

EMEP – 34th 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	49.39	40.08	40.177	3.016	3.055	Q
B2		62.69	52.10	53.854	3.28	2.694	Q
B5		120.29	120.2	111.614	5.296	1.638	S
B6		136.29	132.2	132.592	7.496	0.493	S
B1	HNO ₃	17.18	16.36	16.056	0.645	1.744	S
B2		24.38	21.27	22.113	0.953	2.38	S
B5		52.98	49.08	47.687	3.273	1.617	S
B6		61.58	53.99	57.055	2.75	1.646	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 – 34th 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	39.24	40.08	40.177	3.016	-0.311	S
B2		52.4	52.10	53.854	3.28	-0.443	S
B5		117.62	120.2	111.614	5.296	1.134	S
B6		120.92	132.2	132.592	7.496	-1.557	S
B1	HNO ₃	15.06	16.36	16.056	0.645	-1.545	S
B2		20.89	21.27	22.113	0.953	-1.283	S
B5		45.36	49.08	47.687	3.273	-0.711	S
B6		56.84	53.99	57.055	2.75	-0.078	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	40.349	40.08	40.177	3.016	0.057	S
B2		54.099	52.10	53.854	3.28	0.075	S
B5		114.439	120.2	111.614	5.296	0.534	S
B6		142.44	132.2	132.592	7.496	1.314	S
B1	HNO ₃	16.31	16.36	16.056	0.645	0.394	S
B2		22.48	21.27	22.113	0.953	0.386	S
B5		47.35	49.08	47.687	3.273	-0.103	S
B6		56.26	53.99	57.055	2.75	-0.289	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	37.64	40.08	40.177	3.016	-0.841	S
B2		51.04	52.10	53.854	3.28	-0.858	S
B5		105.63	120.2	111.614	5.296	-1.13	S
B6		137.32	132.2	132.592	7.496	0.631	S
B1	HNO ₃	16.05	16.36	16.056	0.645	-0.009	S
B2		20.51	21.27	22.113	0.953	-1.682	S
B5		45.95	49.08	47.687	3.273	-0.531	S
B6		54.17	53.99	57.055	2.75	-1.049	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 [¤]
B1	SO ₂	41.05	40.08	40.177	3.016	0.289	S
B2		55.05	52.10	53.854	3.28	0.365	S
B5		117.95	120.2	111.614	5.296	1.196	S
B6		141.45	132.2	132.592	7.496	1.182	S
B1	HNO ₃	20.3	16.36	16.056	0.645	6.584	Q
B2		22.6	21.27	22.113	0.953	0.512	S
B5		43.2	49.08	47.687	3.273	-1.371	S
B6		57.7	53.99	57.055	2.75	0.235	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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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	43.5	40.08	40.177	3.016	1.102	S
B2		58.8	52.10	53.854	3.28	1.508	S
B5		105.7	120.2	111.614	5.296	-1.117	S
B6		127.6	132.2	132.592	7.496	-0.666	S
B1	HNO ₃	17.3	16.36	16.056	0.645	1.93	S
B2		23.2	21.27	22.113	0.953	1.141	S
B5		55.6	49.08	47.687	3.273	2.417	S
B6		53.7	53.99	57.055	2.75	-1.22	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	40.3	40.08	40.177	3.016	0.041	S
B2		54.4	52.10	53.854	3.28	0.167	S
B5		112.2	120.2	111.614	5.296	0.111	S
B6		119.5	132.2	132.592	7.496	-1.747	S
B1	HNO ₃	15.8	16.36	16.056	0.645	-0.397	S
B2		22.2	21.27	22.113	0.953	0.092	S
B5		46.1	49.08	47.687	3.273	-0.485	S
B6		58.1	53.99	57.055	2.75	0.38	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	37	40.08	40.177	3.016	-1.053	S
B2		50.956	52.10	53.854	3.28	-0.883	S
B5		105.61	120.2	111.614	5.296	-1.134	S
B6		130.28	132.2	132.592	7.496	-0.308	S
B1	HNO ₃	15.632	16.36	16.056	0.645	-0.658	S
B2		21.954	21.27	22.113	0.953	-0.166	S
B5		42.759	49.08	47.687	3.273	-1.505	S
B6		54.506	53.99	57.055	2.75	-0.927	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	38.45	40.08	40.177	3.016	-0.573	S
B2		51.87	52.10	53.854	3.28	-0.605	S
B5		117.42	120.2	111.614	5.296	1.096	S
B6		132.02	132.2	132.592	7.496	-0.076	S
B1	HNO ₃	16.43	16.36	16.056	0.645	0.58	S
B2		22.23	21.27	22.113	0.953	0.123	S
B5		49.17	49.08	47.687	3.273	0.453	S
B6		62.04	53.99	57.055	2.75	1.813	S

