

EMEP – 38th 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⁻ mg S/l	0.187	0.18	0.179	0.009	0.881	S
G2		0.205	0.205	0.201	0.009	0.396	S
G3		0.622	0.617	0.61	0.02	0.582	S
G4		0.499	0.499	0.492	0.019	0.362	S
G1	NH ₄ ⁺ mg N/l	0.054	0.06	0.061	0.014	-0.445	S
G2		0.167	0.172	0.171	0.013	-0.317	S
G3		0.293	0.296	0.297	0.015	-0.279	S
G4		0.342	0.344	0.345	0.018	-0.163	S
G1	NO ₃ ⁻ mg N/l	0.206	0.204	0.203	0.009	0.366	S
G2		0.34	0.336	0.334	0.012	0.506	S
G3		0.49	0.489	0.486	0.017	0.208	S
G4		0.59	0.587	0.586	0.022	0.162	S
G1	Na ⁺ mg/l	0.24	0.254	0.25	0.011	-0.882	S
G2		0.3	0.326	0.314	0.014	-1.022	S
G3		0.807	0.848	0.835	0.04	-0.716	S
G4		1.051	1.1	1.069	0.055	-0.321	S
G1	Mg ²⁺ mg/l	0.072	0.072	0.07	0.008	0.223	S
G2		0.082	0.083	0.08	0.006	0.35	S
G3		0.245	0.258	0.256	0.014	-0.764	S
G4		0.2	0.206	0.202	0.011	-0.199	S
G1	Cl ⁻ mg/l	0.258	0.27	0.27	0.043	-0.271	S
G2		0.362	0.386	0.374	0.026	-0.487	S
G3		1.16	1.16	1.136	0.042	0.562	S
G4		1.52	1.54	1.512	0.072	0.115	S
G1	Ca ²⁺ mg/l	0.089	0.089	0.09	0.018	-0.043	S
G2		0.078	0.102	0.097	0.021	-0.904	Q
G3		0.309	0.319	0.313	0.028	-0.15	S
G4		0.247	0.255	0.245	0.024	0.065	S
G1	K ⁺ mg/l	0.267	0.272	0.262	0.016	0.324	S
G2		0.33	0.325	0.325	0.022	0.233	S
G3		0.372	0.374	0.369	0.023	0.132	S
G4		0.502	0.509	0.501	0.027	0.037	S
G1	pH pH units	5.54	5.49	5.475	0.162	0.398	S
G2		5.44	5.49	5.485	0.126	-0.356	S
G3		5.4	5.44	5.433	0.127	-0.259	S
G4		5.42	5.44	5.422	0.134	-0.013	S
G1	Cond µS/cm	5.7	5.96	5.957	0.467	-0.55	S
G2		8.4	7.9	7.869	0.528	1.006	S
G3		15.1	15.66	15.556	0.632	-0.722	S
G4		16.6	17.15	16.944	0.548	-0.628	S

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* Z score is unitless

✎ EMEP quality norm; letters indicate:

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

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

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

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

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

EMEP – 38th 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⁻ mg S/l	0.169	0.18	0.179	0.009	-1.222	S
G2		0.193	0.205	0.201	0.009	-0.93	S
G3		0.594	0.617	0.61	0.02	-0.794	S
G4		0.481	0.499	0.492	0.019	-0.607	S
G1	NH ₄ ⁺ mg N/l	0.061	0.06	0.061	0.014	0.035	S
G2		0.17	0.172	0.171	0.013	-0.088	S
G3		0.292	0.296	0.297	0.015	-0.344	S
G4		0.339	0.344	0.345	0.018	-0.327	S
G1	NO ₃ ⁻ mg N/l	0.191	0.204	0.203	0.009	-1.338	S
G2		0.34	0.336	0.334	0.012	0.506	S
G3		0.485	0.489	0.486	0.017	-0.085	S
G4		0.59	0.587	0.586	0.022	0.162	S
G1	Na ⁺ mg/l	0.225	0.254	0.25	0.011	-2.254	S
G2		0.293	0.326	0.314	0.014	-1.535	S
G3		0.807	0.848	0.835	0.04	-0.716	S
G4		1.051	1.1	1.069	0.055	-0.321	S
G1	Mg ²⁺ mg/l	0.05	0.072	0.07	0.008	-2.694	U
G2		0.068	0.083	0.08	0.006	-1.955	Q
G3		0.225	0.258	0.256	0.014	-2.219	S
G4		0.19	0.206	0.202	0.011	-1.113	S
G1	Cl ⁻ mg/l	0.271	0.27	0.27	0.043	0.034	S
G2		0.373	0.386	0.374	0.026	-0.057	S
G3		1.119	1.16	1.136	0.042	-0.406	S
G4		1.49	1.54	1.512	0.072	-0.302	S
G1	Ca ²⁺ mg/l	0.065	0.089	0.09	0.018	-1.366	U
G2		0.08	0.102	0.097	0.021	-0.81	Q
G3		0.265	0.319	0.313	0.028	-1.698	Q
G4		0.227	0.255	0.245	0.024	-0.785	S
G1	K ⁺ mg/l	0.212	0.272	0.262	0.016	-3.14	Q
G2		0.272	0.325	0.325	0.022	-2.367	Q
G3		0.32	0.374	0.369	0.023	-2.147	S
G4		0.436	0.509	0.501	0.027	-2.429	S
G1	pH pH units	5.4	5.49	5.475	0.162	-0.464	S
G2		5.37	5.49	5.485	0.126	-0.911	Q
G3		5.33	5.44	5.433	0.127	-0.812	Q
G4		5.34	5.44	5.422	0.134	-0.609	Q
G1	Cond µS/cm	-999	5.96	5.957	0.467		B
G2		-999	7.9	7.869	0.528		B
G3		-999	15.66	15.556	0.632		B
G4		-999	17.15	16.944	0.548		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

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EMEP – 38th 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⁻ mg S/l	0.192	0.18	0.179	0.009	1.489	S
G2		0.214	0.205	0.201	0.009	1.445	S
G3		0.627	0.617	0.61	0.02	0.827	S
G4		0.509	0.499	0.492	0.019	0.9	S
G1	NH ₄ ⁺ mg N/l	0.067	0.06	0.061	0.014	0.457	S
G2		0.175	0.172	0.171	0.013	0.27	S
G3		0.304	0.296	0.297	0.015	0.463	S
G4		0.354	0.344	0.345	0.018	0.473	S
G1	NO ₃ ⁻ mg N/l	0.209	0.204	0.203	0.009	0.741	S
G2		0.337	0.336	0.334	0.012	0.24	S
G3		0.497	0.489	0.486	0.017	0.591	S
G4		0.597	0.587	0.586	0.022	0.491	S
G1	Na ⁺ mg/l	0.253	0.254	0.25	0.011	0.316	S
G2		0.326	0.326	0.314	0.014	0.894	S
G3		0.852	0.848	0.835	0.04	0.422	S
G4		1.105	1.1	1.069	0.055	0.676	S
G1	Mg ²⁺ mg/l	0.073	0.072	0.07	0.008	0.341	S
G2		0.083	0.083	0.08	0.006	0.547	S
G3		0.265	0.258	0.256	0.014	0.705	S
G4		0.213	0.206	0.202	0.011	0.966	S
G1	Cl ⁻ mg/l	0.273	0.27	0.27	0.043	0.09	S
G2		0.384	0.386	0.374	0.026	0.359	S
G3		1.155	1.16	1.136	0.042	0.434	S
G4		1.531	1.54	1.512	0.072	0.268	S
G1	Ca ²⁺ mg/l	0.094	0.089	0.09	0.018	0.236	S
G2		0.104	0.102	0.097	0.021	0.304	S
G3		0.333	0.319	0.313	0.028	0.696	S
G4		0.262	0.255	0.245	0.024	0.706	S
G1	K ⁺ mg/l	0.27	0.272	0.262	0.016	0.508	S
G2		0.34	0.325	0.325	0.022	0.689	S
G3		0.386	0.374	0.369	0.023	0.759	S
G4		0.519	0.509	0.501	0.027	0.678	S
G1	pH pH units	5.5	5.49	5.475	0.162	0.152	S
G2		5.49	5.49	5.485	0.126	0.041	S
G3		5.42	5.44	5.433	0.127	-0.101	S
G4		5.43	5.44	5.422	0.134	0.062	S
G1	Cond µS/cm	5.96	5.96	5.957	0.467	0.007	S
G2		7.82	7.9	7.869	0.528	-0.092	S
G3		15.64	15.66	15.556	0.632	0.132	S
G4		16.96	17.15	16.944	0.548	0.028	S

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Laboratory 6, SGS France - EHS (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⁻ mg S/l	0.189	0.18	0.179	0.009	1.068	S
G2		0.218	0.205	0.201	0.009	1.799	S
G3		0.662	0.617	0.61	0.02	2.542	S
G4		0.534	0.499	0.492	0.019	2.257	S
G1	NH ₄ ⁺ mg N/l	0.052	0.06	0.061	0.014	-0.612	S
G2		0.15	0.172	0.171	0.013	-1.598	S
G3		0.306	0.296	0.297	0.015	0.567	S
G4		0.355	0.344	0.345	0.018	0.55	S
G1	NO ₃ ⁻ mg N/l	0.209	0.204	0.203	0.009	0.707	S
G2		0.339	0.336	0.334	0.012	0.422	S
G3		0.49	0.489	0.486	0.017	0.238	S
G4		0.587	0.587	0.586	0.022	0.011	S
G1	Na ⁺ mg/l	0.251	0.254	0.25	0.011	0.151	S
G2		0.32	0.326	0.314	0.014	0.445	S
G3		0.84	0.848	0.835	0.04	0.12	S
G4		1.083	1.1	1.069	0.055	0.257	S
G1	Mg ²⁺ mg/l	0.071	0.072	0.07	0.008	0.117	S
G2		0.08	0.083	0.08	0.006	0.07	S
G3		0.259	0.258	0.256	0.014	0.225	S
G4		0.205	0.206	0.202	0.011	0.258	S
G1	Cl ⁻ mg/l	0.28	0.27	0.27	0.043	0.242	S
G2		0.392	0.386	0.374	0.026	0.682	S
G3		1.18	1.16	1.136	0.042	1.039	S
G4		1.554	1.54	1.512	0.072	0.593	S
G1	Ca ²⁺ mg/l	0.077	0.089	0.09	0.018	-0.688	S
G2		0.077	0.102	0.097	0.021	-0.961	Q
G3		0.294	0.319	0.313	0.028	-0.688	S
G4		0.222	0.255	0.245	0.024	-1.01	S
G1	K ⁺ mg/l	0.262	0.272	0.262	0.016	-0.022	S
G2		0.327	0.325	0.325	0.022	0.076	S
G3		0.365	0.374	0.369	0.023	-0.157	S
G4		0.498	0.509	0.501	0.027	-0.128	S
G1	pH pH units	5.56	5.49	5.475	0.162	0.522	S
G2		5.55	5.49	5.485	0.126	0.516	S
G3		5.48	5.44	5.433	0.127	0.374	S
G4		5.52	5.44	5.422	0.134	0.732	S
G1	Cond µS/cm	6.43	5.96	5.957	0.467	1.015	S
G2		12.59	7.9	7.869	0.528	8.935	U
G3		16.36	15.66	15.556	0.632	1.272	S
G4		17.84	17.15	16.944	0.548	1.633	S

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

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

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EMEP – 38th intercomparison of analytical methods

Laboratory 7, synlab Umweltinstitut GmbH, Niederlassung Leipzig (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⁻ mg S/l	0.166	0.18	0.179	0.009	-1.573	S
G2		0.189	0.205	0.201	0.009	-1.372	S
G3		0.605	0.617	0.61	0.02	-0.254	S
G4		0.488	0.499	0.492	0.019	-0.231	S
G1	NH ₄ ⁺ mg N/l	0.06	0.06	0.061	0.014	-0.038	S
G2		0.169	0.172	0.171	0.013	-0.164	S
G3		0.292	0.296	0.297	0.015	-0.344	S
G4		0.342	0.344	0.345	0.018	-0.163	S
G1	NO ₃ ⁻ mg N/l	0.207	0.204	0.203	0.009	0.48	S
G2		0.339	0.336	0.334	0.012	0.422	S
G3		0.491	0.489	0.486	0.017	0.267	S
G4		0.588	0.587	0.586	0.022	0.071	S
G1	Na ⁺ mg/l	0.242	0.254	0.25	0.011	-0.699	S
G2		0.305	0.326	0.314	0.014	-0.655	S
G3		0.799	0.848	0.835	0.04	-0.918	S
G4		1.05	1.1	1.069	0.055	-0.34	S
G1	Mg ²⁺ mg/l	0.067	0.072	0.07	0.008	-0.44	S
G2		0.076	0.083	0.08	0.006	-0.638	S
G3		0.256	0.258	0.256	0.014	0.036	S
G4		0.203	0.206	0.202	0.011	0.076	S
G1	Cl ⁻ mg/l	0.264	0.27	0.27	0.043	-0.13	S
G2		0.372	0.386	0.374	0.026	-0.096	S
G3		1.127	1.16	1.136	0.042	-0.217	S
G4		1.502	1.54	1.512	0.072	-0.135	S
G1	Ca ²⁺ mg/l	0.077	0.089	0.09	0.018	-0.705	S
G2		0.082	0.102	0.097	0.021	-0.717	Q
G3		0.305	0.319	0.313	0.028	-0.29	S
G4		0.243	0.255	0.245	0.024	-0.105	S
G1	K ⁺ mg/l	0.266	0.272	0.262	0.016	0.261	S
G2		0.329	0.325	0.325	0.022	0.188	S
G3		0.369	0.374	0.369	0.023	0	S
G4		0.496	0.509	0.501	0.027	-0.187	S
G1	pH pH units	5.16	5.49	5.475	0.162	-1.942	U
G2		5.2	5.49	5.485	0.126	-2.259	U
G3		5.08	5.44	5.433	0.127	-2.788	U
G4		5.19	5.44	5.422	0.134	-1.727	U
G1	Cond µS/cm	5.25	5.96	5.957	0.467	-1.515	S
G2		7.12	7.9	7.869	0.528	-1.417	S
G3		13.53	15.66	15.556	0.632	-3.206	S
G4		14.99	17.15	16.944	0.548	-3.564	S

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

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 38th 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⁻ mg S/l	0.18	0.18	0.179	0.009	0.063	S
G2		0.201	0.205	0.201	0.009	-0.046	S
G3		0.615	0.617	0.61	0.02	0.238	S
G4		0.499	0.499	0.492	0.019	0.362	S
G1	NH ₄ ⁺ mg N/l	0.058	0.06	0.061	0.014	-0.183	S
G2		0.17	0.172	0.171	0.013	-0.088	S
G3		0.294	0.296	0.297	0.015	-0.214	S
G4		0.341	0.344	0.345	0.018	-0.217	S
G1	NO ₃ ⁻ mg N/l	0.204	0.204	0.203	0.009	0.139	S
G2		0.336	0.336	0.334	0.012	0.171	S
G3		0.49	0.489	0.486	0.017	0.208	S
G4		0.59	0.587	0.586	0.022	0.162	S
G1	Na ⁺ mg/l	0.249	0.254	0.25	0.011	-0.059	S
G2		0.319	0.326	0.314	0.014	0.371	S
G3		0.839	0.848	0.835	0.04	0.094	S
G4		1.082	1.1	1.069	0.055	0.246	S
G1	Mg ²⁺ mg/l	0.07	0.072	0.07	0.008	-0.042	S
G2		0.08	0.083	0.08	0.006	0.02	S
G3		0.257	0.258	0.256	0.014	0.109	S
G4		0.203	0.206	0.202	0.011	0.076	S
G1	Cl ⁻ mg/l	0.259	0.27	0.27	0.043	-0.247	S
G2		0.374	0.386	0.374	0.026	-0.018	S
G3		1.145	1.16	1.136	0.042	0.208	S
G4		1.516	1.54	1.512	0.072	0.059	S
G1	Ca ²⁺ mg/l	0.102	0.089	0.09	0.018	0.674	S
G2		0.101	0.102	0.097	0.021	0.175	S
G3		0.323	0.319	0.313	0.028	0.343	S
G4		0.253	0.255	0.245	0.024	0.32	S
G1	K ⁺ mg/l	0.251	0.272	0.262	0.016	-0.684	S
G2		0.318	0.325	0.325	0.022	-0.305	S
G3		0.366	0.374	0.369	0.023	-0.131	S
G4		0.469	0.509	0.501	0.027	-1.196	S
G1	pH pH units	5.5	5.49	5.475	0.162	0.152	S
G2		5.5	5.49	5.485	0.126	0.12	S
G3		5.49	5.44	5.433	0.127	0.453	S
G4		5.45	5.44	5.422	0.134	0.211	S
G1	Cond µS/cm	6.2	5.96	5.957	0.467	0.522	S
G2		8.2	7.9	7.869	0.528	0.627	S
G3		16.1	15.66	15.556	0.632	0.86	S
G4		17.4	17.15	16.944	0.548	0.831	S

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

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EMEP – 38th intercomparison of analytical methods

