875	0.086	0.365	S
G1	NH ₄ ⁺	0.183	0.134	0.136	0.021	2.206	U
G2		0.486	0.374	0.38	0.032	3.304	U
G3		0.251	0.187	0.194	0.02	2.796	U
G4		0.525	0.401	0.41	0.034	3.36	U
G1	NO ₃ ⁻	0.19	0.214	0.21	0.01	-1.949	Q
G2		0.695	0.695	0.685	0.023	0.423	S
G3		0.327	0.335	0.331	0.012	-0.301	S
G4		0.789	0.78	0.775	0.038	0.37	S
G1	Na ⁺	0.159	0.147	0.136	0.014	1.618	S
G2		0.549	0.562	0.543	0.03	0.198	S
G3		0.298	0.293	0.281	0.019	0.877	S
G4		0.615	0.623	0.606	0.029	0.316	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.161	0.116	0.128	0.083	0.386	U
G2		0.38	0.425	0.407	0.028	-0.984	S
G3		0.195	0.232	0.219	0.027	-0.898	Q
G4		0.417	0.463	0.439	0.037	-0.589	S
G1	Ca ²⁺	0.126	0.089	0.094	0.017	1.896	U
G2		0.204	0.23	0.226	0.022	-0.976	S
G3		0.32	0.115	0.113	0.023	8.935	U
G4		0.243	0.255	0.248	0.03	-0.154	S
G1	K ⁺	0.128	0.102	0.098	0.021	1.443	U
G2		0.505	0.407	0.403	0.034	2.952	Q
G3		0.214	0.17	0.161	0.021	2.543	U
G4		0.634	0.509	0.504	0.039	3.306	Q
G1	pH	4.76	4.7	4.748	0.08	0.149	S
G2		4.21	4.13	4.172	0.049	0.775	S
G3		4.47	4.4	4.432	0.049	0.784	S
G4		4.15	4.1	4.135	0.049	0.312	S
G1	Cond	11.6	14.22	13.076	1.105	-1.335	Q
G2		36.3	45.91	42.56	2.449	-2.556	Q
G3		19.9	24.33	22.893	1.303	-2.296	Q
G4		40.3	50.43	46.62	2.748	-2.3	Q

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Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 32nd intercomparison of analytical methods

Laboratory 117, Standortserkundung/Bodenmonitoring Forsten, Graupa (Germany)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.536	0.59	0.573	0.086	-0.433	S
G2		1.659	1.716	1.703	0.077	-0.569	S
G3		0.851	0.912	0.897	0.043	-1.078	S
G4		1.837	1.883	1.875	0.086	-0.438	S
G1	NH ₄ ⁺	0.129	0.134	0.136	0.021	-0.342	S
G2		0.359	0.374	0.38	0.032	-0.639	S
G3		0.178	0.187	0.194	0.02	-0.773	S
G4		0.382	0.401	0.41	0.034	-0.807	S
G1	NO ₃ ⁻	0.197	0.214	0.21	0.01	-1.271	S
G2		0.646	0.695	0.685	0.023	-1.678	S
G3		0.307	0.335	0.331	0.012	-1.944	S
G4		0.733	0.78	0.775	0.038	-1.1	S
G1	Na ⁺	0.115	0.147	0.136	0.014	-1.536	Q
G2		0.477	0.562	0.543	0.03	-2.192	Q
G3		0.244	0.293	0.281	0.019	-1.935	Q
G4		0.545	0.623	0.606	0.029	-2.077	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	< 0.100	0.116	0.128	0.083	-0.94	U
G2		0.398	0.425	0.407	0.028	-0.33	S
G3		0.198	0.232	0.219	0.027	-0.791	S
G4		0.376	0.463	0.439	0.037	-1.721	Q
G1	Ca ²⁺	0.074	0.089	0.094	0.017	-1.172	Q
G2		0.209	0.23	0.226	0.022	-0.753	S
G3		0.099	0.115	0.113	0.023	-0.594	S
G4		0.234	0.255	0.248	0.03	-0.454	S
G1	K ⁺	0.095	0.102	0.098	0.021	-0.127	S
G2		0.397	0.407	0.403	0.034	-0.186	S
G3		0.162	0.17	0.161	0.021	0.03	S
G4		0.505	0.509	0.504	0.039	0.03	S
G1	pH	4.73	4.7	4.748	0.08	-0.224	S
G2		4.17	4.13	4.172	0.049	-0.04	S
G3		4.45	4.4	4.432	0.049	0.374	S
G4		4.12	4.1	4.135	0.049	-0.295	S
G1	Cond	14	14.22	13.076	1.105	0.836	S
G2		47.6	45.91	42.56	2.449	2.058	S
G3		25.4	24.33	22.893	1.303	1.924	S
G4		53	50.43	46.62	2.748	2.321	S

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Foretaksnr./Enterprise no. 941705561

If your laboratory reported values as less than the detection limit, and your detection limit is lower than the expected value, $\frac{1}{2}$ DL is taken as the reported value in further calculations.

✕ EMEP quality norm; the letters in the column indicates:

S – Satisfactory: Your result deviates less than $\pm 10\%$ of the expected value for SO_4^{2-} and NO_3^- , less than $\pm 15\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and less than ± 0.1 pH-units for pH

Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 118, Forstliche Versuchs-und Forschungsanstalt (Germany)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.59	0.59	0.573	0.086	0.191	S
G2		1.74	1.716	1.703	0.077	0.477	S
G3		0.93	0.912	0.897	0.043	0.773	S
G4		1.94	1.883	1.875	0.086	0.758	S
G1	NH ₄ ⁺	0.131	0.134	0.136	0.021	-0.248	S
G2		0.367	0.374	0.38	0.032	-0.391	S
G3		0.18	0.187	0.194	0.02	-0.675	S
G4		0.4	0.401	0.41	0.034	-0.282	S
G1	NO ₃ ⁻	0.22	0.214	0.21	0.01	1.057	S
G2		0.68	0.695	0.685	0.023	-0.206	S
G3		0.35	0.335	0.331	0.012	1.536	S
G4		0.77	0.78	0.775	0.038	-0.13	S
G1	Na ⁺	0.13	0.147	0.136	0.014	-0.461	S
G2		0.5	0.562	0.543	0.03	-1.429	S
G3		0.29	0.293	0.281	0.019	0.46	S
G4		0.57	0.623	0.606	0.029	-1.222	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.1	0.116	0.128	0.083	-0.341	S
G2		0.41	0.425	0.407	0.028	0.101	S
G3		0.23	0.232	0.219	0.027	0.395	S
G4		0.43	0.463	0.439	0.037	-0.249	S
G1	Ca ²⁺	0.07	0.089	0.094	0.017	-1.408	Q
G2		0.22	0.23	0.226	0.022	-0.262	S
G3		0.11	0.115	0.113	0.023	-0.119	S
G4		0.25	0.255	0.248	0.03	0.08	S
G1	K ⁺	0.08	0.102	0.098	0.021	-0.841	Q
G2		0.36	0.407	0.403	0.034	-1.261	S
G3		0.15	0.17	0.161	0.021	-0.55	S
G4		0.46	0.509	0.504	0.039	-1.113	S
G1	pH	4.72	4.7	4.748	0.08	-0.349	S
G2		4.2	4.13	4.172	0.049	0.571	S
G3		4.5	4.4	4.432	0.049	1.4	S
G4		4.17	4.1	4.135	0.049	0.718	S
G1	Cond	13	14.22	13.076	1.105	-0.069	S
G2		44	45.91	42.56	2.449	0.588	S
G3		23	24.33	22.893	1.303	0.082	S
G4		49	50.43	46.62	2.748	0.866	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 32nd intercomparison of analytical methods

