

## EMEP – 42<sup>nd</sup> intercomparison of analytical methods - 2024

Laboratory 200, FUB AG (Switzerland)

### Nitrogen dioxide in absorbing solution (C-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm <sup>‡</sup>
C1	NO <sub>2</sub> <i>µg N/ml</i>	0.188	0.187	0.189	0.007	-0.174	S
C2		0.122	0.122	0.124	0.009	-0.22	S
C3		0.248	0.248	0.249	0.012	-0.058	S
C4		0.154	0.154	0.155	0.007	-0.13	S

\* Z score is unitless

<sup>‡</sup> EMEP quality norm; letters indicate:

S – Satisfactory: Your result deviates less than ±10% of the expected value

Q – Questionable: Your result deviates between ±10-20% of the expected value

U – Unsatisfactory: Your result deviates more than ±20% of the expected value

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: <https://emep-ccc.nilu.no/intercomparison>

## EMEP – 42<sup>nd</sup> intercomparison of analytical methods - 2024

Laboratory 200, FUB AG (Switzerland)

### Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm <sup>x</sup>
G1	SO <sub>4</sub> <sup>2-</sup> mg S/l	0.316	0.33	0.316	0.021	-0.001	S
G2		0.266	0.281	0.269	0.02	-0.137	S
G3		0.24	0.252	0.243	0.018	-0.157	S
G4		0.226	0.236	0.23	0.018	-0.221	S
G1	NH <sub>4</sub> <sup>+</sup> mg N/l	0.106	0.099	0.101	0.013	0.42	S
G2		0.132	0.123	0.125	0.015	0.499	S
G3		0.202	0.195	0.195	0.018	0.416	S
G4		0.178	0.171	0.171	0.017	0.4	S
G1	NO <sub>3</sub> <sup>-</sup> mg N/l	0.189	0.201	0.194	0.012	-0.395	S
G2		0.282	0.295	0.286	0.015	-0.3	S
G3		0.344	0.359	0.348	0.016	-0.234	S
G4		0.384	0.393	0.379	0.016	0.317	S
G1	Na <sup>+</sup> mg/l	0.723	0.744	0.722	0.037	0.026	S
G2		1.181	1.19	1.162	0.059	0.327	S
G3		1.046	1.06	1.031	0.05	0.302	S
G4		1.053	1.06	1.019	0.057	0.59	S
G1	Mg <sup>2+</sup> mg/l	0.15	0.134	0.131	0.008	2.195	S
G2		0.13	0.114	0.112	0.008	2.328	S
G3		0.113	0.098	0.099	0.009	1.563	Q
G4		0.107	0.092	0.092	0.01	1.516	Q
G1	Cl <sup>-</sup> mg/l	0.985	1	0.972	0.034	0.389	S
G2		1.561	1.58	1.53	0.068	0.463	S
G3		1.412	1.43	1.392	0.058	0.35	S
G4		1.266	1.27	1.227	0.055	0.708	S
G1	Ca <sup>2+</sup> mg/l	0.153	0.166	0.154	0.017	-0.04	S
G2		0.13	0.14	0.132	0.011	-0.163	S
G3		0.113	0.121	0.119	0.021	-0.297	S
G4		0.115	0.114	0.11	0.017	0.285	S
G1	K <sup>+</sup> mg/l	0.114	0.117	0.116	0.01	-0.175	S
G2		0.183	0.181	0.18	0.01	0.245	S
G3		0.22	0.22	0.219	0.014	0.066	S
G4		0.217	0.214	0.211	0.014	0.406	S
G1	pH pH units	-999	5.48	5.477	0.117		B
G2		-999	5.49	5.463	0.099		B
G3		-999	5.44	5.439	0.129		B
G4		-999	5.45	5.46	0.125		B
G1	Cond µS/cm	9.45	9.44	9.701	0.641	-0.392	S
G2		12	12	12.028	0.58	-0.048	S
G3		12.12	12	12.072	0.667	0.072	S
G4		11.45	11.5	11.651	0.735	-0.273	S

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

\* Z score is unitless

✂ EMEP quality norm; letters indicate:

S – Satisfactory: Your result deviates less than  $\pm 10\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ ; less than  $\pm 15\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and less than  $\pm 0.1$  pH-units for pH

Q – Questionable: Your result deviates between  $\pm 10$ - $20\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ ; between  $\pm 15$ - $25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and between  $\pm 0.1$ - $0.2$  pH-units for pH

U – Unsatisfactory: Your result deviates more than  $\pm 20\%$  of the expected value for for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ ; more than  $\pm 25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and more than  $\pm 0.2$  pH-units for pH

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

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

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## EMEP – 42<sup>nd</sup> intercomparison of analytical methods - 2024

Laboratory 200, FUB AG (Switzerland)

### Ammonia on impregnated filters (J-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>¤</sup>
J2	NH <sub>3</sub> <i>µg N/filter</i>	8.83	9.52	9.002	0.921	-0.187	S
J3		7.93	8.72	8.277	0.551	-0.63	S
J4		4.25	4.51	4.134	0.351	0.33	S
J5		5.17	5.81	5.336	0.649	-0.255	S

¥ Reported values are blank corrected. Corrections are done by subtracting the average blank value when a value was reported or 1/2MDL when MDL was reported.

\* Z score is unitless

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S – Satisfactory: Your result deviates less than ±20% of the expected value

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## EMEP – 41<sup>st</sup> intercomparison of analytical methods - 2023

Laboratory 200, FUB AG (Switzerland)

### Nitrogen dioxide in absorbing solution (C-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm †
C1	NO <sub>2</sub>	0.116	0.117	0.115	0.005	0.167	S
C2		0.149	0.149	0.148	0.008	0.097	S
C3	µg N/ml	0.263	0.261	0.259	0.012	0.338	S
C4		0.166	0.165	0.165	0.008	0.082	S

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## EMEP – 41<sup>st</sup> intercomparison of analytical methods - 2023

Laboratory 200, FUB AG (Switzerland)

### Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
G1	SO <sub>4</sub> <sup>2-</sup> mg S/l	0.318	0.314	0.307	0.021	0.532	S
G2		0.329	0.326	0.319	0.021	0.472	S
G3		0.302	0.298	0.294	0.021	0.404	S
G4		0.262	0.26	0.256	0.017	0.361	S
G1	NH <sub>4</sub> <sup>+</sup> mg N/l	0.133	0.134	0.138	0.018	-0.271	S
G2		0.162	0.16	0.162	0.017	-0.018	S
G3		0.147	0.147	0.149	0.019	-0.115	S
G4		0.117	0.12	0.12	0.014	-0.183	S
G1	NO <sub>3</sub> <sup>-</sup> mg N/l	0.238	0.238	0.227	0.031	0.358	S
G2		0.341	0.342	0.329	0.046	0.259	S
G3		0.342	0.343	0.331	0.048	0.229	S
G4		0.275	0.276	0.265	0.039	0.26	S
G1	Na <sup>+</sup> mg/l	0.935	0.948	0.919	0.053	0.298	S
G2		0.851	0.855	0.835	0.06	0.262	S
G3		0.729	0.737	0.718	0.046	0.243	S
G4		0.845	0.851	0.825	0.054	0.365	S
G1	Mg <sup>2+</sup> mg/l	0.119	0.114	0.115	0.012	0.311	S
G2		0.164	0.145	0.144	0.012	1.61	S
G3		0.109	0.103	0.105	0.01	0.382	S
G4		0.082	0.083	0.084	0.01	-0.184	S
G1	Cl <sup>-</sup> mg/l	1.32	1.35	1.319	0.077	0.007	S
G2		1.019	1.04	1.015	0.06	0.071	S
G3		0.868	0.888	0.87	0.045	-0.041	S
G4		1.104	1.12	1.083	0.055	0.375	S
G1	Ca <sup>2+</sup> mg/l	0.212	0.179	0.174	0.023	1.625	Q
G2		0.164	0.14	0.139	0.017	1.481	Q
G3		0.201	0.166	0.162	0.019	2.097	Q
G4		0.19	0.153	0.151	0.022	1.791	Q
G1	K <sup>+</sup> mg/l	0.17	0.162	0.164	0.021	0.297	S
G2		0.203	0.195	0.195	0.025	0.324	S
G3		0.268	0.26	0.257	0.026	0.421	S
G4		0.218	0.21	0.208	0.014	0.7	S
G1	pH pH units	-999	5.47	5.492	0.132		B
G2		-999	5.46	5.465	0.113		B
G3		-999	5.41	5.435	0.11		B
G4		-999	5.42	5.428	0.102		B
G1	Cond µS/cm	11.27	11	11.042	1.511	0.151	S
G2		10.85	10.9	11.214	1.381	-0.264	S
G3		10.24	10.3	10.304	0.517	-0.124	S
G4		10.06	10.1	10.231	0.65	-0.263	S

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\* Z score is unitless

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Q – Questionable: Your result deviates between  $\pm 10$ - $20\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ ; between  $\pm 15$ - $25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and between  $\pm 0.1$ - $0.2$  pH-units for pH

U – Unsatisfactory: Your result deviates more than  $\pm 20\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ ; more than  $\pm 25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and more than  $\pm 0.2$  pH-units for pH

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

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## EMEP – 41<sup>st</sup> intercomparison of analytical methods - 2023

Laboratory 200, FUB AG (Switzerland)

### Ammonia on impregnated filters (J-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>¤</sup>
J1	NH <sub>3</sub> <i>µg N/filter</i>	4.08	3.9	4.06	0.495	0.04	S
J2		5.51	5.525	5.567	0.554	-0.103	S
J4		6.95	6.925	6.853	0.689	0.141	S
J5		7.78	7.725	7.436	0.612	0.563	S

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## EMEP – 40<sup>th</sup> intercomparison of analytical methods - 2022

Laboratory 200, FUB AG (Switzerland)

### Sulphur dioxide and nitric acid on impregnated filters (B-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>¤</sup>
B2	SO <sub>2</sub>	22.4	24.0	22.9	1.72	-0.26	S
B3		19.1	20.0	19.7	1.76	-0.33	S
B5	µg S/filter	31.0	32.1	31.2	2.16	-0.09	S
B6		33.0	34.1	33.4	2.39	-0.16	S
B2	HNO <sub>3</sub>	18.2	19.6	18.6	0.71	-0.60	S
B3		15.9	16.4	16.0	0.79	-0.11	S
B5	µg N/filter	25.4	26.2	25.7	1.31	-0.25	S
B6		26.7	27.8	27.2	1.34	-0.36	S

¥ Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

\* Z score is unitless

¤ EMEP quality norm; letters indicate:

S – Satisfactory: Results deviates less than ±20% of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

Q – Questionable: Results deviates between ±20-40% of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

U – Unsatisfactory: Results deviates more than ±40% of the expected value for SO<sub>2</sub> and for HNO<sub>3</sub>

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## EMEP – 40<sup>th</sup> intercomparison of analytical methods - 2022

Laboratory 200, FUB AG (Switzerland)

### Nitrogen dioxide in absorbing solution (C-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm <sup>†</sup>
C1	NO <sub>2</sub> <i>µg N/ml</i>	0.074	0.074	0.076	0.004	-0.522	S
C2		0.111	0.111	0.113	0.006	-0.343	S
C3		0.185	0.185	0.187	0.007	-0.238	S
C4		0.241	0.241	0.244	0.009	-0.319	S

\* Z score is unitless

<sup>†</sup> EMEP quality norm; letters indicate:

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## EMEP – 40<sup>th</sup> intercomparison of analytical methods - 2022

Laboratory 200, FUB AG (Switzerland)

### Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm <sup>x</sup>
G1	SO <sub>4</sub> <sup>2-</sup> mg S/l	0.691	0.663	0.656	0.024	1.471	S
G2		0.473	0.477	0.47	0.029	0.096	S
G3		0.376	0.375	0.364	0.025	0.48	S
G4		0.236	0.235	0.231	0.019	0.274	S
G1	NH <sub>4</sub> <sup>+</sup> mg N/l	0.245	0.241	0.238	0.029	0.255	S
G2		0.253	0.254	0.252	0.024	0.03	S
G3		0.185	0.187	0.188	0.011	-0.235	S
G4		0.174	0.174	0.172	0.017	0.097	S
G1	NO <sub>3</sub> <sup>-</sup> mg N/l	0.462	0.462	0.455	0.012	0.579	S
G2		0.493	0.501	0.49	0.018	0.15	S
G3		0.348	0.346	0.34	0.016	0.498	S
G4		0.343	0.343	0.334	0.015	0.573	S
G1	Na <sup>+</sup> mg/l	0.634	0.644	0.629	0.039	0.128	S
G2		0.743	0.751	0.736	0.044	0.149	S
G3		0.453	0.456	0.445	0.032	0.244	S
G4		0.58	0.574	0.561	0.032	0.604	S
G1	Mg <sup>2+</sup> mg/l	0.344	0.32	0.323	0.019	1.089	S
G2		0.206	0.196	0.197	0.016	0.555	S
G3		0.164	0.155	0.154	0.014	0.744	S
G4		0.096	0.093	0.093	0.009	0.395	S
G1	Cl <sup>-</sup> mg/l	0.742	0.772	0.763	0.054	-0.382	S
G2		0.909	0.965	0.929	0.055	-0.36	S
G3		0.545	0.579	0.574	0.094	-0.312	S
G4		0.693	0.734	0.716	0.047	-0.486	S
G1	Ca <sup>2+</sup> mg/l	0.287	0.268	0.259	0.023	1.222	S
G2		0.285	0.243	0.23	0.028	1.998	Q
G3		0.21	0.192	0.177	0.022	1.536	S
G4		0.127	0.115	0.109	0.021	0.891	S
G1	K <sup>+</sup> mg/l	0.377	0.374	0.365	0.02	0.59	S
G2		0.482	0.475	0.459	0.028	0.815	S
G3		0.316	0.306	0.298	0.019	0.953	S
G4		0.314	0.306	0.297	0.019	0.894	S
G1	pH pH units	-999	5.43	5.453	0.114		B
G2		-999	5.45	5.475	0.102		B
G3		-999	5.51	5.486	0.092		B
G4		-999	5.48	5.483	0.088		B
G1	Cond µS/cm	14.25	14.16	14.225	1.357	0.018	S
G2		13.79	13.68	13.606	0.732	0.252	S
G3		10.06	9.76	9.901	0.639	0.248	S
G4		9.37	9.13	9.343	0.588	0.046	S

