| **Sample number** | **subsampling number** | **altitude**  **(cf. log Fig.3)** | **δ13C(‰PDB)** | **δ18O(‰SMOW)** | **δ18O(‰PDB)** |
| --- | --- | --- | --- | --- | --- |
| **marl** | | | | | |
| 41 |  | 132 | 2.77 | 29.69 | -1.18 |
| 53 |  | 137 | 1.99 | 29.08 | -1.77 |
| 1 |  | 140 | 1.92 | 28.95 | -1.90 |
| 3 | 1 | 141 | -4.18 | 29.09 | -1.76 |
| 7 |  | 141 | -1.66 | 29.72 | -1.15 |
| 79 |  | 141 | 1.81 | 29.11 | -1.74 |
| 170 | 1 | 143 | -0.41 | 29.28 | -1.57 |
| 80 |  | 147 | 1.84 | 29.13 | -1.72 |
| 81 |  | 150 | 1.43 | 29.13 | -1.72 |
| 82 |  | 153.5 | 1.68 | 29.29 | -1.57 |
| 83 |  | 153.5 | 0.64 | 28.44 | -2.39 |
| 84 |  | 160 | -0.06 | 28.83 | -2.01 |
| 85 |  | 161 | -0.21 | 29.47 | -1.39 |
| 89 |  | 164.5 | -1.17 | 28.91 | -1.94 |
| 37 |  | 166.5 | 2.37 | 29.33 | -1.53 |
| 157 |  | 166.5 | -0.29 | 28.25 | -2.58 |
| 161 |  | 166.5 | -0.13 | 28.91 | -1.94 |
| 90 |  | 174 | 1.89 | 29.77 | -1.10 |
| 169 |  | 175.5 | 2.00 | 29.76 | -1.11 |
| 91 |  | 179.5 | 1.83 | 29.34 | -1.52 |
| 105 |  | 182 | 0.87 | 28.33 | -2.50 |
| 107 |  | 185 | 1.23 | 29.16 | -1.69 |
| 109 |  | 187 | 1.34 | 28.44 | -2.39 |
| 111 |  | 190 | 2.18 | 29.41 | -1.45 |
| 115 |  | 195 | 2.11 | 29.29 | -1.57 |
| 117 |  | 197 | 1.69 | 28.41 | -2.42 |
| 113 |  | 197.8 | 2.30 | 28.78 | -2.06 |
| 119 |  | 199 | -0.58 | 28.00 | -2.82 |
| 121 |  | 202 | 1.15 | 28.33 | -2.50 |
| 123 |  | 205 | 0.23 | 28.97 | -1.88 |
| 124 |  | 205 | 1.47 | 29.48 | -1.38 |
| 130 |  | 209 | 1.11 | 29.63 | -1.24 |
| 132 |  | 210.5 | 0.38 | 28.64 | -2.20 |
| 137 |  | 216 | 0.50 | 28.55 | -2.29 |
| **marl within a cluster of concretions** | | | | | |
| 8 |  | 141 | -1.65 | 29.63 | -1.24 |
| 14 |  | 151.5 | -6.38 | 29.44 | -1.42 |
| 15 | 1 | 151.5 | 0.88 | 29.21 | -1.65 |
| 16 | 1 | 151.5 | 1.27 | 29.42 | -1.44 |
| 17 | 2 | 151.5 | 0.65 | 29.18 | -1.67 |
| 18 |  | 151.5 | 0.88 | 29.19 | -1.67 |
| 19 |  | 151.5 | 1.01 | 29.63 | -1.24 |
| 20 |  | 151.5 | 1.53 | 29.36 | -1.50 |
| 21 | 1 | 151.5 | -6.90 | 29.46 | -1.40 |
| 22 | 1 | 151.5 | 1.52 | 29.29 | -1.57 |
| 23 | 1 | 151.5 | -0.56 | 28.85 | -1.99 |
| 24 |  | 151.5 | 1.37 | 28.88 | -1.97 |
| 25 |  | 151.5 | 1.03 | 29.17 | -1.68 |
| 26 | 1 | 151.5 | -2.91 | 29.62 | -1.25 |
| 27 | 1 | 151.5 | -3.17 | 29.64 | -1.23 |
| 28 | 1 | 151.5 | 1.05 | 29.40 | -1.46 |
| 29 |  | 151.5 | 1.05 | 28.99 | -1.86 |
| 30 | 1 | 151.5 | 1.02 | 29.33 | -1.53 |
| 31 | 1 | 151.5 | 1.38 | 29.20 | -1.66 |
| 32 | 1 | 151.5 | 1.04 | 29.22 | -1.64 |
| 33 | 1 | 151.5 | 0.32 | 28.95 | -1.90 |
