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Supplementary material

**Lowermost Jurassic dinosaur ecosystems from the Bleymard Strait (southern France): sedimentology, mineralogy, palaeobotany and palaeoichnology of the Dolomitic Formation**

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|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Samples** | **O** | **F** | **Na** | **Mg** | **Al** | **Si** | **P** | **S** | **Cl** | **K** | **Ca** | **Ti** | **Cr** | **Mn** | **Fe** | **Rb** | **Sr** | **Zr** | **Ba** | **Zn** | **Pb** | **Σ** |
| **BLS14** | 56.3 |  | T | 11.1 | 1.6 | 4.7 | T | T | T | 0.7 | 23.1 | T |  | 0.3 | 2.0 |  | T |  |  |  |  | 99.8 |
| **BLS13** | 55.7 | 0.4 | T | 10.9 | 2.1 | 4.9 | T | T | T | 0.7 | 23.3 | T |  | 0.2 | 1.6 |  | T |  |  |  |  | 99.7 |
| **BLS12** | 56.2 |  |  | 11.7 | 1.1 | 2.9 | T | T | T | 0.3 | 25.1 | T |  | 0.3 | 2.2 |  | T |  |  |  |  | 99.8 |
| **BLS11** | 51.1 | 0.7 | 0.1 | 2.2 | 11.4 | 23.7 | T | T |  | 5.0 | 2.0 | 0.6 | T | T | 3.1 | T | T | T | T |  | T | 99.8 |
| **BLS10** | 56.1 |  | T | 11.6 | 0.3 | 0.8 | T | T | T | 0.1 | 26.4 | T |  | 0.5 | 4.1 |  |  |  | T |  |  | 99.9 |
| **BLS9** | 55.2 | 0.3 | T | 9.7 | 2.2 | 6.8 | T | 0.2 | T | 0.6 | 22.4 | 0.1 |  | 0.2 | 2.0 |  |  | T |  |  |  | 99.8 |
| **BLS8** | 55.8 |  | T | 9.6 | 1.0 | 3.0 | T | T | T | 0.3 | 24.1 | T |  | 0.6 | 5.3 |  |  |  | T | T |  | 99.7 |
| **BLS7** | 54.0 | 0.5 | T | 8.3 | 3.2 | 8.2 | T | 0.2 | T | 1.0 | 21.8 | 0.1 |  | 0.3 | 2.3 |  |  |  |  | T |  | 99.8 |
| **BLS6** | 56.9 |  | T | 12.8 | 0.4 | 1.0 |  | T | T | 0.1 | 26.3 | T |  | 0.3 | 2.1 |  |  |  |  |  |  | 99.9 |
| **BLS5** | 51.0 | 0.7 | 0.1 | 1.5 | 11.9 | 24.3 | T | 1.1 |  | 5.1 | T | 0.6 | T | T | 3.4 | T | T | T | T |  |  | 99.8 |
| **BLS4** | 55.3 |  | T | 12.1 | 0.4 | 1.2 |  | T | T | 0.1 | 27.5 | T |  | 0.4 | 2.7 |  |  |  |  | T |  | 99.8 |
| **BLS3** | 56.1 |  | T | 9.7 | 2.0 | 4.9 | T | T | T | 0.4 | 22.6 | T |  | 0.3 | 3.6 |  |  |  |  | 0.1 | T | 99.7 |
| **BLS2** | 56.0 |  | T | 10.8 | 1.3 | 3.8 |  | 0.1 | T | 0.3 | 24.9 | T |  | 0.3 | 2.3 |  |  |  |  | T |  | 99.8 |
| **BLS1** | 56.4 |  | T | 11.7 | 1.0 | 2.1 | T | T | T | 0.2 | 25.4 | T |  | 0.4 | 2.7 |  |  |  |  | T |  | 99.8 |

