**表2** 石竹山矿床多金属矿化矽卡岩中石榴石稀土元素组成（10-6）

**Table 2.** Rare earth element composition (10-6) of garnet in polymetallic mineralized skarns of the Shizhushan deposit

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **测试点** | **石榴子石类型** | **La** | **Ce** | **Pr** | **Nd** | **Sm** | **Eu** | **Gd** | **Tb** | **Dy** | **Ho** | **Er** | **Tm** | **Yb** | **Lu** |
| **10**-6 | **10**-6 | **10**-6 | **10**-6 | **10**-6 | **10**-6 | **10**-6 | **10**-6 | **10**-6 | **10**-6 | **10**-6 | **10**-6 | **10**-6 | **10**-6 |
| 24JX-168-Grt1-01 | Grt-1 | 0.03 | 0.68 | 0.41 | 5.4 | 4.2 | 0.03 | 4.6 | 0.81 | 4.7 | 0.80 | 1.9 | 0.26 | 1.6 | 0.18 |
| 24JX-168-Grt1-02 | Grt-1 | 0.02 | 0.37 | 0.27 | 4.5 | 4.8 | 0.03 | 6.7 | 1.3 | 8.0 | 1.4 | 3.4 | 0.47 | 2.8 | 0.31 |
| 24JX-168-Grt1-03 | Grt-1 | 0.02 | 0.40 | 0.30 | 4.6 | 5.2 | 0.03 | 7.3 | 1.5 | 8.7 | 1.6 | 3.8 | 0.52 | 3.2 | 0.37 |
| 24JX-168-Grt1-04 | Grt-1 | 0.05 | 1.2 | 0.64 | 7.4 | 6.2 | 0.04 | 7.9 | 1.5 | 9.3 | 1.6 | 3.9 | 0.55 | 3.3 | 0.40 |
| 24JX-168-Grt1-05 | Grt-1 | 0.02 | 0.29 | 0.20 | 3.2 | 3.6 | 0.02 | 4.7 | 0.92 | 5.7 | 1.0 | 2.5 | 0.36 | 2.1 | 0.23 |
| 24JX-168-Grt1-06 | Grt-1 | 0.01 | 0.16 | 0.15 | 2.8 | 4.2 | 0.05 | 6.4 | 1.3 | 8.1 | 1.5 | 3.7 | 0.53 | 3.2 | 0.40 |
| 24JX-168-Grt1-07 | Grt-1 | 0.03 | 0.72 | 0.50 | 6.6 | 7.1 | 0.04 | 11 | 2.5 | 17 | 3.4 | 9.3 | 1.4 | 8.9 | 1.1 |
| 24JX-168-Grt1-08 | Grt-1 | 0.16 | 1.4 | 0.83 | 10 | 7.4 | 0.04 | 9.5 | 2.0 | 13 | 2.5 | 6.5 | 0.96 | 6.0 | 0.70 |
| 24JX-168-Grt1-09 | Grt-1 | 0.04 | 0.38 | 0.25 | 4.1 | 5.6 | 0.02 | 8.8 | 1.9 | 13 | 2.7 | 6.9 | 1.0 | 6.4 | 0.75 |
| 24JX-168-Grt1-10 | Grt-1 | 0.02 | 0.29 | 0.21 | 3.6 | 3.7 | 0.03 | 5.8 | 1.3 | 7.6 | 1.4 | 3.5 | 0.50 | 3.3 | 0.37 |
| 24JX-168-Grt1-11 | Grt-1 | 0.14 | 1.4 | 0.66 | 7.4 | 5.2 | 0.03 | 5.5 | 0.98 | 5.9 | 1.1 | 2.4 | 0.32 | 2.0 | 0.25 |
| 24JX-168-Grt1-12 | Grt-1 | 0.03 | 0.49 | 0.35 | 4.7 | 4.0 | 0.03 | 4.8 | 0.85 | 4.9 | 0.86 | 2.1 | 0.28 | 1.6 | 0.20 |
| 24JX-168-Grt1-13 | Grt-1 | 0.02 | 0.43 | 0.29 | 4.3 | 3.9 | 0.02 | 4.9 | 0.94 | 5.5 | 0.92 | 2.2 | 0.30 | 1.8 | 0.20 |