Laboratory 120, Landwirtschaftliche Untersuchungs- und Forschungsanstalt LUFA (Germany)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.54	0.59	0.573	0.086	-0.387	S
G2		1.51	1.716	1.703	0.077	-2.494	Q
G3		0.8	0.912	0.897	0.043	-2.273	Q
G4		1.65	1.883	1.875	0.086	-2.608	Q
G1	NH ₄ ⁺	0.17	0.134	0.136	0.021	1.593	U
G2		0.39	0.374	0.38	0.032	0.323	S
G3		0.22	0.187	0.194	0.02	1.28	Q
G4		0.44	0.401	0.41	0.034	0.884	S
G1	NO ₃ ⁻	0.22	0.214	0.21	0.01	1.057	S
G2		0.67	0.695	0.685	0.023	-0.639	S
G3		0.33	0.335	0.331	0.012	-0.083	S
G4		0.77	0.78	0.775	0.038	-0.13	S
G1	Na ⁺	0.14	0.147	0.136	0.014	0.256	S
G2		0.55	0.562	0.543	0.03	0.232	S
G3		0.29	0.293	0.281	0.019	0.46	S
G4		0.62	0.623	0.606	0.029	0.487	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.26	0.116	0.128	0.083	1.578	U
G2		0.41	0.425	0.407	0.028	0.101	S
G3		0.23	0.232	0.219	0.027	0.395	S
G4		0.4	0.463	0.439	0.037	-1.066	S
G1	Ca ²⁺	0.08	0.089	0.094	0.017	-0.818	S
G2		0.22	0.23	0.226	0.022	-0.262	S
G3		0.12	0.115	0.113	0.023	0.312	S
G4		0.25	0.255	0.248	0.03	0.08	S
G1	K ⁺	0.09	0.102	0.098	0.021	-0.365	S
G2		0.36	0.407	0.403	0.034	-1.261	S
G3		0.14	0.17	0.161	0.021	-1.033	Q
G4		0.47	0.509	0.504	0.039	-0.859	S
G1	pH	4.76	4.7	4.748	0.08	0.149	S
G2		4.2	4.13	4.172	0.049	0.571	S
G3		4.44	4.4	4.432	0.049	0.169	S
G4		4.14	4.1	4.135	0.049	0.11	S
G1	Cond	13	14.22	13.076	1.105	-0.069	S
G2		43.5	45.91	42.56	2.449	0.384	S
G3		23	24.33	22.893	1.303	0.082	S
G4		46.5	50.43	46.62	2.748	-0.044	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 32nd intercomparison of analytical methods

Laboratory 121, Landeslabor Schleswig-Holsteinmwelt (Germany)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.82	0.59	0.573	0.086	2.851	U
G2		1.6	1.716	1.703	0.077	-1.332	S
G3		0.96	0.912	0.897	0.043	1.476	S
G4		1.79	1.883	1.875	0.086	-0.983	S
G1	NH ₄ ⁺	0.134	0.134	0.136	0.021	-0.106	S
G2		0.378	0.374	0.38	0.032	-0.049	S
G3		0.187	0.187	0.194	0.02	-0.333	S
G4		0.414	0.401	0.41	0.034	0.126	S
G1	NO ₃ ⁻	0.215	0.214	0.21	0.01	0.551	S
G2		0.668	0.695	0.685	0.023	-0.725	S
G3		0.343	0.335	0.331	0.012	0.969	S
G4		0.751	0.78	0.775	0.038	-0.628	S
G1	Na ⁺	0.135	0.147	0.136	0.014	-0.102	S
G2		0.523	0.562	0.543	0.03	-0.665	S
G3		0.276	0.293	0.281	0.019	-0.269	S
G4		0.58	0.623	0.606	0.029	-0.881	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.141	0.116	0.128	0.083	0.151	Q
G2		0.377	0.425	0.407	0.028	-1.084	S
G3		0.228	0.232	0.219	0.027	0.321	S
G4		0.397	0.463	0.439	0.037	-1.148	S
G1	Ca ²⁺	0.075	0.089	0.094	0.017	-1.113	Q
G2		0.209	0.23	0.226	0.022	-0.753	S
G3		0.1	0.115	0.113	0.023	-0.55	S
G4		0.234	0.255	0.248	0.03	-0.454	S
G1	K ⁺	-999	0.102	0.098	0.021		B
G2		-999	0.407	0.403	0.034		B
G3		-999	0.17	0.161	0.021		B
G4		-999	0.509	0.504	0.039		B
G1	pH	4.8	4.7	4.748	0.08	0.646	S
G2		4.19	4.13	4.172	0.049	0.367	S
G3		4.46	4.4	4.432	0.049	0.579	S
G4		4.43	4.1	4.135	0.049	5.984	U
G1	Cond	15.8	14.22	13.076	1.105	2.464	S
G2		44.5	45.91	42.56	2.449	0.792	S
G3		25.1	24.33	22.893	1.303	1.694	S
G4		83.1	50.43	46.62	2.748	13.273	U

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

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EMEP – 32nd intercomparison of analytical methods

Laboratory 124, Laboratorium voor Bondemkunde, Gent (Belgium)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.592	0.59	0.573	0.086	0.214	S
G2		1.702	1.716	1.703	0.077	-0.014	S
G3		0.894	0.912	0.897	0.043	-0.07	S
G4		1.847	1.883	1.875	0.086	-0.321	S
G1	NH ₄ ⁺	0.126	0.134	0.136	0.021	-0.484	S
G2		0.374	0.374	0.38	0.032	-0.174	S
G3		0.184	0.187	0.194	0.02	-0.48	S
G4		0.406	0.401	0.41	0.034	-0.107	S
G1	NO ₃ ⁻	0.208	0.214	0.21	0.01	-0.157	S
G2		0.68	0.695	0.685	0.023	-0.206	S
G3		0.323	0.335	0.331	0.012	-0.649	S
G4		0.769	0.78	0.775	0.038	-0.157	S
G1	Na ⁺	0.137	0.147	0.136	0.014	0.041	S
G2		0.541	0.562	0.543	0.03	-0.067	S
G3		0.277	0.293	0.281	0.019	-0.217	S
G4		0.603	0.623	0.606	0.029	-0.094	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	< 0.150	0.116	0.128	0.083		B
G2		0.405	0.425	0.407	0.028	-0.078	S
G3		0.223	0.232	0.219	0.027	0.135	S
G4		0.441	0.463	0.439	0.037	0.051	S
G1	Ca ²⁺	0.091	0.089	0.094	0.017	-0.169	S
G2		0.225	0.23	0.226	0.022	-0.038	S
G3		0.115	0.115	0.113	0.023	0.096	S
G4		0.249	0.255	0.248	0.03	0.047	S
G1	K ⁺	< 0.120	0.102	0.098	0.021		B
G2		0.399	0.407	0.403	0.034	-0.128	S
G3		0.16	0.17	0.161	0.021	-0.067	S
G4		0.501	0.509	0.504	0.039	-0.072	S
G1	pH	4.76	4.7	4.748	0.08	0.149	S
G2		4.07	4.13	4.172	0.049	-2.077	S
G3		4.29	4.4	4.432	0.049	-2.908	Q
G4		4.17	4.1	4.135	0.049	0.718	S
G1	Cond	14	14.22	13.076	1.105	0.836	S
G2		43	45.91	42.56	2.449	0.18	S
G3		24	24.33	22.893	1.303	0.85	S
G4		48	50.43	46.62	2.748	0.502	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

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EMEP – 32nd intercomparison of analytical methods

Laboratory 125, Bayerisches Landesamt für Umweltschutz, Augsburg (Germany)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.62	0.59	0.573	0.086	0.538	S
G2		1.73	1.716	1.703	0.077	0.348	S
G3		0.952	0.912	0.897	0.043	1.289	S
G4		1.91	1.883	1.875	0.086	0.41	S
G1	NH ₄ ⁺	0.112	0.134	0.136	0.021	-1.145	Q
G2		0.349	0.374	0.38	0.032	-0.95	S
G3		0.171	0.187	0.194	0.02	-1.115	S
G4		0.378	0.401	0.41	0.034	-0.923	S
G1	NO ₃ ⁻	0.211	0.214	0.21	0.01	0.146	S
G2		0.704	0.695	0.685	0.023	0.834	S
G3		0.33	0.335	0.331	0.012	-0.083	S
G4		0.778	0.78	0.775	0.038	0.079	S
G1	Na ⁺	0.128	0.147	0.136	0.014	-0.604	S
G2		0.486	0.562	0.543	0.03	-1.894	S
G3		0.241	0.293	0.281	0.019	-2.092	Q
G4		0.545	0.623	0.606	0.029	-2.077	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.103	0.116	0.128	0.083	-0.305	S
G2		0.41	0.425	0.407	0.028	0.101	S
G3		0.2	0.232	0.219	0.027	-0.717	S
G4		0.44	0.463	0.439	0.037	0.024	S
G1	Ca ²⁺	0.088	0.089	0.094	0.017	-0.346	S
G2		0.22	0.23	0.226	0.022	-0.262	S
G3		0.105	0.115	0.113	0.023	-0.335	S
G4		0.243	0.255	0.248	0.03	-0.154	S
G1	K ⁺	0.095	0.102	0.098	0.021	-0.127	S
G2		0.383	0.407	0.403	0.034	-0.593	S
G3		0.15	0.17	0.161	0.021	-0.55	S
G4		0.484	0.509	0.504	0.039	-0.504	S
G1	pH	4.74	4.7	4.748	0.08	-0.1	S
G2		4.17	4.13	4.172	0.049	-0.04	S
G3		4.43	4.4	4.432	0.049	-0.036	S
G4		4.14	4.1	4.135	0.049	0.11	S
G1	Cond	11.9	14.22	13.076	1.105	-1.064	Q
G2		38.3	45.91	42.56	2.449	-1.739	Q
G3		20.5	24.33	22.893	1.303	-1.836	Q
G4		43	50.43	46.62	2.748	-1.317	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