| 34 |  | 151.5 | 1.30 | 29.26 | -1.60 |
| 87 | 1 | 163.2 | 1.26 | 29.29 | -1.57 |
| 158 |  | 166.5 | 0.76 | 29.25 | -1.61 |
| 162 |  | 166.5 | 1.12 | 29.34 | -1.52 |
| 164 |  | 166.5 | 1.64 | 29.41 | -1.45 |
| 67 |  | 170 | 1.22 | 29.44 | -1.42 |
| 68 | 1 | 170 | -4.82 | 29.37 | -1.49 |
| 69 |  | 170 | -0.47 | 28.90 | -1.95 |
| 72 |  | 170 | 0.71 | 29.39 | -1.47 |
| 74 |  | 170 | -0.58 | 28.97 | -1.88 |
| 75 |  | 170 | -0.45 | 29.18 | -1.67 |
| **limestone bed** | | | | | |
| 39 |  | 113 | 2.39 | 29.07 | -1.78 |
| 42 |  | 133 | 2.34 | 29.54 | -1.33 |
| 52 |  | 137 | -2.16 | 29.36 | -1.50 |
| 13 |  | 146.5 | 1.86 | 29.63 | -1.24 |
| 54 |  | 146.5 | 1.95 | 29.05 | -1.80 |
| 55 |  | 148 | 2.09 | 29.25 | -1.61 |
| 56 |  | 151.5 | 1.90 | 29.16 | -1.69 |
| 36 |  | 158 | 2.36 | 29.30 | -1.56 |
| 35 |  | 158 | 2.35 | 29.57 | -1.30 |
| 59 |  | 158 | 2.28 | 29.19 | -1.67 |
| 60 |  | 158 | 2.18 | 29.28 | -1.58 |
| 62 |  | 158 | 1.90 | 29.17 | -1.68 |
| 63 | 1 | 158 | 0.98 | 29.34 | -1.52 |
| 88 |  | 163.2 | 0.53 | 28.47 | -2.36 |
| 146 |  | 166.5 | 2.28 | 29.32 | -1.54 |
| 147 |  | 166.5 | 2.11 | 29.30 | -1.56 |
| 148 |  | 166.5 | 1.90 | 29.42 | -1.44 |
| 149 |  | 166.5 | 2.11 | 29.43 | -1.43 |
| 150 |  | 166.5 | 0.86 | 28.65 | -2.19 |
| 153 |  | 166.5 | 1.89 | 29.29 | -1.57 |
| 154 |  | 166.5 | 1.13 | 29.26 | -1.60 |
| 160 |  | 166.5 | 1.16 | 29.03 | -1.82 |
| 163 |  | 166.5 | 1.69 | 29.14 | -1.71 |
| 165 |  | 166.5 | 0.18 | 28.19 | -2.64 |
| 166 |  | 166.5 | 1.16 | 28.33 | -2.50 |
| 167 |  | 166.5 | 1.98 | 29.40 | -1.46 |
| 94 |  | 180.5 | 2.34 | 29.24 | -1.62 |
| 96 |  | 180.5 | 1.71 | 29.19 | -1.67 |
| 99 |  | 181 | 2.10 | 29.57 | -1.30 |
| 101 |  | 181 | 2.30 | 29.88 | -1.00 |
| 103 |  | 181.5 | 1.85 | 29.87 | -1.01 |
| 108 |  | 186.2 | 1.96 | 29.89 | -0.99 |
| 110 |  | 187.5 | 2.27 | 29.70 | -1.17 |
| 114 |  | 193.5 | 1.93 | 29.74 | -1.13 |
| 116 |  | 196.5 | 1.77 | 29.06 | -1.79 |
| 112 |  | 197.5 | 1.93 | 29.85 | -1.02 |
| 118 |  | 197.5 | 2.00 | 29.88 | -1.00 |
| 120 |  | 200.2 | 1.89 | 29.90 | -0.98 |
| 126 |  | 207 | 1.20 | 29.10 | -1.75 |
| 131 |  | 210 | -3.04 | 30.47 | -0.42 |
| 133 |  | 211 | -4.34 | 30.48 | -0.41 |
| 134 |  | 215 | 0.88 | 29.91 | -0.97 |
| 135 |  | 215.2 | -0.42 | 30.03 | -0.85 |
| 136 |  | 216 | -0.36 | 30.00 | -0.88 |
| 138 |  | 218 | 0.59 | 29.73 | -1.14 |
| 139 |  | 219 | -1.68 | 30.39 | -0.50 |
| 140 |  | 224 | 1.05 | 29.21 | -1.65 |
| 141 |  | 225 | 0.70 | 30.54 | -0.36 |
| 142 |  | 228 | 1.46 | 30.02 | -0.86 |
