

EMEP – 32nd 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	109.335	100.2	100.476	12.47	0.71	S
B2		18.535	13.22	14.683	2.554	1.508	U
B3		92.335	92.17	93.898	10.656	-0.147	S
B6		23.535	18.84	19.438	2.174	1.884	Q
B1	HNO ₃	41.05	40.9	41.289	4.474	-0.053	S
B2		10.05	10.8	11.092	1.024	-1.018	S
B3		38.05	37.63	38.302	3.71	-0.068	S
B6		14.65	15.38	15.713	1.116	-0.953	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 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

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 – 32nd intercomparison of analytical methods

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	97.56	100.2	100.476	12.47	-0.234	S
B2		12.47	13.22	14.683	2.554	-0.866	S
B3		90.07	92.17	93.898	10.656	-0.359	S
B6		17.73	18.84	19.438	2.174	-0.786	S
B1	HNO ₃	39.54	40.9	41.289	4.474	-0.391	S
B2		10.01	10.8	11.092	1.024	-1.057	S
B3		35.79	37.63	38.302	3.71	-0.677	S
B6		14.96	15.38	15.713	1.116	-0.675	S

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EMEP – 32nd intercomparison of analytical methods

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	100.8	100.2	100.476	12.47	0.026	S
B2		14.1	13.22	14.683	2.554	-0.228	S
B3		93.5	92.17	93.898	10.656	-0.037	S
B6		19.7	18.84	19.438	2.174	0.121	S
B1	HNO ₃	42.55	40.9	41.289	4.474	0.282	S
B2		11.45	10.8	11.092	1.024	0.35	S
B3		38.75	37.63	38.302	3.71	0.121	S
B6		15.9	15.38	15.713	1.116	0.168	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	100.9	100.2	100.476	12.47	0.034	S
B2		20.56	13.22	14.683	2.554	2.301	U
B3		94.14	92.17	93.898	10.656	0.023	S
B6		23.68	18.84	19.438	2.174	1.951	Q
B1	HNO ₃	38.42	40.9	41.289	4.474	-0.641	S
B2		10.52	10.8	11.092	1.024	-0.559	S
B3		36.88	37.63	38.302	3.71	-0.383	S
B6		15.22	15.38	15.713	1.116	-0.442	S

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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	92.25	100.2	100.476	12.47	-0.66	S
B2		12.95	13.22	14.683	2.554	-0.678	S
B3		86.35	92.17	93.898	10.656	-0.708	S
B6		18.05	18.84	19.438	2.174	-0.638	S
B1	HNO ₃	38.85	40.9	41.289	4.474	-0.545	S
B2		10.75	10.8	11.092	1.024	-0.334	S
B3		35.55	37.63	38.302	3.71	-0.742	S
B6		14.8	15.38	15.713	1.116	-0.818	S

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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	99.799	100.2	100.476	12.47	-0.054	S
B2		13.599	13.22	14.683	2.554	-0.424	S
B3		92.199	92.17	93.898	10.656	-0.159	S
B6		20.599	18.84	19.438	2.174	0.534	S
B1	HNO ₃	39.999	40.9	41.289	4.474	-0.288	S
B2		11.299	10.8	11.092	1.024	0.202	S
B3		37.199	37.63	38.302	3.71	-0.297	S
B6		16.4	15.38	15.713	1.116	0.616	S

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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	93.5	100.2	101.253	12.238	-0.634	S
B2		17.4	13.22	14.577	2.379	1.186	Q
B3		89.4	92.17	94.625	10.273	-0.509	S
B6		20.4	18.84	19.478	2.127	0.434	S
B1	HNO ₃	41.1	40.9	41.262	4.468	-0.036	S
B2		11.2	10.8	11.103	1.054	0.092	S
B3		37.4	37.63	38.256	3.715	-0.23	S
B6		15.5	15.38	15.561	1.188	-0.052	S

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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	103.513	100.2	101.253	12.238	0.185	S
B2		13.614	13.22	14.577	2.379	-0.405	S
B3		94.814	92.17	94.625	10.273	0.018	S
B6		16.713	18.84	19.478	2.127	-1.3	S
B1	HNO ₃	41.423	40.9	41.262	4.468	0.036	S
B2		10.924	10.8	11.103	1.054	-0.171	S
B3		37.123	37.63	38.256	3.715	-0.305	S
B6		15.123	15.38	15.561	1.188	-0.368	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	143.77	100.2	100.476	12.47	3.472	U
B2		16.72	13.22	14.683	2.554	0.798	Q
B3		131.21	92.17	93.898	10.656	3.502	U
B6		22.22	18.84	19.438	2.174	1.28	S
B1	HNO ₃	57.18	40.9	41.289	4.474	3.552	Q
B2		14.2	10.8	11.092	1.024	3.035	Q
B3		51.72	37.63	38.302	3.71	3.617	Q
B6		18.85	15.38	15.713	1.116	2.811	Q

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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	97.04	100.2	100.476	12.47	-0.276	S
B2		13.654	13.22	14.683	2.554	-0.403	S
B3		94.364	92.17	93.898	10.656	0.044	S
B6		18.618	18.84	19.438	2.174	-0.377	S
B1	HNO ₃	40.73	40.9	41.289	4.474	-0.125	S
B2		10.964	10.8	11.092	1.024	-0.125	S
B3		38.549	37.63	38.302	3.71	0.067	S
B6		15.168	15.38	15.713	1.116	-0.488	S