Laboratory 10, Air Quality Reference Centre (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⁻ mg S/l	0.201	0.18	0.179	0.009	2.517	Q
G2		0.216	0.205	0.201	0.009	1.611	S
G3		0.62	0.617	0.61	0.02	0.483	S
G4		0.515	0.499	0.492	0.019	1.223	S
G1	NH ₄ ⁺ mg N/l	0.052	0.06	0.061	0.014	-0.619	S
G2		0.165	0.172	0.171	0.013	-0.469	S
G3		0.286	0.296	0.297	0.015	-0.735	S
G4		0.339	0.344	0.345	0.018	-0.327	S
G1	NO ₃ ⁻ mg N/l	0.243	0.204	0.203	0.009	4.569	Q
G2		0.355	0.336	0.334	0.012	1.766	S
G3		0.52	0.489	0.486	0.017	1.971	S
G4		0.612	0.587	0.586	0.022	1.165	S
G1	Na ⁺ mg/l	0.265	0.254	0.25	0.011	1.404	S
G2		0.328	0.326	0.314	0.014	1.031	S
G3		0.859	0.848	0.835	0.04	0.6	S
G4		1.043	1.1	1.069	0.055	-0.468	S
G1	Mg ²⁺ mg/l	0.07	0.072	0.07	0.008	-0.042	S
G2		0.079	0.083	0.08	0.006	-0.144	S
G3		0.25	0.258	0.256	0.014	-0.401	S
G4		0.199	0.206	0.202	0.011	-0.29	S
G1	Cl ⁻ mg/l	0.41	0.27	0.27	0.043	3.291	U
G2		0.427	0.386	0.374	0.026	2.054	S
G3		1.198	1.16	1.136	0.042	1.459	S
G4		1.548	1.54	1.512	0.072	0.504	S
G1	Ca ²⁺ mg/l	0.085	0.089	0.09	0.018	-0.263	S
G2		0.094	0.102	0.097	0.021	-0.154	S
G3		0.315	0.319	0.313	0.028	0.061	S
G4		0.222	0.255	0.245	0.024	-0.997	S
G1	K ⁺ mg/l	0.26	0.272	0.262	0.016	-0.117	S
G2		0.32	0.325	0.325	0.022	-0.215	S
G3		0.357	0.374	0.369	0.023	-0.526	S
G4		0.482	0.509	0.501	0.027	-0.71	S
G1	pH pH units	5.27	5.49	5.475	0.162	-1.265	U
G2		5.38	5.49	5.485	0.126	-0.832	Q
G3		5.34	5.44	5.433	0.127	-0.733	Q
G4		5.38	5.44	5.422	0.134	-0.311	S
G1	Cond µS/cm	6.24	5.96	5.957	0.467	0.608	S
G2		8.19	7.9	7.869	0.528	0.608	S
G3		16.05	15.66	15.556	0.632	0.781	S
G4		17.46	17.15	16.944	0.548	0.94	S

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EMEP – 38th 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⁻ mg S/l	0.18	0.18	0.179	0.009	0.063	S
G2		0.2	0.205	0.201	0.009	-0.157	S
G3		0.6	0.617	0.61	0.02	-0.499	S
G4		0.48	0.499	0.492	0.019	-0.661	S
G1	NH ₄ ⁺ mg N/l	< 0.040	0.06	0.061	0.014	-2.946	U
G2		0.17	0.172	0.171	0.013	-0.088	S
G3		0.33	0.296	0.297	0.015	2.13	S
G4		0.39	0.344	0.345	0.018	2.467	S
G1	NO ₃ ⁻ mg N/l	0.2	0.204	0.203	0.009	-0.316	S
G2		0.33	0.336	0.334	0.012	-0.333	S
G3		0.48	0.489	0.486	0.017	-0.379	S
G4		0.58	0.587	0.586	0.022	-0.294	S
G1	Na ⁺ mg/l	0.24	0.254	0.25	0.011	-0.882	S
G2		0.3	0.326	0.314	0.014	-1.022	S
G3		0.8	0.848	0.835	0.04	-0.893	S
G4		1.03	1.1	1.069	0.055	-0.706	S
G1	Mg ²⁺ mg/l	0.059	0.072	0.07	0.008	-1.5	Q
G2		0.07	0.083	0.08	0.006	-1.626	Q
G3		0.251	0.258	0.256	0.014	-0.328	S
G4		0.198	0.206	0.202	0.011	-0.381	S
G1	Cl ⁻ mg/l	0.25	0.27	0.27	0.043	-0.458	S
G2		0.36	0.386	0.374	0.026	-0.565	S
G3		1.13	1.16	1.136	0.042	-0.146	S
G4		1.49	1.54	1.512	0.072	-0.302	S
G1	Ca ²⁺ mg/l	0.09	0.089	0.09	0.018	0.012	S
G2		0.09	0.102	0.097	0.021	-0.341	S
G3		0.3	0.319	0.313	0.028	-0.466	S
G4		0.23	0.255	0.245	0.024	-0.657	S
G1	K ⁺ mg/l	0.26	0.272	0.262	0.016	-0.117	S
G2		0.32	0.325	0.325	0.022	-0.215	S
G3		0.37	0.374	0.369	0.023	0.044	S
G4		0.51	0.509	0.501	0.027	0.336	S
G1	pH pH units	5.51	5.49	5.475	0.162	0.214	S
G2		5.52	5.49	5.485	0.126	0.278	S
G3		5.48	5.44	5.433	0.127	0.374	S
G4		5.44	5.44	5.422	0.134	0.136	S
G1	Cond µS/cm	6.1	5.96	5.957	0.467	0.308	S
G2		7.9	7.9	7.869	0.528	0.059	S
G3		15.5	15.66	15.556	0.632	-0.089	S
G4		16.7	17.15	16.944	0.548	-0.446	S

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EMEP – 38th 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⁻ mg S/l	0.184	0.18	0.179	0.009	0.531	S
G2		0.206	0.205	0.201	0.009	0.506	S
G3		0.629	0.617	0.61	0.02	0.926	S
G4		0.501	0.499	0.492	0.019	0.469	S
G1	NH ₄ ⁺ mg N/l	0.067	0.06	0.061	0.014	0.471	S
G2		0.177	0.172	0.171	0.013	0.446	S
G3		0.307	0.296	0.297	0.015	0.632	S
G4		0.378	0.344	0.345	0.018	1.81	S
G1	NO ₃ ⁻ mg N/l	0.211	0.204	0.203	0.009	0.934	S
G2		0.337	0.336	0.334	0.012	0.255	S
G3		0.492	0.489	0.486	0.017	0.326	S
G4		0.591	0.587	0.586	0.022	0.207	S
G1	Na ⁺ mg/l	0.251	0.254	0.25	0.011	0.124	S
G2		0.318	0.326	0.314	0.014	0.298	S
G3		0.875	0.848	0.835	0.04	1.005	S
G4		1.135	1.1	1.069	0.055	1.217	S
G1	Mg ²⁺ mg/l	0.068	0.072	0.07	0.008	-0.307	S
G2		0.074	0.083	0.08	0.006	-0.967	S
G3		0.261	0.258	0.256	0.014	0.4	S
G4		0.206	0.206	0.202	0.011	0.35	S
G1	Cl ⁻ mg/l	0.289	0.27	0.27	0.043	0.456	S
G2		0.389	0.386	0.374	0.026	0.568	S
G3		1.18	1.16	1.136	0.042	1.034	S
G4		1.53	1.54	1.512	0.072	0.254	S
G1	Ca ²⁺ mg/l	0.079	0.089	0.09	0.018	-0.594	S
G2		0.083	0.102	0.097	0.021	-0.67	Q
G3		0.287	0.319	0.313	0.028	-0.924	S
G4		0.228	0.255	0.245	0.024	-0.742	S
G1	K ⁺ mg/l	0.282	0.272	0.262	0.016	1.269	S
G2		0.355	0.325	0.325	0.022	1.354	S
G3		0.405	0.374	0.369	0.023	1.578	S
G4		0.538	0.509	0.501	0.027	1.381	S
G1	pH pH units	5.37	5.49	5.475	0.162	-0.649	Q
G2		5.43	5.49	5.485	0.126	-0.435	S
G3		5.44	5.44	5.433	0.127	0.057	S
G4		5.39	5.44	5.422	0.134	-0.237	S
G1	Cond µS/cm	9.7	5.96	5.957	0.467	8.025	U
G2		10	7.9	7.869	0.528	4.034	U
G3		14.1	15.66	15.556	0.632	-2.304	S
G4		17.2	17.15	16.944	0.548	0.466	S

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* Z score is unitless

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

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

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

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EMEP – 38th 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⁻ mg S/l	0.179	0.18	0.179	0.009	-0.054	S
G2		0.203	0.205	0.201	0.009	0.175	S
G3		0.614	0.617	0.61	0.02	0.189	S
G4		0.503	0.499	0.492	0.019	0.577	S
G1	NH ₄ ⁺ mg N/l	0.065	0.06	0.061	0.014	0.326	S
G2		0.178	0.172	0.171	0.013	0.522	S
G3		0.301	0.296	0.297	0.015	0.242	S
G4		0.341	0.344	0.345	0.018	-0.217	S
G1	NO ₃ ⁻ mg N/l	0.208	0.204	0.203	0.009	0.593	S
G2		0.343	0.336	0.334	0.012	0.758	S
G3		0.488	0.489	0.486	0.017	0.091	S
G4		0.589	0.587	0.586	0.022	0.116	S
G1	Na ⁺ mg/l	0.25	0.254	0.25	0.011	0.032	S
G2		0.312	0.326	0.314	0.014	-0.142	S
G3		0.86	0.848	0.835	0.04	0.626	S
G4		1.103	1.1	1.069	0.055	0.631	S
G1	Mg ²⁺ mg/l	0.073	0.072	0.07	0.008	0.356	S
G2		0.082	0.083	0.08	0.006	0.35	S
G3		0.266	0.258	0.256	0.014	0.763	S
G4		0.21	0.206	0.202	0.011	0.715	S
G1	Cl ⁻ mg/l	0.268	0.27	0.27	0.043	-0.037	S
G2		0.384	0.386	0.374	0.026	0.373	S
G3		1.129	1.16	1.136	0.042	-0.17	S
G4		1.507	1.54	1.512	0.072	-0.066	S
G1	Ca ²⁺ mg/l	0.087	0.089	0.09	0.018	-0.153	S
G2		0.097	0.102	0.097	0.021	-0.013	S
G3		0.319	0.319	0.313	0.028	0.202	S
G4		0.251	0.255	0.245	0.024	0.235	S
G1	K ⁺ mg/l	0.275	0.272	0.262	0.016	0.828	S
G2		0.333	0.325	0.325	0.022	0.368	S
G3		0.37	0.374	0.369	0.023	0.044	S
G4		0.527	0.509	0.501	0.027	0.971	S
G1	pH pH units	5.49	5.49	5.475	0.162	0.09	S
G2		5.42	5.49	5.485	0.126	-0.515	S
G3		5.35	5.44	5.433	0.127	-0.654	S
G4		5.31	5.44	5.422	0.134	-0.833	Q
G1	Cond µS/cm	5.76	5.96	5.957	0.467	-0.421	S
G2		7.9	7.9	7.869	0.528	0.059	S
G3		15.54	15.66	15.556	0.632	-0.026	S
G4		16.92	17.15	16.944	0.548	-0.044	S

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EMEP – 38th intercomparison of analytical methods

Laboratory 18, National Environment Protection Agency (Romania)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.17	0.18	0.179	0.009	-1.106	S
G2		0.198	0.205	0.201	0.009	-0.378	S
G3		0.63	0.617	0.61	0.02	0.975	S
G4		0.528	0.499	0.492	0.019	1.923	S
G1	NH ₄ ⁺ mg N/l	-999	0.06	0.061	0.014		B
G2		-999	0.172	0.171	0.013		B
G3		-999	0.296	0.297	0.015		B
G4		-999	0.344	0.345	0.018		B
G1	NO ₃ ⁻ mg N/l	0.198	0.204	0.203	0.009	-0.543	S
G2		0.333	0.336	0.334	0.012	-0.081	S
G3		0.471	0.489	0.486	0.017	-0.908	S
G4		0.586	0.587	0.586	0.022	-0.021	S
G1	Na ⁺ mg/l	-999	0.254	0.25	0.011		B
G2		-999	0.326	0.314	0.014		B
G3		-999	0.848	0.835	0.04		B
G4		-999	1.1	1.069	0.055		B
G1	Mg ²⁺ mg/l	-999	0.072	0.07	0.008		B
G2		-999	0.083	0.08	0.006		B
G3		-999	0.258	0.256	0.014		B
G4		-999	0.206	0.202	0.011		B
G1	Cl ⁻ mg/l	0.281	0.27	0.27	0.043	0.268	S
G2		0.383	0.386	0.374	0.026	0.334	S
G3		1.081	1.16	1.136	0.042	-1.302	S
G4		1.492	1.54	1.512	0.072	-0.274	S
G1	Ca ²⁺ mg/l	-999	0.089	0.09	0.018		B
G2		-999	0.102	0.097	0.021		B
G3		-999	0.319	0.313	0.028		B
G4		-999	0.255	0.245	0.024		B
G1	K ⁺ mg/l	-999	0.272	0.262	0.016		B
G2		-999	0.325	0.325	0.022		B
G3		-999	0.374	0.369	0.023		B
G4		-999	0.509	0.501	0.027		B
G1	pH pH units	-999	5.49	5.475	0.162		B
G2		-999	5.49	5.485	0.126		B
G3		-999	5.44	5.433	0.127		B
G4		-999	5.44	5.422	0.134		B
G1	Cond µS/cm	-999	5.96	5.957	0.467		B
G2		-999	7.9	7.869	0.528		B
G3		-999	15.66	15.556	0.632		B
G4		-999	17.15	16.944	0.548		B

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EMEP – 38th 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⁻ mg S/l	0.17	0.18	0.179	0.009	-1.106	S
G2		0.2	0.205	0.201	0.009	-0.157	S
G3		0.59	0.617	0.61	0.02	-0.991	S
G4		0.47	0.499	0.492	0.019	-1.2	S
G1	NH ₄ ⁺ mg N/l	0.08	0.06	0.061	0.014	1.417	U
G2		0.193	0.172	0.171	0.013	1.666	S
G3		0.341	0.296	0.297	0.015	2.847	Q
G4		0.4	0.344	0.345	0.018	3.015	Q
G1	NO ₃ ⁻ mg N/l	0.2	0.204	0.203	0.009	-0.316	S
G2		0.32	0.336	0.334	0.012	-1.173	S
G3		0.47	0.489	0.486	0.017	-0.966	S
G4		0.57	0.587	0.586	0.022	-0.75	S
G1	Na ⁺ mg/l	0.24	0.254	0.25	0.011	-0.882	S
G2		0.3	0.326	0.314	0.014	-1.022	S
G3		0.82	0.848	0.835	0.04	-0.387	S
G4		1.02	1.1	1.069	0.055	-0.889	S
G1	Mg ²⁺ mg/l	0.08	0.072	0.07	0.008	1.284	S
G2		0.08	0.083	0.08	0.006	0.02	S
G3		0.25	0.258	0.256	0.014	-0.401	S
G4		0.2	0.206	0.202	0.011	-0.199	S
G1	Cl ⁻ mg/l	< 0.300	0.27	0.27	0.043		B
G2		0.38	0.386	0.374	0.026	0.217	S
G3		1.04	1.16	1.136	0.042	-2.27	S
G4		1.37	1.54	1.512	0.072	-1.969	S
G1	Ca ²⁺ mg/l	< 0.100	0.089	0.09	0.018		B
G2		< 0.100	0.102	0.097	0.021	-2.218	U
G3		0.31	0.319	0.313	0.028	-0.115	S
G4		0.24	0.255	0.245	0.024	-0.232	S
G1	K ⁺ mg/l	0.27	0.272	0.262	0.016	0.513	S
G2		0.33	0.325	0.325	0.022	0.233	S
G3		0.38	0.374	0.369	0.023	0.482	S
G4		0.52	0.509	0.501	0.027	0.709	S
G1	pH pH units	5.34	5.49	5.475	0.162	-0.834	Q
G2		5.33	5.49	5.485	0.126	-1.228	Q
G3		5.32	5.44	5.433	0.127	-0.891	Q
G4		5.32	5.44	5.422	0.134	-0.758	Q
G1	Cond µS/cm	6.3	5.96	5.957	0.467	0.736	S
G2		8.4	7.9	7.869	0.528	1.006	S
G3		15.9	15.66	15.556	0.632	0.544	S
G4		17.2	17.15	16.944	0.548	0.466	S

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

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EMEP – 38th 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⁻ mg S/l	0.181	0.18	0.179	0.009	0.18	S
G2		0.204	0.205	0.201	0.009	0.285	S
G3		0.603	0.617	0.61	0.02	-0.352	S
G4		0.491	0.499	0.492	0.019	-0.069	S
G1	NH ₄ ⁺ mg N/l	0.06	0.06	0.061	0.014	-0.038	S
G2		0.172	0.172	0.171	0.013	0.065	S
G3		0.29	0.296	0.297	0.015	-0.475	S
G4		0.341	0.344	0.345	0.018	-0.217	S
G1	NO ₃ ⁻ mg N/l	0.207	0.204	0.203	0.009	0.48	S
G2		0.332	0.336	0.334	0.012	-0.165	S
G3		0.477	0.489	0.486	0.017	-0.555	S
G4		0.574	0.587	0.586	0.022	-0.568	S
G1	Na ⁺ mg/l	0.23	0.254	0.25	0.011	-1.797	S
G2		0.296	0.326	0.314	0.014	-1.315	S
G3		0.798	0.848	0.835	0.04	-0.943	S
G4		1.02	1.1	1.069	0.055	-0.889	S
G1	Mg ²⁺ mg/l	0.072	0.072	0.07	0.008	0.223	S
G2		0.08	0.083	0.08	0.006	0.02	S
G3		0.255	0.258	0.256	0.014	-0.037	S
G4		0.201	0.206	0.202	0.011	-0.107	S
G1	Cl ⁻ mg/l	0.263	0.27	0.27	0.043	-0.154	S
G2		0.376	0.386	0.374	0.026	0.06	S
G3		1.12	1.16	1.136	0.042	-0.382	S
G4		1.49	1.54	1.512	0.072	-0.302	S
G1	Ca ²⁺ mg/l	0.087	0.089	0.09	0.018	-0.153	S
G2		0.098	0.102	0.097	0.021	0.034	S
G3		0.311	0.319	0.313	0.028	-0.079	S
G4		0.248	0.255	0.245	0.024	0.107	S
G1	K ⁺ mg/l	0.246	0.272	0.262	0.016	-0.998	S
G2		0.307	0.325	0.325	0.022	-0.798	S
G3		0.358	0.374	0.369	0.023	-0.482	S
G4		0.49	0.509	0.501	0.027	-0.412	S
G1	pH pH units	5.54	5.49	5.475	0.162	0.398	S
G2		5.52	5.49	5.485	0.126	0.278	S
G3		5.46	5.44	5.433	0.127	0.216	S
G4		5.48	5.44	5.422	0.134	0.434	S
G1	Cond µS/cm	5.7	5.96	5.957	0.467	-0.55	S
G2		8	7.9	7.869	0.528	0.249	S
G3		15.4	15.66	15.556	0.632	-0.247	S
G4		16.8	17.15	16.944	0.548	-0.263	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 more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 38th intercomparison of analytical methods

