

EMEP – 29th intercomparison of analytical methods

Laboratory 2, Flemish Environment Agency (Belgium)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [*]
G1	SO ₄ ²⁻	0.929	0.859	0.859	0.043	1.604	S
G2	SO ₄ ²⁻	1.186	1.09	1.096	0.064	1.399	S
G3	SO ₄ ²⁻	0.681	0.634	0.642	0.035	1.123	S
G4	SO ₄ ²⁻	0.822	0.771	0.78	0.033	1.301	S
G1	NH ₄ ⁺	0.208	0.134	0.138	0.019	3.711	U
G2	NH ₄ ⁺	0.325	0.214	0.213	0.022	4.962	U
G3	NH ₄ ⁺	0.406	0.267	0.27	0.023	5.949	U
G4	NH ₄ ⁺	0.518	0.348	0.352	0.027	6.196	U
G1	NO ₃ ⁻	0.263	0.27	0.269	0.016	-0.359	S
G2	NO ₃ ⁻	0.341	0.352	0.352	0.02	-0.545	S
G3	NO ₃ ⁻	0.41	0.415	0.415	0.023	-0.218	S
G4	NO ₃ ⁻	0.609	0.607	0.609	0.043	0.001	S
G1	Na ⁺	0.247	0.268	0.261	0.022	-0.631	S
G2	Na ⁺	0.189	0.208	0.2	0.018	-0.63	S
G3	Na ⁺	0.301	0.318	0.311	0.023	-0.417	S
G4	Na ⁺	0.491	0.512	0.499	0.043	-0.184	S
G1	Mg ²⁺	0.107	0.103	0.103	0.01	0.366	S
G2	Mg ²⁺	0.096	0.093	0.093	0.008	0.378	S
G3	Mg ²⁺	0.122	0.114	0.112	0.011	0.936	S
G4	Mg ²⁺	0.153	0.145	0.145	0.012	0.694	S
G1	Cl ⁻	0.161	0.193	0.196	0.037	-0.956	Q
G2	Cl ⁻	0.111	0.154	0.165	0.039	-1.368	U
G3	Cl ⁻	0.236	0.27	0.275	0.061	-0.644	S
G4	Cl ⁻	0.312	0.347	0.348	0.069	-0.525	S
G1	Ca ²⁺	0.008	0.102	0.106	0.034	-2.885	U
G2	Ca ²⁺	0.063	0.14	0.142	0.025	-3.192	U
G3	Ca ²⁺	0.156	0.204	0.2	0.028	-1.588	Q
G4	Ca ²⁺	0.136	0.192	0.189	0.032	-1.627	U
G1	K ⁺	0.126	0.136	0.125	0.031	0.021	S
G2	K ⁺	0.195	0.204	0.194	0.022	0.043	S
G3	K ⁺	0.162	0.17	0.163	0.03	-0.025	S
G4	K ⁺	0.232	0.238	0.23	0.027	0.079	S
G1	pH	4.075	4.4	4.46	0.104	-3.703	U
G2	pH	3.95	4.27	4.329	0.077	-4.929	U
G3	pH	4.23	4.7	4.755	0.083	-6.307	U
G4	pH	4.19	4.57	4.631	0.077	-5.727	U
G1	Cond	21.3	22	21.535	1.76	-0.134	S
G2	Cond	28.1	29	27.802	2.442	0.122	S
G3	Cond	16.4	16	16.357	1.308	0.033	S
G4	Cond	21.1	22	21.283	1.453	-0.126	S

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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 Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.875	0.859	0.859	0.043	0.366	S
G2	SO ₄ ²⁻	1.109	1.09	1.096	0.064	0.196	S
G3	SO ₄ ²⁻	0.655	0.634	0.642	0.035	0.382	S
G4	SO ₄ ²⁻	0.788	0.771	0.78	0.033	0.259	S
G1	NH ₄ ⁺	0.172	0.134	0.138	0.019	1.807	U
G2	NH ₄ ⁺	0.274	0.214	0.213	0.022	2.693	U
G3	NH ₄ ⁺	0.317	0.267	0.27	0.023	2.05	Q
G4	NH ₄ ⁺	0.39	0.348	0.352	0.027	1.417	S
G1	NO ₃ ⁻	0.271	0.27	0.269	0.016	0.141	S
G2	NO ₃ ⁻	0.358	0.352	0.352	0.02	0.307	S
G3	NO ₃ ⁻	0.421	0.415	0.415	0.023	0.261	S
G4	NO ₃ ⁻	0.614	0.607	0.609	0.043	0.118	S
G1	Na ⁺	0.256	0.268	0.261	0.022	-0.227	S
G2	Na ⁺	0.205	0.208	0.2	0.018	0.28	S
G3	Na ⁺	0.322	0.318	0.311	0.023	0.497	S
G4	Na ⁺	0.504	0.512	0.499	0.043	0.118	S
G1	Mg ²⁺	0.098	0.103	0.103	0.01	-0.572	S
G2	Mg ²⁺	0.089	0.093	0.093	0.008	-0.505	S
G3	Mg ²⁺	0.107	0.114	0.112	0.011	-0.45	S
G4	Mg ²⁺	0.136	0.145	0.145	0.012	-0.729	S
G1	Cl ⁻	0.19	0.193	0.196	0.037	-0.17	S
G2	Cl ⁻	0.158	0.154	0.165	0.039	-0.176	S
G3	Cl ⁻	0.276	0.27	0.275	0.061	0.009	S
G4	Cl ⁻	0.346	0.347	0.348	0.069	-0.029	S
G1	Ca ²⁺	0.108	0.102	0.106	0.034	0.063	S
G2	Ca ²⁺	0.145	0.14	0.142	0.025	0.142	S
G3	Ca ²⁺	0.214	0.204	0.2	0.028	0.494	S
G4	Ca ²⁺	0.172	0.192	0.189	0.032	-0.512	S
G1	K ⁺	0.127	0.136	0.125	0.031	0.053	S
G2	K ⁺	0.189	0.204	0.194	0.022	-0.23	S
G3	K ⁺	0.163	0.17	0.163	0.03	0.009	S
G4	K ⁺	0.222	0.238	0.23	0.027	-0.294	S
G1	pH	4.47	4.4	4.46	0.104	0.098	S
G2	pH	4.353	4.27	4.329	0.077	0.308	S
G3	pH	4.755	4.7	4.755	0.083	0.004	S
G4	pH	4.651	4.57	4.631	0.077	0.265	S
G1	Cond	22.56	22	21.535	1.76	0.582	S
G2	Cond	29.3	29	27.802	2.442	0.613	S
G3	Cond	17.53	16	16.357	1.308	0.897	S
G4	Cond	22.78	22	21.283	1.453	1.03	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

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

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.886	0.859	0.859	0.043	0.619	S
G2	SO ₄ ²⁻	1.126	1.09	1.096	0.064	0.462	S
G3	SO ₄ ²⁻	0.652	0.634	0.642	0.035	0.297	S
G4	SO ₄ ²⁻	0.793	0.771	0.78	0.033	0.412	S
G1	NH ₄ ⁺	0.142	0.134	0.138	0.019	0.219	S
G2	NH ₄ ⁺	0.218	0.214	0.213	0.022	0.202	S
G3	NH ₄ ⁺	0.27	0.267	0.27	0.023	-0.009	S
G4	NH ₄ ⁺	0.353	0.348	0.352	0.027	0.035	S
G1	NO ₃ ⁻	0.272	0.27	0.269	0.016	0.203	S
G2	NO ₃ ⁻	0.353	0.352	0.352	0.02	0.056	S
G3	NO ₃ ⁻	0.426	0.415	0.415	0.023	0.479	S
G4	NO ₃ ⁻	0.612	0.607	0.609	0.043	0.071	S
G1	Na ⁺	0.25	0.268	0.261	0.022	-0.496	S
G2	Na ⁺	0.193	0.208	0.2	0.018	-0.402	S
G3	Na ⁺	0.314	0.318	0.311	0.023	0.148	S
G4	Na ⁺	0.5	0.512	0.499	0.043	0.025	S
G1	Mg ²⁺	0.092	0.103	0.103	0.01	-1.198	S
G2	Mg ²⁺	0.084	0.093	0.093	0.008	-1.137	S
G3	Mg ²⁺	0.105	0.114	0.112	0.011	-0.634	S
G4	Mg ²⁺	0.131	0.145	0.145	0.012	-1.148	S
G1	Cl ⁻	0.191	0.193	0.196	0.037	-0.143	S
G2	Cl ⁻	0.152	0.154	0.165	0.039	-0.328	S
G3	Cl ⁻	0.265	0.27	0.275	0.061	-0.171	S
G4	Cl ⁻	0.335	0.347	0.348	0.069	-0.189	S
G1	Ca ²⁺	0.11	0.102	0.106	0.034	0.122	S
G2	Ca ²⁺	0.14	0.14	0.142	0.025	-0.062	S
G3	Ca ²⁺	0.74	0.204	0.2	0.028	19.379	U
G4	Ca ²⁺	0.2	0.192	0.189	0.032	0.355	S
G1	K ⁺	0.12	0.136	0.125	0.031	-0.174	S
G2	K ⁺	0.18	0.204	0.194	0.022	-0.639	S
G3	K ⁺	0.14	0.17	0.163	0.03	-0.762	Q
G4	K ⁺	0.21	0.238	0.23	0.027	-0.742	S
G1	pH	4.42	4.4	4.46	0.104	-0.383	S
G2	pH	4.29	4.27	4.329	0.077	-0.51	S
G3	pH	4.7	4.7	4.755	0.083	-0.657	S
G4	pH	4.59	4.57	4.631	0.077	-0.527	S
G1	Cond	-999	22	21.535	1.76		B
G2	Cond	-999	29	27.802	2.442		B
G3	Cond	-999	16	16.357	1.308		B
G4	Cond	-999	22	21.283	1.453		B

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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 – 29th 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⁻	0.859	0.859	0.859	0.043	-0.002	S
G2	SO ₄ ²⁻	1.097	1.09	1.096	0.064	0.009	S
G3	SO ₄ ²⁻	0.636	0.634	0.642	0.035	-0.159	S
G4	SO ₄ ²⁻	0.785	0.771	0.78	0.033	0.167	S
G1	NH ₄ ⁺	0.138	0.134	0.138	0.019	0.008	S
G2	NH ₄ ⁺	0.213	0.214	0.213	0.022	-0.021	S
G3	NH ₄ ⁺	0.268	0.267	0.27	0.023	-0.097	S
G4	NH ₄ ⁺	0.352	0.348	0.352	0.027	-0.002	S
G1	NO ₃ ⁻	0.273	0.27	0.269	0.016	0.266	S
G2	NO ₃ ⁻	0.353	0.352	0.352	0.02	0.056	S
G3	NO ₃ ⁻	0.42	0.415	0.415	0.023	0.218	S
G4	NO ₃ ⁻	0.615	0.607	0.609	0.043	0.142	S
G1	Na ⁺	0.27	0.268	0.261	0.022	0.4	S
G2	Na ⁺	0.207	0.208	0.2	0.018	0.394	S
G3	Na ⁺	0.321	0.318	0.311	0.023	0.453	S
G4	Na ⁺	0.519	0.512	0.499	0.043	0.465	S
G1	Mg ²⁺	0.103	0.103	0.103	0.01	-0.051	S
G2	Mg ²⁺	0.095	0.093	0.093	0.008	0.252	S
G3	Mg ²⁺	0.114	0.114	0.112	0.011	0.197	S
G4	Mg ²⁺	0.144	0.145	0.145	0.012	-0.06	S
G1	Cl ⁻	0.194	0.193	0.196	0.037	-0.062	S
G2	Cl ⁻	0.157	0.154	0.165	0.039	-0.202	S
G3	Cl ⁻	0.272	0.27	0.275	0.061	-0.056	S
G4	Cl ⁻	0.348	0.347	0.348	0.069	0	S
G1	Ca ²⁺	0.104	0.102	0.106	0.034	-0.055	S
G2	Ca ²⁺	0.143	0.14	0.142	0.025	0.06	S
G3	Ca ²⁺	0.215	0.204	0.2	0.028	0.53	S
G4	Ca ²⁺	0.194	0.192	0.189	0.032	0.17	S
G1	K ⁺	0.134	0.136	0.125	0.031	0.281	S
G2	K ⁺	0.209	0.204	0.194	0.022	0.681	S
G3	K ⁺	0.173	0.17	0.163	0.03	0.344	S
G4	K ⁺	0.251	0.238	0.23	0.027	0.789	S
G1	pH	4.42	4.4	4.46	0.104	-0.383	S
G2	pH	4.29	4.27	4.329	0.077	-0.51	S
G3	pH	4.71	4.7	4.755	0.083	-0.537	S
G4	pH	4.59	4.57	4.631	0.077	-0.527	S
G1	Cond	22.3	22	21.535	1.76	0.434	S
G2	Cond	29	29	27.802	2.442	0.491	S
G3	Cond	16.81	16	16.357	1.308	0.346	S
G4	Cond	21.9	22	21.283	1.453	0.425	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 Youden plots, updated expected values ect:

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EMEP – 29th 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⁻	0.896	0.859	0.859	0.043	0.849	S
G2	SO ₄ ²⁻	1.14	1.09	1.096	0.064	0.68	S
G3	SO ₄ ²⁻	0.667	0.634	0.642	0.035	0.724	S
G4	SO ₄ ²⁻	0.809	0.771	0.78	0.033	0.903	S
G1	NH ₄ ⁺	0.139	0.134	0.138	0.019	0.061	S
G2	NH ₄ ⁺	0.218	0.214	0.213	0.022	0.202	S
G3	NH ₄ ⁺	0.276	0.267	0.27	0.023	0.253	S
G4	NH ₄ ⁺	0.363	0.348	0.352	0.027	0.409	S
G1	NO ₃ ⁻	0.265	0.27	0.269	0.016	-0.234	S
G2	NO ₃ ⁻	0.355	0.352	0.352	0.02	0.156	S
G3	NO ₃ ⁻	0.419	0.415	0.415	0.023	0.174	S
G4	NO ₃ ⁻	0.519	0.607	0.609	0.043	-2.109	Q
G1	Na ⁺	0.247	0.268	0.261	0.022	-0.631	S
G2	Na ⁺	0.193	0.208	0.2	0.018	-0.402	S
G3	Na ⁺	0.299	0.318	0.311	0.023	-0.504	S
G4	Na ⁺	0.495	0.512	0.499	0.043	-0.091	S
G1	Mg ²⁺	0.11	0.103	0.103	0.01	0.679	S
G2	Mg ²⁺	0.101	0.093	0.093	0.008	1.01	S
G3	Mg ²⁺	0.119	0.114	0.112	0.011	0.659	S
G4	Mg ²⁺	0.147	0.145	0.145	0.012	0.192	S
G1	Cl ⁻	0.191	0.193	0.196	0.037	-0.143	S
G2	Cl ⁻	0.155	0.154	0.165	0.039	-0.252	S
G3	Cl ⁻	0.27	0.27	0.275	0.061	-0.089	S
G4	Cl ⁻	0.349	0.347	0.348	0.069	0.015	S
G1	Ca ²⁺	0.086	0.102	0.106	0.034	-0.586	Q
G2	Ca ²⁺	0.096	0.14	0.142	0.025	-1.85	U
G3	Ca ²⁺	0.16	0.204	0.2	0.028	-1.445	Q
G4	Ca ²⁺	0.148	0.192	0.189	0.032	-1.255	Q
G1	K ⁺	0.13	0.136	0.125	0.031	0.151	S
G2	K ⁺	0.195	0.204	0.194	0.022	0.043	S
G3	K ⁺	0.162	0.17	0.163	0.03	-0.025	S
G4	K ⁺	0.228	0.238	0.23	0.027	-0.07	S
G1	pH	4.44	4.4	4.46	0.104	-0.191	S
G2	pH	4.31	4.27	4.329	0.077	-0.25	S
G3	pH	4.72	4.7	4.755	0.083	-0.417	S
G4	pH	4.6	4.57	4.631	0.077	-0.397	S
G1	Cond	21.6	22	21.535	1.76	0.037	S
G2	Cond	28.3	29	27.802	2.442	0.204	S
G3	Cond	16.8	16	16.357	1.308	0.338	S
G4	Cond	21.5	22	21.283	1.453	0.15	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

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

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.781	0.859	0.859	0.043	-1.795	S
G2	SO ₄ ²⁻	1.006	1.09	1.096	0.064	-1.413	S
G3	SO ₄ ²⁻	0.587	0.634	0.642	0.035	-1.555	S
G4	SO ₄ ²⁻	0.724	0.771	0.78	0.033	-1.703	S
G1	NH ₄ ⁺	0.122	0.134	0.138	0.019	-0.839	S
G2	NH ₄ ⁺	0.184	0.214	0.213	0.022	-1.311	S
G3	NH ₄ ⁺	0.261	0.267	0.27	0.023	-0.404	S
G4	NH ₄ ⁺	0.264	0.348	0.352	0.027	-3.288	Q
G1	NO ₃ ⁻	0.226	0.27	0.269	0.016	-2.668	Q
G2	NO ₃ ⁻	0.298	0.352	0.352	0.02	-2.697	Q
G3	NO ₃ ⁻	0.361	0.415	0.415	0.023	-2.351	Q
G4	NO ₃ ⁻	0.521	0.607	0.609	0.043	-2.062	Q
G1	Na ⁺	0.266	0.268	0.261	0.022	0.22	S
G2	Na ⁺	0.207	0.208	0.2	0.018	0.394	S
G3	Na ⁺	0.306	0.318	0.311	0.023	-0.2	S
G4	Na ⁺	0.508	0.512	0.499	0.043	0.21	S
G1	Mg ²⁺	0.115	0.103	0.103	0.01	1.2	S
G2	Mg ²⁺	0.104	0.093	0.093	0.008	1.388	S
G3	Mg ²⁺	0.12	0.114	0.112	0.011	0.752	S
G4	Mg ²⁺	0.154	0.145	0.145	0.012	0.778	S
G1	Cl ⁻	0.157	0.193	0.196	0.037	-1.065	Q
G2	Cl ⁻	0.136	0.154	0.165	0.039	-0.734	S
G3	Cl ⁻	0.227	0.27	0.275	0.061	-0.791	Q
G4	Cl ⁻	0.274	0.347	0.348	0.069	-1.08	Q
G1	Ca ²⁺	0.136	0.102	0.106	0.034	0.888	U
G2	Ca ²⁺	0.158	0.14	0.142	0.025	0.67	S
G3	Ca ²⁺	0.223	0.204	0.2	0.028	0.817	S
G4	Ca ²⁺	0.211	0.192	0.189	0.032	0.696	S
G1	K ⁺	0.088	0.136	0.125	0.031	-1.215	U
G2	K ⁺	0.206	0.204	0.194	0.022	0.544	S
G3	K ⁺	0.149	0.17	0.163	0.03	-0.46	S
G4	K ⁺	0.222	0.238	0.23	0.027	-0.294	S
G1	pH	4.48	4.4	4.46	0.104	0.194	S
G2	pH	4.34	4.27	4.329	0.077	0.139	S
G3	pH	4.72	4.7	4.755	0.083	-0.417	S
G4	pH	4.63	4.57	4.631	0.077	-0.007	S
G1	Cond	22.9	22	21.535	1.76	0.775	S
G2	Cond	29.4	29	27.802	2.442	0.654	S
G3	Cond	17.1	16	16.357	1.308	0.568	S
G4	Cond	22.4	22	21.283	1.453	0.769	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 Youden plots, updated expected values ect:

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

EMEP – 29th intercomparison of analytical methods

Laboratory 12, Met Eireann, 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⁻	0.88	0.859	0.859	0.043	0.481	S
G2	SO ₄ ²⁻	1.13	1.09	1.096	0.064	0.524	S
G3	SO ₄ ²⁻	0.64	0.634	0.642	0.035	-0.045	S
G4	SO ₄ ²⁻	0.8	0.771	0.78	0.033	0.627	S
G1	NH ₄ ⁺	0.15	0.134	0.138	0.019	0.643	S
G2	NH ₄ ⁺	0.23	0.214	0.213	0.022	0.736	S
G3	NH ₄ ⁺	0.29	0.267	0.27	0.023	0.867	S
G4	NH ₄ ⁺	0.37	0.348	0.352	0.027	0.67	S
G1	NO ₃ ⁻	0.25	0.27	0.269	0.016	-1.17	S
G2	NO ₃ ⁻	0.34	0.352	0.352	0.02	-0.595	S
G3	NO ₃ ⁻	0.41	0.415	0.415	0.023	-0.218	S
G4	NO ₃ ⁻	0.62	0.607	0.609	0.043	0.259	S
G1	Na ⁺	0.25	0.268	0.261	0.022	-0.496	S
G2	Na ⁺	0.19	0.208	0.2	0.018	-0.573	S
G3	Na ⁺	0.3	0.318	0.311	0.023	-0.461	S
G4	Na ⁺	0.49	0.512	0.499	0.043	-0.207	S
G1	Mg ²⁺	0.101	0.103	0.103	0.01	-0.26	S
G2	Mg ²⁺	0.092	0.093	0.093	0.008	-0.127	S
G3	Mg ²⁺	0.113	0.114	0.112	0.011	0.105	S
G4	Mg ²⁺	0.147	0.145	0.145	0.012	0.192	S
G1	Cl ⁻	0.24	0.193	0.196	0.037	1.185	Q
G2	Cl ⁻	0.21	0.154	0.165	0.039	1.142	U
G3	Cl ⁻	0.3	0.27	0.275	0.061	0.401	S
G4	Cl ⁻	0.38	0.347	0.348	0.069	0.467	S
G1	Ca ²⁺	0.08	0.102	0.106	0.034	-0.763	Q
G2	Ca ²⁺	0.12	0.14	0.142	0.025	-0.875	S
G3	Ca ²⁺	0.18	0.204	0.2	0.028	-0.727	S
G4	Ca ²⁺	0.16	0.192	0.189	0.032	-0.883	Q
G1	K ⁺	0.12	0.136	0.125	0.031	-0.174	S
G2	K ⁺	0.19	0.204	0.194	0.022	-0.184	S
G3	K ⁺	0.16	0.17	0.163	0.03	-0.092	S
G4	K ⁺	0.23	0.238	0.23	0.027	0.005	S
G1	pH	4.43	4.4	4.46	0.104	-0.287	S
G2	pH	4.29	4.27	4.329	0.077	-0.51	S
G3	pH	4.68	4.7	4.755	0.083	-0.898	S
G4	pH	4.57	4.57	4.631	0.077	-0.787	S
G1	Cond	21.6	22	21.535	1.76	0.037	S
G2	Cond	28.7	29	27.802	2.442	0.368	S
G3	Cond	16.3	16	16.357	1.308	-0.044	S
G4	Cond	21.5	22	21.283	1.453	0.15	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

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

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.83	0.859	0.859	0.043	-0.668	S
G2	SO ₄ ²⁻	1.1	1.09	1.096	0.064	0.055	S
G3	SO ₄ ²⁻	0.63	0.634	0.642	0.035	-0.33	S
G4	SO ₄ ²⁻	0.76	0.771	0.78	0.033	-0.599	S
G1	NH ₄ ⁺	0.13	0.134	0.138	0.019	-0.415	S
G2	NH ₄ ⁺	0.21	0.214	0.213	0.022	-0.154	S
G3	NH ₄ ⁺	0.26	0.267	0.27	0.023	-0.448	S
G4	NH ₄ ⁺	0.34	0.348	0.352	0.027	-0.45	S
G1	NO ₃ ⁻	0.34	0.27	0.269	0.016	4.448	U
G2	NO ₃ ⁻	0.39	0.352	0.352	0.02	1.908	Q
G3	NO ₃ ⁻	0.43	0.415	0.415	0.023	0.653	S
G4	NO ₃ ⁻	0.68	0.607	0.609	0.043	1.665	Q
G1	Na ⁺	0.28	0.268	0.261	0.022	0.847	S
G2	Na ⁺	0.21	0.208	0.2	0.018	0.565	S
G3	Na ⁺	0.3	0.318	0.311	0.023	-0.461	S
G4	Na ⁺	0.53	0.512	0.499	0.043	0.72	S
G1	Mg ²⁺	0.12	0.103	0.103	0.01	1.721	Q
G2	Mg ²⁺	0.11	0.093	0.093	0.008	2.146	Q
G3	Mg ²⁺	0.14	0.114	0.112	0.011	2.599	Q
G4	Mg ²⁺	0.16	0.145	0.145	0.012	1.28	S
G1	Cl ⁻	0.26	0.193	0.196	0.037	1.727	U
G2	Cl ⁻	0.18	0.154	0.165	0.039	0.382	Q
G3	Cl ⁻	0.28	0.27	0.275	0.061	0.074	S
G4	Cl ⁻	0.36	0.347	0.348	0.069	0.176	S
G1	Ca ²⁺	0.13	0.102	0.106	0.034	0.711	U
G2	Ca ²⁺	0.21	0.14	0.142	0.025	2.784	U
G3	Ca ²⁺	0.25	0.204	0.2	0.028	1.786	Q
G4	Ca ²⁺	0.23	0.192	0.189	0.032	1.285	Q
G1	K ⁺	0.15	0.136	0.125	0.031	0.802	S
G2	K ⁺	0.23	0.204	0.194	0.022	1.637	S
G3	K ⁺	0.25	0.17	0.163	0.03	2.923	U
G4	K ⁺	0.25	0.238	0.23	0.027	0.752	S
G1	pH	4.82	4.4	4.46	0.104	3.467	U
G2	pH	4.48	4.27	4.329	0.077	1.959	U
G3	pH	4.8	4.7	4.755	0.083	0.545	S
G4	pH	4.7	4.57	4.631	0.077	0.902	Q
G1	Cond	33.5	22	21.535	1.76	6.796	U
G2	Cond	32	29	27.802	2.442	1.719	S
G3	Cond	20.9	16	16.357	1.308	3.473	U
G4	Cond	25	22	21.283	1.453	2.558	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 Youden plots, updated expected values ect:

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EMEP – 29th intercomparison of analytical methods

Laboratory 14, National Institute of Public Health and Environmental Protection RIVM (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⁻	0.858	0.859	0.859	0.043	-0.025	S
G2	SO ₄ ²⁻	1.09	1.09	1.096	0.064	-0.101	S
G3	SO ₄ ²⁻	0.637	0.634	0.642	0.035	-0.131	S
G4	SO ₄ ²⁻	0.771	0.771	0.78	0.033	-0.262	S
G1	NH ₄ ⁺	0.173	0.134	0.138	0.019	1.86	U
G2	NH ₄ ⁺	0.241	0.214	0.213	0.022	1.225	S
G3	NH ₄ ⁺	0.296	0.267	0.27	0.023	1.13	S
G4	NH ₄ ⁺	0.346	0.348	0.352	0.027	-0.226	S
G1	NO ₃ ⁻	0.276	0.27	0.269	0.016	0.453	S
G2	NO ₃ ⁻	0.361	0.352	0.352	0.02	0.457	S
G3	NO ₃ ⁻	0.42	0.415	0.415	0.023	0.218	S
G4	NO ₃ ⁻	0.603	0.607	0.609	0.043	-0.14	S
G1	Na ⁺	0.271	0.268	0.261	0.022	0.444	S
G2	Na ⁺	0.211	0.208	0.2	0.018	0.622	S
G3	Na ⁺	0.316	0.318	0.311	0.023	0.235	S
G4	Na ⁺	0.512	0.512	0.499	0.043	0.303	S
G1	Mg ²⁺	0.103	0.103	0.103	0.01	-0.051	S
G2	Mg ²⁺	0.094	0.093	0.093	0.008	0.126	S
G3	Mg ²⁺	0.113	0.114	0.112	0.011	0.105	S
G4	Mg ²⁺	0.146	0.145	0.145	0.012	0.108	S
G1	Cl ⁻	0.17	0.193	0.196	0.037	-0.712	S
G2	Cl ⁻	0.13	0.154	0.165	0.039	-0.886	Q
G3	Cl ⁻	0.21	0.27	0.275	0.061	-1.068	Q
G4	Cl ⁻	0.27	0.347	0.348	0.069	-1.138	Q
G1	Ca ²⁺	0.106	0.102	0.106	0.034	0.004	S
G2	Ca ²⁺	0.145	0.14	0.142	0.025	0.142	S
G3	Ca ²⁺	0.21	0.204	0.2	0.028	0.35	S
G4	Ca ²⁺	0.195	0.192	0.189	0.032	0.201	S
G1	K ⁺	0.136	0.136	0.125	0.031	0.346	S
G2	K ⁺	0.198	0.204	0.194	0.022	0.18	S
G3	K ⁺	0.164	0.17	0.163	0.03	0.042	S
G4	K ⁺	0.232	0.238	0.23	0.027	0.079	S
G1	pH	4.52	4.4	4.46	0.104	0.579	Q
G2	pH	4.38	4.27	4.329	0.077	0.659	Q
G3	pH	4.84	4.7	4.755	0.083	1.026	Q
G4	pH	4.7	4.57	4.631	0.077	0.902	Q
G1	Cond	23	22	21.535	1.76	0.832	S
G2	Cond	29	29	27.802	2.442	0.491	S
G3	Cond	17	16	16.357	1.308	0.491	S
G4	Cond	22	22	21.283	1.453	0.494	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

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

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.863	0.859	0.859	0.043	0.09	S
G2	SO ₄ ²⁻	1.115	1.09	1.096	0.064	0.29	S
G3	SO ₄ ²⁻	0.644	0.634	0.642	0.035	0.069	S
G4	SO ₄ ²⁻	0.791	0.771	0.78	0.033	0.351	S
G1	NH ₄ ⁺	0.134	0.134	0.138	0.019	-0.204	S
G2	NH ₄ ⁺	0.214	0.214	0.213	0.022	0.024	S
G3	NH ₄ ⁺	0.268	0.267	0.27	0.023	-0.097	S
G4	NH ₄ ⁺	0.348	0.348	0.352	0.027	-0.151	S
G1	NO ₃ ⁻	0.267	0.27	0.269	0.016	-0.109	S
G2	NO ₃ ⁻	0.354	0.352	0.352	0.02	0.106	S
G3	NO ₃ ⁻	0.412	0.415	0.415	0.023	-0.131	S
G4	NO ₃ ⁻	0.591	0.607	0.609	0.043	-0.421	S
G1	Na ⁺	0.267	0.268	0.261	0.022	0.265	S
G2	Na ⁺	0.207	0.208	0.2	0.018	0.394	S
G3	Na ⁺	0.319	0.318	0.311	0.023	0.366	S
G4	Na ⁺	0.505	0.512	0.499	0.043	0.141	S
G1	Mg ²⁺	0.098	0.103	0.103	0.01	-0.572	S
G2	Mg ²⁺	0.09	0.093	0.093	0.008	-0.379	S
G3	Mg ²⁺	0.109	0.114	0.112	0.011	-0.265	S
G4	Mg ²⁺	0.144	0.145	0.145	0.012	-0.06	S
G1	Cl ⁻	0.194	0.193	0.196	0.037	-0.062	S
G2	Cl ⁻	0.155	0.154	0.165	0.039	-0.252	S
G3	Cl ⁻	0.291	0.27	0.275	0.061	0.254	S
G4	Cl ⁻	0.356	0.347	0.348	0.069	0.117	S
G1	Ca ²⁺	0.097	0.102	0.106	0.034	-0.261	S
G2	Ca ²⁺	0.146	0.14	0.142	0.025	0.182	S
G3	Ca ²⁺	0.215	0.204	0.2	0.028	0.53	S
G4	Ca ²⁺	0.199	0.192	0.189	0.032	0.324	S
G1	K ⁺	0.125	0.136	0.125	0.031	-0.012	S
G2	K ⁺	0.201	0.204	0.194	0.022	0.316	S
G3	K ⁺	0.168	0.17	0.163	0.03	0.176	S
G4	K ⁺	0.25	0.238	0.23	0.027	0.752	S
G1	pH	4.41	4.4	4.46	0.104	-0.479	S
G2	pH	4.32	4.27	4.329	0.077	-0.12	S
G3	pH	4.72	4.7	4.755	0.083	-0.417	S
G4	pH	4.62	4.57	4.631	0.077	-0.137	S
G1	Cond	22	22	21.535	1.76	0.264	S
G2	Cond	28.8	29	27.802	2.442	0.409	S
G3	Cond	15	16	16.357	1.308	-1.038	S
G4	Cond	21.3	22	21.283	1.453	0.012	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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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.852	0.859	0.859	0.043	-0.162	S
G2	SO ₄ ²⁻	1.075	1.09	1.096	0.064	-0.335	S
G3	SO ₄ ²⁻	0.631	0.634	0.642	0.035	-0.302	S
G4	SO ₄ ²⁻	0.77	0.771	0.78	0.033	-0.293	S
G1	NH ₄ ⁺	0.17	0.134	0.138	0.019	1.701	U
G2	NH ₄ ⁺	0.233	0.214	0.213	0.022	0.869	S
G3	NH ₄ ⁺	0.303	0.267	0.27	0.023	1.436	S
G4	NH ₄ ⁺	0.394	0.348	0.352	0.027	1.566	S
G1	NO ₃ ⁻	0.257	0.27	0.269	0.016	-0.733	S
G2	NO ₃ ⁻	0.335	0.352	0.352	0.02	-0.845	S
G3	NO ₃ ⁻	0.401	0.415	0.415	0.023	-0.61	S
G4	NO ₃ ⁻	0.591	0.607	0.609	0.043	-0.421	S
G1	Na ⁺	0.281	0.268	0.261	0.022	0.892	S
G2	Na ⁺	0.206	0.208	0.2	0.018	0.337	S
G3	Na ⁺	0.318	0.318	0.311	0.023	0.322	S
G4	Na ⁺	0.489	0.512	0.499	0.043	-0.23	S
G1	Mg ²⁺	0.102	0.103	0.103	0.01	-0.155	S
G2	Mg ²⁺	0.093	0.093	0.093	0.008	0	S
G3	Mg ²⁺	0.111	0.114	0.112	0.011	-0.08	S
G4	Mg ²⁺	0.142	0.145	0.145	0.012	-0.227	S
G1	Cl ⁻	0.183	0.193	0.196	0.037	-0.36	S
G2	Cl ⁻	0.148	0.154	0.165	0.039	-0.43	S
G3	Cl ⁻	0.26	0.27	0.275	0.061	-0.252	S
G4	Cl ⁻	0.334	0.347	0.348	0.069	-0.204	S
G1	Ca ²⁺	0.104	0.102	0.106	0.034	-0.055	S
G2	Ca ²⁺	0.138	0.14	0.142	0.025	-0.143	S
G3	Ca ²⁺	0.206	0.204	0.2	0.028	0.207	S
G4	Ca ²⁺	0.196	0.192	0.189	0.032	0.232	S
G1	K ⁺	0.156	0.136	0.125	0.031	0.997	S
G2	K ⁺	0.203	0.204	0.194	0.022	0.408	S
G3	K ⁺	0.174	0.17	0.163	0.03	0.377	S
G4	K ⁺	0.24	0.238	0.23	0.027	0.378	S
G1	pH	4.44	4.4	4.46	0.104	-0.191	S
G2	pH	4.3	4.27	4.329	0.077	-0.38	S
G3	pH	4.73	4.7	4.755	0.083	-0.296	S
G4	pH	4.58	4.57	4.631	0.077	-0.657	S
G1	Cond	22	22	21.535	1.76	0.264	S
G2	Cond	28.7	29	27.802	2.442	0.368	S
G3	Cond	16.5	16	16.357	1.308	0.109	S
G4	Cond	21.6	22	21.283	1.453	0.218	S

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Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.85	0.859	0.859	0.043	-0.208	S
G2	SO ₄ ²⁻	1.03	1.09	1.096	0.064	-1.038	S
G3	SO ₄ ²⁻	0.69	0.634	0.642	0.035	1.379	S
G4	SO ₄ ²⁻	0.8	0.771	0.78	0.033	0.627	S
G1	NH ₄ ⁺	0.15	0.134	0.138	0.019	0.643	S
G2	NH ₄ ⁺	0.23	0.214	0.213	0.022	0.736	S
G3	NH ₄ ⁺	0.28	0.267	0.27	0.023	0.429	S
G4	NH ₄ ⁺	0.36	0.348	0.352	0.027	0.297	S
G1	NO ₃ ⁻	0.25	0.27	0.269	0.016	-1.17	S
G2	NO ₃ ⁻	0.33	0.352	0.352	0.02	-1.095	S
G3	NO ₃ ⁻	0.48	0.415	0.415	0.023	2.83	Q
G4	NO ₃ ⁻	0.62	0.607	0.609	0.043	0.259	S
G1	Na ⁺	0.301	0.268	0.261	0.022	1.788	S
G2	Na ⁺	0.249	0.208	0.2	0.018	2.784	Q
G3	Na ⁺	0.359	0.318	0.311	0.023	2.107	S
G4	Na ⁺	0.566	0.512	0.499	0.043	1.554	S
G1	Mg ²⁺	0.11	0.103	0.103	0.01	0.679	S
G2	Mg ²⁺	0.1	0.093	0.093	0.008	0.883	S
G3	Mg ²⁺	0.116	0.114	0.112	0.011	0.382	S
G4	Mg ²⁺	0.15	0.145	0.145	0.012	0.443	S
G1	Cl ⁻	< 0.300	0.193	0.196	0.037		B
G2	Cl ⁻	< 0.300	0.154	0.165	0.039		B
G3	Cl ⁻	0.43	0.27	0.275	0.061	2.522	U
G4	Cl ⁻	0.32	0.347	0.348	0.069	-0.408	S
G1	Ca ²⁺	0.142	0.102	0.106	0.034	1.065	U
G2	Ca ²⁺	0.174	0.14	0.142	0.025	1.321	Q
G3	Ca ²⁺	0.247	0.204	0.2	0.028	1.679	Q
G4	Ca ²⁺	0.234	0.192	0.189	0.032	1.409	Q
G1	K ⁺	0.136	0.136	0.125	0.031	0.346	S
G2	K ⁺	0.216	0.204	0.194	0.022	0.999	S
G3	K ⁺	0.446	0.17	0.163	0.03	9.488	U
G4	K ⁺	0.257	0.238	0.23	0.027	1.013	S
G1	pH	4.52	4.4	4.46	0.104	0.579	Q
G2	pH	4.41	4.27	4.329	0.077	1.049	Q
G3	pH	4.96	4.7	4.755	0.083	2.468	U
G4	pH	4.75	4.57	4.631	0.077	1.552	Q
G1	Cond	21.9	22	21.535	1.76	0.207	S
G2	Cond	28	29	27.802	2.442	0.081	S
G3	Cond	15.7	16	16.357	1.308	-0.503	S
G4	Cond	21.1	22	21.283	1.453	-0.126	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 Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.88	0.859	0.859	0.043	0.481	S
G2	SO ₄ ²⁻	1.1	1.09	1.096	0.064	0.055	S
G3	SO ₄ ²⁻	0.65	0.634	0.642	0.035	0.24	S
G4	SO ₄ ²⁻	0.78	0.771	0.78	0.033	0.014	S
G1	NH ₄ ⁺	-999	0.134	0.138	0.019		B
G2	NH ₄ ⁺	-999	0.214	0.213	0.022		B
G3	NH ₄ ⁺	0.31	0.267	0.27	0.023	1.743	Q
G4	NH ₄ ⁺	0.38	0.348	0.352	0.027	1.043	S
G1	NO ₃ ⁻	0.27	0.27	0.269	0.016	0.078	S
G2	NO ₃ ⁻	0.35	0.352	0.352	0.02	-0.094	S
G3	NO ₃ ⁻	0.42	0.415	0.415	0.023	0.218	S
G4	NO ₃ ⁻	0.6	0.607	0.609	0.043	-0.21	S
G1	Na ⁺	0.26	0.268	0.261	0.022	-0.048	S
G2	Na ⁺	0.2	0.208	0.2	0.018	-0.004	S
G3	Na ⁺	0.32	0.318	0.311	0.023	0.41	S
G4	Na ⁺	0.51	0.512	0.499	0.043	0.257	S
G1	Mg ²⁺	0.1	0.103	0.103	0.01	-0.364	S
G2	Mg ²⁺	0.09	0.093	0.093	0.008	-0.379	S
G3	Mg ²⁺	0.11	0.114	0.112	0.011	-0.172	S
G4	Mg ²⁺	0.15	0.145	0.145	0.012	0.443	S
G1	Cl ⁻	0.2	0.193	0.196	0.037	0.101	S
G2	Cl ⁻	0.16	0.154	0.165	0.039	-0.125	S
G3	Cl ⁻	0.27	0.27	0.275	0.061	-0.089	S
G4	Cl ⁻	0.35	0.347	0.348	0.069	0.03	S
G1	Ca ²⁺	0.1	0.102	0.106	0.034	-0.173	S
G2	Ca ²⁺	0.13	0.14	0.142	0.025	-0.468	S
G3	Ca ²⁺	0.21	0.204	0.2	0.028	0.35	S
G4	Ca ²⁺	0.19	0.192	0.189	0.032	0.046	S
G1	K ⁺	0.14	0.136	0.125	0.031	0.476	S
G2	K ⁺	0.2	0.204	0.194	0.022	0.271	S
G3	K ⁺	0.17	0.17	0.163	0.03	0.243	S
G4	K ⁺	0.24	0.238	0.23	0.027	0.378	S
G1	pH	4.5	4.4	4.46	0.104	0.387	S
G2	pH	4.3	4.27	4.329	0.077	-0.38	S
G3	pH	4.8	4.7	4.755	0.083	0.545	S
G4	pH	4.6	4.57	4.631	0.077	-0.397	S
G1	Cond	22	22	21.535	1.76	0.264	S
G2	Cond	29	29	27.802	2.442	0.491	S
G3	Cond	17	16	16.357	1.308	0.491	S
G4	Cond	22	22	21.283	1.453	0.494	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

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

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.893	0.859	0.859	0.043	0.78	S
G2	SO ₄ ²⁻	1.124	1.09	1.096	0.064	0.43	S
G3	SO ₄ ²⁻	0.662	0.634	0.642	0.035	0.582	S
G4	SO ₄ ²⁻	0.807	0.771	0.78	0.033	0.841	S
G1	NH ₄ ⁺	0.141	0.134	0.138	0.019	0.167	S
G2	NH ₄ ⁺	0.219	0.214	0.213	0.022	0.246	S
G3	NH ₄ ⁺	0.284	0.267	0.27	0.023	0.604	S
G4	NH ₄ ⁺	0.358	0.348	0.352	0.027	0.222	S
G1	NO ₃ ⁻	0.269	0.27	0.269	0.016	0.016	S
G2	NO ₃ ⁻	0.352	0.352	0.352	0.02	0.006	S
G3	NO ₃ ⁻	0.42	0.415	0.415	0.023	0.218	S
G4	NO ₃ ⁻	0.613	0.607	0.609	0.043	0.095	S
G1	Na ⁺	0.265	0.268	0.261	0.022	0.176	S
G2	Na ⁺	0.203	0.208	0.2	0.018	0.167	S
G3	Na ⁺	0.318	0.318	0.311	0.023	0.322	S
G4	Na ⁺	0.513	0.512	0.499	0.043	0.326	S
G1	Mg ²⁺	0.105	0.103	0.103	0.01	0.157	S
G2	Mg ²⁺	0.095	0.093	0.093	0.008	0.252	S
G3	Mg ²⁺	0.117	0.114	0.112	0.011	0.474	S
G4	Mg ²⁺	0.149	0.145	0.145	0.012	0.359	S
G1	Cl ⁻	0.2	0.193	0.196	0.037	0.101	S
G2	Cl ⁻	0.163	0.154	0.165	0.039	-0.049	S
G3	Cl ⁻	0.273	0.27	0.275	0.061	-0.04	S
G4	Cl ⁻	0.349	0.347	0.348	0.069	0.015	S
G1	Ca ²⁺	0.108	0.102	0.106	0.034	0.063	S
G2	Ca ²⁺	0.141	0.14	0.142	0.025	-0.021	S
G3	Ca ²⁺	0.209	0.204	0.2	0.028	0.314	S
G4	Ca ²⁺	0.197	0.192	0.189	0.032	0.263	S
G1	K ⁺	0.138	0.136	0.125	0.031	0.411	S
G2	K ⁺	0.212	0.204	0.194	0.022	0.817	S
G3	K ⁺	0.175	0.17	0.163	0.03	0.411	S
G4	K ⁺	0.249	0.238	0.23	0.027	0.714	S
G1	pH	4.45	4.4	4.46	0.104	-0.094	S
G2	pH	4.32	4.27	4.329	0.077	-0.12	S
G3	pH	4.71	4.7	4.755	0.083	-0.537	S
G4	pH	4.6	4.57	4.631	0.077	-0.397	S
G1	Cond	22.15	22	21.535	1.76	0.349	S
G2	Cond	28.58	29	27.802	2.442	0.319	S
G3	Cond	16.6	16	16.357	1.308	0.186	S
G4	Cond	21.58	22	21.283	1.453	0.205	S

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

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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 Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.973	0.859	0.859	0.043	2.62	Q
G2	SO ₄ ²⁻	1.234	1.09	1.096	0.064	2.149	Q
G3	SO ₄ ²⁻	0.687	0.634	0.642	0.035	1.294	S
G4	SO ₄ ²⁻	0.853	0.771	0.78	0.033	2.251	Q
G1	NH ₄ ⁺	0.189	0.134	0.138	0.019	2.706	U
G2	NH ₄ ⁺	0.309	0.214	0.213	0.022	4.25	U
G3	NH ₄ ⁺	0.363	0.267	0.27	0.023	4.065	U
G4	NH ₄ ⁺	0.43	0.348	0.352	0.027	2.91	Q
G1	NO ₃ ⁻	0.261	0.27	0.269	0.016	-0.483	S
G2	NO ₃ ⁻	0.355	0.352	0.352	0.02	0.156	S
G3	NO ₃ ⁻	0.429	0.415	0.415	0.023	0.61	S
G4	NO ₃ ⁻	0.636	0.607	0.609	0.043	0.634	S
G1	Na ⁺	0.285	0.268	0.261	0.022	1.071	S
G2	Na ⁺	0.252	0.208	0.2	0.018	2.955	Q
G3	Na ⁺	0.3	0.318	0.311	0.023	-0.461	S
G4	Na ⁺	0.463	0.512	0.499	0.043	-0.832	S
G1	Mg ²⁺	0.103	0.103	0.103	0.01	-0.051	S
G2	Mg ²⁺	0.092	0.093	0.093	0.008	-0.127	S
G3	Mg ²⁺	0.109	0.114	0.112	0.011	-0.265	S
G4	Mg ²⁺	0.137	0.145	0.145	0.012	-0.646	S
G1	Cl ⁻	0.183	0.193	0.196	0.037	-0.36	S
G2	Cl ⁻	0.15	0.154	0.165	0.039	-0.379	S
G3	Cl ⁻	0.231	0.27	0.275	0.061	-0.726	S
G4	Cl ⁻	0.29	0.347	0.348	0.069	-0.846	Q
G1	Ca ²⁺	0.191	0.102	0.106	0.034	2.509	U
G2	Ca ²⁺	0.2	0.14	0.142	0.025	2.377	U
G3	Ca ²⁺	0.209	0.204	0.2	0.028	0.314	S
G4	Ca ²⁺	0.204	0.192	0.189	0.032	0.479	S
G1	K ⁺	0.154	0.136	0.125	0.031	0.932	S
G2	K ⁺	0.228	0.204	0.194	0.022	1.546	S
G3	K ⁺	0.17	0.17	0.163	0.03	0.243	S
G4	K ⁺	0.268	0.238	0.23	0.027	1.424	S
G1	pH	4.38	4.4	4.46	0.104	-0.768	S
G2	pH	4.3	4.27	4.329	0.077	-0.38	S
G3	pH	4.69	4.7	4.755	0.083	-0.777	S
G4	pH	4.52	4.57	4.631	0.077	-1.437	S
G1	Cond	20	22	21.535	1.76	-0.872	S
G2	Cond	26.4	29	27.802	2.442	-0.574	S
G3	Cond	14.8	16	16.357	1.308	-1.191	S
G4	Cond	20.7	22	21.283	1.453	-0.401	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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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.885	0.859	0.859	0.043	0.596	S
G2	SO ₄ ²⁻	1.121	1.09	1.096	0.064	0.383	S
G3	SO ₄ ²⁻	0.672	0.634	0.642	0.035	0.867	S
G4	SO ₄ ²⁻	0.797	0.771	0.78	0.033	0.535	S
G1	NH ₄ ⁺	0.147	0.134	0.138	0.019	0.484	S
G2	NH ₄ ⁺	0.217	0.214	0.213	0.022	0.157	S
G3	NH ₄ ⁺	0.286	0.267	0.27	0.023	0.692	S
G4	NH ₄ ⁺	0.367	0.348	0.352	0.027	0.558	S
G1	NO ₃ ⁻	0.273	0.27	0.269	0.016	0.266	S
G2	NO ₃ ⁻	0.36	0.352	0.352	0.02	0.407	S
G3	NO ₃ ⁻	0.432	0.415	0.415	0.023	0.74	S
G4	NO ₃ ⁻	0.632	0.607	0.609	0.043	0.54	S
G1	Na ⁺	0.251	0.268	0.261	0.022	-0.451	S
G2	Na ⁺	0.187	0.208	0.2	0.018	-0.744	S
G3	Na ⁺	0.306	0.318	0.311	0.023	-0.2	S
G4	Na ⁺	0.521	0.512	0.499	0.043	0.511	S
G1	Mg ²⁺	0.115	0.103	0.103	0.01	1.2	S
G2	Mg ²⁺	0.101	0.093	0.093	0.008	1.01	S
G3	Mg ²⁺	0.116	0.114	0.112	0.011	0.382	S
G4	Mg ²⁺	0.152	0.145	0.145	0.012	0.61	S
G1	Cl ⁻	0.191	0.193	0.196	0.037	-0.143	S
G2	Cl ⁻	0.157	0.154	0.165	0.039	-0.202	S
G3	Cl ⁻	0.279	0.27	0.275	0.061	0.058	S
G4	Cl ⁻	0.359	0.347	0.348	0.069	0.161	S
G1	Ca ²⁺	0.197	0.102	0.106	0.034	2.686	U
G2	Ca ²⁺	0.174	0.14	0.142	0.025	1.321	Q
G3	Ca ²⁺	0.245	0.204	0.2	0.028	1.607	Q
G4	Ca ²⁺	0.24	0.192	0.189	0.032	1.594	Q
G1	K ⁺	0.14	0.136	0.125	0.031	0.476	S
G2	K ⁺	0.202	0.204	0.194	0.022	0.362	S
G3	K ⁺	0.169	0.17	0.163	0.03	0.21	S
G4	K ⁺	0.261	0.238	0.23	0.027	1.163	S
G1	pH	4.45	4.4	4.46	0.104	-0.094	S
G2	pH	4.34	4.27	4.329	0.077	0.139	S
G3	pH	4.72	4.7	4.755	0.083	-0.417	S
G4	pH	4.7	4.57	4.631	0.077	0.902	Q
G1	Cond	22.1	22	21.535	1.76	0.321	S
G2	Cond	28.4	29	27.802	2.442	0.245	S
G3	Cond	16.41	16	16.357	1.308	0.04	S
G4	Cond	21.5	22	21.283	1.453	0.15	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 Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.87	0.859	0.859	0.043	0.251	S
G2	SO ₄ ²⁻	1.1	1.09	1.096	0.064	0.055	S
G3	SO ₄ ²⁻	0.649	0.634	0.642	0.035	0.211	S
G4	SO ₄ ²⁻	0.788	0.771	0.78	0.033	0.259	S
G1	NH ₄ ⁺	0.132	0.134	0.138	0.019	-0.31	S
G2	NH ₄ ⁺	0.215	0.214	0.213	0.022	0.068	S
G3	NH ₄ ⁺	0.271	0.267	0.27	0.023	0.034	S
G4	NH ₄ ⁺	0.349	0.348	0.352	0.027	-0.114	S
G1	NO ₃ ⁻	0.27	0.27	0.269	0.016	0.078	S
G2	NO ₃ ⁻	0.355	0.352	0.352	0.02	0.156	S
G3	NO ₃ ⁻	0.42	0.415	0.415	0.023	0.218	S
G4	NO ₃ ⁻	0.607	0.607	0.609	0.043	-0.046	S
G1	Na ⁺	0.261	0.268	0.261	0.022	-0.004	S
G2	Na ⁺	0.202	0.208	0.2	0.018	0.11	S
G3	Na ⁺	0.312	0.318	0.311	0.023	0.061	S
G4	Na ⁺	0.503	0.512	0.499	0.043	0.094	S
G1	Mg ²⁺	0.097	0.103	0.103	0.01	-0.677	S
G2	Mg ²⁺	0.088	0.093	0.093	0.008	-0.632	S
G3	Mg ²⁺	0.109	0.114	0.112	0.011	-0.265	S
G4	Mg ²⁺	0.14	0.145	0.145	0.012	-0.394	S
G1	Cl ⁻	0.177	0.193	0.196	0.037	-0.523	S
G2	Cl ⁻	0.142	0.154	0.165	0.039	-0.582	S
G3	Cl ⁻	0.265	0.27	0.275	0.061	-0.171	S
G4	Cl ⁻	0.362	0.347	0.348	0.069	0.205	S
G1	Ca ²⁺	0.084	0.102	0.106	0.034	-0.645	Q
G2	Ca ²⁺	0.122	0.14	0.142	0.025	-0.793	S
G3	Ca ²⁺	0.185	0.204	0.2	0.028	-0.547	S
G4	Ca ²⁺	0.173	0.192	0.189	0.032	-0.481	S
G1	K ⁺	0.132	0.136	0.125	0.031	0.216	S
G2	K ⁺	0.201	0.204	0.194	0.022	0.316	S
G3	K ⁺	0.168	0.17	0.163	0.03	0.176	S
G4	K ⁺	0.239	0.238	0.23	0.027	0.341	S
G1	pH	4.44	4.4	4.46	0.104	-0.191	S
G2	pH	4.28	4.27	4.329	0.077	-0.64	S
G3	pH	4.69	4.7	4.755	0.083	-0.777	S
G4	pH	4.59	4.57	4.631	0.077	-0.527	S
G1	Cond	23	22	21.535	1.76	0.832	S
G2	Cond	29	29	27.802	2.442	0.491	S
G3	Cond	18	16	16.357	1.308	1.256	S
G4	Cond	21	22	21.283	1.453	-0.195	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