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

\* Z score is unitless

✕ EMEP quality norm; letters indicate:

S – Satisfactory: Your result deviates less than  $\pm 10\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ ; less than  $\pm 15\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and less than  $\pm 0.1$  pH-units for pH

Q – Questionable: Your result deviates between  $\pm 10$ - $20\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ ; between  $\pm 15$ - $25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and between  $\pm 0.1$ - $0.2$  pH-units for pH

U – Unsatisfactory: Your result deviates more than  $\pm 20\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ ; more than  $\pm 25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and more than  $\pm 0.2$  pH-units for pH

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

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

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## EMEP – 40<sup>th</sup> intercomparison of analytical methods - 2022

Laboratory 200, FUB AG (Switzerland)

### Ammonia on impregnated filters (J-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>¤</sup>
J2	NH <sub>3</sub> <i>µg N/filter</i>	33.9	36.1	35.7	1.99	-0.91	S
J3		17.4	18.8	18.3	1.49	-0.629	S
J5		13.8	14.5	14.5	1.52	-0.467	S
J6		10.7	11.2	11.3	0.76	-0.77	S

¥ Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

\* Z score is unitless

¤ EMEP quality norm; letters indicate:

S – Satisfactory: Your result deviates less than ±20% of the expected value

Q – Questionable: Your result deviates between ±20-40% of the expected value

U – Unsatisfactory: Your result deviates more than ±40% of the expected value

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>

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## EMEP – 38<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Sulphur dioxide and nitric acid on impregnated filters (B-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>¤</sup>
B3	SO <sub>2</sub> <i>µg S/filter</i>	19.455	20.13	21.098	9.467	-0.174	S
B4		11.515	12	13.156	8.388	-0.196	S
B5		17.305	18	18.307	7.99	-0.125	S
B6		15.255	16	17.305	9.234	-0.222	S
B3	HNO <sub>3</sub> <i>µg N/filter</i>	7.97	8.18	8.638	6.19	-0.108	S
B4		10.34	9.82	10.697	9.316	-0.038	S
B5		13.18	14.7	14.041	6.723	-0.128	S
B6		12.43	13.1	14.586	12.217	-0.176	S

¥ Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

\* Z score is unitless

¤ EMEP quality norm; letters indicate:

S – Satisfactory: Results deviates less than ±20% of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

Q – Questionable: Results deviates between ±20-40% of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

U – Unsatisfactory: Results deviates more than ±40% of the expected value for SO<sub>2</sub> and for HNO<sub>3</sub>

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

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## EMEP – 38<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Nitrogen dioxide in absorbing solution (C-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm *
C1	NO <sub>2</sub> µg N/ml	0.058	0.06	0.06	0.005	-0.42	S
C2		0.064	0.066	0.066	0.004	-0.552	S
C3		0.102	0.104	0.104	0.007	-0.298	S
C4		0.108	0.11	0.111	0.006	-0.47	S

\* Z score is unitless

✕ EMEP quality norm; letters indicate:

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Q – Questionable: Your result deviates between ±10-20% of the expected value

U – Unsatisfactory: Your result deviates more than ±20% of the expected value

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

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## EMEP – 38<sup>th</sup> 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 <sup>x</sup>
G1	SO <sub>4</sub> <sup>2-</sup> mg S/l	0.181	0.18	0.179	0.009	0.18	S
G2		0.192	0.205	0.201	0.009	-1.041	S
G3		0.607	0.617	0.61	0.02	-0.155	S
G4		0.488	0.499	0.492	0.019	-0.231	S
G1	NH <sub>4</sub> <sup>+</sup> mg N/l	0.062	0.06	0.061	0.014	0.108	S
G2		0.174	0.172	0.171	0.013	0.217	S
G3		0.297	0.296	0.297	0.015	-0.019	S
G4		0.35	0.344	0.345	0.018	0.276	S
G1	NO <sub>3</sub> <sup>-</sup> mg N/l	0.204	0.204	0.203	0.009	0.139	S
G2		0.335	0.336	0.334	0.012	0.087	S
G3		0.484	0.489	0.486	0.017	-0.144	S
G4		0.581	0.587	0.586	0.022	-0.249	S
G1	Na <sup>+</sup> mg/l	0.259	0.254	0.25	0.011	0.855	S
G2		0.325	0.326	0.314	0.014	0.811	S
G3		0.849	0.848	0.835	0.04	0.347	S
G4		1.092	1.1	1.069	0.055	0.43	S
G1	Mg <sup>2+</sup> mg/l	0.083	0.072	0.07	0.008	1.682	Q
G2		0.09	0.083	0.08	0.006	1.667	S
G3		0.273	0.258	0.256	0.014	1.273	S
G4		0.22	0.206	0.202	0.011	1.629	S
G1	Cl <sup>-</sup> mg/l	0.272	0.27	0.27	0.043	0.057	S
G2		0.403	0.386	0.374	0.026	1.116	S
G3		1.145	1.16	1.136	0.042	0.208	S
G4		1.521	1.54	1.512	0.072	0.129	S
G1	Ca <sup>2+</sup> mg/l	0.087	0.089	0.09	0.018	-0.153	S
G2		0.095	0.102	0.097	0.021	-0.107	S
G3		0.333	0.319	0.313	0.028	0.695	S
G4		0.271	0.255	0.245	0.024	1.085	S
G1	K <sup>+</sup> mg/l	0.299	0.272	0.262	0.016	2.34	S
G2		0.371	0.325	0.325	0.022	2.071	S
G3		0.414	0.374	0.369	0.023	1.972	S
G4		0.566	0.509	0.501	0.027	2.427	S
G1	pH pH units	5.53	5.49	5.475	0.162	0.337	S
G2		5.7	5.49	5.485	0.126	1.706	U
G3		5.61	5.44	5.433	0.127	1.401	Q
G4		5.65	5.44	5.422	0.134	1.701	U
G1	Cond µS/cm	5.8	5.96	5.957	0.467	-0.336	S
G2		7.73	7.9	7.869	0.528	-0.262	S
G3		15.32	15.66	15.556	0.632	-0.374	S
G4		16.74	17.15	16.944	0.548	-0.373	S