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<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 126, APPA Laboratorio Biologico Provinciale (Italy)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.477	0.59	0.573	0.086	-1.116	Q
G2		1.44	1.716	1.703	0.077	-3.398	Q
G3		0.754	0.912	0.897	0.043	-3.351	Q
G4		1.59	1.883	1.875	0.086	-3.305	Q
G1	NH ₄ ⁺	0.122	0.134	0.136	0.021	-0.673	S
G2		0.371	0.374	0.38	0.032	-0.267	S
G3		0.183	0.187	0.194	0.02	-0.529	S
G4		0.39	0.401	0.41	0.034	-0.573	S
G1	NO ₃ ⁻	0.197	0.214	0.21	0.01	-1.271	S
G2		0.662	0.695	0.685	0.023	-0.985	S
G3		0.298	0.335	0.331	0.012	-2.672	Q
G4		0.779	0.78	0.775	0.038	0.105	S
G1	Na ⁺	0.101	0.147	0.136	0.014	-2.54	U
G2		0.49	0.562	0.543	0.03	-1.761	S
G3		0.24	0.293	0.281	0.019	-2.144	Q
G4		0.55	0.623	0.606	0.029	-1.906	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.086	0.116	0.128	0.083	-0.509	U
G2		0.358	0.425	0.407	0.028	-1.767	Q
G3		0.195	0.232	0.219	0.027	-0.902	Q
G4		0.401	0.463	0.439	0.037	-1.039	S
G1	Ca ²⁺	0.11	0.089	0.094	0.017	0.952	Q
G2		0.184	0.23	0.226	0.022	-1.868	Q
G3		0.082	0.115	0.113	0.023	-1.327	U
G4		0.192	0.255	0.248	0.03	-1.855	Q
G1	K ⁺	0.065	0.102	0.098	0.021	-1.555	U
G2		0.301	0.407	0.403	0.034	-2.976	U
G3		0.11	0.17	0.161	0.021	-2.483	U
G4		0.4	0.509	0.504	0.039	-2.637	Q
G1	pH	4.62	4.7	4.748	0.08	-1.591	S
G2		4.09	4.13	4.172	0.049	-1.67	S
G3		4.35	4.4	4.432	0.049	-1.677	S
G4		4.04	4.1	4.135	0.049	-1.916	S
G1	Cond	12.81	14.22	13.076	1.105	-0.241	S
G2		43	45.91	42.56	2.449	0.18	S
G3		23.1	24.33	22.893	1.303	0.159	S
G4		47.4	50.43	46.62	2.748	0.284	S

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U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 127, Dept. of Chemistry Malaysia, Environmental Health Division (Malaysia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.585	0.59	0.573	0.086	0.138	S
G2		1.72	1.716	1.703	0.077	0.224	S
G3		0.917	0.912	0.897	0.043	0.471	S
G4		1.903	1.883	1.875	0.086	0.323	S
G1	NH ₄ ⁺	0.129	0.134	0.136	0.021	-0.366	S
G2		0.364	0.374	0.38	0.032	-0.496	S
G3		0.179	0.187	0.194	0.02	-0.739	S
G4		0.393	0.401	0.41	0.034	-0.477	S
G1	NO ₃ ⁻	0.207	0.214	0.21	0.01	-0.299	S
G2		0.69	0.695	0.685	0.023	0.241	S
G3		0.332	0.335	0.331	0.012	0.071	S
G4		0.783	0.78	0.775	0.038	0.202	S
G1	Na ⁺	0.128	0.147	0.136	0.014	-0.597	S
G2		0.537	0.562	0.543	0.03	-0.2	S
G3		0.267	0.293	0.281	0.019	-0.732	S
G4		0.597	0.623	0.606	0.029	-0.296	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.107	0.116	0.128	0.083	-0.262	S
G2		0.424	0.425	0.407	0.028	0.612	S
G3		0.225	0.232	0.219	0.027	0.224	S
G4		0.464	0.463	0.439	0.037	0.689	S
G1	Ca ²⁺	0.122	0.089	0.094	0.017	1.648	U
G2		0.22	0.23	0.226	0.022	-0.266	S
G3		0.123	0.115	0.113	0.023	0.441	S
G4		0.247	0.255	0.248	0.03	-0.027	S
G1	K ⁺	0.087	0.102	0.098	0.021	-0.493	S
G2		0.384	0.407	0.403	0.034	-0.576	S
G3		0.15	0.17	0.161	0.021	-0.54	S
G4		0.486	0.509	0.504	0.039	-0.458	S
G1	pH	4.75	4.7	4.748	0.08	0.024	S
G2		4.22	4.13	4.172	0.049	0.978	S
G3		4.47	4.4	4.432	0.049	0.784	S
G4		4.19	4.1	4.135	0.049	1.123	S
G1	Cond	13.53	14.22	13.076	1.105	0.41	S
G2		43.4	45.91	42.56	2.449	0.343	S
G3		23.4	24.33	22.893	1.303	0.389	S
G4		47.9	50.43	46.62	2.748	0.466	S

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Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 32nd intercomparison of analytical methods

Laboratory 140, C.N.R. Istituto di Ricerca sulle Acque (Italy)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.563	0.59	0.573	0.086	-0.121	S
G2		1.578	1.716	1.703	0.077	-1.616	S
G3		0.85	0.912	0.897	0.043	-1.101	S
G4		1.747	1.883	1.875	0.086	-1.482	S
G1	NH ₄ ⁺	0.132	0.134	0.136	0.021	-0.201	S
G2		0.372	0.374	0.38	0.032	-0.236	S
G3		0.188	0.187	0.194	0.02	-0.284	S
G4		0.4	0.401	0.41	0.034	-0.282	S
G1	NO ₃ ⁻	0.209	0.214	0.21	0.01	-0.056	S
G2		0.649	0.695	0.685	0.023	-1.548	S
G3		0.323	0.335	0.331	0.012	-0.649	S
G4		0.742	0.78	0.775	0.038	-0.864	S
G1	Na ⁺	0.148	0.147	0.136	0.014	0.829	S
G2		0.552	0.562	0.543	0.03	0.298	S
G3		0.291	0.293	0.281	0.019	0.512	S
G4		0.625	0.623	0.606	0.029	0.658	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.121	0.116	0.128	0.083	-0.089	S
G2		0.431	0.425	0.407	0.028	0.856	S
G3		0.202	0.232	0.219	0.027	-0.643	S
G4		0.474	0.463	0.439	0.037	0.95	S
G1	Ca ²⁺	0.123	0.089	0.094	0.017	1.719	U
G2		0.234	0.23	0.226	0.022	0.363	S
G3		0.109	0.115	0.113	0.023	-0.162	S
G4		0.235	0.255	0.248	0.03	-0.42	S
G1	K ⁺	0.113	0.102	0.098	0.021	0.729	S
G2		0.403	0.407	0.403	0.034	-0.012	S
G3		0.167	0.17	0.161	0.021	0.271	S
G4		0.52	0.509	0.504	0.039	0.411	S
G1	pH	4.757	4.7	4.748	0.08	0.111	S
G2		4.189	4.13	4.172	0.049	0.347	S
G3		4.453	4.4	4.432	0.049	0.436	S
G4		4.15	4.1	4.135	0.049	0.312	S
G1	Cond	13.41	14.22	13.076	1.105	0.302	S
G2		41.56	45.91	42.56	2.449	-0.408	S
G3		23.28	24.33	22.893	1.303	0.297	S
G4		48	50.43	46.62	2.748	0.502	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 145, Estonian Environmental Research Centre, Tartu laboratory (Estonia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.511	0.59	0.573	0.086	-0.722	Q
G2		1.6	1.716	1.703	0.077	-1.332	S
G3		0.818	0.912	0.897	0.043	-1.851	Q
G4		1.76	1.883	1.875	0.086	-1.331	S
G1	NH ₄ ⁺	0.121	0.134	0.136	0.021	-0.72	S
G2		0.348	0.374	0.38	0.032	-0.981	S
G3		0.179	0.187	0.194	0.02	-0.724	S
G4		0.4	0.401	0.41	0.034	-0.282	S
G1	NO ₃ ⁻	0.172	0.214	0.21	0.01	-3.801	Q
G2		0.63	0.695	0.685	0.023	-2.371	S
G3		0.268	0.335	0.331	0.012	-5.1	Q
G4		0.706	0.78	0.775	0.038	-1.808	S
G1	Na ⁺	0.133	0.147	0.136	0.014	-0.246	S
G2		0.551	0.562	0.543	0.03	0.265	S
G3		0.277	0.293	0.281	0.019	-0.217	S
G4		0.614	0.623	0.606	0.029	0.282	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.11	0.116	0.128	0.083	-0.221	S
G2		0.417	0.425	0.407	0.028	0.353	S
G3		0.228	0.232	0.219	0.027	0.321	S
G4		0.452	0.463	0.439	0.037	0.351	S
G1	Ca ²⁺	0.104	0.089	0.094	0.017	0.598	Q
G2		0.235	0.23	0.226	0.022	0.408	S
G3		0.108	0.115	0.113	0.023	-0.206	S
G4		0.25	0.255	0.248	0.03	0.08	S
G1	K ⁺	0.1	0.102	0.098	0.021	0.111	S
G2		0.433	0.407	0.403	0.034	0.86	S
G3		0.163	0.17	0.161	0.021	0.078	S
G4		0.519	0.509	0.504	0.039	0.385	S
G1	pH	5.1	4.7	4.748	0.08	4.374	U
G2		4.2	4.13	4.172	0.049	0.571	S
G3		4.5	4.4	4.432	0.049	1.4	S
G4		4.1	4.1	4.135	0.049	-0.7	S
G1	Cond	12.5	14.22	13.076	1.105	-0.521	S
G2		41.6	45.91	42.56	2.449	-0.392	S
G3		22.4	24.33	22.893	1.303	-0.378	S
G4		46.7	50.43	46.62	2.748	0.029	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

