**Appendix**

Table 1S Measured concentrations of compounds in gas phase.

|  |  |  |  |
| --- | --- | --- | --- |
| Solution | Sample | Time | Concentration [µmol/L] |
|  |  |  | [day] | CO | CH4 | C2H2 | C2H4 | C2H6 | C3H6 | C3H8 | iso-C4H10 | n-C4H10 | H2 |
| NaOH | Blank |  | 24 | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. |
|  | Type 304L | 1 | 25 | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | 55 |
|  |  | 2 | 25 | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | 54 |
|  |  | 3 | 25 | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | 83 |
|  | Type 316L | 1 | 28 | N.D. | N.D. | N.D. | N.D. | <0.07 | N.D. | N.D. | N.D. | N.D. | 403 |
|  |  | 2 | 28 | N.D. | N.D. | N.D. | <0.04 | <0.07 | N.D. | N.D. | N.D. | N.D. | 310 |
|  |  | 3 | 28 | N.D. | N.D. | N.D. | N.D. | <0.07 | N.D. | N.D. | N.D. | N.D. | 303 |
| HCl | Blank |  | 21 | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | 7 |
|  | Type 304L | 1 | 22 | N.D. | N.D. | N.D. | N.D. | <0.07 | N.D. | N.D. | N.D. | N.D. | 2068 |
|  |  | 2 | 22 | N.D. | N.D. | N.D. | <0.04 | 0.142 | <0.09 | N.D. | N.D. | N.D. | 1964 |
|  |  | 3 | 22 | N.D. | N.D. | N.D. | N.D. | <0.07 | N.D. | N.D. | N.D. | N.D. | 1786 |
|  | Type 316L | 1 | 23 | N.D. | N.D. | N.D. | N.D. | <0.07 | N.D. | N.D. | N.D. | N.D. | 326 |
|  |  | 2 | 23 | N.D. | N.D. | N.D. | <0.04 | 0.08 | N.D. | N.D. | N.D. | N.D. | 279 |
|  |  | 3 | 23 | N.D. | N.D. | N.D. | N.D. | 0.08 | N.D. | N.D. | N.D. | N.D. | 319 |

The LOQ and LOD of the above compounds are as follows: CO (carbon monoxide, LOQ = 0.62 µmol/L, LOD = 0.19 µmol/L), CH4 (methane, LOQ = 1.08 µmol/L, LOD = 0.32 µmol/L), C2H2 (ethyne, LOQ = 0.04 µmol/L, LOD = 0.01 µmol/L), C2H4 (ethene, LOQ = 0.04 µmol/L, LOD = 0.01 µmol/L), C2H6 (ethane, LOQ = 0.07 µmol/L, LOD = 0.02 µmol/L), C3H6 (propene, LOQ = 0.37 µmol/L, LOD = 0.11 µmol/L), C3H8 (propane, LOQ = 0.09 µmol/L, LOD = 0.03 µmol/L), iso-C4H10 (methylpropane, LOQ = 0.67 µmol/L, LOD = 0.20 µmol/L), n-C4H10 (butane, LOQ = 0.61 µmol/L, LOD = 0.18 µmol/L) and H2 (hydrogen, LOQ = 0.95 µmol/L, LOD = 0.28 µmol/L).

Table 2S Measured concentrations of elements in liquid phase.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Solution | Sample | Time | pH | Eh | DO | Concentration [µmol/L] |
|  |  |  | [day] |  | [mV/SHE] | [mg/L] | Si | Cr | Mn | Fe | Ni | Mo |
| NaOH | Blank | Unfiltered | 24 | 11.71 | 201 | 0.01 | 490 | 0.25 | N.D. | N.D. | <0.07 | 0.17 |
|  |  | Filtered | 24 | 11.72 | 188 | 0.00 | 486 | 0.26 | N.D. | N.D. | <0.07 | 0.17 |
|  | 304L | Unfiltered | 25 | 10.39 | 165 | 0.00 | 5105 | 34.40 | 4.90 | 50.13 | 2.38 | <0.02 |
|  |  | Filtered | 25 | 10.40 | 223 | 0.00 | 4874 | 10.16 | 1.18 | 9.22 | 0.50 | <0.02 |
|  | 316L | Unfiltered | 28 | 10.38 | 158 | 0.00 | 5014 | 52.34 | 8.40 | 85.77 | 5.15 | 11.37 |
|  |  | Filtered | 28 | 10.38 | 215 | 0.00 | 5048 | 13.54 | 1.55 | 15.48 | 0.89 | 10.81 |
| HCl | Blank | Unfiltered | 21 | 2.36 | 712 | 0.03 | 26 | 0.31 | N.D. | 1.81 | N.D. | N.D. |
|  |  | Filtered | 21 | 2.36 | 716 | 0.03 | 39 | 0.18 | N.D. | 1.40 | N.D. | N.D. |
|  | 304L | Unfiltered | 22 | 4.38 | 248 | 0.04 | 882 | 1.96 | 18.55 | 2130.90 | 186.99 | 0.42 |
|  |  | Filtered | 22 | 4.65 | 313 | 0.05 | 885 | 0.70 | 18.36 | 2122.39 | 190.01 | 0.40 |
|  | 316L | Unfiltered | 23 | 4.93 | 205 | 0.04 | 1047 | 1.25 | 38.02 | 2088.37 | 163.31 | 1.16 |
|  |  | Filtered | 23 | 5.04 | 309 | 0.04 | 1040 | 0.71 | 38.32 | 2031.07 | 162.07 | 1.14 |