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\* Z score is unitless

✎ EMEP quality norm; letters indicate:

S – Satisfactory: Your result deviates less than  $\pm 10\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , less than  $\pm 15\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and less than  $\pm 0.1$  pH-units for pH

Q – Questionable: Your result deviates between  $\pm 10\text{-}20\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , between  $\pm 15\text{-}25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  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  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , more than  $\pm 25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and more than  $\pm 0.2$  pH-units for pH

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

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## EMEP – 38<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Ammonia on impregnated filters (J-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>¤</sup>
J1	NH <sub>3</sub> <i>µg N/filter</i>	17.8	17.215	17.254	1.498	0.365	S
J3		15.94	15.88	15.943	1.186	-0.003	S
J4		12.91	12.81	12.674	0.569	0.415	S
J5		12.12	11.82	11.734	0.588	0.655	S

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\* Z score is unitless

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## EMEP – 39<sup>th</sup> intercomparison of analytical methods - 2021

Laboratory 200, FUB AG (Switzerland)

### Sulphur dioxide and nitric acid on impregnated filters (B-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>¤</sup>
B1	SO <sub>2</sub> <i>µg S/filter</i>	21.99	22	21.193	3.246	0.246	S
B2		26.69	26.9	25.943	2.156	0.346	S
B4		12.77	12.8	12.789	0.909	-0.021	S
B5		19.45	19.6	19.056	1.928	0.205	S
B1	HNO <sub>3</sub> <i>µg N/filter</i>	17.435	18	17.922	1.722	-0.371	S
B2		21.295	21.9	21.643	1.722	-0.202	S
B4		10.055	10.5	10.128	0.634	-0.115	S
B5		15.495	16	15.931	15.931	-0.429	S

¥ Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

\* Z score is unitless

¤ EMEP quality norm; letters indicate:

S – Satisfactory: Results deviates less than ±20% of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

Q – Questionable: Results deviates between ±20-40% of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

U – Unsatisfactory: Results deviates more than ±40% of the expected value for SO<sub>2</sub> and for HNO<sub>3</sub>

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## EMEP – 39<sup>th</sup> intercomparison of analytical methods - 2021

Laboratory 200, FUB AG (Switzerland)

### Nitrogen dioxide in absorbing solution (C-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm <sup>†</sup>
C1	NO <sub>2</sub> <i>µg N/ml</i>	0.094	0.094	0.093	0.005	0.254	S
C2		0.077	0.076	0.076	0.006	0.114	S
C3		0.089	0.089	0.089	0.007	-0.066	S
C4		0.103	0.103	0.102	0.008	0.066	S

\* Z score is unitless

<sup>†</sup> EMEP quality norm; letters indicate:

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Q – Questionable: Your result deviates between ±10-20% of the expected value

U – Unsatisfactory: Your result deviates more than ±20% of the expected value

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## EMEP – 39<sup>th</sup> intercomparison of analytical methods - 2021

Laboratory 200, FUB AG (Switzerland)

### Precipitation (G-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm <sup>x</sup>
G1	SO <sub>4</sub> <sup>2-</sup> mg S/l	0.199	0.201	0.199	0.016	-0.019	S
G2		0.244	0.244	0.241	0.013	0.254	S
G3		0.591	0.567	0.613	0.195	-0.115	S
G4		0.685	0.688	0.708	0.242	-0.097	S
G1	NH <sub>4</sub> <sup>+</sup> mg N/l	0.078	0.08	0.081	0.012	-0.221	S
G2		0.223	0.227	0.226	0.016	-0.196	S
G3		0.296	0.294	0.302	0.021	-0.278	S
G4		0.452	0.454	0.463	0.028	-0.41	S
G1	NO <sub>3</sub> <sup>-</sup> mg N/l	0.247	0.249	0.245	0.008	0.264	S
G2		0.365	0.366	0.36	0.012	0.41	S
G3		0.499	0.496	0.492	0.017	0.42	S
G4		0.742	0.738	0.73	0.027	0.454	S
G1	Na <sup>+</sup> mg/l	0.327	0.32	0.318	0.028	0.326	S
G2		0.317	0.317	0.313	0.015	0.305	S
G3		0.949	0.948	0.941	0.045	0.18	S
G4		1.062	1.05	1.039	0.041	0.561	S
G1	Mg <sup>2+</sup> mg/l	0.08	0.077	0.077	0.006	0.514	S
G2		0.085	0.088	0.087	0.006	-0.289	S
G3		0.239	0.237	0.24	0.014	-0.056	S
G4		0.287	0.279	0.277	0.014	0.702	S
G1	Cl <sup>-</sup> mg/l	0.297	0.328	0.324	0.027	-1.006	S
G2		0.343	0.367	0.367	0.035	-0.685	S
G3		1.34	1.35	1.333	0.064	0.11	S
G4		1.415	1.43	1.399	0.078	0.207	S
G1	Ca <sup>2+</sup> mg/l	0.115	0.109	0.106	0.012	0.722	S
G2		0.148	0.14	0.136	0.013	0.875	S
G3		0.322	0.294	0.308	0.018	0.822	S
G4		0.399	0.37	0.359	0.024	1.68	S
G1	K <sup>+</sup> mg/l	0.285	0.289	0.28	0.022	0.217	S
G2		0.251	0.255	0.247	0.016	0.228	S
G3		0.441	0.441	0.439	0.023	0.077	S
G4		0.581	0.577	0.573	0.031	0.256	S
G1	pH pH units	5.26	5.55	5.523	0.178	-1.482	U
G2		5.33	5.52	5.523	0.174	-1.111	Q
G3		5.22	5.48	5.487	0.148	-1.806	U
G4		5.22	5.46	5.468	0.129	-1.919	U
G1	Cond µS/cm	6.79	6.73	6.767	1.348	0.017	S
G2		8.34	8.4	8.392	1.375	-0.038	S
G3		16.08	16.02	16.092	1.087	-0.011	S
G4		19.05	19.5	19.352	1.052	-0.287	S

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\* Z score is unitless

✎ EMEP quality norm; letters indicate:

S – Satisfactory: Your result deviates less than  $\pm 10\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , less than  $\pm 15\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and less than  $\pm 0.1$  pH-units for pH

