**Sedimentary dynamics and developmental environment of loess-like Cretaceous red beds in Lanzhou basin, northwest China**

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**Introduction**

* Magnetic data (Table S1) and trace element data (Table S2)

Table S1. Magnetic data

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | ARM | SIRM | IRM-100 | IRM-300 | Hcr | χ | χfd% | L\* | a\* | b\* | KLY580-680 |
| 1 | 0.51 | 276.69 | 227.78 | 72.44 | 388.99 | 1.01 | 2.12 | 51.02 | 15.91 | 22.56 | 0.88 |
| 2 | 0.83 | 237.41 | 205.02 | 91.82 | 428.04 | 0.91 | 0.39 | 53.95 | 13.59 | 19.35 | 0.80 |
| 3 | 1.33 | 219.71 | 182.64 | 51.08 | 377.58 | 0.94 | 1.89 | 53.77 | 12.01 | 19.70 | 0.65 |
| 4 | 0.33 | 19.16 | 1.52 | -7.93 | 118.19 | 0.56 | 1.26 | 70.28 | 0.69 | 14.66 | 0.41 |
| 5 | 0.19 | 114.32 | 78.45 | 11.76 | 334.27 | 0.91 | 2.34 | 64.51 | 6.17 | 16.21 | 0.33 |
| 6 | 0.77 | 220.61 | 187.77 | 68.24 | 398.81 | 0.99 | 1.08 | 54.80 | 10.54 | 16.23 | 0.85 |
| 7 | 2.19 | 248.80 | 201.44 | 37.81 | 349.67 | 1.03 | 4.14 | 53.23 | 13.96 | 21.02 | 0.56 |
| 8 | 2.20 | 254.98 | 183.05 | -8.13 | 295.67 | 1.07 | 1.99 | 53.36 | 12.84 | 20.42 | 0.64 |
| 9 | 1.41 | 215.57 | 160.88 | -1.21 | 298.72 | 0.81 | 2.63 | 52.11 | 12.31 | 20.08 | 0.60 |
| 10 | 1.28 | 232.47 | 186.99 | 34.23 | 347.00 | 1.03 | 2.41 | 53.34 | 13.05 | 19.74 | 0.65 |
| 11 | 0.42 | 187.00 | 162.95 | 87.37 | 460.09 | 0.93 | 1.54 | 57.20 | 10.75 | 16.55 | 0.54 |
| 12 | 0.15 | 107.44 | 87.18 | 32.02 | 382.75 | 0.91 | 2.33 | 62.19 | 2.86 | 12.75 | 0.25 |
| 13 | 0.01 | 26.81 | 14.93 | -1.83 | 282.29 | 1.02 | 0.69 | 66.73 | 0.94 | 13.33 | 0.13 |
| 14 | 0.02 | 5.64 | -2.07 | -4.47 | 63.50 | 1.15 | 1.25 | 70.16 | -0.48 | 9.90 | 0.10 |
| 15 | 0.05 | 55.32 | 29.58 | -9.18 | 250.40 | 1.23 | 0.58 | 65.97 | 0.32 | 9.71 | 0.12 |
| 16 | 4.13 | 295.70 | 160.98 | -81.83 | 216.26 | 1.24 | 2.27 | 58.28 | 6.11 | 12.41 | 0.58 |
| 17 | 0.45 | 254.58 | 183.71 | -46.12 | 245.57 | 0.93 | 4.21 | 53.79 | 9.15 | 16.02 | 0.47 |
| 18 | 0.23 | 175.96 | 153.17 | 86.63 | 466.68 | 0.91 | 3.92 | 56.12 | 11.94 | 18.20 | 0.57 |
| 19 | 1.44 | 256.39 | 200.58 | 19.01 | 321.37 | 1.01 | 3.19 | 52.71 | 13.10 | 20.59 | 0.69 |
| 20 | 0.62 | 256.96 | 201.93 | 11.93 | 310.66 | 1.03 | 1.37 | 48.53 | 13.45 | 19.87 | 0.64 |
| 21 | 1.48 | 194.71 | 129.53 | 27.01 | 350.01 | 1.07 | 0.00 | 55.91 | 12.49 | 19.77 | 0.35 |
| 22 | 0.66 | 67.21 | 35.81 | -6.57 | 271.34 | 0.90 | 0.39 | 66.20 | 4.30 | 19.75 | 0.40 |
| 23 | 0.23 | 50.41 | 30.98 | -2.78 | 283.51 | 0.95 | 1.50 | 68.32 | 1.94 | 14.97 | 0.17 |
| 24 | 0.24 | 111.73 | 77.13 | 12.38 | 340.87 | 1.21 | 2.04 | 62.43 | 4.26 | 17.58 | 0.36 |
| 25 | 0.05 | 13.50 | 1.42 | -6.71 | 118.70 | 1.11 | 0.00 | 63.62 | 0.50 | 10.02 | 0.15 |
| 26 | 0.03 | 15.75 | -4.70 | -11.98 | 315.18 | 1.31 | 0.27 | 63.64 | -0.82 | 8.80 | 0.15 |
| 27 | 1.86 | 301.70 | 180.71 | -78.22 | 225.49 | 1.27 | 0.28 | 54.85 | 7.50 | 14.32 | 0.56 |
| 28 | 1.52 | 284.70 | 215.91 | -7.23 | 297.14 | 1.04 | 2.73 | 48.97 | 12.57 | 19.58 | 0.78 |

Table S2: trace element data (ppm)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element | UCC | red clays(averaged) | Gray clays(averaged) | Red red  (all sample averaged) |
| Cl |  | 4888.62 | 724.19 | 2955.14 |
| S |  | 543.89 | 584.92 | 562.94 |
| P |  | 493.11 | 477.85 | 486.03 |
| Ba  Bi | 550.00 | 565.28  9.00 | 1246.35  4.72 | 881.49  7.01 |
| Ce |  | 91.61 | 79.51 | 85.99 |
| Co | 10.00 | 30.07 | 24.35 | 27.42 |
| Cr | 35.00 | 126.69 | 82.86 | 106.34 |
| Cu | 25.00 | 33.82 | 77.11 | 53.92 |
| Hf | 5.80 | 5.47 | 5.12 | 5.30 |
| La |  | 43.26 | 42.25 | 42.79 |
| Mn |  | 954.21 | 982.83 | 967.50 |
| Nb | 25.00 | 17.55 | 17.91 | 17.72 |
| Nd |  | 39.63 | 48.18 | 43.60 |
| Ni |  | 46.03 | 39.73 | 43.10 |
| Pb | 20.00 | 18.29 | 11.66 | 15.64 |
| Rb | 112.00 | 162.69 | 146.59 | 155.22 |
| Sr | 350.00 | 462.28 | 526.68 | 492.18 |
| Ti |  | 3863.95 | 4122.62 | 3984.05 |
| Tl | 1.00 | 0.45 | 0.45 | 0.45 |
| V | 60.00 | 116.31 | 114.60 | 115.51 |
| W |  | 43.08 | 22.58 | 33.56 |
| Y | 22.00 | 22.17 | 22.55 | 22.35 |
| Zn | 52.00 | 99.55 | 97.17 | 98.44 |
| Zr | 190.00 | 186.70 | 187.53 | 187.09 |