**The mercury isotope composition of Arctic coastal seawater**

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Following pages contain supplementary data to the paper “Hg isotope ratios in Arctic seawater” and consist of the Tables S1- S3 and Figures S1 – S2.

Table S1. Sampling sites, coordinates, sampling depths, date and time of seawater sampling in the Arctic Ocean

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Location** | **Latitude** | **Longitude** | **Sampling depth (m)** | **Date** | **Time (UTC)** |
| 101 | 76°21.065 | 77°29.065 | 2 | 15-Aug-13 | 17:53 |
|  | 76°20.962 | 77°35.222 | 171 |  | 22:19 |
|  | 76°19.897 | 77°41.351 | 271 |  | 1:48 |
| 115 | 76°25.498 | 71°19.296 | 4 | 18-Aug-13 | 20:35 |
|  | 76°27.015 | 71°24.894 | 270 |  | 1:33 |
|  | 76°29.635 | 71°29.338 | 471 |  | 5:16 |
| 117 | 77°17.471 | 77°0.498 | 2 | 28-Aug-13 | 18:27 |
|  | 77°19.441 | 77°0.935 | 225 |  | 21:32 |
|  | 77°19.442 | 77°0.770 | 441 |  | 1:43 |
| 126 | 77°20.580 | 73°25.660 | 3 | 27-Aug-13 | 3:22 |
|  | 77°20.708 | 73°25.704 | 162 |  | 5:33 |
|  | 77°20.505 | 73°25.577 | 320 |  | 8:14 |
| 132 | 78°59.446 | 72°6.008 | 2 | 20-Aug-13 | 4:36 |
|  | 78°59.687 | 72°15.422 | 115 |  | 7:39 |
|  | 78°59.056 | 72°5.740 | 215 |  | 10:15 |
| 253a | 79°17.651 | 71°17.758 | 2 | 25-Aug-13 | 4:25 |
|  | 79°17.693 | 71°17.924 | 93 |  | 7:59 |
|  | 79°17.653 | 71°17.760 | 173 |  | 9:54 |
| 304 | 74°15.040 | 91°28.205 | 2 | 31-Aug-13 | 4:53 |
|  | 74°14.968 | 91°27.476 | 161 |  | 7:12 |
|  | 74°15.545 | 91°28.765 | 310 |  | 8:53 |
| 323 | 74°9.482 | 80°28.400 | 4 | 13-Aug-13 | 17:00 |
|  | 74°9.458 | 80°27.308 | 375 |  | 1:35 |
|  | 74°10.103 | 80°28.098 | 781 |  | 5:57 |

Table S2. Results of blank samples, for detailed description see paragraph 2.6 of main manuscript

|  |  |  |
| --- | --- | --- |
| **Sample** | **Description** | **γ (ng/L)** |
| Blank | Lab DW, analysis prior to sampling | 0.11 ± 0.13 |
| Field blank 1 | Lab DW, shipped with samples, analysis after sampling | 0.41 ± 0.05 |
| Field blank 2 |  | 0.13 ± 0.05 |
| Field blank 3 |  | 0.39 ± 0.05 |
| BrCl – 1 | Ship BrCl + lab DW, analysis after sampling | 0.30 ± 0.04 |
| BrCl – 2 |  | 0.19 ± 0.05 |
| BrCl – 3 |  | 0.19 ± 0.05 |
| BrCl – 4 |  | 0.20 ± 0.04 |
| BrCl – 5 |  | 0.24 ± 0.05 |
| BrCl – 6 |  | 0.39 ± 0.4 |
| BrCl – 1 | Ship BrCl + ship DW, analysis after sampling | 0.29 ± 0.04 |
| BrCl – 3 |  | 0.17 ± 0.05 |
| BrCl – 6 |  | 0.19 ± 0.05 |
| Carboy field blank | Ship DW, analysis after sampling | < 0.1 |
| Resin blank | Hg elution from cleaned resins prior to sampling | 0.04a |
| Resin field blank 1 | Hg elution from cleaned resins after sampling | 0.32a |
| Resin field blank 2 |  | 0.44a |
| Resin field blank 3 |  | 0.05a |
| Unused column 1 | Hg elution from cleaned resins after sampling | 0.05a |
| Unused column 2 |  | 0.08a |

