

EMEP – 37th 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	0.205	0.209	0.206	0.021	-0.065	S
G2		0.216	0.22	0.214	0.014	0.178	S
G3		0.426	0.419	0.413	0.04	0.338	S
G4		0.431	0.422	0.419	0.038	0.317	S
G1	NH ₄ ⁺ mg N/l	0.082	0.08	0.082	0.01	-0.035	S
G2		0.162	0.16	0.164	0.015	-0.165	S
G3		0.414	0.401	0.412	0.022	0.086	S
G4		0.467	0.454	0.464	0.024	0.134	S
G1	NO ₃ ⁻ mg N/l	0.144	0.149	0.149	0.009	-0.541	S
G2		0.262	0.267	0.253	0.051	0.184	S
G3		0.532	0.547	0.538	0.077	-0.077	S
G4		0.628	0.635	0.625	0.091	0.036	S
G1	Na ⁺ mg/l	0.251	0.268	0.262	0.014	-0.756	S
G2		0.375	0.39	0.379	0.017	-0.233	S
G3		0.842	0.891	0.867	0.033	-0.754	S
G4		1.025	1.06	1.03	0.039	-0.136	S
G1	Mg ²⁺ mg/l	0.08	0.083	0.081	0.008	-0.145	S
G2		0.058	0.062	0.059	0.007	-0.215	S
G3		0.194	0.206	0.205	0.014	-0.79	S
G4		0.166	0.175	0.175	0.011	-0.847	S
G1	Cl ⁻ mg/l	0.326	0.347	0.336	0.022	-0.439	S
G2		0.486	0.502	0.484	0.036	0.044	S
G3		1.205	1.24	1.19	0.049	0.317	S
G4		1.409	1.47	1.422	0.054	-0.241	S
G1	Ca ²⁺ mg/l	0.109	0.115	0.115	0.019	-0.321	S
G2		0.128	0.153	0.148	0.023	-0.889	Q
G3		0.145	0.153	0.155	0.027	-0.347	S
G4		0.195	0.204	0.201	0.025	-0.244	S
G1	K ⁺ mg/l	0.109	0.119	0.112	0.01	-0.334	S
G2		0.175	0.187	0.178	0.012	-0.263	S
G3		0.243	0.255	0.251	0.013	-0.644	S
G4		0.3	0.323	0.315	0.02	-0.746	S
G1	pH pH units	5.49	5.49	5.488	0.15	0.012	S
G2		5.454	5.48	5.486	0.142	-0.226	S
G3		5.412	5.45	5.43	0.12	-0.153	S
G4		5.379	5.43	5.41	0.088	-0.357	S
G1	Cond µS/cm	5.55	5.96	6.058	0.77	-0.66	S
G2		7.84	7.8	7.951	1.189	-0.093	S
G3		14.79	14.47	14.818	0.703	-0.04	S
G4		16.29	16.4	16.524	0.684	-0.343	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.2	0.209	0.206	0.021	-0.302	S
G2		0.21	0.22	0.214	0.014	-0.254	S
G3		0.41	0.419	0.413	0.04	-0.064	S
G4		0.41	0.422	0.419	0.038	-0.228	S
G1	NH ₄ ⁺ mg N/l	0.09	0.08	0.082	0.01	0.748	S
G2		0.16	0.16	0.164	0.015	-0.302	S
G3		0.4	0.401	0.412	0.022	-0.55	S
G4		0.45	0.454	0.464	0.024	-0.57	S
G1	NO ₃ ⁻ mg N/l	0.14	0.149	0.149	0.009	-1.005	S
G2		0.26	0.267	0.253	0.051	0.145	S
G3		0.56	0.547	0.538	0.077	0.287	S
G4		0.65	0.635	0.625	0.091	0.279	S
G1	Na ⁺ mg/l	0.28	0.268	0.262	0.014	1.287	S
G2		0.4	0.39	0.379	0.017	1.217	S
G3		0.88	0.891	0.867	0.033	0.388	S
G4		1.05	1.06	1.03	0.039	0.503	S
G1	Mg ²⁺ mg/l	0.06	0.083	0.081	0.008	-2.619	U
G2		0.06	0.062	0.059	0.007	0.084	S
G3		0.17	0.206	0.205	0.014	-2.534	Q
G4		0.17	0.175	0.175	0.011	-0.48	S
G1	Cl ⁻ mg/l	0.37	0.347	0.336	0.022	1.553	S
G2		0.51	0.502	0.484	0.036	0.705	S
G3		1.2	1.24	1.19	0.049	0.214	S
G4		1.43	1.47	1.422	0.054	0.152	S
G1	Ca ²⁺ mg/l	0.08	0.115	0.115	0.019	-1.887	U
G2		0.11	0.153	0.148	0.023	-1.67	U
G3		0.17	0.153	0.155	0.027	0.566	S
G4		0.19	0.204	0.201	0.025	-0.446	S
G1	K ⁺ mg/l	0.08	0.119	0.112	0.01	-3.242	U
G2		0.15	0.187	0.178	0.012	-2.385	Q
G3		0.2	0.255	0.251	0.013	-3.924	Q
G4		0.27	0.323	0.315	0.02	-2.236	Q
G1	pH pH units	5.5	5.49	5.488	0.15	0.079	S
G2		5.45	5.48	5.486	0.142	-0.255	S
G3		5.42	5.45	5.43	0.12	-0.086	S
G4		5.38	5.43	5.41	0.088	-0.346	S
G1	Cond µS/cm	-999	5.96	6.058	0.77		B
G2		-999	7.8	7.951	1.189		B
G3		-999	14.47	14.818	0.703		B
G4		-999	16.4	16.524	0.684		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.196	0.209	0.206	0.021	-0.492	S
G2		0.214	0.22	0.214	0.014	0.034	S
G3		0.407	0.419	0.413	0.04	-0.139	S
G4		0.416	0.422	0.419	0.038	-0.072	S
G1	NH ₄ ⁺ mg N/l	0.08	0.08	0.082	0.01	-0.23	S
G2		0.157	0.16	0.164	0.015	-0.507	S
G3		0.408	0.401	0.412	0.022	-0.186	S
G4		0.459	0.454	0.464	0.024	-0.198	S
G1	NO ₃ ⁻ mg N/l	0.154	0.149	0.149	0.009	0.619	S
G2		0.272	0.267	0.253	0.051	0.38	S
G3		0.558	0.547	0.538	0.077	0.261	S
G4		0.648	0.635	0.625	0.091	0.257	S
G1	Na ⁺ mg/l	0.272	0.268	0.262	0.014	0.723	S
G2		0.395	0.39	0.379	0.017	0.927	S
G3		0.887	0.891	0.867	0.033	0.599	S
G4		1.052	1.06	1.03	0.039	0.554	S
G1	Mg ²⁺ mg/l	0.084	0.083	0.081	0.008	0.35	S
G2		0.062	0.062	0.059	0.007	0.384	S
G3		0.212	0.206	0.205	0.014	0.518	S
G4		0.181	0.175	0.175	0.011	0.529	S
G1	Cl ⁻ mg/l	0.34	0.347	0.336	0.022	0.195	S
G2		0.501	0.502	0.484	0.036	0.457	S
G3		1.221	1.24	1.19	0.049	0.645	S
G4		1.449	1.47	1.422	0.054	0.507	S
G1	Ca ²⁺ mg/l	0.115	0.115	0.115	0.019	0.003	S
G2		0.155	0.153	0.148	0.023	0.284	S
G3		0.155	0.153	0.155	0.027	0.018	S
G4		0.206	0.204	0.201	0.025	0.199	S
G1	K ⁺ mg/l	0.122	0.119	0.112	0.01	0.969	S
G2		0.194	0.187	0.178	0.012	1.349	S
G3		0.265	0.255	0.251	0.013	1.035	S
G4		0.339	0.323	0.315	0.02	1.191	S
G1	pH pH units	5.47	5.49	5.488	0.15	-0.121	S
G2		5.45	5.48	5.486	0.142	-0.255	S
G3		5.44	5.45	5.43	0.12	0.081	S
G4		5.47	5.43	5.41	0.088	0.676	S
G1	Cond µS/cm	5.69	5.96	6.058	0.77	-0.478	S
G2		7.63	7.8	7.951	1.189	-0.27	S
G3		14.81	14.47	14.818	0.703	-0.011	S
G4		16.58	16.4	16.524	0.684	0.081	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

Laboratory 6, SGS Multilab (France)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.222	0.209	0.206	0.021	0.742	S
G2		0.231	0.22	0.214	0.014	1.256	S
G3		0.449	0.419	0.413	0.04	0.914	S
G4		0.452	0.422	0.419	0.038	0.863	S
G1	NH ₄ ⁺ mg N/l	0.081	0.08	0.082	0.01	-0.133	S
G2		0.155	0.16	0.164	0.015	-0.644	S
G3		0.448	0.401	0.412	0.022	1.63	S
G4		0.503	0.454	0.464	0.024	1.624	S
G1	NO ₃ ⁻ mg N/l	0.156	0.149	0.149	0.009	0.851	S
G2		0.28	0.267	0.253	0.051	0.537	S
G3		0.586	0.547	0.538	0.077	0.624	S
G4		0.679	0.635	0.625	0.091	0.599	S
G1	Na ⁺ mg/l	0.267	0.268	0.262	0.014	0.371	S
G2		0.389	0.39	0.379	0.017	0.579	S
G3		0.88	0.891	0.867	0.033	0.388	S
G4		1.047	1.06	1.03	0.039	0.426	S
G1	Mg ²⁺ mg/l	0.089	0.083	0.081	0.008	0.968	S
G2		0.064	0.062	0.059	0.007	0.684	S
G3		0.219	0.206	0.205	0.014	1.027	S
G4		0.186	0.175	0.175	0.011	0.987	S
G1	Cl ⁻ mg/l	0.364	0.347	0.336	0.022	1.282	S
G2		0.531	0.502	0.484	0.036	1.284	S
G3		1.301	1.24	1.19	0.049	2.285	S
G4		1.545	1.47	1.422	0.054	2.301	S
G1	Ca ²⁺ mg/l	0.135	0.115	0.115	0.019	1.084	Q
G2		0.167	0.153	0.148	0.023	0.805	S
G3		0.165	0.153	0.155	0.027	0.383	S
G4		0.221	0.204	0.201	0.025	0.804	S
G1	K ⁺ mg/l	0.119	0.119	0.112	0.01	0.668	S
G2		0.186	0.187	0.178	0.012	0.67	S
G3		0.258	0.255	0.251	0.013	0.501	S
G4		0.326	0.323	0.315	0.02	0.545	S
G1	pH pH units	5.15	5.49	5.488	0.15	-2.258	U
G2		5.17	5.48	5.486	0.142	-2.231	U
G3		5.04	5.45	5.43	0.12	-3.262	U
G4		5.01	5.43	5.41	0.088	-4.547	U
G1	Cond µS/cm	-999	5.96	6.058	0.77		B
G2		-999	7.8	7.951	1.189		B
G3		-999	14.47	14.818	0.703		B
G4		-999	16.4	16.524	0.684		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.614	0.209	0.206	0.021	19.347	U
G2		0.636	0.22	0.214	0.014	30.386	U
G3		1.24	0.419	0.413	0.04	20.752	U
G4		1.25	0.422	0.419	0.038	21.592	U
G1	NH ₄ ⁺ mg N/l	0.098	0.08	0.082	0.01	1.531	Q
G2		0.195	0.16	0.164	0.015	2.092	Q
G3		0.5	0.401	0.412	0.022	3.991	Q
G4		0.566	0.454	0.464	0.024	4.233	Q
G1	NO ₃ ⁻ mg N/l	0.643	0.149	0.149	0.009	57.349	U
G2		1.16	0.267	0.253	0.051	17.794	U
G3		2.42	0.547	0.538	0.077	24.44	U
G4		2.81	0.635	0.625	0.091	24.127	U
G1	Na ⁺ mg/l	0.244	0.268	0.262	0.014	-1.25	S
G2		0.356	0.39	0.379	0.017	-1.336	S
G3		0.803	0.891	0.867	0.033	-1.927	S
G4		0.954	1.06	1.03	0.039	-1.95	S
G1	Mg ²⁺ mg/l	0.074	0.083	0.081	0.008	-0.887	S
G2		0.052	0.062	0.059	0.007	-1.115	Q
G3		0.197	0.206	0.205	0.014	-0.572	S
G4		0.167	0.175	0.175	0.011	-0.755	S
G1	Cl ⁻ mg/l	0.345	0.347	0.336	0.022	0.421	S
G2		0.498	0.502	0.484	0.036	0.374	S
G3		1.2	1.24	1.19	0.049	0.214	S
G4		1.44	1.47	1.422	0.054	0.339	S
G1	Ca ²⁺ mg/l	0.099	0.115	0.115	0.019	-0.861	S
G2		0.134	0.153	0.148	0.023	-0.628	S
G3		0.138	0.153	0.155	0.027	-0.603	S
G4		0.185	0.204	0.201	0.025	-0.647	S
G1	K ⁺ mg/l	0.114	0.119	0.112	0.01	0.167	S
G2		0.175	0.187	0.178	0.012	-0.263	S
G3		0.243	0.255	0.251	0.013	-0.644	S
G4		0.308	0.323	0.315	0.02	-0.349	S
G1	pH pH units	7.19	5.49	5.488	0.15	11.365	U
G2		6.76	5.48	5.486	0.142	8.992	U
G3		6.23	5.45	5.43	0.12	6.683	U
G4		5.92	5.43	5.41	0.088	5.786	U
G1	Cond µS/cm	5.75	5.96	6.058	0.77	-0.4	S
G2		7.52	7.8	7.951	1.189	-0.362	S
G3		14.65	14.47	14.818	0.703	-0.239	S
G4		16.43	16.4	16.524	0.684	-0.138	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.211	0.209	0.206	0.021	0.22	S
G2		0.218	0.22	0.214	0.014	0.321	S
G3		0.433	0.419	0.413	0.04	0.513	S
G4		0.435	0.422	0.419	0.038	0.421	S
G1	NH ₄ ⁺ mg N/l	0.081	0.08	0.082	0.01	-0.133	S
G2		0.161	0.16	0.164	0.015	-0.234	S
G3		0.401	0.401	0.412	0.022	-0.504	S
G4		0.451	0.454	0.464	0.024	-0.529	S
G1	NO ₃ ⁻ mg N/l	0.152	0.149	0.149	0.009	0.387	S
G2		0.269	0.267	0.253	0.051	0.321	S
G3		0.53	0.547	0.538	0.077	-0.103	S
G4		0.614	0.635	0.625	0.091	-0.118	S
G1	Na ⁺ mg/l	0.269	0.268	0.262	0.014	0.512	S
G2		0.391	0.39	0.379	0.017	0.695	S
G3		0.876	0.891	0.867	0.033	0.268	S
G4		1.041	1.06	1.03	0.039	0.273	S
G1	Mg ²⁺ mg/l	0.083	0.083	0.081	0.008	0.226	S
G2		0.061	0.062	0.059	0.007	0.234	S
G3		0.209	0.206	0.205	0.014	0.3	S
G4		0.178	0.175	0.175	0.011	0.254	S
G1	Cl ⁻ mg/l	0.348	0.347	0.336	0.022	0.557	S
G2		0.509	0.502	0.484	0.036	0.677	S
G3		1.19	1.24	1.19	0.049	0.009	S
G4		1.424	1.47	1.422	0.054	0.04	S
G1	Ca ²⁺ mg/l	0.129	0.115	0.115	0.019	0.76	S
G2		0.161	0.153	0.148	0.023	0.544	S
G3		0.166	0.153	0.155	0.027	0.42	S
G4		0.211	0.204	0.201	0.025	0.401	S
G1	K ⁺ mg/l	0.11	0.119	0.112	0.01	-0.234	S
G2		0.174	0.187	0.178	0.012	-0.348	S
G3		0.257	0.255	0.251	0.013	0.424	S
G4		0.323	0.323	0.315	0.02	0.396	S
G1	pH pH units	5.56	5.49	5.488	0.15	0.48	S
G2		5.49	5.48	5.486	0.142	0.028	S
G3		5.45	5.45	5.43	0.12	0.164	S
G4		5.46	5.43	5.41	0.088	0.563	S
G1	Cond µS/cm	6	5.96	6.058	0.77	-0.075	S
G2		8	7.8	7.951	1.189	0.041	S
G3		15.3	14.47	14.818	0.703	0.686	S
G4		17	16.4	16.524	0.684	0.695	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

