

EMEP – 31st intercomparison of analytical methods

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

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	10	12	11.687	1.143	-1.476	S
B2		11.24	14.03	13.483	1.493	-1.503	S
B4		35.7	88.17	85.222	16.009	-3.093	U
B5		27.75	68.13	67.791	12.587	-3.181	U
B1	HNO ₃	10.935	9.8	9.447	1.635	0.91	S
B2		12.685	11.45	11.263	1.359	1.047	S
B4		88.435	35.99	34.694	4.915	10.935	U
B5		67.815	27.81	27.608	2.334	17.225	U

¥ 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 for SO₂ and HNO₃

Q – Questionable: Your result deviates between ±20-40% of the expected value for SO₂ and HNO₃

U – Unsatisfactory: Your result deviates more than ±40% of the expected value for SO₂ and for HNO₃

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

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

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	11.56	12	11.687	1.143	-0.111	S
B2		13.62	14.03	13.483	1.493	0.092	S
B4		84.9	88.17	85.222	16.009	-0.02	S
B5		66	68.13	67.791	12.587	-0.142	S
B1	HNO ₃	9.03	9.8	9.447	1.635	-0.255	S
B2		10.71	11.45	11.263	1.359	-0.407	S
B4		35.02	35.99	34.694	4.915	0.066	S
B5		27.19	27.81	27.608	2.334	-0.179	S

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

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	12.53	12	11.687	1.143	0.738	S
B2		14.48	14.03	13.483	1.493	0.668	S
B4		86.78	88.17	85.222	16.009	0.097	S
B5		67.69	68.13	67.791	12.587	-0.008	S
B1	HNO ₃	9.905	9.8	9.447	1.635	0.28	S
B2		11.645	11.45	11.263	1.359	0.281	S
B4		35.605	35.99	34.694	4.915	0.185	S
B5		27.575	27.81	27.608	2.334	-0.014	S

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Laboratory 6, SGS Multilab (France)

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	9.525	12	11.687	1.143	-1.892	Q
B2		11.455	14.03	13.483	1.493	-1.359	S
B4		112.905	88.17	85.222	16.009	1.729	Q
B5		82.645	68.13	67.791	12.587	1.18	Q
B1	HNO ₃	4.12	9.8	9.447	1.635	-3.258	U
B2		6.57	11.45	11.263	1.359	-3.454	U
B4		17.7	35.99	34.694	4.915	-3.458	U
B5		22.85	27.81	27.608	2.334	-2.038	S

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S – Satisfactory: Your result deviates less than $\pm 20\%$ of the expected value for SO₂ and HNO₃

Q – Questionable: Your result deviates between $\pm 20-40\%$ of the expected value for SO₂ and HNO₃

U – Unsatisfactory: Your result deviates more than $\pm 40\%$ of the expected value for SO₂ and for HNO₃

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Laboratory 8, Umweltbundesamt, Langen (Germany)

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	12.2	12	11.687	1.143	0.449	S
B2		14.3	14.03	13.483	1.493	0.547	S
B4		90.3	88.17	85.222	16.009	0.317	S
B5		69	68.13	67.791	12.587	0.096	S
B1	HNO ₃	9.425	9.8	9.447	1.635	-0.013	S
B2		11.025	11.45	11.263	1.359	-0.175	S
B4		35.225	35.99	34.694	4.915	0.108	S
B5		26.825	27.81	27.608	2.334	-0.335	S

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Q – Questionable: Your result deviates between $\pm 20-40\%$ of the expected value for SO₂ and HNO₃

U – Unsatisfactory: Your result deviates more than $\pm 40\%$ of the expected value for SO₂ and for HNO₃

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

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	13.1	12	11.687	1.143	1.236	S
B2		13.3	14.03	13.483	1.493	-0.123	S
B4		89.9	88.17	85.222	16.009	0.292	S
B5		75.9	68.13	67.791	12.587	0.644	S
B1	HNO ₃	11.5	9.8	9.447	1.635	1.256	S
B2		10.9	11.45	11.263	1.359	-0.267	S
B4		35.3	35.99	34.694	4.915	0.123	S
B5		29.7	27.81	27.608	2.334	0.896	S

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U – Unsatisfactory: Your result deviates more than $\pm 40\%$ of the expected value for SO₂ and for HNO₃