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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	96.64	100.2	100.476	12.47	-0.308	S
B2		13.11	13.22	14.683	2.554	-0.616	S
B3		88.37	92.17	93.898	10.656	-0.519	S
B6		17.75	18.84	19.438	2.174	-0.776	S
B1	HNO ₃	38.48	40.9	41.289	4.474	-0.628	S
B2		12.18	10.8	11.092	1.024	1.063	S
B3		38.36	37.63	38.302	3.71	0.016	S
B6		16.84	15.38	15.713	1.116	1.01	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 – 32nd 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	90.953	100.2	100.476	12.47	-0.764	S
B2		13.815	13.22	14.683	2.554	-0.34	S
B3		100.236	92.17	93.898	10.656	0.595	S
B6		18.526	18.84	19.438	2.174	-0.419	S
B1	HNO ₃	38.803	40.9	41.289	4.474	-0.556	S
B2		9.829	10.8	11.092	1.024	-1.233	S
B3		37.327	37.63	38.302	3.71	-0.263	S
B6		14.64	15.38	15.713	1.116	-0.962	S

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EMEP – 32nd 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	0.401	100.2	100.476	12.47	-8.025	U
B2		0.026	13.22	14.683	2.554	-5.738	U
B3		0.383	92.17	93.898	10.656	-8.776	U
B6		0.057	18.84	19.438	2.174	-8.914	U
B1	HNO ₃	0.341	40.9	41.289	4.474	-9.152	U
B2		0.07	10.8	11.092	1.024	-10.764	U
B3		0.308	37.63	38.302	3.71	-10.24	U
B6		0.135	15.38	15.713	1.116	-13.961	U

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EMEP – 32nd 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	94.95	100.2	100.476	12.47	-0.443	S
B2		13.35	13.22	14.683	2.554	-0.522	S
B3		90.75	92.17	93.898	10.656	-0.295	S
B6		19.05	18.84	19.438	2.174	-0.178	S
B1	HNO ₃	41.99	40.9	41.289	4.474	0.157	S
B2		11.19	10.8	11.092	1.024	0.096	S
B3		38.69	37.63	38.302	3.71	0.105	S
B6		15.9	15.38	15.713	1.116	0.168	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 – 32nd 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	98.96	100.2	100.476	12.47	-0.122	S
B2		13.17	13.22	14.683	2.554	-0.592	S
B3		93.44	92.17	93.898	10.656	-0.043	S
B6		17.28	18.84	19.438	2.174	-0.993	S
B1	HNO ₃	37.96	40.9	41.289	4.474	-0.744	S
B2		10.11	10.8	11.092	1.024	-0.959	S
B3		36.45	37.63	38.302	3.71	-0.499	S
B6		14.22	15.38	15.713	1.116	-1.338	S

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

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EMEP – 32nd 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	97.03	100.2	100.476	12.47	-0.276	S
B2		12.76	13.22	14.683	2.554	-0.753	S
B3		89.45	92.17	93.898	10.656	-0.417	S
B6		18.19	18.84	19.438	2.174	-0.574	S
B1	HNO ₃	40.735	40.9	41.289	4.474	-0.124	S
B2		11.405	10.8	11.092	1.024	0.306	S
B3		37.015	37.63	38.302	3.71	-0.347	S
B6		15.98	15.38	15.713	1.116	0.239	S

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EMEP – 32nd 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	102.93	100.2	100.476	12.47	0.197	S
B2		13.31	13.22	14.683	2.554	-0.537	S
B3		93.26	92.17	93.898	10.656	-0.06	S
B6		19.48	18.84	19.438	2.174	0.019	S
B1	HNO ₃	41.035	40.9	41.289	4.474	-0.057	S
B2		11.235	10.8	11.092	1.024	0.14	S
B3		36.895	37.63	38.302	3.71	-0.379	S
B6		16.18	15.38	15.713	1.116	0.419	S

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EMEP – 32nd 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	91.2	100.2	100.476	12.47	-0.744	S
B2		11.9	13.22	14.683	2.554	-1.089	S
B3		83.3	92.17	93.898	10.656	-0.995	S
B6		16.2	18.84	19.438	2.174	-1.489	S
B1	HNO ₃	42.2	40.9	41.289	4.474	0.204	S
B2		11.5	10.8	11.092	1.024	0.399	S
B3		38.2	37.63	38.302	3.71	-0.027	S
B6		16.2	15.38	15.713	1.116	0.436	S

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EMEP – 32nd intercomparison of analytical methods

Laboratory 178, Environmental Chemistry and EANET Monitoring Laboratory, Limnological Institute RAS/SB, Irkutsk (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	9.62	100.2	100.476	12.47	-7.286	U
B2		18.2	13.22	14.683	2.554	1.377	Q
B3		3.68	92.17	93.898	10.656	-8.467	U
B6		< 0.830	18.84	19.438	2.174	-8.749	U
B1	HNO ₃	9.56	40.9	41.289	4.474	-7.092	U
B2		10.67	10.8	11.092	1.024	-0.412	S
B3		< 0.570	37.63	38.302	3.71	-10.246	U
B6		< 0.570	15.38	15.713	1.116	-13.827	U

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