Laboratory 10, Institute for Atmospheric Physics (Hungary)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.199	0.209	0.206	0.021	-0.35	S
G2		0.213	0.22	0.214	0.014	-0.038	S
G3		0.408	0.419	0.413	0.04	-0.114	S
G4		0.403	0.422	0.419	0.038	-0.41	S
G1	NH ₄ ⁺ mg N/l	0.06	0.08	0.082	0.01	-2.187	U
G2		0.137	0.16	0.164	0.015	-1.875	S
G3		0.392	0.401	0.412	0.022	-0.913	S
G4		0.442	0.454	0.464	0.024	-0.901	S
G1	NO ₃ ⁻ mg N/l	0.141	0.149	0.149	0.009	-0.889	S
G2		0.254	0.267	0.253	0.051	0.027	S
G3		0.533	0.547	0.538	0.077	-0.064	S
G4		0.597	0.635	0.625	0.091	-0.306	S
G1	Na ⁺ mg/l	0.38	0.268	0.262	0.014	8.332	U
G2		0.348	0.39	0.379	0.017	-1.8	S
G3		0.73	0.891	0.867	0.033	-4.122	Q
G4		1.145	1.06	1.03	0.039	2.931	S
G1	Mg ²⁺ mg/l	0.075	0.083	0.081	0.008	-0.763	S
G2		0.053	0.062	0.059	0.007	-0.965	S
G3		0.189	0.206	0.205	0.014	-1.154	S
G4		0.156	0.175	0.175	0.011	-1.763	S
G1	Cl ⁻ mg/l	0.295	0.347	0.336	0.022	-1.842	S
G2		0.488	0.502	0.484	0.036	0.099	S
G3		1.161	1.24	1.19	0.049	-0.586	S
G4		1.238	1.47	1.422	0.054	-3.437	Q
G1	Ca ²⁺ mg/l	0.106	0.115	0.115	0.019	-0.483	S
G2		0.165	0.153	0.148	0.023	0.718	S
G3		0.157	0.153	0.155	0.027	0.091	S
G4		0.259	0.204	0.201	0.025	2.335	U
G1	K ⁺ mg/l	0.194	0.119	0.112	0.01	8.189	U
G2		0.194	0.187	0.178	0.012	1.349	S
G3		0.277	0.255	0.251	0.013	1.95	S
G4		0.561	0.323	0.315	0.02	12.218	U
G1	pH pH units	5.39	5.49	5.488	0.15	-0.656	Q
G2		5.46	5.48	5.486	0.142	-0.184	S
G3		5.35	5.45	5.43	0.12	-0.671	Q
G4		5.39	5.43	5.41	0.088	-0.232	S
G1	Cond µS/cm	6.1	5.96	6.058	0.77	0.054	S
G2		7.82	7.8	7.951	1.189	-0.11	S
G3		15.04	14.47	14.818	0.703	0.316	S
G4		16.86	16.4	16.524	0.684	0.491	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.21	0.209	0.206	0.021	0.172	S
G2		0.22	0.22	0.214	0.014	0.465	S
G3		0.42	0.419	0.413	0.04	0.187	S
G4		0.43	0.422	0.419	0.038	0.292	S
G1	NH ₄ ⁺ mg N/l	< 0.040	0.08	0.082	0.01	-6.102	U
G2		0.14	0.16	0.164	0.015	-1.67	S
G3		0.44	0.401	0.412	0.022	1.267	S
G4		0.5	0.454	0.464	0.024	1.5	S
G1	NO ₃ ⁻ mg N/l	0.15	0.149	0.149	0.009	0.155	S
G2		0.26	0.267	0.253	0.051	0.145	S
G3		0.54	0.547	0.538	0.077	0.027	S
G4		0.63	0.635	0.625	0.091	0.058	S
G1	Na ⁺ mg/l	0.25	0.268	0.262	0.014	-0.827	S
G2		0.37	0.39	0.379	0.017	-0.523	S
G3		0.86	0.891	0.867	0.033	-0.213	S
G4		1.02	1.06	1.03	0.039	-0.264	S
G1	Mg ²⁺ mg/l	0.071	0.083	0.081	0.008	-1.258	S
G2		0.051	0.062	0.059	0.007	-1.264	Q
G3		0.197	0.206	0.205	0.014	-0.572	S
G4		0.168	0.175	0.175	0.011	-0.663	S
G1	Cl ⁻ mg/l	0.34	0.347	0.336	0.022	0.195	S
G2		0.49	0.502	0.484	0.036	0.154	S
G3		1.18	1.24	1.19	0.049	-0.196	S
G4		1.41	1.47	1.422	0.054	-0.222	S
G1	Ca ²⁺ mg/l	0.09	0.115	0.115	0.019	-1.347	Q
G2		0.12	0.153	0.148	0.023	-1.236	Q
G3		0.13	0.153	0.155	0.027	-0.895	Q
G4		0.18	0.204	0.201	0.025	-0.849	S
G1	K ⁺ mg/l	0.11	0.119	0.112	0.01	-0.234	S
G2		0.17	0.187	0.178	0.012	-0.688	S
G3		0.25	0.255	0.251	0.013	-0.11	S
G4		0.31	0.323	0.315	0.02	-0.249	S
G1	pH pH units	5.48	5.49	5.488	0.15	-0.055	S
G2		5.48	5.48	5.486	0.142	-0.043	S
G3		5.45	5.45	5.43	0.12	0.164	S
G4		5.44	5.43	5.41	0.088	0.336	S
G1	Cond µS/cm	5.7	5.96	6.058	0.77	-0.465	S
G2		7.6	7.8	7.951	1.189	-0.295	S
G3		14.5	14.47	14.818	0.703	-0.452	S
G4		16.3	16.4	16.524	0.684	-0.328	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.21	0.209	0.206	0.021	0.172	S
G2		0.22	0.22	0.214	0.014	0.465	S
G3		0.42	0.419	0.413	0.04	0.187	S
G4		0.43	0.422	0.419	0.038	0.292	S
G1	NH ₄ ⁺ mg N/l	0.087	0.08	0.082	0.01	0.455	S
G2		0.175	0.16	0.164	0.015	0.724	S
G3		0.441	0.401	0.412	0.022	1.312	S
G4		0.486	0.454	0.464	0.024	0.92	S
G1	NO ₃ ⁻ mg N/l	0.151	0.149	0.149	0.009	0.271	S
G2		0.263	0.267	0.253	0.051	0.204	S
G3		0.548	0.547	0.538	0.077	0.131	S
G4		0.641	0.635	0.625	0.091	0.18	S
G1	Na ⁺ mg/l	0.286	0.268	0.262	0.014	1.71	S
G2		0.417	0.39	0.379	0.017	2.204	S
G3		0.925	0.891	0.867	0.033	1.742	S
G4		1.092	1.06	1.03	0.039	1.576	S
G1	Mg ²⁺ mg/l	0.082	0.083	0.081	0.008	0.103	S
G2		0.061	0.062	0.059	0.007	0.234	S
G3		0.218	0.206	0.205	0.014	0.954	S
G4		0.187	0.175	0.175	0.011	1.079	S
G1	Cl ⁻ mg/l	0.349	0.347	0.336	0.022	0.603	S
G2		0.496	0.502	0.484	0.036	0.319	S
G3		1.19	1.24	1.19	0.049	0.009	S
G4		1.424	1.47	1.422	0.054	0.04	S
G1	Ca ²⁺ mg/l	0.112	0.115	0.115	0.019	-0.159	S
G2		0.154	0.153	0.148	0.023	0.24	S
G3		0.158	0.153	0.155	0.027	0.127	S
G4		0.21	0.204	0.201	0.025	0.36	S
G1	K ⁺ mg/l	0.107	0.119	0.112	0.01	-0.535	S
G2		0.185	0.187	0.178	0.012	0.585	S
G3		0.263	0.255	0.251	0.013	0.882	S
G4		0.328	0.323	0.315	0.02	0.645	S
G1	pH pH units	5.54	5.49	5.488	0.15	0.346	S
G2		5.47	5.48	5.486	0.142	-0.113	S
G3		5.44	5.45	5.43	0.12	0.081	S
G4		5.44	5.43	5.41	0.088	0.336	S
G1	Cond µS/cm	5.7	5.96	6.058	0.77	-0.465	S
G2		7.5	7.8	7.951	1.189	-0.379	S
G3		14.7	14.47	14.818	0.703	-0.168	S
G4		16.5	16.4	16.524	0.684	-0.036	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.203	0.209	0.206	0.021	-0.16	S
G2		0.213	0.22	0.214	0.014	-0.038	S
G3		0.4	0.419	0.413	0.04	-0.315	S
G4		0.402	0.422	0.419	0.038	-0.436	S
G1	NH ₄ ⁺ mg N/l	0.076	0.08	0.082	0.01	-0.622	S
G2		0.155	0.16	0.164	0.015	-0.644	S
G3		0.406	0.401	0.412	0.022	-0.277	S
G4		0.448	0.454	0.464	0.024	-0.653	S
G1	NO ₃ ⁻ mg N/l	0.151	0.149	0.149	0.009	0.271	S
G2		0.262	0.267	0.253	0.051	0.184	S
G3		0.54	0.547	0.538	0.077	0.027	S
G4		0.63	0.635	0.625	0.091	0.058	S
G1	Na ⁺ mg/l	0.259	0.268	0.262	0.014	-0.193	S
G2		0.376	0.39	0.379	0.017	-0.175	S
G3		0.873	0.891	0.867	0.033	0.178	S
G4		1.035	1.06	1.03	0.039	0.12	S
G1	Mg ²⁺ mg/l	0.082	0.083	0.081	0.008	0.103	S
G2		0.061	0.062	0.059	0.007	0.234	S
G3		0.207	0.206	0.205	0.014	0.154	S
G4		0.178	0.175	0.175	0.011	0.254	S
G1	Cl ⁻ mg/l	0.316	0.347	0.336	0.022	-0.892	S
G2		0.447	0.502	0.484	0.036	-1.031	S
G3		1.14	1.24	1.19	0.049	-1.016	S
G4		1.363	1.47	1.422	0.054	-1.1	S
G1	Ca ²⁺ mg/l	0.111	0.115	0.115	0.019	-0.213	S
G2		0.148	0.153	0.148	0.023	-0.02	S
G3		0.152	0.153	0.155	0.027	-0.092	S
G4		0.203	0.204	0.201	0.025	0.078	S
G1	K ⁺ mg/l	0.117	0.119	0.112	0.01	0.468	S
G2		0.183	0.187	0.178	0.012	0.416	S
G3		0.252	0.255	0.251	0.013	0.043	S
G4		0.315	0.323	0.315	0.02	-0.001	S
G1	pH pH units	5.44	5.49	5.488	0.15	-0.322	S
G2		5.38	5.48	5.486	0.142	-0.749	Q
G3		5.36	5.45	5.43	0.12	-0.588	S
G4		5.37	5.43	5.41	0.088	-0.459	S
G1	Cond µS/cm	6	5.96	6.058	0.77	-0.075	S
G2		7.8	7.8	7.951	1.189	-0.127	S
G3		14.9	14.47	14.818	0.703	0.117	S
G4		16.7	16.4	16.524	0.684	0.257	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

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

* Z score is unitless

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

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

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

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

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

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

EMEP – 37th 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	0.214	0.209	0.206	0.021	0.362	S
G2		0.222	0.22	0.214	0.014	0.609	S
G3		0.425	0.419	0.413	0.04	0.312	S
G4		0.426	0.422	0.419	0.038	0.188	S
G1	NH ₄ ⁺ mg N/l	0.1	0.08	0.082	0.01	1.727	U
G2		0.16	0.16	0.164	0.015	-0.302	S
G3		0.29	0.401	0.412	0.022	-5.545	U
G4		0.4	0.454	0.464	0.024	-2.64	S
G1	NO ₃ ⁻ mg N/l	0.148	0.149	0.149	0.009	-0.077	S
G2		0.264	0.267	0.253	0.051	0.223	S
G3		0.546	0.547	0.538	0.077	0.105	S
G4		0.633	0.635	0.625	0.091	0.092	S
G1	Na ⁺ mg/l	-999	0.268	0.262	0.014		B
G2		-999	0.39	0.379	0.017		B
G3		-999	0.891	0.867	0.033		B
G4		-999	1.06	1.03	0.039		B
G1	Mg ²⁺ mg/l	-999	0.083	0.081	0.008		B
G2		-999	0.062	0.059	0.007		B
G3		-999	0.206	0.205	0.014		B
G4		-999	0.175	0.175	0.011		B
G1	Cl ⁻ mg/l	0.394	0.347	0.336	0.022	2.64	S
G2		0.537	0.502	0.484	0.036	1.449	S
G3		1.211	1.24	1.19	0.049	0.44	S
G4		1.431	1.47	1.422	0.054	0.171	S
G1	Ca ²⁺ mg/l	0.26	0.115	0.115	0.019	7.836	U
G2		0.3	0.153	0.148	0.023	6.579	U
G3		0.44	0.153	0.155	0.027	10.43	U
G4		0.5	0.204	0.201	0.025	12.048	U
G1	K ⁺ mg/l	-999	0.119	0.112	0.01		B
G2		-999	0.187	0.178	0.012		B
G3		-999	0.255	0.251	0.013		B
G4		-999	0.323	0.315	0.02		B
G1	pH pH units	4.95	5.49	5.488	0.15	-3.594	U
G2		4.85	5.48	5.486	0.142	-4.49	U
G3		4.75	5.45	5.43	0.12	-5.686	U
G4		4.8	5.43	5.41	0.088	-6.932	U
G1	Cond µS/cm	6.4	5.96	6.058	0.77	0.444	S
G2		8.3	7.8	7.951	1.189	0.294	S
G3		15.2	14.47	14.818	0.703	0.543	S
G4		16.7	16.4	16.524	0.684	0.257	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.21	0.209	0.206	0.021	0.172	S
G2		0.21	0.22	0.214	0.014	-0.254	S
G3		0.41	0.419	0.413	0.04	-0.064	S
G4		0.41	0.422	0.419	0.038	-0.228	S
G1	NH ₄ ⁺ mg N/l	0.1	0.08	0.082	0.01	1.727	U
G2		0.184	0.16	0.164	0.015	1.34	S
G3		0.45	0.401	0.412	0.022	1.721	S
G4		0.503	0.454	0.464	0.024	1.624	S
G1	NO ₃ ⁻ mg N/l	0.15	0.149	0.149	0.009	0.155	S
G2		0.26	0.267	0.253	0.051	0.145	S
G3		0.54	0.547	0.538	0.077	0.027	S
G4		0.63	0.635	0.625	0.091	0.058	S
G1	Na ⁺ mg/l	0.252	0.268	0.262	0.014	-0.686	S
G2		0.372	0.39	0.379	0.017	-0.407	S
G3		0.854	0.891	0.867	0.033	-0.393	S
G4		0.999	1.06	1.03	0.039	-0.8	S
G1	Mg ²⁺ mg/l	0.081	0.083	0.081	0.008	-0.021	S
G2		0.061	0.062	0.059	0.007	0.234	S
G3		0.207	0.206	0.205	0.014	0.154	S
G4		0.178	0.175	0.175	0.011	0.254	S
G1	Cl ⁻ mg/l	0.34	0.347	0.336	0.022	0.195	S
G2		0.51	0.502	0.484	0.036	0.705	S
G3		1.14	1.24	1.19	0.049	-1.016	S
G4		1.36	1.47	1.422	0.054	-1.156	S
G1	Ca ²⁺ mg/l	0.107	0.115	0.115	0.019	-0.429	S
G2		0.144	0.153	0.148	0.023	-0.194	S
G3		0.148	0.153	0.155	0.027	-0.238	S
G4		0.201	0.204	0.201	0.025	-0.002	S
G1	K ⁺ mg/l	0.113	0.119	0.112	0.01	0.067	S
G2		0.178	0.187	0.178	0.012	-0.009	S
G3		0.25	0.255	0.251	0.013	-0.11	S
G4		0.318	0.323	0.315	0.02	0.148	S
G1	pH pH units	5.44	5.49	5.488	0.15	-0.322	S
G2		5.325	5.48	5.486	0.142	-1.137	Q
G3		5.375	5.45	5.43	0.12	-0.462	S
G4		5.34	5.43	5.41	0.088	-0.8	S
G1	Cond µS/cm	6.04	5.96	6.058	0.77	-0.023	S
G2		7.96	7.8	7.951	1.189	0.008	S
G3		15.035	14.47	14.818	0.703	0.309	S
G4		16.805	16.4	16.524	0.684	0.41	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	-999	0.209	0.206	0.021		B
G2		-999	0.22	0.214	0.014		B
G3		-999	0.419	0.413	0.04		B
G4		-999	0.422	0.419	0.038		B
G1	NH ₄ ⁺ mg N/l	< 0.120	0.08	0.082	0.01		B
G2		0.15	0.16	0.164	0.015	-0.986	S
G3		0.44	0.401	0.412	0.022	1.267	S
G4		0.49	0.454	0.464	0.024	1.086	S
G1	NO ₃ ⁻ mg N/l	-999	0.149	0.149	0.009		B
G2		-999	0.267	0.253	0.051		B
G3		-999	0.547	0.538	0.077		B
G4		-999	0.635	0.625	0.091		B
G1	Na ⁺ mg/l	-999	0.268	0.262	0.014		B
G2		-999	0.39	0.379	0.017		B
G3		-999	0.891	0.867	0.033		B
G4		-999	1.06	1.03	0.039		B
G1	Mg ²⁺ mg/l	-999	0.083	0.081	0.008		B
G2		-999	0.062	0.059	0.007		B
G3		-999	0.206	0.205	0.014		B
G4		-999	0.175	0.175	0.011		B
G1	Cl ⁻ mg/l	-999	0.347	0.336	0.022		B
G2		-999	0.502	0.484	0.036		B
G3		-999	1.24	1.19	0.049		B
G4		-999	1.47	1.422	0.054		B
G1	Ca ²⁺ mg/l	-999	0.115	0.115	0.019		B
G2		-999	0.153	0.148	0.023		B
G3		-999	0.153	0.155	0.027		B
G4		-999	0.204	0.201	0.025		B
G1	K ⁺ mg/l	-999	0.119	0.112	0.01		B
G2		-999	0.187	0.178	0.012		B
G3		-999	0.255	0.251	0.013		B
G4		-999	0.323	0.315	0.02		B
G1	pH pH units	-999	5.49	5.488	0.15		B
G2		-999	5.48	5.486	0.142		B
G3		-999	5.45	5.43	0.12		B
G4		-999	5.43	5.41	0.088		B
G1	Cond μS/cm	-999	5.96	6.058	0.77		B
G2		-999	7.8	7.951	1.189		B
G3		-999	14.47	14.818	0.703		B
G4		-999	16.4	16.524	0.684		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.212	0.209	0.206	0.021	0.267	S
G2		0.219	0.22	0.214	0.014	0.393	S
G3		0.425	0.419	0.413	0.04	0.312	S
G4		0.429	0.422	0.419	0.038	0.266	S
G1	NH ₄ ⁺ mg N/l	0.082	0.08	0.082	0.01	-0.025	S
G2		0.16	0.16	0.164	0.015	-0.302	S
G3		0.405	0.401	0.412	0.022	-0.323	S
G4		0.45	0.454	0.464	0.024	-0.57	S
G1	NO ₃ ⁻ mg N/l	0.152	0.149	0.149	0.009	0.387	S
G2		0.265	0.267	0.253	0.051	0.243	S
G3		0.548	0.547	0.538	0.077	0.131	S
G4		0.636	0.635	0.625	0.091	0.125	S
G1	Na ⁺ mg/l	0.265	0.268	0.262	0.014	0.23	S
G2		0.392	0.39	0.379	0.017	0.753	S
G3		0.918	0.891	0.867	0.033	1.531	S
G4		1	1.06	1.03	0.039	-0.775	S
G1	Mg ²⁺ mg/l	0.086	0.083	0.081	0.008	0.573	S
G2		0.061	0.062	0.059	0.007	0.294	S
G3		0.213	0.206	0.205	0.014	0.59	S
G4		0.18	0.175	0.175	0.011	0.437	S
G1	Cl ⁻ mg/l	0.344	0.347	0.336	0.022	0.376	S
G2		0.5	0.502	0.484	0.036	0.429	S
G3		1.21	1.24	1.19	0.049	0.419	S
G4		1.44	1.47	1.422	0.054	0.339	S
G1	Ca ²⁺ mg/l	0.118	0.115	0.115	0.019	0.165	S
G2		0.155	0.153	0.148	0.023	0.284	S
G3		0.157	0.153	0.155	0.027	0.091	S
G4		0.207	0.204	0.201	0.025	0.239	S
G1	K ⁺ mg/l	0.114	0.119	0.112	0.01	0.167	S
G2		0.181	0.187	0.178	0.012	0.246	S
G3		0.262	0.255	0.251	0.013	0.806	S
G4		0.332	0.323	0.315	0.02	0.843	S
G1	pH pH units	5.53	5.49	5.488	0.15	0.279	S
G2		5.5	5.48	5.486	0.142	0.098	S
G3		5.45	5.45	5.43	0.12	0.164	S
G4		5.42	5.43	5.41	0.088	0.108	S
G1	Cond µS/cm	6	5.96	6.058	0.77	-0.075	S
G2		7.8	7.8	7.951	1.189	-0.127	S
G3		14.8	14.47	14.818	0.703	-0.025	S
G4		16.5	16.4	16.524	0.684	-0.036	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