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EMEP – 32nd intercomparison of analytical methods

Laboratory 146, Cellule de Recherche en Environnement et Biotechnologies Public Research Center-
Gabriel Lippm (Luxembourg)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm st
G1	SO ₄ ²⁻	0.575	0.59	0.573	0.086	0.018	S
G2		1.689	1.716	1.703	0.077	-0.182	S
G3		0.89	0.912	0.897	0.043	-0.164	S
G4		1.858	1.883	1.875	0.086	-0.194	S
G1	NH ₄ ⁺	0.135	0.134	0.136	0.021	-0.059	S
G2		0.378	0.374	0.38	0.032	-0.049	S
G3		0.19	0.187	0.194	0.02	-0.186	S
G4		0.408	0.401	0.41	0.034	-0.049	S
G1	NO ₃ ⁻	0.211	0.214	0.21	0.01	0.146	S
G2		0.706	0.695	0.685	0.023	0.921	S
G3		0.355	0.335	0.331	0.012	1.94	S
G4		0.8	0.78	0.775	0.038	0.656	S
G1	Na ⁺	0.139	0.147	0.136	0.014	0.184	S
G2		0.554	0.562	0.543	0.03	0.364	S
G3		0.286	0.293	0.281	0.019	0.252	S
G4		0.619	0.623	0.606	0.029	0.453	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.108	0.116	0.128	0.083	-0.245	S
G2		0.414	0.425	0.407	0.028	0.245	S
G3		0.226	0.232	0.219	0.027	0.246	S
G4		0.457	0.463	0.439	0.037	0.487	S
G1	Ca ²⁺	0.088	0.089	0.094	0.017	-0.346	S
G2		0.224	0.23	0.226	0.022	-0.083	S
G3		0.109	0.115	0.113	0.023	-0.162	S
G4		0.248	0.255	0.248	0.03	0.013	S
G1	K ⁺	0.125	0.102	0.098	0.021	1.3	Q
G2		0.474	0.407	0.403	0.034	2.051	Q
G3		0.192	0.17	0.161	0.021	1.48	S
G4		0.593	0.509	0.504	0.039	2.265	Q
G1	pH	4.75	4.7	4.748	0.08	0.024	S
G2		4.16	4.13	4.172	0.049	-0.244	S
G3		4.46	4.4	4.432	0.049	0.579	S
G4		4.12	4.1	4.135	0.049	-0.295	S
G1	Cond	13.2	14.22	13.076	1.105	0.112	S
G2		43.5	45.91	42.56	2.449	0.384	S
G3		23.5	24.33	22.893	1.303	0.466	S
G4		48.4	50.43	46.62	2.748	0.647	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 153, Slovenian Forestry Institute, Ljubljana (Slovenia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.594	0.59	0.573	0.086	0.238	S
G2		1.754	1.716	1.703	0.077	0.658	S
G3		0.916	0.912	0.897	0.043	0.445	S
G4		1.93	1.883	1.875	0.086	0.642	S
G1	NH ₄ ⁺	0.211	0.134	0.136	0.021	3.527	U
G2		0.435	0.374	0.38	0.032	1.72	Q
G3		0.268	0.187	0.194	0.02	3.627	U
G4		0.468	0.401	0.41	0.034	1.699	Q
G1	NO ₃ ⁻	0.205	0.214	0.21	0.01	-0.461	S
G2		0.689	0.695	0.685	0.023	0.184	S
G3		0.329	0.335	0.331	0.012	-0.164	S
G4		0.779	0.78	0.775	0.038	0.105	S
G1	Na ⁺	0.147	0.147	0.136	0.014	0.758	S
G2		0.619	0.562	0.543	0.03	2.523	S
G3		0.31	0.293	0.281	0.019	1.501	S
G4		0.691	0.623	0.606	0.029	2.914	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.098	0.116	0.128	0.083	-0.365	Q
G2		0.388	0.425	0.407	0.028	-0.689	S
G3		0.209	0.232	0.219	0.027	-0.383	S
G4		0.424	0.463	0.439	0.037	-0.412	S
G1	Ca ²⁺	0.21	0.089	0.094	0.017	6.851	U
G2		0.316	0.23	0.226	0.022	4.023	U
G3		0.238	0.115	0.113	0.023	5.399	U
G4		0.351	0.255	0.248	0.03	3.449	U
G1	K ⁺	0.096	0.102	0.098	0.021	-0.079	S
G2		0.418	0.407	0.403	0.034	0.424	S
G3		0.164	0.17	0.161	0.021	0.126	S
G4		0.524	0.509	0.504	0.039	0.512	S
G1	pH	4.71	4.7	4.748	0.08	-0.473	S
G2		4.19	4.13	4.172	0.049	0.367	S
G3		4.47	4.4	4.432	0.049	0.784	S
G4		4.14	4.1	4.135	0.049	0.11	S
G1	Cond	12.18	14.22	13.076	1.105	-0.811	S
G2		42.38	45.91	42.56	2.449	-0.073	S
G3		22.86	24.33	22.893	1.303	-0.025	S
G4		48	50.43	46.62	2.748	0.502	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 155, Environmental Research Branch, Farnheim (UK)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.549	0.59	0.573	0.086	-0.283	S
G2		1.665	1.716	1.703	0.077	-0.492	S
G3		0.856	0.912	0.897	0.043	-0.961	S
G4		1.837	1.883	1.875	0.086	-0.438	S
G1	NH ₄ ⁺	0.134	0.134	0.136	0.021	-0.106	S
G2		0.373	0.374	0.38	0.032	-0.205	S
G3		0.193	0.187	0.194	0.02	-0.04	S
G4		0.402	0.401	0.41	0.034	-0.224	S
G1	NO ₃ ⁻	0.202	0.214	0.21	0.01	-0.765	S
G2		0.691	0.695	0.685	0.023	0.271	S
G3		0.325	0.335	0.331	0.012	-0.487	S
G4		0.785	0.78	0.775	0.038	0.263	S
G1	Na ⁺	0.14	0.147	0.136	0.014	0.256	S
G2		0.555	0.562	0.543	0.03	0.398	S
G3		0.289	0.293	0.281	0.019	0.408	S
G4		0.628	0.623	0.606	0.029	0.76	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.118	0.116	0.128	0.083	-0.125	S
G2		0.403	0.425	0.407	0.028	-0.15	S
G3		0.218	0.232	0.219	0.027	-0.05	S
G4		0.436	0.463	0.439	0.037	-0.085	S
G1	Ca ²⁺	0.105	0.089	0.094	0.017	0.657	Q
G2		0.263	0.23	0.226	0.022	1.658	S
G3		0.128	0.115	0.113	0.023	0.657	S
G4		0.265	0.255	0.248	0.03	0.58	S
G1	K ⁺	0.097	0.102	0.098	0.021	-0.032	S
G2		0.39	0.407	0.403	0.034	-0.39	S
G3		0.159	0.17	0.161	0.021	-0.115	S
G4		0.485	0.509	0.504	0.039	-0.478	S
G1	pH	4.76	4.7	4.748	0.08	0.149	S
G2		4.18	4.13	4.172	0.049	0.164	S
G3		4.44	4.4	4.432	0.049	0.169	S
G4		4.14	4.1	4.135	0.049	0.11	S
G1	Cond	13.4	14.22	13.076	1.105	0.293	S
G2		43.2	45.91	42.56	2.449	0.262	S
G3		23.2	24.33	22.893	1.303	0.236	S
G4		47.8	50.43	46.62	2.748	0.429	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 158, Acid Deposition and Oxidant Research Center ADOCRC, Niigata (Japan)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.62	0.59	0.573	0.086	0.538	S
G2		1.76	1.716	1.703	0.077	0.735	S
G3		0.92	0.912	0.897	0.043	0.539	S
G4		1.91	1.883	1.875	0.086	0.41	S
G1	NH ₄ ⁺	0.17	0.134	0.136	0.021	1.593	U
G2		0.43	0.374	0.38	0.032	1.565	S
G3		0.24	0.187	0.194	0.02	2.258	U
G4		0.46	0.401	0.41	0.034	1.466	S
G1	NO ₃ ⁻	0.22	0.214	0.21	0.01	1.057	S
G2		0.73	0.695	0.685	0.023	1.96	S
G3		0.35	0.335	0.331	0.012	1.536	S
G4		0.81	0.78	0.775	0.038	0.918	S
G1	Na ⁺	0.15	0.147	0.136	0.014	0.973	S
G2		0.59	0.562	0.543	0.03	1.56	S
G3		0.31	0.293	0.281	0.019	1.501	S
G4		0.65	0.623	0.606	0.029	1.513	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.11	0.116	0.128	0.083	-0.221	S
G2		0.41	0.425	0.407	0.028	0.101	S
G3		0.22	0.232	0.219	0.027	0.024	S
G4		0.43	0.463	0.439	0.037	-0.249	S
G1	Ca ²⁺	0.1	0.089	0.094	0.017	0.362	S
G2		0.26	0.23	0.226	0.022	1.524	S
G3		0.13	0.115	0.113	0.023	0.743	S
G4		0.29	0.255	0.248	0.03	1.414	S
G1	K ⁺	0.11	0.102	0.098	0.021	0.587	S
G2		0.43	0.407	0.403	0.034	0.773	S
G3		0.18	0.17	0.161	0.021	0.9	S
G4		0.54	0.509	0.504	0.039	0.919	S
G1	pH	4.69	4.7	4.748	0.08	-0.721	S
G2		4.21	4.13	4.172	0.049	0.775	S
G3		4.44	4.4	4.432	0.049	0.169	S
G4		4.15	4.1	4.135	0.049	0.312	S
G1	Cond	13.34	14.22	13.076	1.105	0.239	S
G2		42.5	45.91	42.56	2.449	-0.024	S
G3		22.6	24.33	22.893	1.303	-0.225	S
G4		46.33	50.43	46.62	2.748	-0.106	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 165, Institute of Meteorology and Hydrology, Ha Noi city (Vietnam)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.664	0.59	0.573	0.086	1.047	Q
G2		1.907	1.716	1.703	0.077	2.634	Q
G3		1.05	0.912	0.897	0.043	3.585	Q
G4		2.031	1.883	1.875	0.086	1.814	S
G1	NH ₄ ⁺	0.14	0.134	0.136	0.021	0.177	S
G2		0.338	0.374	0.38	0.032	-1.291	S
G3		0.211	0.187	0.194	0.02	0.84	S
G4		0.389	0.401	0.41	0.034	-0.603	S
G1	NO ₃ ⁻	0.214	0.214	0.21	0.01	0.45	S
G2		0.692	0.695	0.685	0.023	0.314	S
G3		0.339	0.335	0.331	0.012	0.646	S
G4		0.779	0.78	0.775	0.038	0.105	S
G1	Na ⁺	0.132	0.147	0.136	0.014	-0.317	S
G2		0.5	0.562	0.543	0.03	-1.429	S
G3		0.258	0.293	0.281	0.019	-1.206	S
G4		0.62	0.623	0.606	0.029	0.487	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.122	0.116	0.128	0.083	-0.077	S
G2		0.425	0.425	0.407	0.028	0.641	S
G3		0.235	0.232	0.219	0.027	0.58	S
G4		0.455	0.463	0.439	0.037	0.433	S
G1	Ca ²⁺	0.085	0.089	0.094	0.017	-0.523	S
G2		0.225	0.23	0.226	0.022	-0.038	S
G3		0.116	0.115	0.113	0.023	0.139	S
G4		0.263	0.255	0.248	0.03	0.514	S
G1	K ⁺	0.885	0.102	0.098	0.021	37.464	U
G2		1.446	0.407	0.403	0.034	30.296	U
G3		0.981	0.17	0.161	0.021	39.614	U
G4		1.868	0.509	0.504	0.039	34.65	U
G1	pH	4.74	4.7	4.748	0.08	-0.1	S
G2		4.12	4.13	4.172	0.049	-1.059	S
G3		4.41	4.4	4.432	0.049	-0.446	S
G4		4.22	4.1	4.135	0.049	1.73	Q
G1	Cond	13.6	14.22	13.076	1.105	0.474	S
G2		43	45.91	42.56	2.449	0.18	S
G3		22.6	24.33	22.893	1.303	-0.225	S
G4		41.8	50.43	46.62	2.748	-1.754	Q