| 24JX-168-Grt1-14 | Grt-1 | 0.05 | 0.30 | 0.17 | 2.4 | 2.5 | 0.02 | 3.4 | 0.69 | 4.1 | 0.80 | 1.9 | 0.26 | 1.7 | 0.20 |
| 24JX-168-Grt1-15 | Grt-1 | 0.03 | 0.28 | 0.18 | 3.0 | 3.0 | 0.01 | 3.5 | 0.68 | 4.0 | 0.68 | 1.7 | 0.23 | 1.5 | 0.18 |
| 24JX-168-Grt1-16 | Grt-1 | 0.07 | 1.5 | 0.79 | 7.5 | 4.7 | 0.03 | 5.3 | 0.97 | 5.6 | 0.99 | 2.3 | 0.33 | 1.9 | 0.25 |
| 24JX-168-Grt1-17 | Grt-1 | 0.08 | 1.8 | 0.92 | 9.0 | 7.1 | 0.05 | 9.7 | 2.2 | 15 | 3.0 | 7.9 | 1.2 | 7.3 | 0.84 |
| 24JX-168-Grt1-18 | Grt-1 | 0.03 | 0.45 | 0.31 | 4.5 | 5.4 | 0.03 | 8.6 | 1.9 | 13 | 2.6 | 6.7 | 0.99 | 6.2 | 0.76 |
| 24JX-168-Grt1-19 | Grt-1 | 0.05 | 0.80 | 0.49 | 6.4 | 6.6 | 0.04 | 8.8 | 1.6 | 9.0 | 1.5 | 3.5 | 0.47 | 2.8 | 0.33 |
| 24JX-168-Grt1-20 | Grt-1 | 0.04 | 0.73 | 0.42 | 5.2 | 5.1 | 0.03 | 7.0 | 1.4 | 7.7 | 1.3 | 3.1 | 0.41 | 2.5 | 0.30 |
| 24JX-181-Grt1-01 | Grt-1 | 0.00 | 0.03 | 0.01 | 0.09 | 0.25 | 0.00 | 0.77 | 0.27 | 2.6 | 0.82 | 3.2 | 0.70 | 6.3 | 0.99 |
| 24JX-181-Grt1-02 | Grt-1 | 0.02 | 0.04 | 0.01 | 0.11 | 0.30 | 0.02 | 1.4 | 0.70 | 8.5 | 2.7 | 10 | 2.0 | 17 | 2.4 |
| 24JX-181-Grt1-03 | Grt-1 | 0.01 | 0.06 | 0.03 | 0.33 | 0.68 | 0.01 | 2.1 | 0.78 | 9.0 | 2.9 | 11 | 2.3 | 19 | 2.8 |
| 24JX-181-Grt1-05 | Grt-1 | 0.03 | 0.05 | 0.02 | 0.39 | 0.75 | 0.01 | 2.3 | 0.81 | 7.6 | 2.0 | 6.8 | 1.2 | 9.4 | 1.3 |
| 24JX-181-Grt1-06 | Grt-1 | 0.01 | 0.05 | 0.02 | 0.26 | 0.43 | 0.03 | 1.9 | 0.81 | 8.5 | 2.5 | 8.8 | 1.7 | 14 | 2.0 |
| 24JX-181-Grt1-07 | Grt-1 | 0.01 | 0.05 | 0.02 | 0.14 | 0.33 | 0.02 | 1.7 | 0.78 | 8.5 | 2.4 | 8.2 | 1.5 | 12 | 1.6 |
| 24JX-181-Grt1-08 | Grt-1 | 0.00 | 0.05 | 0.02 | 0.21 | 0.35 | 0.02 | 1.3 | 0.62 | 6.8 | 2.0 | 7.7 | 1.5 | 13 | 1.8 |
| 24JX-181-Grt1-09 | Grt-1 | 0.02 | 0.09 | 0.05 | 0.62 | 0.85 | 0.02 | 2.8 | 1.2 | 13 | 4.0 | 15 | 3.0 | 24 | 3.6 |
| 24JX-181-Grt1-10 | Grt-1 | 0.03 | 0.16 | 0.08 | 1.0 | 1.5 | 0.02 | 4.0 | 1.4 | 14 | 4.0 | 15 | 2.9 | 24 | 3.6 |
| 24JX-181-Grt1-11 | Grt-1 | 0.01 | 0.03 | 0.02 | 0.19 | 0.44 | 0.01 | 1.5 | 0.65 | 7.4 | 2.3 | 8.9 | 1.8 | 15 | 2.2 |
| 24JX-181-Grt1-12 | Grt-1 | 0.01 | 0.03 | 0.01 | 0.10 | 0.24 | 0.01 | 1.3 | 0.68 | 8.8 | 2.8 | 11 | 2.2 | 18 | 2.6 |