Laboratory 21, Swiss Federal Laboratories for Materials Science and Technology (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⁻ mg S/l	0.182	0.18	0.179	0.009	0.297	S
G2		0.211	0.205	0.201	0.009	1.059	S
G3		0.624	0.617	0.61	0.02	0.68	S
G4		0.501	0.499	0.492	0.019	0.469	S
G1	NH ₄ ⁺ mg N/l	0.061	0.06	0.061	0.014	0.035	S
G2		0.168	0.172	0.171	0.013	-0.24	S
G3		0.295	0.296	0.297	0.015	-0.149	S
G4		0.34	0.344	0.345	0.018	-0.272	S
G1	NO ₃ ⁻ mg N/l	0.21	0.204	0.203	0.009	0.82	S
G2		0.344	0.336	0.334	0.012	0.842	S
G3		0.496	0.489	0.486	0.017	0.561	S
G4		0.592	0.587	0.586	0.022	0.253	S
G1	Na ⁺ mg/l	0.244	0.254	0.25	0.011	-0.516	S
G2		0.313	0.326	0.314	0.014	-0.069	S
G3		0.833	0.848	0.835	0.04	-0.058	S
G4		1.087	1.1	1.069	0.055	0.338	S
G1	Mg ²⁺ mg/l	0.074	0.072	0.07	0.008	0.489	S
G2		0.084	0.083	0.08	0.006	0.679	S
G3		0.266	0.258	0.256	0.014	0.763	S
G4		0.213	0.206	0.202	0.011	0.99	S
G1	Cl ⁻ mg/l	0.268	0.27	0.27	0.043	-0.037	S
G2		0.384	0.386	0.374	0.026	0.373	S
G3		1.144	1.16	1.136	0.042	0.184	S
G4		1.514	1.54	1.512	0.072	0.031	S
G1	Ca ²⁺ mg/l	0.082	0.089	0.09	0.018	-0.429	S
G2		0.094	0.102	0.097	0.021	-0.154	S
G3		0.295	0.319	0.313	0.028	-0.642	S
G4		0.243	0.255	0.245	0.024	-0.105	S
G1	K ⁺ mg/l	0.278	0.272	0.262	0.016	1.017	S
G2		0.347	0.325	0.325	0.022	0.995	S
G3		0.387	0.374	0.369	0.023	0.789	S
G4		0.531	0.509	0.501	0.027	1.12	S
G1	pH pH units	5.39	5.49	5.475	0.162	-0.526	Q
G2		5.46	5.49	5.485	0.126	-0.197	S
G3		5.44	5.44	5.433	0.127	0.057	S
G4		5.44	5.44	5.422	0.134	0.136	S
G1	Cond μS/cm	6.081	5.96	5.957	0.467	0.267	S
G2		7.842	7.9	7.869	0.528	-0.05	S
G3		15.53	15.66	15.556	0.632	-0.042	S
G4		16.86	17.15	16.944	0.548	-0.154	S

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

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EMEP – 38th 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⁻ mg S/l	0.182	0.18	0.179	0.009	0.297	S
G2		0.214	0.205	0.201	0.009	1.39	S
G3		0.685	0.617	0.61	0.02	3.677	Q
G4		0.527	0.499	0.492	0.019	1.869	S
G1	NH ₄ ⁺ mg N/l	0.06	0.06	0.061	0.014	-0.038	S
G2		0.14	0.172	0.171	0.013	-2.375	Q
G3		0.287	0.296	0.297	0.015	-0.67	S
G4		0.3	0.344	0.345	0.018	-2.464	S
G1	NO ₃ ⁻ mg N/l	0.21	0.204	0.203	0.009	0.82	S
G2		0.352	0.336	0.334	0.012	1.514	S
G3		0.521	0.489	0.486	0.017	2.029	S
G4		0.64	0.587	0.586	0.022	2.442	S
G1	Na ⁺ mg/l	0.285	0.254	0.25	0.011	3.233	S
G2		0.499	0.326	0.314	0.014	13.572	U
G3		0.901	0.848	0.835	0.04	1.663	S
G4		1.139	1.1	1.069	0.055	1.29	S
G1	Mg ²⁺ mg/l	0.046	0.072	0.07	0.008	-3.224	U
G2		0.083	0.083	0.08	0.006	0.514	S
G3		0.262	0.258	0.256	0.014	0.472	S
G4		0.251	0.206	0.202	0.011	4.463	Q
G1	Cl ⁻ mg/l	0.116	0.27	0.27	0.043	-3.599	U
G2		0.278	0.386	0.374	0.026	-3.77	U
G3		1.216	1.16	1.136	0.042	1.883	S
G4		1.695	1.54	1.512	0.072	2.545	S
G1	Ca ²⁺ mg/l	0.091	0.089	0.09	0.018	0.067	S
G2		0.146	0.102	0.097	0.021	2.286	U
G3		0.389	0.319	0.313	0.028	2.666	Q
G4		0.364	0.255	0.245	0.024	5.036	U
G1	K ⁺ mg/l	0.221	0.272	0.262	0.016	-2.573	Q
G2		0.291	0.325	0.325	0.022	-1.515	S
G3		0.397	0.374	0.369	0.023	1.227	S
G4		0.828	0.509	0.501	0.027	12.214	U
G1	pH pH units	5.63	5.49	5.475	0.162	0.953	Q
G2		5.59	5.49	5.485	0.126	0.834	S
G3		5.58	5.44	5.433	0.127	1.164	Q
G4		5.58	5.44	5.422	0.134	1.179	Q
G1	Cond μS/cm	7.39	5.96	5.957	0.467	3.073	Q
G2		8.69	7.9	7.869	0.528	1.554	S
G3		15.67	15.66	15.556	0.632	0.18	S
G4		16.7	17.15	16.944	0.548	-0.446	S

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

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EMEP – 38th 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⁻ mg S/l	0.165	0.18	0.179	0.009	-1.69	S
G2		0.187	0.205	0.201	0.009	-1.593	S
G3		0.563	0.617	0.61	0.02	-2.317	S
G4		0.456	0.499	0.492	0.019	-1.954	S
G1	NH ₄ ⁺ mg N/l	0.037	0.06	0.061	0.014	-1.688	U
G2		0.153	0.172	0.171	0.013	-1.384	S
G3		0.27	0.296	0.297	0.015	-1.777	S
G4		0.311	0.344	0.345	0.018	-1.861	S
G1	NO ₃ ⁻ mg N/l	0.2	0.204	0.203	0.009	-0.316	S
G2		0.331	0.336	0.334	0.012	-0.249	S
G3		0.477	0.489	0.486	0.017	-0.555	S
G4		0.577	0.587	0.586	0.022	-0.431	S
G1	Na ⁺ mg/l	0.202	0.254	0.25	0.011	-4.357	Q
G2		0.266	0.326	0.314	0.014	-3.515	Q
G3		0.776	0.848	0.835	0.04	-1.5	S
G4		1.01	1.1	1.069	0.055	-1.072	S
G1	Mg ²⁺ mg/l	0.051	0.072	0.07	0.008	-2.561	U
G2		0.057	0.083	0.08	0.006	-3.766	U
G3		0.19	0.258	0.256	0.014	-4.766	U
G4		0.147	0.206	0.202	0.011	-5.043	U
G1	Cl ⁻ mg/l	0.254	0.27	0.27	0.043	-0.365	S
G2		0.361	0.386	0.374	0.026	-0.526	S
G3		1.1	1.16	1.136	0.042	-0.854	S
G4		1.47	1.54	1.512	0.072	-0.58	S
G1	Ca ²⁺ mg/l	0.075	0.089	0.09	0.018	-0.815	Q
G2		0.087	0.102	0.097	0.021	-0.482	S
G3		0.219	0.319	0.313	0.028	-3.317	U
G4		0.173	0.255	0.245	0.024	-3.079	U
G1	K ⁺ mg/l	0.214	0.272	0.262	0.016	-3.014	Q
G2		0.272	0.325	0.325	0.022	-2.367	Q
G3		0.307	0.374	0.369	0.023	-2.716	Q
G4		0.432	0.509	0.501	0.027	-2.578	Q
G1	pH pH units	5.14	5.49	5.475	0.162	-2.066	U
G2		5.35	5.49	5.485	0.126	-1.07	Q
G3		5.4	5.44	5.433	0.127	-0.259	S
G4		5.47	5.44	5.422	0.134	0.36	S
G1	Cond µS/cm	5.85	5.96	5.957	0.467	-0.228	S
G2		7.58	7.9	7.869	0.528	-0.546	S
G3		15.13	15.66	15.556	0.632	-0.675	S
G4		16.83	17.15	16.944	0.548	-0.209	S

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

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EMEP – 38th 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⁻ mg S/l	-999	0.18	0.179	0.009		B
G2		-999	0.205	0.201	0.009		B
G3		0.603	0.617	0.61	0.02	-0.352	S
G4		0.489	0.499	0.492	0.019	-0.177	S
G1	NH ₄ ⁺ mg N/l	-999	0.06	0.061	0.014		B
G2		-999	0.172	0.171	0.013		B
G3		0.302	0.296	0.297	0.015	0.307	S
G4		0.352	0.344	0.345	0.018	0.385	S
G1	NO ₃ ⁻ mg N/l	-999	0.204	0.203	0.009		B
G2		-999	0.336	0.334	0.012		B
G3		0.477	0.489	0.486	0.017	-0.555	S
G4		0.574	0.587	0.586	0.022	-0.568	S
G1	Na ⁺ mg/l	-999	0.254	0.25	0.011		B
G2		-999	0.326	0.314	0.014		B
G3		0.858	0.848	0.835	0.04	0.575	S
G4		1.119	1.1	1.069	0.055	0.924	S
G1	Mg ²⁺ mg/l	-999	0.072	0.07	0.008		B
G2		-999	0.083	0.08	0.006		B
G3		0.218	0.258	0.256	0.014	-2.729	Q
G4		0.176	0.206	0.202	0.011	-2.392	S
G1	Cl ⁻ mg/l	-999	0.27	0.27	0.043		B
G2		-999	0.386	0.374	0.026		B
G3		1.16	1.16	1.136	0.042	0.562	S
G4		1.53	1.54	1.512	0.072	0.254	S
G1	Ca ²⁺ mg/l	-999	0.089	0.09	0.018		B
G2		-999	0.102	0.097	0.021		B
G3		-999	0.319	0.313	0.028		B
G4		-999	0.255	0.245	0.024		B
G1	K ⁺ mg/l	-999	0.272	0.262	0.016		B
G2		-999	0.325	0.325	0.022		B
G3		0.382	0.374	0.369	0.023	0.57	S
G4		0.523	0.509	0.501	0.027	0.821	S
G1	pH pH units	-999	5.49	5.475	0.162		B
G2		-999	5.49	5.485	0.126		B
G3		-999	5.44	5.433	0.127		B
G4		-999	5.44	5.422	0.134		B
G1	Cond µS/cm	-999	5.96	5.957	0.467		B
G2		-999	7.9	7.869	0.528		B
G3		-999	15.66	15.556	0.632		B
G4		-999	17.15	16.944	0.548		B

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

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

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

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

EMEP – 38th 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⁻ mg S/l	0.178	0.18	0.179	0.009	-0.171	S
G2		0.204	0.205	0.201	0.009	0.285	S
G3		0.626	0.617	0.61	0.02	0.778	S
G4		0.511	0.499	0.492	0.019	1.008	S
G1	NH ₄ ⁺ mg N/l	0.058	0.06	0.061	0.014	-0.183	S
G2		0.173	0.172	0.171	0.013	0.141	S
G3		0.299	0.296	0.297	0.015	0.111	S
G4		0.352	0.344	0.345	0.018	0.385	S
G1	NO ₃ ⁻ mg N/l	0.213	0.204	0.203	0.009	1.161	S
G2		0.349	0.336	0.334	0.012	1.262	S
G3		0.496	0.489	0.486	0.017	0.561	S
G4		0.585	0.587	0.586	0.022	-0.066	S
G1	Na ⁺ mg/l	0.25	0.254	0.25	0.011	0.032	S
G2		0.315	0.326	0.314	0.014	0.078	S
G3		0.824	0.848	0.835	0.04	-0.285	S
G4		1.056	1.1	1.069	0.055	-0.23	S
G1	Mg ²⁺ mg/l	0.073	0.072	0.07	0.008	0.356	S
G2		0.084	0.083	0.08	0.006	0.679	S
G3		0.266	0.258	0.256	0.014	0.763	S
G4		0.211	0.206	0.202	0.011	0.807	S
G1	Cl ⁻ mg/l	0.278	0.27	0.27	0.043	0.198	S
G2		0.393	0.386	0.374	0.026	0.725	S
G3		1.157	1.16	1.136	0.042	0.491	S
G4		1.557	1.54	1.512	0.072	0.629	S
G1	Ca ²⁺ mg/l	0.091	0.089	0.09	0.018	0.067	S
G2		0.099	0.102	0.097	0.021	0.081	S
G3		0.318	0.319	0.313	0.028	0.167	S
G4		0.251	0.255	0.245	0.024	0.235	S
G1	K ⁺ mg/l	0.272	0.272	0.262	0.016	0.639	S
G2		0.333	0.325	0.325	0.022	0.368	S
G3		0.375	0.374	0.369	0.023	0.263	S
G4		0.503	0.509	0.501	0.027	0.074	S
G1	pH pH units	5.4	5.49	5.475	0.162	-0.464	S
G2		5.4	5.49	5.485	0.126	-0.673	S
G3		5.39	5.44	5.433	0.127	-0.338	S
G4		5.39	5.44	5.422	0.134	-0.237	S
G1	Cond µS/cm	6	5.96	5.957	0.467	0.093	S
G2		7.9	7.9	7.869	0.528	0.059	S
G3		15.7	15.66	15.556	0.632	0.227	S
G4		17.2	17.15	16.944	0.548	0.466	S

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* Z score is unitless

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

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

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 38th 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⁻ mg S/l	0.191	0.18	0.179	0.009	1.349	S
G2		0.215	0.205	0.201	0.009	1.501	S
G3		0.626	0.617	0.61	0.02	0.778	S
G4		0.497	0.499	0.492	0.019	0.254	S
G1	NH ₄ ⁺ mg N/l	0.105	0.06	0.061	0.014	3.234	U
G2		0.186	0.172	0.171	0.013	1.132	S
G3		0.326	0.296	0.297	0.015	1.87	S
G4		0.375	0.344	0.345	0.018	1.645	S
G1	NO ₃ ⁻ mg N/l	0.208	0.204	0.203	0.009	0.593	S
G2		0.338	0.336	0.334	0.012	0.339	S
G3		0.496	0.489	0.486	0.017	0.561	S
G4		0.594	0.587	0.586	0.022	0.344	S
G1	Na ⁺ mg/l	0.252	0.254	0.25	0.011	0.215	S
G2		0.334	0.326	0.314	0.014	1.471	S
G3		0.926	0.848	0.835	0.04	2.296	S
G4		1.174	1.1	1.069	0.055	1.931	S
G1	Mg ²⁺ mg/l	0.08	0.072	0.07	0.008	1.284	S
G2		0.091	0.083	0.08	0.006	1.831	S
G3		0.286	0.258	0.256	0.014	2.219	S
G4		0.221	0.206	0.202	0.011	1.721	S
G1	Cl ⁻ mg/l	0.268	0.27	0.27	0.043	-0.037	S
G2		0.384	0.386	0.374	0.026	0.373	S
G3		1.249	1.16	1.136	0.042	2.662	S
G4		1.62	1.54	1.512	0.072	1.504	S
G1	Ca ²⁺ mg/l	0.102	0.089	0.09	0.018	0.674	S
G2		0.114	0.102	0.097	0.021	0.785	S
G3		0.351	0.319	0.313	0.028	1.328	S
G4		0.279	0.255	0.245	0.024	1.424	S
G1	K ⁺ mg/l	0.278	0.272	0.262	0.016	1.017	S
G2		0.348	0.325	0.325	0.022	1.04	S
G3		0.443	0.374	0.369	0.023	3.243	Q
G4		0.522	0.509	0.501	0.027	0.784	S
G1	pH pH units	5.34	5.49	5.475	0.162	-0.834	Q
G2		5.31	5.49	5.485	0.126	-1.387	Q
G3		5.37	5.44	5.433	0.127	-0.496	S
G4		5.29	5.44	5.422	0.134	-0.982	Q
G1	Cond µS/cm	5.47	5.96	5.957	0.467	-1.043	S
G2		6.97	7.9	7.869	0.528	-1.701	S
G3		13.7	15.66	15.556	0.632	-2.937	S
G4		14.7	17.15	16.944	0.548	-4.093	S