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

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EMEP – 32nd intercomparison of analytical methods

Laboratory 166, Forest Research Institute, Laboratory of Forest Environment Chemistry (Poland)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.582	0.59	0.573	0.086	0.099	S
G2		1.715	1.716	1.703	0.077	0.154	S
G3		0.898	0.912	0.897	0.043	0.023	S
G4		1.872	1.883	1.875	0.086	-0.031	S
G1	NH ₄ ⁺	0.14	0.134	0.136	0.021	0.177	S
G2		0.391	0.374	0.38	0.032	0.354	S
G3		0.197	0.187	0.194	0.02	0.156	S
G4		0.418	0.401	0.41	0.034	0.242	S
G1	NO ₃ ⁻	0.208	0.214	0.21	0.01	-0.157	S
G2		0.688	0.695	0.685	0.023	0.141	S
G3		0.335	0.335	0.331	0.012	0.322	S
G4		0.787	0.78	0.775	0.038	0.315	S
G1	Na ⁺	0.141	0.147	0.136	0.014	0.328	S
G2		0.568	0.562	0.543	0.03	0.829	S
G3		0.291	0.293	0.281	0.019	0.512	S
G4		0.617	0.623	0.606	0.029	0.384	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.113	0.116	0.128	0.083	-0.185	S
G2		0.408	0.425	0.407	0.028	0.03	S
G3		0.229	0.232	0.219	0.027	0.358	S
G4		0.442	0.463	0.439	0.037	0.078	S
G1	Ca ²⁺	0.09	0.089	0.094	0.017	-0.228	S
G2		0.229	0.23	0.226	0.022	0.14	S
G3		0.119	0.115	0.113	0.023	0.269	S
G4		0.252	0.255	0.248	0.03	0.147	S
G1	K ⁺	0.09	0.102	0.098	0.021	-0.365	S
G2		0.415	0.407	0.403	0.034	0.337	S
G3		0.15	0.17	0.161	0.021	-0.55	S
G4		0.515	0.509	0.504	0.039	0.284	S
G1	pH	4.78	4.7	4.748	0.08	0.397	S
G2		4.19	4.13	4.172	0.049	0.367	S
G3		4.45	4.4	4.432	0.049	0.374	S
G4		4.19	4.1	4.135	0.049	1.123	S
G1	Cond	12.4	14.22	13.076	1.105	-0.612	S
G2		42.8	45.91	42.56	2.449	0.098	S
G3		22.5	24.33	22.893	1.303	-0.301	S
G4		45.5	50.43	46.62	2.748	-0.408	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 176, Main Geophysical Observatory, Saint-Petersburg (Russian Federation)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.575	0.59	0.573	0.086	0.018	S
G2		1.709	1.716	1.703	0.077	0.076	S
G3		0.894	0.912	0.897	0.043	-0.07	S
G4		1.872	1.883	1.875	0.086	-0.031	S
G1	NH ₄ ⁺	0.14	0.134	0.136	0.021	0.177	S
G2		0.389	0.374	0.38	0.032	0.292	S
G3		0.202	0.187	0.194	0.02	0.4	S
G4		0.436	0.401	0.41	0.034	0.767	S
G1	NO ₃ ⁻	0.221	0.214	0.21	0.01	1.158	S
G2		0.516	0.695	0.685	0.023	-7.309	U
G3		0.35	0.335	0.331	0.012	1.536	S
G4		0.841	0.78	0.775	0.038	1.73	S
G1	Na ⁺	0.19	0.147	0.136	0.014	3.84	U
G2		0.555	0.562	0.543	0.03	0.398	S
G3		0.27	0.293	0.281	0.019	-0.581	S
G4		0.603	0.623	0.606	0.029	-0.094	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.115	0.116	0.128	0.083	-0.161	S
G2		0.412	0.425	0.407	0.028	0.173	S
G3		0.223	0.232	0.219	0.027	0.135	S
G4		0.469	0.463	0.439	0.037	0.814	S
G1	Ca ²⁺	0.11	0.089	0.094	0.017	0.952	Q
G2		0.255	0.23	0.226	0.022	1.301	S
G3		0.12	0.115	0.113	0.023	0.312	S
G4		0.27	0.255	0.248	0.03	0.747	S
G1	K ⁺	0.11	0.102	0.098	0.021	0.587	S
G2		0.41	0.407	0.403	0.034	0.192	S
G3		0.158	0.17	0.161	0.021	-0.163	S
G4		0.468	0.509	0.504	0.039	-0.91	S
G1	pH	4.645	4.7	4.748	0.08	-1.281	S
G2		4.093	4.13	4.172	0.049	-1.609	S
G3		4.36	4.4	4.432	0.049	-1.472	S
G4		4.05	4.1	4.135	0.049	-1.713	S
G1	Cond	12.15	14.22	13.076	1.105	-0.838	S
G2		37.3	45.91	42.56	2.449	-2.148	Q
G3		20.45	24.33	22.893	1.303	-1.874	Q
G4		43.35	50.43	46.62	2.748	-1.19	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 178, Environmental Chemistry and EANET Monitoring Laboratory, Limnological Institute
RAS/SB, Irkutsk (Russian Federation)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm st
G1	SO ₄ ²⁻	0.574	0.59	0.573	0.086	0.006	S
G2		1.646	1.716	1.703	0.077	-0.737	S
G3		0.877	0.912	0.897	0.043	-0.469	S
G4		1.799	1.883	1.875	0.086	-0.879	S
G1	NH ₄ ⁺	0.16	0.134	0.136	0.021	1.121	Q
G2		0.39	0.374	0.38	0.032	0.323	S
G3		0.21	0.187	0.194	0.02	0.791	S
G4		0.41	0.401	0.41	0.034	0.009	S
G1	NO ₃ ⁻	0.216	0.214	0.21	0.01	0.652	S
G2		0.709	0.695	0.685	0.023	1.051	S
G3		0.338	0.335	0.331	0.012	0.565	S
G4		0.799	0.78	0.775	0.038	0.63	S
G1	Na ⁺	0.149	0.147	0.136	0.014	0.901	S