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

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.851	0.859	0.859	0.043	-0.185	S
G2	SO ₄ ²⁻	1.082	1.09	1.096	0.064	-0.226	S
G3	SO ₄ ²⁻	0.639	0.634	0.642	0.035	-0.074	S
G4	SO ₄ ²⁻	0.772	0.771	0.78	0.033	-0.232	S
G1	NH ₄ ⁺	0.135	0.134	0.138	0.019	-0.151	S
G2	NH ₄ ⁺	0.215	0.214	0.213	0.022	0.068	S
G3	NH ₄ ⁺	0.271	0.267	0.27	0.023	0.034	S
G4	NH ₄ ⁺	0.355	0.348	0.352	0.027	0.11	S
G1	NO ₃ ⁻	0.266	0.27	0.269	0.016	-0.171	S
G2	NO ₃ ⁻	0.352	0.352	0.352	0.02	0.006	S
G3	NO ₃ ⁻	0.416	0.415	0.415	0.023	0.043	S
G4	NO ₃ ⁻	0.607	0.607	0.609	0.043	-0.046	S
G1	Na ⁺	0.264	0.268	0.261	0.022	0.131	S
G2	Na ⁺	0.205	0.208	0.2	0.018	0.28	S
G3	Na ⁺	0.315	0.318	0.311	0.023	0.192	S
G4	Na ⁺	0.505	0.512	0.499	0.043	0.141	S
G1	Mg ²⁺	0.102	0.103	0.103	0.01	-0.155	S
G2	Mg ²⁺	0.096	0.093	0.093	0.008	0.378	S
G3	Mg ²⁺	0.112	0.114	0.112	0.011	0.012	S
G4	Mg ²⁺	0.141	0.145	0.145	0.012	-0.311	S
G1	Cl ⁻	0.193	0.193	0.196	0.037	-0.089	S
G2	Cl ⁻	0.154	0.154	0.165	0.039	-0.278	S
G3	Cl ⁻	0.271	0.27	0.275	0.061	-0.073	S
G4	Cl ⁻	0.347	0.347	0.348	0.069	-0.014	S
G1	Ca ²⁺	0.109	0.102	0.106	0.034	0.092	S
G2	Ca ²⁺	0.143	0.14	0.142	0.025	0.06	S
G3	Ca ²⁺	0.214	0.204	0.2	0.028	0.494	S
G4	Ca ²⁺	0.2	0.192	0.189	0.032	0.355	S
G1	K ⁺	0.136	0.136	0.125	0.031	0.346	S
G2	K ⁺	0.203	0.204	0.194	0.022	0.408	S
G3	K ⁺	0.168	0.17	0.163	0.03	0.176	S
G4	K ⁺	0.237	0.238	0.23	0.027	0.266	S
G1	pH	4.44	4.4	4.46	0.104	-0.191	S
G2	pH	4.32	4.27	4.329	0.077	-0.12	S
G3	pH	4.72	4.7	4.755	0.083	-0.417	S
G4	pH	4.61	4.57	4.631	0.077	-0.267	S
G1	Cond	-999	22	21.535	1.76		B
G2	Cond	-999	29	27.802	2.442		B
G3	Cond	-999	16	16.357	1.308		B
G4	Cond	-999	22	21.283	1.453		B

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

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.85	0.859	0.859	0.043	-0.208	S
G2	SO ₄ ²⁻	1.09	1.09	1.096	0.064	-0.101	S
G3	SO ₄ ²⁻	0.64	0.634	0.642	0.035	-0.045	S
G4	SO ₄ ²⁻	0.773	0.771	0.78	0.033	-0.201	S
G1	NH ₄ ⁺	0.136	0.134	0.138	0.019	-0.098	S
G2	NH ₄ ⁺	0.214	0.214	0.213	0.022	0.024	S
G3	NH ₄ ⁺	0.273	0.267	0.27	0.023	0.122	S
G4	NH ₄ ⁺	0.352	0.348	0.352	0.027	-0.002	S
G1	NO ₃ ⁻	0.268	0.27	0.269	0.016	-0.047	S
G2	NO ₃ ⁻	0.352	0.352	0.352	0.02	0.006	S
G3	NO ₃ ⁻	0.415	0.415	0.415	0.023	0	S
G4	NO ₃ ⁻	0.597	0.607	0.609	0.043	-0.28	S
G1	Na ⁺	0.265	0.268	0.261	0.022	0.176	S
G2	Na ⁺	0.209	0.208	0.2	0.018	0.508	S
G3	Na ⁺	0.318	0.318	0.311	0.023	0.322	S
G4	Na ⁺	0.518	0.512	0.499	0.043	0.442	S
G1	Mg ²⁺	0.103	0.103	0.103	0.01	-0.051	S
G2	Mg ²⁺	0.094	0.093	0.093	0.008	0.126	S
G3	Mg ²⁺	0.114	0.114	0.112	0.011	0.197	S
G4	Mg ²⁺	0.145	0.145	0.145	0.012	0.024	S
G1	Cl ⁻	0.191	0.193	0.196	0.037	-0.143	S
G2	Cl ⁻	0.151	0.154	0.165	0.039	-0.354	S
G3	Cl ⁻	0.272	0.27	0.275	0.061	-0.056	S
G4	Cl ⁻	0.353	0.347	0.348	0.069	0.073	S
G1	Ca ²⁺	0.105	0.102	0.106	0.034	-0.026	S
G2	Ca ²⁺	0.143	0.14	0.142	0.025	0.06	S
G3	Ca ²⁺	0.205	0.204	0.2	0.028	0.171	S
G4	Ca ²⁺	0.192	0.192	0.189	0.032	0.108	S
G1	K ⁺	0.139	0.136	0.125	0.031	0.444	S
G2	K ⁺	0.205	0.204	0.194	0.022	0.499	S
G3	K ⁺	0.17	0.17	0.163	0.03	0.243	S
G4	K ⁺	0.241	0.238	0.23	0.027	0.416	S
G1	pH	4.43	4.4	4.46	0.104	-0.287	S
G2	pH	4.33	4.27	4.329	0.077	0.009	S
G3	pH	4.71	4.7	4.755	0.083	-0.537	S
G4	pH	4.61	4.57	4.631	0.077	-0.267	S
G1	Cond	22.3	22	21.535	1.76	0.434	S
G2	Cond	29.3	29	27.802	2.442	0.613	S
G3	Cond	17.1	16	16.357	1.308	0.568	S
G4	Cond	22.2	22	21.283	1.453	0.631	S

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Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.86	0.859	0.859	0.043	0.021	S
G2	SO ₄ ²⁻	1.11	1.09	1.096	0.064	0.212	S
G3	SO ₄ ²⁻	0.632	0.634	0.642	0.035	-0.273	S
G4	SO ₄ ²⁻	0.775	0.771	0.78	0.033	-0.14	S
G1	NH ₄ ⁺	0.13	0.134	0.138	0.019	-0.415	S
G2	NH ₄ ⁺	0.207	0.214	0.213	0.022	-0.287	S
G3	NH ₄ ⁺	0.265	0.267	0.27	0.023	-0.229	S
G4	NH ₄ ⁺	0.349	0.348	0.352	0.027	-0.114	S
G1	NO ₃ ⁻	0.257	0.27	0.269	0.016	-0.733	S
G2	NO ₃ ⁻	0.338	0.352	0.352	0.02	-0.695	S
G3	NO ₃ ⁻	0.4	0.415	0.415	0.023	-0.653	S
G4	NO ₃ ⁻	0.593	0.607	0.609	0.043	-0.374	S
G1	Na ⁺	0.273	0.268	0.261	0.022	0.534	S
G2	Na ⁺	0.211	0.208	0.2	0.018	0.622	S
G3	Na ⁺	0.325	0.318	0.311	0.023	0.627	S
G4	Na ⁺	0.526	0.512	0.499	0.043	0.627	S
G1	Mg ²⁺	0.104	0.103	0.103	0.01	0.053	S
G2	Mg ²⁺	0.095	0.093	0.093	0.008	0.252	S
G3	Mg ²⁺	0.116	0.114	0.112	0.011	0.382	S
G4	Mg ²⁺	0.146	0.145	0.145	0.012	0.108	S
G1	Cl ⁻	0.184	0.193	0.196	0.037	-0.333	S
G2	Cl ⁻	0.153	0.154	0.165	0.039	-0.303	S
G3	Cl ⁻	0.268	0.27	0.275	0.061	-0.122	S
G4	Cl ⁻	0.349	0.347	0.348	0.069	0.015	S
G1	Ca ²⁺	0.103	0.102	0.106	0.034	-0.085	S
G2	Ca ²⁺	0.14	0.14	0.142	0.025	-0.062	S
G3	Ca ²⁺	0.209	0.204	0.2	0.028	0.314	S
G4	Ca ²⁺	0.197	0.192	0.189	0.032	0.263	S
G1	K ⁺	0.125	0.136	0.125	0.031	-0.012	S
G2	K ⁺	0.188	0.204	0.194	0.022	-0.275	S
G3	K ⁺	0.163	0.17	0.163	0.03	0.009	S
G4	K ⁺	0.234	0.238	0.23	0.027	0.154	S
G1	pH	4.59	4.4	4.46	0.104	1.253	Q
G2	pH	4.33	4.27	4.329	0.077	0.009	S
G3	pH	4.95	4.7	4.755	0.083	2.348	U
G4	pH	4.62	4.57	4.631	0.077	-0.137	S
G1	Cond	20.5	22	21.535	1.76	-0.588	S
G2	Cond	26.5	29	27.802	2.442	-0.533	S
G3	Cond	15.2	16	16.357	1.308	-0.885	S
G4	Cond	18.4	22	21.283	1.453	-1.984	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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Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.868	0.859	0.859	0.043	0.205	S
G2	SO ₄ ²⁻	1.099	1.09	1.096	0.064	0.04	S
G3	SO ₄ ²⁻	0.645	0.634	0.642	0.035	0.097	S
G4	SO ₄ ²⁻	0.782	0.771	0.78	0.033	0.075	S
G1	NH ₄ ⁺	0.144	0.134	0.138	0.019	0.325	S
G2	NH ₄ ⁺	0.22	0.214	0.213	0.022	0.291	S
G3	NH ₄ ⁺	0.273	0.267	0.27	0.023	0.122	S
G4	NH ₄ ⁺	0.349	0.348	0.352	0.027	-0.114	S
G1	NO ₃ ⁻	0.263	0.27	0.269	0.016	-0.359	S
G2	NO ₃ ⁻	0.347	0.352	0.352	0.02	-0.244	S
G3	NO ₃ ⁻	0.373	0.415	0.415	0.023	-1.829	Q
G4	NO ₃ ⁻	0.608	0.607	0.609	0.043	-0.023	S
G1	Na ⁺	0.258	0.268	0.261	0.022	-0.138	S
G2	Na ⁺	0.194	0.208	0.2	0.018	-0.345	S
G3	Na ⁺	0.306	0.318	0.311	0.023	-0.2	S
G4	Na ⁺	0.496	0.512	0.499	0.043	-0.068	S
G1	Mg ²⁺	0.093	0.103	0.103	0.01	-1.094	S
G2	Mg ²⁺	0.082	0.093	0.093	0.008	-1.389	S
G3	Mg ²⁺	0.101	0.114	0.112	0.011	-1.004	S
G4	Mg ²⁺	0.147	0.145	0.145	0.012	0.192	S
G1	Cl ⁻	0.175	0.193	0.196	0.037	-0.577	S
G2	Cl ⁻	0.133	0.154	0.165	0.039	-0.81	S
G3	Cl ⁻	0.243	0.27	0.275	0.061	-0.53	S
G4	Cl ⁻	0.301	0.347	0.348	0.069	-0.686	S
G1	Ca ²⁺	0.085	0.102	0.106	0.034	-0.615	Q
G2	Ca ²⁺	0.119	0.14	0.142	0.025	-0.915	Q
G3	Ca ²⁺	0.184	0.204	0.2	0.028	-0.583	S
G4	Ca ²⁺	0.169	0.192	0.189	0.032	-0.605	S
G1	K ⁺	0.124	0.136	0.125	0.031	-0.044	S
G2	K ⁺	0.182	0.204	0.194	0.022	-0.548	S
G3	K ⁺	0.148	0.17	0.163	0.03	-0.494	S
G4	K ⁺	0.217	0.238	0.23	0.027	-0.481	S
G1	pH	4.47	4.4	4.46	0.104	0.098	S
G2	pH	4.34	4.27	4.329	0.077	0.139	S
G3	pH	4.72	4.7	4.755	0.083	-0.417	S
G4	pH	4.59	4.57	4.631	0.077	-0.527	S
G1	Cond	22.3	22	21.535	1.76	0.434	S
G2	Cond	28.5	29	27.802	2.442	0.286	S
G3	Cond	14.48	16	16.357	1.308	-1.435	S
G4	Cond	22.2	22	21.283	1.453	0.631	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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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.84	0.859	0.859	0.043	-0.438	S
G2	SO ₄ ²⁻	1.13	1.09	1.096	0.064	0.524	S
G3	SO ₄ ²⁻	0.64	0.634	0.642	0.035	-0.045	S
G4	SO ₄ ²⁻	0.76	0.771	0.78	0.033	-0.599	S
G1	NH ₄ ⁺	0.13	0.134	0.138	0.019	-0.415	S
G2	NH ₄ ⁺	0.2	0.214	0.213	0.022	-0.599	S
G3	NH ₄ ⁺	0.25	0.267	0.27	0.023	-0.886	S
G4	NH ₄ ⁺	0.33	0.348	0.352	0.027	-0.824	S
G1	NO ₃ ⁻	0.26	0.27	0.269	0.016	-0.546	S
G2	NO ₃ ⁻	0.35	0.352	0.352	0.02	-0.094	S
G3	NO ₃ ⁻	0.41	0.415	0.415	0.023	-0.218	S
G4	NO ₃ ⁻	0.61	0.607	0.609	0.043	0.024	S
G1	Na ⁺	-999	0.268	0.261	0.022		B
G2	Na ⁺	-999	0.208	0.2	0.018		B
G3	Na ⁺	-999	0.318	0.311	0.023		B
G4	Na ⁺	-999	0.512	0.499	0.043		B
G1	Mg ²⁺	-999	0.103	0.103	0.01		B
G2	Mg ²⁺	-999	0.093	0.093	0.008		B
G3	Mg ²⁺	-999	0.114	0.112	0.011		B
G4	Mg ²⁺	-999	0.145	0.145	0.012		B
G1	Cl ⁻	0.17	0.193	0.196	0.037	-0.712	S
G2	Cl ⁻	0.14	0.154	0.165	0.039	-0.633	S
G3	Cl ⁻	0.25	0.27	0.275	0.061	-0.415	S
G4	Cl ⁻	0.34	0.347	0.348	0.069	-0.116	S
G1	Ca ²⁺	-999	0.102	0.106	0.034		B
G2	Ca ²⁺	-999	0.14	0.142	0.025		B
G3	Ca ²⁺	-999	0.204	0.2	0.028		B
G4	Ca ²⁺	-999	0.192	0.189	0.032		B
G1	K ⁺	-999	0.136	0.125	0.031		B
G2	K ⁺	-999	0.204	0.194	0.022		B
G3	K ⁺	-999	0.17	0.163	0.03		B
G4	K ⁺	-999	0.238	0.23	0.027		B
G1	pH	4.45	4.4	4.46	0.104	-0.094	S
G2	pH	4.31	4.27	4.329	0.077	-0.25	S
G3	pH	4.74	4.7	4.755	0.083	-0.176	S
G4	pH	4.59	4.57	4.631	0.077	-0.527	S
G1	Cond	20.5	22	21.535	1.76	-0.588	S
G2	Cond	27.5	29	27.802	2.442	-0.124	S
G3	Cond	16	16	16.357	1.308	-0.273	S
G4	Cond	21	22	21.283	1.453	-0.195	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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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.977	0.859	0.859	0.043	2.712	Q
G2	SO ₄ ²⁻	1.23	1.09	1.096	0.064	2.086	Q
G3	SO ₄ ²⁻	0.736	0.634	0.642	0.035	2.69	Q
G4	SO ₄ ²⁻	0.886	0.771	0.78	0.033	3.263	Q
G1	NH ₄ ⁺	0.136	0.134	0.138	0.019	-0.098	S
G2	NH ₄ ⁺	0.23	0.214	0.213	0.022	0.736	S
G3	NH ₄ ⁺	0.285	0.267	0.27	0.023	0.648	S
G4	NH ₄ ⁺	0.376	0.348	0.352	0.027	0.894	S
G1	NO ₃ ⁻	0.305	0.27	0.269	0.016	2.263	Q
G2	NO ₃ ⁻	0.401	0.352	0.352	0.02	2.459	Q
G3	NO ₃ ⁻	0.476	0.415	0.415	0.023	2.656	Q
G4	NO ₃ ⁻	0.692	0.607	0.609	0.043	1.946	Q
G1	Na ⁺	0.262	0.268	0.261	0.022	0.041	S
G2	Na ⁺	0.2	0.208	0.2	0.018	-0.004	S
G3	Na ⁺	0.321	0.318	0.311	0.023	0.453	S
G4	Na ⁺	0.516	0.512	0.499	0.043	0.396	S
G1	Mg ²⁺	0.099	0.103	0.103	0.01	-0.468	S
G2	Mg ²⁺	0.09	0.093	0.093	0.008	-0.379	S
G3	Mg ²⁺	0.112	0.114	0.112	0.011	0.012	S
G4	Mg ²⁺	0.152	0.145	0.145	0.012	0.61	S
G1	Cl ⁻	0.219	0.193	0.196	0.037	0.616	S
G2	Cl ⁻	0.186	0.154	0.165	0.039	0.534	Q
G3	Cl ⁻	0.308	0.27	0.275	0.061	0.531	S
G4	Cl ⁻	0.401	0.347	0.348	0.069	0.774	Q
G1	Ca ²⁺	0.093	0.102	0.106	0.034	-0.379	S
G2	Ca ²⁺	0.131	0.14	0.142	0.025	-0.428	S
G3	Ca ²⁺	0.192	0.204	0.2	0.028	-0.296	S
G4	Ca ²⁺	0.186	0.192	0.189	0.032	-0.078	S
G1	K ⁺	0.139	0.136	0.125	0.031	0.444	S
G2	K ⁺	0.209	0.204	0.194	0.022	0.681	S
G3	K ⁺	0.173	0.17	0.163	0.03	0.344	S
G4	K ⁺	0.247	0.238	0.23	0.027	0.64	S
G1	pH	4.43	4.4	4.46	0.104	-0.287	S
G2	pH	4.34	4.27	4.329	0.077	0.139	S
G3	pH	4.82	4.7	4.755	0.083	0.785	Q
G4	pH	4.68	4.57	4.631	0.077	0.642	Q
G1	Cond	25.1	22	21.535	1.76	2.025	S
G2	Cond	33.4	29	27.802	2.442	2.292	Q
G3	Cond	19.2	16	16.357	1.308	2.173	Q
G4	Cond	25	22	21.283	1.453	2.558	S

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Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th intercomparison of analytical methods

Laboratory 47, Jelenia Gora (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⁻	0.803	0.859	0.859	0.043	-1.289	S
G2	SO ₄ ²⁻	1.039	1.09	1.096	0.064	-0.898	S
G3	SO ₄ ²⁻	0.592	0.634	0.642	0.035	-1.413	S
G4	SO ₄ ²⁻	0.724	0.771	0.78	0.033	-1.703	S
G1	NH ₄ ⁺	0.192	0.134	0.138	0.019	2.865	U
G2	NH ₄ ⁺	0.26	0.214	0.213	0.022	2.07	Q
G3	NH ₄ ⁺	0.336	0.267	0.27	0.023	2.882	U
G4	NH ₄ ⁺	0.398	0.348	0.352	0.027	1.716	S
G1	NO ₃ ⁻	0.241	0.27	0.269	0.016	-1.732	Q
G2	NO ₃ ⁻	0.314	0.352	0.352	0.02	-1.896	Q
G3	NO ₃ ⁻	0.374	0.415	0.415	0.023	-1.785	S
G4	NO ₃ ⁻	0.553	0.607	0.609	0.043	-1.312	S
G1	Na ⁺	0.167	0.268	0.261	0.022	-4.214	U
G2	Na ⁺	0.131	0.208	0.2	0.018	-3.93	U
G3	Na ⁺	0.201	0.318	0.311	0.023	-4.769	U
G4	Na ⁺	0.339	0.512	0.499	0.043	-3.705	U
G1	Mg ²⁺	0.102	0.103	0.103	0.01	-0.155	S
G2	Mg ²⁺	0.096	0.093	0.093	0.008	0.378	S
G3	Mg ²⁺	0.111	0.114	0.112	0.011	-0.08	S
G4	Mg ²⁺	0.145	0.145	0.145	0.012	0.024	S
G1	Cl ⁻	0.176	0.193	0.196	0.037	-0.55	S
G2	Cl ⁻	0.144	0.154	0.165	0.039	-0.531	S
G3	Cl ⁻	0.243	0.27	0.275	0.061	-0.53	S
G4	Cl ⁻	0.31	0.347	0.348	0.069	-0.554	S
G1	Ca ²⁺	0.1	0.102	0.106	0.034	-0.173	S
G2	Ca ²⁺	0.136	0.14	0.142	0.025	-0.224	S
G3	Ca ²⁺	0.189	0.204	0.2	0.028	-0.404	S
G4	Ca ²⁺	0.18	0.192	0.189	0.032	-0.264	S
G1	K ⁺	0.095	0.136	0.125	0.031	-0.988	U
G2	K ⁺	0.148	0.204	0.194	0.022	-2.096	U
G3	K ⁺	0.119	0.17	0.163	0.03	-1.465	U
G4	K ⁺	0.174	0.238	0.23	0.027	-2.087	U
G1	pH	4.699	4.4	4.46	0.104	2.302	U
G2	pH	4.589	4.27	4.329	0.077	3.375	U
G3	pH	4.942	4.7	4.755	0.083	2.252	U
G4	pH	4.859	4.57	4.631	0.077	2.969	U
G1	Cond	19.4	22	21.535	1.76	-1.213	S
G2	Cond	25.9	29	27.802	2.442	-0.779	S
G3	Cond	15.1	16	16.357	1.308	-0.961	S
G4	Cond	19.1	22	21.283	1.453	-1.502	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