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

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 38th 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⁻ mg S/l	0.174	0.18	0.179	0.009	-0.638	S
G2		0.198	0.205	0.201	0.009	-0.378	S
G3		0.604	0.617	0.61	0.02	-0.303	S
G4		0.482	0.499	0.492	0.019	-0.554	S
G1	NH ₄ ⁺ mg N/l	0.057	0.06	0.061	0.014	-0.256	S
G2		0.17	0.172	0.171	0.013	-0.088	S
G3		0.291	0.296	0.297	0.015	-0.41	S
G4		0.341	0.344	0.345	0.018	-0.217	S
G1	NO ₃ ⁻ mg N/l	0.203	0.204	0.203	0.009	0.025	S
G2		0.331	0.336	0.334	0.012	-0.249	S
G3		0.491	0.489	0.486	0.017	0.267	S
G4		0.58	0.587	0.586	0.022	-0.294	S
G1	Na ⁺ mg/l	0.237	0.254	0.25	0.011	-1.156	S
G2		0.305	0.326	0.314	0.014	-0.655	S
G3		0.821	0.848	0.835	0.04	-0.361	S
G4		1.066	1.1	1.069	0.055	-0.047	S
G1	Mg ²⁺ mg/l	0.059	0.072	0.07	0.008	-1.5	Q
G2		0.068	0.083	0.08	0.006	-1.955	Q
G3		0.251	0.258	0.256	0.014	-0.328	S
G4		0.193	0.206	0.202	0.011	-0.838	S
G1	Cl ⁻ mg/l	0.263	0.27	0.27	0.043	-0.154	S
G2		0.37	0.386	0.374	0.026	-0.174	S
G3		1.129	1.16	1.136	0.042	-0.17	S
G4		1.464	1.54	1.512	0.072	-0.663	S
G1	Ca ²⁺ mg/l	0.075	0.089	0.09	0.018	-0.815	Q
G2		0.079	0.102	0.097	0.021	-0.857	Q
G3		0.327	0.319	0.313	0.028	0.484	S
G4		0.235	0.255	0.245	0.024	-0.445	S
G1	K ⁺ mg/l	0.244	0.272	0.262	0.016	-1.124	S
G2		0.31	0.325	0.325	0.022	-0.663	S
G3		0.351	0.374	0.369	0.023	-0.788	S
G4		0.489	0.509	0.501	0.027	-0.449	S
G1	pH pH units	5.72	5.49	5.475	0.162	1.507	U
G2		5.63	5.49	5.485	0.126	1.151	Q
G3		5.42	5.44	5.433	0.127	-0.101	S
G4		5.51	5.44	5.422	0.134	0.658	S
G1	Cond µS/cm	6.28	5.96	5.957	0.467	0.693	S
G2		8.47	7.9	7.869	0.528	1.138	S
G3		16.48	15.66	15.556	0.632	1.462	S
G4		17.81	17.15	16.944	0.548	1.579	S

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Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 38th intercomparison of analytical methods

Laboratory 32, Center for Physical Sciences and Technology (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⁻ mg S/l	0.189	0.18	0.179	0.009	1.115	S
G2		0.204	0.205	0.201	0.009	0.285	S
G3		0.599	0.617	0.61	0.02	-0.548	S
G4		0.477	0.499	0.492	0.019	-0.823	S
G1	NH ₄ ⁺ mg N/l	0.065	0.06	0.061	0.014	0.326	S
G2		0.175	0.172	0.171	0.013	0.293	S
G3		0.308	0.296	0.297	0.015	0.698	S
G4		0.344	0.344	0.345	0.018	-0.053	S
G1	NO ₃ ⁻ mg N/l	0.195	0.204	0.203	0.009	-0.884	S
G2		0.339	0.336	0.334	0.012	0.422	S
G3		0.477	0.489	0.486	0.017	-0.555	S
G4		0.589	0.587	0.586	0.022	0.116	S
G1	Na ⁺ mg/l	0.24	0.254	0.25	0.011	-0.882	S
G2		0.32	0.326	0.314	0.014	0.445	S
G3		0.835	0.848	0.835	0.04	-0.007	S
G4		1.08	1.1	1.069	0.055	0.21	S
G1	Mg ²⁺ mg/l	0.067	0.072	0.07	0.008	-0.44	S
G2		0.081	0.083	0.08	0.006	0.185	S
G3		0.212	0.258	0.256	0.014	-3.165	Q
G4		0.183	0.206	0.202	0.011	-1.752	S
G1	Cl ⁻ mg/l	0.255	0.27	0.27	0.043	-0.341	S
G2		0.369	0.386	0.374	0.026	-0.213	S
G3		1.096	1.16	1.136	0.042	-0.948	S
G4		1.512	1.54	1.512	0.072	0.004	S
G1	Ca ²⁺ mg/l	0.114	0.089	0.09	0.018	1.336	U
G2		0.167	0.102	0.097	0.021	3.271	U
G3		0.271	0.319	0.313	0.028	-1.487	Q
G4		0.232	0.255	0.245	0.024	-0.572	S
G1	K ⁺ mg/l	0.255	0.272	0.262	0.016	-0.432	S
G2		0.355	0.325	0.325	0.022	1.354	S
G3		0.355	0.374	0.369	0.023	-0.613	S
G4		0.5	0.509	0.501	0.027	-0.038	S
G1	pH pH units	5.42	5.49	5.475	0.162	-0.341	S
G2		5.5	5.49	5.485	0.126	0.12	S
G3		5.48	5.44	5.433	0.127	0.374	S
G4		5.46	5.44	5.422	0.134	0.285	S
G1	Cond μS/cm	6.2	5.96	5.957	0.467	0.522	S
G2		8	7.9	7.869	0.528	0.249	S
G3		16	15.66	15.556	0.632	0.702	S
G4		17	17.15	16.944	0.548	0.101	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

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EMEP – 38th intercomparison of analytical methods

Laboratory 33, Latvian Environment, Geology and Meteorology 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⁻ mg S/l	0.14	0.18	0.179	0.009	-4.612	U
G2		0.19	0.205	0.201	0.009	-1.262	S
G3		0.593	0.617	0.61	0.02	-0.843	S
G4		0.495	0.499	0.492	0.019	0.146	S
G1	NH ₄ ⁺ mg N/l	0.046	0.06	0.061	0.014	-1.055	Q
G2		0.15	0.172	0.171	0.013	-1.613	S
G3		0.28	0.296	0.297	0.015	-1.126	S
G4		0.34	0.344	0.345	0.018	-0.272	S
G1	NO ₃ ⁻ mg N/l	0.186	0.204	0.203	0.009	-1.906	S
G2		0.339	0.336	0.334	0.012	0.422	S
G3		0.515	0.489	0.486	0.017	1.677	S
G4		0.65	0.587	0.586	0.022	2.898	Q
G1	Na ⁺ mg/l	0.268	0.254	0.25	0.011	1.679	S
G2		0.335	0.326	0.314	0.014	1.545	S
G3		0.916	0.848	0.835	0.04	2.043	S
G4		1.175	1.1	1.069	0.055	1.95	S
G1	Mg ²⁺ mg/l	0.061	0.072	0.07	0.008	-1.235	Q
G2		0.068	0.083	0.08	0.006	-1.955	Q
G3		0.253	0.258	0.256	0.014	-0.182	S
G4		0.208	0.206	0.202	0.011	0.533	S
G1	Cl ⁻ mg/l	0.273	0.27	0.27	0.043	0.081	S
G2		0.362	0.386	0.374	0.026	-0.487	S
G3		1.178	1.16	1.136	0.042	0.987	S
G4		1.8	1.54	1.512	0.072	4.004	Q
G1	Ca ²⁺ mg/l	0.082	0.089	0.09	0.018	-0.429	S
G2		0.108	0.102	0.097	0.021	0.503	S
G3		0.357	0.319	0.313	0.028	1.539	S
G4		0.274	0.255	0.245	0.024	1.212	S
G1	K ⁺ mg/l	0.257	0.272	0.262	0.016	-0.306	S
G2		0.322	0.325	0.325	0.022	-0.125	S
G3		0.379	0.374	0.369	0.023	0.438	S
G4		0.504	0.509	0.501	0.027	0.111	S
G1	pH pH units	5.6	5.49	5.475	0.162	0.768	Q
G2		5.6	5.49	5.485	0.126	0.913	Q
G3		5.6	5.44	5.433	0.127	1.322	Q
G4		5.8	5.44	5.422	0.134	2.818	U
G1	Cond μS/cm	6.31	5.96	5.957	0.467	0.758	S
G2		8.49	7.9	7.869	0.528	1.176	S
G3		16.14	15.66	15.556	0.632	0.924	S
G4		17.4	17.15	16.944	0.548	0.831	S

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

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

EMEP – 38th intercomparison of analytical methods

Laboratory 34, Ministry of Environment and Urbanisation (Turkey)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.21	0.18	0.179	0.009	3.569	Q
G2		0.22	0.205	0.201	0.009	2.053	S
G3		0.53	0.617	0.61	0.02	-3.939	Q
G4		0.44	0.499	0.492	0.019	-2.815	Q
G1	NH ₄ ⁺ mg N/l	0.09	0.06	0.061	0.014	2.144	U
G2		0.53	0.172	0.171	0.013	27.36	U
G3		0.22	0.296	0.297	0.015	-5.034	U
G4		0.27	0.344	0.345	0.018	-4.107	Q
G1	NO ₃ ⁻ mg N/l	0.17	0.204	0.203	0.009	-3.723	Q
G2		0.29	0.336	0.334	0.012	-3.692	Q
G3		0.43	0.489	0.486	0.017	-3.316	Q
G4		0.53	0.587	0.586	0.022	-2.574	S
G1	Na ⁺ mg/l	0.336	0.254	0.25	0.011	7.897	U
G2		0.429	0.326	0.314	0.014	8.416	U
G3		0.734	0.848	0.835	0.04	-2.553	S
G4		0.9	1.1	1.069	0.055	-3.087	Q
G1	Mg ²⁺ mg/l	0.075	0.072	0.07	0.008	0.608	S
G2		0.086	0.083	0.08	0.006	0.959	S
G3		0.267	0.258	0.256	0.014	0.8	S
G4		0.201	0.206	0.202	0.011	-0.089	S
G1	Cl ⁻ mg/l	0.69	0.27	0.27	0.043	9.853	U
G2		0.75	0.386	0.374	0.026	14.677	U
G3		1.21	1.16	1.136	0.042	1.742	S
G4		1.44	1.54	1.512	0.072	-0.996	S
G1	Ca ²⁺ mg/l	0.05	0.089	0.09	0.018	-2.216	U
G2		0.066	0.102	0.097	0.021	-1.463	U
G3		0.287	0.319	0.313	0.028	-0.934	S
G4		0.21	0.255	0.245	0.024	-1.49	Q
G1	K ⁺ mg/l	0.35	0.272	0.262	0.016	5.559	U
G2		0.458	0.325	0.325	0.022	5.949	U
G3		0.51	0.374	0.369	0.023	6.179	U
G4		0.675	0.509	0.501	0.027	6.503	U
G1	pH pH units	7.66	5.49	5.475	0.162	13.458	U
G2		7.01	5.49	5.485	0.126	12.096	U
G3		6.18	5.44	5.433	0.127	5.907	U
G4		6.06	5.44	5.422	0.134	4.756	U
G1	Cond μS/cm	6.7	5.96	5.957	0.467	1.594	S
G2		8.3	7.9	7.869	0.528	0.816	S
G3		16.2	15.66	15.556	0.632	1.019	S
G4		17.8	17.15	16.944	0.548	1.56	S

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

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EMEP – 38th 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⁻ mg S/l	0.188	0.18	0.179	0.009	0.998	S
G2		0.21	0.205	0.201	0.009	0.948	S
G3		0.629	0.617	0.61	0.02	0.926	S
G4		0.507	0.499	0.492	0.019	0.792	S
G1	NH ₄ ⁺ mg N/l	0.06	0.06	0.061	0.014	-0.038	S
G2		0.172	0.172	0.171	0.013	0.065	S
G3		0.294	0.296	0.297	0.015	-0.214	S
G4		0.346	0.344	0.345	0.018	0.057	S
G1	NO ₃ ⁻ mg N/l	0.217	0.204	0.203	0.009	1.615	S
G2		0.352	0.336	0.334	0.012	1.514	S
G3		0.508	0.489	0.486	0.017	1.266	S
G4		0.608	0.587	0.586	0.022	0.983	S
G1	Na ⁺ mg/l	0.261	0.254	0.25	0.011	1.038	S
G2		0.328	0.326	0.314	0.014	1.031	S
G3		0.851	0.848	0.835	0.04	0.398	S
G4		1.111	1.1	1.069	0.055	0.778	S
G1	Mg ²⁺ mg/l	0.074	0.072	0.07	0.008	0.489	S
G2		0.083	0.083	0.08	0.006	0.514	S
G3		0.264	0.258	0.256	0.014	0.618	S
G4		0.21	0.206	0.202	0.011	0.715	S
G1	Cl ⁻ mg/l	0.293	0.27	0.27	0.043	0.549	S
G2		0.396	0.386	0.374	0.026	0.842	S
G3		1.182	1.16	1.136	0.042	1.081	S
G4		1.572	1.54	1.512	0.072	0.837	S
G1	Ca ²⁺ mg/l	0.103	0.089	0.09	0.018	0.729	Q
G2		0.098	0.102	0.097	0.021	0.034	S
G3		0.315	0.319	0.313	0.028	0.061	S
G4		0.254	0.255	0.245	0.024	0.362	S
G1	K ⁺ mg/l	0.274	0.272	0.262	0.016	0.765	S
G2		0.34	0.325	0.325	0.022	0.682	S
G3		0.382	0.374	0.369	0.023	0.57	S
G4		0.523	0.509	0.501	0.027	0.821	S
G1	pH pH units	5.86	5.49	5.475	0.162	2.37	U
G2		5.91	5.49	5.485	0.126	3.372	U
G3		5.9	5.44	5.433	0.127	3.693	U
G4		5.9	5.44	5.422	0.134	3.564	U
G1	Cond µS/cm	6.3	5.96	5.957	0.467	0.736	S
G2		8.24	7.9	7.869	0.528	0.703	S
G3		15.87	15.66	15.556	0.632	0.496	S
G4		17.36	17.15	16.944	0.548	0.758	S

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EMEP – 38th intercomparison of analytical methods

Laboratory 36, Slovenian Environment Agency (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⁻ mg S/l	0.175	0.18	0.179	0.009	-0.521	S
G2		0.198	0.205	0.201	0.009	-0.378	S
G3		0.609	0.617	0.61	0.02	-0.057	S
G4		0.492	0.499	0.492	0.019	-0.015	S
G1	NH ₄ ⁺ mg N/l	0.194	0.06	0.061	0.014	9.705	U
G2		0.174	0.172	0.171	0.013	0.217	S
G3		0.297	0.296	0.297	0.015	-0.019	S
G4		0.349	0.344	0.345	0.018	0.221	S
G1	NO ₃ ⁻ mg N/l	0.202	0.204	0.203	0.009	-0.088	S
G2		0.33	0.336	0.334	0.012	-0.333	S
G3		0.478	0.489	0.486	0.017	-0.496	S
G4		0.573	0.587	0.586	0.022	-0.614	S
G1	Na ⁺ mg/l	0.25	0.254	0.25	0.011	0.032	S
G2		0.323	0.326	0.314	0.014	0.665	S
G3		0.84	0.848	0.835	0.04	0.12	S
G4		1.08	1.1	1.069	0.055	0.21	S
G1	Mg ²⁺ mg/l	0.072	0.072	0.07	0.008	0.223	S
G2		0.08	0.083	0.08	0.006	0.02	S
G3		0.259	0.258	0.256	0.014	0.254	S
G4		0.209	0.206	0.202	0.011	0.624	S
G1	Cl ⁻ mg/l	0.257	0.27	0.27	0.043	-0.294	S
G2		0.365	0.386	0.374	0.026	-0.37	S
G3		1.12	1.16	1.136	0.042	-0.382	S
G4		1.49	1.54	1.512	0.072	-0.302	S
G1	Ca ²⁺ mg/l	0.101	0.089	0.09	0.018	0.619	S
G2		0.099	0.102	0.097	0.021	0.081	S
G3		0.32	0.319	0.313	0.028	0.237	S
G4		0.26	0.255	0.245	0.024	0.617	S
G1	K ⁺ mg/l	0.261	0.272	0.262	0.016	-0.054	S
G2		0.32	0.325	0.325	0.022	-0.215	S
G3		0.367	0.374	0.369	0.023	-0.087	S
G4		0.513	0.509	0.501	0.027	0.448	S
G1	pH pH units	5.45	5.49	5.475	0.162	-0.156	S
G2		5.52	5.49	5.485	0.126	0.278	S
G3		5.43	5.44	5.433	0.127	-0.022	S
G4		5.44	5.44	5.422	0.134	0.136	S
G1	Cond µS/cm	5.68	5.96	5.957	0.467	-0.593	S
G2		7.57	7.9	7.869	0.528	-0.565	S
G3		15.2	15.66	15.556	0.632	-0.564	S
G4		16.5	17.15	16.944	0.548	-0.81	S

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EMEP – 38th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.181	0.18	0.179	0.009	0.18	S
G2		0.205	0.205	0.201	0.009	0.396	S
G3		0.598	0.617	0.61	0.02	-0.598	S
G4		0.482	0.499	0.492	0.019	-0.554	S
G1	NH ₄ ⁺ mg N/l	0.057	0.06	0.061	0.014	-0.256	S
G2		0.176	0.172	0.171	0.013	0.37	S
G3		0.302	0.296	0.297	0.015	0.307	S
G4		0.348	0.344	0.345	0.018	0.166	S
G1	NO ₃ ⁻ mg N/l	0.201	0.204	0.203	0.009	-0.202	S
G2		0.329	0.336	0.334	0.012	-0.417	S
G3		0.481	0.489	0.486	0.017	-0.32	S
G4		0.579	0.587	0.586	0.022	-0.34	S
G1	Na ⁺ mg/l	0.241	0.254	0.25	0.011	-0.791	S
G2		0.313	0.326	0.314	0.014	-0.069	S
G3		0.804	0.848	0.835	0.04	-0.792	S
G4		1.052	1.1	1.069	0.055	-0.303	S
G1	Mg ²⁺ mg/l	0.07	0.072	0.07	0.008	-0.042	S
G2		0.082	0.083	0.08	0.006	0.35	S
G3		0.263	0.258	0.256	0.014	0.545	S
G4		0.211	0.206	0.202	0.011	0.807	S
G1	Cl ⁻ mg/l	0.265	0.27	0.27	0.043	-0.107	S
G2		0.373	0.386	0.374	0.026	-0.057	S
G3		1.118	1.16	1.136	0.042	-0.429	S
G4		1.496	1.54	1.512	0.072	-0.219	S
G1	Ca ²⁺ mg/l	0.088	0.089	0.09	0.018	-0.098	S
G2		0.096	0.102	0.097	0.021	-0.06	S
G3		0.307	0.319	0.313	0.028	-0.22	S
G4		0.249	0.255	0.245	0.024	0.15	S
G1	K ⁺ mg/l	0.257	0.272	0.262	0.016	-0.306	S
G2		0.323	0.325	0.325	0.022	-0.081	S
G3		0.364	0.374	0.369	0.023	-0.219	S
G4		0.494	0.509	0.501	0.027	-0.262	S
G1	pH pH units	5.71	5.49	5.475	0.162	1.446	U
G2		5.72	5.49	5.485	0.126	1.865	U
G3		5.62	5.44	5.433	0.127	1.48	Q
G4		5.54	5.44	5.422	0.134	0.881	S
G1	Cond µS/cm	5.7	5.96	5.957	0.467	-0.55	S
G2		7.48	7.9	7.869	0.528	-0.735	S
G3		15.24	15.66	15.556	0.632	-0.5	S
G4		16.66	17.15	16.944	0.548	-0.519	S

