

Summary statistics EMEP laboratory intercalibration Round 33

Sulphur dioxide in absorbing solution (A-samples)

| Sample | Component | Unit | N | Expected value | Mean value | Median | Standard deviation | RSD (%) |
|--------|-----------|---------|----|----------------|------------|--------|--------------------|---------|
| A1 | SO2 | µg S/ml | 14 | 0.24 | 0.201 | 0.22 | 0.061 | 30.5 |
| A2 | SO2 | µg S/ml | 13 | 0.12 | 0.11 | 0.115 | 0.028 | 25.2 |
| A4 | SO2 | µg S/ml | 14 | 0.481 | 0.42 | 0.466 | 0.131 | 31.2 |
| A5 | SO2 | µg S/ml | 14 | 0.701 | 0.651 | 0.677 | 0.094 | 14.5 |

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

| Sample | Component | Unit | N | Expected value | Mean value | Median | Standard deviation | RSD (%) |
|--------|-----------|-------------|----|----------------|------------|--------|--------------------|---------|
| B2 | SO2 | ug S/filter | 18 | 20.4 | 20.2 | 20.13 | 1.57 | 7.8 |
| B3 | SO2 | ug S/filter | 19 | 92.2 | 91.82 | 92.16 | 11.25 | 12.2 |
| B4 | SO2 | ug S/filter | 19 | 104 | 104.17 | 103.83 | 13.88 | 13.3 |
| B5 | SO2 | ug S/filter | 19 | 22 | 22.09 | 21.21 | 3.16 | 14.3 |
| B2 | HNO3 | ug N/filter | 19 | 16.7 | 17.04 | 17.09 | 1.09 | 6.4 |
| B3 | HNO3 | ug N/filter | 19 | 37.6 | 37.31 | 37.00 | 2.31 | 6.2 |
| B4 | HNO3 | ug N/filter | 19 | 42.5 | 41.87 | 41.23 | 3.54 | 8.5 |
| B5 | HNO3 | ug N/filter | 19 | 18 | 18.46 | 18.20 | 1.24 | 6.7 |

Nitrogen dioxide in absorbing solution (C-samples)

| Sample | Component | Unit | N | Expected value | Mean value | Median | Standard deviation | RSD (%) |
|--------|-----------|---------|----|----------------|------------|--------|--------------------|---------|
| C1 | NO2 | ug N/ml | 28 | 0.057 | 0.058 | 0.057 | 0.004 | 6.5 |
| C2 | NO2 | ug N/ml | 28 | 0.043 | 0.043 | 0.043 | 0.004 | 10.3 |
| C3 | NO2 | ug N/ml | 28 | 0.101 | 0.101 | 0.101 | 0.005 | 5.0 |
| C4 | NO2 | ug N/ml | 28 | 0.131 | 0.131 | 0.131 | 0.008 | 5.8 |

Ammonia on impregnated filters (J-samples)

| Sample | Component | Unit | N | Expected value | Mean value | Median | Standard deviation | RSD (%) |
|--------|-----------|-------------|----|----------------|------------|--------|--------------------|---------|
| J1 | NH3 | ug N/filter | 21 | 38.1 | 37.354 | 37.849 | 3.469 | 9.3 |
| J2 | NH3 | ug N/filter | 21 | 48.12 | 46.542 | 47.349 | 5.902 | 12.7 |
| J4 | NH3 | ug N/filter | 21 | 15.04 | 14.28 | 14.455 | 1.145 | 8.0 |
| J5 | NH3 | ug N/filter | 21 | 17.54 | 17.609 | 17.349 | 1.905 | 10.8 |