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 Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.868	0.859	0.859	0.043	0.205	S
G2	SO ₄ ²⁻	1.098	1.09	1.096	0.064	0.024	S
G3	SO ₄ ²⁻	0.659	0.634	0.642	0.035	0.496	S
G4	SO ₄ ²⁻	0.792	0.771	0.78	0.033	0.381	S
G1	NH ₄ ⁺	0.125	0.134	0.138	0.019	-0.68	S
G2	NH ₄ ⁺	0.2	0.214	0.213	0.022	-0.599	S
G3	NH ₄ ⁺	0.26	0.267	0.27	0.023	-0.448	S
G4	NH ₄ ⁺	0.346	0.348	0.352	0.027	-0.226	S
G1	NO ₃ ⁻	0.27	0.27	0.269	0.016	0.078	S
G2	NO ₃ ⁻	0.358	0.352	0.352	0.02	0.307	S
G3	NO ₃ ⁻	0.426	0.415	0.415	0.023	0.479	S
G4	NO ₃ ⁻	0.622	0.607	0.609	0.043	0.306	S
G1	Na ⁺	0.24	0.268	0.261	0.022	-0.944	S
G2	Na ⁺	0.18	0.208	0.2	0.018	-1.142	S
G3	Na ⁺	0.297	0.318	0.311	0.023	-0.591	S
G4	Na ⁺	0.458	0.512	0.499	0.043	-0.948	S
G1	Mg ²⁺	0.07	0.103	0.103	0.01	-3.492	U
G2	Mg ²⁺	0.058	0.093	0.093	0.008	-4.419	U
G3	Mg ²⁺	0.087	0.114	0.112	0.011	-2.297	Q
G4	Mg ²⁺	0.119	0.145	0.145	0.012	-2.153	Q
G1	Cl ⁻	0.187	0.193	0.196	0.037	-0.252	S
G2	Cl ⁻	0.149	0.154	0.165	0.039	-0.404	S
G3	Cl ⁻	0.264	0.27	0.275	0.061	-0.187	S
G4	Cl ⁻	0.344	0.347	0.348	0.069	-0.058	S
G1	Ca ²⁺	< 0.050	0.102	0.106	0.034	-2.384	U
G2	Ca ²⁺	< 0.050	0.14	0.142	0.025	-4.737	U
G3	Ca ²⁺	0.139	0.204	0.2	0.028	-2.199	U
G4	Ca ²⁺	0.115	0.192	0.189	0.032	-2.277	U
G1	K ⁺	0.124	0.136	0.125	0.031	-0.044	S
G2	K ⁺	0.194	0.204	0.194	0.022	-0.002	S
G3	K ⁺	0.159	0.17	0.163	0.03	-0.125	S
G4	K ⁺	0.23	0.238	0.23	0.027	0.005	S
G1	pH	4.45	4.4	4.46	0.104	-0.094	S
G2	pH	4.32	4.27	4.329	0.077	-0.12	S
G3	pH	4.73	4.7	4.755	0.083	-0.296	S
G4	pH	4.61	4.57	4.631	0.077	-0.267	S
G1	Cond	23	22	21.535	1.76	0.832	S
G2	Cond	29	29	27.802	2.442	0.491	S
G3	Cond	17	16	16.357	1.308	0.491	S
G4	Cond	22	22	21.283	1.453	0.494	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

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

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.887	0.859	0.859	0.043	0.642	S
G2	SO ₄ ²⁻	1.12	1.09	1.096	0.064	0.368	S
G3	SO ₄ ²⁻	0.675	0.634	0.642	0.035	0.952	S
G4	SO ₄ ²⁻	0.81	0.771	0.78	0.033	0.933	S
G1	NH ₄ ⁺	0.128	0.134	0.138	0.019	-0.521	S
G2	NH ₄ ⁺	0.203	0.214	0.213	0.022	-0.465	S
G3	NH ₄ ⁺	0.254	0.267	0.27	0.023	-0.71	S
G4	NH ₄ ⁺	0.338	0.348	0.352	0.027	-0.525	S
G1	NO ₃ ⁻	0.274	0.27	0.269	0.016	0.328	S
G2	NO ₃ ⁻	0.356	0.352	0.352	0.02	0.206	S
G3	NO ₃ ⁻	0.426	0.415	0.415	0.023	0.479	S
G4	NO ₃ ⁻	0.63	0.607	0.609	0.043	0.493	S
G1	Na ⁺	0.261	0.268	0.261	0.022	-0.004	S
G2	Na ⁺	0.203	0.208	0.2	0.018	0.167	S
G3	Na ⁺	0.31	0.318	0.311	0.023	-0.026	S
G4	Na ⁺	0.499	0.512	0.499	0.043	0.002	S
G1	Mg ²⁺	0.105	0.103	0.103	0.01	0.157	S
G2	Mg ²⁺	0.098	0.093	0.093	0.008	0.631	S
G3	Mg ²⁺	0.116	0.114	0.112	0.011	0.382	S
G4	Mg ²⁺	0.145	0.145	0.145	0.012	0.024	S
G1	Cl ⁻	0.181	0.193	0.196	0.037	-0.414	S
G2	Cl ⁻	0.151	0.154	0.165	0.039	-0.354	S
G3	Cl ⁻	0.244	0.27	0.275	0.061	-0.513	S
G4	Cl ⁻	0.339	0.347	0.348	0.069	-0.131	S
G1	Ca ²⁺	0.098	0.102	0.106	0.034	-0.232	S
G2	Ca ²⁺	0.141	0.14	0.142	0.025	-0.021	S
G3	Ca ²⁺	0.197	0.204	0.2	0.028	-0.116	S
G4	Ca ²⁺	0.188	0.192	0.189	0.032	-0.016	S
G1	K ⁺	0.125	0.136	0.125	0.031	-0.012	S
G2	K ⁺	0.2	0.204	0.194	0.022	0.271	S
G3	K ⁺	0.155	0.17	0.163	0.03	-0.259	S
G4	K ⁺	0.239	0.238	0.23	0.027	0.341	S
G1	pH	4.48	4.4	4.46	0.104	0.194	S
G2	pH	4.35	4.27	4.329	0.077	0.269	S
G3	pH	4.75	4.7	4.755	0.083	-0.056	S
G4	pH	4.64	4.57	4.631	0.077	0.122	S
G1	Cond	20.9	22	21.535	1.76	-0.361	S
G2	Cond	26.5	29	27.802	2.442	-0.533	S
G3	Cond	15.7	16	16.357	1.308	-0.503	S
G4	Cond	20.4	22	21.283	1.453	-0.607	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 Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.85	0.859	0.859	0.043	-0.208	S
G2	SO ₄ ²⁻	1.115	1.09	1.096	0.064	0.29	S
G3	SO ₄ ²⁻	0.633	0.634	0.642	0.035	-0.245	S
G4	SO ₄ ²⁻	0.764	0.771	0.78	0.033	-0.477	S
G1	NH ₄ ⁺	0.045	0.134	0.138	0.019	-4.913	U
G2	NH ₄ ⁺	0.143	0.214	0.213	0.022	-3.135	U
G3	NH ₄ ⁺	0.203	0.267	0.27	0.023	-2.945	Q
G4	NH ₄ ⁺	0.269	0.348	0.352	0.027	-3.101	Q
G1	NO ₃ ⁻	0.271	0.27	0.269	0.016	0.141	S
G2	NO ₃ ⁻	0.352	0.352	0.352	0.02	0.006	S
G3	NO ₃ ⁻	0.407	0.415	0.415	0.023	-0.348	S
G4	NO ₃ ⁻	0.594	0.607	0.609	0.043	-0.351	S
G1	Na ⁺	0.261	0.268	0.261	0.022	-0.004	S
G2	Na ⁺	0.207	0.208	0.2	0.018	0.394	S
G3	Na ⁺	0.316	0.318	0.311	0.023	0.235	S
G4	Na ⁺	0.513	0.512	0.499	0.043	0.326	S
G1	Mg ²⁺	0.108	0.103	0.103	0.01	0.47	S
G2	Mg ²⁺	0.1	0.093	0.093	0.008	0.883	S
G3	Mg ²⁺	0.12	0.114	0.112	0.011	0.752	S
G4	Mg ²⁺	0.173	0.145	0.145	0.012	2.369	Q
G1	Cl ⁻	0.195	0.193	0.196	0.037	-0.035	S
G2	Cl ⁻	0.181	0.154	0.165	0.039	0.407	Q
G3	Cl ⁻	0.265	0.27	0.275	0.061	-0.171	S
G4	Cl ⁻	0.345	0.347	0.348	0.069	-0.043	S
G1	Ca ²⁺	0.103	0.102	0.106	0.034	-0.085	S
G2	Ca ²⁺	0.146	0.14	0.142	0.025	0.182	S
G3	Ca ²⁺	0.212	0.204	0.2	0.028	0.422	S
G4	Ca ²⁺	1.27	0.192	0.189	0.032	33.496	U
G1	K ⁺	0.135	0.136	0.125	0.031	0.314	S
G2	K ⁺	0.202	0.204	0.194	0.022	0.362	S
G3	K ⁺	0.167	0.17	0.163	0.03	0.143	S
G4	K ⁺	0.238	0.238	0.23	0.027	0.304	S
G1	pH	-999	4.4	4.46	0.104		B
G2	pH	-999	4.27	4.329	0.077		B
G3	pH	-999	4.7	4.755	0.083		B
G4	pH	-999	4.57	4.631	0.077		B
G1	Cond	-999	22	21.535	1.76		B
G2	Cond	-999	29	27.802	2.442		B
G3	Cond	-999	16	16.357	1.308		B
G4	Cond	-999	22	21.283	1.453		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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Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th intercomparison of analytical methods

Laboratory 40, Hydrometeorological Institute, Skopje (Macedonia)

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	0.859	0.859	0.043		B
G2	SO ₄ ²⁻	-999	1.09	1.096	0.064		B
G3	SO ₄ ²⁻	-999	0.634	0.642	0.035		B
G4	SO ₄ ²⁻	-999	0.771	0.78	0.033		B
G1	NH ₄ ⁺	0.165	0.134	0.138	0.019	1.436	Q
G2	NH ₄ ⁺	0.178	0.214	0.213	0.022	-1.578	Q
G3	NH ₄ ⁺	0.232	0.267	0.27	0.023	-1.674	S
G4	NH ₄ ⁺	0.315	0.348	0.352	0.027	-1.384	S
G1	NO ₃ ⁻	0.312	0.27	0.269	0.016	2.7	Q
G2	NO ₃ ⁻	0.375	0.352	0.352	0.02	1.158	S
G3	NO ₃ ⁻	0.496	0.415	0.415	0.023	3.527	Q
G4	NO ₃ ⁻	0.733	0.607	0.609	0.043	2.908	U
G1	Na ⁺	0.353	0.268	0.261	0.022	4.099	U
G2	Na ⁺	0.291	0.208	0.2	0.018	5.18	U
G3	Na ⁺	0.37	0.318	0.311	0.023	2.603	Q
G4	Na ⁺	0.597	0.512	0.499	0.043	2.282	Q
G1	Mg ²⁺	-999	0.103	0.103	0.01		B
G2	Mg ²⁺	-999	0.093	0.093	0.008		B
G3	Mg ²⁺	-999	0.114	0.112	0.011		B
G4	Mg ²⁺	-999	0.145	0.145	0.012		B
G1	Cl ⁻	0.316	0.193	0.196	0.037	3.245	U
G2	Cl ⁻	0.292	0.154	0.165	0.039	3.222	U
G3	Cl ⁻	0.456	0.27	0.275	0.061	2.947	U
G4	Cl ⁻	0.516	0.347	0.348	0.069	2.452	U
G1	Ca ²⁺	-999	0.102	0.106	0.034		B
G2	Ca ²⁺	-999	0.14	0.142	0.025		B
G3	Ca ²⁺	-999	0.204	0.2	0.028		B
G4	Ca ²⁺	-999	0.192	0.189	0.032		B
G1	K ⁺	0.111	0.136	0.125	0.031	-0.461	Q
G2	K ⁺	0.191	0.204	0.194	0.022	-0.148	S
G3	K ⁺	0.164	0.17	0.163	0.03	0.039	S
G4	K ⁺	0.222	0.238	0.23	0.027	-0.29	S
G1	pH	4.57	4.4	4.46	0.104	1.061	Q
G2	pH	4.11	4.27	4.329	0.077	-2.85	Q
G3	pH	4.88	4.7	4.755	0.083	1.507	Q
G4	pH	4.18	4.57	4.631	0.077	-5.857	U
G1	Cond	15	22	21.535	1.76	-3.712	U
G2	Cond	21	29	27.802	2.442	-2.785	U
G3	Cond	12	16	16.357	1.308	-3.332	Q
G4	Cond	18	22	21.283	1.453	-2.259	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

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 Youden plots, updated expected values ect:

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EMEP – 29th 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⁻	0.834	0.859	0.859	0.043	-0.57	S
G2	SO ₄ ²⁻	1.123	1.09	1.096	0.064	0.423	S
G3	SO ₄ ²⁻	0.701	0.634	0.642	0.035	1.704	Q
G4	SO ₄ ²⁻	0.841	0.771	0.78	0.033	1.896	S
G1	NH ₄ ⁺	0.112	0.134	0.138	0.019	-1.373	Q
G2	NH ₄ ⁺	0.184	0.214	0.213	0.022	-1.32	S
G3	NH ₄ ⁺	0.222	0.267	0.27	0.023	-2.134	Q
G4	NH ₄ ⁺	0.3	0.348	0.352	0.027	-1.959	S
G1	NO ₃ ⁻	0.305	0.27	0.269	0.016	2.288	Q
G2	NO ₃ ⁻	0.359	0.352	0.352	0.02	0.342	S
G3	NO ₃ ⁻	0.433	0.415	0.415	0.023	0.775	S
G4	NO ₃ ⁻	0.519	0.607	0.609	0.043	-2.097	Q
G1	Na ⁺	0.316	0.268	0.261	0.022	2.473	Q
G2	Na ⁺	0.195	0.208	0.2	0.018	-0.3	S
G3	Na ⁺	0.284	0.318	0.311	0.023	-1.174	S
G4	Na ⁺	0.461	0.512	0.499	0.043	-0.874	S
G1	Mg ²⁺	0.12	0.103	0.103	0.01	1.721	Q
G2	Mg ²⁺	0.084	0.093	0.093	0.008	-1.111	S
G3	Mg ²⁺	0.112	0.114	0.112	0.011	-0.025	S
G4	Mg ²⁺	0.143	0.145	0.145	0.012	-0.16	S
G1	Cl ⁻	0.165	0.193	0.196	0.037	-0.851	S
G2	Cl ⁻	0.197	0.154	0.165	0.039	0.815	U
G3	Cl ⁻	0.256	0.27	0.275	0.061	-0.326	S
G4	Cl ⁻	0.323	0.347	0.348	0.069	-0.362	S
G1	Ca ²⁺	0.201	0.102	0.106	0.034	2.801	U
G2	Ca ²⁺	0.164	0.14	0.142	0.025	0.93	Q
G3	Ca ²⁺	0.237	0.204	0.2	0.028	1.338	Q
G4	Ca ²⁺	0.227	0.192	0.189	0.032	1.201	Q
G1	K ⁺	0.346	0.136	0.125	0.031	7.178	U
G2	K ⁺	0.195	0.204	0.194	0.022	0.034	S
G3	K ⁺	0.316	0.17	0.163	0.03	5.12	U
G4	K ⁺	0.435	0.238	0.23	0.027	7.673	U
G1	pH	5.14	4.4	4.46	0.104	6.546	U
G2	pH	4.83	4.27	4.329	0.077	6.507	U
G3	pH	5.22	4.7	4.755	0.083	5.594	U
G4	pH	5.04	4.57	4.631	0.077	5.322	U
G1	Cond	23	22	21.535	1.76	0.832	S
G2	Cond	29	29	27.802	2.442	0.491	S
G3	Cond	17	16	16.357	1.308	0.491	S
G4	Cond	22	22	21.283	1.453	0.494	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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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th intercomparison of analytical methods

Laboratory 43, Centre for Monitoring and Prognostication, Tbilisi (Georgia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	1.765	0.859	0.859	0.043	20.834	U
G2	SO ₄ ²⁻	0.608	1.09	1.096	0.064	-7.632	U
G3	SO ₄ ²⁻	0.689	0.634	0.642	0.035	1.351	S
G4	SO ₄ ²⁻	0.78	0.771	0.78	0.033	0.014	S
G1	NH ₄ ⁺	-999	0.134	0.138	0.019		B
G2	NH ₄ ⁺	-999	0.214	0.213	0.022		B
G3	NH ₄ ⁺	-999	0.267	0.27	0.023		B
G4	NH ₄ ⁺	-999	0.348	0.352	0.027		B
G1	NO ₃ ⁻	0.174	0.27	0.269	0.016	-5.914	U
G2	NO ₃ ⁻	0.154	0.352	0.352	0.02	-9.906	U
G3	NO ₃ ⁻	0.189	0.415	0.415	0.023	-9.841	U
G4	NO ₃ ⁻	0.139	0.607	0.609	0.043	-11.016	U
G1	Na ⁺	-999	0.268	0.261	0.022		B
G2	Na ⁺	-999	0.208	0.2	0.018		B
G3	Na ⁺	-999	0.318	0.311	0.023		B
G4	Na ⁺	-999	0.512	0.499	0.043		B
G1	Mg ²⁺	-999	0.103	0.103	0.01		B
G2	Mg ²⁺	-999	0.093	0.093	0.008		B
G3	Mg ²⁺	-999	0.114	0.112	0.011		B
G4	Mg ²⁺	-999	0.145	0.145	0.012		B
G1	Cl ⁻	0.771	0.193	0.196	0.037	15.579	U
G2	Cl ⁻	0.233	0.154	0.165	0.039	1.726	U
G3	Cl ⁻	0.552	0.27	0.275	0.061	4.514	U
G4	Cl ⁻	0.576	0.347	0.348	0.069	3.328	U
G1	Ca ²⁺	-999	0.102	0.106	0.034		B
G2	Ca ²⁺	-999	0.14	0.142	0.025		B
G3	Ca ²⁺	-999	0.204	0.2	0.028		B
G4	Ca ²⁺	-999	0.192	0.189	0.032		B
G1	K ⁺	-999	0.136	0.125	0.031		B
G2	K ⁺	-999	0.204	0.194	0.022		B
G3	K ⁺	-999	0.17	0.163	0.03		B
G4	K ⁺	-999	0.238	0.23	0.027		B
G1	pH	4.17	4.4	4.46	0.104	-2.789	U
G2	pH	4	4.27	4.329	0.077	-4.279	U
G3	pH	4.67	4.7	4.755	0.083	-1.018	S
G4	pH	4.57	4.57	4.631	0.077	-0.787	S
G1	Cond	20.8	22	21.535	1.76	-0.418	S
G2	Cond	21.5	29	27.802	2.442	-2.58	U
G3	Cond	15.8	16	16.357	1.308	-0.426	S
G4	Cond	18.8	22	21.283	1.453	-1.709	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 Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.902	0.859	0.859	0.043	0.987	S
G2	SO ₄ ²⁻	1.156	1.09	1.096	0.064	0.93	S
G3	SO ₄ ²⁻	0.657	0.634	0.642	0.035	0.439	S
G4	SO ₄ ²⁻	0.81	0.771	0.78	0.033	0.933	S
G1	NH ₄ ⁺	0.106	0.134	0.138	0.019	-1.685	Q
G2	NH ₄ ⁺	0.296	0.214	0.213	0.022	3.672	U
G3	NH ₄ ⁺	0.239	0.267	0.27	0.023	-1.368	S
G4	NH ₄ ⁺	0.326	0.348	0.352	0.027	-0.973	S
G1	NO ₃ ⁻	0.272	0.27	0.269	0.016	0.203	S
G2	NO ₃ ⁻	0.357	0.352	0.352	0.02	0.256	S
G3	NO ₃ ⁻	0.421	0.415	0.415	0.023	0.261	S
G4	NO ₃ ⁻	0.631	0.607	0.609	0.043	0.517	S
G1	Na ⁺	0.213	0.268	0.261	0.022	-2.153	Q
G2	Na ⁺	0.179	0.208	0.2	0.018	-1.199	S
G3	Na ⁺	0.272	0.318	0.311	0.023	-1.679	S
G4	Na ⁺	0.415	0.512	0.499	0.043	-1.944	Q
G1	Mg ²⁺	0.056	0.103	0.103	0.01	-4.952	U
G2	Mg ²⁺	0.057	0.093	0.093	0.008	-4.545	U
G3	Mg ²⁺	0.064	0.114	0.112	0.011	-4.422	U
G4	Mg ²⁺	0.083	0.145	0.145	0.012	-5.167	U
G1	Cl ⁻	0.177	0.193	0.196	0.037	-0.523	S
G2	Cl ⁻	0.14	0.154	0.165	0.039	-0.633	S
G3	Cl ⁻	0.25	0.27	0.275	0.061	-0.415	S
G4	Cl ⁻	0.323	0.347	0.348	0.069	-0.364	S
G1	Ca ²⁺	0.202	0.102	0.106	0.034	2.834	U
G2	Ca ²⁺	0.087	0.14	0.142	0.025	-2.216	U
G3	Ca ²⁺	0.127	0.204	0.2	0.028	-2.63	U
G4	Ca ²⁺	0.106	0.192	0.189	0.032	-2.556	U
G1	K ⁺	0.067	0.136	0.125	0.031	-1.899	U
G2	K ⁺	0.158	0.204	0.194	0.022	-1.641	Q
G3	K ⁺	0.115	0.17	0.163	0.03	-1.599	U
G4	K ⁺	0.172	0.238	0.23	0.027	-2.162	U
G1	pH	4.24	4.4	4.46	0.104	-2.115	Q
G2	pH	4.12	4.27	4.329	0.077	-2.72	Q
G3	pH	4.48	4.7	4.755	0.083	-3.302	U
G4	pH	4.45	4.57	4.631	0.077	-2.347	Q
G1	Cond	22.2	22	21.535	1.76	0.378	S
G2	Cond	28.8	29	27.802	2.442	0.409	S
G3	Cond	16.7	16	16.357	1.308	0.262	S
G4	Cond	21.7	22	21.283	1.453	0.287	S

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Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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	0.859	0.859	0.043		B
G2	SO ₄ ²⁻	-999	1.09	1.096	0.064		B
G3	SO ₄ ²⁻	-999	0.634	0.642	0.035		B
G4	SO ₄ ²⁻	-999	0.771	0.78	0.033		B
G1	NH ₄ ⁺	-999	0.134	0.138	0.019		B
G2	NH ₄ ⁺	-999	0.214	0.213	0.022		B
G3	NH ₄ ⁺	-999	0.267	0.27	0.023		B
G4	NH ₄ ⁺	-999	0.348	0.352	0.027		B
G1	NO ₃ ⁻	-999	0.27	0.269	0.016		B
G2	NO ₃ ⁻	-999	0.352	0.352	0.02		B
G3	NO ₃ ⁻	-999	0.415	0.415	0.023		B
G4	NO ₃ ⁻	-999	0.607	0.609	0.043		B
G1	Na ⁺	-999	0.268	0.261	0.022		B
G2	Na ⁺	-999	0.208	0.2	0.018		B
G3	Na ⁺	-999	0.318	0.311	0.023		B
G4	Na ⁺	-999	0.512	0.499	0.043		B
G1	Mg ²⁺	-999	0.103	0.103	0.01		B
G2	Mg ²⁺	-999	0.093	0.093	0.008		B
G3	Mg ²⁺	-999	0.114	0.112	0.011		B
G4	Mg ²⁺	-999	0.145	0.145	0.012		B
G1	Cl ⁻	-999	0.193	0.196	0.037		B
G2	Cl ⁻	-999	0.154	0.165	0.039		B
G3	Cl ⁻	-999	0.27	0.275	0.061		B
G4	Cl ⁻	-999	0.347	0.348	0.069		B
G1	Ca ²⁺	-999	0.102	0.106	0.034		B
G2	Ca ²⁺	-999	0.14	0.142	0.025		B
G3	Ca ²⁺	-999	0.204	0.2	0.028		B
G4	Ca ²⁺	-999	0.192	0.189	0.032		B
G1	K ⁺	-999	0.136	0.125	0.031		B
G2	K ⁺	-999	0.204	0.194	0.022		B
G3	K ⁺	-999	0.17	0.163	0.03		B
G4	K ⁺	-999	0.238	0.23	0.027		B
G1	pH	4.43	4.4	4.46	0.104	-0.287	S
G2	pH	4.32	4.27	4.329	0.077	-0.12	S
G3	pH	4.71	4.7	4.755	0.083	-0.537	S
G4	pH	4.6	4.57	4.631	0.077	-0.397	S
G1	Cond	21.98	22	21.535	1.76	0.253	S
G2	Cond	28.64	29	27.802	2.442	0.343	S
G3	Cond	16.71	16	16.357	1.308	0.27	S
G4	Cond	21.15	22	21.283	1.453	-0.091	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 Youden plots, updated expected values ect:

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

EMEP – 29th intercomparison of analytical methods

Laboratory 104, Hessige Landwirtschaftliche (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⁻	0.831	0.859	0.859	0.043	-0.645	S
G2	SO ₄ ²⁻	1.066	1.09	1.096	0.064	-0.476	S
G3	SO ₄ ²⁻	0.624	0.634	0.642	0.035	-0.501	S
G4	SO ₄ ²⁻	0.759	0.771	0.78	0.033	-0.63	S
G1	NH ₄ ⁺	0.138	0.134	0.138	0.019	0.008	S
G2	NH ₄ ⁺	0.205	0.214	0.213	0.022	-0.376	S
G3	NH ₄ ⁺	0.305	0.267	0.27	0.023	1.524	S
G4	NH ₄ ⁺	0.355	0.348	0.352	0.027	0.11	S
G1	NO ₃ ⁻	0.263	0.27	0.269	0.016	-0.359	S
G2	NO ₃ ⁻	0.343	0.352	0.352	0.02	-0.444	S
G3	NO ₃ ⁻	0.413	0.415	0.415	0.023	-0.087	S
G4	NO ₃ ⁻	0.605	0.607	0.609	0.043	-0.093	S
G1	Na ⁺	0.288	0.268	0.261	0.022	1.206	S
G2	Na ⁺	0.233	0.208	0.2	0.018	1.874	S
G3	Na ⁺	0.326	0.318	0.311	0.023	0.671	S
G4	Na ⁺	0.141	0.512	0.499	0.043	-8.293	U
G1	Mg ²⁺	0.096	0.103	0.103	0.01	-0.781	S
G2	Mg ²⁺	0.088	0.093	0.093	0.008	-0.632	S
G3	Mg ²⁺	0.108	0.114	0.112	0.011	-0.357	S
G4	Mg ²⁺	0.141	0.145	0.145	0.012	-0.311	S
G1	Cl ⁻	0.205	0.193	0.196	0.037	0.236	S
G2	Cl ⁻	0.19	0.154	0.165	0.039	0.635	Q
G3	Cl ⁻	0.285	0.27	0.275	0.061	0.156	S
G4	Cl ⁻	0.37	0.347	0.348	0.069	0.322	S
G1	Ca ²⁺	0.095	0.102	0.106	0.034	-0.32	S
G2	Ca ²⁺	0.13	0.14	0.142	0.025	-0.468	S
G3	Ca ²⁺	0.193	0.204	0.2	0.028	-0.26	S
G4	Ca ²⁺	0.187	0.192	0.189	0.032	-0.047	S
G1	K ⁺	0.144	0.136	0.125	0.031	0.606	S
G2	K ⁺	0.2	0.204	0.194	0.022	0.271	S
G3	K ⁺	0.168	0.17	0.163	0.03	0.176	S
G4	K ⁺	0.237	0.238	0.23	0.027	0.266	S
G1	pH	4.76	4.4	4.46	0.104	2.889	U
G2	pH	4.74	4.27	4.329	0.077	5.338	U
G3	pH	4.78	4.7	4.755	0.083	0.305	S
G4	pH	4.79	4.57	4.631	0.077	2.072	U
G1	Cond	32.8	22	21.535	1.76	6.399	U
G2	Cond	20.3	29	27.802	2.442	-3.071	U
G3	Cond	26.8	16	16.357	1.308	7.984	U
G4	Cond	32.3	22	21.283	1.453	7.582	U

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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

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

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th intercomparison of analytical methods

Laboratory 107, The Finnish Forest Institute (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⁻	0.846	0.859	0.859	0.043	-0.3	S
G2	SO ₄ ²⁻	1.102	1.09	1.096	0.064	0.087	S
G3	SO ₄ ²⁻	0.607	0.634	0.642	0.035	-0.985	S
G4	SO ₄ ²⁻	0.761	0.771	0.78	0.033	-0.569	S
G1	NH ₄ ⁺	0.13	0.134	0.138	0.019	-0.415	S
G2	NH ₄ ⁺	0.21	0.214	0.213	0.022	-0.154	S
G3	NH ₄ ⁺	0.261	0.267	0.27	0.023	-0.404	S
G4	NH ₄ ⁺	0.353	0.348	0.352	0.027	0.035	S
G1	NO ₃ ⁻	0.266	0.27	0.269	0.016	-0.171	S
G2	NO ₃ ⁻	0.351	0.352	0.352	0.02	-0.044	S
G3	NO ₃ ⁻	0.399	0.415	0.415	0.023	-0.697	S
G4	NO ₃ ⁻	0.598	0.607	0.609	0.043	-0.257	S
G1	Na ⁺	-999	0.268	0.261	0.022		B
G2	Na ⁺	-999	0.208	0.2	0.018		B
G3	Na ⁺	-999	0.318	0.311	0.023		B
G4	Na ⁺	-999	0.512	0.499	0.043		B
G1	Mg ²⁺	-999	0.103	0.103	0.01		B
G2	Mg ²⁺	-999	0.093	0.093	0.008		B
G3	Mg ²⁺	-999	0.114	0.112	0.011		B
G4	Mg ²⁺	-999	0.145	0.145	0.012		B
G1	Cl ⁻	0.178	0.193	0.196	0.037	-0.496	S
G2	Cl ⁻	0.177	0.154	0.165	0.039	0.306	S
G3	Cl ⁻	0.245	0.27	0.275	0.061	-0.497	S
G4	Cl ⁻	0.327	0.347	0.348	0.069	-0.306	S
G1	Ca ²⁺	-999	0.102	0.106	0.034		B
G2	Ca ²⁺	-999	0.14	0.142	0.025		B
G3	Ca ²⁺	-999	0.204	0.2	0.028		B
G4	Ca ²⁺	-999	0.192	0.189	0.032		B
G1	K ⁺	-999	0.136	0.125	0.031		B
G2	K ⁺	-999	0.204	0.194	0.022		B
G3	K ⁺	-999	0.17	0.163	0.03		B
G4	K ⁺	-999	0.238	0.23	0.027		B
G1	pH	4.45	4.4	4.46	0.104	-0.094	S
G2	pH	4.31	4.27	4.329	0.077	-0.25	S
G3	pH	4.73	4.7	4.755	0.083	-0.296	S
G4	pH	4.6	4.57	4.631	0.077	-0.397	S
G1	Cond	21.6	22	21.535	1.76	0.037	S
G2	Cond	28.5	29	27.802	2.442	0.286	S
G3	Cond	16.4	16	16.357	1.308	0.033	S
G4	Cond	21.6	22	21.283	1.453	0.218	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 Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.86	0.859	0.859	0.043	0.021	S
G2	SO ₄ ²⁻	1.03	1.09	1.096	0.064	-1.038	S
G3	SO ₄ ²⁻	0.63	0.634	0.642	0.035	-0.33	S
G4	SO ₄ ²⁻	0.74	0.771	0.78	0.033	-1.212	S
G1	NH ₄ ⁺	0.23	0.134	0.138	0.019	4.875	U
G2	NH ₄ ⁺	0.29	0.214	0.213	0.022	3.405	U
G3	NH ₄ ⁺	0.27	0.267	0.27	0.023	-0.009	S
G4	NH ₄ ⁺	0.35	0.348	0.352	0.027	-0.077	S
G1	NO ₃ ⁻	0.3	0.27	0.269	0.016	1.951	Q
G2	NO ₃ ⁻	0.35	0.352	0.352	0.02	-0.094	S
G3	NO ₃ ⁻	0.44	0.415	0.415	0.023	1.089	S
G4	NO ₃ ⁻	0.62	0.607	0.609	0.043	0.259	S
G1	Na ⁺	0.26	0.268	0.261	0.022	-0.048	S
G2	Na ⁺	0.2	0.208	0.2	0.018	-0.004	S
G3	Na ⁺	0.32	0.318	0.311	0.023	0.41	S
G4	Na ⁺	0.52	0.512	0.499	0.043	0.488	S
G1	Mg ²⁺	0.1	0.103	0.103	0.01	-0.364	S
G2	Mg ²⁺	0.09	0.093	0.093	0.008	-0.379	S
G3	Mg ²⁺	0.11	0.114	0.112	0.011	-0.172	S
G4	Mg ²⁺	0.15	0.145	0.145	0.012	0.443	S
G1	Cl ⁻	< 0.200	0.193	0.196	0.037		B
G2	Cl ⁻	< 0.200	0.154	0.165	0.039		B
G3	Cl ⁻	0.26	0.27	0.275	0.061	-0.252	S
G4	Cl ⁻	0.35	0.347	0.348	0.069	0.03	S
G1	Ca ²⁺	0.1	0.102	0.106	0.034	-0.173	S
G2	Ca ²⁺	0.13	0.14	0.142	0.025	-0.468	S
G3	Ca ²⁺	0.2	0.204	0.2	0.028	-0.009	S
G4	Ca ²⁺	0.18	0.192	0.189	0.032	-0.264	S
G1	K ⁺	0.14	0.136	0.125	0.031	0.476	S
G2	K ⁺	0.22	0.204	0.194	0.022	1.181	S
G3	K ⁺	0.18	0.17	0.163	0.03	0.578	S
G4	K ⁺	0.24	0.238	0.23	0.027	0.378	S
G1	pH	4.42	4.4	4.46	0.104	-0.383	S
G2	pH	4.32	4.27	4.329	0.077	-0.12	S
G3	pH	4.72	4.7	4.755	0.083	-0.417	S
G4	pH	4.59	4.57	4.631	0.077	-0.527	S
G1	Cond	17.7	22	21.535	1.76	-2.179	Q
G2	Cond	25	29	27.802	2.442	-1.147	S
G3	Cond	14.8	16	16.357	1.308	-1.191	S
G4	Cond	20.1	22	21.283	1.453	-0.814	S

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Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.85	0.859	0.859	0.043	-0.208	S
G2	SO ₄ ²⁻	1.09	1.09	1.096	0.064	-0.101	S
G3	SO ₄ ²⁻	0.64	0.634	0.642	0.035	-0.045	S
G4	SO ₄ ²⁻	0.77	0.771	0.78	0.033	-0.293	S
G1	NH ₄ ⁺	0.12	0.134	0.138	0.019	-0.945	S
G2	NH ₄ ⁺	0.2	0.214	0.213	0.022	-0.599	S
G3	NH ₄ ⁺	0.26	0.267	0.27	0.023	-0.448	S
G4	NH ₄ ⁺	0.34	0.348	0.352	0.027	-0.45	S
G1	NO ₃ ⁻	0.26	0.27	0.269	0.016	-0.546	S
G2	NO ₃ ⁻	0.34	0.352	0.352	0.02	-0.595	S
G3	NO ₃ ⁻	0.4	0.415	0.415	0.023	-0.653	S
G4	NO ₃ ⁻	0.58	0.607	0.609	0.043	-0.679	S
G1	Na ⁺	0.28	0.268	0.261	0.022	0.847	S
G2	Na ⁺	0.21	0.208	0.2	0.018	0.565	S
G3	Na ⁺	0.33	0.318	0.311	0.023	0.845	S
G4	Na ⁺	0.53	0.512	0.499	0.043	0.72	S
G1	Mg ²⁺	0.09	0.103	0.103	0.01	-1.407	S
G2	Mg ²⁺	0.08	0.093	0.093	0.008	-1.642	S
G3	Mg ²⁺	0.1	0.114	0.112	0.011	-1.096	S
G4	Mg ²⁺	0.14	0.145	0.145	0.012	-0.394	S
G1	Cl ⁻	0.2	0.193	0.196	0.037	0.101	S
G2	Cl ⁻	0.16	0.154	0.165	0.039	-0.125	S
G3	Cl ⁻	0.28	0.27	0.275	0.061	0.074	S
G4	Cl ⁻	0.35	0.347	0.348	0.069	0.03	S
G1	Ca ²⁺	0.1	0.102	0.106	0.034	-0.173	S
G2	Ca ²⁺	0.14	0.14	0.142	0.025	-0.062	S
G3	Ca ²⁺	0.2	0.204	0.2	0.028	-0.009	S
G4	Ca ²⁺	0.19	0.192	0.189	0.032	0.046	S
G1	K ⁺	0.14	0.136	0.125	0.031	0.476	S
G2	K ⁺	0.21	0.204	0.194	0.022	0.726	S
G3	K ⁺	0.17	0.17	0.163	0.03	0.243	S
G4	K ⁺	0.24	0.238	0.23	0.027	0.378	S
G1	pH	4.57	4.4	4.46	0.104	1.061	Q
G2	pH	4.43	4.27	4.329	0.077	1.309	Q
G3	pH	4.92	4.7	4.755	0.083	1.988	U
G4	pH	4.73	4.57	4.631	0.077	1.292	Q
G1	Cond	20.9	22	21.535	1.76	-0.361	S
G2	Cond	27.4	29	27.802	2.442	-0.165	S
G3	Cond	15.5	16	16.357	1.308	-0.656	S
G4	Cond	20.9	22	21.283	1.453	-0.263	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 Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	-999	0.859	0.859	0.043		B
G2	SO ₄ ²⁻	-999	1.09	1.096	0.064		B
G3	SO ₄ ²⁻	-999	0.634	0.642	0.035		B
G4	SO ₄ ²⁻	-999	0.771	0.78	0.033		B
G1	NH ₄ ⁺	-999	0.134	0.138	0.019		B
G2	NH ₄ ⁺	-999	0.214	0.213	0.022		B
G3	NH ₄ ⁺	-999	0.267	0.27	0.023		B
G4	NH ₄ ⁺	-999	0.348	0.352	0.027		B
G1	NO ₃ ⁻	-999	0.27	0.269	0.016		B
G2	NO ₃ ⁻	-999	0.352	0.352	0.02		B
G3	NO ₃ ⁻	-999	0.415	0.415	0.023		B
G4	NO ₃ ⁻	-999	0.607	0.609	0.043		B
G1	Na ⁺	0.24	0.268	0.261	0.022	-0.944	S
G2	Na ⁺	0.202	0.208	0.2	0.018	0.11	S
G3	Na ⁺	0.282	0.318	0.311	0.023	-1.244	S
G4	Na ⁺	0.46	0.512	0.499	0.043	-0.902	S
G1	Mg ²⁺	0.109	0.103	0.103	0.01	0.574	S
G2	Mg ²⁺	0.094	0.093	0.093	0.008	0.126	S
G3	Mg ²⁺	0.12	0.114	0.112	0.011	0.752	S
G4	Mg ²⁺	0.143	0.145	0.145	0.012	-0.143	S
G1	Cl ⁻	-999	0.193	0.196	0.037		B
G2	Cl ⁻	-999	0.154	0.165	0.039		B
G3	Cl ⁻	-999	0.27	0.275	0.061		B
G4	Cl ⁻	-999	0.347	0.348	0.069		B
G1	Ca ²⁺	0.369	0.102	0.106	0.034	7.756	U
G2	Ca ²⁺	0.252	0.14	0.142	0.025	4.491	U
G3	Ca ²⁺	0.268	0.204	0.2	0.028	2.433	U
G4	Ca ²⁺	0.191	0.192	0.189	0.032	0.077	S
G1	K ⁺	0.183	0.136	0.125	0.031	1.875	U
G2	K ⁺	0.24	0.204	0.194	0.022	2.092	Q
G3	K ⁺	0.224	0.17	0.163	0.03	2.052	U
G4	K ⁺	0.279	0.238	0.23	0.027	1.835	Q
G1	pH	4.33	4.4	4.46	0.104	-1.249	S
G2	pH	4.46	4.27	4.329	0.077	1.699	Q
G3	pH	4.79	4.7	4.755	0.083	0.425	S
G4	pH	4.86	4.57	4.631	0.077	2.982	U
G1	Cond	18.3	22	21.535	1.76	-1.838	Q
G2	Cond	21	29	27.802	2.442	-2.785	U
G3	Cond	14.1	16	16.357	1.308	-1.726	S
G4	Cond	16.5	22	21.283	1.453	-3.291	Q

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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 Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.82	0.859	0.859	0.043	-0.898	S
G2	SO ₄ ²⁻	1.04	1.09	1.096	0.064	-0.882	S
G3	SO ₄ ²⁻	0.61	0.634	0.642	0.035	-0.9	S
G4	SO ₄ ²⁻	0.75	0.771	0.78	0.033	-0.906	S
G1	NH ₄ ⁺	0.16	0.134	0.138	0.019	1.172	Q
G2	NH ₄ ⁺	0.22	0.214	0.213	0.022	0.291	S
G3	NH ₄ ⁺	0.27	0.267	0.27	0.023	-0.009	S
G4	NH ₄ ⁺	0.34	0.348	0.352	0.027	-0.45	S
G1	NO ₃ ⁻	0.26	0.27	0.269	0.016	-0.546	S
G2	NO ₃ ⁻	0.34	0.352	0.352	0.02	-0.595	S
G3	NO ₃ ⁻	0.4	0.415	0.415	0.023	-0.653	S
G4	NO ₃ ⁻	0.58	0.607	0.609	0.043	-0.679	S
G1	Na ⁺	0.26	0.268	0.261	0.022	-0.048	S
G2	Na ⁺	0.19	0.208	0.2	0.018	-0.573	S
G3	Na ⁺	0.31	0.318	0.311	0.023	-0.026	S
G4	Na ⁺	0.51	0.512	0.499	0.043	0.257	S
G1	Mg ²⁺	0.13	0.103	0.103	0.01	2.764	U
G2	Mg ²⁺	0.11	0.093	0.093	0.008	2.146	Q
G3	Mg ²⁺	0.13	0.114	0.112	0.011	1.675	S
G4	Mg ²⁺	0.16	0.145	0.145	0.012	1.28	S
G1	Cl ⁻	0.18	0.193	0.196	0.037	-0.441	S
G2	Cl ⁻	0.14	0.154	0.165	0.039	-0.633	S
G3	Cl ⁻	0.25	0.27	0.275	0.061	-0.415	S
G4	Cl ⁻	0.32	0.347	0.348	0.069	-0.408	S
G1	Ca ²⁺	0.12	0.102	0.106	0.034	0.417	Q
G2	Ca ²⁺	0.15	0.14	0.142	0.025	0.345	S
G3	Ca ²⁺	0.2	0.204	0.2	0.028	-0.009	S
G4	Ca ²⁺	0.18	0.192	0.189	0.032	-0.264	S
G1	K ⁺	0.12	0.136	0.125	0.031	-0.174	S
G2	K ⁺	0.18	0.204	0.194	0.022	-0.639	S
G3	K ⁺	0.15	0.17	0.163	0.03	-0.427	S
G4	K ⁺	0.22	0.238	0.23	0.027	-0.369	S
G1	pH	4.53	4.4	4.46	0.104	0.676	Q
G2	pH	4.36	4.27	4.329	0.077	0.399	S
G3	pH	4.77	4.7	4.755	0.083	0.184	S
G4	pH	4.69	4.57	4.631	0.077	0.772	Q
G1	Cond	22.2	22	21.535	1.76	0.378	S
G2	Cond	28.7	29	27.802	2.442	0.368	S
G3	Cond	16.7	16	16.357	1.308	0.262	S
G4	Cond	21.7	22	21.283	1.453	0.287	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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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.871	0.859	0.859	0.043	0.274	S
G2	SO ₄ ²⁻	1.11	1.09	1.096	0.064	0.212	S
G3	SO ₄ ²⁻	0.667	0.634	0.642	0.035	0.724	S
G4	SO ₄ ²⁻	0.806	0.771	0.78	0.033	0.811	S
G1	NH ₄ ⁺	0.127	0.134	0.138	0.019	-0.574	S
G2	NH ₄ ⁺	0.205	0.214	0.213	0.022	-0.376	S
G3	NH ₄ ⁺	0.266	0.267	0.27	0.023	-0.185	S
G4	NH ₄ ⁺	0.343	0.348	0.352	0.027	-0.338	S
G1	NO ₃ ⁻	0.289	0.27	0.269	0.016	1.264	S
G2	NO ₃ ⁻	0.381	0.352	0.352	0.02	1.458	S
G3	NO ₃ ⁻	0.417	0.415	0.415	0.023	0.087	S
G4	NO ₃ ⁻	0.615	0.607	0.609	0.043	0.142	S
G1	Na ⁺	0.298	0.268	0.261	0.022	1.654	S
G2	Na ⁺	0.223	0.208	0.2	0.018	1.305	S
G3	Na ⁺	0.342	0.318	0.311	0.023	1.367	S
G4	Na ⁺	0.536	0.512	0.499	0.043	0.859	S
G1	Mg ²⁺	0.091	0.103	0.103	0.01	-1.302	S
G2	Mg ²⁺	0.083	0.093	0.093	0.008	-1.263	S
G3	Mg ²⁺	0.1	0.114	0.112	0.011	-1.096	S
G4	Mg ²⁺	0.128	0.145	0.145	0.012	-1.399	S
G1	Cl ⁻	0.295	0.193	0.196	0.037	2.676	U
G2	Cl ⁻	0.26	0.154	0.165	0.039	2.41	U
G3	Cl ⁻	0.382	0.27	0.275	0.061	1.739	U
G4	Cl ⁻	0.44	0.347	0.348	0.069	1.343	U
G1	Ca ²⁺	0.101	0.102	0.106	0.034	-0.144	S
G2	Ca ²⁺	0.133	0.14	0.142	0.025	-0.346	S
G3	Ca ²⁺	0.195	0.204	0.2	0.028	-0.188	S
G4	Ca ²⁺	0.181	0.192	0.189	0.032	-0.233	S
G1	K ⁺	0.188	0.136	0.125	0.031	2.038	U
G2	K ⁺	0.215	0.204	0.194	0.022	0.954	S
G3	K ⁺	0.208	0.17	0.163	0.03	1.516	Q
G4	K ⁺	0.262	0.238	0.23	0.027	1.2	S
G1	pH	4.74	4.4	4.46	0.104	2.697	U
G2	pH	4.42	4.27	4.329	0.077	1.179	Q
G3	pH	4.91	4.7	4.755	0.083	1.867	U
G4	pH	4.72	4.57	4.631	0.077	1.162	Q
G1	Cond	17	22	21.535	1.76	-2.576	Q
G2	Cond	24.2	29	27.802	2.442	-1.475	Q
G3	Cond	14	16	16.357	1.308	-1.802	S
G4	Cond	18.3	22	21.283	1.453	-2.053	Q