a units for resins are ng of Hg

Table S3. Results of total Hg and Hg isotope ratio measurements for the Arctic Ocean seawater samples and reference UM-Almadén Hg solution with ± 2SD.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Station** | **Depth (m)** | **γHg (ng/L)** | **Pre-conc.** | **δ199Hg (‰)** | **δ200Hg (‰)** | **δ 201Hg (‰)** | **δ202Hg (‰)** | **Δ199Hg (‰)** | **Δ200Hg (‰)** | **Δ201Hg (‰)** |
| 101 | 2 | 0.45 ± 0.05 | Ship | -0.35 | -1.07 | -1.56 | -2.33 | 0.23 | 0.10 | 0.19 |
|  | 171 | 0.53 ± 0.05 | Ship | -0.47 | -1.14 | -1.70 | -2.51 | 0.16 | 0.12 | 0.19 |
|  | 271 | 0.37 ± 0.05 | Ship | -0.41 | -1.12 | -1.62 | -2.46 | 0.21 | 0.12 | 0.23 |
| 115 | 4 | 0.47 ± 0.05 | Ship | -0.35 | -1.15 | -1.71 | -2.54 | 0.28 | 0.12 | 0.20 |
|  | 270 | 0.54 ± 0.05 | Ship | -0.38 | -1.03 | -1.61 | -2.41 | 0.22 | 0.18 | 0.20 |
|  | 471 | 0.47 ± 0.05 | Ship | -0.43 | -1.18 | -1.67 | -2.46 | 0.19 | 0.06 | 0.18 |
| 117 | 2 | 0.20 ± 0.03 | Lab | 0.02 | 0.20 | -0.07 | -0.60 | 0.17 | 0.50 | 0.38 |
|  | 225 | 0.11 ± 0.06 | Lab | -0.31 | -0.25 | -0.89 | -1.37 | 0.04 | 0.44 | 0.14 |
|  | 441 | 0.14 ± 0.05 | Lab | -0.47 | -0.33 | -1.19 | -1.48 | -0.09 | 0.42 | -0.08 |
| 126 | 3 | 0.51 ± 0.05 | Ship | -0.09 | -0.51 | -0.93 | -1.22 | 0.21 | 0.11 | -0.01 |
|  | 162 | 0.46 ± 0.05 | Ship | -0.16 | -0.45 | -0.64 | -1.10 | 0.12 | 0.11 | 0.19 |
|  | 320 | Empty | Ship |  |  |  |  |  |  |  |
| 132 | 2 | 0.55 ± 0.05 | Ship | -0.24 | -1.12 | -1.66 | -2.43 | 0.37 | 0.10 | 0.17 |
|  | 115 | 0.31 ± 0.06 | Ship | -0.58 | -1.38 | -1.85 | -2.85 | 0.13 | 0.05 | 0.29 |
|  | 215 | 0.46 ± 0.05 | Ship | -0.41 | -1.32 | -1.93 | -2.79 | 0.29 | 0.08 | 0.17 |
| 253a | 2 | 0.43 ± 0.05 | Ship | -0.13 | -0.49 | -0.72 | -1.21 | 0.18 | 0.12 | 0.19 |
|  | 93 | Empty | Ship |  |  |  |  |  |  |  |
|  | 173 | Empty | Ship |  |  |  |  |  |  |  |
| 304 | 2 | 0.25 ± 0.05 | Lab | -0.24 | -0.23 | -0.24 | -0.87 | -0.02 | 0.20 | 0.41 |
|  | 161 | 0.18 ± 0.07 | Lab | -0.44 | -0.19 | -0.74 | -0.98 | -0.19 | 0.30 | 0.00 |
|  | 310 | 0.11 ± 0.06 | Lab | -0.51 | -0.21 | -1.31 | -1.35 | -0.17 | 0.47 | -0.30 |
| 323 | 4 | 0.63 ± 0.05 | Ship | -0.19 | -0.22 | -0.86 | -1.47 | 0.18 | 0.52 | 0.24 |
|  | 375 | 0.57 ± 0.05 | Ship | -0.22 | -0.43 | -1.03 | -1.62 | 0.19 | 0.39 | 0.18 |
|  | 781 | 0.63 ± 0.05 | Ship | -0.23 | -0.61 | -1.17 | -1.80 | 0.23 | 0.29 | 0.18 |
|  |  |  |  |  |  |  |  |  |  |  |
| UM-Almadén (n = 9) | – | – | – | -0.21 ± 0.05 | -0.33 ± 0.09 | -0.39 ± 0.18 | -0.54 ± 0.07 | -0.08 ± 0.05 | -0.06 ± 0.11 | 0.01 ± 0.14 |



Fig. S1. Depth versus absolute salinity for the sampling sites



Fig. S2. Depth versus temperature for the sampling sites