

EMEP – 33rd 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 [¤]
B2	SO ₂	33.117	20.4	20.213	1.571	8.214	U
B3		111.618	92.2	91.817	11.246	1.761	Q
B4		133.118	104	104.174	13.881	2.085	Q
B5		33.218	22	22.087	3.156	3.527	U
B2	HNO ₃	16.175	16.7	17.038	1.094	-0.788	S
B3		37.475	37.6	37.305	2.307	0.074	S
B4		42.475	42.5	41.872	3.542	0.17	S
B5		17.775	18	18.46	1.238	-0.553	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 – 33rd 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 [¤]
B2	SO ₂	18.17	20.4	20.213	1.571	-1.3	S
B3		92.16	92.2	91.817	11.246	0.03	S
B4		105.44	104	104.174	13.881	0.091	S
B5		21.21	22	22.087	3.156	-0.278	S
B2	HNO ₃	15.52	16.7	17.038	1.094	-1.387	S
B3		36.38	37.6	37.305	2.307	-0.401	S
B4		39.45	42.5	41.872	3.542	-0.684	S
B5		17.29	18	18.46	1.238	-0.945	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 [¤]
B2	SO ₂	21.561	20.4	20.213	1.571	0.858	S
B3		94.207	92.2	91.817	11.246	0.212	S
B4		105.457	104	104.174	13.881	0.092	S
B5		22.863	22	22.087	3.156	0.246	S
B2	HNO ₃	17.089	16.7	17.038	1.094	0.047	S
B3		38.179	37.6	37.305	2.307	0.379	S
B4		41.228	42.5	41.872	3.542	-0.182	S
B5		18.698	18	18.46	1.238	0.192	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 [¤]
B2	SO ₂	19.9	20.4	20.213	1.571	-0.199	S
B3		93.8	92.2	91.817	11.246	0.176	S
B4		104.1	104	104.174	13.881	-0.005	S
B5		20.8	22	22.087	3.156	-0.408	S
B2	HNO ₃	17.1	16.7	17.038	1.094	0.057	S
B3		37	37.6	37.305	2.307	-0.132	S
B4		41.9	42.5	41.872	3.542	0.008	S
B5		18.2	18	18.46	1.238	-0.21	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 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 [¤]
B2	SO ₂	19.25	20.4	20.213	1.571	-0.613	S
B3		84.95	92.2	91.817	11.246	-0.611	S
B4		94.55	104	104.174	13.881	-0.693	S
B5		20.85	22	22.087	3.156	-0.392	S
B2	HNO ₃	16.65	16.7	17.038	1.094	-0.354	S
B3		35.55	37.6	37.305	2.307	-0.761	S
B4		40.75	42.5	41.872	3.542	-0.317	S
B5		18.05	18	18.46	1.238	-0.331	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 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 [¤]
B2	SO ₂	19.3	20.4	20.213	1.571	-0.581	S
B3		92.7	92.2	91.817	11.246	0.078	S
B4		92.5	104	104.174	13.881	-0.841	S
B5		21.3	22	22.087	3.156	-0.249	S
B2	HNO ₃	17.6	16.7	17.038	1.094	0.514	S
B3		38.6	37.6	37.305	2.307	0.561	S
B4		43.2	42.5	41.872	3.542	0.375	S
B5		18.9	18	18.46	1.238	0.356	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 [¤]
B2	SO ₂	19.8	20.4	20.213	1.571	-0.263	S
B3		60.1	92.2	91.817	11.246	-2.82	Q
B4		62.1	104	104.174	13.881	-3.031	U
B5		18.7	22	22.087	3.156	-1.073	S
B2	HNO ₃	16.7	16.7	17.038	1.094	-0.309	S
B3		36.4	37.6	37.305	2.307	-0.392	S
B4		40.6	42.5	41.872	3.542	-0.359	S
B5		17.5	18	18.46	1.238	-0.776	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 [¤]
B2	SO ₂	20.36	20.4	20.213	1.571	0.094	S
B3		91.7	92.2	91.817	11.246	-0.01	S
B4		103.6	104	104.174	13.881	-0.041	S
B5		22.09	22	22.087	3.156	0.001	S
B2	HNO ₃	16.639	16.7	17.038	1.094	-0.365	S
B3		34.349	37.6	37.305	2.307	-1.282	S
B4		39.828	42.5	41.872	3.542	-0.577	S
B5		17.838	18	18.46	1.238	-0.502	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 [¤]
B2	SO ₂	21.57	20.4	20.213	1.571	0.864	S
B3		113.63	92.2	91.817	11.246	1.94	Q
B4		133.43	104	104.174	13.881	2.108	Q
B5		20.33	22	22.087	3.156	-0.557	S
B2	HNO ₃	18.65	16.7	17.038	1.094	1.473	S
B3		44.75	37.6	37.305	2.307	3.227	S
B4		48.43	42.5	41.872	3.542	1.852	S
B5		20.36	18	18.46	1.238	1.535	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 [¤]
B2	SO ₂	21.726	20.4	20.213	1.571	0.963	S
B3		93.919	92.2	91.817	11.246	0.187	S
B4		101.395	104	104.174	13.881	-0.2	S
B5		22.986	22	22.087	3.156	0.285	S
B2	HNO ₃	17.305	16.7	17.038	1.094	0.244	S
B3		37.296	37.6	37.305	2.307	-0.004	S
B4		42.121	42.5	41.872	3.542	0.07	S
B5		18.814	18	18.46	1.238	0.286	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 [¤]
B2	SO ₂	20.66	20.4	20.213	1.571	0.285	S
B3		97.98	92.2	91.817	11.246	0.548	S
B4		110.43	104	104.174	13.881	0.451	S
B5		21.57	22	22.087	3.156	-0.164	S
B2	HNO ₃	17.25	16.7	17.038	1.094	0.194	S
B3		38.58	37.6	37.305	2.307	0.553	S
B4		40.54	42.5	41.872	3.542	-0.376	S
B5		18.69	18	18.46	1.238	0.186	S