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

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.72	0.859	0.859	0.043	-3.198	Q
G2	SO ₄ ²⁻	0.9	1.09	1.096	0.064	-3.069	Q
G3	SO ₄ ²⁻	0.52	0.634	0.642	0.035	-3.464	Q
G4	SO ₄ ²⁻	0.62	0.771	0.78	0.033	-4.891	Q
G1	NH ₄ ⁺	0.13	0.134	0.138	0.019	-0.415	S
G2	NH ₄ ⁺	0.21	0.214	0.213	0.022	-0.154	S
G3	NH ₄ ⁺	0.27	0.267	0.27	0.023	-0.009	S
G4	NH ₄ ⁺	0.35	0.348	0.352	0.027	-0.077	S
G1	NO ₃ ⁻	0.32	0.27	0.269	0.016	3.199	Q
G2	NO ₃ ⁻	0.44	0.352	0.352	0.02	4.412	U
G3	NO ₃ ⁻	0.51	0.415	0.415	0.023	4.137	U
G4	NO ₃ ⁻	0.74	0.607	0.609	0.043	3.072	U
G1	Na ⁺	0.25	0.268	0.261	0.022	-0.496	S
G2	Na ⁺	0.2	0.208	0.2	0.018	-0.004	S
G3	Na ⁺	0.3	0.318	0.311	0.023	-0.461	S
G4	Na ⁺	0.49	0.512	0.499	0.043	-0.207	S
G1	Mg ²⁺	0.11	0.103	0.103	0.01	0.679	S
G2	Mg ²⁺	0.1	0.093	0.093	0.008	0.883	S
G3	Mg ²⁺	0.11	0.114	0.112	0.011	-0.172	S
G4	Mg ²⁺	0.15	0.145	0.145	0.012	0.443	S
G1	Cl ⁻	0.29	0.193	0.196	0.037	2.54	U
G2	Cl ⁻	< 0.250	0.154	0.165	0.039		B
G3	Cl ⁻	0.3	0.27	0.275	0.061	0.401	S
G4	Cl ⁻	0.38	0.347	0.348	0.069	0.467	S
G1	Ca ²⁺	0.1	0.102	0.106	0.034	-0.173	S
G2	Ca ²⁺	0.14	0.14	0.142	0.025	-0.062	S
G3	Ca ²⁺	0.21	0.204	0.2	0.028	0.35	S
G4	Ca ²⁺	0.19	0.192	0.189	0.032	0.046	S
G1	K ⁺	0.13	0.136	0.125	0.031	0.151	S
G2	K ⁺	0.2	0.204	0.194	0.022	0.271	S
G3	K ⁺	0.17	0.17	0.163	0.03	0.243	S
G4	K ⁺	0.23	0.238	0.23	0.027	0.005	S
G1	pH	4.48	4.4	4.46	0.104	0.194	S
G2	pH	4.36	4.27	4.329	0.077	0.399	S
G3	pH	4.77	4.7	4.755	0.083	0.184	S
G4	pH	4.65	4.57	4.631	0.077	0.252	S
G1	Cond	23	22	21.535	1.76	0.832	S
G2	Cond	29	29	27.802	2.442	0.491	S
G3	Cond	17	16	16.357	1.308	0.491	S
G4	Cond	22	22	21.283	1.453	0.494	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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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.86	0.859	0.859	0.043	0.021	S
G2	SO ₄ ²⁻	1.13	1.09	1.096	0.064	0.524	S
G3	SO ₄ ²⁻	0.66	0.634	0.642	0.035	0.525	S
G4	SO ₄ ²⁻	0.8	0.771	0.78	0.033	0.627	S
G1	NH ₄ ⁺	0.149	0.134	0.138	0.019	0.59	S
G2	NH ₄ ⁺	0.211	0.214	0.213	0.022	-0.109	S
G3	NH ₄ ⁺	0.27	0.267	0.27	0.023	-0.009	S
G4	NH ₄ ⁺	0.366	0.348	0.352	0.027	0.521	S
G1	NO ₃ ⁻	0.28	0.27	0.269	0.016	0.703	S
G2	NO ₃ ⁻	0.35	0.352	0.352	0.02	-0.094	S
G3	NO ₃ ⁻	0.41	0.415	0.415	0.023	-0.218	S
G4	NO ₃ ⁻	0.6	0.607	0.609	0.043	-0.21	S
G1	Na ⁺	0.22	0.268	0.261	0.022	-1.84	Q
G2	Na ⁺	0.17	0.208	0.2	0.018	-1.711	Q
G3	Na ⁺	0.26	0.318	0.311	0.023	-2.201	Q
G4	Na ⁺	0.43	0.512	0.499	0.043	-1.597	Q
G1	Mg ²⁺	0.093	0.103	0.103	0.01	-1.094	S
G2	Mg ²⁺	0.087	0.093	0.093	0.008	-0.758	S
G3	Mg ²⁺	0.103	0.114	0.112	0.011	-0.819	S
G4	Mg ²⁺	0.134	0.145	0.145	0.012	-0.897	S
G1	Cl ⁻	0.14	0.193	0.196	0.037	-1.526	U
G2	Cl ⁻	0.1	0.154	0.165	0.039	-1.647	U
G3	Cl ⁻	0.21	0.27	0.275	0.061	-1.068	Q
G4	Cl ⁻	0.3	0.347	0.348	0.069	-0.7	S
G1	Ca ²⁺	0.08	0.102	0.106	0.034	-0.763	Q
G2	Ca ²⁺	0.11	0.14	0.142	0.025	-1.281	Q
G3	Ca ²⁺	0.17	0.204	0.2	0.028	-1.086	Q
G4	Ca ²⁺	0.16	0.192	0.189	0.032	-0.883	Q
G1	K ⁺	0.11	0.136	0.125	0.031	-0.5	Q
G2	K ⁺	0.17	0.204	0.194	0.022	-1.095	Q
G3	K ⁺	0.15	0.17	0.163	0.03	-0.427	S
G4	K ⁺	0.21	0.238	0.23	0.027	-0.742	S
G1	pH	4.45	4.4	4.46	0.104	-0.094	S
G2	pH	4.32	4.27	4.329	0.077	-0.12	S
G3	pH	4.73	4.7	4.755	0.083	-0.296	S
G4	pH	4.61	4.57	4.631	0.077	-0.267	S
G1	Cond	21.5	22	21.535	1.76	-0.02	S
G2	Cond	27.1	29	27.802	2.442	-0.287	S
G3	Cond	15.6	16	16.357	1.308	-0.579	S
G4	Cond	20.5	22	21.283	1.453	-0.539	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 Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.789	0.859	0.859	0.043	-1.611	S
G2	SO ₄ ²⁻	0.986	1.09	1.096	0.064	-1.726	S
G3	SO ₄ ²⁻	0.581	0.634	0.642	0.035	-1.726	S
G4	SO ₄ ²⁻	0.726	0.771	0.78	0.033	-1.641	S
G1	NH ₄ ⁺	0.112	0.134	0.138	0.019	-1.368	Q
G2	NH ₄ ⁺	0.209	0.214	0.213	0.022	-0.198	S
G3	NH ₄ ⁺	0.282	0.267	0.27	0.023	0.516	S
G4	NH ₄ ⁺	0.363	0.348	0.352	0.027	0.409	S
G1	NO ₃ ⁻	0.266	0.27	0.269	0.016	-0.171	S
G2	NO ₃ ⁻	0.352	0.352	0.352	0.02	0.006	S
G3	NO ₃ ⁻	0.413	0.415	0.415	0.023	-0.087	S
G4	NO ₃ ⁻	0.606	0.607	0.609	0.043	-0.069	S
G1	Na ⁺	0.255	0.268	0.261	0.022	-0.272	S
G2	Na ⁺	0.207	0.208	0.2	0.018	0.394	S
G3	Na ⁺	0.303	0.318	0.311	0.023	-0.33	S
G4	Na ⁺	0.493	0.512	0.499	0.043	-0.137	S
G1	Mg ²⁺	0.085	0.103	0.103	0.01	-1.928	Q
G2	Mg ²⁺	0.081	0.093	0.093	0.008	-1.515	S
G3	Mg ²⁺	0.095	0.114	0.112	0.011	-1.558	Q
G4	Mg ²⁺	0.129	0.145	0.145	0.012	-1.315	S
G1	Cl ⁻	0.186	0.193	0.196	0.037	-0.279	S
G2	Cl ⁻	0.186	0.154	0.165	0.039	0.534	Q
G3	Cl ⁻	0.279	0.27	0.275	0.061	0.058	S
G4	Cl ⁻	0.371	0.347	0.348	0.069	0.336	S
G1	Ca ²⁺	0.081	0.102	0.106	0.034	-0.733	Q
G2	Ca ²⁺	0.118	0.14	0.142	0.025	-0.956	Q
G3	Ca ²⁺	0.166	0.204	0.2	0.028	-1.229	Q
G4	Ca ²⁺	0.166	0.192	0.189	0.032	-0.698	S
G1	K ⁺	0.088	0.136	0.125	0.031	-1.215	U
G2	K ⁺	0.148	0.204	0.194	0.022	-2.096	U
G3	K ⁺	0.109	0.17	0.163	0.03	-1.8	U
G4	K ⁺	0.191	0.238	0.23	0.027	-1.452	Q
G1	pH	4.46	4.4	4.46	0.104	0.002	S
G2	pH	4.33	4.27	4.329	0.077	0.009	S
G3	pH	4.72	4.7	4.755	0.083	-0.417	S
G4	pH	4.61	4.57	4.631	0.077	-0.267	S
G1	Cond	23	22	21.535	1.76	0.832	S
G2	Cond	29	29	27.802	2.442	0.491	S
G3	Cond	17	16	16.357	1.308	0.491	S
G4	Cond	22	22	21.283	1.453	0.494	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 Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.77	0.859	0.859	0.043	-2.048	Q
G2	SO ₄ ²⁻	0.94	1.09	1.096	0.064	-2.444	Q
G3	SO ₄ ²⁻	0.63	0.634	0.642	0.035	-0.33	S
G4	SO ₄ ²⁻	0.72	0.771	0.78	0.033	-1.825	S
G1	NH ₄ ⁺	0.137	0.134	0.138	0.019	-0.045	S
G2	NH ₄ ⁺	0.184	0.214	0.213	0.022	-1.311	S
G3	NH ₄ ⁺	0.233	0.267	0.27	0.023	-1.63	S
G4	NH ₄ ⁺	0.311	0.348	0.352	0.027	-1.533	S
G1	NO ₃ ⁻	0.278	0.27	0.269	0.016	0.578	S
G2	NO ₃ ⁻	0.367	0.352	0.352	0.02	0.757	S
G3	NO ₃ ⁻	0.431	0.415	0.415	0.023	0.697	S
G4	NO ₃ ⁻	0.613	0.607	0.609	0.043	0.095	S
G1	Na ⁺	0.238	0.268	0.261	0.022	-1.034	S
G2	Na ⁺	0.178	0.208	0.2	0.018	-1.256	S
G3	Na ⁺	0.287	0.318	0.311	0.023	-1.027	S
G4	Na ⁺	0.471	0.512	0.499	0.043	-0.647	S
G1	Mg ²⁺	0.096	0.103	0.103	0.01	-0.781	S
G2	Mg ²⁺	0.087	0.093	0.093	0.008	-0.758	S
G3	Mg ²⁺	0.107	0.114	0.112	0.011	-0.45	S
G4	Mg ²⁺	0.136	0.145	0.145	0.012	-0.729	S
G1	Cl ⁻	0.19	0.193	0.196	0.037	-0.17	S
G2	Cl ⁻	0.151	0.154	0.165	0.039	-0.354	S
G3	Cl ⁻	0.258	0.27	0.275	0.061	-0.285	S
G4	Cl ⁻	0.324	0.347	0.348	0.069	-0.35	S
G1	Ca ²⁺	0.077	0.102	0.106	0.034	-0.851	Q
G2	Ca ²⁺	0.115	0.14	0.142	0.025	-1.078	Q
G3	Ca ²⁺	0.177	0.204	0.2	0.028	-0.834	S
G4	Ca ²⁺	0.16	0.192	0.189	0.032	-0.883	Q
G1	K ⁺	< 0.150	0.136	0.125	0.031		B
G2	K ⁺	0.181	0.204	0.194	0.022	-0.594	S
G3	K ⁺	0.154	0.17	0.163	0.03	-0.293	S
G4	K ⁺	0.218	0.238	0.23	0.027	-0.444	S
G1	pH	4.55	4.4	4.46	0.104	0.868	Q
G2	pH	4.33	4.27	4.329	0.077	0.009	S
G3	pH	4.75	4.7	4.755	0.083	-0.056	S
G4	pH	4.61	4.57	4.631	0.077	-0.267	S
G1	Cond	22.9	22	21.535	1.76	0.775	S
G2	Cond	29.4	29	27.802	2.442	0.654	S
G3	Cond	18.4	16	16.357	1.308	1.562	S
G4	Cond	23	22	21.283	1.453	1.182	S

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Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.864	0.859	0.859	0.043	0.113	S
G2	SO ₄ ²⁻	1.104	1.09	1.096	0.064	0.118	S
G3	SO ₄ ²⁻	0.636	0.634	0.642	0.035	-0.159	S
G4	SO ₄ ²⁻	0.772	0.771	0.78	0.033	-0.232	S
G1	NH ₄ ⁺	0.121	0.134	0.138	0.019	-0.892	S
G2	NH ₄ ⁺	0.207	0.214	0.213	0.022	-0.287	S
G3	NH ₄ ⁺	0.286	0.267	0.27	0.023	0.692	S
G4	NH ₄ ⁺	0.385	0.348	0.352	0.027	1.23	S
G1	NO ₃ ⁻	0.275	0.27	0.269	0.016	0.39	S
G2	NO ₃ ⁻	0.358	0.352	0.352	0.02	0.307	S
G3	NO ₃ ⁻	0.411	0.415	0.415	0.023	-0.174	S
G4	NO ₃ ⁻	0.595	0.607	0.609	0.043	-0.327	S
G1	Na ⁺	0.255	0.268	0.261	0.022	-0.272	S
G2	Na ⁺	0.199	0.208	0.2	0.018	-0.061	S
G3	Na ⁺	0.303	0.318	0.311	0.023	-0.33	S
G4	Na ⁺	0.511	0.512	0.499	0.043	0.28	S
G1	Mg ²⁺	0.102	0.103	0.103	0.01	-0.155	S
G2	Mg ²⁺	0.093	0.093	0.093	0.008	0	S
G3	Mg ²⁺	0.113	0.114	0.112	0.011	0.105	S
G4	Mg ²⁺	0.144	0.145	0.145	0.012	-0.06	S
G1	Cl ⁻	0.199	0.193	0.196	0.037	0.074	S
G2	Cl ⁻	0.18	0.154	0.165	0.039	0.382	Q
G3	Cl ⁻	0.244	0.27	0.275	0.061	-0.513	S
G4	Cl ⁻	0.289	0.347	0.348	0.069	-0.861	Q
G1	Ca ²⁺	0.099	0.102	0.106	0.034	-0.202	S
G2	Ca ²⁺	0.138	0.14	0.142	0.025	-0.143	S
G3	Ca ²⁺	0.199	0.204	0.2	0.028	-0.045	S
G4	Ca ²⁺	0.189	0.192	0.189	0.032	0.015	S
G1	K ⁺	0.134	0.136	0.125	0.031	0.281	S
G2	K ⁺	0.2	0.204	0.194	0.022	0.271	S
G3	K ⁺	0.168	0.17	0.163	0.03	0.176	S
G4	K ⁺	0.24	0.238	0.23	0.027	0.378	S
G1	pH	4.45	4.4	4.46	0.104	-0.094	S
G2	pH	4.29	4.27	4.329	0.077	-0.51	S
G3	pH	4.72	4.7	4.755	0.083	-0.417	S
G4	pH	4.59	4.57	4.631	0.077	-0.527	S
G1	Cond	23	22	21.535	1.76	0.832	S
G2	Cond	30	29	27.802	2.442	0.9	S
G3	Cond	17	16	16.357	1.308	0.491	S
G4	Cond	22	22	21.283	1.453	0.494	S

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

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.884	0.859	0.859	0.043	0.573	S
G2	SO ₄ ²⁻	1.12	1.09	1.096	0.064	0.368	S
G3	SO ₄ ²⁻	0.659	0.634	0.642	0.035	0.496	S
G4	SO ₄ ²⁻	0.798	0.771	0.78	0.033	0.565	S
G1	NH ₄ ⁺	0.16	0.134	0.138	0.019	1.172	Q
G2	NH ₄ ⁺	0.239	0.214	0.213	0.022	1.136	S
G3	NH ₄ ⁺	0.298	0.267	0.27	0.023	1.217	S
G4	NH ₄ ⁺	0.387	0.348	0.352	0.027	1.305	S
G1	NO ₃ ⁻	0.271	0.27	0.269	0.016	0.141	S
G2	NO ₃ ⁻	0.342	0.352	0.352	0.02	-0.494	S
G3	NO ₃ ⁻	0.409	0.415	0.415	0.023	-0.261	S
G4	NO ₃ ⁻	0.603	0.607	0.609	0.043	-0.14	S
G1	Na ⁺	0.248	0.268	0.261	0.022	-0.586	S
G2	Na ⁺	0.185	0.208	0.2	0.018	-0.858	S
G3	Na ⁺	0.268	0.318	0.311	0.023	-1.853	Q
G4	Na ⁺	0.438	0.512	0.499	0.043	-1.412	S
G1	Mg ²⁺	0.098	0.103	0.103	0.01	-0.572	S
G2	Mg ²⁺	0.086	0.093	0.093	0.008	-0.884	S
G3	Mg ²⁺	0.097	0.114	0.112	0.011	-1.373	S
G4	Mg ²⁺	0.127	0.145	0.145	0.012	-1.483	S
G1	Cl ⁻	0.301	0.193	0.196	0.037	2.839	U
G2	Cl ⁻	0.247	0.154	0.165	0.039	2.081	U
G3	Cl ⁻	0.326	0.27	0.275	0.061	0.825	Q
G4	Cl ⁻	0.595	0.347	0.348	0.069	3.605	U
G1	Ca ²⁺	0.102	0.102	0.106	0.034	-0.114	S
G2	Ca ²⁺	0.139	0.14	0.142	0.025	-0.102	S
G3	Ca ²⁺	0.181	0.204	0.2	0.028	-0.691	S
G4	Ca ²⁺	0.175	0.192	0.189	0.032	-0.419	S
G1	K ⁺	0.129	0.136	0.125	0.031	0.118	S
G2	K ⁺	0.185	0.204	0.194	0.022	-0.412	S
G3	K ⁺	0.145	0.17	0.163	0.03	-0.594	S
G4	K ⁺	0.207	0.238	0.23	0.027	-0.854	S
G1	pH	4.25	4.4	4.46	0.104	-2.019	Q
G2	pH	4.12	4.27	4.329	0.077	-2.72	Q
G3	pH	4.38	4.7	4.755	0.083	-4.504	U
G4	pH	4.3	4.57	4.631	0.077	-4.297	U
G1	Cond	21.4	22	21.535	1.76	-0.077	S
G2	Cond	28.4	29	27.802	2.442	0.245	S
G3	Cond	16.4	16	16.357	1.308	0.033	S
G4	Cond	21.7	22	21.283	1.453	0.287	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 Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.83	0.859	0.859	0.043	-0.668	S
G2	SO ₄ ²⁻	1.06	1.09	1.096	0.064	-0.57	S
G3	SO ₄ ²⁻	0.64	0.634	0.642	0.035	-0.045	S
G4	SO ₄ ²⁻	0.76	0.771	0.78	0.033	-0.599	S
G1	NH ₄ ⁺	0.132	0.134	0.138	0.019	-0.31	S
G2	NH ₄ ⁺	0.207	0.214	0.213	0.022	-0.287	S
G3	NH ₄ ⁺	0.268	0.267	0.27	0.023	-0.097	S
G4	NH ₄ ⁺	0.336	0.348	0.352	0.027	-0.6	S
G1	NO ₃ ⁻	0.271	0.27	0.269	0.016	0.141	S
G2	NO ₃ ⁻	0.343	0.352	0.352	0.02	-0.444	S
G3	NO ₃ ⁻	0.407	0.415	0.415	0.023	-0.348	S
G4	NO ₃ ⁻	0.548	0.607	0.609	0.043	-1.429	S
G1	Na ⁺	0.26	0.268	0.261	0.022	-0.048	S
G2	Na ⁺	0.19	0.208	0.2	0.018	-0.573	S
G3	Na ⁺	0.3	0.318	0.311	0.023	-0.461	S
G4	Na ⁺	0.48	0.512	0.499	0.043	-0.438	S
G1	Mg ²⁺	0.13	0.103	0.103	0.01	2.764	U
G2	Mg ²⁺	0.12	0.093	0.093	0.008	3.408	U
G3	Mg ²⁺	0.14	0.114	0.112	0.011	2.599	Q
G4	Mg ²⁺	0.17	0.145	0.145	0.012	2.117	Q
G1	Cl ⁻	0.16	0.193	0.196	0.037	-0.984	Q
G2	Cl ⁻	0.15	0.154	0.165	0.039	-0.379	S
G3	Cl ⁻	0.22	0.27	0.275	0.061	-0.905	Q
G4	Cl ⁻	0.27	0.347	0.348	0.069	-1.138	Q
G1	Ca ²⁺	0.1	0.102	0.106	0.034	-0.173	S
G2	Ca ²⁺	0.14	0.14	0.142	0.025	-0.062	S
G3	Ca ²⁺	0.18	0.204	0.2	0.028	-0.727	S
G4	Ca ²⁺	0.18	0.192	0.189	0.032	-0.264	S
G1	K ⁺	0.14	0.136	0.125	0.031	0.476	S
G2	K ⁺	0.2	0.204	0.194	0.022	0.271	S
G3	K ⁺	0.17	0.17	0.163	0.03	0.243	S
G4	K ⁺	0.25	0.238	0.23	0.027	0.752	S
G1	pH	4.49	4.4	4.46	0.104	0.291	S
G2	pH	4.35	4.27	4.329	0.077	0.269	S
G3	pH	4.79	4.7	4.755	0.083	0.425	S
G4	pH	4.66	4.57	4.631	0.077	0.382	S
G1	Cond	20.88	22	21.535	1.76	-0.372	S
G2	Cond	27.62	29	27.802	2.442	-0.074	S
G3	Cond	16.42	16	16.357	1.308	0.048	S
G4	Cond	21.4	22	21.283	1.453	0.081	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 Youden plots, updated expected values ect:

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

EMEP – 29th intercomparison of analytical methods

Laboratory 146, Luxembourg Institute of Science and Technology (LIST) (Luxembourg)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.842	0.859	0.859	0.043	-0.392	S
G2	SO ₄ ²⁻	1.071	1.09	1.096	0.064	-0.398	S
G3	SO ₄ ²⁻	0.624	0.634	0.642	0.035	-0.501	S
G4	SO ₄ ²⁻	0.755	0.771	0.78	0.033	-0.753	S
G1	NH ₄ ⁺	0.136	0.134	0.138	0.019	-0.098	S
G2	NH ₄ ⁺	0.212	0.214	0.213	0.022	-0.065	S
G3	NH ₄ ⁺	0.265	0.267	0.27	0.023	-0.229	S
G4	NH ₄ ⁺	0.347	0.348	0.352	0.027	-0.189	S
G1	NO ₃ ⁻	0.252	0.27	0.269	0.016	-1.045	S
G2	NO ₃ ⁻	0.332	0.352	0.352	0.02	-0.995	S
G3	NO ₃ ⁻	0.397	0.415	0.415	0.023	-0.784	S
G4	NO ₃ ⁻	0.586	0.607	0.609	0.043	-0.538	S
G1	Na ⁺	0.265	0.268	0.261	0.022	0.176	S
G2	Na ⁺	0.212	0.208	0.2	0.018	0.679	S
G3	Na ⁺	0.316	0.318	0.311	0.023	0.235	S
G4	Na ⁺	0.515	0.512	0.499	0.043	0.372	S
G1	Mg ²⁺	0.118	0.103	0.103	0.01	1.513	S
G2	Mg ²⁺	0.106	0.093	0.093	0.008	1.641	S
G3	Mg ²⁺	0.109	0.114	0.112	0.011	-0.265	S
G4	Mg ²⁺	0.149	0.145	0.145	0.012	0.359	S
G1	Cl ⁻	0.186	0.193	0.196	0.037	-0.279	S
G2	Cl ⁻	0.158	0.154	0.165	0.039	-0.176	S
G3	Cl ⁻	0.26	0.27	0.275	0.061	-0.252	S
G4	Cl ⁻	0.335	0.347	0.348	0.069	-0.189	S
G1	Ca ²⁺	0.142	0.102	0.106	0.034	1.065	U
G2	Ca ²⁺	0.165	0.14	0.142	0.025	0.955	Q
G3	Ca ²⁺	0.183	0.204	0.2	0.028	-0.619	S
G4	Ca ²⁺	0.201	0.192	0.189	0.032	0.386	S
G1	K ⁺	0.136	0.136	0.125	0.031	0.346	S
G2	K ⁺	0.206	0.204	0.194	0.022	0.544	S
G3	K ⁺	0.171	0.17	0.163	0.03	0.277	S
G4	K ⁺	0.244	0.238	0.23	0.027	0.528	S
G1	pH	4.48	4.4	4.46	0.104	0.194	S
G2	pH	4.36	4.27	4.329	0.077	0.399	S
G3	pH	4.73	4.7	4.755	0.083	-0.296	S
G4	pH	4.6	4.57	4.631	0.077	-0.397	S
G1	Cond	25	22	21.535	1.76	1.968	S
G2	Cond	30.1	29	27.802	2.442	0.941	S
G3	Cond	16.6	16	16.357	1.308	0.186	S
G4	Cond	21.7	22	21.283	1.453	0.287	S

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Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th intercomparison of analytical methods

Laboratory 150, Fundacion Centro de estudios ambientales del mediterrain, Paterna (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⁻	0.88	0.859	0.859	0.043	0.481	S
G2	SO ₄ ²⁻	1.11	1.09	1.096	0.064	0.212	S
G3	SO ₄ ²⁻	0.64	0.634	0.642	0.035	-0.045	S
G4	SO ₄ ²⁻	0.78	0.771	0.78	0.033	0.014	S
G1	NH ₄ ⁺	0.146	0.134	0.138	0.019	0.431	S
G2	NH ₄ ⁺	0.218	0.214	0.213	0.022	0.202	S
G3	NH ₄ ⁺	0.261	0.267	0.27	0.023	-0.404	S
G4	NH ₄ ⁺	0.351	0.348	0.352	0.027	-0.039	S
G1	NO ₃ ⁻	0.26	0.27	0.269	0.016	-0.546	S
G2	NO ₃ ⁻	0.35	0.352	0.352	0.02	-0.094	S
G3	NO ₃ ⁻	0.4	0.415	0.415	0.023	-0.653	S
G4	NO ₃ ⁻	0.59	0.607	0.609	0.043	-0.444	S
G1	Na ⁺	0.253	0.268	0.261	0.022	-0.362	S
G2	Na ⁺	0.195	0.208	0.2	0.018	-0.289	S
G3	Na ⁺	0.314	0.318	0.311	0.023	0.148	S
G4	Na ⁺	0.52	0.512	0.499	0.043	0.488	S
G1	Mg ²⁺	0.101	0.103	0.103	0.01	-0.26	S
G2	Mg ²⁺	0.095	0.093	0.093	0.008	0.252	S
G3	Mg ²⁺	0.114	0.114	0.112	0.011	0.197	S
G4	Mg ²⁺	0.148	0.145	0.145	0.012	0.275	S
G1	Cl ⁻	0.18	0.193	0.196	0.037	-0.441	S
G2	Cl ⁻	0.15	0.154	0.165	0.039	-0.379	S
G3	Cl ⁻	0.26	0.27	0.275	0.061	-0.252	S
G4	Cl ⁻	0.31	0.347	0.348	0.069	-0.554	S
G1	Ca ²⁺	0.101	0.102	0.106	0.034	-0.144	S
G2	Ca ²⁺	0.178	0.14	0.142	0.025	1.483	U
G3	Ca ²⁺	0.2	0.204	0.2	0.028	-0.009	S
G4	Ca ²⁺	0.194	0.192	0.189	0.032	0.17	S
G1	K ⁺	0.15	0.136	0.125	0.031	0.802	S
G2	K ⁺	0.23	0.204	0.194	0.022	1.637	S
G3	K ⁺	0.19	0.17	0.163	0.03	0.913	S
G4	K ⁺	0.26	0.238	0.23	0.027	1.125	S
G1	pH	4.56	4.4	4.46	0.104	0.964	Q
G2	pH	4.37	4.27	4.329	0.077	0.529	Q
G3	pH	4.8	4.7	4.755	0.083	0.545	S
G4	pH	4.69	4.57	4.631	0.077	0.772	Q
G1	Cond	21	22	21.535	1.76	-0.304	S
G2	Cond	27.3	29	27.802	2.442	-0.205	S
G3	Cond	15.5	16	16.357	1.308	-0.656	S
G4	Cond	20.4	22	21.283	1.453	-0.607	S