The LOQ and LOD of the above elements are as follows: Si (LOQ = 0.21 µmol/L, LOD = 0.06 µmol/L), Cr (LOQ = 0.02 µmol/L, LOD = 0.01 µmol/L), Mn (LOQ = 0.05 µmol/L, LOD = 0.02 µmol/L), Fe (LOQ = 0.18 µmol/L, LOD = 0.05 µmol/L), Ni (LOQ = 0.07 µmol/L, LOD = 0.02 µmol/L) and Mo (LOQ = 0.02 µmol/L, LOD = 0.01 µmol/L).

Table 3S Measured concentrations of carbon compounds in liquid phase.

|  |  |  |  |
| --- | --- | --- | --- |
| Solution | Sample | Time | Concentration [µmol-C/L] |
|  |  |  | [day] | CH­3OH | C2H5OH | HCOOH | CH3COOH | (COOH)2 | HCHO | CH3CHO | TC | IC | TOC |
| NaOH | Blank | Unfiltered | 24 | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | N.D. | <27.86 | N.D. | － |
|  |  | Filtered | 24 | N.D. | N.D. | N.D. | N.D. | N.D. | <0.15 | <0.20 | <27.86 | N.D. | － |
|  | 304L | Unfiltered | 25 | N.D. | N.D. | 0.87 | 2.74 | 1.55 | <0.15 | <0.20 | 231.14 | N.D. | 231.14 |
|  |  | Filtered | 25 | N.D. | N.D. | 0.96 | 2.54 | 1.59 | <0.15 | <0.20 | 52.29 | N.D. | 52.29 |
|  | 316L | Unfiltered | 28 | N.D. | N.D. | 1.16 | 3.62 | 1.43 | <0.15 | <0.20 | 251.29 | N.D. | 251.29 |
|  |  | Filtered | 28 | N.D. | N.D. | 1.64 | 4.84 | 1.50 | <0.15 | <0.20 | 61.78 | N.D. | 61.78 |
| HCl | Blank | Unfiltered | 21 | N.D. | N.D. | 0.42 | N.D. | N.D. | <0.15 | N.D. | N.D. | N.D. | － |
|  |  | Filtered | 21 | N.D. | N.D. | 0.42 | N.D. | <0.66 | <0.15 | N.D. | N.D. | N.D. | － |
|  | 304L | Unfiltered | 22 | N.D. | N.D. | 31.85 | 17.58 | N.D. | N.D. | N.D. | 66.86 | N.D. | 66.86 |
|  |  | Filtered | 22 | <6.43 | N.D. | 21.21 | 8.71 | <0.66 | N.D. | N.D. | 35.05 | N.D. | 35.05 |
|  | 316L | Unfiltered | 23 | N.D. | N.D. | 14.11 | 6.03 | N.D. | <0.15 | N.D. | 61.53 | N.D. | 61.53 |
|  |  | Filtered | 23 | <6.43 | <17.51 | 10.48 | 4.84 | N.D. | <0.15 | N.D. | 36.13 | N.D. | 36.13 |

The LOQ and LOD of the above compounds are as follows: CH3OH (methanol, LOQ = 6.43 µmol-C/L, LOD = 1.93 µmol-C/L), C2H5OH (ethanol, LOQ = 17.51 µmol-C/L, LOD = 5.25 µmol-C/L), HCOOH (formic acid, LOQ = 0.35 µmol-C/L, LOD = 0.11 µmol-C/L), CH3COOH (acetic acid, LOQ = 1.34 µmol-C/L, LOD = 0.40 µmol-C/L), (COOH)2 (oxalic acid, LOQ = 0.66 µmol-C/L, LOD = 0.20 µmol-C/L), HCHO (formaldehyde, LOQ = 0.15 µmol-C/L, LOD = 0.04 µmol-C/L), CH3CHO (acetaldehyde, LOQ = 0.20 µmol-C/L, LOD = 0.06 µmol-C/L), TC (total carbon, LOQ = 27.86 µmol-C/L, LOD = 8.36 µmol-C/L) and IC (inorganic carbon, LOQ = 9.38 µmol-C/L, LOD = 2.81 µmol-C/L)

The TOC (total organic carbon) concentration was calculated by subtracting the IC concentration from the TC concentration. Note that TC and IC concentrations under the LOD were defined as zero.