G2		0.561	0.562	0.543	0.03	0.597	S
G3		0.3	0.293	0.281	0.019	0.981	S
G4		0.63	0.623	0.606	0.029	0.829	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.111	0.116	0.128	0.083	-0.209	S
G2		0.411	0.425	0.407	0.028	0.137	S
G3		0.223	0.232	0.219	0.027	0.135	S
G4		0.445	0.463	0.439	0.037	0.16	S
G1	Ca ²⁺	0.106	0.089	0.094	0.017	0.716	Q
G2		0.248	0.23	0.226	0.022	0.988	S
G3		0.117	0.115	0.113	0.023	0.183	S
G4		0.254	0.255	0.248	0.03	0.213	S
G1	K ⁺	0.104	0.102	0.098	0.021	0.301	S
G2		0.408	0.407	0.403	0.034	0.133	S
G3		0.17	0.17	0.161	0.021	0.416	S
G4		0.499	0.509	0.504	0.039	-0.123	S
G1	pH	4.53	4.7	4.748	0.08	-2.71	Q
G2		4.14	4.13	4.172	0.049	-0.651	S
G3		4.38	4.4	4.432	0.049	-1.062	S
G4		4.09	4.1	4.135	0.049	-0.903	S
G1	Cond	14.5	14.22	13.076	1.105	1.288	S
G2		37.4	45.91	42.56	2.449	-2.107	Q
G3		22.5	24.33	22.893	1.303	-0.301	S
G4		41.8	50.43	46.62	2.748	-1.754	Q

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EMEP – 32nd intercomparison of analytical methods

Laboratory 179, Murmansk Environmental Monitoring Center, Murmansk (Russian Federation)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.586	0.59	0.573	0.086	0.145	S
G2		1.685	1.716	1.703	0.077	-0.234	S
G3		0.89	0.912	0.897	0.043	-0.164	S
G4		1.859	1.883	1.875	0.086	-0.182	S
G1	NH ₄ ⁺	0.14	0.134	0.136	0.021	0.177	S
G2		0.387	0.374	0.38	0.032	0.23	S
G3		0.198	0.187	0.194	0.02	0.205	S
G4		0.42	0.401	0.41	0.034	0.301	S
G1	NO ₃ ⁻	0.212	0.214	0.21	0.01	0.247	S
G2		0.643	0.695	0.685	0.023	-1.808	S
G3		0.312	0.335	0.331	0.012	-1.539	S
G4		0.733	0.78	0.775	0.038	-1.1	S
G1	Na ⁺	0.11	0.147	0.136	0.014	-1.894	U
G2		0.54	0.562	0.543	0.03	-0.1	S
G3		0.26	0.293	0.281	0.019	-1.102	S
G4		0.6	0.623	0.606	0.029	-0.197	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.136	0.116	0.128	0.083	0.091	Q
G2		0.439	0.425	0.407	0.028	1.144	S
G3		0.235	0.232	0.219	0.027	0.58	S
G4		0.511	0.463	0.439	0.037	1.959	S
G1	Ca ²⁺	0.08	0.089	0.094	0.017	-0.818	S
G2		0.19	0.23	0.226	0.022	-1.6	Q
G3		0.1	0.115	0.113	0.023	-0.55	S
G4		0.34	0.255	0.248	0.03	3.082	U
G1	K ⁺	0.1	0.102	0.098	0.021	0.111	S
G2		0.38	0.407	0.403	0.034	-0.68	S
G3		0.12	0.17	0.161	0.021	-2	U
G4		0.5	0.509	0.504	0.039	-0.097	S
G1	pH	-999	4.7	4.748	0.08		B
G2		-999	4.13	4.172	0.049		B
G3		-999	4.4	4.432	0.049		B
G4		-999	4.1	4.135	0.049		B
G1	Cond	13.33	14.22	13.076	1.105	0.229	S
G2		45.83	45.91	42.56	2.449	1.335	S
G3		24.38	24.33	22.893	1.303	1.141	S
G4		49.78	50.43	46.62	2.748	1.15	S

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 181, TNO innovation for life (The Netherlands)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.57	0.59	0.573	0.086	-0.04	S
G2		1.7	1.716	1.703	0.077	-0.04	S
G3		0.87	0.912	0.897	0.043	-0.633	S
G4		1.9	1.883	1.875	0.086	0.294	S
G1	NH ₄ ⁺	0.14	0.134	0.136	0.021	0.177	S
G2		0.39	0.374	0.38	0.032	0.323	S
G3		0.19	0.187	0.194	0.02	-0.186	S
G4		0.41	0.401	0.41	0.034	0.009	S
G1	NO ₃ ⁻	0.21	0.214	0.21	0.01	0.045	S
G2		0.67	0.695	0.685	0.023	-0.639	S
G3		0.33	0.335	0.331	0.012	-0.083	S
G4		0.75	0.78	0.775	0.038	-0.655	S
G1	Na ⁺	0.15	0.147	0.136	0.014	0.973	S
G2		0.56	0.562	0.543	0.03	0.564	S
G3		0.29	0.293	0.281	0.019	0.46	S
G4		0.62	0.623	0.606	0.029	0.487	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	0.15	0.116	0.128	0.083	0.259	U
G2		0.43	0.425	0.407	0.028	0.82	S
G3		0.25	0.232	0.219	0.027	1.135	S
G4		0.45	0.463	0.439	0.037	0.296	S
G1	Ca ²⁺	0.09	0.089	0.094	0.017	-0.228	S
G2		0.24	0.23	0.226	0.022	0.631	S
G3		0.12	0.115	0.113	0.023	0.312	S
G4		0.26	0.255	0.248	0.03	0.414	S
G1	K ⁺	0.1	0.102	0.098	0.021	0.111	S
G2		0.41	0.407	0.403	0.034	0.192	S
G3		0.17	0.17	0.161	0.021	0.416	S
G4		0.51	0.509	0.504	0.039	0.157	S
G1	pH	4.8	4.7	4.748	0.08	0.646	S
G2		4.2	4.13	4.172	0.049	0.571	S
G3		4.5	4.4	4.432	0.049	1.4	S
G4		4.2	4.1	4.135	0.049	1.325	Q
G1	Cond	14.3	14.22	13.076	1.105	1.107	S
G2		46.2	45.91	42.56	2.449	1.487	S
G3		25	24.33	22.893	1.303	1.617	S
G4		50.8	50.43	46.62	2.748	1.521	S

