Table 1. List of studied seep carbonates, sample locations, and remarks describing the samples and where they were collected; GC = gravity core; cmbsf = centimetres below seafloor.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name  | Sample ID | Location | Water depth(m) | Coordinates | Remarks |
|  S-1 | HH 1029 | Storfjordrenna  | 378 | 76.1069 °N 15. 9679 °E | Seabed crust at the seafloor |
|  S-2 | HH1077 | Storfjordrenna  | 378 | 76.1070 °N 15. 9694 °E | Seabed crust at the seafloor |
|  S-3 | 1520GC | Storfjordrenna  | 380 | 76. 1057 °N 15. 9661 °E | Weakly lithified nodular at sediment depth of 282 cmbsf |
| V-1 | P1606002 | Vestnesa Ridge  | 1204 | 79.0026 °N 6.9213 °E | Seabed crust at the seafloor (P002 in Fig.1) |
| V-2 | P1606011 | Vestnesa Ridge  | 1207 | 79.0076 °N 6.8993 °E | Seabed crust at the seafloor (P011 in Fig.1) |
| V-3 | P1606012 | Vestnesa Ridge  | 1207 | 79.0077 °N 6.8992 °E | Seabed crust at the seafloor (P012 in Fig.1) |
|  V-4 | GeoB21616-1-2R-1E | Vestnesa Ridge | 1210 | 79.0069 °N 6.9041 °E | Cored crust from MeBo core 127 at sediment depth of ~590 - 595 cmbsf (Mebo 127 in Fig. 1) |

Table 2. Mineralogical compositions (weight-%) of the carbonates; Mg-calcite = magnesium-calcite.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| name | Sample ID | Aragonite  | Mg-calcite  | Dolomite  | Quartz | Plagioclase |
| S-1 | HH 1029  | 55 | 23 |  | 10 | 3 |
| S-2 | HH 1077  | 75 | 10 |  | 7 | 2 |
| S-3 | 1520GC  |  | 60 | 1 | 23 | 4 |
| V-1 | P1606002  | 61 | 11 | Trace | 12 | 5 |
| V-2 | P1606011  | 40 | 2 |  | 23 | 11 |
| V-3 | P1606012  | 70 |  |  |  |  |
| V-4 | Mebo 127  | 77 | 2 |  | 10 | 4 |

Table 3. Lipid biomarker concentrations and compound-specific 13C values. (FA: fatty acids; PMI: pentamethyleicosane; Ar: archaeol; OH-Ar: sn2-hydroxylarchaeol; n.d.: not determined, content too low for accurate analysis)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | HH 1029 (S-1) | HH 1077 (S-2) | 1520GC (S-3) | P1606002 (V-1) | P1606011 (V-2) | P1606012 (V-3) | Mebo 127 (V-4) |
| Concentration (g/g carbonate) | 13C (‰) | Concentration (g/g carbonate) | 13C (‰) | Concentration (g/g carbonate) | 13C (‰) | Concentration (g/g carbonate) | 13C (‰) | Concentration (g/g carbonate) | 13C (‰) | Concentration (g/g carbonate) | 13C (‰) | Concentration (g/g carbonate) | 13C (‰) |
| i-15-FA | 0.30 | -62 | 0.31 | -76 | 0.42 | -39 | 0.85 | -74 | 0.40 | -83 | 2.79 | -91 | 0.76 | -99 |
| ai-15-FA | 0.35 | -64 | 0.45 | -76 | 0.34 | -33 | 0.85 | -71 | 0.40 | -70 | 0.35 | -78 | 0.87 | -90 |
| Ar | 1.00 | -102 | 3.64 | -99 | 0.49 | -90 | 0.71 | -99 | 0.67 | -104 | 0.82 | -105 | 11.37 | -109 |
| OH-Ar | 0.16 | -95 | 0.94 | -101 | 0.07 | -93 | 0.13 | n.d. | 0.13 | -103 | 0.27 | -105 | 0.49 | -83 |
| 4methyl sterol | 0.04 | -45 | 0.14 | -57 | 0.29 | -64 | 0.02 | -52 | 0.03 | -46 | 0.02 | -61 | 0.16 | -108 |
| Diploptene | 0.08 | -54 | 0.36 | -52 | 0.15 | -46 | 0.17 | -51 | 0.18 | -52 | 0.15 | n.d. | 0.70 | -79 |
| crocetane | 0.36 | -97 | 1.65 | -105 | n.d. | n.d. | 0.30 | -99 | 0.47 | -103 | 0.05 | n.d. | 1.76 | -115 |
| PMI:0 | 0.07 | -91 | 0.20 | -96 | 0.09 |  | 0.03 |  | 0.05 | -100 | 0.03 | n.d. | 0.14 | -113 |
| OH-Ar/Ar | 0.2 | 0.3 | 0.1 | 0.2 | 0.2 | 0.3 | 0.04 |
| ai-15-FA/i-15-FA | 1.2 | 1.4 | 0.8 | 0.9 | 1.0 | 0.1 | 1.1 |
| 13C Ar-OH-Ar | -6 | 3 | 3 |  | -1 |  | -27 |