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

* Z score is unitless

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

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.211	0.209	0.206	0.021	0.22	S
G2		0.218	0.22	0.214	0.014	0.321	S
G3		0.428	0.419	0.413	0.04	0.388	S
G4		0.432	0.422	0.419	0.038	0.343	S
G1	NH ₄ ⁺ mg N/l	0.082	0.08	0.082	0.01	-0.035	S
G2		0.149	0.16	0.164	0.015	-1.055	S
G3		0.391	0.401	0.412	0.022	-0.958	S
G4		0.448	0.454	0.464	0.024	-0.653	S
G1	NO ₃ ⁻ mg N/l	0.15	0.149	0.149	0.009	0.155	S
G2		0.264	0.267	0.253	0.051	0.223	S
G3		0.555	0.547	0.538	0.077	0.222	S
G4		0.643	0.635	0.625	0.091	0.202	S
G1	Na ⁺ mg/l	0.264	0.268	0.262	0.014	0.16	S
G2		0.382	0.39	0.379	0.017	0.173	S
G3		0.875	0.891	0.867	0.033	0.238	S
G4		1.045	1.06	1.03	0.039	0.375	S
G1	Mg ²⁺ mg/l	0.085	0.083	0.081	0.008	0.474	S
G2		0.061	0.062	0.059	0.007	0.234	S
G3		0.213	0.206	0.205	0.014	0.59	S
G4		0.182	0.175	0.175	0.011	0.62	S
G1	Cl ⁻ mg/l	0.346	0.347	0.336	0.022	0.467	S
G2		0.501	0.502	0.484	0.036	0.457	S
G3		1.214	1.24	1.19	0.049	0.501	S
G4		1.448	1.47	1.422	0.054	0.488	S
G1	Ca ²⁺ mg/l	0.112	0.115	0.115	0.019	-0.159	S
G2		0.148	0.153	0.148	0.023	-0.02	S
G3		0.156	0.153	0.155	0.027	0.054	S
G4		0.205	0.204	0.201	0.025	0.159	S
G1	K ⁺ mg/l	0.119	0.119	0.112	0.01	0.668	S
G2		0.185	0.187	0.178	0.012	0.585	S
G3		0.256	0.255	0.251	0.013	0.348	S
G4		0.325	0.323	0.315	0.02	0.496	S
G1	pH pH units	5.44	5.49	5.488	0.15	-0.322	S
G2		5.39	5.48	5.486	0.142	-0.678	S
G3		5.38	5.45	5.43	0.12	-0.421	S
G4		5.37	5.43	5.41	0.088	-0.459	S
G1	Cond µS/cm	5.17	5.96	6.058	0.77	-1.153	S
G2		7.73	7.8	7.951	1.189	-0.186	S
G3		14.56	14.47	14.818	0.703	-0.367	S
G4		16.16	16.4	16.524	0.684	-0.533	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.187	0.209	0.206	0.021	-0.919	Q
G2		0.194	0.22	0.214	0.014	-1.405	Q
G3		0.38	0.419	0.413	0.04	-0.816	S
G4		0.383	0.422	0.419	0.038	-0.929	S
G1	NH ₄ ⁺ mg N/l	0.062	0.08	0.082	0.01	-1.953	Q
G2		0.139	0.16	0.164	0.015	-1.739	S
G3		0.37	0.401	0.412	0.022	-1.912	S
G4		0.415	0.454	0.464	0.024	-2.019	S
G1	NO ₃ ⁻ mg N/l	0.15	0.149	0.149	0.009	0.155	S
G2		0.268	0.267	0.253	0.051	0.302	S
G3		0.561	0.547	0.538	0.077	0.3	S
G4		0.648	0.635	0.625	0.091	0.257	S
G1	Na ⁺ mg/l	0.248	0.268	0.262	0.014	-0.968	S
G2		0.363	0.39	0.379	0.017	-0.93	S
G3		0.826	0.891	0.867	0.033	-1.235	S
G4		0.984	1.06	1.03	0.039	-1.183	S
G1	Mg ²⁺ mg/l	0.082	0.083	0.081	0.008	0.115	S
G2		0.068	0.062	0.059	0.007	1.313	S
G3		0.179	0.206	0.205	0.014	-1.88	S
G4		0.154	0.175	0.175	0.011	-1.947	S
G1	Cl ⁻ mg/l	0.314	0.347	0.336	0.022	-0.982	S
G2		0.456	0.502	0.484	0.036	-0.783	S
G3		1.12	1.24	1.19	0.049	-1.426	S
G4		1.34	1.47	1.422	0.054	-1.53	S
G1	Ca ²⁺ mg/l	0.123	0.115	0.115	0.019	0.436	S
G2		0.145	0.153	0.148	0.023	-0.151	S
G3		0.151	0.153	0.155	0.027	-0.128	S
G4		0.187	0.204	0.201	0.025	-0.567	S
G1	K ⁺ mg/l	0.11	0.119	0.112	0.01	-0.234	S
G2		0.163	0.187	0.178	0.012	-1.282	S
G3		0.223	0.255	0.251	0.013	-2.169	S
G4		0.278	0.323	0.315	0.02	-1.839	S
G1	pH pH units	5.36	5.49	5.488	0.15	-0.856	Q
G2		5.79	5.48	5.486	0.142	2.145	U
G3		5.72	5.45	5.43	0.12	2.421	U
G4		6.12	5.43	5.41	0.088	8.057	U
G1	Cond µS/cm	5.96	5.96	6.058	0.77	-0.127	S
G2		7.27	7.8	7.951	1.189	-0.572	S
G3		13.95	14.47	14.818	0.703	-1.234	S
G4		15.96	16.4	16.524	0.684	-0.825	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.209	0.206	0.021		B
G2		-999	0.22	0.214	0.014		B
G3		0.434	0.419	0.413	0.04	0.538	S
G4		0.41	0.422	0.419	0.038	-0.228	S
G1	NH ₄ ⁺ mg N/l	-999	0.08	0.082	0.01		B
G2		-999	0.16	0.164	0.015		B
G3		-999	0.401	0.412	0.022		B
G4		-999	0.454	0.464	0.024		B
G1	NO ₃ ⁻ mg N/l	-999	0.149	0.149	0.009		B
G2		-999	0.267	0.253	0.051		B
G3		0.538	0.547	0.538	0.077	0.001	S
G4		0.593	0.635	0.625	0.091	-0.35	S
G1	Na ⁺ mg/l	-999	0.268	0.262	0.014		B
G2		-999	0.39	0.379	0.017		B
G3		-999	0.891	0.867	0.033		B
G4		-999	1.06	1.03	0.039		B
G1	Mg ²⁺ mg/l	-999	0.083	0.081	0.008		B
G2		-999	0.062	0.059	0.007		B
G3		-999	0.206	0.205	0.014		B
G4		-999	0.175	0.175	0.011		B
G1	Cl ⁻ mg/l	-999	0.347	0.336	0.022		B
G2		-999	0.502	0.484	0.036		B
G3		1.204	1.24	1.19	0.049	0.296	S
G4		1.39	1.47	1.422	0.054	-0.596	S
G1	Ca ²⁺ mg/l	-999	0.115	0.115	0.019		B
G2		-999	0.153	0.148	0.023		B
G3		-999	0.153	0.155	0.027		B
G4		-999	0.204	0.201	0.025		B
G1	K ⁺ mg/l	-999	0.119	0.112	0.01		B
G2		-999	0.187	0.178	0.012		B
G3		-999	0.255	0.251	0.013		B
G4		-999	0.323	0.315	0.02		B
G1	pH pH units	-999	5.49	5.488	0.15		B
G2		-999	5.48	5.486	0.142		B
G3		-999	5.45	5.43	0.12		B
G4		-999	5.43	5.41	0.088		B
G1	Cond μS/cm	-999	5.96	6.058	0.77		B
G2		-999	7.8	7.951	1.189		B
G3		-999	14.47	14.818	0.703		B
G4		-999	16.4	16.524	0.684		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

Laboratory 26, Environment Canada, Ontario (Canada)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.207	0.209	0.206	0.021	0.03	S
G2		0.215	0.22	0.214	0.014	0.106	S
G3		0.42	0.419	0.413	0.04	0.187	S
G4		0.423	0.422	0.419	0.038	0.11	S
G1	NH ₄ ⁺ mg N/l	0.079	0.08	0.082	0.01	-0.328	S
G2		0.162	0.16	0.164	0.015	-0.165	S
G3		0.41	0.401	0.412	0.022	-0.096	S
G4		0.462	0.454	0.464	0.024	-0.073	S
G1	NO ₃ ⁻ mg N/l	0.149	0.149	0.149	0.009	0.039	S
G2		0.266	0.267	0.253	0.051	0.262	S
G3		0.549	0.547	0.538	0.077	0.144	S
G4		0.635	0.635	0.625	0.091	0.114	S
G1	Na ⁺ mg/l	0.262	0.268	0.262	0.014	0.019	S
G2		0.381	0.39	0.379	0.017	0.115	S
G3		0.868	0.891	0.867	0.033	0.028	S
G4		1.027	1.06	1.03	0.039	-0.085	S
G1	Mg ²⁺ mg/l	0.085	0.083	0.081	0.008	0.474	S
G2		0.061	0.062	0.059	0.007	0.234	S
G3		0.206	0.206	0.205	0.014	0.082	S
G4		0.179	0.175	0.175	0.011	0.345	S
G1	Cl ⁻ mg/l	0.346	0.347	0.336	0.022	0.467	S
G2		0.503	0.502	0.484	0.036	0.512	S
G3		1.206	1.24	1.19	0.049	0.337	S
G4		1.434	1.47	1.422	0.054	0.227	S
G1	Ca ²⁺ mg/l	0.114	0.115	0.115	0.019	-0.051	S
G2		0.152	0.153	0.148	0.023	0.153	S
G3		0.152	0.153	0.155	0.027	-0.092	S
G4		0.206	0.204	0.201	0.025	0.199	S
G1	K ⁺ mg/l	0.122	0.119	0.112	0.01	0.969	S
G2		0.191	0.187	0.178	0.012	1.095	S
G3		0.261	0.255	0.251	0.013	0.73	S
G4		0.332	0.323	0.315	0.02	0.843	S
G1	pH pH units	5.54	5.49	5.488	0.15	0.346	S
G2		5.5	5.48	5.486	0.142	0.098	S
G3		5.45	5.45	5.43	0.12	0.164	S
G4		5.44	5.43	5.41	0.088	0.336	S
G1	Cond µS/cm	-999	5.96	6.058	0.77		B
G2		-999	7.8	7.951	1.189		B
G3		-999	14.47	14.818	0.703		B
G4		-999	16.4	16.524	0.684		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.206	0.209	0.206	0.021	-0.018	S
G2		0.214	0.22	0.214	0.014	0.034	S
G3		0.425	0.419	0.413	0.04	0.312	S
G4		0.428	0.422	0.419	0.038	0.24	S
G1	NH ₄ ⁺ mg N/l	0.078	0.08	0.082	0.01	-0.426	S
G2		0.157	0.16	0.164	0.015	-0.507	S
G3		0.408	0.401	0.412	0.022	-0.186	S
G4		0.461	0.454	0.464	0.024	-0.115	S
G1	NO ₃ ⁻ mg N/l	0.146	0.149	0.149	0.009	-0.309	S
G2		0.266	0.267	0.253	0.051	0.262	S
G3		0.544	0.547	0.538	0.077	0.079	S
G4		0.63	0.635	0.625	0.091	0.058	S
G1	Na ⁺ mg/l	0.263	0.268	0.262	0.014	0.089	S
G2		0.378	0.39	0.379	0.017	-0.059	S
G3		0.86	0.891	0.867	0.033	-0.213	S
G4		1.022	1.06	1.03	0.039	-0.212	S
G1	Mg ²⁺ mg/l	0.082	0.083	0.081	0.008	0.103	S
G2		0.063	0.062	0.059	0.007	0.534	S
G3		0.214	0.206	0.205	0.014	0.663	S
G4		0.184	0.175	0.175	0.011	0.804	S
G1	Cl ⁻ mg/l	0.349	0.347	0.336	0.022	0.603	S
G2		0.508	0.502	0.484	0.036	0.65	S
G3		1.203	1.24	1.19	0.049	0.276	S
G4		1.439	1.47	1.422	0.054	0.32	S
G1	Ca ²⁺ mg/l	0.116	0.115	0.115	0.019	0.057	S
G2		0.148	0.153	0.148	0.023	-0.02	S
G3		0.156	0.153	0.155	0.027	0.054	S
G4		0.2	0.204	0.201	0.025	-0.043	S
G1	K ⁺ mg/l	0.117	0.119	0.112	0.01	0.468	S
G2		0.181	0.187	0.178	0.012	0.246	S
G3		0.26	0.255	0.251	0.013	0.653	S
G4		0.32	0.323	0.315	0.02	0.247	S
G1	pH pH units	5.38	5.49	5.488	0.15	-0.723	Q
G2		5.45	5.48	5.486	0.142	-0.255	S
G3		5.38	5.45	5.43	0.12	-0.421	S
G4		5.38	5.43	5.41	0.088	-0.346	S
G1	Cond µS/cm	6	5.96	6.058	0.77	-0.075	S
G2		7.9	7.8	7.951	1.189	-0.043	S
G3		15.1	14.47	14.818	0.703	0.401	S
G4		16.8	16.4	16.524	0.684	0.403	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.206	0.209	0.206	0.021	-0.018	S
G2		0.209	0.22	0.214	0.014	-0.326	S
G3		0.377	0.419	0.413	0.04	-0.891	Q
G4		0.392	0.422	0.419	0.038	-0.696	S
G1	NH ₄ ⁺ mg N/l	0.079	0.08	0.082	0.01	-0.328	S
G2		0.179	0.16	0.164	0.015	0.998	S
G3		0.444	0.401	0.412	0.022	1.448	S
G4		0.483	0.454	0.464	0.024	0.796	S
G1	NO ₃ ⁻ mg N/l	0.15	0.149	0.149	0.009	0.155	S
G2		0.266	0.267	0.253	0.051	0.262	S
G3		0.562	0.547	0.538	0.077	0.313	S
G4		0.661	0.635	0.625	0.091	0.401	S
G1	Na ⁺ mg/l	0.274	0.268	0.262	0.014	0.864	S
G2		0.396	0.39	0.379	0.017	0.985	S
G3		0.886	0.891	0.867	0.033	0.569	S
G4		1.04	1.06	1.03	0.039	0.248	S
G1	Mg ²⁺ mg/l	0.094	0.083	0.081	0.008	1.587	S
G2		0.067	0.062	0.059	0.007	1.134	S
G3		0.227	0.206	0.205	0.014	1.608	S
G4		0.19	0.175	0.175	0.011	1.354	S
G1	Cl ⁻ mg/l	0.372	0.347	0.336	0.022	1.644	S
G2		0.555	0.502	0.484	0.036	1.945	S
G3		1.404	1.24	1.19	0.049	4.398	S
G4		1.71	1.47	1.422	0.054	5.385	Q
G1	Ca ²⁺ mg/l	0.133	0.115	0.115	0.019	0.976	Q
G2		0.171	0.153	0.148	0.023	0.978	S
G3		0.171	0.153	0.155	0.027	0.602	S
G4		0.222	0.204	0.201	0.025	0.844	S
G1	K ⁺ mg/l	0.124	0.119	0.112	0.01	1.17	S
G2		0.19	0.187	0.178	0.012	1.01	S
G3		0.265	0.255	0.251	0.013	1.035	S
G4		0.327	0.323	0.315	0.02	0.595	S
G1	pH pH units	5.43	5.49	5.488	0.15	-0.389	S
G2		5.33	5.48	5.486	0.142	-1.102	Q
G3		5.38	5.45	5.43	0.12	-0.421	S
G4		5.34	5.43	5.41	0.088	-0.8	S
G1	Cond µS/cm	5.2	5.96	6.058	0.77	-1.114	S
G2		6.9	7.8	7.951	1.189	-0.884	S
G3		13	14.47	14.818	0.703	-2.585	S
G4		14.5	16.4	16.524	0.684	-2.96	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.209	0.209	0.206	0.021	0.125	S
G2		0.215	0.22	0.214	0.014	0.106	S
G3		0.427	0.419	0.413	0.04	0.363	S
G4		0.433	0.422	0.419	0.038	0.369	S
G1	NH ₄ ⁺ mg N/l	0.074	0.08	0.082	0.01	-0.817	S
G2		0.159	0.16	0.164	0.015	-0.371	S
G3		0.4	0.401	0.412	0.022	-0.55	S
G4		0.453	0.454	0.464	0.024	-0.446	S
G1	NO ₃ ⁻ mg N/l	0.148	0.149	0.149	0.009	-0.077	S
G2		0.258	0.267	0.253	0.051	0.106	S
G3		0.554	0.547	0.538	0.077	0.209	S
G4		0.644	0.635	0.625	0.091	0.213	S
G1	Na ⁺ mg/l	0.251	0.268	0.262	0.014	-0.756	S
G2		0.37	0.39	0.379	0.017	-0.523	S
G3		0.85	0.891	0.867	0.033	-0.514	S
G4		1.018	1.06	1.03	0.039	-0.315	S
G1	Mg ²⁺ mg/l	0.07	0.083	0.081	0.008	-1.382	Q
G2		0.047	0.062	0.059	0.007	-1.864	Q
G3		0.196	0.206	0.205	0.014	-0.645	S
G4		0.166	0.175	0.175	0.011	-0.847	S
G1	Cl ⁻ mg/l	0.339	0.347	0.336	0.022	0.15	S
G2		0.481	0.502	0.484	0.036	-0.094	S
G3		1.168	1.24	1.19	0.049	-0.442	S
G4		1.399	1.47	1.422	0.054	-0.427	S
G1	Ca ²⁺ mg/l	0.097	0.115	0.115	0.019	-0.969	Q
G2		0.134	0.153	0.148	0.023	-0.628	S
G3		0.135	0.153	0.155	0.027	-0.713	S
G4		0.187	0.204	0.201	0.025	-0.567	S
G1	K ⁺ mg/l	0.093	0.119	0.112	0.01	-1.939	Q
G2		0.155	0.187	0.178	0.012	-1.961	Q
G3		0.225	0.255	0.251	0.013	-2.017	S
G4		0.291	0.323	0.315	0.02	-1.193	S
G1	pH pH units	5.4	5.49	5.488	0.15	-0.589	S
G2		5.48	5.48	5.486	0.142	-0.043	S
G3		5.52	5.45	5.43	0.12	0.749	S
G4		5.4	5.43	5.41	0.088	-0.119	S
G1	Cond µS/cm	5.93	5.96	6.058	0.77	-0.166	S
G2		8.23	7.8	7.951	1.189	0.235	S
G3		15.4	14.47	14.818	0.703	0.828	S
G4		17.19	16.4	16.524	0.684	0.973	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.197	0.209	0.206	0.021	-0.445	S
G2		0.207	0.22	0.214	0.014	-0.47	S
G3		0.433	0.419	0.413	0.04	0.513	S
G4		0.428	0.422	0.419	0.038	0.24	S
G1	NH ₄ ⁺ mg N/l	0.078	0.08	0.082	0.01	-0.426	S
G2		0.136	0.16	0.164	0.015	-1.944	S
G3		0.412	0.401	0.412	0.022	-0.005	S
G4		0.435	0.454	0.464	0.024	-1.191	S
G1	NO ₃ ⁻ mg N/l	0.147	0.149	0.149	0.009	-0.193	S
G2		0.26	0.267	0.253	0.051	0.145	S
G3		0.581	0.547	0.538	0.077	0.559	S
G4		0.689	0.635	0.625	0.091	0.71	S
G1	Na ⁺ mg/l	0.26	0.268	0.262	0.014	-0.122	S
G2		0.385	0.39	0.379	0.017	0.347	S
G3		0.91	0.891	0.867	0.033	1.29	S
G4		1.06	1.06	1.03	0.039	0.759	S
G1	Mg ²⁺ mg/l	0.087	0.083	0.081	0.008	0.721	S
G2		0.062	0.062	0.059	0.007	0.384	S
G3		0.202	0.206	0.205	0.014	-0.209	S
G4		0.17	0.175	0.175	0.011	-0.48	S
G1	Cl ⁻ mg/l	0.322	0.347	0.336	0.022	-0.62	S
G2		0.479	0.502	0.484	0.036	-0.149	S
G3		1.248	1.24	1.19	0.049	1.198	S
G4		1.489	1.47	1.422	0.054	1.255	S
G1	Ca ²⁺ mg/l	0.106	0.115	0.115	0.019	-0.483	S
G2		0.129	0.153	0.148	0.023	-0.845	Q
G3		0.129	0.153	0.155	0.027	-0.932	Q
G4		0.17	0.204	0.201	0.025	-1.252	Q
G1	K ⁺ mg/l	0.115	0.119	0.112	0.01	0.267	S
G2		0.18	0.187	0.178	0.012	0.161	S
G3		0.25	0.255	0.251	0.013	-0.11	S
G4		0.32	0.323	0.315	0.02	0.247	S
G1	pH pH units	5.57	5.49	5.488	0.15	0.546	S
G2		5.62	5.48	5.486	0.142	0.945	Q
G3		5.47	5.45	5.43	0.12	0.331	S
G4		5.44	5.43	5.41	0.088	0.336	S
G1	Cond µS/cm	5.9	5.96	6.058	0.77	-0.205	S
G2		7.7	7.8	7.951	1.189	-0.211	S
G3		15.1	14.47	14.818	0.703	0.401	S
G4		16.9	16.4	16.524	0.684	0.549	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