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EMEP – 29th intercomparison of analytical methods

Laboratory 151, Laboratoire de l'Unite des Eaux et Forest (EFOR) (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⁻	0.851	0.859	0.859	0.043	-0.185	S
G2	SO ₄ ²⁻	1.069	1.09	1.096	0.064	-0.429	S
G3	SO ₄ ²⁻	0.627	0.634	0.642	0.035	-0.415	S
G4	SO ₄ ²⁻	0.762	0.771	0.78	0.033	-0.538	S
G1	NH ₄ ⁺	0.116	0.134	0.138	0.019	-1.156	S
G2	NH ₄ ⁺	0.202	0.214	0.213	0.022	-0.51	S
G3	NH ₄ ⁺	0.272	0.267	0.27	0.023	0.078	S
G4	NH ₄ ⁺	0.345	0.348	0.352	0.027	-0.263	S
G1	NO ₃ ⁻	0.248	0.27	0.269	0.016	-1.295	S
G2	NO ₃ ⁻	0.326	0.352	0.352	0.02	-1.295	S
G3	NO ₃ ⁻	0.388	0.415	0.415	0.023	-1.176	S
G4	NO ₃ ⁻	0.58	0.607	0.609	0.043	-0.679	S
G1	Na ⁺	0.248	0.268	0.261	0.022	-0.586	S
G2	Na ⁺	0.191	0.208	0.2	0.018	-0.516	S
G3	Na ⁺	0.307	0.318	0.311	0.023	-0.156	S
G4	Na ⁺	0.51	0.512	0.499	0.043	0.257	S
G1	Mg ²⁺	0.101	0.103	0.103	0.01	-0.26	S
G2	Mg ²⁺	0.098	0.093	0.093	0.008	0.631	S
G3	Mg ²⁺	0.011	0.114	0.112	0.011	-9.282	U
G4	Mg ²⁺	0.146	0.145	0.145	0.012	0.108	S
G1	Cl ⁻	0.209	0.193	0.196	0.037	0.345	S
G2	Cl ⁻	1.444	0.154	0.165	0.039	32.434	U
G3	Cl ⁻	1.719	0.27	0.275	0.061	23.56	U
G4	Cl ⁻	2.566	0.347	0.348	0.069	32.372	U
G1	Ca ²⁺	0.091	0.102	0.106	0.034	-0.438	S
G2	Ca ²⁺	0.129	0.14	0.142	0.025	-0.509	S
G3	Ca ²⁺	0.198	0.204	0.2	0.028	-0.08	S
G4	Ca ²⁺	0.181	0.192	0.189	0.032	-0.233	S
G1	K ⁺	0.143	0.136	0.125	0.031	0.574	S
G2	K ⁺	0.205	0.204	0.194	0.022	0.499	S
G3	K ⁺	0.175	0.17	0.163	0.03	0.411	S
G4	K ⁺	0.245	0.238	0.23	0.027	0.565	S
G1	pH	-999	4.4	4.46	0.104		B
G2	pH	-999	4.27	4.329	0.077		B
G3	pH	-999	4.7	4.755	0.083		B
G4	pH	-999	4.57	4.631	0.077		B
G1	Cond	-999	22	21.535	1.76		B
G2	Cond	-999	29	27.802	2.442		B
G3	Cond	-999	16	16.357	1.308		B
G4	Cond	-999	22	21.283	1.453		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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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.879	0.859	0.859	0.043	0.458	S
G2	SO ₄ ²⁻	1.111	1.09	1.096	0.064	0.227	S
G3	SO ₄ ²⁻	0.652	0.634	0.642	0.035	0.297	S
G4	SO ₄ ²⁻	0.795	0.771	0.78	0.033	0.473	S
G1	NH ₄ ⁺	0.128	0.134	0.138	0.019	-0.521	S
G2	NH ₄ ⁺	0.202	0.214	0.213	0.022	-0.51	S
G3	NH ₄ ⁺	0.264	0.267	0.27	0.023	-0.272	S
G4	NH ₄ ⁺	0.334	0.348	0.352	0.027	-0.674	S
G1	NO ₃ ⁻	0.265	0.27	0.269	0.016	-0.234	S
G2	NO ₃ ⁻	0.336	0.352	0.352	0.02	-0.795	S
G3	NO ₃ ⁻	0.405	0.415	0.415	0.023	-0.436	S
G4	NO ₃ ⁻	0.608	0.607	0.609	0.043	-0.023	S
G1	Na ⁺	0.273	0.268	0.261	0.022	0.534	S
G2	Na ⁺	0.214	0.208	0.2	0.018	0.793	S
G3	Na ⁺	0.324	0.318	0.311	0.023	0.584	S
G4	Na ⁺	0.516	0.512	0.499	0.043	0.396	S
G1	Mg ²⁺	0.105	0.103	0.103	0.01	0.157	S
G2	Mg ²⁺	0.096	0.093	0.093	0.008	0.378	S
G3	Mg ²⁺	0.116	0.114	0.112	0.011	0.382	S
G4	Mg ²⁺	0.147	0.145	0.145	0.012	0.192	S
G1	Cl ⁻	0.177	0.193	0.196	0.037	-0.523	S
G2	Cl ⁻	0.133	0.154	0.165	0.039	-0.81	S
G3	Cl ⁻	0.253	0.27	0.275	0.061	-0.367	S
G4	Cl ⁻	0.332	0.347	0.348	0.069	-0.233	S
G1	Ca ²⁺	0.109	0.102	0.106	0.034	0.092	S
G2	Ca ²⁺	0.145	0.14	0.142	0.025	0.142	S
G3	Ca ²⁺	0.208	0.204	0.2	0.028	0.279	S
G4	Ca ²⁺	0.196	0.192	0.189	0.032	0.232	S
G1	K ⁺	0.126	0.136	0.125	0.031	0.021	S
G2	K ⁺	0.19	0.204	0.194	0.022	-0.184	S
G3	K ⁺	0.16	0.17	0.163	0.03	-0.092	S
G4	K ⁺	0.224	0.238	0.23	0.027	-0.219	S
G1	pH	4.49	4.4	4.46	0.104	0.291	S
G2	pH	4.35	4.27	4.329	0.077	0.269	S
G3	pH	4.77	4.7	4.755	0.083	0.184	S
G4	pH	4.65	4.57	4.631	0.077	0.252	S
G1	Cond	22	22	21.535	1.76	0.264	S
G2	Cond	28.4	29	27.802	2.442	0.245	S
G3	Cond	16.5	16	16.357	1.308	0.109	S
G4	Cond	21.5	22	21.283	1.453	0.15	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

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

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th intercomparison of analytical methods

Laboratory 156, Laboratory of Forest Land and Biogeochemistry, Ilisia (Greece)

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	0.859	0.859	0.043		B
G2	SO ₄ ²⁻	-999	1.09	1.096	0.064		B
G3	SO ₄ ²⁻	-999	0.634	0.642	0.035		B
G4	SO ₄ ²⁻	-999	0.771	0.78	0.033		B
G1	NH ₄ ⁺	0.128	0.134	0.138	0.019	-0.521	S
G2	NH ₄ ⁺	0.202	0.214	0.213	0.022	-0.51	S
G3	NH ₄ ⁺	0.264	0.267	0.27	0.023	-0.272	S
G4	NH ₄ ⁺	0.334	0.348	0.352	0.027	-0.674	S
G1	NO ₃ ⁻	-999	0.27	0.269	0.016		B
G2	NO ₃ ⁻	-999	0.352	0.352	0.02		B
G3	NO ₃ ⁻	-999	0.415	0.415	0.023		B
G4	NO ₃ ⁻	-999	0.607	0.609	0.043		B
G1	Na ⁺	0.273	0.268	0.261	0.022	0.534	S
G2	Na ⁺	0.214	0.208	0.2	0.018	0.793	S
G3	Na ⁺	0.324	0.318	0.311	0.023	0.584	S
G4	Na ⁺	0.516	0.512	0.499	0.043	0.396	S
G1	Mg ²⁺	0.105	0.103	0.103	0.01	0.157	S
G2	Mg ²⁺	0.096	0.093	0.093	0.008	0.378	S
G3	Mg ²⁺	0.116	0.114	0.112	0.011	0.382	S
G4	Mg ²⁺	0.147	0.145	0.145	0.012	0.192	S
G1	Cl ⁻	-999	0.193	0.196	0.037		B
G2	Cl ⁻	-999	0.154	0.165	0.039		B
G3	Cl ⁻	-999	0.27	0.275	0.061		B
G4	Cl ⁻	-999	0.347	0.348	0.069		B
G1	Ca ²⁺	0.109	0.102	0.106	0.034	0.092	S
G2	Ca ²⁺	0.145	0.14	0.142	0.025	0.142	S
G3	Ca ²⁺	0.208	0.204	0.2	0.028	0.279	S
G4	Ca ²⁺	0.196	0.192	0.189	0.032	0.232	S
G1	K ⁺	0.126	0.136	0.125	0.031	0.021	S
G2	K ⁺	0.19	0.204	0.194	0.022	-0.184	S
G3	K ⁺	0.16	0.17	0.163	0.03	-0.092	S
G4	K ⁺	0.224	0.238	0.23	0.027	-0.219	S
G1	pH	4.49	4.4	4.46	0.104	0.291	S
G2	pH	4.35	4.27	4.329	0.077	0.269	S
G3	pH	4.77	4.7	4.755	0.083	0.184	S
G4	pH	4.65	4.57	4.631	0.077	0.252	S
G1	Cond	22.02	22	21.535	1.76	0.275	S
G2	Cond	28.43	29	27.802	2.442	0.257	S
G3	Cond	16.46	16	16.357	1.308	0.078	S
G4	Cond	21.47	22	21.283	1.453	0.129	S

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Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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EMEP – 29th intercomparison of analytical methods

Laboratory 158, Asia Center for Air Pollution Research (ACAP) (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⁻	0.857	0.859	0.859	0.043	-0.048	S
G2	SO ₄ ²⁻	1.083	1.09	1.096	0.064	-0.21	S
G3	SO ₄ ²⁻	0.61	0.634	0.642	0.035	-0.9	S
G4	SO ₄ ²⁻	0.732	0.771	0.78	0.033	-1.458	S
G1	NH ₄ ⁺	0.16	0.134	0.138	0.019	1.172	Q
G2	NH ₄ ⁺	0.243	0.214	0.213	0.022	1.314	S
G3	NH ₄ ⁺	0.301	0.267	0.27	0.023	1.349	S
G4	NH ₄ ⁺	0.378	0.348	0.352	0.027	0.969	S
G1	NO ₃ ⁻	0.275	0.27	0.269	0.016	0.39	S
G2	NO ₃ ⁻	0.375	0.352	0.352	0.02	1.158	S
G3	NO ₃ ⁻	0.429	0.415	0.415	0.023	0.61	S
G4	NO ₃ ⁻	0.628	0.607	0.609	0.043	0.446	S
G1	Na ⁺	0.272	0.268	0.261	0.022	0.489	S
G2	Na ⁺	0.211	0.208	0.2	0.018	0.622	S
G3	Na ⁺	0.327	0.318	0.311	0.023	0.714	S
G4	Na ⁺	0.531	0.512	0.499	0.043	0.743	S
G1	Mg ²⁺	0.103	0.103	0.103	0.01	-0.051	S
G2	Mg ²⁺	0.095	0.093	0.093	0.008	0.252	S
G3	Mg ²⁺	0.119	0.114	0.112	0.011	0.659	S
G4	Mg ²⁺	0.154	0.145	0.145	0.012	0.778	S
G1	Cl ⁻	0.206	0.193	0.196	0.037	0.263	S
G2	Cl ⁻	0.152	0.154	0.165	0.039	-0.328	S
G3	Cl ⁻	0.271	0.27	0.275	0.061	-0.073	S
G4	Cl ⁻	0.355	0.347	0.348	0.069	0.103	S
G1	Ca ²⁺	0.102	0.102	0.106	0.034	-0.114	S
G2	Ca ²⁺	0.138	0.14	0.142	0.025	-0.143	S
G3	Ca ²⁺	0.203	0.204	0.2	0.028	0.099	S
G4	Ca ²⁺	0.191	0.192	0.189	0.032	0.077	S
G1	K ⁺	0.128	0.136	0.125	0.031	0.086	S
G2	K ⁺	0.2	0.204	0.194	0.022	0.271	S
G3	K ⁺	0.17	0.17	0.163	0.03	0.243	S
G4	K ⁺	0.246	0.238	0.23	0.027	0.602	S
G1	pH	4.4	4.4	4.46	0.104	-0.575	S
G2	pH	4.3	4.27	4.329	0.077	-0.38	S
G3	pH	4.72	4.7	4.755	0.083	-0.417	S
G4	pH	4.59	4.57	4.631	0.077	-0.527	S
G1	Cond	21.9	22	21.535	1.76	0.207	S
G2	Cond	28.6	29	27.802	2.442	0.327	S
G3	Cond	16.6	16	16.357	1.308	0.186	S
G4	Cond	21.7	22	21.283	1.453	0.287	S

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Q – Questionable: Your result deviates between ± 10 - 20% of the expected value for SO_4^{2-} and NO_3^- , between ± 15 - 25% of the expected value for NH_4^+ , Cl^- , Na^+ , Mg^{2+} , Ca^{2+} , K^+ and cond and between ± 0.1 - 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 Youden plots, updated expected values ect:

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EMEP – 29th intercomparison of analytical methods

Laboratory 160, Coillte, Wicklow (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⁻	0.812	0.859	0.859	0.043	-1.082	S
G2	SO ₄ ²⁻	1.232	1.09	1.096	0.064	2.118	Q
G3	SO ₄ ²⁻	< 0.720	0.634	0.642	0.035		B
G4	SO ₄ ²⁻	0.881	0.771	0.78	0.033	3.109	Q
G1	NH ₄ ⁺	0.142	0.134	0.138	0.019	0.219	S
G2	NH ₄ ⁺	0.216	0.214	0.213	0.022	0.113	S
G3	NH ₄ ⁺	0.275	0.267	0.27	0.023	0.21	S
G4	NH ₄ ⁺	0.399	0.348	0.352	0.027	1.753	S
G1	NO ₃ ⁻	< 0.500	0.27	0.269	0.016		B
G2	NO ₃ ⁻	< 0.500	0.352	0.352	0.02		B
G3	NO ₃ ⁻	< 0.500	0.415	0.415	0.023		B
G4	NO ₃ ⁻	0.717	0.607	0.609	0.043	2.532	Q
G1	Na ⁺	< 0.290	0.268	0.261	0.022		B
G2	Na ⁺	< 0.290	0.208	0.2	0.018		B
G3	Na ⁺	< 0.290	0.318	0.311	0.023	-7.206	U
G4	Na ⁺	< 0.290	0.512	0.499	0.043	-8.2	U
G1	Mg ²⁺	< 0.140	0.103	0.103	0.01		B
G2	Mg ²⁺	< 0.140	0.093	0.093	0.008		B
G3	Mg ²⁺	< 0.140	0.114	0.112	0.011		B
G4	Mg ²⁺	< 0.140	0.145	0.145	0.012	-6.255	U
G1	Cl ⁻	< 0.670	0.193	0.196	0.037		B
G2	Cl ⁻	< 0.670	0.154	0.165	0.039		B
G3	Cl ⁻	< 0.670	0.27	0.275	0.061		B
G4	Cl ⁻	< 0.670	0.347	0.348	0.069		B
G1	Ca ²⁺	< 0.690	0.102	0.106	0.034		B
G2	Ca ²⁺	< 0.690	0.14	0.142	0.025		B
G3	Ca ²⁺	< 0.690	0.204	0.2	0.028		B
G4	Ca ²⁺	< 0.690	0.192	0.189	0.032		B
G1	K ⁺	< 0.090	0.136	0.125	0.031	-2.614	U
G2	K ⁺	< 0.090	0.204	0.194	0.022	-6.785	U
G3	K ⁺	< 0.090	0.17	0.163	0.03	-3.944	U
G4	K ⁺	0.107	0.238	0.23	0.027	-4.59	U
G1	pH	-999	4.4	4.46	0.104		B
G2	pH	-999	4.27	4.329	0.077		B
G3	pH	-999	4.7	4.755	0.083		B
G4	pH	-999	4.57	4.631	0.077		B
G1	Cond	-999	22	21.535	1.76		B
G2	Cond	-999	29	27.802	2.442		B
G3	Cond	-999	16	16.357	1.308		B
G4	Cond	-999	22	21.283	1.453		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 Youden plots, updated expected values ect:

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

EMEP – 29th intercomparison of analytical methods

Laboratory 164, Pollution Control Department (PCD) (Thailand)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm ^x
G1	SO ₄ ²⁻	0.83	0.859	0.859	0.043	-0.668	S
G2	SO ₄ ²⁻	1.07	1.09	1.096	0.064	-0.413	S
G3	SO ₄ ²⁻	0.62	0.634	0.642	0.035	-0.615	S
G4	SO ₄ ²⁻	0.76	0.771	0.78	0.033	-0.599	S
G1	NH ₄ ⁺	0.11	0.134	0.138	0.019	-1.474	Q
G2	NH ₄ ⁺	0.2	0.214	0.213	0.022	-0.599	S
G3	NH ₄ ⁺	0.26	0.267	0.27	0.023	-0.448	S
G4	NH ₄ ⁺	0.32	0.348	0.352	0.027	-1.197	S
G1	NO ₃ ⁻	0.24	0.27	0.269	0.016	-1.794	Q
G2	NO ₃ ⁻	0.34	0.352	0.352	0.02	-0.595	S
G3	NO ₃ ⁻	0.42	0.415	0.415	0.023	0.218	S
G4	NO ₃ ⁻	0.63	0.607	0.609	0.043	0.493	S
G1	Na ⁺	0.23	0.268	0.261	0.022	-1.392	S
G2	Na ⁺	0.18	0.208	0.2	0.018	-1.142	S
G3	Na ⁺	0.3	0.318	0.311	0.023	-0.461	S
G4	Na ⁺	0.49	0.512	0.499	0.043	-0.207	S
G1	Mg ²⁺	0.07	0.103	0.103	0.01	-3.492	U
G2	Mg ²⁺	0.07	0.093	0.093	0.008	-2.904	Q
G3	Mg ²⁺	0.08	0.114	0.112	0.011	-2.944	U
G4	Mg ²⁺	0.11	0.145	0.145	0.012	-2.906	Q
G1	Cl ⁻	0.19	0.193	0.196	0.037	-0.17	S
G2	Cl ⁻	0.14	0.154	0.165	0.039	-0.633	S
G3	Cl ⁻	0.27	0.27	0.275	0.061	-0.089	S
G4	Cl ⁻	0.34	0.347	0.348	0.069	-0.116	S
G1	Ca ²⁺	0.08	0.102	0.106	0.034	-0.763	Q
G2	Ca ²⁺	0.11	0.14	0.142	0.025	-1.281	Q
G3	Ca ²⁺	0.18	0.204	0.2	0.028	-0.727	S
G4	Ca ²⁺	0.16	0.192	0.189	0.032	-0.883	Q
G1	K ⁺	0.1	0.136	0.125	0.031	-0.825	U
G2	K ⁺	0.16	0.204	0.194	0.022	-1.55	Q
G3	K ⁺	0.18	0.17	0.163	0.03	0.578	S
G4	K ⁺	0.19	0.238	0.23	0.027	-1.489	Q
G1	pH	4.43	4.4	4.46	0.104	-0.287	S
G2	pH	4.27	4.27	4.329	0.077	-0.77	S
G3	pH	4.66	4.7	4.755	0.083	-1.138	S
G4	pH	4.54	4.57	4.631	0.077	-1.177	S
G1	Cond	21.1	22	21.535	1.76	-0.247	S
G2	Cond	27.3	29	27.802	2.442	-0.205	S
G3	Cond	16.7	16	16.357	1.308	0.262	S
G4	Cond	20.5	22	21.283	1.453	-0.539	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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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th 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⁻	0.893	0.859	0.859	0.043	0.78	S
G2	SO ₄ ²⁻	1.146	1.09	1.096	0.064	0.774	S
G3	SO ₄ ²⁻	0.65	0.634	0.642	0.035	0.24	S
G4	SO ₄ ²⁻	0.798	0.771	0.78	0.033	0.565	S
G1	NH ₄ ⁺	0.129	0.134	0.138	0.019	-0.468	S
G2	NH ₄ ⁺	0.203	0.214	0.213	0.022	-0.465	S
G3	NH ₄ ⁺	0.265	0.267	0.27	0.023	-0.229	S
G4	NH ₄ ⁺	0.356	0.348	0.352	0.027	0.147	S
G1	NO ₃ ⁻	0.282	0.27	0.269	0.016	0.827	S
G2	NO ₃ ⁻	0.345	0.352	0.352	0.02	-0.344	S
G3	NO ₃ ⁻	0.405	0.415	0.415	0.023	-0.436	S
G4	NO ₃ ⁻	0.595	0.607	0.609	0.043	-0.327	S
G1	Na ⁺	0.254	0.268	0.261	0.022	-0.317	S
G2	Na ⁺	0.182	0.208	0.2	0.018	-1.028	S
G3	Na ⁺	0.303	0.318	0.311	0.023	-0.33	S
G4	Na ⁺	0.49	0.512	0.499	0.043	-0.207	S
G1	Mg ²⁺	0.086	0.103	0.103	0.01	-1.824	Q
G2	Mg ²⁺	0.08	0.093	0.093	0.008	-1.642	S
G3	Mg ²⁺	0.096	0.114	0.112	0.011	-1.466	Q
G4	Mg ²⁺	0.119	0.145	0.145	0.012	-2.153	Q
G1	Cl ⁻	0.182	0.193	0.196	0.037	-0.387	S
G2	Cl ⁻	0.138	0.154	0.165	0.039	-0.683	S
G3	Cl ⁻	0.256	0.27	0.275	0.061	-0.318	S
G4	Cl ⁻	0.344	0.347	0.348	0.069	-0.058	S
G1	Ca ²⁺	0.083	0.102	0.106	0.034	-0.674	Q
G2	Ca ²⁺	0.101	0.14	0.142	0.025	-1.647	U
G3	Ca ²⁺	0.154	0.204	0.2	0.028	-1.66	Q
G4	Ca ²⁺	0.141	0.192	0.189	0.032	-1.472	U
G1	K ⁺	0.238	0.136	0.125	0.031	3.664	U
G2	K ⁺	0.313	0.204	0.194	0.022	5.415	U
G3	K ⁺	0.333	0.17	0.163	0.03	5.703	U
G4	K ⁺	0.425	0.238	0.23	0.027	7.289	U
G1	pH	4.46	4.4	4.46	0.104	0.002	S
G2	pH	4.28	4.27	4.329	0.077	-0.64	S
G3	pH	4.68	4.7	4.755	0.083	-0.898	S
G4	pH	4.58	4.57	4.631	0.077	-0.657	S
G1	Cond	18.9	22	21.535	1.76	-1.497	S
G2	Cond	28.2	29	27.802	2.442	0.163	S
G3	Cond	16.9	16	16.357	1.308	0.415	S
G4	Cond	21.8	22	21.283	1.453	0.356	S