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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 187, Public Health Institute - Nis, Department for Sanitary Chemistry (Republic of Serbia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	-999	0.59	0.573	0.086		B
G2		-999	1.716	1.703	0.077		B
G3		-999	0.912	0.897	0.043		B
G4		-999	1.883	1.875	0.086		B
G1	NH ₄ ⁺	0.26	0.134	0.136	0.021	5.84	U
G2		0.352	0.374	0.38	0.032	-0.857	S
G3		0.194	0.187	0.194	0.02	0.009	S
G4		0.355	0.401	0.41	0.034	-1.593	S
G1	NO ₃ ⁻	0.252	0.214	0.21	0.01	4.296	Q
G2		0.735	0.695	0.685	0.023	2.177	S
G3		0.318	0.335	0.331	0.012	-1.054	S
G4		0.791	0.78	0.775	0.038	0.42	S
G1	Na ⁺	0.21	0.147	0.136	0.014	5.274	U
G2		0.614	0.562	0.543	0.03	2.357	S
G3		0.4	0.293	0.281	0.019	6.188	U
G4		0.651	0.623	0.606	0.029	1.547	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	-999	0.116	0.128	0.083		B
G2		-999	0.425	0.407	0.028		B
G3		-999	0.232	0.219	0.027		B
G4		-999	0.463	0.439	0.037		B
G1	Ca ²⁺	0.112	0.089	0.094	0.017	1.07	U
G2		0.253	0.23	0.226	0.022	1.211	S
G3		0.113	0.115	0.113	0.023	0.01	S
G4		0.238	0.255	0.248	0.03	-0.32	S
G1	K ⁺	0.1	0.102	0.098	0.021	0.111	S
G2		0.345	0.407	0.403	0.034	-1.697	Q
G3		0.195	0.17	0.161	0.021	1.625	S
G4		0.478	0.509	0.504	0.039	-0.656	S
G1	pH	-999	4.7	4.748	0.08		B
G2		-999	4.13	4.172	0.049		B
G3		-999	4.4	4.432	0.049		B
G4		-999	4.1	4.135	0.049		B
G1	Cond	-999	14.22	13.076	1.105		B
G2		-999	45.91	42.56	2.449		B
G3		-999	24.33	22.893	1.303		B
G4		-999	50.43	46.62	2.748		B

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

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EMEP – 32nd intercomparison of analytical methods

Laboratory 191, Institute for Public Health - Pancevo (Republic of Serbia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	2.78	0.59	0.573	0.086	25.519	U
G2		-999	1.716	1.703	0.077		B
G3		-999	0.912	0.897	0.043		B
G4		-999	1.883	1.875	0.086		B
G1	NH ₄ ⁺	-999	0.134	0.136	0.021		B
G2		0.38	0.374	0.38	0.032	0.013	S
G3		-999	0.187	0.194	0.02		B
G4		-999	0.401	0.41	0.034		B
G1	NO ₃ ⁻	-999	0.214	0.21	0.01		B
G2		-999	0.695	0.685	0.023		B
G3		0.33	0.335	0.331	0.012	-0.083	S
G4		-999	0.78	0.775	0.038		B
G1	Na ⁺	-999	0.147	0.136	0.014		B
G2		-999	0.562	0.543	0.03		B
G3		-999	0.293	0.281	0.019		B
G4		-999	0.623	0.606	0.029		B
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	-999	0.116	0.128	0.083		B
G2		-999	0.425	0.407	0.028		B
G3		-999	0.232	0.219	0.027		B
G4		< 5.000	0.463	0.439	0.037		B
G1	Ca ²⁺	-999	0.089	0.094	0.017		B
G2		-999	0.23	0.226	0.022		B
G3		-999	0.115	0.113	0.023		B
G4		-999	0.255	0.248	0.03		B
G1	K ⁺	-999	0.102	0.098	0.021		B
G2		-999	0.407	0.403	0.034		B
G3		-999	0.17	0.161	0.021		B
G4		-999	0.509	0.504	0.039		B
G1	pH	-999	4.7	4.748	0.08		B
G2		-999	4.13	4.172	0.049		B
G3		-999	4.4	4.432	0.049		B
G4		-999	4.1	4.135	0.049		B
G1	Cond	-999	14.22	13.076	1.105		B
G2		-999	45.91	42.56	2.449		B
G3		-999	24.33	22.893	1.303		B
G4		-999	50.43	46.62	2.748		B

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

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EMEP – 32nd intercomparison of analytical methods

Laboratory 193, Institute of Public Health of Vojvodina (Republic of Serbia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	-999	0.59	0.573	0.086		B
G2		-999	1.716	1.703	0.077		B
G3		-999	0.912	0.897	0.043		B
G4		1.89	1.883	1.875	0.086	0.178	S
G1	NH ₄ ⁺	-999	0.134	0.136	0.021		B
G2		-999	0.374	0.38	0.032		B
G3		0.18	0.187	0.194	0.02	-0.675	S
G4		-999	0.401	0.41	0.034		B
G1	NO ₃ ⁻	-999	0.214	0.21	0.01		B
G2		0.66	0.695	0.685	0.023	-1.072	S
G3		-999	0.335	0.331	0.012		B
G4		-999	0.78	0.775	0.038		B
G1	Na ⁺	0.112	0.147	0.136	0.014	-1.751	Q
G2		-999	0.562	0.543	0.03		B
G3		-999	0.293	0.281	0.019		B
G4		-999	0.623	0.606	0.029		B
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	-999	0.116	0.128	0.083		B
G2		-999	0.425	0.407	0.028		B
G3		-999	0.232	0.219	0.027		B
G4		-999	0.463	0.439	0.037		B
G1	Ca ²⁺	-999	0.089	0.094	0.017		B
G2		-999	0.23	0.226	0.022		B
G3		-999	0.115	0.113	0.023		B
G4		-999	0.255	0.248	0.03		B
G1	K ⁺	0.085	0.102	0.098	0.021	-0.603	Q
G2		-999	0.407	0.403	0.034		B
G3		-999	0.17	0.161	0.021		B
G4		-999	0.509	0.504	0.039		B
G1	pH	-999	4.7	4.748	0.08		B
G2		-999	4.13	4.172	0.049		B
G3		-999	4.4	4.432	0.049		B
G4		-999	4.1	4.135	0.049		B
G1	Cond	-999	14.22	13.076	1.105		B
G2		-999	45.91	42.56	2.449		B
G3		-999	24.33	22.893	1.303		B
G4		-999	50.43	46.62	2.748		B

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S – Satisfactory: Your result deviates less than $\pm 10\%$ of the expected value for SO_4^{2-} and NO_3^- , less than $\pm 15\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and less than ± 0.1 pH-units for pH

Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 32nd intercomparison of analytical methods