Laboratory 33, Environmental Pollution Observ. Centre (Latvia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.197	0.209	0.206	0.021	-0.445	S
G2		0.21	0.22	0.214	0.014	-0.254	S
G3		0.4	0.419	0.413	0.04	-0.315	S
G4		0.418	0.422	0.419	0.038	-0.02	S
G1	NH ₄ ⁺ mg N/l	0.075	0.08	0.082	0.01	-0.72	S
G2		0.15	0.16	0.164	0.015	-0.986	S
G3		0.385	0.401	0.412	0.022	-1.231	S
G4		0.437	0.454	0.464	0.024	-1.108	S
G1	NO ₃ ⁻ mg N/l	0.155	0.149	0.149	0.009	0.735	S
G2		0.26	0.267	0.253	0.051	0.145	S
G3		0.538	0.547	0.538	0.077	0.001	S
G4		0.647	0.635	0.625	0.091	0.246	S
G1	Na ⁺ mg/l	0.24	0.268	0.262	0.014	-1.531	S
G2		0.352	0.39	0.379	0.017	-1.568	S
G3		0.829	0.891	0.867	0.033	-1.145	S
G4		1.008	1.06	1.03	0.039	-0.57	S
G1	Mg ²⁺ mg/l	0.067	0.083	0.081	0.008	-1.753	Q
G2		0.06	0.062	0.059	0.007	0.084	S
G3		0.209	0.206	0.205	0.014	0.3	S
G4		0.183	0.175	0.175	0.011	0.712	S
G1	Cl ⁻ mg/l	0.312	0.347	0.336	0.022	-1.073	S
G2		0.47	0.502	0.484	0.036	-0.397	S
G3		1.103	1.24	1.19	0.049	-1.775	S
G4		1.406	1.47	1.422	0.054	-0.297	S
G1	Ca ²⁺ mg/l	0.119	0.115	0.115	0.019	0.219	S
G2		0.142	0.153	0.148	0.023	-0.281	S
G3		0.154	0.153	0.155	0.027	-0.019	S
G4		0.212	0.204	0.201	0.025	0.441	S
G1	K ⁺ mg/l	0.112	0.119	0.112	0.01	-0.034	S
G2		0.169	0.187	0.178	0.012	-0.773	S
G3		0.236	0.255	0.251	0.013	-1.178	S
G4		0.298	0.323	0.315	0.02	-0.845	S
G1	pH pH units	5.51	5.49	5.488	0.15	0.146	S
G2		5.51	5.48	5.486	0.142	0.169	S
G3		5.46	5.45	5.43	0.12	0.248	S
G4		5.52	5.43	5.41	0.088	1.244	S
G1	Cond µS/cm	6.01	5.96	6.058	0.77	-0.062	S
G2		7.94	7.8	7.951	1.189	-0.009	S
G3		15.35	14.47	14.818	0.703	0.757	S
G4		17.05	16.4	16.524	0.684	0.769	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.211	0.209	0.206	0.021	0.22	S
G2		0.22	0.22	0.214	0.014	0.465	S
G3		0.426	0.419	0.413	0.04	0.338	S
G4		0.43	0.422	0.419	0.038	0.292	S
G1	NH ₄ ⁺ mg N/l	0.08	0.08	0.082	0.01	-0.23	S
G2		0.162	0.16	0.164	0.015	-0.165	S
G3		0.417	0.401	0.412	0.022	0.222	S
G4		0.472	0.454	0.464	0.024	0.341	S
G1	NO ₃ ⁻ mg N/l	0.148	0.149	0.149	0.009	-0.077	S
G2		0.27	0.267	0.253	0.051	0.341	S
G3		0.552	0.547	0.538	0.077	0.183	S
G4		0.64	0.635	0.625	0.091	0.169	S
G1	Na ⁺ mg/l	0.272	0.268	0.262	0.014	0.723	S
G2		0.401	0.39	0.379	0.017	1.275	S
G3		0.893	0.891	0.867	0.033	0.779	S
G4		1.061	1.06	1.03	0.039	0.784	S
G1	Mg ²⁺ mg/l	0.083	0.083	0.081	0.008	0.226	S
G2		0.061	0.062	0.059	0.007	0.234	S
G3		0.209	0.206	0.205	0.014	0.3	S
G4		0.179	0.175	0.175	0.011	0.345	S
G1	Cl ⁻ mg/l	0.355	0.347	0.336	0.022	0.874	S
G2		0.517	0.502	0.484	0.036	0.898	S
G3		1.247	1.24	1.19	0.049	1.178	S
G4		1.481	1.47	1.422	0.054	1.105	S
G1	Ca ²⁺ mg/l	0.11	0.115	0.115	0.019	-0.267	S
G2		0.148	0.153	0.148	0.023	-0.02	S
G3		0.149	0.153	0.155	0.027	-0.201	S
G4		0.201	0.204	0.201	0.025	-0.002	S
G1	K ⁺ mg/l	0.119	0.119	0.112	0.01	0.668	S
G2		0.19	0.187	0.178	0.012	1.01	S
G3		0.26	0.255	0.251	0.013	0.653	S
G4		0.327	0.323	0.315	0.02	0.595	S
G1	pH pH units	5.38	5.49	5.488	0.15	-0.723	Q
G2		5.37	5.48	5.486	0.142	-0.819	Q
G3		5.28	5.45	5.43	0.12	-1.256	Q
G4		5.29	5.43	5.41	0.088	-1.368	Q
G1	Cond µS/cm	6	5.96	6.058	0.77	-0.075	S
G2		8	7.8	7.951	1.189	0.041	S
G3		15.2	14.47	14.818	0.703	0.543	S
G4		16.9	16.4	16.524	0.684	0.549	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

Laboratory 36, Hydrometeorological Institute of Slovenia (Slovenia)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.21	0.209	0.206	0.021	0.172	S
G2		0.219	0.22	0.214	0.014	0.393	S
G3		0.421	0.419	0.413	0.04	0.212	S
G4		0.423	0.422	0.419	0.038	0.11	S
G1	NH ₄ ⁺ mg N/l	0.078	0.08	0.082	0.01	-0.426	S
G2		0.152	0.16	0.164	0.015	-0.849	S
G3		0.397	0.401	0.412	0.022	-0.686	S
G4		0.45	0.454	0.464	0.024	-0.57	S
G1	NO ₃ ⁻ mg N/l	0.143	0.149	0.149	0.009	-0.657	S
G2		0.265	0.267	0.253	0.051	0.243	S
G3		0.565	0.547	0.538	0.077	0.352	S
G4		0.658	0.635	0.625	0.091	0.368	S
G1	Na ⁺ mg/l	0.274	0.268	0.262	0.014	0.864	S
G2		0.386	0.39	0.379	0.017	0.405	S
G3		0.867	0.891	0.867	0.033	-0.003	S
G4		1.04	1.06	1.03	0.039	0.248	S
G1	Mg ²⁺ mg/l	0.082	0.083	0.081	0.008	0.103	S
G2		0.061	0.062	0.059	0.007	0.234	S
G3		0.205	0.206	0.205	0.014	0.009	S
G4		0.178	0.175	0.175	0.011	0.254	S
G1	Cl ⁻ mg/l	0.345	0.347	0.336	0.022	0.421	S
G2		0.495	0.502	0.484	0.036	0.292	S
G3		1.18	1.24	1.19	0.049	-0.196	S
G4		1.4	1.47	1.422	0.054	-0.409	S
G1	Ca ²⁺ mg/l	0.111	0.115	0.115	0.019	-0.213	S
G2		0.154	0.153	0.148	0.023	0.24	S
G3		0.151	0.153	0.155	0.027	-0.128	S
G4		0.202	0.204	0.201	0.025	0.038	S
G1	K ⁺ mg/l	0.116	0.119	0.112	0.01	0.368	S
G2		0.181	0.187	0.178	0.012	0.246	S
G3		0.252	0.255	0.251	0.013	0.043	S
G4		0.324	0.323	0.315	0.02	0.446	S
G1	pH pH units	5.49	5.49	5.488	0.15	0.012	S
G2		5.48	5.48	5.486	0.142	-0.043	S
G3		5.46	5.45	5.43	0.12	0.248	S
G4		5.43	5.43	5.41	0.088	0.222	S
G1	Cond µS/cm	5.55	5.96	6.058	0.77	-0.66	S
G2		7.43	7.8	7.951	1.189	-0.438	S
G3		14.5	14.47	14.818	0.703	-0.452	S
G4		16.2	16.4	16.524	0.684	-0.474	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.208	0.209	0.206	0.021	0.077	S
G2		0.217	0.22	0.214	0.014	0.249	S
G3		0.42	0.419	0.413	0.04	0.187	S
G4		0.422	0.422	0.419	0.038	0.084	S
G1	NH ₄ ⁺ mg N/l	0.078	0.08	0.082	0.01	-0.426	S
G2		0.163	0.16	0.164	0.015	-0.097	S
G3		0.408	0.401	0.412	0.022	-0.186	S
G4		0.46	0.454	0.464	0.024	-0.156	S
G1	NO ₃ ⁻ mg N/l	0.147	0.149	0.149	0.009	-0.193	S
G2		0.259	0.267	0.253	0.051	0.125	S
G3		0.546	0.547	0.538	0.077	0.105	S
G4		0.634	0.635	0.625	0.091	0.103	S
G1	Na ⁺ mg/l	0.247	0.268	0.262	0.014	-1.038	S
G2		0.372	0.39	0.379	0.017	-0.407	S
G3		0.846	0.891	0.867	0.033	-0.634	S
G4		1.012	1.06	1.03	0.039	-0.468	S
G1	Mg ²⁺ mg/l	0.074	0.083	0.081	0.008	-0.887	S
G2		0.053	0.062	0.059	0.007	-0.965	S
G3		0.203	0.206	0.205	0.014	-0.136	S
G4		0.178	0.175	0.175	0.011	0.254	S
G1	Cl ⁻ mg/l	0.35	0.347	0.336	0.022	0.648	S
G2		0.485	0.502	0.484	0.036	0.016	S
G3		1.148	1.24	1.19	0.049	-0.852	S
G4		1.354	1.47	1.422	0.054	-1.269	S
G1	Ca ²⁺ mg/l	0.1	0.115	0.115	0.019	-0.807	S
G2		0.134	0.153	0.148	0.023	-0.628	S
G3		0.128	0.153	0.155	0.027	-0.968	Q
G4		0.175	0.204	0.201	0.025	-1.05	S
G1	K ⁺ mg/l	0.111	0.119	0.112	0.01	-0.134	S
G2		0.188	0.187	0.178	0.012	0.84	S
G3		0.253	0.255	0.251	0.013	0.119	S
G4		0.321	0.323	0.315	0.02	0.297	S
G1	pH pH units	5.64	5.49	5.488	0.15	1.014	Q
G2		5.96	5.48	5.486	0.142	3.345	U
G3		5.55	5.45	5.43	0.12	1	S
G4		5.85	5.43	5.41	0.088	4.991	U
G1	Cond µS/cm	5.9	5.96	6.058	0.77	-0.205	S
G2		7.7	7.8	7.951	1.189	-0.211	S
G3		15.1	14.47	14.818	0.703	0.401	S
G4		16.7	16.4	16.524	0.684	0.257	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.2	0.209	0.206	0.021	-0.302	S
G2		0.208	0.22	0.214	0.014	-0.398	S
G3		0.402	0.419	0.413	0.04	-0.264	S
G4		0.4	0.422	0.419	0.038	-0.488	S
G1	NH ₄ ⁺ mg N/l	0.078	0.08	0.082	0.01	-0.426	S
G2		0.158	0.16	0.164	0.015	-0.439	S
G3		0.408	0.401	0.412	0.022	-0.186	S
G4		0.463	0.454	0.464	0.024	-0.032	S
G1	NO ₃ ⁻ mg N/l	0.146	0.149	0.149	0.009	-0.309	S
G2		0.263	0.267	0.253	0.051	0.204	S
G3		0.55	0.547	0.538	0.077	0.157	S
G4		0.638	0.635	0.625	0.091	0.147	S
G1	Na ⁺ mg/l	0.254	0.268	0.262	0.014	-0.545	S
G2		0.374	0.39	0.379	0.017	-0.291	S
G3		0.876	0.891	0.867	0.033	0.268	S
G4		1.052	1.06	1.03	0.039	0.554	S
G1	Mg ²⁺ mg/l	0.084	0.083	0.081	0.008	0.35	S
G2		0.062	0.062	0.059	0.007	0.384	S
G3		0.213	0.206	0.205	0.014	0.59	S
G4		0.18	0.175	0.175	0.011	0.437	S
G1	Cl ⁻ mg/l	0.311	0.347	0.336	0.022	-1.118	S
G2		0.456	0.502	0.484	0.036	-0.783	S
G3		1.13	1.24	1.19	0.049	-1.221	S
G4		1.392	1.47	1.422	0.054	-0.558	S
G1	Ca ²⁺ mg/l	0.116	0.115	0.115	0.019	0.057	S
G2		0.154	0.153	0.148	0.023	0.24	S
G3		0.157	0.153	0.155	0.027	0.091	S
G4		0.207	0.204	0.201	0.025	0.239	S
G1	K ⁺ mg/l	0.115	0.119	0.112	0.01	0.267	S
G2		0.181	0.187	0.178	0.012	0.246	S
G3		0.256	0.255	0.251	0.013	0.348	S
G4		0.318	0.323	0.315	0.02	0.148	S
G1	pH pH units	5.45	5.49	5.488	0.15	-0.255	S
G2		5.4	5.48	5.486	0.142	-0.607	S
G3		5.39	5.45	5.43	0.12	-0.337	S
G4		5.4	5.43	5.41	0.088	-0.119	S
G1	Cond µS/cm	6.37	5.96	6.058	0.77	0.405	S
G2		7.77	7.8	7.951	1.189	-0.152	S
G3		14.95	14.47	14.818	0.703	0.188	S
G4		16.83	16.4	16.524	0.684	0.447	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

Laboratory 42, State Hydrometeorological Service, Chisnau (Moldova)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	-999	0.209	0.206	0.021		B
G2		-999	0.22	0.214	0.014		B
G3		-999	0.419	0.413	0.04		B
G4		-999	0.422	0.419	0.038		B
G1	NH ₄ ⁺ mg N/l	-999	0.08	0.082	0.01		B
G2		-999	0.16	0.164	0.015		B
G3		-999	0.401	0.412	0.022		B
G4		-999	0.454	0.464	0.024		B
G1	NO ₃ ⁻ mg N/l	-999	0.149	0.149	0.009		B
G2		-999	0.267	0.253	0.051		B
G3		-999	0.547	0.538	0.077		B
G4		-999	0.635	0.625	0.091		B
G1	Na ⁺ mg/l	-999	0.268	0.262	0.014		B
G2		-999	0.39	0.379	0.017		B
G3		-999	0.891	0.867	0.033		B
G4		-999	1.06	1.03	0.039		B
G1	Mg ²⁺ mg/l	-999	0.083	0.081	0.008		B
G2		-999	0.062	0.059	0.007		B
G3		-999	0.206	0.205	0.014		B
G4		-999	0.175	0.175	0.011		B
G1	Cl ⁻ mg/l	-999	0.347	0.336	0.022		B
G2		-999	0.502	0.484	0.036		B
G3		-999	1.24	1.19	0.049		B
G4		-999	1.47	1.422	0.054		B
G1	Ca ²⁺ mg/l	-999	0.115	0.115	0.019		B
G2		-999	0.153	0.148	0.023		B
G3		-999	0.153	0.155	0.027		B
G4		-999	0.204	0.201	0.025		B
G1	K ⁺ mg/l	-999	0.119	0.112	0.01		B
G2		-999	0.187	0.178	0.012		B
G3		-999	0.255	0.251	0.013		B
G4		-999	0.323	0.315	0.02		B
G1	pH pH units	5.66	5.49	5.488	0.15	1.147	Q
G2		5.58	5.48	5.486	0.142	0.663	S
G3		5.38	5.45	5.43	0.12	-0.421	S
G4		5.32	5.43	5.41	0.088	-1.027	Q
G1	Cond µS/cm	9	5.96	6.058	0.77	3.82	U
G2		10	7.8	7.951	1.189	1.723	U
G3		14	14.47	14.818	0.703	-1.163	S
G4		17	16.4	16.524	0.684	0.695	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.204	0.209	0.206	0.021	-0.112	S
G2		0.215	0.22	0.214	0.014	0.106	S
G3		0.416	0.419	0.413	0.04	0.087	S
G4		0.415	0.422	0.419	0.038	-0.098	S
G1	NH ₄ ⁺ mg N/l	0.126	0.08	0.082	0.01	4.271	U
G2		0.181	0.16	0.164	0.015	1.134	S
G3		0.357	0.401	0.412	0.022	-2.502	S
G4		0.436	0.454	0.464	0.024	-1.15	S
G1	NO ₃ ⁻ mg N/l	0.149	0.149	0.149	0.009	0.039	S
G2		0.272	0.267	0.253	0.051	0.38	S
G3		0.562	0.547	0.538	0.077	0.313	S
G4		0.646	0.635	0.625	0.091	0.235	S
G1	Na ⁺ mg/l	0.272	0.268	0.262	0.014	0.723	S
G2		0.375	0.39	0.379	0.017	-0.233	S
G3		0.772	0.891	0.867	0.033	-2.859	S
G4		0.927	1.06	1.03	0.039	-2.64	S
G1	Mg ²⁺ mg/l	0.09	0.083	0.081	0.008	1.092	S
G2		0.066	0.062	0.059	0.007	0.984	S
G3		0.22	0.206	0.205	0.014	1.099	S
G4		0.191	0.175	0.175	0.011	1.445	S
G1	Cl ⁻ mg/l	0.336	0.347	0.336	0.022	0.014	S
G2		0.496	0.502	0.484	0.036	0.319	S
G3		1.21	1.24	1.19	0.049	0.419	S
G4		1.433	1.47	1.422	0.054	0.208	S
G1	Ca ²⁺ mg/l	0.126	0.115	0.115	0.019	0.598	S
G2		0.166	0.153	0.148	0.023	0.761	S
G3		0.167	0.153	0.155	0.027	0.456	S
G4		0.221	0.204	0.201	0.025	0.804	S
G1	K ⁺ mg/l	0.127	0.119	0.112	0.01	1.471	S
G2		0.202	0.187	0.178	0.012	2.028	S
G3		0.271	0.255	0.251	0.013	1.492	S
G4		0.349	0.323	0.315	0.02	1.688	S
G1	pH pH units	5.485	5.49	5.488	0.15	-0.021	S
G2		5.593	5.48	5.486	0.142	0.755	Q
G3		5.449	5.45	5.43	0.12	0.156	S
G4		5.421	5.43	5.41	0.088	0.12	S
G1	Cond µS/cm	5.9	5.96	6.058	0.77	-0.205	S
G2		7.7	7.8	7.951	1.189	-0.211	S
G3		14.5	14.47	14.818	0.703	-0.452	S
G4		16.1	16.4	16.524	0.684	-0.621	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.209	0.206	0.021		B
G2		-999	0.22	0.214	0.014		B
G3		-999	0.419	0.413	0.04		B
G4		-999	0.422	0.419	0.038		B
G1	NH ₄ ⁺ mg N/l	-999	0.08	0.082	0.01		B
G2		-999	0.16	0.164	0.015		B
G3		-999	0.401	0.412	0.022		B
G4		-999	0.454	0.464	0.024		B
G1	NO ₃ ⁻ mg N/l	-999	0.149	0.149	0.009		B
G2		-999	0.267	0.253	0.051		B
G3		-999	0.547	0.538	0.077		B
G4		-999	0.635	0.625	0.091		B
G1	Na ⁺ mg/l	-999	0.268	0.262	0.014		B
G2		-999	0.39	0.379	0.017		B
G3		-999	0.891	0.867	0.033		B
G4		-999	1.06	1.03	0.039		B
G1	Mg ²⁺ mg/l	-999	0.083	0.081	0.008		B
G2		-999	0.062	0.059	0.007		B
G3		-999	0.206	0.205	0.014		B
G4		-999	0.175	0.175	0.011		B
G1	Cl ⁻ mg/l	-999	0.347	0.336	0.022		B
G2		-999	0.502	0.484	0.036		B
G3		-999	1.24	1.19	0.049		B
G4		-999	1.47	1.422	0.054		B
G1	Ca ²⁺ mg/l	-999	0.115	0.115	0.019		B
G2		-999	0.153	0.148	0.023		B
G3		-999	0.153	0.155	0.027		B
G4		-999	0.204	0.201	0.025		B
G1	K ⁺ mg/l	-999	0.119	0.112	0.01		B
G2		-999	0.187	0.178	0.012		B
G3		-999	0.255	0.251	0.013		B
G4		-999	0.323	0.315	0.02		B
G1	pH pH units	5.47	5.49	5.488	0.15	-0.121	S
G2		5.44	5.48	5.486	0.142	-0.325	S
G3		5.42	5.45	5.43	0.12	-0.086	S
G4		5.39	5.43	5.41	0.088	-0.232	S
G1	Cond µS/cm	6.05	5.96	6.058	0.77	-0.01	S
G2		7.98	7.8	7.951	1.189	0.025	S
G3		15.24	14.47	14.818	0.703	0.6	S
G4		16.99	16.4	16.524	0.684	0.681	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.204	0.209	0.206	0.021	-0.112	S
G2		0.211	0.22	0.214	0.014	-0.182	S
G3		0.419	0.419	0.413	0.04	0.162	S
G4		0.421	0.422	0.419	0.038	0.058	S
G1	NH ₄ ⁺ mg N/l	0.086	0.08	0.082	0.01	0.357	S
G2		0.167	0.16	0.164	0.015	0.177	S
G3		0.423	0.401	0.412	0.022	0.495	S
G4		0.486	0.454	0.464	0.024	0.92	S
G1	NO ₃ ⁻ mg N/l	0.151	0.149	0.149	0.009	0.271	S
G2		0.268	0.267	0.253	0.051	0.302	S
G3		0.557	0.547	0.538	0.077	0.248	S
G4		0.644	0.635	0.625	0.091	0.213	S
G1	Na ⁺ mg/l	0.268	0.268	0.262	0.014	0.441	S
G2		0.396	0.39	0.379	0.017	0.985	S
G3		0.902	0.891	0.867	0.033	1.05	S
G4		1.076	1.06	1.03	0.039	1.167	S
G1	Mg ²⁺ mg/l	0.089	0.083	0.081	0.008	0.968	S
G2		0.065	0.062	0.059	0.007	0.834	S
G3		0.223	0.206	0.205	0.014	1.317	S
G4		0.188	0.175	0.175	0.011	1.17	S
G1	Cl ⁻ mg/l	0.342	0.347	0.336	0.022	0.286	S
G2		0.494	0.502	0.484	0.036	0.264	S
G3		1.216	1.24	1.19	0.049	0.542	S
G4		1.429	1.47	1.422	0.054	0.133	S
G1	Ca ²⁺ mg/l	0.117	0.115	0.115	0.019	0.111	S
G2		0.151	0.153	0.148	0.023	0.11	S
G3		0.152	0.153	0.155	0.027	-0.092	S
G4		0.203	0.204	0.201	0.025	0.078	S
G1	K ⁺ mg/l	0.108	0.119	0.112	0.01	-0.435	S
G2		0.173	0.187	0.178	0.012	-0.433	S
G3		0.256	0.255	0.251	0.013	0.348	S
G4		0.323	0.323	0.315	0.02	0.396	S
G1	pH pH units	5.84	5.49	5.488	0.15	2.349	U
G2		5.79	5.48	5.486	0.142	2.145	U
G3		5.77	5.45	5.43	0.12	2.839	U
G4		5.72	5.43	5.41	0.088	3.515	U
G1	Cond µS/cm	5.66	5.96	6.058	0.77	-0.517	S
G2		7.43	7.8	7.951	1.189	-0.438	S
G3		14.87	14.47	14.818	0.703	0.074	S
G4		16.56	16.4	16.524	0.684	0.052	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