| 24JX-181-Grt1-13 | Grt-1 | 0.02 | 0.05 | 0.01 | 0.15 | 0.31 | 0.01 | 1.3 | 0.70 | 9.0 | 3.1 | 13 | 2.6 | 23 | 3.2 |
| 24JX-181-Grt1-14 | Grt-1 | 0.01 | 0.05 | 0.02 | 0.20 | 0.41 | 0.01 | 1.6 | 0.92 | 12 | 4.1 | 17 | 3.6 | 31 | 4.4 |
| 24JX-181-Grt1-15 | Grt-1 | 0.05 | 0.13 | 0.03 | 0.28 | 0.59 | 0.01 | 2.3 | 0.95 | 10 | 3.2 | 12 | 2.5 | 20 | 3.0 |
| 24JX-181-Grt1-16 | Grt-1 | 0.02 | 0.09 | 0.03 | 0.35 | 0.85 | 0.01 | 3.6 | 1.6 | 19 | 6.2 | 25 | 5.2 | 43 | 6.4 |
| 24JX-181-Grt1-17 | Grt-1 | 0.01 | 0.07 | 0.03 | 0.26 | 0.47 | 0.01 | 2.1 | 1.1 | 13 | 4.1 | 16 | 3.2 | 26 | 3.6 |
| 24JX-181-Grt1-18 | Grt-1 | 0.01 | 0.06 | 0.02 | 0.34 | 0.71 | 0.01 | 3.0 | 1.3 | 15 | 5.1 | 21 | 4.7 | 41 | 6.1 |
| 24JX-181-Grt1-19 | Grt-1 | 0.01 | 0.06 | 0.03 | 0.31 | 0.86 | 0.03 | 3.4 | 1.4 | 15 | 4.4 | 17 | 3.4 | 28 | 4.2 |
| 24JX-181-Grt1-20 | Grt-1 | 0.01 | 0.03 | 0.01 | 0.18 | 0.43 | 0.00 | 1.8 | 0.70 | 7.4 | 2.3 | 8.8 | 1.8 | 15 | 2.4 |
| 24JX-168-Grt2-01 | Grt-2 | 159 | 326 | 36 | 126 | 29 | 0.46 | 23 | 3.8 | 21 | 4.0 | 9.9 | 1.6 | 11 | 1.6 |
| 24JX-168-Grt2-02 | Grt-2 | 229 | 463 | 49 | 169 | 38 | 0.80 | 30 | 4.5 | 24 | 4.1 | 9.7 | 1.4 | 9.5 | 1.3 |
| 24JX-168-Grt2-03 | Grt-2 | 24 | 29 | 2.8 | 11 | 6.4 | 0.22 | 11 | 2.9 | 22 | 5.1 | 16 | 2.9 | 22 | 3.4 |
| 24JX-168-Grt2-04 | Grt-2 | 37 | 47 | 4.1 | 13 | 4.2 | 0.24 | 5.7 | 1.4 | 10.0 | 2.3 | 7.0 | 1.3 | 10 | 1.5 |
| 24JX-168-Grt2-05 | Grt-2 | 79 | 161 | 15 | 49 | 12 | 0.29 | 12 | 2.7 | 18 | 4.0 | 12 | 2.1 | 16 | 2.5 |
| 24JX-168-Grt2-06 | Grt-2 | 58 | 90 | 8.3 | 25 | 6.0 | 0.39 | 6.2 | 1.3 | 9.4 | 2.1 | 6.4 | 1.2 | 8.8 | 1.3 |
| 24JX-168-Grt2-07 | Grt-2 | 53 | 89 | 8.4 | 25 | 5.5 | 0.33 | 5.2 | 1.1 | 7.6 | 1.6 | 5.1 | 0.89 | 6.9 | 1.1 |
| 24JX-168-Grt2-08 | Grt-2 | 175 | 330 | 31 | 84 | 12 | 0.44 | 6.9 | 0.87 | 4.2 | 0.66 | 1.6 | 0.21 | 1.4 | 0.17 |
| 24JX-168-Grt2-09 | Grt-2 | 46 | 74 | 7.1 | 22 | 4.7 | 0.33 | 4.2 | 0.85 | 6.0 | 1.3 | 4.1 | 0.71 | 5.5 | 0.82 |
| 24JX-168-Grt2-10 | Grt-2 | 406 | 496 | 45 | 147 | 31 | 2.0 | 22 | 3.4 | 17 | 2.9 | 6.9 | 0.98 | 6.5 | 0.84 |
| 24JX-168-Grt2-11 | Grt-2 | 23 | 35 | 3.5 | 15 | 8.1 | 0.17 | 12 | 2.8 | 21 | 4.7 | 15 | 2.8 | 23 | 3.4 |
