**Table S1:** AMS results of all presented samples with their respective errors and masses.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Pure gases** | |  |  |  |  |
| **14C-free CH4** | **Sample ID** | **Standard type** | **F14CS** | **±** | **mS [µg C]** |
|  | 7108.0.0.6a | Blank Gas | 0.0091 | 0.0007 | 45 |
|  | 7108.0.0.6b | Blank Gas | 0.0092 | 0.0011 | 31 |
|  | 7108.0.0.6c | Blank Gas | 0.0014 | 0.0005 | 49 |
|  | 7108.0.0.6d | Blank Gas | 0.0046 | 0.0006 | 48 |
|  | 7108.0.0.6e | Blank Gas | 0.0048 | 0.0006 | 49 |
|  | 7108.0.0.5a | Blank Gas | 0.0033 | 0.0019 | 10 |
|  | 7108.0.0.5b | Blank Gas | 0.0008 | 0.0017 | 10 |
|  | 7108.0.0.5c | Blank Gas | 0.0018 | 0.0019 | 10 |
|  | 7108.0.0.5d | Blank Gas | -0.0004 | 0.0016 | 19 |
|  | 7108.0.0.5e | Blank Gas | 0.0023 | 0.0016 | 19 |
|  | 7108.0.0.5f | Blank Gas | 0.0005 | 0.0016 | 17 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  | |
| **Ox-II** | **Sample ID** | **Standard type** | **F14CS** | **±** | | **mS [µg C]** |
|  | 1002.1.0.84a | Ox-II | 1.3188 | 0.0107 | 46 | |
|  | 1002.1.0.84b | Ox-II | 1.3455 | 0.0166 | 17 | |
|  | 1002.1.0.85 | Ox-II | 1.3242 | 0.0113 | 41 | |
|  | 1002.1.0.86a | Ox-II | 1.3357 | 0.0118 | 29 | |
|  | 1002.1.0.92a | Ox-II | 1.3213 | 0.0173 | 10 | |
|  | 1002.1.0.92b | Ox-II | 1.3486 | 0.0175 | 10 | |
|  | 1002.1.0.92c | Ox-II | 1.3457 | 0.0149 | 12 | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Gas mixtures** | |  |  |  |  |
| **14C-free CH4:Ox-II CO2** | **Sample ID** | **Standard type** | **F14CS** | **±** | **mS [µg C]** |
|  | 7108.1.0.3a | Blank Gas | 0.0041 | 0.0010 | 45 |
|  | 7108.1.0.3c | Blank Gas | 0.0230 | 0.0014 | 49 |
|  | 7108.1.0.3d | Blank Gas | 0.0023 | 0.0006 | 56 |
|  | 7108.1.0.3e | Blank Gas | 0.0021 | 0.0006 | 50 |
|  | 7108.1.0.2e | Blank Gas | 0.0051 | 0.0006 | 23 |
|  | 7108.1.0.1a | Blank Gas | 0.0066 | 0.0018 | 31 |
|  | 7108.1.0.1c | Blank Gas | 0.0066 | 0.0021 | 37 |
|  | 7108.1.0.1e | Blank Gas | 0.0008 | 0.0006 | 32 |
|  | 7108.1.0.4a | Blank Gas | 0.0032 | 0.0019 | 50 |
|  | 7108.1.0.4b | Blank Gas | 0.0031 | 0.0020 | 46 |
|  | 7108.1.0.4c | Blank Gas | 0.0080 | 0.0028 | 51 |
|  | 7108.1.0.4d | Blank Gas | 0.0081 | 0.0021 | 47 |
|  | 7108.1.0.4e | Blank Gas | 0.0035 | 0.0020 | 47 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |
| **Biogas** | **Sample ID** | **Standard type** | **F14CS** | **±** | **mS [µg C]** |
|  | 7109.1.0.1a | Modern | 0.9703 | 0.0116 | 49 |
|  | 7109.1.0.1b | Modern | 0.9915 | 0.0132 | 44 |
|  | 7109.1.0.1c | Modern | 0.9909 | 0.0131 | 49 |
|  | 7109.1.0.1e | Modern | 0.9920 | 0.0068 | 50 |
|  | 7109.1.0.2a | Modern | 1.0002 | 0.0216 | 34 |
|  | 7109.1.0.2b | Modern | 0.9678 | 0.0234 | 19 |
|  | 7109.1.0.2c | Modern | 0.9883 | 0.0211 | 36 |
|  | 7109.1.0.2d | Modern | 0.9675 | 0.0110 | 28 |
|  | 7109.1.0.2e | Modern | 0.9814 | 0.0209 | 36 |