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

* Z score is unitless

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

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

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

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

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

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

EMEP – 37th 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	0.197	0.209	0.206	0.021	-0.445	S
G2		0.212	0.22	0.214	0.014	-0.11	S
G3		0.406	0.419	0.413	0.04	-0.164	S
G4		0.409	0.422	0.419	0.038	-0.254	S
G1	NH ₄ ⁺ mg N/l	0.086	0.08	0.082	0.01	0.357	S
G2		0.174	0.16	0.164	0.015	0.656	S
G3		0.414	0.401	0.412	0.022	0.086	S
G4		0.476	0.454	0.464	0.024	0.506	S
G1	NO ₃ ⁻ mg N/l	0.135	0.149	0.149	0.009	-1.585	S
G2		0.254	0.267	0.253	0.051	0.027	S
G3		0.536	0.547	0.538	0.077	-0.025	S
G4		0.624	0.635	0.625	0.091	-0.008	S
G1	Na ⁺ mg/l	0.267	0.268	0.262	0.014	0.371	S
G2		0.391	0.39	0.379	0.017	0.695	S
G3		0.896	0.891	0.867	0.033	0.87	S
G4		1.069	1.06	1.03	0.039	0.989	S
G1	Mg ²⁺ mg/l	0.083	0.083	0.081	0.008	0.226	S
G2		0.068	0.062	0.059	0.007	1.283	S
G3		0.197	0.206	0.205	0.014	-0.572	S
G4		0.168	0.175	0.175	0.011	-0.663	S
G1	Cl ⁻ mg/l	0.33	0.347	0.336	0.022	-0.258	S
G2		0.495	0.502	0.484	0.036	0.292	S
G3		1.192	1.24	1.19	0.049	0.05	S
G4		1.422	1.47	1.422	0.054	0.002	S
G1	Ca ²⁺ mg/l	0.087	0.115	0.115	0.019	-1.509	Q
G2		0.132	0.153	0.148	0.023	-0.715	S
G3		0.13	0.153	0.155	0.027	-0.895	Q
G4		0.178	0.204	0.201	0.025	-0.929	S
G1	K ⁺ mg/l	0.11	0.119	0.112	0.01	-0.234	S
G2		0.18	0.187	0.178	0.012	0.161	S
G3		0.251	0.255	0.251	0.013	-0.033	S
G4		0.309	0.323	0.315	0.02	-0.299	S
G1	pH pH units	5.4	5.49	5.488	0.15	-0.589	S
G2		5.453	5.48	5.486	0.142	-0.233	S
G3		5.37	5.45	5.43	0.12	-0.504	S
G4		5.36	5.43	5.41	0.088	-0.573	S
G1	Cond µS/cm	5.778	5.96	6.058	0.77	-0.364	S
G2		7.82	7.8	7.951	1.189	-0.11	S
G3		14.943	14.47	14.818	0.703	0.178	S
G4		16.867	16.4	16.524	0.684	0.501	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.226	0.209	0.206	0.021	0.932	S
G2		0.224	0.22	0.214	0.014	0.753	S
G3		0.453	0.419	0.413	0.04	1.015	S
G4		0.47	0.422	0.419	0.038	1.331	Q
G1	NH ₄ ⁺ mg N/l	0.089	0.08	0.082	0.01	0.65	S
G2		0.154	0.16	0.164	0.015	-0.713	S
G3		0.411	0.401	0.412	0.022	-0.05	S
G4		0.47	0.454	0.464	0.024	0.258	S
G1	NO ₃ ⁻ mg N/l	0.175	0.149	0.149	0.009	3.056	Q
G2		< 0.050	0.267	0.253	0.051	-4.463	U
G3		< 0.050	0.547	0.538	0.077	-6.661	U
G4		< 0.050	0.635	0.625	0.091	-6.621	U
G1	Na ⁺ mg/l	0.254	0.268	0.262	0.014	-0.545	S
G2		0.367	0.39	0.379	0.017	-0.697	S
G3		0.84	0.891	0.867	0.033	-0.814	S
G4		0.979	1.06	1.03	0.039	-1.311	S
G1	Mg ²⁺ mg/l	0.081	0.083	0.081	0.008	-0.021	S
G2		0.058	0.062	0.059	0.007	-0.215	S
G3		0.202	0.206	0.205	0.014	-0.209	S
G4		0.17	0.175	0.175	0.011	-0.48	S
G1	Cl ⁻ mg/l	0.346	0.347	0.336	0.022	0.467	S
G2		0.494	0.502	0.484	0.036	0.264	S
G3		1.29	1.24	1.19	0.049	2.06	S
G4		1.56	1.47	1.422	0.054	2.582	S
G1	Ca ²⁺ mg/l	0.104	0.115	0.115	0.019	-0.591	S
G2		0.14	0.153	0.148	0.023	-0.368	S
G3		0.141	0.153	0.155	0.027	-0.494	S
G4		0.184	0.204	0.201	0.025	-0.688	S
G1	K ⁺ mg/l	0.106	0.119	0.112	0.01	-0.635	S
G2		0.171	0.187	0.178	0.012	-0.603	S
G3		0.242	0.255	0.251	0.013	-0.72	S
G4		0.303	0.323	0.315	0.02	-0.597	S
G1	pH pH units	5.56	5.49	5.488	0.15	0.48	S
G2		5.51	5.48	5.486	0.142	0.169	S
G3		5.57	5.45	5.43	0.12	1.167	Q
G4		5.41	5.43	5.41	0.088	-0.005	S
G1	Cond µS/cm	5.5	5.96	6.058	0.77	-0.725	S
G2		8.2	7.8	7.951	1.189	0.209	S
G3		15.7	14.47	14.818	0.703	1.254	S
G4		16.6	16.4	16.524	0.684	0.111	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.217	0.209	0.206	0.021	0.505	S
G2		0.22	0.22	0.214	0.014	0.465	S
G3		0.404	0.419	0.413	0.04	-0.214	S
G4		0.407	0.422	0.419	0.038	-0.306	S
G1	NH ₄ ⁺ mg N/l	0.08	0.08	0.082	0.01	-0.23	S
G2		0.17	0.16	0.164	0.015	0.382	S
G3		0.39	0.401	0.412	0.022	-1.004	S
G4		0.445	0.454	0.464	0.024	-0.777	S
G1	NO ₃ ⁻ mg N/l	0.149	0.149	0.149	0.009	0.039	S
G2		0.266	0.267	0.253	0.051	0.262	S
G3		0.55	0.547	0.538	0.077	0.157	S
G4		0.64	0.635	0.625	0.091	0.169	S
G1	Na ⁺ mg/l	0.26	0.268	0.262	0.014	-0.122	S
G2		0.39	0.39	0.379	0.017	0.637	S
G3		0.87	0.891	0.867	0.033	0.088	S
G4		1.03	1.06	1.03	0.039	-0.008	S
G1	Mg ²⁺ mg/l	0.09	0.083	0.081	0.008	1.092	S
G2		0.1	0.062	0.059	0.007	6.079	U
G3		0.22	0.206	0.205	0.014	1.099	S
G4		0.19	0.175	0.175	0.011	1.354	S
G1	Cl ⁻ mg/l	0.34	0.347	0.336	0.022	0.195	S
G2		0.54	0.502	0.484	0.036	1.531	S
G3		1.19	1.24	1.19	0.049	0.009	S
G4		1.42	1.47	1.422	0.054	-0.035	S
G1	Ca ²⁺ mg/l	0.16	0.115	0.115	0.019	2.434	U
G2		0.18	0.153	0.148	0.023	1.369	Q
G3		0.2	0.153	0.155	0.027	1.662	U
G4		0.23	0.204	0.201	0.025	1.166	S
G1	K ⁺ mg/l	0.12	0.119	0.112	0.01	0.769	S
G2		0.19	0.187	0.178	0.012	1.01	S
G3		0.25	0.255	0.251	0.013	-0.11	S
G4		0.31	0.323	0.315	0.02	-0.249	S
G1	pH pH units	5.78	5.49	5.488	0.15	1.949	U
G2		5.59	5.48	5.486	0.142	0.734	Q
G3		5.52	5.45	5.43	0.12	0.749	S
G4		5.49	5.43	5.41	0.088	0.903	S
G1	Cond µS/cm	5.5	5.96	6.058	0.77	-0.725	S
G2		7.4	7.8	7.951	1.189	-0.463	S
G3		14.6	14.47	14.818	0.703	-0.31	S
G4		16.5	16.4	16.524	0.684	-0.036	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.204	0.209	0.206	0.021	-0.112	S
G2		0.214	0.22	0.214	0.014	0.034	S
G3		0.406	0.419	0.413	0.04	-0.164	S
G4		0.406	0.422	0.419	0.038	-0.332	S
G1	NH ₄ ⁺ mg N/l	0.097	0.08	0.082	0.01	1.433	Q
G2		0.173	0.16	0.164	0.015	0.587	S
G3		0.406	0.401	0.412	0.022	-0.277	S
G4		0.462	0.454	0.464	0.024	-0.073	S
G1	NO ₃ ⁻ mg N/l	0.14	0.149	0.149	0.009	-1.005	S
G2		0.246	0.267	0.253	0.051	-0.13	S
G3		0.523	0.547	0.538	0.077	-0.194	S
G4		0.612	0.635	0.625	0.091	-0.14	S
G1	Na ⁺ mg/l	0.29	0.268	0.262	0.014	1.991	S
G2		0.409	0.39	0.379	0.017	1.74	S
G3		0.89	0.891	0.867	0.033	0.689	S
G4		1.068	1.06	1.03	0.039	0.963	S
G1	Mg ²⁺ mg/l	0.071	0.083	0.081	0.008	-1.258	S
G2		0.054	0.062	0.059	0.007	-0.815	S
G3		0.193	0.206	0.205	0.014	-0.863	S
G4		0.165	0.175	0.175	0.011	-0.938	S
G1	Cl ⁻ mg/l	0.323	0.347	0.336	0.022	-0.575	S
G2		0.46	0.502	0.484	0.036	-0.673	S
G3		1.141	1.24	1.19	0.049	-0.996	S
G4		1.371	1.47	1.422	0.054	-0.951	S
G1	Ca ²⁺ mg/l	0.096	0.115	0.115	0.019	-1.023	Q
G2		0.135	0.153	0.148	0.023	-0.585	S
G3		0.145	0.153	0.155	0.027	-0.347	S
G4		0.195	0.204	0.201	0.025	-0.244	S
G1	K ⁺ mg/l	0.106	0.119	0.112	0.01	-0.635	S
G2		0.159	0.187	0.178	0.012	-1.621	S
G3		0.24	0.255	0.251	0.013	-0.873	S
G4		0.296	0.323	0.315	0.02	-0.945	S
G1	pH pH units	5.42	5.49	5.488	0.15	-0.455	S
G2		5.33	5.48	5.486	0.142	-1.102	Q
G3		5.31	5.45	5.43	0.12	-1.006	Q
G4		5.3	5.43	5.41	0.088	-1.254	Q
G1	Cond µS/cm	5.7	5.96	6.058	0.77	-0.465	S
G2		7.4	7.8	7.951	1.189	-0.463	S
G3		13.9	14.47	14.818	0.703	-1.305	S
G4		15.6	16.4	16.524	0.684	-1.352	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.197	0.209	0.206	0.021	-0.435	S
G2		0.005	0.22	0.214	0.014	-14.999	U
G3		0.407	0.419	0.413	0.04	-0.126	S
G4		0.408	0.422	0.419	0.038	-0.277	S
G1	NH ₄ ⁺ mg N/l	0.08	0.08	0.082	0.01	-0.221	S
G2		0.16	0.16	0.164	0.015	-0.302	S
G3		0.392	0.401	0.412	0.022	-0.913	S
G4		0.457	0.454	0.464	0.024	-0.28	S
G1	NO ₃ ⁻ mg N/l	0.145	0.149	0.149	0.009	-0.413	S
G2		0.008	0.267	0.253	0.051	-4.799	U
G3		0.533	0.547	0.538	0.077	-0.06	S
G4		0.62	0.635	0.625	0.091	-0.051	S
G1	Na ⁺ mg/l	0.23	0.268	0.262	0.014	-2.236	S
G2		0.35	0.39	0.379	0.017	-1.684	S
G3		0.85	0.891	0.867	0.033	-0.514	S
G4		1.02	1.06	1.03	0.039	-0.264	S
G1	Mg ²⁺ mg/l	0.09	0.083	0.081	0.008	1.092	S
G2		0.06	0.062	0.059	0.007	0.084	S
G3		0.2	0.206	0.205	0.014	-0.354	S
G4		0.17	0.175	0.175	0.011	-0.48	S
G1	Cl ⁻ mg/l	0.331	0.347	0.336	0.022	-0.217	S
G2		0.011	0.502	0.484	0.036	-13.033	U
G3		1.21	1.24	1.19	0.049	0.413	S
G4		1.397	1.47	1.422	0.054	-0.465	S
G1	Ca ²⁺ mg/l	0.12	0.115	0.115	0.019	0.273	S
G2		0.13	0.153	0.148	0.023	-0.802	Q
G3		0.14	0.153	0.155	0.027	-0.53	S
G4		0.19	0.204	0.201	0.025	-0.446	S
G1	K ⁺ mg/l	0.12	0.119	0.112	0.01	0.769	S
G2		0.19	0.187	0.178	0.012	1.01	S
G3		0.27	0.255	0.251	0.013	1.416	S
G4		0.34	0.323	0.315	0.02	1.241	S
G1	pH pH units	5.6	5.49	5.488	0.15	0.747	Q
G2		5.26	5.48	5.486	0.142	-1.596	U
G3		5.31	5.45	5.43	0.12	-1.006	Q
G4		5.28	5.43	5.41	0.088	-1.481	Q
G1	Cond µS/cm	5.9	5.96	6.058	0.77	-0.205	S
G2		8	7.8	7.951	1.189	0.041	S
G3		13.8	14.47	14.818	0.703	-1.447	S
G4		15.3	16.4	16.524	0.684	-1.79	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

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

* Z score is unitless

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

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.12	0.209	0.206	0.021	-4.099	U
G2		0.158	0.22	0.214	0.014	-3.994	U
G3		0.161	0.419	0.413	0.04	-6.308	U
G4		0.214	0.422	0.419	0.038	-5.319	U
G1	NH ₄ ⁺ mg N/l	0.07	0.08	0.082	0.01	-1.209	S
G2		0.148	0.16	0.164	0.015	-1.123	S
G3		0.389	0.401	0.412	0.022	-1.049	S
G4		0.443	0.454	0.464	0.024	-0.86	S
G1	NO ₃ ⁻ mg N/l	0.145	0.149	0.149	0.009	-0.425	S
G2		0.26	0.267	0.253	0.051	0.145	S
G3		0.54	0.547	0.538	0.077	0.027	S
G4		0.625	0.635	0.625	0.091	0.003	S
G1	Na ⁺ mg/l	0.254	0.268	0.262	0.014	-0.545	S
G2		0.367	0.39	0.379	0.017	-0.697	S
G3		0.84	0.891	0.867	0.033	-0.814	S
G4		0.979	1.06	1.03	0.039	-1.311	S
G1	Mg ²⁺ mg/l	0.088	0.083	0.081	0.008	0.845	S
G2		0.065	0.062	0.059	0.007	0.834	S
G3		0.22	0.206	0.205	0.014	1.099	S
G4		0.187	0.175	0.175	0.011	1.079	S
G1	Cl ⁻ mg/l	0.277	0.347	0.336	0.022	-2.657	Q
G2		0.373	0.502	0.484	0.036	-3.07	U
G3		1.02	1.24	1.19	0.049	-3.477	Q
G4		1.183	1.47	1.422	0.054	-4.464	Q
G1	Ca ²⁺ mg/l	0.12	0.115	0.115	0.019	0.273	S
G2		0.158	0.153	0.148	0.023	0.414	S
G3		0.161	0.153	0.155	0.027	0.237	S
G4		0.214	0.204	0.201	0.025	0.521	S
G1	K ⁺ mg/l	0.091	0.119	0.112	0.01	-2.139	Q
G2		0.151	0.187	0.178	0.012	-2.3	Q
G3		0.224	0.255	0.251	0.013	-2.093	S
G4		0.277	0.323	0.315	0.02	-1.889	S
G1	pH pH units	5.3	5.49	5.488	0.15	-1.257	Q
G2		5.45	5.48	5.486	0.142	-0.255	S
G3		5.37	5.45	5.43	0.12	-0.504	S
G4		5.41	5.43	5.41	0.088	-0.005	S
G1	Cond µS/cm	9.6	5.96	6.058	0.77	4.599	U
G2		8.6	7.8	7.951	1.189	0.546	S
G3		14.5	14.47	14.818	0.703	-0.452	S
G4		16	16.4	16.524	0.684	-0.767	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