| 24JX-168-Grt2-12 | Grt-2 | 12 | 20 | 2.4 | 13 | 9.1 | 0.21 | 13 | 3.1 | 23 | 5.3 | 18 | 3.5 | 29 | 4.8 |
| 24JX-168-Grt2-13 | Grt-2 | 87 | 170 | 17 | 59 | 22 | 0.33 | 26 | 5.0 | 30 | 5.9 | 16 | 2.6 | 20 | 2.9 |
| 24JX-168-Grt2-14 | Grt-2 | 26 | 46 | 4.7 | 18 | 9.1 | 0.16 | 13 | 3.2 | 23 | 5.2 | 16 | 3.1 | 26 | 4.3 |
| 24JX-168-Grt2-15 | Grt-2 | 80 | 116 | 9.4 | 26 | 10.0 | 0.31 | 14 | 3.1 | 21 | 4.8 | 15 | 2.9 | 25 | 4.2 |
| 24JX-168-Grt2-16 | Grt-2 | 8.7 | 14 | 1.8 | 10 | 6.8 | 0.23 | 8.7 | 2.1 | 15 | 3.6 | 12 | 2.3 | 19 | 3.0 |
| 24JX-168-Grt2-17 | Grt-2 | 18 | 26 | 2.4 | 9.5 | 6.9 | 0.15 | 12 | 2.9 | 22 | 5.3 | 18 | 3.5 | 30 | 5.0 |
| 24JX-168-Grt2-18 | Grt-2 | 49 | 68 | 6.2 | 19 | 5.1 | 0.26 | 6.0 | 1.4 | 10 | 2.3 | 6.9 | 1.3 | 10.0 | 1.5 |
| 24JX-168-Grt2-19 | Grt-2 | 35 | 48 | 4.4 | 14 | 3.9 | 0.21 | 4.8 | 1.1 | 8.2 | 1.9 | 5.8 | 1.1 | 8.3 | 1.3 |
| 24JX-168-Grt2-20 | Grt-2 | 118 | 236 | 26 | 98 | 26 | 0.47 | 25 | 4.7 | 29 | 5.9 | 16 | 2.4 | 16 | 2.3 |
| 24JX-181-Grt2-03 | Grt-2 | 170 | 505 | 70 | 328 | 98 | 0.53 | 86 | 14 | 77 | 14 | 34 | 4.5 | 26 | 3.2 |
| 24JX-181-Grt2-04 | Grt-2 | 210 | 576 | 79 | 375 | 124 | 0.67 | 120 | 20 | 110 | 19 | 44 | 5.5 | 30 | 3.5 |
| 24JX-181-Grt2-05 | Grt-2 | 134 | 343 | 42 | 163 | 36 | 0.37 | 23 | 3.4 | 20 | 3.9 | 11 | 1.7 | 11 | 1.6 |
| 24JX-181-Grt2-06 | Grt-2 | 203 | 571 | 77 | 361 | 115 | 0.67 | 111 | 19 | 107 | 20 | 47 | 6.1 | 34 | 3.9 |
| 24JX-181-Grt2-07 | Grt-2 | 266 | 724 | 96 | 434 | 145 | 0.83 | 143 | 24 | 133 | 23 | 51 | 6.3 | 34 | 3.7 |
| 24JX-181-Grt2-08 | Grt-2 | 174 | 479 | 62 | 265 | 63 | 0.51 | 44 | 6.6 | 37 | 7.4 | 20 | 2.9 | 19 | 2.5 |
| 24JX-181-Grt2-09 | Grt-2 | 692 | 1838 | 234 | 946 | 249 | 2.5 | 196 | 31 | 169 | 32 | 77 | 10 | 57 | 6.8 |
| 24JX-181-Grt2-10 | Grt-2 | 1891 | 5476 | 726 | 2994 | 721 | 3.5 | 448 | 53 | 209 | 26 | 45 | 4.8 | 24 | 2.5 |
| 24JX-181-Grt2-11 | Grt-2 | 176 | 490 | 64 | 282 | 81 | 0.56 | 67 | 11 | 60 | 11 | 27 | 3.6 | 21 | 2.6 |
| 24JX-181-Grt2-12 | Grt-2 | 614 | 1598 | 205 | 885 | 294 | 1.7 | 292 | 47 | 248 | 41 | 88 | 11 | 54 | 5.9 |
| 24JX-181-Grt2-13 | Grt-2 | 161 | 443 | 58 | 258 | 71 | 0.55 | 56 | 9.3 | 54 | 10 | 26 | 3.6 | 21 | 2.7 |