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* Z score is unitless

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

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

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

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

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

EMEP – 38th intercomparison of analytical methods

Laboratory 39, Central Environmental Analysis Laboratory - CentLab (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⁻ mg S/l	0.183	0.18	0.179	0.009	0.414	S
G2		0.206	0.205	0.201	0.009	0.506	S
G3		0.61	0.617	0.61	0.02	-0.008	S
G4		0.493	0.499	0.492	0.019	0.039	S
G1	NH ₄ ⁺ mg N/l	0.06	0.06	0.061	0.014	-0.038	S
G2		0.173	0.172	0.171	0.013	0.141	S
G3		0.297	0.296	0.297	0.015	-0.019	S
G4		0.345	0.344	0.345	0.018	0.002	S
G1	NO ₃ ⁻ mg N/l	0.21	0.204	0.203	0.009	0.82	S
G2		0.342	0.336	0.334	0.012	0.674	S
G3		0.499	0.489	0.486	0.017	0.737	S
G4		0.602	0.587	0.586	0.022	0.709	S
G1	Na ⁺ mg/l	0.244	0.254	0.25	0.011	-0.516	S
G2		0.31	0.326	0.314	0.014	-0.289	S
G3		0.828	0.848	0.835	0.04	-0.184	S
G4		1.085	1.1	1.069	0.055	0.301	S
G1	Mg ²⁺ mg/l	0.071	0.072	0.07	0.008	0.091	S
G2		0.081	0.083	0.08	0.006	0.185	S
G3		0.26	0.258	0.256	0.014	0.327	S
G4		0.204	0.206	0.202	0.011	0.167	S
G1	Cl ⁻ mg/l	0.263	0.27	0.27	0.043	-0.154	S
G2		0.37	0.386	0.374	0.026	-0.174	S
G3		1.138	1.16	1.136	0.042	0.043	S
G4		1.518	1.54	1.512	0.072	0.087	S
G1	Ca ²⁺ mg/l	0.087	0.089	0.09	0.018	-0.153	S
G2		0.097	0.102	0.097	0.021	-0.013	S
G3		0.311	0.319	0.313	0.028	-0.079	S
G4		0.255	0.255	0.245	0.024	0.405	S
G1	K ⁺ mg/l	0.268	0.272	0.262	0.016	0.387	S
G2		0.324	0.325	0.325	0.022	-0.036	S
G3		0.37	0.374	0.369	0.023	0.044	S
G4		0.506	0.509	0.501	0.027	0.186	S
G1	pH pH units	5.45	5.49	5.475	0.162	-0.156	S
G2		5.4	5.49	5.485	0.126	-0.673	S
G3		5.45	5.44	5.433	0.127	0.137	S
G4		5.43	5.44	5.422	0.134	0.062	S
G1	Cond µS/cm	5.92	5.96	5.957	0.467	-0.078	S
G2		7.69	7.9	7.869	0.528	-0.338	S
G3		15.4	15.66	15.556	0.632	-0.247	S
G4		16.5	17.15	16.944	0.548	-0.81	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 more statistics, Youden plots, updated expected values ect:
<http://www.nilu.no/projects/ccc/intercomparison.html>

EMEP – 38th 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⁻ mg S/l	0.167	0.18	0.179	0.009	-1.468	S
G2		0.179	0.205	0.201	0.009	-2.499	Q
G3		0.636	0.617	0.61	0.02	1.25	S
G4		0.464	0.499	0.492	0.019	-1.517	S
G1	NH ₄ ⁺ mg N/l	0.163	0.06	0.061	0.014	7.451	U
G2		0.204	0.172	0.171	0.013	2.504	Q
G3		0.33	0.296	0.297	0.015	2.13	S
G4		0.353	0.344	0.345	0.018	0.44	S
G1	NO ₃ ⁻ mg N/l	0.214	0.204	0.203	0.009	1.331	S
G2		0.342	0.336	0.334	0.012	0.649	S
G3		0.496	0.489	0.486	0.017	0.543	S
G4		0.596	0.587	0.586	0.022	0.426	S
G1	Na ⁺ mg/l	0.25	0.254	0.25	0.011	0.032	S
G2		0.327	0.326	0.314	0.014	0.958	S
G3		0.869	0.848	0.835	0.04	0.853	S
G4		1.084	1.1	1.069	0.055	0.283	S
G1	Mg ²⁺ mg/l	0.073	0.072	0.07	0.008	0.356	S
G2		0.084	0.083	0.08	0.006	0.679	S
G3		0.261	0.258	0.256	0.014	0.4	S
G4		0.212	0.206	0.202	0.011	0.898	S
G1	Cl ⁻ mg/l	0.267	0.27	0.27	0.043	-0.062	S
G2		0.384	0.386	0.374	0.026	0.353	S
G3		1.16	1.16	1.136	0.042	0.569	S
G4		1.528	1.54	1.512	0.072	0.223	S
G1	Ca ²⁺ mg/l	0.094	0.089	0.09	0.018	0.233	S
G2		0.104	0.102	0.097	0.021	0.315	S
G3		0.326	0.319	0.313	0.028	0.449	S
G4		0.259	0.255	0.245	0.024	0.575	S
G1	K ⁺ mg/l	0.269	0.272	0.262	0.016	0.45	S
G2		0.353	0.325	0.325	0.022	1.264	S
G3		0.396	0.374	0.369	0.023	1.183	S
G4		0.554	0.509	0.501	0.027	1.979	S
G1	pH pH units	4.885	5.49	5.475	0.162	-3.637	U
G2		4.717	5.49	5.485	0.126	-6.09	U
G3		4.67	5.44	5.433	0.127	-6.029	U
G4		4.762	5.44	5.422	0.134	-4.916	U
G1	Cond µS/cm	6.3	5.96	5.957	0.467	0.736	S
G2		8.2	7.9	7.869	0.528	0.627	S
G3		16	15.66	15.556	0.632	0.702	S
G4		17.2	17.15	16.944	0.548	0.466	S

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Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 38th 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⁻ mg S/l	-999	0.18	0.179	0.009		B
G2		-999	0.205	0.201	0.009		B
G3		-999	0.617	0.61	0.02		B
G4		-999	0.499	0.492	0.019		B
G1	NH ₄ ⁺ mg N/l	-999	0.06	0.061	0.014		B
G2		-999	0.172	0.171	0.013		B
G3		-999	0.296	0.297	0.015		B
G4		-999	0.344	0.345	0.018		B
G1	NO ₃ ⁻ mg N/l	-999	0.204	0.203	0.009		B
G2		-999	0.336	0.334	0.012		B
G3		-999	0.489	0.486	0.017		B
G4		-999	0.587	0.586	0.022		B
G1	Na ⁺ mg/l	-999	0.254	0.25	0.011		B
G2		-999	0.326	0.314	0.014		B
G3		-999	0.848	0.835	0.04		B
G4		-999	1.1	1.069	0.055		B
G1	Mg ²⁺ mg/l	-999	0.072	0.07	0.008		B
G2		-999	0.083	0.08	0.006		B
G3		-999	0.258	0.256	0.014		B
G4		-999	0.206	0.202	0.011		B
G1	Cl ⁻ mg/l	-999	0.27	0.27	0.043		B
G2		-999	0.386	0.374	0.026		B
G3		-999	1.16	1.136	0.042		B
G4		-999	1.54	1.512	0.072		B
G1	Ca ²⁺ mg/l	-999	0.089	0.09	0.018		B
G2		-999	0.102	0.097	0.021		B
G3		-999	0.319	0.313	0.028		B
G4		-999	0.255	0.245	0.024		B
G1	K ⁺ mg/l	-999	0.272	0.262	0.016		B
G2		-999	0.325	0.325	0.022		B
G3		-999	0.374	0.369	0.023		B
G4		-999	0.509	0.501	0.027		B
G1	pH pH units	5.42	5.49	5.475	0.162	-0.341	S
G2		5.39	5.49	5.485	0.126	-0.753	Q
G3		5.46	5.44	5.433	0.127	0.216	S
G4		5.4	5.44	5.422	0.134	-0.162	S
G1	Cond µS/cm	5.34	5.96	5.957	0.467	-1.322	S
G2		7.45	7.9	7.869	0.528	-0.792	S
G3		15.43	15.66	15.556	0.632	-0.2	S
G4		16.87	17.15	16.944	0.548	-0.136	S

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

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EMEP – 38th intercomparison of analytical methods

Laboratory 49, The Cyprus Institute (Cyl) (Cyprus)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.178	0.18	0.179	0.009	-0.171	S
G2		0.203	0.205	0.201	0.009	0.175	S
G3		0.62	0.617	0.61	0.02	0.483	S
G4		0.499	0.499	0.492	0.019	0.362	S
G1	NH ₄ ⁺ mg N/l	0.059	0.06	0.061	0.014	-0.11	S
G2		0.184	0.172	0.171	0.013	0.979	S
G3		0.319	0.296	0.297	0.015	1.414	S
G4		0.378	0.344	0.345	0.018	1.81	S
G1	NO ₃ ⁻ mg N/l	0.209	0.204	0.203	0.009	0.707	S
G2		0.344	0.336	0.334	0.012	0.842	S
G3		0.5	0.489	0.486	0.017	0.796	S
G4		0.6	0.587	0.586	0.022	0.618	S
G1	Na ⁺ mg/l	0.244	0.254	0.25	0.011	-0.516	S
G2		0.306	0.326	0.314	0.014	-0.582	S
G3		0.794	0.848	0.835	0.04	-1.045	S
G4		1.027	1.1	1.069	0.055	-0.761	S
G1	Mg ²⁺ mg/l	0.077	0.072	0.07	0.008	0.886	S
G2		0.09	0.083	0.08	0.006	1.667	S
G3		0.27	0.258	0.256	0.014	1.054	S
G4		0.215	0.206	0.202	0.011	1.172	S
G1	Cl ⁻ mg/l	0.265	0.27	0.27	0.043	-0.107	S
G2		0.382	0.386	0.374	0.026	0.295	S
G3		1.159	1.16	1.136	0.042	0.538	S
G4		1.534	1.54	1.512	0.072	0.309	S
G1	Ca ²⁺ mg/l	0.1	0.089	0.09	0.018	0.564	S
G2		0.104	0.102	0.097	0.021	0.315	S
G3		0.354	0.319	0.313	0.028	1.434	S
G4		0.268	0.255	0.245	0.024	0.957	S
G1	K ⁺ mg/l	0.242	0.272	0.262	0.016	-1.25	S
G2		0.305	0.325	0.325	0.022	-0.888	S
G3		0.349	0.374	0.369	0.023	-0.876	S
G4		0.48	0.509	0.501	0.027	-0.785	S
G1	pH pH units	-999	5.49	5.475	0.162		B
G2		-999	5.49	5.485	0.126		B
G3		-999	5.44	5.433	0.127		B
G4		-999	5.44	5.422	0.134		B
G1	Cond µS/cm	-999	5.96	5.957	0.467		B
G2		-999	7.9	7.869	0.528		B
G3		-999	15.66	15.556	0.632		B
G4		-999	17.15	16.944	0.548		B

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

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

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

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

EMEP – 38th intercomparison of analytical methods

Laboratory 50, CEA Saclay - Orme des Merisiers (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⁻ mg S/l	0.167	0.18	0.179	0.009	-1.456	S
G2		0.191	0.205	0.201	0.009	-1.151	S
G3		0.594	0.617	0.61	0.02	-0.794	S
G4		0.478	0.499	0.492	0.019	-0.769	S
G1	NH ₄ ⁺ mg N/l	0.075	0.06	0.061	0.014	1.053	Q
G2		0.186	0.172	0.171	0.013	1.132	S
G3		0.318	0.296	0.297	0.015	1.349	S
G4		0.366	0.344	0.345	0.018	1.152	S
G1	NO ₃ ⁻ mg N/l	0.196	0.204	0.203	0.009	-0.77	S
G2		0.324	0.336	0.334	0.012	-0.837	S
G3		0.473	0.489	0.486	0.017	-0.79	S
G4		0.569	0.587	0.586	0.022	-0.796	S
G1	Na ⁺ mg/l	0.249	0.254	0.25	0.011	-0.059	S
G2		0.321	0.326	0.314	0.014	0.518	S
G3		0.853	0.848	0.835	0.04	0.448	S
G4		1.098	1.1	1.069	0.055	0.539	S
G1	Mg ²⁺ mg/l	0.075	0.072	0.07	0.008	0.621	S
G2		0.079	0.083	0.08	0.006	-0.144	S
G3		0.239	0.258	0.256	0.014	-1.201	S
G4		0.186	0.206	0.202	0.011	-1.478	S
G1	Cl ⁻ mg/l	0.261	0.27	0.27	0.043	-0.201	S
G2		0.376	0.386	0.374	0.026	0.06	S
G3		1.154	1.16	1.136	0.042	0.42	S
G4		1.534	1.54	1.512	0.072	0.309	S
G1	Ca ²⁺ mg/l	0.065	0.089	0.09	0.018	-1.366	U
G2		0.081	0.102	0.097	0.021	-0.764	Q
G3		0.299	0.319	0.313	0.028	-0.502	S
G4		0.251	0.255	0.245	0.024	0.235	S
G1	K ⁺ mg/l	0.252	0.272	0.262	0.016	-0.621	S
G2		0.314	0.325	0.325	0.022	-0.484	S
G3		0.352	0.374	0.369	0.023	-0.745	S
G4		0.486	0.509	0.501	0.027	-0.561	S
G1	pH pH units	5.41	5.49	5.475	0.162	-0.402	S
G2		5.42	5.49	5.485	0.126	-0.515	S
G3		5.41	5.44	5.433	0.127	-0.18	S
G4		5.4	5.44	5.422	0.134	-0.162	S
G1	Cond µS/cm	5.88	5.96	5.957	0.467	-0.164	S
G2		7.75	7.9	7.869	0.528	-0.224	S
G3		15.45	15.66	15.556	0.632	-0.168	S
G4		16.85	17.15	16.944	0.548	-0.172	S

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

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EMEP – 38th intercomparison of analytical methods

Laboratory 53, ARPA UMBRIA multisite laboratory

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.19	0.18	0.179	0.009	1.232	S
G2		0.228	0.205	0.201	0.009	2.937	Q
G3		0.604	0.617	0.61	0.02	-0.303	S
G4		0.493	0.499	0.492	0.019	0.039	S
G1	NH ₄ ⁺ mg N/l	0.064	0.06	0.061	0.014	0.253	S
G2		0.179	0.172	0.171	0.013	0.598	S
G3		0.267	0.296	0.297	0.015	-1.973	S
G4		0.309	0.344	0.345	0.018	-1.971	S
G1	NO ₃ ⁻ mg N/l	0.213	0.204	0.203	0.009	1.161	S
G2		0.331	0.336	0.334	0.012	-0.249	S
G3		0.476	0.489	0.486	0.017	-0.614	S
G4		0.585	0.587	0.586	0.022	-0.066	S
G1	Na ⁺ mg/l	0.26	0.254	0.25	0.011	0.947	S
G2		0.298	0.326	0.314	0.014	-1.169	S
G3		0.764	0.848	0.835	0.04	-1.804	S
G4		0.996	1.1	1.069	0.055	-1.329	S
G1	Mg ²⁺ mg/l	0.054	0.072	0.07	0.008	-2.163	Q
G2		0.061	0.083	0.08	0.006	-3.107	U
G3		0.224	0.258	0.256	0.014	-2.292	S
G4		0.179	0.206	0.202	0.011	-2.118	S
G1	Cl ⁻ mg/l	0.776	0.27	0.27	0.043	11.868	U
G2		0.909	0.386	0.374	0.026	20.892	U
G3		1.664	1.16	1.136	0.042	12.455	U
G4		2.037	1.54	1.512	0.072	7.296	U
G1	Ca ²⁺ mg/l	0.038	0.089	0.09	0.018	-2.855	U
G2		0.029	0.102	0.097	0.021	-3.203	U
G3		0.224	0.319	0.313	0.028	-3.141	U
G4		0.169	0.255	0.245	0.024	-3.249	U
G1	K ⁺ mg/l	0.253	0.272	0.262	0.016	-0.558	S
G2		0.307	0.325	0.325	0.022	-0.798	S
G3		0.341	0.374	0.369	0.023	-1.227	S
G4		0.475	0.509	0.501	0.027	-0.972	S
G1	pH pH units	5.49	5.49	5.475	0.162	0.09	S
G2		5.49	5.49	5.485	0.126	0.041	S
G3		5.49	5.44	5.433	0.127	0.453	S
G4		5.37	5.44	5.422	0.134	-0.386	S
G1	Cond µS/cm	6.7	5.96	5.957	0.467	1.594	S
G2		8.6	7.9	7.869	0.528	1.384	S
G3		16.8	15.66	15.556	0.632	1.968	S
G4		19	17.15	16.944	0.548	3.749	S

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EMEP – 38th intercomparison of analytical methods