Laboratory 118, Forstliche Versuchs-und Forschungsanstalt (Germany)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.2	0.209	0.206	0.021	-0.302	S
G2		0.21	0.22	0.214	0.014	-0.254	S
G3		0.42	0.419	0.413	0.04	0.187	S
G4		0.43	0.422	0.419	0.038	0.292	S
G1	NH ₄ ⁺ mg N/l	0.082	0.08	0.082	0.01	-0.035	S
G2		0.163	0.16	0.164	0.015	-0.097	S
G3		0.416	0.401	0.412	0.022	0.177	S
G4		0.478	0.454	0.464	0.024	0.589	S
G1	NO ₃ ⁻ mg N/l	0.151	0.149	0.149	0.009	0.271	S
G2		0.253	0.267	0.253	0.051	0.008	S
G3		0.54	0.547	0.538	0.077	0.027	S
G4		0.635	0.635	0.625	0.091	0.114	S
G1	Na ⁺ mg/l	0.23	0.268	0.262	0.014	-2.236	S
G2		0.34	0.39	0.379	0.017	-2.264	S
G3		0.8	0.891	0.867	0.033	-2.017	S
G4		0.96	1.06	1.03	0.039	-1.797	S
G1	Mg ²⁺ mg/l	0.053	0.083	0.081	0.008	-3.485	U
G2		0.04	0.062	0.059	0.007	-2.913	U
G3		0.166	0.206	0.205	0.014	-2.825	Q
G4		0.148	0.175	0.175	0.011	-2.497	Q
G1	Cl ⁻ mg/l	0.34	0.347	0.336	0.022	0.195	S
G2		0.49	0.502	0.484	0.036	0.154	S
G3		1.17	1.24	1.19	0.049	-0.401	S
G4		1.41	1.47	1.422	0.054	-0.222	S
G1	Ca ²⁺ mg/l	< 0.070	0.115	0.115	0.019	-4.318	U
G2		0.08	0.153	0.148	0.023	-2.973	U
G3		0.11	0.153	0.155	0.027	-1.626	U
G4		0.15	0.204	0.201	0.025	-2.058	U
G1	K ⁺ mg/l	0.1	0.119	0.112	0.01	-1.237	Q
G2		0.16	0.187	0.178	0.012	-1.537	S
G3		0.24	0.255	0.251	0.013	-0.873	S
G4		0.31	0.323	0.315	0.02	-0.249	S
G1	pH pH units	5.57	5.49	5.488	0.15	0.546	S
G2		5.49	5.48	5.486	0.142	0.028	S
G3		5.46	5.45	5.43	0.12	0.248	S
G4		5.43	5.43	5.41	0.088	0.222	S
G1	Cond µS/cm	6	5.96	6.058	0.77	-0.075	S
G2		7	7.8	7.951	1.189	-0.799	S
G3		14	14.47	14.818	0.703	-1.163	S
G4		16	16.4	16.524	0.684	-0.767	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.2	0.209	0.206	0.021	-0.326	S
G2		0.2	0.22	0.214	0.014	-0.973	S
G3		0.413	0.419	0.413	0.04	0.012	S
G4		0.414	0.422	0.419	0.038	-0.124	S
G1	NH ₄ ⁺ mg N/l	0.103	0.08	0.082	0.01	2.02	U
G2		0.19	0.16	0.164	0.015	1.75	Q
G3		0.43	0.401	0.412	0.022	0.812	S
G4		0.47	0.454	0.464	0.024	0.258	S
G1	NO ₃ ⁻ mg N/l	0.173	0.149	0.149	0.009	2.824	Q
G2		0.29	0.267	0.253	0.051	0.733	S
G3		0.59	0.547	0.538	0.077	0.676	S
G4		0.68	0.635	0.625	0.091	0.61	S
G1	Na ⁺ mg/l	0.272	0.268	0.262	0.014	0.723	S
G2		0.394	0.39	0.379	0.017	0.869	S
G3		0.91	0.891	0.867	0.033	1.29	S
G4		1.07	1.06	1.03	0.039	1.014	S
G1	Mg ²⁺ mg/l	0.078	0.083	0.081	0.008	-0.392	S
G2		0.057	0.062	0.059	0.007	-0.365	S
G3		0.216	0.206	0.205	0.014	0.808	S
G4		0.18	0.175	0.175	0.011	0.437	S
G1	Cl ⁻ mg/l	0.273	0.347	0.336	0.022	-2.838	Q
G2		0.41	0.502	0.484	0.036	-2.05	Q
G3		1.22	1.24	1.19	0.049	0.624	S
G4		1.46	1.47	1.422	0.054	0.713	S
G1	Ca ²⁺ mg/l	0.112	0.115	0.115	0.019	-0.159	S
G2		0.149	0.153	0.148	0.023	0.023	S
G3		0.15	0.153	0.155	0.027	-0.165	S
G4		0.201	0.204	0.201	0.025	-0.002	S
G1	K ⁺ mg/l	0.099	0.119	0.112	0.01	-1.337	Q
G2		0.157	0.187	0.178	0.012	-1.791	Q
G3		0.224	0.255	0.251	0.013	-2.093	S
G4		0.285	0.323	0.315	0.02	-1.491	S
G1	pH pH units	5.46	5.49	5.488	0.15	-0.188	S
G2		5.45	5.48	5.486	0.142	-0.255	S
G3		5.41	5.45	5.43	0.12	-0.17	S
G4		5.41	5.43	5.41	0.088	-0.005	S
G1	Cond µS/cm	6	5.96	6.058	0.77	-0.075	S
G2		8	7.8	7.951	1.189	0.041	S
G3		15	14.47	14.818	0.703	0.259	S
G4		17	16.4	16.524	0.684	0.695	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.226	0.209	0.206	0.021	0.932	S
G2		0.231	0.22	0.214	0.014	1.256	S
G3		0.427	0.419	0.413	0.04	0.363	S
G4		0.447	0.422	0.419	0.038	0.733	S
G1	NH ₄ ⁺ mg N/l	0.081	0.08	0.082	0.01	-0.133	S
G2		0.159	0.16	0.164	0.015	-0.371	S
G3		0.415	0.401	0.412	0.022	0.131	S
G4		0.457	0.454	0.464	0.024	-0.28	S
G1	NO ₃ ⁻ mg N/l	0.152	0.149	0.149	0.009	0.387	S
G2		0.271	0.267	0.253	0.051	0.361	S
G3		0.55	0.547	0.538	0.077	0.157	S
G4		0.635	0.635	0.625	0.091	0.114	S
G1	Na ⁺ mg/l	0.246	0.268	0.262	0.014	-1.109	S
G2		0.357	0.39	0.379	0.017	-1.278	S
G3		0.822	0.891	0.867	0.033	-1.356	S
G4		0.969	1.06	1.03	0.039	-1.567	S
G1	Mg ²⁺ mg/l	0.075	0.083	0.081	0.008	-0.763	S
G2		0.055	0.062	0.059	0.007	-0.665	S
G3		0.202	0.206	0.205	0.014	-0.209	S
G4		0.171	0.175	0.175	0.011	-0.388	S
G1	Cl ⁻ mg/l	0.339	0.347	0.336	0.022	0.15	S
G2		0.449	0.502	0.484	0.036	-0.976	S
G3		1.07	1.24	1.19	0.049	-2.452	S
G4		1.29	1.47	1.422	0.054	-2.465	S
G1	Ca ²⁺ mg/l	0.089	0.115	0.115	0.019	-1.401	Q
G2		0.122	0.153	0.148	0.023	-1.149	Q
G3		0.139	0.153	0.155	0.027	-0.567	S
G4		0.183	0.204	0.201	0.025	-0.728	S
G1	K ⁺ mg/l	0.107	0.119	0.112	0.01	-0.535	S
G2		0.167	0.187	0.178	0.012	-0.942	S
G3		0.248	0.255	0.251	0.013	-0.262	S
G4		0.286	0.323	0.315	0.02	-1.441	S
G1	pH pH units	5.56	5.49	5.488	0.15	0.48	S
G2		5.51	5.48	5.486	0.142	0.169	S
G3		5.45	5.45	5.43	0.12	0.164	S
G4		5.45	5.43	5.41	0.088	0.449	S
G1	Cond µS/cm	6.1	5.96	6.058	0.77	0.054	S
G2		6.7	7.8	7.951	1.189	-1.052	S
G3		13.8	14.47	14.818	0.703	-1.447	S
G4		15.4	16.4	16.524	0.684	-1.644	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.223	0.209	0.206	0.021	0.789	S
G2		0.217	0.22	0.214	0.014	0.249	S
G3		0.423	0.419	0.413	0.04	0.262	S
G4		0.434	0.422	0.419	0.038	0.395	S
G1	NH ₄ ⁺ mg N/l	-999	0.08	0.082	0.01		B
G2		-999	0.16	0.164	0.015		B
G3		-999	0.401	0.412	0.022		B
G4		-999	0.454	0.464	0.024		B
G1	NO ₃ ⁻ mg N/l	0.153	0.149	0.149	0.009	0.503	S
G2		0.258	0.267	0.253	0.051	0.106	S
G3		0.553	0.547	0.538	0.077	0.196	S
G4		0.63	0.635	0.625	0.091	0.058	S
G1	Na ⁺ mg/l	0.273	0.268	0.262	0.014	0.794	S
G2		0.387	0.39	0.379	0.017	0.463	S
G3		0.896	0.891	0.867	0.033	0.87	S
G4		1.067	1.06	1.03	0.039	0.937	S
G1	Mg ²⁺ mg/l	< 0.090	0.083	0.081	0.008		B
G2		< 0.090	0.062	0.059	0.007		B
G3		0.2	0.206	0.205	0.014	-0.354	S
G4		0.18	0.175	0.175	0.011	0.437	S
G1	Cl ⁻ mg/l	0.344	0.347	0.336	0.022	0.376	S
G2		0.495	0.502	0.484	0.036	0.292	S
G3		1.211	1.24	1.19	0.049	0.44	S
G4		1.448	1.47	1.422	0.054	0.488	S
G1	Ca ²⁺ mg/l	0.101	0.115	0.115	0.019	-0.753	S
G2		0.134	0.153	0.148	0.023	-0.628	S
G3		0.161	0.153	0.155	0.027	0.237	S
G4		0.196	0.204	0.201	0.025	-0.204	S
G1	K ⁺ mg/l	0.188	0.119	0.112	0.01	7.587	U
G2		0.176	0.187	0.178	0.012	-0.179	S
G3		0.255	0.255	0.251	0.013	0.272	S
G4		0.32	0.323	0.315	0.02	0.247	S
G1	pH pH units	5.59	5.49	5.488	0.15	0.68	S
G2		5.53	5.48	5.486	0.142	0.31	S
G3		5.54	5.45	5.43	0.12	0.916	S
G4		5.48	5.43	5.41	0.088	0.79	S
G1	Cond µS/cm	-999	5.96	6.058	0.77		B
G2		-999	7.8	7.951	1.189		B
G3		-999	14.47	14.818	0.703		B
G4		-999	16.4	16.524	0.684		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.183	0.209	0.206	0.021	-1.109	Q
G2		0.188	0.22	0.214	0.014	-1.836	Q
G3		0.41	0.419	0.413	0.04	-0.064	S
G4		0.395	0.422	0.419	0.038	-0.618	S
G1	NH ₄ ⁺ mg N/l	0.081	0.08	0.082	0.01	-0.133	S
G2		0.16	0.16	0.164	0.015	-0.302	S
G3		0.411	0.401	0.412	0.022	-0.05	S
G4		0.47	0.454	0.464	0.024	0.258	S
G1	NO ₃ ⁻ mg N/l	0.131	0.149	0.149	0.009	-2.049	Q
G2		0.249	0.267	0.253	0.051	-0.071	S
G3		0.531	0.547	0.538	0.077	-0.09	S
G4		0.624	0.635	0.625	0.091	-0.008	S
G1	Na ⁺ mg/l	0.259	0.268	0.262	0.014	-0.193	S
G2		0.371	0.39	0.379	0.017	-0.465	S
G3		0.833	0.891	0.867	0.033	-1.025	S
G4		1.01	1.06	1.03	0.039	-0.519	S
G1	Mg ²⁺ mg/l	0.08	0.083	0.081	0.008	-0.207	S
G2		0.057	0.062	0.059	0.007	-0.395	S
G3		0.195	0.206	0.205	0.014	-0.718	S
G4		0.17	0.175	0.175	0.011	-0.48	S
G1	Cl ⁻ mg/l	0.295	0.347	0.336	0.022	-1.842	S
G2		0.454	0.502	0.484	0.036	-0.838	S
G3		1.21	1.24	1.19	0.049	0.419	S
G4		1.44	1.47	1.422	0.054	0.339	S
G1	Ca ²⁺ mg/l	0.113	0.115	0.115	0.019	-0.105	S
G2		0.145	0.153	0.148	0.023	-0.151	S
G3		0.149	0.153	0.155	0.027	-0.201	S
G4		0.199	0.204	0.201	0.025	-0.083	S
G1	K ⁺ mg/l	0.118	0.119	0.112	0.01	0.568	S
G2		0.18	0.187	0.178	0.012	0.161	S
G3		0.253	0.255	0.251	0.013	0.119	S
G4		0.323	0.323	0.315	0.02	0.396	S
G1	pH pH units	5.7	5.49	5.488	0.15	1.414	U
G2		5.5	5.48	5.486	0.142	0.098	S
G3		5.4	5.45	5.43	0.12	-0.254	S
G4		5.4	5.43	5.41	0.088	-0.119	S
G1	Cond µS/cm	6	5.96	6.058	0.77	-0.075	S
G2		8.1	7.8	7.951	1.189	0.125	S
G3		15.7	14.47	14.818	0.703	1.254	S
G4		18.4	16.4	16.524	0.684	2.742	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.19	0.209	0.206	0.021	-0.777	S
G2		0.196	0.22	0.214	0.014	-1.261	Q
G3		0.403	0.419	0.413	0.04	-0.239	S
G4		0.403	0.422	0.419	0.038	-0.41	S
G1	NH ₄ ⁺ mg N/l	0.058	0.08	0.082	0.01	-2.383	U
G2		0.129	0.16	0.164	0.015	-2.423	Q
G3		0.328	0.401	0.412	0.022	-3.819	Q
G4		0.386	0.454	0.464	0.024	-3.22	S
G1	NO ₃ ⁻ mg N/l	0.121	0.149	0.149	0.009	-3.209	Q
G2		0.248	0.267	0.253	0.051	-0.09	S
G3		0.552	0.547	0.538	0.077	0.183	S
G4		0.622	0.635	0.625	0.091	-0.03	S
G1	Na ⁺ mg/l	0.276	0.268	0.262	0.014	1.005	S
G2		0.407	0.39	0.379	0.017	1.624	S
G3		0.919	0.891	0.867	0.033	1.561	S
G4		1.059	1.06	1.03	0.039	0.733	S
G1	Mg ²⁺ mg/l	0.123	0.083	0.081	0.008	5.174	U
G2		0.127	0.062	0.059	0.007	10.126	U
G3		0.242	0.206	0.205	0.014	2.698	Q
G4		0.245	0.175	0.175	0.011	6.396	U
G1	Cl ⁻ mg/l	0.306	0.347	0.336	0.022	-1.344	S
G2		0.46	0.502	0.484	0.036	-0.673	S
G3		1.148	1.24	1.19	0.049	-0.852	S
G4		1.379	1.47	1.422	0.054	-0.801	S
G1	Ca ²⁺ mg/l	0.218	0.115	0.115	0.019	5.567	U
G2		0.316	0.153	0.148	0.023	7.274	U
G3		0.283	0.153	0.155	0.027	4.694	U
G4		0.322	0.204	0.201	0.025	4.874	U
G1	K ⁺ mg/l	0.175	0.119	0.112	0.01	6.284	U
G2		0.172	0.187	0.178	0.012	-0.518	S
G3		0.266	0.255	0.251	0.013	1.111	S
G4		0.32	0.323	0.315	0.02	0.247	S
G1	pH pH units	5.22	5.49	5.488	0.15	-1.791	U
G2		5.23	5.48	5.486	0.142	-1.807	U
G3		5.17	5.45	5.43	0.12	-2.176	U
G4		5.17	5.43	5.41	0.088	-2.73	U
G1	Cond µS/cm	7	5.96	6.058	0.77	1.223	Q
G2		8.4	7.8	7.951	1.189	0.378	S
G3		13.5	14.47	14.818	0.703	-1.874	S
G4		14.7	16.4	16.524	0.684	-2.668	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.204	0.209	0.206	0.021	-0.112	S
G2		0.21	0.22	0.214	0.014	-0.254	S
G3		0.403	0.419	0.413	0.04	-0.239	S
G4		0.412	0.422	0.419	0.038	-0.176	S
G1	NH ₄ ⁺ mg N/l	0.076	0.08	0.082	0.01	-0.651	S
G2		0.17	0.16	0.164	0.015	0.382	S
G3		0.448	0.401	0.412	0.022	1.63	S
G4		0.518	0.454	0.464	0.024	2.245	S
G1	NO ₃ ⁻ mg N/l	0.149	0.149	0.149	0.009	0.039	S
G2		0.256	0.267	0.253	0.051	0.066	S
G3		0.531	0.547	0.538	0.077	-0.09	S
G4		0.626	0.635	0.625	0.091	0.014	S
G1	Na ⁺ mg/l	0.249	0.268	0.262	0.014	-0.897	S
G2		0.366	0.39	0.379	0.017	-0.755	S
G3		0.856	0.891	0.867	0.033	-0.333	S
G4		1.034	1.06	1.03	0.039	0.094	S
G1	Mg ²⁺ mg/l	0.086	0.083	0.081	0.008	0.634	S
G2		0.056	0.062	0.059	0.007	-0.56	S
G3		0.212	0.206	0.205	0.014	0.518	S
G4		0.182	0.175	0.175	0.011	0.62	S
G1	Cl ⁻ mg/l	0.331	0.347	0.336	0.022	-0.212	S
G2		0.467	0.502	0.484	0.036	-0.48	S
G3		1.156	1.24	1.19	0.049	-0.688	S
G4		1.395	1.47	1.422	0.054	-0.502	S
G1	Ca ²⁺ mg/l	0.151	0.115	0.115	0.019	1.948	U
G2		0.189	0.153	0.148	0.023	1.76	Q
G3		0.177	0.153	0.155	0.027	0.822	Q
G4		0.251	0.204	0.201	0.025	2.013	Q
G1	K ⁺ mg/l	0.091	0.119	0.112	0.01	-2.099	Q
G2		0.155	0.187	0.178	0.012	-1.961	Q
G3		0.23	0.255	0.251	0.013	-1.635	S
G4		0.295	0.323	0.315	0.02	-0.994	S
G1	pH pH units	5.53	5.49	5.488	0.15	0.279	S
G2		5.55	5.48	5.486	0.142	0.451	S
G3		5.56	5.45	5.43	0.12	1.084	Q
G4		5.44	5.43	5.41	0.088	0.336	S
G1	Cond µS/cm	5.4	5.96	6.058	0.77	-0.854	S
G2		7.3	7.8	7.951	1.189	-0.547	S
G3		14.3	14.47	14.818	0.703	-0.736	S
G4		16	16.4	16.524	0.684	-0.767	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.199	0.209	0.206	0.021	-0.35	S
G2		0.204	0.22	0.214	0.014	-0.686	S
G3		0.401	0.419	0.413	0.04	-0.289	S
G4		0.405	0.422	0.419	0.038	-0.358	S
G1	NH ₄ ⁺ mg N/l	0.116	0.08	0.082	0.01	3.292	U
G2		0.196	0.16	0.164	0.015	2.16	Q
G3		0.464	0.401	0.412	0.022	2.356	Q
G4		0.519	0.454	0.464	0.024	2.287	S
G1	NO ₃ ⁻ mg N/l	0.144	0.149	0.149	0.009	-0.541	S
G2		0.253	0.267	0.253	0.051	0.008	S
G3		0.522	0.547	0.538	0.077	-0.207	S
G4		0.611	0.635	0.625	0.091	-0.151	S
G1	Na ⁺ mg/l	0.253	0.268	0.262	0.014	-0.615	S
G2		0.363	0.39	0.379	0.017	-0.93	S
G3		0.92	0.891	0.867	0.033	1.591	S
G4		1.071	1.06	1.03	0.039	1.04	S
G1	Mg ²⁺ mg/l	0.097	0.083	0.081	0.008	1.958	Q
G2		0.065	0.062	0.059	0.007	0.834	S
G3		0.235	0.206	0.205	0.014	2.189	S
G4		0.179	0.175	0.175	0.011	0.345	S
G1	Cl ⁻ mg/l	0.323	0.347	0.336	0.022	-0.575	S
G2		0.455	0.502	0.484	0.036	-0.811	S
G3		1.135	1.24	1.19	0.049	-1.119	S
G4		1.359	1.47	1.422	0.054	-1.175	S
G1	Ca ²⁺ mg/l	0.119	0.115	0.115	0.019	0.219	S
G2		0.148	0.153	0.148	0.023	-0.02	S
G3		0.18	0.153	0.155	0.027	0.931	Q
G4		0.225	0.204	0.201	0.025	0.965	S
G1	K ⁺ mg/l	0.119	0.119	0.112	0.01	0.668	S
G2		0.18	0.187	0.178	0.012	0.161	S
G3		0.262	0.255	0.251	0.013	0.806	S
G4		0.325	0.323	0.315	0.02	0.496	S
G1	pH pH units	4.66	5.49	5.488	0.15	-5.531	U
G2		5.72	5.48	5.486	0.142	1.651	U
G3		5.36	5.45	5.43	0.12	-0.588	S
G4		5.28	5.43	5.41	0.088	-1.481	Q
G1	Cond µS/cm	6.29	5.96	6.058	0.77	0.301	S
G2		8.11	7.8	7.951	1.189	0.134	S
G3		15.89	14.47	14.818	0.703	1.525	S
G4		17.75	16.4	16.524	0.684	1.792	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