| 24JX-181-Grt2-14 | Grt-2 | 407 | 834 | 81 | 258 | 48 | 1.3 | 37 | 6.3 | 36 | 6.6 | 16 | 2.3 | 14 | 1.7 |
| 24JX-181-Grt2-15 | Grt-2 | 136 | 254 | 24 | 73 | 15 | 0.47 | 12 | 2.2 | 13 | 2.4 | 5.8 | 0.86 | 5.3 | 0.69 |
| 24JX-181-Grt2-16 | Grt-2 | 164 | 385 | 48 | 211 | 61 | 0.58 | 51 | 8.3 | 48 | 9.6 | 25 | 3.4 | 20 | 2.6 |
| 24JX-181-Grt2-17 | Grt-2 | 30 | 49 | 4.5 | 13 | 2.5 | 0.13 | 1.5 | 0.25 | 1.6 | 0.36 | 1.0 | 0.21 | 1.6 | 0.25 |
| 24JX-181-Grt2-18 | Grt-2 | 42 | 82 | 8.3 | 27 | 5.6 | 0.16 | 3.8 | 0.64 | 4.1 | 0.84 | 2.6 | 0.45 | 3.4 | 0.52 |
| 24JX-181-Grt2-19 | Grt-2 | 38 | 68 | 6.4 | 20 | 3.7 | 0.20 | 2.5 | 0.38 | 2.3 | 0.50 | 1.6 | 0.29 | 2.3 | 0.36 |
| 24JX-181-Grt2-20 | Grt-2 | 26 | 35 | 2.9 | 8.3 | 1.5 | 0.15 | 0.94 | 0.16 | 1.0 | 0.22 | 0.69 | 0.14 | 1.1 | 0.17 |
| 24JX-181-Grt2-21 | Grt-2 | 252 | 623 | 82 | 380 | 128 | 0.78 | 122 | 19 | 98 | 16 | 34 | 4.1 | 22 | 2.4 |
| 24JX-181-Grt2-22 | Grt-2 | 1407 | 3801 | 471 | 1871 | 463 | 3.1 | 345 | 50 | 240 | 36 | 75 | 9.1 | 49 | 5.5 |
| 24JX-181-Grt2-23 | Grt-2 | 1079 | 2654 | 311 | 1125 | 261 | 3.3 | 199 | 31 | 156 | 25 | 56 | 7.1 | 41 | 4.7 |
| 24JX-181-Grt2-24 | Grt-2 | 57 | 123 | 16 | 68 | 24 | 0.21 | 25 | 4.1 | 21 | 3.5 | 7.6 | 0.91 | 4.9 | 0.60 |
| 24JX-181-Grt2-25 | Grt-2 | 1328 | 3654 | 470 | 1937 | 504 | 2.3 | 374 | 51 | 231 | 32 | 59 | 6.4 | 32 | 3.2 |
| 24JX-181-Grt2-26 | Grt-2 | 1590 | 4445 | 566 | 2297 | 596 | 3.3 | 469 | 69 | 335 | 51 | 105 | 12 | 65 | 7.2 |
| 24JX-181-Grt2-27 | Grt-2 | 1771 | 4929 | 633 | 2609 | 685 | 3.7 | 525 | 75 | 353 | 52 | 104 | 12 | 64 | 7.0 |
| 24JX-181-Grt2-28 | Grt-2 | 34 | 59 | 5.7 | 18 | 3.6 | 0.15 | 2.4 | 0.38 | 2.4 | 0.53 | 1.5 | 0.27 | 2.2 | 0.32 |
| 24JX-181-Grt2-29 | Grt-2 | 37 | 64 | 6.0 | 18 | 3.3 | 0.16 | 2.2 | 0.36 | 2.2 | 0.48 | 1.4 | 0.26 | 2.1 | 0.33 |
| 24JX-181-Grt2-30 | Grt-2 | 211 | 483 | 53 | 195 | 51 | 0.78 | 46 | 8.9 | 55 | 10 | 27 | 4.1 | 25 | 3.0 |
| 24JX-171-Grt3-01 | Grt-3 | 0.26 | 1.8 | 0.43 | 2.6 | 0.83 | 0.08 | 0.69 | 0.10 | 0.54 | 0.11 | 0.30 | 0.04 | 0.25 | 0.04 |