Q – Questionable: Your result deviates between  $\pm 10\text{-}20\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , between  $\pm 15\text{-}25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  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  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , more than  $\pm 25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and more than  $\pm 0.2$  pH-units for pH

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

Please check the EMEP intercalibration website for more statistics, Youden plots, updated expected values ect:  
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## EMEP – 39<sup>th</sup> intercomparison of analytical methods - 2021

Laboratory 200, FUB AG (Switzerland)

### Ammonia on impregnated filters (J-samples)

Sample name	Determinand	Reported value <sup>‡</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>‡</sup>
J2	NH <sub>3</sub> <i>µg N/filter</i>	21.635	22.9	21.882	1.414	-0.174	S
J3		22.965	24.1	23.37	1.537	-0.263	S
J5		27.255	28.5	28.246	1.805	-0.549	S
J6		25.005	25.7	25.459	1.229	-0.369	S

<sup>‡</sup> Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

<sup>\*</sup> Z score is unitless

<sup>‡</sup> EMEP quality norm; letters indicate:

S – Satisfactory: Your result deviates less than ±20% of the expected value

Q – Questionable: Your result deviates between ±20-40% of the expected value

U – Unsatisfactory: Your result deviates more than ±40% of the expected value

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

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## EMEP – 37<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Sulphur dioxide and nitric acid on impregnated filters (B-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>¤</sup>
B1	SO <sub>2</sub> <i>µg S/filter</i>	8.09	8.42	7.37	2.612	0.276	S
B2		10.07	10.4	8.604	3.642	0.402	S
B3		19.22	20.4	17.235	6.092	0.326	S
B4		15.86	16.4	14.227	5.026	0.325	S
B1	HNO <sub>3</sub> <i>µg N/filter</i>	7.61	7.53	7.475	0.511	0.265	S
B2		6.72	6.87	6.308	1.412	0.292	S
B3		15.11	15.71	15.075	0.641	0.055	S
B4		12.37	12.76	12.406	0.547	-0.065	S

¥ Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

\* Z score is unitless

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

S – Satisfactory: Your result deviates less than ±20% of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

Q – Questionable: Your result deviates between ±20-40% of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

U – Unsatisfactory: Your result deviates more than ±40% of the expected value for SO<sub>2</sub> and for HNO<sub>3</sub>

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## EMEP – 37<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Nitrogen dioxide in absorbing solution (C-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm <sup>†</sup>
C1	NO <sub>2</sub>  µg N/ml	0.294	0.288	0.294	0.008	0.028	S
C2		0.272	0.272	0.271	0.007	0.095	S
C3		0.1	0.1	0.1	0.003	-0.099	S
C4		0.092	0.092	0.092	0.004	-0.016	S

\* Z score is unitless

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## EMEP – 37<sup>th</sup> 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 <sup>x</sup>
G1	SO <sub>4</sub> <sup>2-</sup> 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 <sub>4</sub> <sup>+</sup> 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 <sub>3</sub> <sup>-</sup> 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 <sup>+</sup> 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 <sup>2+</sup> 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 <sup>-</sup> 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 <sup>2+</sup> 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 <sup>+</sup> 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

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\* Z score is unitless

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Q – Questionable: Your result deviates between  $\pm 10\text{-}20\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , between  $\pm 15\text{-}25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  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  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , more than  $\pm 25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and more than  $\pm 0.2$  pH-units for pH

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

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## EMEP – 37<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Ammonia on impregnated filters (J-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>¤</sup>
J2	NH <sub>3</sub> <i>µg N/filter</i>	18.435	19.6	19.482	1.581	-0.662	S
J4		19.835	21.3	20.923	1.383	-0.787	S
J5		21.345	23.3	22.667	1.473	-0.898	S
J6		17.575	18.8	18.196	1.912	-0.325	S

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## EMEP – 36<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Sulphur dioxide and nitric acid on impregnated filters (B-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>¤</sup>
B1	SO <sub>2</sub> <i>µg S/filter</i>	10.92	11.2	11.497	2.392	-0.241	S
B2		30.61	31.3	30.609	3.342	0	S
B4		14.68	15.2	15.755	2.882	-0.373	S
B6		9.76	10	9.591	3.03	0.056	S
B1	HNO <sub>3</sub> <i>µg N/filter</i>	9.08	9.16	8.868	0.546	0.389	S
B2		24.5	25.5	23.484	1.821	0.558	S
B4		12.27	12.4	12.513	1.409	-0.173	S
B6		8.16	8.18	8.004	0.514	0.303	S

¥ Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

\* Z score is unitless

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

S – Satisfactory: Your result deviates less than ±20% of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

Q – Questionable: Your result deviates between ±20-40% of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

U – Unsatisfactory: Your result deviates more than ±40% of the expected value for SO<sub>2</sub> and for HNO<sub>3</sub>

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## EMEP – 36<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Nitrogen dioxide in absorbing solution (C-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm <sup>‡</sup>
C1	NO <sub>2</sub>  µg N/ml	0.128	0.127	0.122	0.01	0.577	S
C2		0.168	0.166	0.162	0.011	0.547	S
C3		0.372	0.372	0.368	0.017	0.27	S
C4		0.299	0.297	0.295	0.013	0.272	S