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EMEP – 29th 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⁻	0.894	0.859	0.859	0.043	0.803	S
G2	SO ₄ ²⁻	1.136	1.09	1.096	0.064	0.618	S
G3	SO ₄ ²⁻	0.65	0.634	0.642	0.035	0.24	S
G4	SO ₄ ²⁻	0.785	0.771	0.78	0.033	0.167	S
G1	NH ₄ ⁺	0.132	0.134	0.138	0.019	-0.31	S
G2	NH ₄ ⁺	0.214	0.214	0.213	0.022	0.024	S
G3	NH ₄ ⁺	0.274	0.267	0.27	0.023	0.166	S
G4	NH ₄ ⁺	0.348	0.348	0.352	0.027	-0.151	S
G1	NO ₃ ⁻	0.274	0.27	0.269	0.016	0.328	S
G2	NO ₃ ⁻	0.361	0.352	0.352	0.02	0.457	S
G3	NO ₃ ⁻	0.424	0.415	0.415	0.023	0.392	S
G4	NO ₃ ⁻	0.606	0.607	0.609	0.043	-0.069	S
G1	Na ⁺	0.242	0.268	0.261	0.022	-0.854	S
G2	Na ⁺	0.189	0.208	0.2	0.018	-0.63	S
G3	Na ⁺	0.295	0.318	0.311	0.023	-0.678	S
G4	Na ⁺	0.494	0.512	0.499	0.043	-0.114	S
G1	Mg ²⁺	0.1	0.103	0.103	0.01	-0.364	S
G2	Mg ²⁺	0.092	0.093	0.093	0.008	-0.127	S
G3	Mg ²⁺	0.11	0.114	0.112	0.011	-0.172	S
G4	Mg ²⁺	0.14	0.145	0.145	0.012	-0.394	S
G1	Cl ⁻	0.176	0.193	0.196	0.037	-0.55	S
G2	Cl ⁻	0.145	0.154	0.165	0.039	-0.506	S
G3	Cl ⁻	0.261	0.27	0.275	0.061	-0.236	S
G4	Cl ⁻	0.311	0.347	0.348	0.069	-0.54	S
G1	Ca ²⁺	0.105	0.102	0.106	0.034	-0.026	S
G2	Ca ²⁺	0.149	0.14	0.142	0.025	0.304	S
G3	Ca ²⁺	0.201	0.204	0.2	0.028	0.027	S
G4	Ca ²⁺	0.191	0.192	0.189	0.032	0.077	S
G1	K ⁺	0.12	0.136	0.125	0.031	-0.174	S
G2	K ⁺	0.184	0.204	0.194	0.022	-0.457	S
G3	K ⁺	0.152	0.17	0.163	0.03	-0.36	S
G4	K ⁺	0.22	0.238	0.23	0.027	-0.369	S
G1	pH	4.39	4.4	4.46	0.104	-0.672	S
G2	pH	4.35	4.27	4.329	0.077	0.269	S
G3	pH	4.72	4.7	4.755	0.083	-0.417	S
G4	pH	4.59	4.57	4.631	0.077	-0.527	S
G1	Cond	21.8	22	21.535	1.76	0.15	S
G2	Cond	26	29	27.802	2.442	-0.738	S
G3	Cond	16.62	16	16.357	1.308	0.201	S
G4	Cond	21.5	22	21.283	1.453	0.15	S

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EMEP – 29th intercomparison of analytical methods

Laboratory 167, CEH Edinburgh (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⁻	0.896	0.859	0.859	0.043	0.849	S
G2	SO ₄ ²⁻	1.174	1.09	1.096	0.064	1.212	S
G3	SO ₄ ²⁻	0.667	0.634	0.642	0.035	0.724	S
G4	SO ₄ ²⁻	0.798	0.771	0.78	0.033	0.565	S
G1	NH ₄ ⁺	0.119	0.134	0.138	0.019	-0.997	S
G2	NH ₄ ⁺	0.197	0.214	0.213	0.022	-0.732	S
G3	NH ₄ ⁺	0.245	0.267	0.27	0.023	-1.105	S
G4	NH ₄ ⁺	0.324	0.348	0.352	0.027	-1.048	S
G1	NO ₃ ⁻	0.251	0.27	0.269	0.016	-1.108	S
G2	NO ₃ ⁻	0.345	0.352	0.352	0.02	-0.344	S
G3	NO ₃ ⁻	0.407	0.415	0.415	0.023	-0.348	S
G4	NO ₃ ⁻	0.606	0.607	0.609	0.043	-0.069	S
G1	Na ⁺	0.278	0.268	0.261	0.022	0.758	S
G2	Na ⁺	0.22	0.208	0.2	0.018	1.134	S
G3	Na ⁺	0.319	0.318	0.311	0.023	0.366	S
G4	Na ⁺	0.521	0.512	0.499	0.043	0.511	S
G1	Mg ²⁺	0.176	0.103	0.103	0.01	7.56	U
G2	Mg ²⁺	0.128	0.093	0.093	0.008	4.418	U
G3	Mg ²⁺	0.137	0.114	0.112	0.011	2.322	Q
G4	Mg ²⁺	0.173	0.145	0.145	0.012	2.369	Q
G1	Cl ⁻	0.232	0.193	0.196	0.037	0.968	Q
G2	Cl ⁻	0.208	0.154	0.165	0.039	1.092	U
G3	Cl ⁻	0.302	0.27	0.275	0.061	0.433	S
G4	Cl ⁻	0.365	0.347	0.348	0.069	0.249	S
G1	Ca ²⁺	0.332	0.102	0.106	0.034	6.666	U
G2	Ca ²⁺	0.216	0.14	0.142	0.025	3.028	U
G3	Ca ²⁺	0.228	0.204	0.2	0.028	0.997	S
G4	Ca ²⁺	0.278	0.192	0.189	0.032	2.771	U
G1	K ⁺	0.063	0.136	0.125	0.031	-2.029	U
G2	K ⁺	0.141	0.204	0.194	0.022	-2.415	U
G3	K ⁺	0.104	0.17	0.163	0.03	-1.968	U
G4	K ⁺	0.184	0.238	0.23	0.027	-1.714	Q
G1	pH	-999	4.4	4.46	0.104		B
G2	pH	-999	4.27	4.329	0.077		B
G3	pH	-999	4.7	4.755	0.083		B
G4	pH	-999	4.57	4.631	0.077		B
G1	Cond	-999	22	21.535	1.76		B
G2	Cond	-999	29	27.802	2.442		B
G3	Cond	-999	16	16.357	1.308		B
G4	Cond	-999	22	21.283	1.453		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 Youden plots, updated expected values ect:

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

EMEP – 29th intercomparison of analytical methods

Laboratory 172, UMR SAS INRA; Rennes (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⁻	0.901	0.859	0.859	0.043	0.955	S
G2	SO ₄ ²⁻	1.132	1.09	1.096	0.064	0.562	S
G3	SO ₄ ²⁻	0.66	0.634	0.642	0.035	0.522	S
G4	SO ₄ ²⁻	0.863	0.771	0.78	0.033	2.542	Q
G1	NH ₄ ⁺	0.157	0.134	0.138	0.019	1.013	Q
G2	NH ₄ ⁺	0.24	0.214	0.213	0.022	1.185	S
G3	NH ₄ ⁺	0.296	0.267	0.27	0.023	1.121	S
G4	NH ₄ ⁺	0.392	0.348	0.352	0.027	1.477	S
G1	NO ₃ ⁻	0.272	0.27	0.269	0.016	0.178	S
G2	NO ₃ ⁻	0.355	0.352	0.352	0.02	0.176	S
G3	NO ₃ ⁻	0.421	0.415	0.415	0.023	0.274	S
G4	NO ₃ ⁻	0.629	0.607	0.609	0.043	0.474	S
G1	Na ⁺	0.216	0.268	0.261	0.022	-2.019	Q
G2	Na ⁺	0.156	0.208	0.2	0.018	-2.508	Q
G3	Na ⁺	0.273	0.318	0.311	0.023	-1.636	S
G4	Na ⁺	0.472	0.512	0.499	0.043	-0.624	S
G1	Mg ²⁺	0.091	0.103	0.103	0.01	-1.302	S
G2	Mg ²⁺	0.088	0.093	0.093	0.008	-0.632	S
G3	Mg ²⁺	0.103	0.114	0.112	0.011	-0.819	S
G4	Mg ²⁺	0.129	0.145	0.145	0.012	-1.315	S
G1	Cl ⁻	0.17	0.193	0.196	0.037	-0.712	S
G2	Cl ⁻	0.137	0.154	0.165	0.039	-0.709	S
G3	Cl ⁻	0.246	0.27	0.275	0.061	-0.481	S
G4	Cl ⁻	0.351	0.347	0.348	0.069	0.044	S
G1	Ca ²⁺	0.1	0.102	0.106	0.034	-0.173	S
G2	Ca ²⁺	0.132	0.14	0.142	0.025	-0.387	S
G3	Ca ²⁺	0.196	0.204	0.2	0.028	-0.152	S
G4	Ca ²⁺	0.189	0.192	0.189	0.032	0.015	S
G1	K ⁺	0.048	0.136	0.125	0.031	-2.517	U
G2	K ⁺	0.112	0.204	0.194	0.022	-3.735	U
G3	K ⁺	0.089	0.17	0.163	0.03	-2.47	U
G4	K ⁺	0.159	0.238	0.23	0.027	-2.647	U
G1	pH	4.3	4.4	4.46	0.104	-1.538	Q
G2	pH	3.9	4.27	4.329	0.077	-5.579	U
G3	pH	4.12	4.7	4.755	0.083	-7.629	U
G4	pH	4.14	4.57	4.631	0.077	-6.377	U
G1	Cond	22	22	21.535	1.76	0.264	S
G2	Cond	29	29	27.802	2.442	0.491	S
G3	Cond	16.5	16	16.357	1.308	0.109	S
G4	Cond	21.8	22	21.283	1.453	0.356	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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B – Blank: You reported either no value or the detection limit

Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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

EMEP – 29th intercomparison of analytical methods

Laboratory 175, Primorsky Environmental Pollution Monitoring Center, Vladivostok (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⁻	0.49	0.859	0.859	0.043	-8.487	U
G2	SO ₄ ²⁻	0.65	1.09	1.096	0.064	-6.975	U
G3	SO ₄ ²⁻	0.28	0.634	0.642	0.035	-10.301	U
G4	SO ₄ ²⁻	0.62	0.771	0.78	0.033	-4.891	Q
G1	NH ₄ ⁺	0.12	0.134	0.138	0.019	-0.945	S
G2	NH ₄ ⁺	0.16	0.214	0.213	0.022	-2.378	U
G3	NH ₄ ⁺	0.26	0.267	0.27	0.023	-0.448	S
G4	NH ₄ ⁺	0.36	0.348	0.352	0.027	0.297	S
G1	NO ₃ ⁻	0.3	0.27	0.269	0.016	1.951	Q
G2	NO ₃ ⁻	0.39	0.352	0.352	0.02	1.908	Q
G3	NO ₃ ⁻	0.37	0.415	0.415	0.023	-1.96	Q
G4	NO ₃ ⁻	0.54	0.607	0.609	0.043	-1.616	Q
G1	Na ⁺	0.14	0.268	0.261	0.022	-5.423	U
G2	Na ⁺	0.13	0.208	0.2	0.018	-3.987	U
G3	Na ⁺	0.18	0.318	0.311	0.023	-5.683	U
G4	Na ⁺	0.38	0.512	0.499	0.043	-2.755	U
G1	Mg ²⁺	0.12	0.103	0.103	0.01	1.721	Q
G2	Mg ²⁺	0.11	0.093	0.093	0.008	2.146	Q
G3	Mg ²⁺	0.11	0.114	0.112	0.011	-0.172	S
G4	Mg ²⁺	0.16	0.145	0.145	0.012	1.28	S
G1	Cl ⁻	0.13	0.193	0.196	0.037	-1.797	U
G2	Cl ⁻	0.09	0.154	0.165	0.039	-1.901	U
G3	Cl ⁻	0.11	0.27	0.275	0.061	-2.7	U
G4	Cl ⁻	0.11	0.347	0.348	0.069	-3.473	U
G1	Ca ²⁺	0.24	0.102	0.106	0.034	3.954	U
G2	Ca ²⁺	0.29	0.14	0.142	0.025	6.036	U
G3	Ca ²⁺	0.28	0.204	0.2	0.028	2.864	U
G4	Ca ²⁺	0.31	0.192	0.189	0.032	3.762	U
G1	K ⁺	0.16	0.136	0.125	0.031	1.127	Q
G2	K ⁺	0.22	0.204	0.194	0.022	1.181	S
G3	K ⁺	0.2	0.17	0.163	0.03	1.248	Q
G4	K ⁺	0.3	0.238	0.23	0.027	2.619	U
G1	pH	4.5	4.4	4.46	0.104	0.387	S
G2	pH	4.38	4.27	4.329	0.077	0.659	Q
G3	pH	4.86	4.7	4.755	0.083	1.266	Q
G4	pH	4.67	4.57	4.631	0.077	0.512	S
G1	Cond	1.8	22	21.535	1.76	-11.21	U
G2	Cond	2.4	29	27.802	2.442	-10.4	U
G3	Cond	1.27	16	16.357	1.308	-11.535	U
G4	Cond	1.87	22	21.283	1.453	-13.36	U

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EMEP – 29th 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⁻	0.08	0.859	0.859	0.043	-17.916	U
G2	SO ₄ ²⁻	0.99	1.09	1.096	0.064	-1.663	S
G3	SO ₄ ²⁻	0.59	0.634	0.642	0.035	-1.47	S
G4	SO ₄ ²⁻	0.69	0.771	0.78	0.033	-2.745	Q
G1	NH ₄ ⁺	0.13	0.134	0.138	0.019	-0.415	S
G2	NH ₄ ⁺	0.22	0.214	0.213	0.022	0.291	S
G3	NH ₄ ⁺	0.26	0.267	0.27	0.023	-0.448	S
G4	NH ₄ ⁺	0.35	0.348	0.352	0.027	-0.077	S
G1	NO ₃ ⁻	0.33	0.27	0.269	0.016	3.824	U
G2	NO ₃ ⁻	0.42	0.352	0.352	0.02	3.41	Q
G3	NO ₃ ⁻	0.49	0.415	0.415	0.023	3.266	Q
G4	NO ₃ ⁻	0.78	0.607	0.609	0.043	4.009	U
G1	Na ⁺	0.23	0.268	0.261	0.022	-1.392	S
G2	Na ⁺	0.17	0.208	0.2	0.018	-1.711	Q
G3	Na ⁺	0.29	0.318	0.311	0.023	-0.896	S
G4	Na ⁺	0.51	0.512	0.499	0.043	0.257	S
G1	Mg ²⁺	0.1	0.103	0.103	0.01	-0.364	S
G2	Mg ²⁺	0.09	0.093	0.093	0.008	-0.379	S
G3	Mg ²⁺	0.11	0.114	0.112	0.011	-0.172	S
G4	Mg ²⁺	0.14	0.145	0.145	0.012	-0.394	S
G1	Cl ⁻	0.18	0.193	0.196	0.037	-0.441	S
G2	Cl ⁻	0.15	0.154	0.165	0.039	-0.379	S
G3	Cl ⁻	0.26	0.27	0.275	0.061	-0.252	S
G4	Cl ⁻	0.33	0.347	0.348	0.069	-0.262	S
G1	Ca ²⁺	0.09	0.102	0.106	0.034	-0.468	S
G2	Ca ²⁺	0.13	0.14	0.142	0.025	-0.468	S
G3	Ca ²⁺	0.18	0.204	0.2	0.028	-0.727	S
G4	Ca ²⁺	0.17	0.192	0.189	0.032	-0.574	S
G1	K ⁺	0.1	0.136	0.125	0.031	-0.825	U
G2	K ⁺	0.17	0.204	0.194	0.022	-1.095	Q
G3	K ⁺	0.14	0.17	0.163	0.03	-0.762	Q
G4	K ⁺	0.21	0.238	0.23	0.027	-0.742	S
G1	pH	4.46	4.4	4.46	0.104	0.002	S
G2	pH	4.34	4.27	4.329	0.077	0.139	S
G3	pH	4.74	4.7	4.755	0.083	-0.176	S
G4	pH	4.62	4.57	4.631	0.077	-0.137	S
G1	Cond	20.8	22	21.535	1.76	-0.418	S
G2	Cond	27	29	27.802	2.442	-0.328	S
G3	Cond	15.8	16	16.357	1.308	-0.426	S
G4	Cond	20.7	22	21.283	1.453	-0.401	S

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EMEP – 29th 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 ^u
G1	SO ₄ ²⁻	0.89	0.859	0.859	0.043	0.711	S
G2	SO ₄ ²⁻	1.17	1.09	1.096	0.064	1.149	S
G3	SO ₄ ²⁻	0.68	0.634	0.642	0.035	1.094	S
G4	SO ₄ ²⁻	0.82	0.771	0.78	0.033	1.24	S
G1	NH ₄ ⁺	0.11	0.134	0.138	0.019	-1.474	Q
G2	NH ₄ ⁺	0.17	0.214	0.213	0.022	-1.933	Q
G3	NH ₄ ⁺	0.24	0.267	0.27	0.023	-1.324	S
G4	NH ₄ ⁺	0.31	0.348	0.352	0.027	-1.57	S
G1	NO ₃ ⁻	0.28	0.27	0.269	0.016	0.703	S
G2	NO ₃ ⁻	0.44	0.352	0.352	0.02	4.412	U
G3	NO ₃ ⁻	0.43	0.415	0.415	0.023	0.653	S
G4	NO ₃ ⁻	0.65	0.607	0.609	0.043	0.962	S
G1	Na ⁺	0.23	0.268	0.261	0.022	-1.392	S
G2	Na ⁺	0.17	0.208	0.2	0.018	-1.711	Q
G3	Na ⁺	0.27	0.318	0.311	0.023	-1.766	Q
G4	Na ⁺	0.47	0.512	0.499	0.043	-0.67	S
G1	Mg ²⁺	0.1	0.103	0.103	0.01	-0.364	S
G2	Mg ²⁺	0.09	0.093	0.093	0.008	-0.379	S
G3	Mg ²⁺	0.11	0.114	0.112	0.011	-0.172	S
G4	Mg ²⁺	0.15	0.145	0.145	0.012	0.443	S
G1	Cl ⁻	0.19	0.193	0.196	0.037	-0.17	S
G2	Cl ⁻	0.23	0.154	0.165	0.039	1.65	U
G3	Cl ⁻	0.28	0.27	0.275	0.061	0.074	S
G4	Cl ⁻	0.34	0.347	0.348	0.069	-0.116	S
G1	Ca ²⁺	0.11	0.102	0.106	0.034	0.122	S
G2	Ca ²⁺	0.14	0.14	0.142	0.025	-0.062	S
G3	Ca ²⁺	0.2	0.204	0.2	0.028	-0.009	S
G4	Ca ²⁺	0.19	0.192	0.189	0.032	0.046	S
G1	K ⁺	0.09	0.136	0.125	0.031	-1.15	U
G2	K ⁺	0.15	0.204	0.194	0.022	-2.005	U
G3	K ⁺	0.12	0.17	0.163	0.03	-1.432	U
G4	K ⁺	0.19	0.238	0.23	0.027	-1.489	Q
G1	pH	4.32	4.4	4.46	0.104	-1.345	S
G2	pH	4.29	4.27	4.329	0.077	-0.51	S
G3	pH	4.68	4.7	4.755	0.083	-0.898	S
G4	pH	4.48	4.57	4.631	0.077	-1.957	S
G1	Cond	22.55	22	21.535	1.76	0.576	S
G2	Cond	29.13	29	27.802	2.442	0.544	S
G3	Cond	16.6	16	16.357	1.308	0.186	S
G4	Cond	22.3	22	21.283	1.453	0.7	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

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

EMEP – 29th 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⁻	0.783	0.859	0.859	0.043	-1.749	S
G2	SO ₄ ²⁻	0.957	1.09	1.096	0.064	-2.179	Q
G3	SO ₄ ²⁻	0.55	0.634	0.642	0.035	-2.609	Q
G4	SO ₄ ²⁻	0.653	0.771	0.78	0.033	-3.879	Q
G1	NH ₄ ⁺	0.21	0.134	0.138	0.019	3.817	U
G2	NH ₄ ⁺	0.354	0.214	0.213	0.022	6.252	U
G3	NH ₄ ⁺	0.447	0.267	0.27	0.023	7.745	U
G4	NH ₄ ⁺	0.584	0.348	0.352	0.027	8.661	U
G1	NO ₃ ⁻	0.254	0.27	0.269	0.016	-0.92	S
G2	NO ₃ ⁻	0.311	0.352	0.352	0.02	-2.046	Q
G3	NO ₃ ⁻	0.383	0.415	0.415	0.023	-1.394	S
G4	NO ₃ ⁻	0.581	0.607	0.609	0.043	-0.655	S
G1	Na ⁺	0.322	0.268	0.261	0.022	2.729	Q
G2	Na ⁺	0.234	0.208	0.2	0.018	1.931	S
G3	Na ⁺	0.378	0.318	0.311	0.023	2.933	Q
G4	Na ⁺	0.599	0.512	0.499	0.043	2.319	Q
G1	Mg ²⁺	0.101	0.103	0.103	0.01	-0.26	S
G2	Mg ²⁺	0.095	0.093	0.093	0.008	0.252	S
G3	Mg ²⁺	0.119	0.114	0.112	0.011	0.659	S
G4	Mg ²⁺	0.151	0.145	0.145	0.012	0.527	S
G1	Cl ⁻	0.252	0.193	0.196	0.037	1.51	U
G2	Cl ⁻	0.268	0.154	0.165	0.039	2.613	U
G3	Cl ⁻	0.361	0.27	0.275	0.061	1.396	U
G4	Cl ⁻	0.469	0.347	0.348	0.069	1.766	U
G1	Ca ²⁺	0.11	0.102	0.106	0.034	0.122	S
G2	Ca ²⁺	0.144	0.14	0.142	0.025	0.101	S
G3	Ca ²⁺	0.204	0.204	0.2	0.028	0.135	S
G4	Ca ²⁺	0.192	0.192	0.189	0.032	0.108	S
G1	K ⁺	0.207	0.136	0.125	0.031	2.656	U
G2	K ⁺	0.297	0.204	0.194	0.022	4.686	U
G3	K ⁺	0.249	0.17	0.163	0.03	2.889	U
G4	K ⁺	0.346	0.238	0.23	0.027	4.338	U
G1	pH	-999	4.4	4.46	0.104		B
G2	pH	-999	4.27	4.329	0.077		B
G3	pH	-999	4.7	4.755	0.083		B
G4	pH	-999	4.57	4.631	0.077		B
G1	Cond	-999	22	21.535	1.76		B
G2	Cond	-999	29	27.802	2.442		B
G3	Cond	-999	16	16.357	1.308		B
G4	Cond	-999	22	21.283	1.453		B

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Please check the EMEP intercalibration website for Youden plots, updated expected values ect:

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EMEP – 29th intercomparison of analytical methods

Laboratory 180, vTI - Institut für Agrarrelevante Klimaforschung (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⁻	0.855	0.859	0.859	0.043	-0.094	S
G2	SO ₄ ²⁻	1.093	1.09	1.096	0.064	-0.054	S
G3	SO ₄ ²⁻	0.638	0.634	0.642	0.035	-0.102	S
G4	SO ₄ ²⁻	0.775	0.771	0.78	0.033	-0.14	S
G1	NH ₄ ⁺	0.135	0.134	0.138	0.019	-0.151	S
G2	NH ₄ ⁺	0.204	0.214	0.213	0.022	-0.421	S
G3	NH ₄ ⁺	0.259	0.267	0.27	0.023	-0.491	S
G4	NH ₄ ⁺	0.338	0.348	0.352	0.027	-0.525	S
G1	NO ₃ ⁻	0.272	0.27	0.269	0.016	0.203	S
G2	NO ₃ ⁻	0.351	0.352	0.352	0.02	-0.044	S
G3	NO ₃ ⁻	0.413	0.415	0.415	0.023	-0.087	S
G4	NO ₃ ⁻	0.598	0.607	0.609	0.043	-0.257	S
G1	Na ⁺	0.3	0.268	0.261	0.022	1.743	S
G2	Na ⁺	0.237	0.208	0.2	0.018	2.101	S
G3	Na ⁺	0.357	0.318	0.311	0.023	2.02	S
G4	Na ⁺	0.573	0.512	0.499	0.043	1.716	S
G1	Mg ²⁺	0.109	0.103	0.103	0.01	0.574	S
G2	Mg ²⁺	0.1	0.093	0.093	0.008	0.883	S
G3	Mg ²⁺	0.12	0.114	0.112	0.011	0.752	S
G4	Mg ²⁺	0.151	0.145	0.145	0.012	0.527	S
G1	Cl ⁻	0.197	0.193	0.196	0.037	0.019	S
G2	Cl ⁻	0.164	0.154	0.165	0.039	-0.024	S
G3	Cl ⁻	0.271	0.27	0.275	0.061	-0.073	S
G4	Cl ⁻	0.343	0.347	0.348	0.069	-0.073	S
G1	Ca ²⁺	0.115	0.102	0.106	0.034	0.269	S
G2	Ca ²⁺	0.163	0.14	0.142	0.025	0.873	Q
G3	Ca ²⁺	0.212	0.204	0.2	0.028	0.422	S
G4	Ca ²⁺	0.209	0.192	0.189	0.032	0.634	S
G1	K ⁺	0.06	0.136	0.125	0.031	-2.126	U
G2	K ⁺	0.148	0.204	0.194	0.022	-2.096	U
G3	K ⁺	0.107	0.17	0.163	0.03	-1.867	U
G4	K ⁺	0.191	0.238	0.23	0.027	-1.452	Q
G1	pH	-999	4.4	4.46	0.104		B
G2	pH	-999	4.27	4.329	0.077		B
G3	pH	-999	4.7	4.755	0.083		B
G4	pH	-999	4.57	4.631	0.077		B
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