| 143 |  | 230 | 2.16 | 28.11 | -2.71 |
| 144 |  | 234 | 2.63 | 27.99 | -2.83 |
| 145 |  | 234 | 0.30 | 28.86 | -1.99 |
| **limestone ball** | | | | | |
| 92 |  | 180.5 | 2.05 | 29.82 | -1.05 |
| 93 |  | 180.5 | 2.15 | 29.76 | -1.11 |
| 95 |  | 180.5 | 2.20 | 29.81 | -1.06 |
| 98 |  | 180.5 | 2.22 | 29.42 | -1.44 |
| 100 |  | 181 | 2.12 | 29.84 | -1.03 |
| 102 |  | 181.5 | 1.92 | 29.82 | -1.05 |
| 104 |  | 181.5 | -3.07 | 30.37 | -0.52 |
| 106 |  | 182 | -1.83 | 30.22 | -0.67 |
| 122 |  | 204 | 2.09 | 30.12 | -0.76 |
| 125 |  | 207 | 1.30 | 30.17 | -0.71 |
| 129 |  | 207 | 1.29 | 29.98 | -0.90 |
| 127 |  | 210 | -1.02 | 30.25 | -0.64 |
| 128 |  | 211 | -1.93 | 30.34 | -0.55 |
| **limestone ball centred on a cluster of concretions** | | | | | |
| 66 | 1 | 170 | 1.11 | 29.37 | -1.49 |
| 70 | 1 | 170 | 1.31 | 29.40 | -1.46 |
| 71 |  | 170 | 0.15 | 29.30 | -1.56 |
| 73 | 1 | 170 | 1.03 | 29.05 | -1.80 |
| **nodule encased in marl** | | | | | |
| 43 |  | 135 | -24.38 | 30.78 | -0.12 |
| 44 |  | 135 | -25.21 | 30.50 | -0.39 |
| 46 |  | 135 | -25.95 | 30.73 | -0.17 |
| 47 |  | 136 | -31.02 | 30.85 | -0.05 |
| 48 |  | 136 | -28.76 | 30.76 | -0.14 |
| 49 |  | 137 | -24.05 | 30.61 | -0.29 |
| 50 |  | 137 | -38.33 | 30.85 | -0.05 |
| 51 | 1 | 137 | -24.85 | 30.69 | -0.21 |
| 51 | 2 | 137 | -27.80 | 30.90 | -0.01 |
| 51 | 3 | 137 | -28.06 | 30.74 | -0.16 |
| 51 | 4 | 137 | -32.87 | 30.94 | 0.03 |
| 51 | 5 | 137 | -32.39 | 30.88 | -0.03 |
| 51 | 6 | 137 | -5.23 | 29.73 | -1.14 |
| 3 | 2 | 141 | -32.83 | 30.63 | -0.27 |
| 3 | 3 | 141 | -35.22 | 30.74 | -0.16 |
| 3 | 4 | 141 | -35.71 | 30.85 | -0.05 |
| 4 | 1 | 141 | -19.21 | 29.92 | -0.96 |
| 4 | 2 | 141 | -28.16 | 30.37 | -0.52 |
| 4 | 3 | 141 | -31.39 | 30.57 | -0.33 |
| 6 |  | 141 | -30.28 | 30.58 | -0.32 |
| **nodule encased in a limestone ball** | | | | | |
| 2 | 1 | 141 | -19.40 | 29.67 | -1.20 |
| 2 | 2 | 141 | -19.73 | 30.16 | -0.72 |
| 2 | 3 | 141 | -30.88 | 30.58 | -0.32 |
| 2 | 4 | 141 | -29.72 | 30.81 | -0.09 |
| 2 | 5 | 141 | -30.84 | 30.67 | -0.23 |
| 2 | 6 | 141 | -28.05 | 30.65 | -0.25 |
| 2 | 7 | 141 | -29.29 | 30.61 | -0.29 |
| 2 | 8 | 141 | -13.27 | 29.82 | -1.05 |
| 2 | 9 | 141 | -7.25 | 28.65 | -2.19 |
| 5 | 1 | 141 | -8.67 | 29.68 | -1.19 |
| 5 | 2 | 141 | -17.74 | 30.17 | -0.71 |
| 5 | 3 | 141 | -11.41 | 30.06 | -0.82 |
| 5 | 4 | 141 | -8.86 | 29.82 | -1.05 |
| 5 | 5 | 141 | -14.36 | 30.29 | -0.60 |
| 5 | 6 | 141 | -9.12 | 30.04 | -0.84 |
| 5 | 7 | 141 | -25.60 | 30.70 | -0.20 |