\* Z score is unitless

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## EMEP – 36<sup>th</sup> 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 <sup>x</sup>
G1	SO <sub>4</sub> <sup>2-</sup> mg S/l	0.252	0.251	0.247	0.009	0.506	S
G2		0.369	0.366	0.364	0.023	0.213	S
G3		0.537	0.527	0.525	0.025	0.505	S
G4		0.463	0.463	0.459	0.021	0.182	S
G1	NH <sub>4</sub> <sup>+</sup> mg N/l	0.111	0.107	0.105	0.02	0.282	S
G2		0.136	0.134	0.134	0.015	0.123	S
G3		0.509	0.481	0.489	0.029	0.685	S
G4		0.587	0.561	0.574	0.036	0.359	S
G1	NO <sub>3</sub> <sup>-</sup> mg N/l	0.168	0.165	0.162	0.023	0.262	S
G2		0.263	0.26	0.263	0.014	-0.018	S
G3		0.578	0.577	0.575	0.027	0.109	S
G4		0.667	0.67	0.665	0.028	0.073	S
G1	Na <sup>+</sup> mg/l	0.283	0.286	0.28	0.021	0.132	S
G2		0.41	0.408	0.405	0.021	0.24	S
G3		0.755	0.769	0.741	0.049	0.278	S
G4		0.98	1.019	0.982	0.03	-0.061	S
G1	Mg <sup>2+</sup> mg/l	0.073	0.072	0.07	0.006	0.442	S
G2		0.103	0.103	0.103	0.005	0.083	S
G3		0.186	0.186	0.187	0.011	-0.072	S
G4		0.154	0.155	0.155	0.006	-0.141	S
G1	Cl <sup>-</sup> mg/l	0.395	0.386	0.377	0.027	0.652	S
G2		0.473	0.463	0.451	0.027	0.794	S
G3		1.159	1.16	1.136	0.075	0.301	S
G4		1.529	1.54	1.488	0.083	0.5	S
G1	Ca <sup>2+</sup> mg/l	0.129	0.128	0.127	0.02	0.082	S
G2		0.157	0.153	0.152	0.018	0.271	S
G3		0.199	0.192	0.19	0.017	0.535	S
G4		0.22	0.217	0.217	0.024	0.143	S
G1	K <sup>+</sup> mg/l	0.114	0.102	0.096	0.012	1.452	S
G2		0.178	0.17	0.161	0.016	1.049	S
G3		0.254	0.238	0.23	0.021	1.14	S
G4		0.289	0.272	0.267	0.02	1.095	S
G1	pH pH units	5.379	5.29	5.32	0.136	0.439	S
G2		5.189	5.14	5.153	0.097	0.369	S
G3		5.108	5.1	5.068	0.1	0.4	S
G4		5.228	5.17	5.164	0.102	0.634	S
G1	Cond µS/cm	7.145	7.005	7.159	0.928	-0.015	S
G2		9.95	9.7	9.727	0.649	0.344	S
G3		17.155	16.9	17.216	1.197	-0.051	S
G4		18.26	18.37	18.377	0.882	-0.133	S

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\* 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  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , less than  $\pm 15\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and less than  $\pm 0.1$  pH-units for pH

Q – Questionable: Your result deviates between  $\pm 10\text{-}20\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , between  $\pm 15\text{-}25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  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  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , more than  $\pm 25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and more than  $\pm 0.2$  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 – 36<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Ammonia on impregnated filters (J-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>¤</sup>
J1	NH <sub>3</sub> <i>µg N/filter</i>	14.29	15.3	15.451	1.439	-0.807	S
J2		12.11	12.5	12.402	1.435	-0.203	S
J3		19.6	20.5	20.326	1.345	-0.54	S
J6		29.27	30.5	30.094	1.381	-0.597	S

¥ Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

\* Z score is unitless

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

S – Satisfactory: Your result deviates less than ±20% of the expected value

Q – Questionable: Your result deviates between ±20-40% of the expected value

U – Unsatisfactory: Your result deviates more than ±40% of the expected value

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

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## EMEP – 35<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Sulphur dioxide and nitric acid on impregnated filters (B-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>¤</sup>
B1	SO <sub>2</sub> <i>µg S/filter</i>	102.25	100.2	101.226	6.781	0.151	S
B2		59.9	60.11	59.812	3.051	0.029	S
B5		57.1	56.11	56.532	3.757	0.151	S
B6		101.65	100.2	100.157	5.055	0.295	S
B1	HNO <sub>3</sub> <i>µg N/filter</i>	41.57	40.9	42.541	2.685	-0.362	S
B2		24.22	24.54	24.73	1.416	-0.361	S
B5		23.07	22.9	23.452	1.305	-0.293	S
B6		41.86	40.9	41.788	2.096	0.035	S

¥ Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

\* Z score is unitless

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

S – Satisfactory: Your result deviates less than ±20% of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

Q – Questionable: Your result deviates between ±20-40% of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

U – Unsatisfactory: Your result deviates more than ±40% of the expected value for SO<sub>2</sub> and for HNO<sub>3</sub>

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## EMEP – 35<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Nitrogen dioxide in absorbing solution (C-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score *	EMEP quality norm <sup>†</sup>
C1	NO <sub>2</sub> <i>µg N/ml</i>	0.097	0.092	0.094	0.003	1.054	S
C2		0.105	0.099	0.102	0.004	0.809	S
C3		0.172	0.163	0.167	0.007	0.715	S
C4		0.179	0.17	0.175	0.007	0.533	S

\* Z score is unitless

<sup>†</sup> EMEP quality norm; the letters in the column indicates:

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U – Unsatisfactory: Your result deviates more than ±20% of the expected value

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## EMEP – 35<sup>th</sup> 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 <sup>x</sup>
G1	SO <sub>4</sub> <sup>2-</sup> mg S/l	1.325	1.319	1.342	0.081	-0.213	S
G2		0.847	0.856	0.876	0.103	-0.28	S
G3		2.126	2.08	2.108	0.113	0.162	S
G4		2.093	2.2	2.231	0.151	-0.919	S
G1	NH <sub>4</sub> <sup>+</sup> mg N/l	0.253	0.241	0.241	0.016	0.725	S
G2		0.172	0.16	0.161	0.015	0.731	S
G3		0.416	0.401	0.404	0.023	0.527	S
G4		0.552	0.535	0.537	0.029	0.515	S
G1	NO <sub>3</sub> <sup>-</sup> mg N/l	0.542	0.546	0.544	0.019	-0.126	S
G2		0.362	0.364	0.363	0.015	-0.059	S
G3		0.921	0.911	0.918	0.027	0.095	S
G4		0.917	0.942	0.938	0.084	-0.252	S
G1	Na <sup>+</sup> mg/l	0.537	0.548	0.527	0.026	0.365	S
G2		0.424	0.365	0.355	0.025	2.712	Q
G3		0.907	0.913	0.893	0.042	0.344	S
G4		0.758	0.73	0.713	0.033	1.377	S
G1	Mg <sup>2+</sup> mg/l	0.153	0.155	0.153	0.007	0.058	S
G2		0.09	0.093	0.09	0.005	-0.06	S
G3		0.203	0.206	0.205	0.009	-0.265	S
G4		0.203	0.206	0.206	0.01	-0.312	S
G1	Cl <sup>-</sup> mg/l	0.342	0.347	0.337	0.018	0.265	S
G2		0.245	0.232	0.231	0.022	0.635	S
G3		0.586	0.579	0.57	0.028	0.567	S
G4		0.488	0.463	0.457	0.03	1.009	S
G1	Ca <sup>2+</sup> mg/l	0.193	0.192	0.191	0.039	0.04	S
G2		0.121	0.115	0.116	0.034	0.152	S
G3		0.259	0.255	0.254	0.03	0.159	S
G4		0.255	0.255	0.252	0.02	0.129	S
G1	K <sup>+</sup> mg/l	0.311	0.306	0.294	0.02	0.845	S
G2		0.215	0.204	0.198	0.018	0.929	S
G3		0.519	0.509	0.501	0.032	0.564	S
G4		0.422	0.407	0.399	0.023	0.981	S
G1	pH pH units	4.23	4.22	4.283	0.096	-0.557	S
G2		4.42	4.4	4.431	0.078	-0.147	S
G3		4.01	4	4.035	0.06	-0.423	S
G4		3.98	4	3.999	0.062	-0.312	S
G1	Cond µS/cm	34.7	35.3	34.442	1.716	0.15	S
G2		23.23	23.4	23.141	0.851	0.104	S
G3		57.1	57.9	56.924	2.088	0.084	S
G4		59.9	57.9	59.644	2.643	0.097	S