Precipitation (G-samples)

| Sample | Component | Unit | N | Expected value | Mean value | Median | Standard deviation | RSD (%) |
|--------|-----------|---------|----|----------------|------------|--------|--------------------|---------|
| G1 | SO4 | mg S/l | 58 | 0.666 | 0.642 | 0.655 | 0.089 | 13.9 |
| G2 | SO4 | mg S/l | 58 | 0.535 | 0.52 | 0.522 | 0.081 | 15.5 |
| G3 | SO4 | mg S/l | 58 | 1.474 | 1.423 | 1.47 | 0.234 | 16.5 |
| G4 | SO4 | mg S/l | 58 | 1.319 | 1.272 | 1.308 | 0.194 | 15.3 |
| G1 | NH4 | mg N/l | 59 | 0.187 | 0.184 | 0.184 | 0.014 | 7.9 |
| G2 | NH4 | mg N/l | 60 | 0.241 | 0.235 | 0.234 | 0.018 | 7.8 |
| G3 | NH4 | mg N/l | 61 | 0.267 | 0.272 | 0.27 | 0.023 | 8.3 |
| G4 | NH4 | mg N/l | 60 | 0.401 | 0.4 | 0.399 | 0.021 | 5.4 |
| G1 | NO3 | mg N/l | 61 | 0.357 | 0.344 | 0.349 | 0.024 | 6.9 |
| G2 | NO3 | mg N/l | 62 | 0.379 | 0.362 | 0.368 | 0.032 | 8.9 |
| G3 | NO3 | mg N/l | 62 | 0.607 | 0.595 | 0.601 | 0.044 | 7.5 |
| G4 | NO3 | mg N/l | 62 | 0.707 | 0.685 | 0.694 | 0.057 | 8.3 |
| G1 | Na | mg/l | 53 | 0.304 | 0.29 | 0.293 | 0.016 | 5.6 |
| G2 | Na | mg/l | 54 | 0.283 | 0.268 | 0.273 | 0.018 | 6.5 |
| G3 | Na | mg/l | 55 | 0.608 | 0.59 | 0.595 | 0.024 | 4.1 |
| G4 | Na | mg/l | 55 | 0.548 | 0.526 | 0.53 | 0.023 | 4.4 |
| G1 | Mg | mg/l | 51 | 0.103 | 0.101 | 0.101 | 0.006 | 5.7 |
| G2 | Mg | mg/l | 49 | 0.093 | 0.087 | 0.088 | 0.005 | 5.5 |
| G3 | Mg | mg/l | 53 | 0.175 | 0.168 | 0.168 | 0.008 | 4.7 |
| G4 | Mg | mg/l | 54 | 0.155 | 0.15 | 0.15 | 0.007 | 4.9 |
| G1 | Cl | mg/l | 52 | 0.193 | 0.187 | 0.186 | 0.016 | 8.8 |
| G2 | Cl | mg/l | 55 | 0.27 | 0.258 | 0.26 | 0.021 | 8.0 |
| G3 | Cl | mg/l | 56 | 0.386 | 0.367 | 0.37 | 0.026 | 7.1 |
| G4 | Cl | mg/l | 55 | 0.347 | 0.332 | 0.335 | 0.026 | 7.8 |
| G1 | Ca | mg/l | 54 | 0.128 | 0.13 | 0.126 | 0.026 | 20.2 |
| G2 | Ca | mg/l | 53 | 0.115 | 0.12 | 0.117 | 0.025 | 20.5 |
| G3 | Ca | mg/l | 54 | 0.217 | 0.213 | 0.213 | 0.029 | 13.4 |
| G4 | Ca | mg/l | 55 | 0.192 | 0.191 | 0.19 | 0.027 | 14.2 |
| G1 | K | mg/l | 52 | 0.17 | 0.162 | 0.165 | 0.016 | 9.7 |
| G2 | K | mg/l | 54 | 0.204 | 0.189 | 0.193 | 0.017 | 8.8 |
| G3 | K | mg/l | 55 | 0.34 | 0.325 | 0.329 | 0.02 | 6.1 |
| G4 | K | mg/l | 55 | 0.306 | 0.294 | 0.297 | 0.019 | 6.5 |
| G1 | pH | pH-unit | 57 | 4.57 | 4.629 | 4.63 | 0.131 | 2.8 |
| G2 | pH | pH-unit | 57 | 4.7 | 4.738 | 4.75 | 0.132 | 2.8 |
| G3 | pH | pH-unit | 57 | 4.18 | 4.2 | 4.21 | 0.122 | 2.9 |
| G4 | pH | pH-unit | 57 | 4.22 | 4.248 | 4.26 | 0.134 | 3.2 |
| G1 | Cond. | µS/cm | 56 | 17.7 | 16.55 | 17.05 | 1.471 | 8.9 |
| G2 | Cond. | µS/cm | 56 | 15.2 | 14.389 | 14.8 | 1.524 | 10.6 |
| G3 | Cond. | µS/cm | 54 | 39.3 | 37.557 | 38.45 | 3.093 | 8.2 |
| G4 | Cond. | µS/cm | 55 | 37 | 34.831 | 35.85 | 3.076 | 8.8 |