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EMEP – 33rd 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 [¤]
B2	SO ₂	22.439	20.4	20.213	1.571	1.417	S
B3		88.114	92.2	91.817	11.246	-0.329	S
B4		103.834	104	104.174	13.881	-0.025	S
B5		24.654	22	22.087	3.156	0.813	S
B2	HNO ₃	17.108	16.7	17.038	1.094	0.064	S
B3		37	37.6	37.305	2.307	-0.132	S
B4		41.701	42.5	41.872	3.542	-0.048	S
B5		13.566	18	18.46	1.238	-3.955	Q

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EMEP – 33rd 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 [¤]
B2	SO ₂	10.98	20.4	20.213	1.571	-5.877	U
B3		-0.71	92.2	91.817	11.246	-8.228	U
B4		73.98	104	104.174	13.881	-2.175	Q
B5		55.79	22	22.087	3.156	10.678	U
B2	HNO ₃	19.759	16.7	17.038	1.094	2.486	S
B3		42.559	37.6	37.305	2.307	2.277	S
B4		57.189	42.5	41.872	3.542	4.324	Q
B5		19.999	18	18.46	1.238	1.244	S

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EMEP – 33rd 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 [¤]
B2	SO ₂	22.105	20.4	20.213	1.571	1.204	S
B3		96.525	92.2	91.817	11.246	0.419	S
B4		110.145	104	104.174	13.881	0.43	S
B5		23.495	22	22.087	3.156	0.446	S
B2	HNO ₃	18.45	16.7	17.038	1.094	1.29	S
B3		39.36	37.6	37.305	2.307	0.891	S
B4		46.18	42.5	41.872	3.542	1.216	S
B5		19.82	18	18.46	1.238	1.099	S

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EMEP – 33rd 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 [¤]
B2	SO ₂	18.2	20.4	20.213	1.571	-1.281	S
B3		83.16	92.2	91.817	11.246	-0.77	S
B4		83.73	104	104.174	13.881	-1.473	S
B5		20.49	22	22.087	3.156	-0.506	S
B2	HNO ₃	15.57	16.7	17.038	1.094	-1.341	S
B3		32.78	37.6	37.305	2.307	-1.962	S
B4		33.44	42.5	41.872	3.542	-2.381	Q
B5		16.96	18	18.46	1.238	-1.212	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 – 33rd 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 [¤]
B2	SO ₂	19.04	20.4	20.213	1.571	-0.746	S
B3		89.92	92.2	91.817	11.246	-0.169	S
B4		100.85	104	104.174	13.881	-0.239	S
B5		20.85	22	22.087	3.156	-0.392	S
B2	HNO ₃	15.65	16.7	17.038	1.094	-1.268	S
B3		36.65	37.6	37.305	2.307	-0.284	S
B4		38.25	42.5	41.872	3.542	-1.023	S
B5		16.67	18	18.46	1.238	-1.446	S

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EMEP – 33rd 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 [¤]
B2	SO ₂	19.439	20.4	20.213	1.571	-0.492	S
B3		90.34	92.2	91.817	11.246	-0.131	S
B4		99.639	104	104.174	13.881	-0.327	S
B5		20.54	22	22.087	3.156	-0.49	S
B2	HNO ₃	15.913	16.7	17.038	1.094	-1.028	S
B3		35.093	37.6	37.305	2.307	-0.959	S
B4		40.723	42.5	41.872	3.542	-0.324	S
B5		17.023	18	18.46	1.238	-1.161	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 – 33rd 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 [¤]
B2	SO ₂	17.1	20.4	20.213	1.571	-1.981	S
B3		80.2	92.2	91.817	11.246	-1.033	S
B4		110.4	104	104.174	13.881	0.449	S
B5		18.5	22	22.087	3.156	-1.137	S
B2	HNO ₃	18.8	16.7	17.038	1.094	1.61	S
B3		37.9	37.6	37.305	2.307	0.258	S
B4		48.5	42.5	41.872	3.542	1.871	S
B5		20	18	18.46	1.238	1.245	S

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EMEP – 33rd 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 [¤]
B2	SO ₂	22.46	20.4	20.213	1.571	1.43	S
B3		98.86	92.2	91.817	11.246	0.626	S
B4		111.36	104	104.174	13.881	0.518	S
B5		24.36	22	22.087	3.156	0.72	S
B2	HNO ₃	19.1	16.7	17.038	1.094	1.884	S
B3		41.6	37.6	37.305	2.307	1.862	S
B4		45.8	42.5	41.872	3.542	1.109	S
B5		20.7	18	18.46	1.238	1.81	S

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EMEP – 33rd intercomparison of analytical methods

Laboratory 200, FUB AG (Switzerland)

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 [¤]
B2	SO ₂	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 ₃	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

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