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

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	12.55	12	11.687	1.143	0.755	S
B2		15.66	14.03	13.483	1.493	1.458	S
B4		85.41	88.17	85.222	16.009	0.012	S
B5		66.42	68.13	67.791	12.587	-0.109	S
B1	HNO ₃	10.05	9.8	9.447	1.635	0.369	S
B2		11.55	11.45	11.263	1.359	0.211	S
B4		35.4	35.99	34.694	4.915	0.144	S
B5		27.24	27.81	27.608	2.334	-0.158	S

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U – Unsatisfactory: Your result deviates more than $\pm 40\%$ of the expected value for SO₂ and for HNO₃

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

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	12.136	12	11.687	1.143	0.393	S
B2		13.796	14.03	13.483	1.493	0.21	S
B4		88.727	88.17	85.222	16.009	0.219	S
B5		68.356	68.13	67.791	12.587	0.045	S
B1	HNO ₃	9.743	9.8	9.447	1.635	0.181	S
B2		11.613	11.45	11.263	1.359	0.258	S
B4		34.803	35.99	34.694	4.915	0.022	S
B5		26.823	27.81	27.608	2.334	-0.336	S

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

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	12.275	12	11.687	1.143	0.515	S
B2		14.465	14.03	13.483	1.493	0.658	S
B4		105.665	88.17	85.222	16.009	1.277	S
B5		79.765	68.13	67.791	12.587	0.951	S
B1	HNO ₃	10.88	9.8	9.447	1.635	0.877	S
B2		12.89	11.45	11.263	1.359	1.198	S
B4		42.06	35.99	34.694	4.915	1.499	S
B5		33.22	27.81	27.608	2.334	2.404	S

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Laboratory 31, Slovak Hydrometeorological Institute (Slovakia)

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	12.23	12	11.687	1.143	0.475	S
B2		14.093	14.03	13.483	1.493	0.409	S
B4		84.925	88.17	85.222	16.009	-0.019	S
B5		68.213	68.13	67.791	12.587	0.034	S
B1	HNO ₃	9.89	9.8	9.447	1.635	0.271	S
B2		11.552	11.45	11.263	1.359	0.213	S
B4		36.751	35.99	34.694	4.915	0.419	S
B5		27.674	27.81	27.608	2.334	0.028	S

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U – Unsatisfactory: Your result deviates more than $\pm 40\%$ of the expected value for SO₂ and for HNO₃

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EMEP – 31st intercomparison of analytical methods

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

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	12.01	12	11.687	1.143	0.283	S
B2		13.04	14.03	13.483	1.493	-0.297	S
B4		68.77	88.17	85.222	16.009	-1.028	Q
B5		86.87	68.13	67.791	12.587	1.516	Q
B1	HNO ₃	9.59	9.8	9.447	1.635	0.088	S
B2		11.43	11.45	11.263	1.359	0.123	S
B4		34.73	35.99	34.694	4.915	0.007	S
B5		27.69	27.81	27.608	2.334	0.035	S

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U – Unsatisfactory: Your result deviates more than $\pm 40\%$ of the expected value for SO₂ and for HNO₃

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EMEP – 31st intercomparison of analytical methods

Laboratory 33, Environmental Pollution Observ. Centre (Latvia)

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	13.07	12	11.687	1.143	1.211	S
B2		15.485	14.03	13.483	1.493	1.341	S
B4		91.951	88.17	85.222	16.009	0.42	S
B5		69.456	68.13	67.791	12.587	0.132	S
B1	HNO ₃	10.627	9.8	9.447	1.635	0.721	S
B2		12.162	11.45	11.263	1.359	0.662	S
B4		37.526	35.99	34.694	4.915	0.576	S
B5		28.893	27.81	27.608	2.334	0.551	S

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EMEP – 31st intercomparison of analytical methods

Laboratory 34, Ministry of Environment and Urbanisation (Turkey)

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	0.082	12	11.687	1.143	-10.154	U
B2		0.099	14.03	13.483	1.493	-8.966	U
B4		0.63	88.17	85.222	16.009	-5.284	U
B5		0.477	68.13	67.791	12.587	-5.348	U
B1	HNO ₃	0.059	9.8	9.447	1.635	-5.742	U
B2		0.07	11.45	11.263	1.359	-8.238	U
B4		0.233	35.99	34.694	4.915	-7.012	U
B5		0.17	27.81	27.608	2.334	-11.755	U