Laboratory 110, Thüringer Landesanstalt für Landwirtschaft und Ländlichen Raum, 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⁻ mg S/l	0.13	0.18	0.179	0.009	-5.781	U
G2		0.188	0.205	0.201	0.009	-1.482	S
G3		0.583	0.617	0.61	0.02	-1.335	S
G4		0.503	0.499	0.492	0.019	0.577	S
G1	NH ₄ ⁺ mg N/l	0.049	0.06	0.061	0.014	-0.837	Q
G2		0.139	0.172	0.171	0.013	-2.451	Q
G3		0.247	0.296	0.297	0.015	-3.275	Q
G4		0.286	0.344	0.345	0.018	-3.231	Q
G1	NO ₃ ⁻ mg N/l	0.181	0.204	0.203	0.009	-2.474	Q
G2		0.314	0.336	0.334	0.012	-1.677	S
G3		0.454	0.489	0.486	0.017	-1.906	S
G4		0.54	0.587	0.586	0.022	-2.118	S
G1	Na ⁺ mg/l	0.257	0.254	0.25	0.011	0.673	S
G2		0.32	0.326	0.314	0.014	0.445	S
G3		0.855	0.848	0.835	0.04	0.499	S
G4		1.07	1.1	1.069	0.055	0.027	S
G1	Mg ²⁺ mg/l	0.076	0.072	0.07	0.008	0.754	S
G2		0.085	0.083	0.08	0.006	0.844	S
G3		0.272	0.258	0.256	0.014	1.2	S
G4		0.213	0.206	0.202	0.011	0.99	S
G1	Cl ⁻ mg/l	0.209	0.27	0.27	0.043	-1.419	Q
G2		0.312	0.386	0.374	0.026	-2.441	Q
G3		1.08	1.16	1.136	0.042	-1.326	S
G4		1.46	1.54	1.512	0.072	-0.719	S
G1	Ca ²⁺ mg/l	0.091	0.089	0.09	0.018	0.067	S
G2		0.1	0.102	0.097	0.021	0.128	S
G3		0.323	0.319	0.313	0.028	0.343	S
G4		0.256	0.255	0.245	0.024	0.447	S
G1	K ⁺ mg/l	0.276	0.272	0.262	0.016	0.891	S
G2		0.331	0.325	0.325	0.022	0.278	S
G3		0.378	0.374	0.369	0.023	0.395	S
G4		0.5	0.509	0.501	0.027	-0.038	S
G1	pH pH units	5.58	5.49	5.475	0.162	0.645	S
G2		5.58	5.49	5.485	0.126	0.754	S
G3		5.44	5.44	5.433	0.127	0.057	S
G4		5.44	5.44	5.422	0.134	0.136	S
G1	Cond µS/cm	< 10.000	5.96	5.957	0.467		B
G2		< 10.000	7.9	7.869	0.528		B
G3		15.6	15.66	15.556	0.632	0.069	S
G4		17.1	17.15	16.944	0.548	0.284	S

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

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EMEP – 38th intercomparison of analytical methods

Laboratory 112, Nordwestdeutsche Forstliche Versuchsanstalt (NFV) (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⁻ mg S/l	0.174	0.18	0.179	0.009	-0.638	S
G2		0.198	0.205	0.201	0.009	-0.378	S
G3		0.618	0.617	0.61	0.02	0.385	S
G4		0.494	0.499	0.492	0.019	0.092	S
G1	NH ₄ ⁺ mg N/l	0.064	0.06	0.061	0.014	0.253	S
G2		0.178	0.172	0.171	0.013	0.522	S
G3		0.311	0.296	0.297	0.015	0.893	S
G4		0.361	0.344	0.345	0.018	0.878	S
G1	NO ₃ ⁻ mg N/l	0.199	0.204	0.203	0.009	-0.429	S
G2		0.332	0.336	0.334	0.012	-0.165	S
G3		0.486	0.489	0.486	0.017	-0.027	S
G4		0.579	0.587	0.586	0.022	-0.34	S
G1	Na ⁺ mg/l	0.265	0.254	0.25	0.011	1.404	S
G2		0.336	0.326	0.314	0.014	1.618	S
G3		0.873	0.848	0.835	0.04	0.955	S
G4		1.122	1.1	1.069	0.055	0.979	S
G1	Mg ²⁺ mg/l	0.074	0.072	0.07	0.008	0.489	S
G2		0.084	0.083	0.08	0.006	0.679	S
G3		0.261	0.258	0.256	0.014	0.4	S
G4		0.207	0.206	0.202	0.011	0.441	S
G1	Cl ⁻ mg/l	0.264	0.27	0.27	0.043	-0.13	S
G2		0.377	0.386	0.374	0.026	0.099	S
G3		1.129	1.16	1.136	0.042	-0.17	S
G4		1.489	1.54	1.512	0.072	-0.316	S
G1	Ca ²⁺ mg/l	0.091	0.089	0.09	0.018	0.067	S
G2		0.11	0.102	0.097	0.021	0.597	S
G3		0.329	0.319	0.313	0.028	0.554	S
G4		0.253	0.255	0.245	0.024	0.32	S
G1	K ⁺ mg/l	0.281	0.272	0.262	0.016	1.206	S
G2		0.348	0.325	0.325	0.022	1.04	S
G3		0.385	0.374	0.369	0.023	0.701	S
G4		0.521	0.509	0.501	0.027	0.746	S
G1	pH pH units	5.54	5.49	5.475	0.162	0.398	S
G2		5.46	5.49	5.485	0.126	-0.197	S
G3		5.5	5.44	5.433	0.127	0.532	S
G4		5.5	5.44	5.422	0.134	0.583	S
G1	Cond µS/cm	5.4	5.96	5.957	0.467	-1.193	S
G2		7.1	7.9	7.869	0.528	-1.455	S
G3		14.5	15.66	15.556	0.632	-1.672	S
G4		15.9	17.15	16.944	0.548	-1.905	S

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Foretaksnr./Enterprise no. 941705561

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* Z score is unitless

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

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

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

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

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

EMEP – 38th intercomparison of analytical methods

Laboratory 114, C.N.R. Institute of Water Research (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⁻ mg S/l	0.184	0.18	0.179	0.009	0.531	S
G2		0.207	0.205	0.201	0.009	0.617	S
G3		0.594	0.617	0.61	0.02	-0.794	S
G4		0.467	0.499	0.492	0.019	-1.361	S
G1	NH ₄ ⁺ mg N/l	0.06	0.06	0.061	0.014	-0.038	S
G2		0.171	0.172	0.171	0.013	-0.012	S
G3		0.295	0.296	0.297	0.015	-0.149	S
G4		0.346	0.344	0.345	0.018	0.057	S
G1	NO ₃ ⁻ mg N/l	0.193	0.204	0.203	0.009	-1.111	S
G2		0.32	0.336	0.334	0.012	-1.173	S
G3		0.475	0.489	0.486	0.017	-0.673	S
G4		0.567	0.587	0.586	0.022	-0.887	S
G1	Na ⁺ mg/l	0.24	0.254	0.25	0.011	-0.882	S
G2		0.3	0.326	0.314	0.014	-1.022	S
G3		0.8	0.848	0.835	0.04	-0.893	S
G4		1.03	1.1	1.069	0.055	-0.706	S
G1	Mg ²⁺ mg/l	0.07	0.072	0.07	0.008	-0.042	S
G2		0.08	0.083	0.08	0.006	0.02	S
G3		0.26	0.258	0.256	0.014	0.327	S
G4		0.2	0.206	0.202	0.011	-0.199	S
G1	Cl ⁻ mg/l	0.25	0.27	0.27	0.043	-0.458	S
G2		0.36	0.386	0.374	0.026	-0.565	S
G3		1.12	1.16	1.136	0.042	-0.382	S
G4		1.46	1.54	1.512	0.072	-0.719	S
G1	Ca ²⁺ mg/l	0.09	0.089	0.09	0.018	0.012	S
G2		0.12	0.102	0.097	0.021	1.066	Q
G3		0.33	0.319	0.313	0.028	0.589	S
G4		0.26	0.255	0.245	0.024	0.617	S
G1	K ⁺ mg/l	0.26	0.272	0.262	0.016	-0.117	S
G2		0.32	0.325	0.325	0.022	-0.215	S
G3		0.35	0.374	0.369	0.023	-0.832	S
G4		0.48	0.509	0.501	0.027	-0.785	S
G1	pH pH units	5.61	5.49	5.475	0.162	0.83	Q
G2		5.54	5.49	5.485	0.126	0.437	S
G3		5.51	5.44	5.433	0.127	0.611	S
G4		5.48	5.44	5.422	0.134	0.434	S
G1	Cond µS/cm	5.7	5.96	5.957	0.467	-0.55	S
G2		7.8	7.9	7.869	0.528	-0.13	S
G3		15.5	15.66	15.556	0.632	-0.089	S
G4		16.9	17.15	16.944	0.548	-0.081	S

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EMEP – 38th 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⁻ mg S/l	0.164	0.18	0.179	0.009	-1.807	S
G2		0.188	0.205	0.201	0.009	-1.482	S
G3		0.573	0.617	0.61	0.02	-1.826	S
G4		0.461	0.499	0.492	0.019	-1.684	S
G1	NH ₄ ⁺ mg N/l	0.048	0.06	0.061	0.014	-0.91	Q
G2		0.172	0.172	0.171	0.013	0.065	S
G3		0.271	0.296	0.297	0.015	-1.712	S
G4		0.343	0.344	0.345	0.018	-0.108	S
G1	NO ₃ ⁻ mg N/l	0.187	0.204	0.203	0.009	-1.792	S
G2		0.311	0.336	0.334	0.012	-1.929	S
G3		0.463	0.489	0.486	0.017	-1.378	S
G4		0.561	0.587	0.586	0.022	-1.161	S
G1	Na ⁺ mg/l	0.25	0.254	0.25	0.011	0.032	S
G2		0.31	0.326	0.314	0.014	-0.289	S
G3		0.816	0.848	0.835	0.04	-0.488	S
G4		1.069	1.1	1.069	0.055	0.008	S
G1	Mg ²⁺ mg/l	0.066	0.072	0.07	0.008	-0.572	S
G2		0.074	0.083	0.08	0.006	-0.967	S
G3		0.24	0.258	0.256	0.014	-1.128	S
G4		0.19	0.206	0.202	0.011	-1.113	S
G1	Cl ⁻ mg/l	0.257	0.27	0.27	0.043	-0.294	S
G2		0.355	0.386	0.374	0.026	-0.76	S
G3		1.078	1.16	1.136	0.042	-1.373	S
G4		1.461	1.54	1.512	0.072	-0.705	S
G1	Ca ²⁺ mg/l	0.089	0.089	0.09	0.018	-0.043	S
G2		0.089	0.102	0.097	0.021	-0.388	S
G3		0.309	0.319	0.313	0.028	-0.15	S
G4		0.246	0.255	0.245	0.024	0.022	S
G1	K ⁺ mg/l	0.254	0.272	0.262	0.016	-0.495	S
G2		0.315	0.325	0.325	0.022	-0.439	S
G3		0.355	0.374	0.369	0.023	-0.613	S
G4		0.491	0.509	0.501	0.027	-0.374	S
G1	pH pH units	5.53	5.49	5.475	0.162	0.337	S
G2		5.54	5.49	5.485	0.126	0.437	S
G3		5.39	5.44	5.433	0.127	-0.338	S
G4		5.47	5.44	5.422	0.134	0.36	S
G1	Cond µS/cm	5.1	5.96	5.957	0.467	-1.836	S
G2		7.1	7.9	7.869	0.528	-1.455	S
G3		15	15.66	15.556	0.632	-0.88	S
G4		16.3	17.15	16.944	0.548	-1.175	S

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EMEP – 38th intercomparison of analytical methods

Laboratory 116, Institute for Applied Plant Biology (Switzerland)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.19	0.18	0.179	0.009	1.232	S
G2		0.187	0.205	0.201	0.009	-1.593	S
G3		0.584	0.617	0.61	0.02	-1.286	S
G4		0.469	0.499	0.492	0.019	-1.254	S
G1	NH ₄ ⁺ mg N/l	0.058	0.06	0.061	0.014	-0.183	S
G2		0.168	0.172	0.171	0.013	-0.24	S
G3		0.29	0.296	0.297	0.015	-0.475	S
G4		0.342	0.344	0.345	0.018	-0.163	S
G1	NO ₃ ⁻ mg N/l	0.208	0.204	0.203	0.009	0.593	S
G2		0.34	0.336	0.334	0.012	0.506	S
G3		0.5	0.489	0.486	0.017	0.796	S
G4		0.601	0.587	0.586	0.022	0.663	S
G1	Na ⁺ mg/l	0.26	0.254	0.25	0.011	0.947	S
G2		0.33	0.326	0.314	0.014	1.178	S
G3		0.91	0.848	0.835	0.04	1.891	S
G4		1.15	1.1	1.069	0.055	1.492	S
G1	Mg ²⁺ mg/l	0.08	0.072	0.07	0.008	1.284	S
G2		0.08	0.083	0.08	0.006	0.02	S
G3		0.26	0.258	0.256	0.014	0.327	S
G4		0.21	0.206	0.202	0.011	0.715	S
G1	Cl ⁻ mg/l	0.268	0.27	0.27	0.043	-0.037	S
G2		0.365	0.386	0.374	0.026	-0.37	S
G3		1.114	1.16	1.136	0.042	-0.524	S
G4		1.472	1.54	1.512	0.072	-0.552	S
G1	Ca ²⁺ mg/l	0.09	0.089	0.09	0.018	0.012	S
G2		0.1	0.102	0.097	0.021	0.128	S
G3		0.33	0.319	0.313	0.028	0.589	S
G4		0.26	0.255	0.245	0.024	0.617	S
G1	K ⁺ mg/l	0.24	0.272	0.262	0.016	-1.376	S
G2		0.3	0.325	0.325	0.022	-1.112	S
G3		0.37	0.374	0.369	0.023	0.044	S
G4		0.51	0.509	0.501	0.027	0.336	S
G1	pH pH units	5.44	5.49	5.475	0.162	-0.218	S
G2		5.45	5.49	5.485	0.126	-0.277	S
G3		5.4	5.44	5.433	0.127	-0.259	S
G4		5.37	5.44	5.422	0.134	-0.386	S
G1	Cond µS/cm	5.5	5.96	5.957	0.467	-0.979	S
G2		7.3	7.9	7.869	0.528	-1.076	S
G3		14.2	15.66	15.556	0.632	-2.146	S
G4		15.4	17.15	16.944	0.548	-2.817	S

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EMEP – 38th intercomparison of analytical methods

Laboratory 117, SBS Standortserkundung/Bodenmonitoring (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⁻ mg S/l	0.181	0.18	0.179	0.009	0.18	S
G2		0.212	0.205	0.201	0.009	1.169	S
G3		0.663	0.617	0.61	0.02	2.596	S
G4		0.536	0.499	0.492	0.019	2.354	S
G1	NH ₄ ⁺ mg N/l	< 0.080	0.06	0.061	0.014		B
G2		0.16	0.172	0.171	0.013	-0.85	S
G3		0.28	0.296	0.297	0.015	-1.126	S
G4		0.33	0.344	0.345	0.018	-0.82	S
G1	NO ₃ ⁻ mg N/l	0.19	0.204	0.203	0.009	-1.451	S
G2		0.32	0.336	0.334	0.012	-1.173	S
G3		0.46	0.489	0.486	0.017	-1.554	S
G4		0.54	0.587	0.586	0.022	-2.118	S
G1	Na ⁺ mg/l	0.235	0.254	0.25	0.011	-1.339	S
G2		0.297	0.326	0.314	0.014	-1.242	S
G3		0.759	0.848	0.835	0.04	-1.93	S
G4		0.964	1.1	1.069	0.055	-1.915	S
G1	Mg ²⁺ mg/l	0.072	0.072	0.07	0.008	0.223	S
G2		0.081	0.083	0.08	0.006	0.185	S
G3		0.26	0.258	0.256	0.014	0.327	S
G4		0.205	0.206	0.202	0.011	0.258	S
G1	Cl ⁻ mg/l	0.43	0.27	0.27	0.043	3.76	U
G2		0.46	0.386	0.374	0.026	3.343	Q
G3		1.09	1.16	1.136	0.042	-1.09	S
G4		1.32	1.54	1.512	0.072	-2.663	S
G1	Ca ²⁺ mg/l	0.09	0.089	0.09	0.018	0.012	S
G2		0.102	0.102	0.097	0.021	0.222	S
G3		0.352	0.319	0.313	0.028	1.363	S
G4		0.274	0.255	0.245	0.024	1.212	S
G1	K ⁺ mg/l	0.235	0.272	0.262	0.016	-1.691	S
G2		0.292	0.325	0.325	0.022	-1.47	S
G3		0.333	0.374	0.369	0.023	-1.577	S
G4		0.452	0.509	0.501	0.027	-1.831	S
G1	pH pH units	5.42	5.49	5.475	0.162	-0.341	S
G2		5.41	5.49	5.485	0.126	-0.594	S
G3		5.42	5.44	5.433	0.127	-0.101	S
G4		5.38	5.44	5.422	0.134	-0.311	S
G1	Cond µS/cm	< 10.000	5.96	5.957	0.467		B
G2		< 10.000	7.9	7.869	0.528		B
G3		15.1	15.66	15.556	0.632	-0.722	S
G4		16.5	17.15	16.944	0.548	-0.81	S