| 5 | 8 | 141 | -20.88 | 30.34 | -0.55 |
| 15 | 2 | 151.5 | -30.64 | 30.41 | -0.48 |
| 16 | 2 | 151.5 | -29.49 | 30.42 | -0.47 |
| 17 | 1 | 151.5 | -19.14 | 29.99 | -0.89 |
| 18 | 2 | 151.5 | -31.98 | 30.43 | -0.46 |
| 21 | 2 | 151.5 | -8.06 | 29.67 | -1.20 |
| 22 | 2 | 151.5 | -25.69 | 30.35 | -0.54 |
| 23 | 2 | 151.5 | -36.58 | 30.39 | -0.50 |
| 26 | 2 | 151.5 | -28.58 | 30.01 | -0.87 |
| 27 | 2 | 151.5 | -22.84 | 30.23 | -0.66 |
| 28 | 2 | 151.5 | -28.09 | 30.36 | -0.53 |
| 30 | 2 | 151.5 | -35.01 | 30.61 | -0.29 |
| 31 | 2 | 151.5 | -30.29 | 30.44 | -0.45 |
| 32 | 2 | 151.5 | -27.27 | 30.59 | -0.31 |
| 33 | 2 | 151.5 | -31.58 | 30.38 | -0.51 |
| 87 | 2 | 163.2 | -24.35 | 29.58 | -1.29 |
| 65 | 2 | 170 | -21.43 | 30.02 | -0.86 |
| 66 | 2 | 170 | -13.70 | 29.88 | -1.00 |
| 68 | 2 | 170 | -25.05 | 29.41 | -1.45 |
| 70 | 2 | 170 | -30.28 | 30.59 | -0.31 |
| 70 | 3 | 170 | -35.26 | 30.65 | -0.25 |
| 73 | 2 | 170 | -24.80 | 30.20 | -0.69 |
| **cortex of tube** | | | | | |
| 170 | 2 | 143 | -35.98 | 30.64 | -0.26 |
| 170 | 3 | 143 | -36.67 | 30.93 | 0.02 |
| 170 | 4 | 143 | -37.39 | 30.85 | -0.06 |
| 171 |  | 145 | -32.22 | 30.64 | -0.26 |
| 172 |  | 145 | -35.61 | 30.53 | -0.36 |
| 173 | 1 | 151 | -33.98 | 30.62 | -0.26 |
| 174 | 1 | 158 | -27.87 | 29.25 | -1.60 |
| 175 |  | 164 | -27.67 | 29.97 | -0.91 |
| 176 |  | 175 | -30.64 | 30.37 | -0.65 |
| 177 |  | 172 | -21.87 | 30.24 | -0.06 |
| 178 |  | 172 | -25.84 | 30.26 | -0.63 |
| **geopetal infill of tube** | | | | | |
| 170 | 5 | 143 | -40.02 | 31.17 | 0.25 |
| 170 | 6 | 143 | 1.65 | 29.76 | -1.12 |
| 173 | 2 | 151 | 1.24 | 29.71 | -1.16 |
| 173 | 3 | 151 | -26.28 | 29.76 | -1.11 |
| 174 | 2 | 158 | -7.19 | 29.35 | -1.51 |
| 174 | 3 | 158 | -23.24 | 28.60 | -2.24 |
| 174 | 4 | 158 | -1.76 | 28.56 | -2.27 |
| 175 |  | 164 | -15.22 | 30.36 | -0.53 |
| 175 |  | 164 | -21.91 | 29.94 | -0.94 |
| 175 |  | 164 | -14.14 | 30.50 | -0.40 |
| **blocky sparite in tube** | | | | | |
| 173 | 4 | 151 | 1.88 | 28.96 | -1.89 |
| 174 | 5 | 158 | -0.49 | 26.24 | -4.53 |
| 175 |  | 164 | 1.57 | 29.21 | -1.65 |
| 176 |  | 175 | 0.71 | 29.69 | -1.18 |
| 177 |  | 172 | 1.46 | 30.24 | -0.65 |
| 170 | 7 | 143 | 9.41 | 29.26 | -1.60 |
| **sparite in compaction crack** | | | | | |
| 170 | 8 | 143 | 4.13 | 27.48 | -3.33 |
| **sparite in fault** | | | | | |
| 86 | 1 | 162 | -8.69 | 27.16 | -3.63 |
| 86 | 2 | 162 | -8.75 | 25.31 | -5.43 |
| 179 |  | 153 | -4.52 | 25.49 | -5.26 |
| 180 |  | 143 | 0.86 | 27.39 | -3.41 |