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

* Z score is unitless

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

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

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

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

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

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

EMEP – 37th 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	0.198	0.209	0.206	0.021	-0.397	S
G2		0.205	0.22	0.214	0.014	-0.614	S
G3		0.418	0.419	0.413	0.04	0.137	S
G4		0.419	0.422	0.419	0.038	0.006	S
G1	NH ₄ ⁺ mg N/l	-999	0.08	0.082	0.01		B
G2		-999	0.16	0.164	0.015		B
G3		-999	0.401	0.412	0.022		B
G4		-999	0.454	0.464	0.024		B
G1	NO ₃ ⁻ mg N/l	0.139	0.149	0.149	0.009	-1.121	S
G2		0.26	0.267	0.253	0.051	0.145	S
G3		0.545	0.547	0.538	0.077	0.092	S
G4		0.635	0.635	0.625	0.091	0.114	S
G1	Na ⁺ mg/l	0.267	0.268	0.262	0.014	0.371	S
G2		0.384	0.39	0.379	0.017	0.289	S
G3		0.868	0.891	0.867	0.033	0.028	S
G4		1.033	1.06	1.03	0.039	0.069	S
G1	Mg ²⁺ mg/l	0.083	0.083	0.081	0.008	0.226	S
G2		0.06	0.062	0.059	0.007	0.084	S
G3		0.205	0.206	0.205	0.014	0.009	S
G4		0.176	0.175	0.175	0.011	0.07	S
G1	Cl ⁻ mg/l	0.34	0.347	0.336	0.022	0.195	S
G2		0.499	0.502	0.484	0.036	0.402	S
G3		1.235	1.24	1.19	0.049	0.932	S
G4		1.464	1.47	1.422	0.054	0.787	S
G1	Ca ²⁺ mg/l	0.113	0.115	0.115	0.019	-0.105	S
G2		0.151	0.153	0.148	0.023	0.11	S
G3		0.147	0.153	0.155	0.027	-0.274	S
G4		0.2	0.204	0.201	0.025	-0.043	S
G1	K ⁺ mg/l	0.118	0.119	0.112	0.01	0.568	S
G2		0.178	0.187	0.178	0.012	-0.009	S
G3		0.247	0.255	0.251	0.013	-0.339	S
G4		0.312	0.323	0.315	0.02	-0.15	S
G1	pH pH units	5.55	5.49	5.488	0.15	0.413	S
G2		5.51	5.48	5.486	0.142	0.169	S
G3		5.44	5.45	5.43	0.12	0.081	S
G4		5.45	5.43	5.41	0.088	0.449	S
G1	Cond µS/cm	5.85	5.96	6.058	0.77	-0.27	S
G2		7.88	7.8	7.951	1.189	-0.06	S
G3		14.83	14.47	14.818	0.703	0.017	S
G4		16.59	16.4	16.524	0.684	0.096	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.212	0.209	0.206	0.021	0.267	S
G2		0.22	0.22	0.214	0.014	0.465	S
G3		0.422	0.419	0.413	0.04	0.237	S
G4		0.425	0.422	0.419	0.038	0.162	S
G1	NH ₄ ⁺ mg N/l	0.081	0.08	0.082	0.01	-0.133	S
G2		0.169	0.16	0.164	0.015	0.314	S
G3		0.416	0.401	0.412	0.022	0.177	S
G4		0.467	0.454	0.464	0.024	0.134	S
G1	NO ₃ ⁻ mg N/l	0.15	0.149	0.149	0.009	0.155	S
G2		0.269	0.267	0.253	0.051	0.321	S
G3		0.565	0.547	0.538	0.077	0.352	S
G4		0.658	0.635	0.625	0.091	0.368	S
G1	Na ⁺ mg/l	0.27	0.268	0.262	0.014	0.582	S
G2		0.392	0.39	0.379	0.017	0.753	S
G3		0.883	0.891	0.867	0.033	0.479	S
G4		1.05	1.06	1.03	0.039	0.503	S
G1	Mg ²⁺ mg/l	0.086	0.083	0.081	0.008	0.597	S
G2		0.065	0.062	0.059	0.007	0.834	S
G3		0.213	0.206	0.205	0.014	0.59	S
G4		0.183	0.175	0.175	0.011	0.712	S
G1	Cl ⁻ mg/l	0.347	0.347	0.336	0.022	0.512	S
G2		0.504	0.502	0.484	0.036	0.54	S
G3		1.22	1.24	1.19	0.049	0.624	S
G4		1.46	1.47	1.422	0.054	0.713	S
G1	Ca ²⁺ mg/l	0.117	0.115	0.115	0.019	0.111	S
G2		0.155	0.153	0.148	0.023	0.284	S
G3		0.162	0.153	0.155	0.027	0.274	S
G4		0.207	0.204	0.201	0.025	0.239	S
G1	K ⁺ mg/l	0.122	0.119	0.112	0.01	0.969	S
G2		0.188	0.187	0.178	0.012	0.84	S
G3		0.26	0.255	0.251	0.013	0.653	S
G4		0.325	0.323	0.315	0.02	0.496	S
G1	pH pH units	5.54	5.49	5.488	0.15	0.346	S
G2		5.57	5.48	5.486	0.142	0.592	S
G3		5.42	5.45	5.43	0.12	-0.086	S
G4		5.55	5.43	5.41	0.088	1.585	Q
G1	Cond μS/cm	5.9	5.96	6.058	0.77	-0.205	S
G2		7.8	7.8	7.951	1.189	-0.127	S
G3		15.1	14.47	14.818	0.703	0.401	S
G4		17	16.4	16.524	0.684	0.695	S

**Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001**

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.21	0.209	0.206	0.021	0.172	S
G2		0.216	0.22	0.214	0.014	0.178	S
G3		0.417	0.419	0.413	0.04	0.112	S
G4		0.423	0.422	0.419	0.038	0.11	S
G1	NH ₄ ⁺ mg N/l	0.089	0.08	0.082	0.01	0.65	S
G2		0.18	0.16	0.164	0.015	1.066	S
G3		0.41	0.401	0.412	0.022	-0.096	S
G4		0.46	0.454	0.464	0.024	-0.156	S
G1	NO ₃ ⁻ mg N/l	0.146	0.149	0.149	0.009	-0.309	S
G2		0.267	0.267	0.253	0.051	0.282	S
G3		0.551	0.547	0.538	0.077	0.17	S
G4		0.639	0.635	0.625	0.091	0.158	S
G1	Na ⁺ mg/l	0.27	0.268	0.262	0.014	0.582	S
G2		0.371	0.39	0.379	0.017	-0.465	S
G3		0.866	0.891	0.867	0.033	-0.033	S
G4		1.176	1.06	1.03	0.039	3.723	S
G1	Mg ²⁺ mg/l	0.084	0.083	0.081	0.008	0.35	S
G2		0.059	0.062	0.059	0.007	-0.065	S
G3		0.201	0.206	0.205	0.014	-0.282	S
G4		0.181	0.175	0.175	0.011	0.529	S
G1	Cl ⁻ mg/l	0.344	0.347	0.336	0.022	0.376	S
G2		0.498	0.502	0.484	0.036	0.374	S
G3		1.22	1.24	1.19	0.049	0.624	S
G4		1.446	1.47	1.422	0.054	0.451	S
G1	Ca ²⁺ mg/l	0.106	0.115	0.115	0.019	-0.483	S
G2		0.163	0.153	0.148	0.023	0.631	S
G3		0.149	0.153	0.155	0.027	-0.201	S
G4		0.208	0.204	0.201	0.025	0.28	S
G1	K ⁺ mg/l	0.117	0.119	0.112	0.01	0.468	S
G2		0.177	0.187	0.178	0.012	-0.094	S
G3		0.256	0.255	0.251	0.013	0.348	S
G4		0.329	0.323	0.315	0.02	0.694	S
G1	pH pH units	-999	5.49	5.488	0.15		B
G2		-999	5.48	5.486	0.142		B
G3		-999	5.45	5.43	0.12		B
G4		-999	5.43	5.41	0.088		B
G1	Cond µS/cm	6.22	5.96	6.058	0.77	0.21	S
G2		7.97	7.8	7.951	1.189	0.016	S
G3		15.39	14.47	14.818	0.703	0.814	S
G4		16.95	16.4	16.524	0.684	0.622	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

Laboratory 174, Background Monitoring Department, Institute of Global Climate and Ecology (IGCE),
Moscow (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	0.214	0.209	0.206	0.021	0.362	S
G2		0.22	0.22	0.214	0.014	0.465	S
G3		0.422	0.419	0.413	0.04	0.237	S
G4		0.428	0.422	0.419	0.038	0.24	S
G1	NH ₄ ⁺ mg N/l	0.074	0.08	0.082	0.01	-0.817	S
G2		0.128	0.16	0.164	0.015	-2.491	Q
G3		0.374	0.401	0.412	0.022	-1.73	S
G4		0.43	0.454	0.464	0.024	-1.398	S
G1	NO ₃ ⁻ mg N/l	0.157	0.149	0.149	0.009	0.967	S
G2		0.278	0.267	0.253	0.051	0.498	S
G3		0.569	0.547	0.538	0.077	0.404	S
G4		0.685	0.635	0.625	0.091	0.666	S
G1	Na ⁺ mg/l	0.3	0.268	0.262	0.014	2.696	S
G2		0.408	0.39	0.379	0.017	1.682	S
G3		0.912	0.891	0.867	0.033	1.351	S
G4		1.073	1.06	1.03	0.039	1.091	S
G1	Mg ²⁺ mg/l	0.108	0.083	0.081	0.008	3.319	U
G2		0.077	0.062	0.059	0.007	2.632	Q
G3		0.189	0.206	0.205	0.014	-1.154	S
G4		0.21	0.175	0.175	0.011	3.187	Q
G1	Cl ⁻ mg/l	0.222	0.347	0.336	0.022	-5.147	U
G2		0.383	0.502	0.484	0.036	-2.794	Q
G3		1.16	1.24	1.19	0.049	-0.606	S
G4		1.441	1.47	1.422	0.054	0.357	S
G1	Ca ²⁺ mg/l	0.168	0.115	0.115	0.019	2.866	U
G2		0.214	0.153	0.148	0.023	2.845	U
G3		0.201	0.153	0.155	0.027	1.698	U
G4		0.26	0.204	0.201	0.025	2.375	U
G1	K ⁺ mg/l	0.165	0.119	0.112	0.01	5.281	U
G2		0.19	0.187	0.178	0.012	1.01	S
G3		0.308	0.255	0.251	0.013	4.315	Q
G4		0.382	0.323	0.315	0.02	3.327	Q
G1	pH pH units	5.72	5.49	5.488	0.15	1.548	U
G2		5.65	5.48	5.486	0.142	1.157	Q
G3		5.61	5.45	5.43	0.12	1.501	Q
G4		5.55	5.43	5.41	0.088	1.585	Q
G1	Cond µS/cm	5.6	5.96	6.058	0.77	-0.595	S
G2		7.3	7.8	7.951	1.189	-0.547	S
G3		14.3	14.47	14.818	0.703	-0.736	S
G4		16.5	16.4	16.524	0.684	-0.036	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

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

* Z score is unitless

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

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm [†]
G1	SO ₄ ²⁻ mg S/l	0.62	0.209	0.206	0.021	19.632	U
G2		0.664	0.22	0.214	0.014	32.4	U
G3		1.236	0.419	0.413	0.04	20.652	U
G4		1.27	0.422	0.419	0.038	22.111	U
G1	NH ₄ ⁺ mg N/l	0.1	0.08	0.082	0.01	1.727	U
G2		0.2	0.16	0.164	0.015	2.434	U
G3		0.523	0.401	0.412	0.022	5.035	U
G4		0.592	0.454	0.464	0.024	5.309	U
G1	NO ₃ ⁻ mg N/l	0.63	0.149	0.149	0.009	55.841	U
G2		1.107	0.267	0.253	0.051	16.754	U
G3		2.325	0.547	0.538	0.077	23.207	U
G4		2.771	0.635	0.625	0.091	23.696	U
G1	Na ⁺ mg/l	0.26	0.268	0.262	0.014	-0.122	S
G2		0.38	0.39	0.379	0.017	0.057	S
G3		0.871	0.891	0.867	0.033	0.118	S
G4		1.029	1.06	1.03	0.039	-0.034	S
G1	Mg ²⁺ mg/l	0.083	0.083	0.081	0.008	0.226	S
G2		0.06	0.062	0.059	0.007	0.084	S
G3		0.211	0.206	0.205	0.014	0.445	S
G4		0.182	0.175	0.175	0.011	0.62	S
G1	Cl ⁻ mg/l	0.282	0.347	0.336	0.022	-2.431	Q
G2		0.418	0.502	0.484	0.036	-1.83	Q
G3		1.074	1.24	1.19	0.049	-2.37	S
G4		1.326	1.47	1.422	0.054	-1.792	S
G1	Ca ²⁺ mg/l	0.116	0.115	0.115	0.019	0.057	S
G2		0.144	0.153	0.148	0.023	-0.194	S
G3		0.105	0.153	0.155	0.027	-1.809	U
G4		0.142	0.204	0.201	0.025	-2.38	U
G1	K ⁺ mg/l	0.108	0.119	0.112	0.01	-0.435	S
G2		0.174	0.187	0.178	0.012	-0.348	S
G3		0.248	0.255	0.251	0.013	-0.262	S
G4		0.307	0.323	0.315	0.02	-0.398	S
G1	pH pH units	5.41	5.49	5.488	0.15	-0.522	S
G2		5.37	5.48	5.486	0.142	-0.819	Q
G3		5.3	5.45	5.43	0.12	-1.089	Q
G4		5.32	5.43	5.41	0.088	-1.027	Q
G1	Cond µS/cm	5.85	5.96	6.058	0.77	-0.27	S
G2		7.77	7.8	7.951	1.189	-0.152	S
G3		15.12	14.47	14.818	0.703	0.43	S
G4		17	16.4	16.524	0.684	0.695	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

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

* Z score is unitless

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

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.217	0.209	0.206	0.021	0.505	S
G2		0.215	0.22	0.214	0.014	0.106	S
G3		0.435	0.419	0.413	0.04	0.563	S
G4		0.452	0.422	0.419	0.038	0.863	S
G1	NH ₄ ⁺ mg N/l	0.078	0.08	0.082	0.01	-0.426	S
G2		0.17	0.16	0.164	0.015	0.382	S
G3		0.431	0.401	0.412	0.022	0.858	S
G4		0.486	0.454	0.464	0.024	0.92	S
G1	NO ₃ ⁻ mg N/l	0.154	0.149	0.149	0.009	0.619	S
G2		0.263	0.267	0.253	0.051	0.204	S
G3		0.542	0.547	0.538	0.077	0.053	S
G4		0.641	0.635	0.625	0.091	0.18	S
G1	Na ⁺ mg/l	0.262	0.268	0.262	0.014	0.019	S
G2		0.374	0.39	0.379	0.017	-0.291	S
G3		0.842	0.891	0.867	0.033	-0.754	S
G4		0.998	1.06	1.03	0.039	-0.826	S
G1	Mg ²⁺ mg/l	< 0.100	0.083	0.081	0.008		B
G2		< 0.100	0.062	0.059	0.007		B
G3		0.138	0.206	0.205	0.014	-4.86	U
G4		0.132	0.175	0.175	0.011	-3.964	Q
G1	Cl ⁻ mg/l	0.354	0.347	0.336	0.022	0.829	S
G2		0.527	0.502	0.484	0.036	1.173	S
G3		1.29	1.24	1.19	0.049	2.06	S
G4		1.561	1.47	1.422	0.054	2.6	S
G1	Ca ²⁺ mg/l	0.159	0.115	0.115	0.019	2.38	U
G2		0.186	0.153	0.148	0.023	1.629	Q
G3		0.19	0.153	0.155	0.027	1.297	Q
G4		0.219	0.204	0.201	0.025	0.723	S
G1	K ⁺ mg/l	0.122	0.119	0.112	0.01	0.969	S
G2		0.176	0.187	0.178	0.012	-0.179	S
G3		0.265	0.255	0.251	0.013	1.035	S
G4		0.308	0.323	0.315	0.02	-0.349	S
G1	pH pH units	-999	5.49	5.488	0.15		B
G2		-999	5.48	5.486	0.142		B
G3		-999	5.45	5.43	0.12		B
G4		-999	5.43	5.41	0.088		B
G1	Cond µS/cm	6	5.96	6.058	0.77	-0.075	S
G2		7.4	7.8	7.951	1.189	-0.463	S
G3		14.7	14.47	14.818	0.703	-0.168	S
G4		16.5	16.4	16.524	0.684	-0.036	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu-tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

Laboratory 181, TNO innovation for life (The Netherlands)