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

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

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

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

EMEP – 38th 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⁻ mg S/l	0.186	0.18	0.179	0.009	0.764	S
G2		0.197	0.205	0.201	0.009	-0.488	S
G3		0.597	0.617	0.61	0.02	-0.647	S
G4		0.467	0.499	0.492	0.019	-1.361	S
G1	NH ₄ ⁺ mg N/l	0.039	0.06	0.061	0.014	-1.564	U
G2		0.171	0.172	0.171	0.013	-0.012	S
G3		0.261	0.296	0.297	0.015	-2.363	S
G4		0.328	0.344	0.345	0.018	-0.93	S
G1	NO ₃ ⁻ mg N/l	0.209	0.204	0.203	0.009	0.707	S
G2		0.342	0.336	0.334	0.012	0.674	S
G3		0.5	0.489	0.486	0.017	0.796	S
G4		0.576	0.587	0.586	0.022	-0.477	S
G1	Na ⁺ mg/l	0.243	0.254	0.25	0.011	-0.608	S
G2		0.312	0.326	0.314	0.014	-0.142	S
G3		0.819	0.848	0.835	0.04	-0.412	S
G4		1.047	1.1	1.069	0.055	-0.395	S
G1	Mg ²⁺ mg/l	0.072	0.072	0.07	0.008	0.223	S
G2		0.082	0.083	0.08	0.006	0.35	S
G3		0.254	0.258	0.256	0.014	-0.11	S
G4		0.203	0.206	0.202	0.011	0.076	S
G1	Cl ⁻ mg/l	0.309	0.27	0.27	0.043	0.924	S
G2		0.385	0.386	0.374	0.026	0.412	S
G3		1.09	1.16	1.136	0.042	-1.09	S
G4		1.48	1.54	1.512	0.072	-0.441	S
G1	Ca ²⁺ mg/l	0.094	0.089	0.09	0.018	0.233	S
G2		0.098	0.102	0.097	0.021	0.034	S
G3		0.306	0.319	0.313	0.028	-0.255	S
G4		0.243	0.255	0.245	0.024	-0.105	S
G1	K ⁺ mg/l	0.272	0.272	0.262	0.016	0.639	S
G2		0.319	0.325	0.325	0.022	-0.26	S
G3		0.37	0.374	0.369	0.023	0.044	S
G4		0.484	0.509	0.501	0.027	-0.636	S
G1	pH pH units	5.57	5.49	5.475	0.162	0.583	S
G2		5.51	5.49	5.485	0.126	0.199	S
G3		5.46	5.44	5.433	0.127	0.216	S
G4		4.49	5.44	5.422	0.134	-6.943	U
G1	Cond µS/cm	5.1	5.96	5.957	0.467	-1.836	S
G2		6.9	7.9	7.869	0.528	-1.833	S
G3		14.4	15.66	15.556	0.632	-1.83	S
G4		15.6	17.15	16.944	0.548	-2.452	S

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* Z score is unitless

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

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

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 38th 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⁻ mg S/l	0.174	0.18	0.179	0.009	-0.638	S
G2		0.204	0.205	0.201	0.009	0.285	S
G3		0.648	0.617	0.61	0.02	1.859	S
G4		0.496	0.499	0.492	0.019	0.2	S
G1	NH ₄ ⁺ mg N/l	-999	0.06	0.061	0.014		B
G2		-999	0.172	0.171	0.013		B
G3		-999	0.296	0.297	0.015		B
G4		-999	0.344	0.345	0.018		B
G1	NO ₃ ⁻ mg N/l	0.204	0.204	0.203	0.009	0.139	S
G2		0.333	0.336	0.334	0.012	-0.081	S
G3		0.493	0.489	0.486	0.017	0.385	S
G4		0.588	0.587	0.586	0.022	0.071	S
G1	Na ⁺ mg/l	0.245	0.254	0.25	0.011	-0.425	S
G2		0.311	0.326	0.314	0.014	-0.215	S
G3		0.87	0.848	0.835	0.04	0.879	S
G4		1.133	1.1	1.069	0.055	1.18	S
G1	Mg ²⁺ mg/l	0.073	0.072	0.07	0.008	0.356	S
G2		0.082	0.083	0.08	0.006	0.35	S
G3		0.255	0.258	0.256	0.014	-0.037	S
G4		0.205	0.206	0.202	0.011	0.258	S
G1	Cl ⁻ mg/l	0.27	0.27	0.27	0.043	0.01	S
G2		0.373	0.386	0.374	0.026	-0.057	S
G3		1.115	1.16	1.136	0.042	-0.5	S
G4		1.506	1.54	1.512	0.072	-0.08	S
G1	Ca ²⁺ mg/l	0.088	0.089	0.09	0.018	-0.098	S
G2		0.101	0.102	0.097	0.021	0.175	S
G3		0.33	0.319	0.313	0.028	0.589	S
G4		0.265	0.255	0.245	0.024	0.83	S
G1	K ⁺ mg/l	0.237	0.272	0.262	0.016	-1.565	S
G2		0.311	0.325	0.325	0.022	-0.619	S
G3		0.379	0.374	0.369	0.023	0.438	S
G4		0.527	0.509	0.501	0.027	0.971	S
G1	pH pH units	5.62	5.49	5.475	0.162	0.891	Q
G2		5.62	5.49	5.485	0.126	1.072	Q
G3		5.6	5.44	5.433	0.127	1.322	Q
G4		5.55	5.44	5.422	0.134	0.956	Q
G1	Cond µS/cm	6.1	5.96	5.957	0.467	0.308	S
G2		7.6	7.9	7.869	0.528	-0.508	S
G3		14.3	15.66	15.556	0.632	-1.988	S
G4		15.1	17.15	16.944	0.548	-3.364	S

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

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:
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EMEP – 38th 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⁻ mg S/l	0.165	0.18	0.179	0.009	-1.69	S
G2		0.185	0.205	0.201	0.009	-1.814	S
G3		0.591	0.617	0.61	0.02	-0.942	S
G4		0.466	0.499	0.492	0.019	-1.415	S
G1	NH ₄ ⁺ mg N/l	0.078	0.06	0.061	0.014	1.242	U
G2		0.182	0.172	0.171	0.013	0.827	S
G3		0.316	0.296	0.297	0.015	1.219	S
G4		0.353	0.344	0.345	0.018	0.44	S
G1	NO ₃ ⁻ mg N/l	0.193	0.204	0.203	0.009	-1.111	S
G2		0.322	0.336	0.334	0.012	-1.005	S
G3		0.478	0.489	0.486	0.017	-0.496	S
G4		0.612	0.587	0.586	0.022	1.165	S
G1	Na ⁺ mg/l	0.246	0.254	0.25	0.011	-0.333	S
G2		0.315	0.326	0.314	0.014	0.078	S
G3		0.83	0.848	0.835	0.04	-0.134	S
G4		1.08	1.1	1.069	0.055	0.21	S
G1	Mg ²⁺ mg/l	0.071	0.072	0.07	0.008	0.117	S
G2		0.081	0.083	0.08	0.006	0.218	S
G3		0.256	0.258	0.256	0.014	0.036	S
G4		0.205	0.206	0.202	0.011	0.258	S
G1	Cl ⁻ mg/l	0.244	0.27	0.27	0.043	-0.599	S
G2		0.342	0.386	0.374	0.026	-1.269	S
G3		1.12	1.16	1.136	0.042	-0.382	S
G4		1.47	1.54	1.512	0.072	-0.58	S
G1	Ca ²⁺ mg/l	0.096	0.089	0.09	0.018	0.343	S
G2		0.099	0.102	0.097	0.021	0.081	S
G3		0.318	0.319	0.313	0.028	0.167	S
G4		0.258	0.255	0.245	0.024	0.532	S
G1	K ⁺ mg/l	0.272	0.272	0.262	0.016	0.639	S
G2		0.34	0.325	0.325	0.022	0.682	S
G3		0.382	0.374	0.369	0.023	0.57	S
G4		0.522	0.509	0.501	0.027	0.784	S
G1	pH pH units	5.43	5.49	5.475	0.162	-0.279	S
G2		5.25	5.49	5.485	0.126	-1.863	U
G3		5.16	5.44	5.433	0.127	-2.156	U
G4		5.09	5.44	5.422	0.134	-2.472	U
G1	Cond µS/cm	6.2	5.96	5.957	0.467	0.522	S
G2		8.1	7.9	7.869	0.528	0.438	S
G3		15.9	15.66	15.556	0.632	0.544	S
G4		17.5	17.15	16.944	0.548	1.013	S

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

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EMEP – 38th 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⁻ mg S/l	0.185	0.18	0.179	0.009	0.647	S
G2		0.204	0.205	0.201	0.009	0.285	S
G3		0.708	0.617	0.61	0.02	4.807	Q
G4		0.564	0.499	0.492	0.019	3.861	Q
G1	NH ₄ ⁺ mg N/l	0.05	0.06	0.061	0.014	-0.765	Q
G2		0.143	0.172	0.171	0.013	-2.146	Q
G3		0.244	0.296	0.297	0.015	-3.47	Q
G4		0.298	0.344	0.345	0.018	-2.573	S
G1	NO ₃ ⁻ mg N/l	0.198	0.204	0.203	0.009	-0.543	S
G2		0.331	0.336	0.334	0.012	-0.249	S
G3		0.519	0.489	0.486	0.017	1.912	S
G4		0.636	0.587	0.586	0.022	2.26	S
G1	Na ⁺ mg/l	0.193	0.254	0.25	0.011	-5.18	Q
G2		0.225	0.326	0.314	0.014	-6.522	U
G3		1.242	0.848	0.835	0.04	10.293	U
G4		1.57	1.1	1.069	0.055	9.184	U
G1	Mg ²⁺ mg/l	0.123	0.072	0.07	0.008	6.986	U
G2		0.144	0.083	0.08	0.006	10.556	U
G3		0.32	0.258	0.256	0.014	4.692	Q
G4		0.279	0.206	0.202	0.011	7.022	U
G1	Cl ⁻ mg/l	0.267	0.27	0.27	0.043	-0.06	S
G2		0.362	0.386	0.374	0.026	-0.487	S
G3		1.192	1.16	1.136	0.042	1.317	S
G4		1.606	1.54	1.512	0.072	1.309	S
G1	Ca ²⁺ mg/l	0.541	0.089	0.09	0.018	24.885	U
G2		0.381	0.102	0.097	0.021	13.311	U
G3		0.548	0.319	0.313	0.028	8.261	U
G4		0.514	0.255	0.245	0.024	11.408	U
G1	K ⁺ mg/l	0.294	0.272	0.262	0.016	2.025	S
G2		0.384	0.325	0.325	0.022	2.654	Q
G3		0.152	0.374	0.369	0.023	-9.508	U
G4		0.22	0.509	0.501	0.027	-10.497	U
G1	pH pH units	5.41	5.49	5.475	0.162	-0.402	S
G2		5.36	5.49	5.485	0.126	-0.99	Q
G3		5.32	5.44	5.433	0.127	-0.891	Q
G4		5.36	5.44	5.422	0.134	-0.46	S
G1	Cond µS/cm	5.2	5.96	5.957	0.467	-1.622	S
G2		6.8	7.9	7.869	0.528	-2.022	S
G3		13.3	15.66	15.556	0.632	-3.57	Q
G4		14.7	17.15	16.944	0.548	-4.093	S

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

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

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

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EMEP – 38th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.19	0.18	0.179	0.009	1.232	S
G2		0.211	0.205	0.201	0.009	1.059	S
G3		0.616	0.617	0.61	0.02	0.287	S
G4		0.505	0.499	0.492	0.019	0.685	S
G1	NH ₄ ⁺ mg N/l	0.051	0.06	0.061	0.014	-0.656	S
G2		0.175	0.172	0.171	0.013	0.293	S
G3		0.305	0.296	0.297	0.015	0.502	S
G4		0.356	0.344	0.345	0.018	0.604	S
G1	NO ₃ ⁻ mg N/l	0.22	0.204	0.203	0.009	1.956	S
G2		0.347	0.336	0.334	0.012	1.094	S
G3		0.491	0.489	0.486	0.017	0.267	S
G4		0.591	0.587	0.586	0.022	0.207	S
G1	Na ⁺ mg/l	0.25	0.254	0.25	0.011	0.032	S
G2		0.319	0.326	0.314	0.014	0.371	S
G3		0.846	0.848	0.835	0.04	0.271	S
G4		1.01	1.1	1.069	0.055	-1.072	S
G1	Mg ²⁺ mg/l	0.086	0.072	0.07	0.008	2.08	Q
G2		0.086	0.083	0.08	0.006	1.008	S
G3		0.256	0.258	0.256	0.014	0.036	S
G4		0.175	0.206	0.202	0.011	-2.484	Q
G1	Cl ⁻ mg/l	0.302	0.27	0.27	0.043	0.76	S
G2		0.386	0.386	0.374	0.026	0.451	S
G3		1.11	1.16	1.136	0.042	-0.618	S
G4		1.52	1.54	1.512	0.072	0.115	S
G1	Ca ²⁺ mg/l	0.108	0.089	0.09	0.018	1.005	Q
G2		0.096	0.102	0.097	0.021	-0.06	S
G3		0.297	0.319	0.313	0.028	-0.572	S
G4		0.201	0.255	0.245	0.024	-1.889	Q
G1	K ⁺ mg/l	0.257	0.272	0.262	0.016	-0.306	S
G2		0.337	0.325	0.325	0.022	0.547	S
G3		0.368	0.374	0.369	0.023	-0.044	S
G4		0.48	0.509	0.501	0.027	-0.785	S
G1	pH pH units	5.55	5.49	5.475	0.162	0.46	S
G2		5.6	5.49	5.485	0.126	0.913	Q
G3		5.65	5.44	5.433	0.127	1.717	U
G4		5.495	5.44	5.422	0.134	0.546	S
G1	Cond µS/cm	5.7	5.96	5.957	0.467	-0.55	S
G2		7.6	7.9	7.869	0.528	-0.508	S
G3		15.4	15.66	15.556	0.632	-0.247	S
G4		16.8	17.15	16.944	0.548	-0.263	S

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

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

EMEP – 38th intercomparison of analytical methods

Laboratory 153, Slovenian Forestry Institute, Ljubljana (Slovenia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.171	0.18	0.179	0.009	-0.989	S
G2		0.192	0.205	0.201	0.009	-1.041	S
G3		0.587	0.617	0.61	0.02	-1.138	S
G4		0.473	0.499	0.492	0.019	-1.038	S
G1	NH ₄ ⁺ mg N/l	0.069	0.06	0.061	0.014	0.617	Q
G2		0.177	0.172	0.171	0.013	0.446	S
G3		0.3	0.296	0.297	0.015	0.177	S
G4		0.344	0.344	0.345	0.018	-0.053	S
G1	NO ₃ ⁻ mg N/l	0.201	0.204	0.203	0.009	-0.202	S
G2		1.506	0.336	0.334	0.012	98.421	U
G3		2.071	0.489	0.486	0.017	93.075	U
G4		2.509	0.587	0.586	0.022	87.677	U
G1	Na ⁺ mg/l	0.268	0.254	0.25	0.011	1.679	S
G2		0.334	0.326	0.314	0.014	1.471	S
G3		0.892	0.848	0.835	0.04	1.435	S
G4		1.137	1.1	1.069	0.055	1.254	S
G1	Mg ²⁺ mg/l	0.072	0.072	0.07	0.008	0.223	S
G2		0.081	0.083	0.08	0.006	0.185	S
G3		0.271	0.258	0.256	0.014	1.127	S
G4		0.215	0.206	0.202	0.011	1.172	S
G1	Cl ⁻ mg/l	0.246	0.27	0.27	0.043	-0.552	S
G2		0.358	0.386	0.374	0.026	-0.643	S
G3		1.066	1.16	1.136	0.042	-1.656	S
G4		1.438	1.54	1.512	0.072	-1.024	S
G1	Ca ²⁺ mg/l	0.123	0.089	0.09	0.018	1.832	U
G2		0.119	0.102	0.097	0.021	1.019	Q
G3		0.35	0.319	0.313	0.028	1.293	S
G4		0.28	0.255	0.245	0.024	1.467	S
G1	K ⁺ mg/l	0.254	0.272	0.262	0.016	-0.495	S
G2		0.326	0.325	0.325	0.022	0.054	S
G3		0.356	0.374	0.369	0.023	-0.569	S
G4		0.481	0.509	0.501	0.027	-0.748	S
G1	pH pH units	5.42	5.49	5.475	0.162	-0.341	S
G2		5.44	5.49	5.485	0.126	-0.356	S
G3		5.36	5.44	5.433	0.127	-0.575	S
G4		5.26	5.44	5.422	0.134	-1.205	Q
G1	Cond µS/cm	6.27	5.96	5.957	0.467	0.672	S
G2		8.38	7.9	7.869	0.528	0.968	S
G3		16.8	15.66	15.556	0.632	1.968	S
G4		18	17.15	16.944	0.548	1.925	S

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

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EMEP – 38th 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⁻ mg S/l	0.176	0.18	0.179	0.009	-0.404	S
G2		0.195	0.205	0.201	0.009	-0.709	S
G3		0.61	0.617	0.61	0.02	-0.008	S
G4		0.495	0.499	0.492	0.019	0.146	S
G1	NH ₄ ⁺ mg N/l	0.072	0.06	0.061	0.014	0.835	Q
G2		0.163	0.172	0.171	0.013	-0.622	S
G3		0.285	0.296	0.297	0.015	-0.8	S
G4		0.342	0.344	0.345	0.018	-0.163	S
G1	NO ₃ ⁻ mg N/l	0.203	0.204	0.203	0.009	0.025	S
G2		0.334	0.336	0.334	0.012	0.003	S
G3		0.484	0.489	0.486	0.017	-0.144	S
G4		0.58	0.587	0.586	0.022	-0.294	S
G1	Na ⁺ mg/l	0.246	0.254	0.25	0.011	-0.333	S
G2		0.312	0.326	0.314	0.014	-0.142	S
G3		0.828	0.848	0.835	0.04	-0.184	S
G4		1.066	1.1	1.069	0.055	-0.047	S
G1	Mg ²⁺ mg/l	0.069	0.072	0.07	0.008	-0.174	S
G2		0.078	0.083	0.08	0.006	-0.309	S
G3		0.247	0.258	0.256	0.014	-0.619	S
G4		0.197	0.206	0.202	0.011	-0.473	S
G1	Cl ⁻ mg/l	0.262	0.27	0.27	0.043	-0.177	S
G2		0.371	0.386	0.374	0.026	-0.135	S
G3		1.16	1.16	1.136	0.042	0.562	S
G4		1.552	1.54	1.512	0.072	0.559	S
G1	Ca ²⁺ mg/l	0.095	0.089	0.09	0.018	0.288	S
G2		0.1	0.102	0.097	0.021	0.128	S
G3		0.316	0.319	0.313	0.028	0.097	S
G4		0.261	0.255	0.245	0.024	0.66	S
G1	K ⁺ mg/l	0.239	0.272	0.262	0.016	-1.439	S
G2		0.296	0.325	0.325	0.022	-1.291	S
G3		0.35	0.374	0.369	0.023	-0.832	S
G4		0.479	0.509	0.501	0.027	-0.822	S
G1	pH pH units	5.51	5.49	5.475	0.162	0.214	S
G2		5.56	5.49	5.485	0.126	0.596	S
G3		5.54	5.44	5.433	0.127	0.848	S
G4		5.53	5.44	5.422	0.134	0.807	S
G1	Cond µS/cm	6.05	5.96	5.957	0.467	0.2	S
G2		8.03	7.9	7.869	0.528	0.305	S
G3		15.74	15.66	15.556	0.632	0.291	S
G4		17.2	17.15	16.944	0.548	0.466	S