Heavy metals in precipitation (H-samples)

| Sample | Component | Unit | N | Expected value | Mean value | Median | Standard deviation | RSD (%) |
|--------|-----------|------|----|----------------|------------|--------|--------------------|---------|
| H1 | As | µg/l | 39 | 5 | 5.046 | 5 | 0.652 | 12.9 |
| H2 | As | µg/l | 38 | 6 | 5.992 | 6.01 | 0.547 | 9.1 |
| H3 | As | µg/l | 29 | 0.3 | 0.39 | 0.314 | 0.232 | 59.5 |
| H4 | As | µg/l | 27 | 0.9 | 0.939 | 0.91 | 0.088 | 9.4 |
| H1 | Cd | µg/l | 45 | 0.6 | 0.601 | 0.6 | 0.052 | 8.6 |
| H2 | Cd | µg/l | 44 | 0.55 | 0.551 | 0.56 | 0.043 | 7.9 |
| H3 | Cd | µg/l | 36 | 0.08 | 0.086 | 0.083 | 0.02 | 23.4 |
| H4 | Cd | µg/l | 33 | 0.06 | 0.061 | 0.062 | 0.01 | 17.1 |
| H1 | Cr | µg/l | 41 | 5 | 4.969 | 5 | 0.28 | 5.6 |
| H2 | Cr | µg/l | 41 | 8.4 | 8.379 | 8.44 | 0.627 | 7.5 |
| H3 | Cr | µg/l | 36 | 0.85 | 0.818 | 0.85 | 0.124 | 15.2 |
| H4 | Cr | µg/l | 32 | 0.8 | 0.814 | 0.8 | 0.059 | 7.2 |
| H1 | Cu | µg/l | 40 | 7.5 | 7.42 | 7.5 | 1.007 | 13.6 |
| H2 | Cu | µg/l | 38 | 7 | 6.896 | 6.928 | 0.488 | 7.1 |
| H3 | Cu | µg/l | 33 | 0.9 | 0.889 | 0.907 | 0.148 | 16.7 |
| H4 | Cu | µg/l | 32 | 0.9 | 0.886 | 0.905 | 0.13 | 14.7 |
| H1 | Pb | µg/l | 43 | 23 | 22.494 | 22.6 | 1.219 | 5.4 |
| H2 | Pb | µg/l | 46 | 23.5 | 23.18 | 23.3 | 1.916 | 8.3 |
| H3 | Pb | µg/l | 38 | 1.1 | 1.173 | 1.135 | 0.353 | 30.1 |
| H4 | Pb | µg/l | 37 | 1 | 0.999 | 1 | 0.169 | 16.9 |
| H1 | Ni | µg/l | 40 | 8 | 7.841 | 7.96 | 0.404 | 5.2 |
| H2 | Ni | µg/l | 39 | 10.4 | 10.364 | 10.46 | 0.631 | 6.1 |
| H3 | Ni | µg/l | 34 | 0.5 | 0.592 | 0.54 | 0.175 | 29.5 |
| H4 | Ni | µg/l | 34 | 1.2 | 1.175 | 1.198 | 0.137 | 11.6 |
| H1 | Zn | µg/l | 43 | 110 | 112.65 | 110.81 | 7.215 | 6.4 |
| H2 | Zn | µg/l | 43 | 115 | 117.897 | 115.77 | 7.706 | 6.5 |
| H3 | Zn | µg/l | 39 | 8 | 8.697 | 8.6 | 1.972 | 22.7 |
| H4 | Zn | µg/l | 37 | 9.5 | 10.391 | 10.06 | 1.482 | 14.3 |