Laboratory 194, Institute of Public Health - Zrenjanin (Republic of Serbia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	-999	0.59	0.573	0.086		B
G2		-999	1.716	1.703	0.077		B
G3		-999	0.912	0.897	0.043		B
G4		-999	1.883	1.875	0.086		B
G1	NH ₄ ⁺	-999	0.134	0.136	0.021		B
G2		-999	0.374	0.38	0.032		B
G3		-999	0.187	0.194	0.02		B
G4		-999	0.401	0.41	0.034		B
G1	NO ₃ ⁻	-999	0.214	0.21	0.01		B
G2		-999	0.695	0.685	0.023		B
G3		-999	0.335	0.331	0.012		B
G4		-999	0.78	0.775	0.038		B
G1	Na ⁺	0.22	0.147	0.136	0.014	5.991	U
G2		0.61	0.562	0.543	0.03	2.224	S
G3		0.4	0.293	0.281	0.019	6.188	U
G4		0.65	0.623	0.606	0.029	1.513	S
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	-999	0.116	0.128	0.083		B
G2		-999	0.425	0.407	0.028		B
G3		-999	0.232	0.219	0.027		B
G4		-999	0.463	0.439	0.037		B
G1	Ca ²⁺	0.099	0.089	0.094	0.017	0.303	S
G2		0.22	0.23	0.226	0.022	-0.262	S
G3		0.11	0.115	0.113	0.023	-0.119	S
G4		0.24	0.255	0.248	0.03	-0.254	S
G1	K ⁺	0.1	0.102	0.098	0.021	0.111	S
G2		0.42	0.407	0.403	0.034	0.482	S
G3		0.16	0.17	0.161	0.021	-0.067	S
G4		0.51	0.509	0.504	0.039	0.157	S
G1	pH	-999	4.7	4.748	0.08		B
G2		-999	4.13	4.172	0.049		B
G3		-999	4.4	4.432	0.049		B
G4		-999	4.1	4.135	0.049		B
G1	Cond	-999	14.22	13.076	1.105		B
G2		-999	45.91	42.56	2.449		B
G3		-999	24.33	22.893	1.303		B
G4		-999	50.43	46.62	2.748		B

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EMEP – 32nd intercomparison of analytical methods

Laboratory 195, Institute of Public Health - Suobtica (Republic of Serbia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	-999	0.59	0.573	0.086		B
G2		-999	1.716	1.703	0.077		B
G3		-999	0.912	0.897	0.043		B
G4		-999	1.883	1.875	0.086		B
G1	NH ₄ ⁺	0.16	0.134	0.136	0.021	1.121	Q
G2		0.393	0.374	0.38	0.032	0.416	S
G3		0.213	0.187	0.194	0.02	0.938	S
G4		0.453	0.401	0.41	0.034	1.262	S
G1	NO ₃ ⁻	0.234	0.214	0.21	0.01	2.474	S
G2		0.784	0.695	0.685	0.023	4.299	Q
G3		0.398	0.335	0.331	0.012	5.42	Q
G4		0.898	0.78	0.775	0.038	3.224	Q
G1	Na ⁺	-999	0.147	0.136	0.014		B
G2		-999	0.562	0.543	0.03		B
G3		-999	0.293	0.281	0.019		B
G4		-999	0.623	0.606	0.029		B
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	-999	0.116	0.128	0.083		B
G2		-999	0.425	0.407	0.028		B
G3		-999	0.232	0.219	0.027		B
G4		-999	0.463	0.439	0.037		B
G1	Ca ²⁺	-999	0.089	0.094	0.017		B
G2		-999	0.23	0.226	0.022		B
G3		-999	0.115	0.113	0.023		B
G4		-999	0.255	0.248	0.03		B
G1	K ⁺	-999	0.102	0.098	0.021		B
G2		-999	0.407	0.403	0.034		B
G3		-999	0.17	0.161	0.021		B
G4		-999	0.509	0.504	0.039		B
G1	pH	-999	4.7	4.748	0.08		B
G2		-999	4.13	4.172	0.049		B
G3		-999	4.4	4.432	0.049		B
G4		-999	4.1	4.135	0.049		B
G1	Cond	-999	14.22	13.076	1.105		B
G2		-999	45.91	42.56	2.449		B
G3		-999	24.33	22.893	1.303		B
G4		-999	50.43	46.62	2.748		B

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EMEP – 32nd intercomparison of analytical methods

Laboratory 197, Institute of Occupational Health - Novi Sad (Republic of Serbia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	-999	0.59	0.573	0.086		B
G2		-999	1.716	1.703	0.077		B
G3		-999	0.912	0.897	0.043		B
G4		-999	1.883	1.875	0.086		B
G1	NH ₄ ⁺	0.064	0.134	0.136	0.021	-3.41	U
G2		0.165	0.374	0.38	0.032	-6.663	U
G3		0.09	0.187	0.194	0.02	-5.075	U
G4		0.18	0.401	0.41	0.034	-6.693	U
G1	NO ₃ ⁻	0.204	0.214	0.21	0.01	-0.562	S
G2		0.685	0.695	0.685	0.023	0.011	S
G3		0.333	0.335	0.331	0.012	0.16	S
G4		0.767	0.78	0.775	0.038	-0.209	S
G1	Na ⁺	-999	0.147	0.136	0.014		B
G2		-999	0.562	0.543	0.03		B
G3		-999	0.293	0.281	0.019		B
G4		-999	0.623	0.606	0.029		B
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	-999	0.116	0.128	0.083		B
G2		-999	0.425	0.407	0.028		B
G3		-999	0.232	0.219	0.027		B
G4		-999	0.463	0.439	0.037		B
G1	Ca ²⁺	-999	0.089	0.094	0.017		B
G2		-999	0.23	0.226	0.022		B
G3		-999	0.115	0.113	0.023		B
G4		-999	0.255	0.248	0.03		B
G1	K ⁺	-999	0.102	0.098	0.021		B
G2		-999	0.407	0.403	0.034		B
G3		-999	0.17	0.161	0.021		B
G4		-999	0.509	0.504	0.039		B
G1	pH	-999	4.7	4.748	0.08		B
G2		-999	4.13	4.172	0.049		B
G3		-999	4.4	4.432	0.049		B
G4		-999	4.1	4.135	0.049		B
G1	Cond	-999	14.22	13.076	1.105		B
G2		-999	45.91	42.56	2.449		B
G3		-999	24.33	22.893	1.303		B
G4		-999	50.43	46.62	2.748		B

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Q – Questionable: Your result deviates between $\pm 10\text{-}20\%$ of the expected value for SO_4^{2-} and NO_3^- , between $\pm 15\text{-}25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between $\pm 0.1\text{-}0.2$ pH-units for pH

U – Unsatisfactory: Your result deviates more than $\pm 20\%$ of the expected value for SO_4^{2-} and NO_3^- , more than $\pm 25\%$ of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and more than ± 0.2 pH-units for pH

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EMEP – 32nd intercomparison of analytical methods

Laboratory 198, Institute for public health - Sremska Mitrovica (Republic of Serbia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	< 1.670	0.59	0.573	0.086		B
G2		< 1.670	1.716	1.703	0.077	-11.213	U
G3		< 1.670	0.912	0.897	0.043		B
G4		< 1.670	1.883	1.875	0.086	-12.069	U
G1	NH ₄ ⁺	0.145	0.134	0.136	0.021	0.413	S
G2		0.372	0.374	0.38	0.032	-0.236	S
G3		0.206	0.187	0.194	0.02	0.596	S
G4		0.414	0.401	0.41	0.034	0.126	S
G1	NO ₃ ⁻	-999	0.214	0.21	0.01		B
G2		-999	0.695	0.685	0.023		B
G3		-999	0.335	0.331	0.012		B
G4		-999	0.78	0.775	0.038		B
G1	Na ⁺	-999	0.147	0.136	0.014		B
G2		-999	0.562	0.543	0.03		B
G3		-999	0.293	0.281	0.019		B
G4		-999	0.623	0.606	0.029		B
G1	Mg ²⁺	-999	0	0	0		B
G2		-999	0	0	0		B
G3		-999	0	0	0		B
G4		-999	0	0	0		B
G1	Cl ⁻	15.5	0.116	0.128	0.083	184.314	U
G2		15.7	0.425	0.407	0.028	549.538	U
G3		17.1	0.232	0.219	0.027	625.262	U
G4		17.7	0.463	0.439	0.037	470.439	U
G1	Ca ²⁺	-999	0.089	0.094	0.017		B
G2		-999	0.23	0.226	0.022		B
G3		-999	0.115	0.113	0.023		B
G4		-999	0.255	0.248	0.03		B
G1	K ⁺	-999	0.102	0.098	0.021		B
G2		-999	0.407	0.403	0.034		B
G3		-999	0.17	0.161	0.021		B
G4		-999	0.509	0.504	0.039		B
G1	pH	-999	4.7	4.748	0.08		B
G2		-999	4.13	4.172	0.049		B
G3		-999	4.4	4.432	0.049		B
G4		-999	4.1	4.135	0.049		B
G1	Cond	-999	14.22	13.076	1.105		B
G2		-999	45.91	42.56	2.449		B
G3		-999	24.33	22.893	1.303		B
G4		-999	50.43	46.62	2.748		B

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