Supplementary Table S1. Chemical composition of Bleymard samples obtained by XRF analyses; T for trace elements (content < 0.1 %).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Samples** | **Lithofacies** | **Calcite** | **Dolomite** | **Quartz** | **Rutile** | **Clay** |
| **BLS14** | F5 | 0.4 ± 0.9 | 88.6 ± 2.5 | 4.7 ± 0.6 | 0.5 ± 0.4 | 5.7 ± 2.3 |
| **BLS13** | F5 | 0.2 ± 1.3 | 90 ± 2.6 | 3.1 ± 0.6 | 0.4 ± 0.4 | 6.1 ± 2.3 |
| **BLS12** | F2 | 0.9 ± 0.3 | 94.5 ± 1.5 | 2.5 ± 0.4 | 0.4 ± 0.4 | 1.5 ± 1.4 |
| **BLS11** | F3 | 1.4 ± 1 | 7.4 ± 1.3 | 17 ± 1.3 | 1.9 ± 0.7 | 72 ± 2 |
| **BLS10** | F2 | 5.3 ± 0.9 | 93 ± 0.8 | 0.5 ± 1.9 | 0.8 ± 0.9 | 0.2 ± 0.9 |
| **BLS9** | F5 | 1.6 ± 2.5 | 86.8 ± 0.3 | 5.9 ± 0.7 | 0.6 ± 0.5 | 4.9 ± 2.4 |
| **BLS8** | F2 | 9.6 ± 0.7 | 84.6 ± 2.5 | 4.1 ± 1.3 | 0.4 ± 0.7 | 0.9 ± 2.4 |
| **BLS7** | F4 | 0 ± 0.2 | 86.1 ± 2.7 | 5.4 ± 0.7 | 0.5 ± 0.6 | 7.8 ± 2.7 |
| **BLS6** | F2 | 0.5 ± 0.5 | 97.9 ± 1.2 | 0.7 ± 0.5 | 0.4 ± 0.4 | 0.3 ± 0.8 |
| **BLS5** | F3 | 2.7 ± 1.8 | 3.2 ± 0.9 | 16.7 ± 2.3 | 1.7 ± 0.9 | 75.4 ± 0.7 |
| **BLS4** | F2 | 0.7 ± 0.9 | 96.9 ± 1.6 | 1.2 ± 0.5 | 0.4 ± 0.4 | 0.6 ± 1.2 |
| **BLS3** | F1 | 0.3 ± 0.6 | 90.4 ± 2.5 | 6 ± 0.6 | 0.5 ± 0.6 | 2.7 ± 2.5 |
| **BLS2** | F1 | 0.7 ± 1.8 | 94.6 ± 2.1 | 3.3 ± 0.5 | 0.3 ± 0.4 | 0.9 ± 1.1 |
| **BLS1** | F1 | 0.3 ± 0.9 | 97.1 ± 1.7 | 1.5 ± 0.7 | 0.5 ± 0.5 | 0.4 ± 1.2 |

Supplementary Table S2. Mineralogical composition of Bleymard samples obtained by XRD analyses (in weight %). Accuracy of the measurement is estimated by multiplying the goodness of fit (GOF) by the standard deviation given by Rietveld software.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Samples** | **Smectite** | **Illite** | **Kaolinite** | **Chlorite** | **Σ** |
| BLS14 | 0 | 99.6 | 0.3 | 0.1 | 100 |
| BLS13 | 0 | 99.9 | 0.0 | 0.1 | 100 |
| BLS12 | 0 | 97.3 | 2.7 | 0 | 100 |
| BLS11 | 0 | 99.9 | 0.1 | 0 | 100 |
| BLS10 | 0 | 96.5 | 3.5 | 0 | 100 |
| BLS9 | 0 | 99.5 | 0.4 | 0.1 | 100 |
| BLS8 | 0 | 92.1 | 7.9 | 0 | 100 |
| BLS7 | 0 | 97.1 | 2.6 | 0.3 | 100 |
| BLS6 | 0 | 94.3 | 5.7 | 0 | 100 |
| BLS5 | 0 | 98.2 | 1.3 | 0.5 | 100 |
| BLS4 | 0 | 96.3 | 3.7 | 0 | 100 |
| BLS3 | 0 | 82.4 | 17.6 | 0 | 100 |
| BLS2 | 0 | 87.2 | 12.8 | 0 | 100 |
| BLS1 | 0 | 77.0 | 23.0 | 0 | 100 |

Supplementary Table S3. Qualitative mineralogical composition of Bleymard < 2 µm decarbonated samples obtained by RIR method on XRD diffractograms (in weight %).

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**Supplementary Figure S1.** X-Ray diffractograms (oriented preparation of decarbonated clay fraction) of level 2 and level 11 samples. Three analytical conditions were performed on both samples: air dried, glycolated and after heating to 550°C.