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\* Z score is unitless

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S – Satisfactory: Your result deviates less than  $\pm 10\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , less than  $\pm 15\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and less than  $\pm 0.1$  pH-units for pH

Q – Questionable: Your result deviates between  $\pm 10\text{-}20\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , between  $\pm 15\text{-}25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  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  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , more than  $\pm 25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and more than  $\pm 0.2$  pH-units for pH

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

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## EMEP – 35<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Ammonia on impregnated filters (J-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score <sup>*</sup>	EMEP quality norm <sup>¤</sup>
J1	NH <sub>3</sub> <i>µg N/filter</i>	50.81	54.14	51.498	2.363	-0.291	S
J4		27.17	28.07	27.099	1.761	0.04	S
J5		30.15	30.08	30.823	3.055	-0.22	S
J6		53.88	56.14	54.322	2.012	-0.22	S

¥ Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

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## EMEP – 34<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Sulphur dioxide and nitric acid on impregnated filters (B-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm <sup>¤</sup>
B1	SO <sub>2</sub>	40.5	40.08	40.177	3.016	0.107	S
B2		54.1	52.10	53.854	3.28	0.075	S
B5		116.2	120.2	111.614	5.296	0.866	S
B6		121.6	132.2	132.592	7.496	-1.466	S
B1	HNO <sub>3</sub>	15.95	16.36	16.056	0.645	-0.164	S
B2		21.05	21.27	22.113	0.953	-1.115	S
B5		47.45	49.08	47.687	3.273	-0.072	S
B6		54.85	53.99	57.055	2.75	-0.802	S

¥ Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

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

S – Satisfactory: Your result deviates less than  $\pm 20\%$  of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

Q – Questionable: Your result deviates between  $\pm 20-40\%$  of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

U – Unsatisfactory: Your result deviates more than  $\pm 40\%$  of the expected value for SO<sub>2</sub> and for HNO<sub>3</sub>

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## EMEP – 34<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Nitrogen dioxide in absorbing solution (C-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm <sup>⌘</sup>
C1	NO <sub>2</sub>	0.148	0.146	0.138	0.02	0.494	S
C2	NO <sub>2</sub>	0.134	0.132	0.126	0.015	0.537	S
C3	NO <sub>2</sub>	0.06	0.059	0.062	0.015	-0.121	S
C4	NO <sub>2</sub>	0.074	0.073	0.077	0.02	-0.143	S

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

S – Satisfactory: Your result deviates less than  $\pm 10\%$  of the expected value

Q – Questionable: Your result deviates between  $\pm 10\text{-}20\%$  of the expected value

U – Unsatisfactory: Your result deviates more than  $\pm 20\%$  of the expected value

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>

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## EMEP – 34<sup>th</sup> 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 <sup>x</sup>
G1	SO <sub>4</sub> <sup>2-</sup>	0.939	0.927	0.93	0.034	0.253	S
G2		0.616	0.618	0.624	0.035	-0.22	S
G3		1.64	1.603	1.627	0.06	0.22	S
G4		1.511	1.498	1.513	0.064	-0.036	S
G1	NH <sub>4</sub> <sup>+</sup>	0.16	0.160	0.16	0.012	-0.026	S
G2		0.213	0.214	0.216	0.013	-0.214	S
G3		0.325	0.321	0.326	0.014	-0.07	S
G4		0.491	0.481	0.489	0.021	0.092	S
G1	NO <sub>3</sub> <sup>-</sup>	0.369	0.364	0.367	0.011	0.174	S
G2		0.413	0.398	0.401	0.014	0.878	S
G3		0.743	0.729	0.739	0.031	0.117	S
G4		0.858	0.821	0.828	0.035	0.871	S
G1	Na <sup>+</sup>	0.367	0.365	0.361	0.021	0.273	S
G2		0.345	0.343	0.339	0.02	0.309	S
G3		0.786	0.780	0.778	0.03	0.271	S
G4		0.616	0.608	0.604	0.024	0.491	S
G1	Mg <sup>2+</sup>	0.125	0.124	0.122	0.007	0.374	S
G2		0.082	0.083	0.082	0.004	-0.109	S
G3		0.101	0.103	0.104	0.004	-0.594	S
G4		0.186	0.186	0.186	0.008	-0.01	S
G1	Cl <sup>-</sup>	0.225	0.232	0.233	0.016	-0.528	S
G2		0.306	0.309	0.306	0.014	-0.018	S
G3		0.527	0.540	0.537	0.024	-0.397	S
G4		0.377	0.386	0.386	0.022	-0.388	S
G1	Ca <sup>2+</sup>	0.153	0.153	0.149	0.021	0.209	S
G2		0.11	0.102	0.1	0.024	0.412	S
G3		0.223	0.230	0.228	0.021	-0.24	S
G4		0.25	0.230	0.229	0.023	0.895	S
G1	K <sup>+</sup>	0.211	0.204	0.195	0.018	0.893	S
G2		0.277	0.272	0.261	0.023	0.706	S
G3		0.416	0.407	0.399	0.026	0.648	S
G4		0.35	0.340	0.332	0.022	0.802	S
G1	pH	4.38	4.40	4.443	0.088	-0.715	S
G2		4.6	4.57	4.586	0.057	0.239	S
G3		4.12	4.10	4.114	0.038	0.156	S
G4		4.21	4.18	4.186	0.04	0.593	S
G1	Cond	23.93	24.0	22.637	2.391	0.541	S
G2		18.64	18.1	17.637	1.435	0.699	S
G3		46.5	45.1	44.427	3.539	0.586	S
G4		42.28	41.7	40.361	2.811	0.683	S

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

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

S – Satisfactory: Your result deviates less than  $\pm 10\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , less than  $\pm 15\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and less than  $\pm 0.1$  pH-units for pH

Q – Questionable: Your result deviates between  $\pm 10\text{-}20\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , between  $\pm 15\text{-}25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  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  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , more than  $\pm 25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and more than  $\pm 0.2$  pH-units for pH

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

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## EMEP – 34<sup>th</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Ammonia on impregnated filters (J-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm <sup>¤</sup>
J1	NH <sub>3</sub>	23.26	24.06	22.744	2.07	0.249	S
J2	NH <sub>3</sub>	25.91	26.07	25.238	1.515	0.444	S
J3	NH <sub>3</sub>	39.28	40.10	39.184	5.618	0.017	S
J4	NH <sub>3</sub>	45.3	46.12	43.379	5.16	0.372	S