| 24JX-171-Grt3-02 | Grt-3 | 0.37 | 1.9 | 0.43 | 2.6 | 0.82 | 0.11 | 0.74 | 0.11 | 0.64 | 0.13 | 0.34 | 0.05 | 0.32 | 0.04 |
| 24JX-171-Grt3-03 | Grt-3 | 0.31 | 1.9 | 0.46 | 3.1 | 0.81 | 0.10 | 0.73 | 0.10 | 0.57 | 0.12 | 0.31 | 0.04 | 0.26 | 0.04 |
| 24JX-171-Grt3-04 | Grt-3 | 0.55 | 2.9 | 0.58 | 2.7 | 0.54 | 0.09 | 0.42 | 0.06 | 0.36 | 0.07 | 0.17 | 0.02 | 0.14 | 0.02 |
| 24JX-171-Grt3-05 | Grt-3 | 0.69 | 3.2 | 0.50 | 1.7 | 0.28 | 0.06 | 0.20 | 0.03 | 0.14 | 0.03 | 0.07 | 0.01 | 0.07 | 0.01 |
| 24JX-171-Grt3-06 | Grt-3 | 1.0 | 4.2 | 0.58 | 1.8 | 0.26 | 0.05 | 0.22 | 0.03 | 0.25 | 0.04 | 0.10 | 0.01 | 0.11 | 0.02 |
| 24JX-171-Grt3-07 | Grt-3 | 0.59 | 3.0 | 0.59 | 3.1 | 0.89 | 0.10 | 0.92 | 0.14 | 0.86 | 0.18 | 0.52 | 0.07 | 0.47 | 0.06 |
| 24JX-171-Grt3-08 | Grt-3 | 0.57 | 2.9 | 0.60 | 3.5 | 0.98 | 0.11 | 0.94 | 0.13 | 0.83 | 0.18 | 0.48 | 0.06 | 0.42 | 0.06 |
| 24JX-171-Grt3-09 | Grt-3 | 0.48 | 2.5 | 0.59 | 3.6 | 1.1 | 0.12 | 1.0 | 0.15 | 0.89 | 0.18 | 0.49 | 0.07 | 0.44 | 0.07 |
| 24JX-171-Grt3-10 | Grt-3 | 0.96 | 2.0 | 0.49 | 3.0 | 0.74 | 0.09 | 0.51 | 0.06 | 0.30 | 0.05 | 0.12 | 0.02 | 0.10 | 0.01 |
| 24JX-171-Grt3-11 | Grt-3 | 0.42 | 2.2 | 0.55 | 3.1 | 0.83 | 0.10 | 0.54 | 0.08 | 0.45 | 0.09 | 0.23 | 0.03 | 0.21 | 0.03 |
| 24JX-171-Grt3-12 | Grt-3 | 0.28 | 1.8 | 0.44 | 2.7 | 0.77 | 0.11 | 0.55 | 0.08 | 0.39 | 0.09 | 0.22 | 0.03 | 0.18 | 0.03 |
| 24JX-171-Grt3-13 | Grt-3 | 0.20 | 1.4 | 0.36 | 2.3 | 0.79 | 0.09 | 0.70 | 0.10 | 0.56 | 0.11 | 0.29 | 0.04 | 0.24 | 0.03 |
| 24JX-171-Grt3-14 | Grt-3 | 0.33 | 2.1 | 0.53 | 3.3 | 0.94 | 0.10 | 0.70 | 0.08 | 0.52 | 0.09 | 0.23 | 0.03 | 0.19 | 0.02 |
| 24JX-171-Grt3-15 | Grt-3 | 0.97 | 5.6 | 1.3 | 5.9 | 1.2 | 0.15 | 0.84 | 0.13 | 0.75 | 0.17 | 0.49 | 0.06 | 0.42 | 0.06 |
| 24JX-171-Grt3-16 | Grt-3 | 0.85 | 5.5 | 0.95 | 3.9 | 0.70 | 0.11 | 0.51 | 0.08 | 0.47 | 0.11 | 0.32 | 0.05 | 0.26 | 0.04 |
| 24JX-171-Grt3-17 | Grt-3 | 0.89 | 5.4 | 1.2 | 6.4 | 1.4 | 0.16 | 0.99 | 0.15 | 0.92 | 0.19 | 0.53 | 0.08 | 0.50 | 0.07 |
| 24JX-171-Grt3-18 | Grt-3 | 0.38 | 2.8 | 0.69 | 3.9 | 0.63 | 0.10 | 0.37 | 0.05 | 0.28 | 0.06 | 0.14 | 0.02 | 0.13 | 0.02 |