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.209	0.209	0.206	0.021	0.125	S
G2		0.215	0.22	0.214	0.014	0.106	S
G3		0.419	0.419	0.413	0.04	0.162	S
G4		0.412	0.422	0.419	0.038	-0.176	S
G1	NH ₄ ⁺ mg N/l	0.12	0.08	0.082	0.01	3.684	U
G2		0.195	0.16	0.164	0.015	2.092	Q
G3		0.431	0.401	0.412	0.022	0.858	S
G4		0.485	0.454	0.464	0.024	0.879	S
G1	NO ₃ ⁻ mg N/l	0.16	0.149	0.149	0.009	1.315	S
G2		0.259	0.267	0.253	0.051	0.125	S
G3		0.543	0.547	0.538	0.077	0.066	S
G4		0.613	0.635	0.625	0.091	-0.129	S
G1	Na ⁺ mg/l	0.275	0.268	0.262	0.014	0.935	S
G2		0.386	0.39	0.379	0.017	0.405	S
G3		0.871	0.891	0.867	0.033	0.118	S
G4		1.025	1.06	1.03	0.039	-0.136	S
G1	Mg ²⁺ mg/l	< 0.180	0.083	0.081	0.008		B
G2		< 0.180	0.062	0.059	0.007		B
G3		0.209	0.206	0.205	0.014	0.3	S
G4		< 0.180	0.175	0.175	0.011		B
G1	Cl ⁻ mg/l	0.39	0.347	0.336	0.022	2.454	S
G2		0.486	0.502	0.484	0.036	0.044	S
G3		1.201	1.24	1.19	0.049	0.235	S
G4		1.38	1.47	1.422	0.054	-0.783	S
G1	Ca ²⁺ mg/l	0.139	0.115	0.115	0.019	1.3	Q
G2		0.167	0.153	0.148	0.023	0.805	S
G3		0.666	0.153	0.155	0.027	18.686	U
G4		0.213	0.204	0.201	0.025	0.481	S
G1	K ⁺ mg/l	0.125	0.119	0.112	0.01	1.27	S
G2		0.182	0.187	0.178	0.012	0.331	S
G3		0.247	0.255	0.251	0.013	-0.339	S
G4		0.304	0.323	0.315	0.02	-0.547	S
G1	pH pH units	5.51	5.49	5.488	0.15	0.146	S
G2		5.47	5.48	5.486	0.142	-0.113	S
G3		5.48	5.45	5.43	0.12	0.415	S
G4		5.45	5.43	5.41	0.088	0.449	S
G1	Cond µS/cm	6.7	5.96	6.058	0.77	0.833	S
G2		15.2	7.8	7.951	1.189	6.095	U
G3		17.3	14.47	14.818	0.703	3.529	Q
G4		< 1.000	16.4	16.524	0.684	-23.43	U

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

Laboratory 186, Public Health Institute - Kralevo (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	0.209	0.206	0.021		B
G2		-999	0.22	0.214	0.014		B
G3		-999	0.419	0.413	0.04		B
G4		-999	0.422	0.419	0.038		B
G1	NH ₄ ⁺ mg N/l	-999	0.08	0.082	0.01		B
G2		-999	0.16	0.164	0.015		B
G3		-999	0.401	0.412	0.022		B
G4		-999	0.454	0.464	0.024		B
G1	NO ₃ ⁻ mg N/l	-999	0.149	0.149	0.009		B
G2		-999	0.267	0.253	0.051		B
G3		-999	0.547	0.538	0.077		B
G4		-999	0.635	0.625	0.091		B
G1	Na ⁺ mg/l	0.1	0.268	0.262	0.014	-11.395	U
G2		0.197	0.39	0.379	0.017	-10.562	U
G3		0.576	0.891	0.867	0.033	-8.753	U
G4		0.733	1.06	1.03	0.039	-7.597	U
G1	Mg ²⁺ mg/l	-999	0.083	0.081	0.008		B
G2		-999	0.062	0.059	0.007		B
G3		-999	0.206	0.205	0.014		B
G4		-999	0.175	0.175	0.011		B
G1	Cl ⁻ mg/l	-999	0.347	0.336	0.022		B
G2		-999	0.502	0.484	0.036		B
G3		-999	1.24	1.19	0.049		B
G4		-999	1.47	1.422	0.054		B
G1	Ca ²⁺ mg/l	-999	0.115	0.115	0.019		B
G2		-999	0.153	0.148	0.023		B
G3		-999	0.153	0.155	0.027		B
G4		-999	0.204	0.201	0.025		B
G1	K ⁺ mg/l	-999	0.119	0.112	0.01		B
G2		-999	0.187	0.178	0.012		B
G3		-999	0.255	0.251	0.013		B
G4		-999	0.323	0.315	0.02		B
G1	pH pH units	-999	5.49	5.488	0.15		B
G2		-999	5.48	5.486	0.142		B
G3		-999	5.45	5.43	0.12		B
G4		-999	5.43	5.41	0.088		B
G1	Cond µS/cm	-999	5.96	6.058	0.77		B
G2		-999	7.8	7.951	1.189		B
G3		-999	14.47	14.818	0.703		B
G4		-999	16.4	16.524	0.684		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	0.304	0.209	0.206	0.021	4.634	U
G2		0.266	0.22	0.214	0.014	3.774	U
G3		0.464	0.419	0.413	0.04	1.291	Q
G4		0.548	0.422	0.419	0.038	3.357	U
G1	NH ₄ ⁺ mg N/l	0.088	0.08	0.082	0.01	0.552	S
G2		0.177	0.16	0.164	0.015	0.861	S
G3		0.396	0.401	0.412	0.022	-0.731	S
G4		0.451	0.454	0.464	0.024	-0.529	S
G1	NO ₃ ⁻ mg N/l	-999	0.149	0.149	0.009		B
G2		-999	0.267	0.253	0.051		B
G3		-999	0.547	0.538	0.077		B
G4		-999	0.635	0.625	0.091		B
G1	Na ⁺ mg/l	-999	0.268	0.262	0.014		B
G2		-999	0.39	0.379	0.017		B
G3		-999	0.891	0.867	0.033		B
G4		-999	1.06	1.03	0.039		B
G1	Mg ²⁺ mg/l	-999	0.083	0.081	0.008		B
G2		-999	0.062	0.059	0.007		B
G3		-999	0.206	0.205	0.014		B
G4		-999	0.175	0.175	0.011		B
G1	Cl ⁻ mg/l	< 2.000	0.347	0.336	0.022		B
G2		< 2.000	0.502	0.484	0.036		B
G3		< 2.000	1.24	1.19	0.049		B
G4		< 2.000	1.47	1.422	0.054		B
G1	Ca ²⁺ mg/l	-999	0.115	0.115	0.019		B
G2		< 1.000	0.153	0.148	0.023		B
G3		< 1.000	0.153	0.155	0.027		B
G4		< 1.000	0.204	0.201	0.025		B
G1	K ⁺ mg/l	-999	0.119	0.112	0.01		B
G2		-999	0.187	0.178	0.012		B
G3		-999	0.255	0.251	0.013		B
G4		-999	0.323	0.315	0.02		B
G1	pH pH units	-999	5.49	5.488	0.15		B
G2		-999	5.48	5.486	0.142		B
G3		-999	5.45	5.43	0.12		B
G4		-999	5.43	5.41	0.088		B
G1	Cond µS/cm	-999	5.96	6.058	0.77		B
G2		-999	7.8	7.951	1.189		B
G3		-999	14.47	14.818	0.703		B
G4		-999	16.4	16.524	0.684		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	-999	0.209	0.206	0.021		B
G2		-999	0.22	0.214	0.014		B
G3		-999	0.419	0.413	0.04		B
G4		-999	0.422	0.419	0.038		B
G1	NH ₄ ⁺ mg N/l	-999	0.08	0.082	0.01		B
G2		-999	0.16	0.164	0.015		B
G3		-999	0.401	0.412	0.022		B
G4		-999	0.454	0.464	0.024		B
G1	NO ₃ ⁻ mg N/l	-999	0.149	0.149	0.009		B
G2		-999	0.267	0.253	0.051		B
G3		-999	0.547	0.538	0.077		B
G4		-999	0.635	0.625	0.091		B
G1	Na ⁺ mg/l	0.263	0.268	0.262	0.014	0.089	S
G2		0.374	0.39	0.379	0.017	-0.291	S
G3		0.836	0.891	0.867	0.033	-0.935	S
G4		0.997	1.06	1.03	0.039	-0.851	S
G1	Mg ²⁺ mg/l	0.084	0.083	0.081	0.008	0.35	S
G2		0.063	0.062	0.059	0.007	0.534	S
G3		0.206	0.206	0.205	0.014	0.082	S
G4		0.177	0.175	0.175	0.011	0.162	S
G1	Cl ⁻ mg/l	-999	0.347	0.336	0.022		B
G2		-999	0.502	0.484	0.036		B
G3		-999	1.24	1.19	0.049		B
G4		-999	1.47	1.422	0.054		B
G1	Ca ²⁺ mg/l	0.117	0.115	0.115	0.019	0.111	S
G2		0.182	0.153	0.148	0.023	1.456	Q
G3		0.148	0.153	0.155	0.027	-0.238	S
G4		0.213	0.204	0.201	0.025	0.481	S
G1	K ⁺ mg/l	0.11	0.119	0.112	0.01	-0.234	S
G2		0.172	0.187	0.178	0.012	-0.518	S
G3		0.238	0.255	0.251	0.013	-1.025	S
G4		0.311	0.323	0.315	0.02	-0.2	S
G1	pH pH units	-999	5.49	5.488	0.15		B
G2		-999	5.48	5.486	0.142		B
G3		-999	5.45	5.43	0.12		B
G4		-999	5.43	5.41	0.088		B
G1	Cond μS/cm	-999	5.96	6.058	0.77		B
G2		-999	7.8	7.951	1.189		B
G3		-999	14.47	14.818	0.703		B
G4		-999	16.4	16.524	0.684		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

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

Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm ^x
G1	SO ₄ ²⁻ mg S/l	-999	0.209	0.206	0.021		B
G2		-999	0.22	0.214	0.014		B
G3		-999	0.419	0.413	0.04		B
G4		-999	0.422	0.419	0.038		B
G1	NH ₄ ⁺ mg N/l	0.088	0.08	0.082	0.01	0.552	S
G2		0.179	0.16	0.164	0.015	0.998	S
G3		0.398	0.401	0.412	0.022	-0.641	S
G4		0.45	0.454	0.464	0.024	-0.57	S
G1	NO ₃ ⁻ mg N/l	-999	0.149	0.149	0.009		B
G2		-999	0.267	0.253	0.051		B
G3		-999	0.547	0.538	0.077		B
G4		-999	0.635	0.625	0.091		B
G1	Na ⁺ mg/l	-999	0.268	0.262	0.014		B
G2		-999	0.39	0.379	0.017		B
G3		-999	0.891	0.867	0.033		B
G4		-999	1.06	1.03	0.039		B
G1	Mg ²⁺ mg/l	-999	0.083	0.081	0.008		B
G2		-999	0.062	0.059	0.007		B
G3		-999	0.206	0.205	0.014		B
G4		-999	0.175	0.175	0.011		B
G1	Cl ⁻ mg/l	-999	0.347	0.336	0.022		B
G2		-999	0.502	0.484	0.036		B
G3		-999	1.24	1.19	0.049		B
G4		-999	1.47	1.422	0.054		B
G1	Ca ²⁺ mg/l	-999	0.115	0.115	0.019		B
G2		-999	0.153	0.148	0.023		B
G3		-999	0.153	0.155	0.027		B
G4		-999	0.204	0.201	0.025		B
G1	K ⁺ mg/l	-999	0.119	0.112	0.01		B
G2		-999	0.187	0.178	0.012		B
G3		-999	0.255	0.251	0.013		B
G4		-999	0.323	0.315	0.02		B
G1	pH pH units	-999	5.49	5.488	0.15		B
G2		-999	5.48	5.486	0.142		B
G3		-999	5.45	5.43	0.12		B
G4		-999	5.43	5.41	0.088		B
G1	Cond μS/cm	-999	5.96	6.058	0.77		B
G2		-999	7.8	7.951	1.189		B
G3		-999	14.47	14.818	0.703		B
G4		-999	16.4	16.524	0.684		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.207	0.209	0.206	0.021	0.03	S
G2		0.217	0.22	0.214	0.014	0.249	S
G3		0.419	0.419	0.413	0.04	0.162	S
G4		0.427	0.422	0.419	0.038	0.214	S
G1	NH ₄ ⁺ mg N/l	0.078	0.08	0.082	0.01	-0.426	S
G2		0.164	0.16	0.164	0.015	-0.029	S
G3		0.424	0.401	0.412	0.022	0.54	S
G4		0.474	0.454	0.464	0.024	0.424	S
G1	NO ₃ ⁻ mg N/l	0.15	0.149	0.149	0.009	0.155	S
G2		0.264	0.267	0.253	0.051	0.223	S
G3		0.554	0.547	0.538	0.077	0.209	S
G4		0.64	0.635	0.625	0.091	0.169	S
G1	Na ⁺ mg/l	0.263	0.268	0.262	0.014	0.089	S
G2		0.383	0.39	0.379	0.017	0.231	S
G3		0.871	0.891	0.867	0.033	0.118	S
G4		1.033	1.06	1.03	0.039	0.069	S
G1	Mg ²⁺ mg/l	0.087	0.083	0.081	0.008	0.721	S
G2		0.062	0.062	0.059	0.007	0.384	S
G3		0.214	0.206	0.205	0.014	0.663	S
G4		0.183	0.175	0.175	0.011	0.712	S
G1	Cl ⁻ mg/l	0.344	0.347	0.336	0.022	0.376	S
G2		0.496	0.502	0.484	0.036	0.319	S
G3		1.21	1.24	1.19	0.049	0.419	S
G4		1.44	1.47	1.422	0.054	0.339	S
G1	Ca ²⁺ mg/l	0.116	0.115	0.115	0.019	0.057	S
G2		0.161	0.153	0.148	0.023	0.544	S
G3		0.154	0.153	0.155	0.027	-0.019	S
G4		0.204	0.204	0.201	0.025	0.118	S
G1	K ⁺ mg/l	0.128	0.119	0.112	0.01	1.571	S
G2		0.2	0.187	0.178	0.012	1.858	S
G3		0.272	0.255	0.251	0.013	1.569	S
G4		0.346	0.323	0.315	0.02	1.539	S
G1	pH pH units	5.54	5.49	5.488	0.15	0.346	S
G2		5.39	5.48	5.486	0.142	-0.678	S
G3		5.53	5.45	5.43	0.12	0.833	S
G4		5.48	5.43	5.41	0.088	0.79	S
G1	Cond µS/cm	6.31	5.96	6.058	0.77	0.327	S
G2		7.89	7.8	7.951	1.189	-0.051	S
G3		15.52	14.47	14.818	0.703	0.998	S
G4		16.96	16.4	16.524	0.684	0.637	S

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th intercomparison of analytical methods

Laboratory 201, Public Health Institute "Timok" (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	0.209	0.206	0.021		B
G2		-999	0.22	0.214	0.014		B
G3		-999	0.419	0.413	0.04		B
G4		-999	0.422	0.419	0.038		B
G1	NH ₄ ⁺ mg N/l	0.105	0.08	0.082	0.01	2.216	U
G2		0.176	0.16	0.164	0.015	0.792	S
G3		0.428	0.401	0.412	0.022	0.722	S
G4		0.483	0.454	0.464	0.024	0.796	S
G1	NO ₃ ⁻ mg N/l	-999	0.149	0.149	0.009		B
G2		-999	0.267	0.253	0.051		B
G3		-999	0.547	0.538	0.077		B
G4		-999	0.635	0.625	0.091		B
G1	Na ⁺ mg/l	-999	0.268	0.262	0.014		B
G2		-999	0.39	0.379	0.017		B
G3		-999	0.891	0.867	0.033		B
G4		-999	1.06	1.03	0.039		B
G1	Mg ²⁺ mg/l	0.064	0.083	0.081	0.008	-2.124	Q
G2		0.043	0.062	0.059	0.007	-2.463	U
G3		0.174	0.206	0.205	0.014	-2.244	Q
G4		0.148	0.175	0.175	0.011	-2.497	Q
G1	Cl ⁻ mg/l	-999	0.347	0.336	0.022		B
G2		-999	0.502	0.484	0.036		B
G3		-999	1.24	1.19	0.049		B
G4		-999	1.47	1.422	0.054		B
G1	Ca ²⁺ mg/l	0.083	0.115	0.115	0.019	-1.725	U
G2		0.093	0.153	0.148	0.023	-2.408	U
G3		0.1	0.153	0.155	0.027	-1.991	U
G4		0.124	0.204	0.201	0.025	-3.106	U
G1	K ⁺ mg/l	-999	0.119	0.112	0.01		B
G2		-999	0.187	0.178	0.012		B
G3		-999	0.255	0.251	0.013		B
G4		-999	0.323	0.315	0.02		B
G1	pH pH units	6.355	5.49	5.488	0.15	5.789	U
G2		6.023	5.48	5.486	0.142	3.79	U
G3		5.91	5.45	5.43	0.12	4.009	U
G4		5.837	5.43	5.41	0.088	4.844	U
G1	Cond µS/cm	72.5	5.96	6.058	0.77	86.262	U
G2		33.5	7.8	7.951	1.189	21.481	U
G3		35.4	14.47	14.818	0.703	29.265	U
G4		39.7	16.4	16.524	0.684	33.887	U

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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

EMEP – 37th 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	0.209	0.206	0.021		B
G2		-999	0.22	0.214	0.014		B
G3		-999	0.419	0.413	0.04		B
G4		-999	0.422	0.419	0.038		B
G1	NH ₄ ⁺ mg N/l	-999	0.08	0.082	0.01		B
G2		-999	0.16	0.164	0.015		B
G3		-999	0.401	0.412	0.022		B
G4		-999	0.454	0.464	0.024		B
G1	NO ₃ ⁻ mg N/l	-999	0.149	0.149	0.009		B
G2		-999	0.267	0.253	0.051		B
G3		-999	0.547	0.538	0.077		B
G4		-999	0.635	0.625	0.091		B
G1	Na ⁺ mg/l	0.238	0.268	0.262	0.014	-1.672	S
G2		0.348	0.39	0.379	0.017	-1.8	S
G3		0.73	0.891	0.867	0.033	-4.122	Q
G4		0.845	1.06	1.03	0.039	-4.735	Q
G1	Mg ²⁺ mg/l	0.062	0.083	0.081	0.008	-2.372	U
G2		0.048	0.062	0.059	0.007	-1.714	Q
G3		0.169	0.206	0.205	0.014	-2.607	Q
G4		0.149	0.175	0.175	0.011	-2.405	S
G1	Cl ⁻ mg/l	< 2.000	0.347	0.336	0.022		B
G2		< 2.000	0.502	0.484	0.036		B
G3		< 2.000	1.24	1.19	0.049		B
G4		< 2.000	1.47	1.422	0.054		B
G1	Ca ²⁺ mg/l	< 1.000	0.115	0.115	0.019		B
G2		< 1.000	0.153	0.148	0.023		B
G3		< 1.000	0.153	0.155	0.027		B
G4		< 1.000	0.204	0.201	0.025		B
G1	K ⁺ mg/l	0.107	0.119	0.112	0.01	-0.535	S
G2		0.142	0.187	0.178	0.012	-3.064	Q
G3		0.237	0.255	0.251	0.013	-1.101	S
G4		0.291	0.323	0.315	0.02	-1.193	S
G1	pH pH units	-999	5.49	5.488	0.15		B
G2		-999	5.48	5.486	0.142		B
G3		-999	5.45	5.43	0.12		B
G4		-999	5.43	5.41	0.088		B
G1	Cond µS/cm	-999	5.96	6.058	0.77		B
G2		-999	7.8	7.951	1.189		B
G3		-999	14.47	14.818	0.703		B
G4		-999	16.4	16.524	0.684		B

Deltaker i CIENS og Framsenteret / Associated with CIENS and the Fram Centre
ISO-sertifisert etter / ISO certified according to NS-EN ISO 9001/ISO 14001

NILU – Norsk institutt for luftforskning
PO Box 100
NO-2027 KJELLER, Norway
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Besøk/visit: Instituttveien 18, 2007 Kjeller

NILU – Norsk institutt for luftforskning
Framsenteret / The Fram Centre
NO-9296 TROMSØ, Norway
Phone: +47 77 75 03 75/Fax: +47 77 75 03 76
Besøk/visit: Hjalmar Johansens gt. 14, 9007 Tromsø

e-mail: nilu@nilu.no
nilu.tromso@nilu.no
Internet: www.nilu.no
Bank: 5102.05.19030
Foretaksnr./Enterprise no. 941705561

Vennligst adresser post til NILU, ikke til enkeltpersoner/Please reply to the institute.

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; the letters in the column indicates:

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

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

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

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

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