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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	41.89	40.08	40.177	3.016	0.568	S
B2		55.87	52.10	53.854	3.28	0.615	S
B5		109.08	120.2	111.614	5.296	-0.478	S
B6		135.45	132.2	132.592	7.496	0.381	S
B1	HNO ₃	16.341	16.36	16.056	0.645	0.442	S
B2		22.061	21.27	22.113	0.953	-0.054	S
B5		45.551	49.08	47.687	3.273	-0.652	S
B6		53.781	53.99	57.055	2.75	-1.191	S

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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	37.055	40.08	40.177	3.016	-1.035	S
B2		50.555	52.10	53.854	3.28	-1.006	S
B5		104.955	120.2	111.614	5.296	-1.257	S
B6		130.955	132.2	132.592	7.496	-0.218	S
B1	HNO ₃	15.625	16.36	16.056	0.645	-0.668	S
B2		21.725	21.27	22.113	0.953	-0.407	S
B5		47.825	49.08	47.687	3.273	0.042	S
B6		59.225	53.99	57.055	2.75	0.789	S

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EMEP – 34th 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	39.727	40.08	40.177	3.016	-0.149	S
B2		54.037	52.10	53.854	3.28	0.056	S
B5		112.107	120.2	111.614	5.296	0.093	S
B6		138.107	132.2	132.592	7.496	0.736	S
B1	HNO ₃	16.205	16.36	16.056	0.645	0.231	S
B2		22.455	21.27	22.113	0.953	0.359	S
B5		48.005	49.08	47.687	3.273	0.097	S
B6		57.045	53.99	57.055	2.75	-0.004	S

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EMEP – 34th 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	39.61	40.08	40.177	3.016	-0.188	S
B2		52.01	52.10	53.854	3.28	-0.562	S
B5		106.9	120.2	111.614	5.296	-0.89	S
B6		131.9	132.2	132.592	7.496	-0.092	S
B1	HNO ₃	15.29	16.36	16.056	0.645	-1.188	S
B2		21.62	21.27	22.113	0.953	-0.517	S
B5		47.17	49.08	47.687	3.273	-0.158	S
B6		55.64	53.99	57.055	2.75	-0.515	S

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EMEP – 34th intercomparison of analytical methods

Laboratory 158, Asia Center for Air Pollution Research (ACAP) (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	39.21	40.08	40.177	3.016	-0.321	S
B2		53.96	52.10	53.854	3.28	0.032	S
B5		113.02	120.2	111.614	5.296	0.266	S
B6		143.98	132.2	132.592	7.496	1.519	S
B1	HNO ₃	16.37	16.36	16.056	0.645	0.487	S
B2		22.98	21.27	22.113	0.953	0.91	S
B5		50.37	49.08	47.687	3.273	0.82	S
B6		61.17	53.99	57.055	2.75	1.496	S

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EMEP – 34th 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	37.92	40.08	40.177	3.016	-0.748	S
B2		49.82	52.10	53.854	3.28	-1.23	S
B5		106.7	120.2	111.614	5.296	-0.928	S
B6		131.66	132.2	132.592	7.496	-0.124	S
B1	HNO ₃	15.295	16.36	16.056	0.645	-1.18	S
B2		21.465	21.27	22.113	0.953	-0.68	S
B5		48.145	49.08	47.687	3.273	0.14	S
B6		56.275	53.99	57.055	2.75	-0.284	S

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EMEP – 34th 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	61.7	40.08	40.177	3.016	7.136	U
B2		82	52.10	53.854	3.28	8.58	U
B5		190	120.2	111.614	5.296	14.801	U
B6		226	132.2	132.592	7.496	12.461	U
B1	HNO ₃	19.9	16.36	16.056	0.645	5.963	Q
B2		27.3	21.27	22.113	0.953	5.444	Q
B5		67.2	49.08	47.687	3.273	5.961	Q
B6		75.8	53.99	57.055	2.75	6.817	U

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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 [¤]
B1	SO ₂	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 ₃	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

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