| 24JX-171-Grt3-19 | Grt-3 | 0.29 | 1.9 | 0.48 | 3.0 | 0.83 | 0.09 | 0.67 | 0.10 | 0.56 | 0.12 | 0.30 | 0.04 | 0.28 | 0.03 |
| 24JX-171-Grt3-20 | Grt-3 | 0.31 | 1.9 | 0.50 | 2.8 | 0.86 | 0.09 | 0.73 | 0.11 | 0.65 | 0.15 | 0.36 | 0.05 | 0.32 | 0.05 |
| 24JX-177-Grt3-01 | Grt-3 | 0.60 | 3.4 | 0.59 | 2.2 | 0.33 | 0.06 | 0.24 | 0.03 | 0.17 | 0.04 | 0.09 | 0.01 | 0.09 | 0.01 |
| 24JX-177-Grt3-02 | Grt-3 | 0.45 | 2.9 | 0.54 | 1.8 | 0.15 | 0.03 | 0.11 | 0.01 | 0.07 | 0.02 | 0.03 | 0.00 | 0.07 | 0.00 |
| 24JX-177-Grt3-03 | Grt-3 | 0.48 | 2.8 | 0.46 | 1.4 | 0.14 | 0.03 | 0.06 | 0.01 | 0.05 | 0.01 | 0.03 | 0.00 | 0.03 | 0.00 |
| 24JX-177-Grt3-04 | Grt-3 | 0.67 | 3.5 | 0.58 | 2.1 | 0.25 | 0.06 | 0.12 | 0.01 | 0.08 | 0.02 | 0.04 | 0.01 | 0.04 | 0.01 |
| 24JX-177-Grt3-07 | Grt-3 | 0.26 | 1.6 | 0.43 | 2.1 | 0.42 | 0.09 | 0.14 | 0.01 | 0.05 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 |
| 24JX-177-Grt3-08 | Grt-3 | 0.55 | 3.5 | 0.77 | 4.0 | 0.82 | 0.07 | 0.42 | 0.05 | 0.25 | 0.04 | 0.11 | 0.01 | 0.10 | 0.01 |
| 24JX-177-Grt3-09 | Grt-3 | 0.29 | 1.4 | 0.33 | 2.1 | 0.51 | 0.05 | 0.28 | 0.04 | 0.18 | 0.03 | 0.08 | 0.01 | 0.06 | 0.01 |
| 24JX-177-Grt3-10 | Grt-3 | 0.72 | 4.1 | 0.59 | 1.9 | 0.22 | 0.03 | 0.18 | 0.03 | 0.17 | 0.04 | 0.09 | 0.02 | 0.12 | 0.01 |
| 24JX-177-Grt3-11 | Grt-3 | 0.85 | 3.2 | 0.50 | 1.9 | 0.24 | 0.07 | 0.16 | 0.03 | 0.15 | 0.03 | 0.07 | 0.01 | 0.05 | 0.01 |
| 24JX-177-Grt3-12 | Grt-3 | 0.77 | 3.6 | 0.52 | 1.7 | 0.23 | 0.10 | 0.18 | 0.03 | 0.14 | 0.03 | 0.07 | 0.01 | 0.06 | 0.01 |
| 24JX-177-Grt3-13 | Grt-3 | 0.93 | 3.5 | 0.48 | 1.6 | 0.26 | 0.03 | 0.21 | 0.03 | 0.16 | 0.03 | 0.06 | 0.01 | 0.05 | 0.01 |
| 24JX-177-Grt3-15 | Grt-3 | 0.64 | 3.2 | 0.55 | 2.4 | 0.45 | 0.05 | 0.32 | 0.05 | 0.28 | 0.06 | 0.17 | 0.02 | 0.14 | 0.02 |
| 24JX-177-Grt3-16 | Grt-3 | 1.2 | 5.9 | 0.87 | 3.3 | 0.53 | 0.05 | 0.40 | 0.05 | 0.34 | 0.06 | 0.18 | 0.02 | 0.15 | 0.03 |
| 24JX-177-Grt3-17 | Grt-3 | 1.1 | 5.1 | 0.83 | 3.4 | 0.58 | 0.06 | 0.47 | 0.07 | 0.38 | 0.08 | 0.21 | 0.04 | 0.21 | 0.03 |
| 24JX-177-Grt3-18 | Grt-3 | 0.96 | 4.6 | 0.73 | 2.9 | 0.49 | 0.06 | 0.39 | 0.06 | 0.34 | 0.07 | 0.18 | 0.03 | 0.16 | 0.02 |