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EMEP – 31st intercomparison of analytical methods

Laboratory 36, Hydrometeorological Institute of Slovenia (Slovenia)

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	11.775	12	11.687	1.143	0.077	S
B2		13.875	14.03	13.483	1.493	0.262	S
B4		87.205	88.17	85.222	16.009	0.124	S
B5		66.885	68.13	67.791	12.587	-0.072	S
B1	HNO ₃	10.75	9.8	9.447	1.635	0.797	S
B2		12.4	11.45	11.263	1.359	0.837	S
B4		38.18	35.99	34.694	4.915	0.709	S
B5		29.14	27.81	27.608	2.334	0.656	S

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U – Unsatisfactory: Your result deviates more than $\pm 40\%$ of the expected value for SO₂ and for HNO₃

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EMEP – 31st intercomparison of analytical methods

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

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	23.471	12	11.687	1.143	10.311	U
B2		27.57	14.03	13.483	1.493	9.437	U
B4		167.571	88.17	85.222	16.009	5.144	U
B5		140.571	68.13	67.791	12.587	5.782	U
B1	HNO ₃	9.749	9.8	9.447	1.635	0.185	S
B2		11.53	11.45	11.263	1.359	0.196	S
B4		37.73	35.99	34.694	4.915	0.618	S
B5		29.93	27.81	27.608	2.334	0.995	S

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U – Unsatisfactory: Your result deviates more than $\pm 40\%$ of the expected value for SO₂ and for HNO₃

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EMEP – 31st intercomparison of analytical methods

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

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	11.93	12	11.687	1.143	0.213	S
B2		14.03	14.03	13.483	1.493	0.366	S
B4		85.43	88.17	85.222	16.009	0.013	S
B5		67.93	68.13	67.791	12.587	0.011	S
B1	HNO ₃	8.11	9.8	9.447	1.635	-0.818	S
B2		11.68	11.45	11.263	1.359	0.307	S
B4		33.98	35.99	34.694	4.915	-0.145	S
B5		27.88	27.81	27.608	2.334	0.117	S

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EMEP – 31st intercomparison of analytical methods

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

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	11.19	12	11.687	1.143	-0.435	S
B2		13.38	14.03	13.483	1.493	-0.069	S
B4		80.58	88.17	85.222	16.009	-0.29	S
B5		59.91	68.13	67.791	12.587	-0.626	S
B1	HNO ₃	8.98	9.8	9.447	1.635	-0.286	S
B2		10.89	11.45	11.263	1.359	-0.274	S
B4		33.26	35.99	34.694	4.915	-0.292	S
B5		24.63	27.81	27.608	2.334	-1.276	S

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U – Unsatisfactory: Your result deviates more than $\pm 40\%$ of the expected value for SO₂ and for HNO₃

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EMEP – 31st intercomparison of analytical methods

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

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	11.44	12	11.687	1.143	-0.216	S
B2		13.24	14.03	13.483	1.493	-0.163	S
B4		90.27	88.17	85.222	16.009	0.315	S
B5		69.7	68.13	67.791	12.587	0.152	S
B1	HNO ₃	8.57	9.8	9.447	1.635	-0.536	S
B2		11.35	11.45	11.263	1.359	0.064	S
B4		33.98	35.99	34.694	4.915	-0.145	S
B5		27.42	27.81	27.608	2.334	-0.08	S

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EMEP – 31st intercomparison of analytical methods

Laboratory 182, Research Institute for Analytical Instrumentation, ICIA (Romania)

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

Sample name	Determinand	Reported value [¥]	Expected value	Mean value	Standard deviation	Z score	EMEP quality norm [¤]
B1	SO ₂	9.155	12	11.687	1.143	-2.215	Q
B2		9.755	14.03	13.483	1.493	-2.497	Q
B4		79.355	88.17	85.222	16.009	-0.366	S
B5		59.955	68.13	67.791	12.587	-0.623	S
B1	HNO ₃	8.19	9.8	9.447	1.635	-0.769	S
B2		10.15	11.45	11.263	1.359	-0.819	S
B4		32.55	35.99	34.694	4.915	-0.436	S
B5		24.65	27.81	27.608	2.334	-1.267	S

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