¥ Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

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

S – Satisfactory: Your result deviates less than ±20% of the expected value

Q – Questionable: Your result deviates between ±20-40% of the expected value

U – Unsatisfactory: Your result deviates more than ±40% of the expected value

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

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## EMEP – 33<sup>rd</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Sulphur dioxide and nitric acid on impregnated filters (B-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm <sup>¤</sup>
B2	SO <sub>2</sub>	20.75	20.4	20.213	1.571	0.342	S
B3		90.65	92.2	91.817	11.246	-0.104	S
B4		101.35	104	104.174	13.881	-0.203	S
B5		20.85	22	22.087	3.156	-0.392	S
B2	HNO <sub>3</sub>	16.45	16.7	17.038	1.094	-0.537	S
B3		36.05	37.6	37.305	2.307	-0.544	S
B4		40.45	42.5	41.872	3.542	-0.401	S
B5		17.45	18	18.46	1.238	-0.816	S

¥ Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

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

S – Satisfactory: Your result deviates less than  $\pm 20\%$  of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

Q – Questionable: Your result deviates between  $\pm 20-40\%$  of the expected value for SO<sub>2</sub> and HNO<sub>3</sub>

U – Unsatisfactory: Your result deviates more than  $\pm 40\%$  of the expected value for SO<sub>2</sub> and for HNO<sub>3</sub>

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## EMEP – 33<sup>rd</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Nitrogen dioxide in absorbing solution (C-samples)

Sample name	Determinand	Reported value	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm <sup>⌘</sup>
C1	NO <sub>2</sub>	0.057	0.057	0.058	0.004	-0.256	S
C2	NO <sub>2</sub>	0.043	0.043	0.043	0.004	0.018	S
C3	NO <sub>2</sub>	0.101	0.101	0.101	0.005	-0.044	S
C4	NO <sub>2</sub>	0.13	0.131	0.131	0.008	-0.083	S

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

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Q – Questionable: Your result deviates between  $\pm 10\text{-}20\%$  of the expected value

U – Unsatisfactory: Your result deviates more than  $\pm 20\%$  of the expected value

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## EMEP – 33<sup>rd</sup> 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 <sup>st</sup>
G1	SO <sub>4</sub> <sup>2-</sup>	0.635	0.666	0.642	0.089	-0.081	S
G2		0.509	0.535	0.52	0.081	-0.142	S
G3		1.447	1.474	1.423	0.234	0.103	S
G4		1.273	1.319	1.272	0.194	0.007	S
G1	NH <sub>4</sub> <sup>+</sup>	0.189	0.187	0.184	0.014	0.339	S
G2		0.246	0.241	0.235	0.018	0.583	S
G3		0.281	0.267	0.272	0.023	0.406	S
G4		0.416	0.401	0.4	0.021	0.764	S
G1	NO <sub>3</sub> <sup>-</sup>	0.351	0.357	0.344	0.024	0.313	S
G2		0.37	0.379	0.362	0.032	0.254	S
G3		0.601	0.607	0.595	0.044	0.133	S
G4		0.68	0.707	0.685	0.057	-0.095	S
G1	Na <sup>+</sup>	0.31	0.304	0.29	0.016	1.203	S
G2		0.291	0.283	0.268	0.018	1.293	S
G3		0.612	0.608	0.59	0.024	0.918	S
G4		0.55	0.548	0.526	0.023	1.016	S
G1	Mg <sup>2+</sup>	0.098	0.103	0.101	0.006	-0.523	S
G2		0.085	0.093	0.087	0.005	-0.498	S
G3		0.165	0.175	0.168	0.008	-0.367	S
G4		0.147	0.155	0.15	0.007	-0.419	S
G1	Cl <sup>-</sup>	0.184	0.193	0.187	0.016	-0.19	S
G2		0.259	0.27	0.258	0.021	0.03	S
G3		0.362	0.386	0.367	0.026	-0.196	S
G4		0.334	0.347	0.332	0.026	0.069	S
G1	Ca <sup>2+</sup>	0.116	0.128	0.13	0.026	-0.525	S
G2		0.117	0.115	0.12	0.025	-0.125	S
G3		0.208	0.217	0.213	0.029	-0.173	S
G4		0.187	0.192	0.191	0.027	-0.143	S
G1	K <sup>+</sup>	0.177	0.17	0.162	0.016	0.981	S
G2		0.212	0.204	0.189	0.017	1.397	S
G3		0.347	0.34	0.325	0.02	1.091	S
G4		0.318	0.306	0.294	0.019	1.267	S
G1	pH	4.61	4.57	4.629	0.131	-0.145	S
G2		4.75	4.7	4.738	0.132	0.091	S
G3		4.19	4.18	4.2	0.122	-0.083	S
G4		4.24	4.22	4.248	0.134	-0.061	S
G1	Cond	17.18	17.7	16.55	1.471	0.428	S
G2		15.43	15.2	14.389	1.524	0.683	S
G3		40.32	39.3	37.557	3.093	0.893	S
G4		37.83	37	34.831	3.076	0.975	S

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

S – Satisfactory: Your result deviates less than  $\pm 10\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , less than  $\pm 15\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and less than  $\pm 0.1$  pH-units for pH

Q – Questionable: Your result deviates between  $\pm 10\text{-}20\%$  of the expected value for  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , between  $\pm 15\text{-}25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  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  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ , more than  $\pm 25\%$  of the expected value for  $\text{NH}_4^+$ ,  $\text{Cl}^-$ ,  $\text{Na}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{K}^+$  and cond and more than  $\pm 0.2$  pH-units for pH

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

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## EMEP – 33<sup>rd</sup> intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

### Ammonia on impregnated filters (J-samples)

Sample name	Determinand	Reported value <sup>¥</sup>	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm <sup>¤</sup>
J1	NH <sub>3</sub>	38.2	38.1	37.354	3.469	0.244	S
J2	NH <sub>3</sub>	46.75	48.12	46.542	5.902	0.035	S
J4	NH <sub>3</sub>	14.85	15.04	14.28	1.145	0.498	S
J5	NH <sub>3</sub>	17.5	17.54	17.609	1.905	-0.057	S

¥ Reported values are blank corrected. Corrections are done by subtracting the blank value when a value was reported or 1/2MDL when MDL was reported.

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

S – Satisfactory: Your result deviates less than  $\pm 20\%$  of the expected value

Q – Questionable: Your result deviates between  $\pm 20\text{--}40\%$  of the expected value

U – Unsatisfactory: Your result deviates more than  $\pm 40\%$  of the expected value

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

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