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EMEP – 38th 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⁻ mg S/l	0.181	0.18	0.179	0.009	0.18	S
G2		0.203	0.205	0.201	0.009	0.175	S
G3		0.618	0.617	0.61	0.02	0.385	S
G4		0.498	0.499	0.492	0.019	0.308	S
G1	NH ₄ ⁺ mg N/l	0.06	0.06	0.061	0.014	-0.038	S
G2		0.174	0.172	0.171	0.013	0.217	S
G3		0.295	0.296	0.297	0.015	-0.149	S
G4		0.343	0.344	0.345	0.018	-0.108	S
G1	NO ₃ ⁻ mg N/l	0.209	0.204	0.203	0.009	0.707	S
G2		0.34	0.336	0.334	0.012	0.506	S
G3		0.494	0.489	0.486	0.017	0.443	S
G4		0.591	0.587	0.586	0.022	0.207	S
G1	Na ⁺ mg/l	0.256	0.254	0.25	0.011	0.581	S
G2		0.326	0.326	0.314	0.014	0.885	S
G3		0.851	0.848	0.835	0.04	0.398	S
G4		1.101	1.1	1.069	0.055	0.594	S
G1	Mg ²⁺ mg/l	0.072	0.072	0.07	0.008	0.223	S
G2		0.082	0.083	0.08	0.006	0.35	S
G3		0.26	0.258	0.256	0.014	0.327	S
G4		0.207	0.206	0.202	0.011	0.441	S
G1	Cl ⁻ mg/l	0.267	0.27	0.27	0.043	-0.06	S
G2		0.377	0.386	0.374	0.026	0.099	S
G3		1.14	1.16	1.136	0.042	0.09	S
G4		1.501	1.54	1.512	0.072	-0.149	S
G1	Ca ²⁺ mg/l	0.089	0.089	0.09	0.018	-0.043	S
G2		0.1	0.102	0.097	0.021	0.128	S
G3		0.319	0.319	0.313	0.028	0.202	S
G4		0.251	0.255	0.245	0.024	0.235	S
G1	K ⁺ mg/l	0.274	0.272	0.262	0.016	0.765	S
G2		0.338	0.325	0.325	0.022	0.592	S
G3		0.377	0.374	0.369	0.023	0.351	S
G4		0.512	0.509	0.501	0.027	0.41	S
G1	pH pH units	5.62	5.49	5.475	0.162	0.891	Q
G2		5.55	5.49	5.485	0.126	0.516	S
G3		5.6	5.44	5.433	0.127	1.322	Q
G4		5.58	5.44	5.422	0.134	1.179	Q
G1	Cond µS/cm	5.8	5.96	5.957	0.467	-0.336	S
G2		7.8	7.9	7.869	0.528	-0.13	S
G3		15.4	15.66	15.556	0.632	-0.247	S
G4		16.8	17.15	16.944	0.548	-0.263	S

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EMEP – 38th intercomparison of analytical methods

Laboratory 166, Forest Research Institute, Laboratory of Natural 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⁻ mg S/l	0.178	0.18	0.179	0.009	-0.171	S
G2		0.204	0.205	0.201	0.009	0.285	S
G3		0.619	0.617	0.61	0.02	0.434	S
G4		0.496	0.499	0.492	0.019	0.2	S
G1	NH ₄ ⁺ mg N/l	0.071	0.06	0.061	0.014	0.762	Q
G2		0.192	0.172	0.171	0.013	1.589	S
G3		0.308	0.296	0.297	0.015	0.698	S
G4		0.357	0.344	0.345	0.018	0.659	S
G1	NO ₃ ⁻ mg N/l	0.204	0.204	0.203	0.009	0.139	S
G2		0.343	0.336	0.334	0.012	0.758	S
G3		0.493	0.489	0.486	0.017	0.385	S
G4		0.589	0.587	0.586	0.022	0.116	S
G1	Na ⁺ mg/l	0.246	0.254	0.25	0.011	-0.333	S
G2		0.307	0.326	0.314	0.014	-0.509	S
G3		0.808	0.848	0.835	0.04	-0.69	S
G4		1.034	1.1	1.069	0.055	-0.633	S
G1	Mg ²⁺ mg/l	0.069	0.072	0.07	0.008	-0.174	S
G2		0.079	0.083	0.08	0.006	-0.144	S
G3		0.252	0.258	0.256	0.014	-0.255	S
G4		0.198	0.206	0.202	0.011	-0.381	S
G1	Cl ⁻ mg/l	0.27	0.27	0.27	0.043	0.01	S
G2		0.382	0.386	0.374	0.026	0.295	S
G3		1.163	1.16	1.136	0.042	0.633	S
G4		1.531	1.54	1.512	0.072	0.268	S
G1	Ca ²⁺ mg/l	-999	0.089	0.09	0.018		B
G2		-999	0.102	0.097	0.021		B
G3		-999	0.319	0.313	0.028		B
G4		-999	0.255	0.245	0.024		B
G1	K ⁺ mg/l	0.25	0.272	0.262	0.016	-0.747	S
G2		0.311	0.325	0.325	0.022	-0.619	S
G3		0.356	0.374	0.369	0.023	-0.569	S
G4		0.486	0.509	0.501	0.027	-0.561	S
G1	pH pH units	5.73	5.49	5.475	0.162	1.569	U
G2		5.44	5.49	5.485	0.126	-0.356	S
G3		5.52	5.44	5.433	0.127	0.69	S
G4		5.45	5.44	5.422	0.134	0.211	S
G1	Cond µS/cm	6.64	5.96	5.957	0.467	1.465	S
G2		9.34	7.9	7.869	0.528	2.785	Q
G3		16.27	15.66	15.556	0.632	1.129	S
G4		17.37	17.15	16.944	0.548	0.776	S

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

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

EMEP – 38th intercomparison of analytical methods

Laboratory 178, Laboratory of Hydrochemistry and Atmospheric Chemistry an EANET Monitoring Laboratory (Russian Federation)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm [†]
G1	SO ₄ ²⁻ mg S/l	0.175	0.18	0.179	0.009	-0.521	S
G2		0.196	0.205	0.201	0.009	-0.599	S
G3		0.596	0.617	0.61	0.02	-0.696	S
G4		0.483	0.499	0.492	0.019	-0.5	S
G1	NH ₄ ⁺ mg N/l	0.06	0.06	0.061	0.014	-0.038	S
G2		0.161	0.172	0.171	0.013	-0.774	S
G3		0.294	0.296	0.297	0.015	-0.214	S
G4		0.326	0.344	0.345	0.018	-1.039	S
G1	NO ₃ ⁻ mg N/l	0.204	0.204	0.203	0.009	0.139	S
G2		0.331	0.336	0.334	0.012	-0.249	S
G3		0.484	0.489	0.486	0.017	-0.144	S
G4		0.583	0.587	0.586	0.022	-0.157	S
G1	Na ⁺ mg/l	0.253	0.254	0.25	0.011	0.307	S
G2		0.312	0.326	0.314	0.014	-0.142	S
G3		0.821	0.848	0.835	0.04	-0.361	S
G4		1.06	1.1	1.069	0.055	-0.156	S
G1	Mg ²⁺ mg/l	0.07	0.072	0.07	0.008	-0.042	S
G2		0.08	0.083	0.08	0.006	0.02	S
G3		0.265	0.258	0.256	0.014	0.691	S
G4		0.21	0.206	0.202	0.011	0.715	S
G1	Cl ⁻ mg/l	0.273	0.27	0.27	0.043	0.081	S
G2		0.372	0.386	0.374	0.026	-0.096	S
G3		1.131	1.16	1.136	0.042	-0.122	S
G4		1.526	1.54	1.512	0.072	0.198	S
G1	Ca ²⁺ mg/l	0.089	0.089	0.09	0.018	-0.043	S
G2		0.105	0.102	0.097	0.021	0.362	S
G3		0.277	0.319	0.313	0.028	-1.276	S
G4		0.25	0.255	0.245	0.024	0.192	S
G1	K ⁺ mg/l	0.261	0.272	0.262	0.016	-0.054	S
G2		0.327	0.325	0.325	0.022	0.099	S
G3		0.375	0.374	0.369	0.023	0.263	S
G4		0.508	0.509	0.501	0.027	0.261	S
G1	pH pH units	5.38	5.49	5.475	0.162	-0.587	Q
G2		5.42	5.49	5.485	0.126	-0.515	S
G3		5.39	5.44	5.433	0.127	-0.338	S
G4		5.32	5.44	5.422	0.134	-0.758	Q
G1	Cond µS/cm	6.13	5.96	5.957	0.467	0.372	S
G2		8.05	7.9	7.869	0.528	0.343	S
G3		16.06	15.66	15.556	0.632	0.797	S
G4		17.29	17.15	16.944	0.548	0.63	S

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

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EMEP – 38th intercomparison of analytical methods

Laboratory 179, Environmental Pollution Monitoring Center (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⁻ mg S/l	0.183	0.18	0.179	0.009	0.414	S
G2		0.199	0.205	0.201	0.009	-0.267	S
G3		0.615	0.617	0.61	0.02	0.238	S
G4		0.499	0.499	0.492	0.019	0.362	S
G1	NH ₄ ⁺ mg N/l	< 0.078	0.06	0.061	0.014		B
G2		0.183	0.172	0.171	0.013	0.903	S
G3		0.298	0.296	0.297	0.015	0.046	S
G4		0.349	0.344	0.345	0.018	0.221	S
G1	NO ₃ ⁻ mg N/l	0.183	0.204	0.203	0.009	-2.247	Q
G2		0.314	0.336	0.334	0.012	-1.677	S
G3		0.464	0.489	0.486	0.017	-1.319	S
G4		0.568	0.587	0.586	0.022	-0.842	S
G1	Na ⁺ mg/l	0.254	0.254	0.25	0.011	0.398	S
G2		0.316	0.326	0.314	0.014	0.151	S
G3		0.831	0.848	0.835	0.04	-0.108	S
G4		1.064	1.1	1.069	0.055	-0.083	S
G1	Mg ²⁺ mg/l	< 0.100	0.072	0.07	0.008		B
G2		< 0.100	0.083	0.08	0.006		B
G3		0.242	0.258	0.256	0.014	-0.983	S
G4		0.192	0.206	0.202	0.011	-0.93	S
G1	Cl ⁻ mg/l	0.258	0.27	0.27	0.043	-0.271	S
G2		0.383	0.386	0.374	0.026	0.334	S
G3		1.06	1.16	1.136	0.042	-1.798	S
G4		1.436	1.54	1.512	0.072	-1.052	S
G1	Ca ²⁺ mg/l	0.1	0.089	0.09	0.018	0.564	S
G2		0.111	0.102	0.097	0.021	0.644	S
G3		0.294	0.319	0.313	0.028	-0.678	S
G4		0.232	0.255	0.245	0.024	-0.572	S
G1	K ⁺ mg/l	0.277	0.272	0.262	0.016	0.954	S
G2		0.33	0.325	0.325	0.022	0.233	S
G3		0.36	0.374	0.369	0.023	-0.394	S
G4		0.525	0.509	0.501	0.027	0.896	S
G1	pH pH units	5.48	5.49	5.475	0.162	0.029	S
G2		5.55	5.49	5.485	0.126	0.516	S
G3		5.04	5.44	5.433	0.127	-3.104	U
G4		5.02	5.44	5.422	0.134	-2.993	U
G1	Cond μS/cm	5.7	5.96	5.957	0.467	-0.55	S
G2		7.7	7.9	7.869	0.528	-0.319	S
G3		15.5	15.66	15.556	0.632	-0.089	S
G4		16.7	17.15	16.944	0.548	-0.446	S

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EMEP – 38th intercomparison of analytical methods

Laboratory 200, FUB AG (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⁻ mg S/l	0.181	0.18	0.179	0.009	0.18	S
G2		0.192	0.205	0.201	0.009	-1.041	S
G3		0.607	0.617	0.61	0.02	-0.155	S
G4		0.488	0.499	0.492	0.019	-0.231	S
G1	NH ₄ ⁺ mg N/l	0.062	0.06	0.061	0.014	0.108	S
G2		0.174	0.172	0.171	0.013	0.217	S
G3		0.297	0.296	0.297	0.015	-0.019	S
G4		0.35	0.344	0.345	0.018	0.276	S
G1	NO ₃ ⁻ mg N/l	0.204	0.204	0.203	0.009	0.139	S
G2		0.335	0.336	0.334	0.012	0.087	S
G3		0.484	0.489	0.486	0.017	-0.144	S
G4		0.581	0.587	0.586	0.022	-0.249	S
G1	Na ⁺ mg/l	0.259	0.254	0.25	0.011	0.855	S
G2		0.325	0.326	0.314	0.014	0.811	S
G3		0.849	0.848	0.835	0.04	0.347	S
G4		1.092	1.1	1.069	0.055	0.43	S
G1	Mg ²⁺ mg/l	0.083	0.072	0.07	0.008	1.682	Q
G2		0.09	0.083	0.08	0.006	1.667	S
G3		0.273	0.258	0.256	0.014	1.273	S
G4		0.22	0.206	0.202	0.011	1.629	S
G1	Cl ⁻ mg/l	0.272	0.27	0.27	0.043	0.057	S
G2		0.403	0.386	0.374	0.026	1.116	S
G3		1.145	1.16	1.136	0.042	0.208	S
G4		1.521	1.54	1.512	0.072	0.129	S
G1	Ca ²⁺ mg/l	0.087	0.089	0.09	0.018	-0.153	S
G2		0.095	0.102	0.097	0.021	-0.107	S
G3		0.333	0.319	0.313	0.028	0.695	S
G4		0.271	0.255	0.245	0.024	1.085	S
G1	K ⁺ mg/l	0.299	0.272	0.262	0.016	2.34	S
G2		0.371	0.325	0.325	0.022	2.071	S
G3		0.414	0.374	0.369	0.023	1.972	S
G4		0.566	0.509	0.501	0.027	2.427	S
G1	pH pH units	5.53	5.49	5.475	0.162	0.337	S
G2		5.7	5.49	5.485	0.126	1.706	U
G3		5.61	5.44	5.433	0.127	1.401	Q
G4		5.65	5.44	5.422	0.134	1.701	U
G1	Cond µS/cm	5.8	5.96	5.957	0.467	-0.336	S
G2		7.73	7.9	7.869	0.528	-0.262	S
G3		15.32	15.66	15.556	0.632	-0.374	S
G4		16.74	17.15	16.944	0.548	-0.373	S

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EMEP – 38th intercomparison of analytical methods

Laboratory 203, The Public Health Institute Vranje (Republic of Serbia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	-999	0.18	0.179	0.009		B
G2		-999	0.205	0.201	0.009		B
G3		-999	0.617	0.61	0.02		B
G4		-999	0.499	0.492	0.019		B
G1	NH ₄ ⁺ mg N/l	-999	0.06	0.061	0.014		B
G2		-999	0.172	0.171	0.013		B
G3		-999	0.296	0.297	0.015		B
G4		-999	0.344	0.345	0.018		B
G1	NO ₃ ⁻ mg N/l	-999	0.204	0.203	0.009		B
G2		-999	0.336	0.334	0.012		B
G3		-999	0.489	0.486	0.017		B
G4		-999	0.587	0.586	0.022		B
G1	Na ⁺ mg/l	0.345	0.254	0.25	0.011	8.72	U
G2		0.42	0.326	0.314	0.014	7.778	U
G3		0.852	0.848	0.835	0.04	0.423	S
G4		0.949	1.1	1.069	0.055	-2.189	S
G1	Mg ²⁺ mg/l	0.058	0.072	0.07	0.008	-1.633	Q
G2		0.07	0.083	0.08	0.006	-1.626	Q
G3		0.221	0.258	0.256	0.014	-2.511	S
G4		0.188	0.206	0.202	0.011	-1.295	S
G1	Cl ⁻ mg/l	< 1.000	0.27	0.27	0.043		B
G2		< 1.000	0.386	0.374	0.026		B
G3		< 1.000	1.16	1.136	0.042	-15.013	U
G4		< 1.000	1.54	1.512	0.072	-14.052	U
G1	Ca ²⁺ mg/l	0.16	0.089	0.09	0.018	3.873	U
G2		0.128	0.102	0.097	0.021	1.441	U
G3		0.262	0.319	0.313	0.028	-1.804	Q
G4		0.25	0.255	0.245	0.024	0.192	S
G1	K ⁺ mg/l	-999	0.272	0.262	0.016		B
G2		-999	0.325	0.325	0.022		B
G3		-999	0.374	0.369	0.023		B
G4		-999	0.509	0.501	0.027		B
G1	pH pH units	-999	5.49	5.475	0.162		B
G2		-999	5.49	5.485	0.126		B
G3		-999	5.44	5.433	0.127		B
G4		-999	5.44	5.422	0.134		B
G1	Cond µS/cm	-999	5.96	5.957	0.467		B
G2		-999	7.9	7.869	0.528		B
G3		-999	15.66	15.556	0.632		B
G4		-999	17.15	16.944	0.548		B

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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.

* Z score is unitless

✎ EMEP quality norm; letters indicate:

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

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

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

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

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