| 24JX-177-Grt3-19 | Grt-3 | 1.2 | 6.3 | 1.1 | 4.2 | 0.80 | 0.07 | 0.55 | 0.08 | 0.41 | 0.10 | 0.24 | 0.04 | 0.24 | 0.03 |
| 24JX-177-Grt3-20 | Grt-3 | 0.49 | 3.2 | 0.64 | 2.7 | 0.24 | 0.05 | 0.12 | 0.01 | 0.06 | 0.01 | 0.03 | 0.00 | 0.03 | 0.00 |

**表2** 石竹山矿床多金属矿化矽卡岩中石榴子石U-Pb定年结果

**Table 2.** LA-ICP-MS U-Pb data of garnet in polymetallic mineralized skarns of the Shizhushan deposit

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **分析点** | **石榴子石类型** | 238U/206Pb | | 207Pb/206Pb | |
| **Ratio** | **1sigma** | **Ratio** | **1sigma** |
| 24JX-168-Grt2-01 | Grt2 | 24.8468 | 0.5369 | 0.1645 | 0.0052 |
| 24JX-168-Grt2-02 | Grt2 | 22.2467 | 0.3399 | 0.2487 | 0.0090 |
| 24JX-168-Grt2-03 | Grt2 | 21.1129 | 0.3796 | 0.2122 | 0.0065 |
| 24JX-168-Grt2-04 | Grt2 | 22.2537 | 0.9792 | 0.1693 | 0.0152 |
| 24JX-168-Grt2-05 | Grt2 | 21.4287 | 0.3735 | 0.2475 | 0.0073 |
| 24JX-168-Grt2-06 | Grt2 | 5.6935 | 0.7975 | 0.6273 | 0.0252 |
| 24JX-168-Grt2-07 | Grt2 | 5.9499 | 0.5783 | 0.6195 | 0.0223 |
| 24JX-168-Grt2-08 | Grt2 | 20.7579 | 0.6869 | 0.2337 | 0.0146 |
| 24JX-168-Grt2-09 | Grt2 | 12.4299 | 1.2518 | 0.4520 | 0.0231 |
| 24JX-168-Grt2-10 | Grt2 | 19.6204 | 0.3393 | 0.2548 | 0.0121 |
| 24JX-168-Grt2-11 | Grt2 | 6.7030 | 0.3325 | 0.6469 | 0.0196 |
| 24JX-168-Grt2-12 | Grt2 | 10.5104 | 0.3607 | 0.5307 | 0.0157 |
| 24JX-168-Grt2-13 | Grt2 | 16.3049 | 0.5793 | 0.4068 | 0.0159 |
| 24JX-168-Grt2-14 | Grt2 | 23.8243 | 0.4415 | 0.1213 | 0.0044 |
| 24JX-181-Grt2-01 | Grt2 | 21.7814 | 0.3974 | 0.2011 | 0.0080 |
| 24JX-181-Grt2-02 | Grt2 | 20.9315 | 0.3879 | 0.2239 | 0.0066 |
| 24JX-181-Grt2-03 | Grt2 | 20.7230 | 0.3101 | 0.2269 | 0.0054 |
| 24JX-181-Grt2-04 | Grt2 | 22.1860 | 0.3503 | 0.1894 | 0.0067 |
| 24JX-181-Grt2-05 | Grt2 | 22.8489 | 0.3572 | 0.1861 | 0.0066 |
| 24JX-181-Grt2-06 | Grt2 | 20.8245 | 0.7733 | 0.2130 | 0.0137 |
| 24JX-181-Grt2-07 | Grt2 | 25.5223 | 0.2813 | 0.0698 | 0.0007 |
| 24JX-181-Grt2-08 | Grt2 | 21.1639 | 0.5271 | 0.2249 | 0.0105 |
| 24JX-181-Grt2-09 | Grt2 | 25.5687 | 0.2889 | 0.1161 | 0.0013 |
| 24JX-181-Grt2-10 | Grt2 | 22.4475 | 0.2813 | 0.1948 | 0.0035 |
| 24JX-181-Grt2-11 | Grt2 | 21.8405 | 0.2989 | 0.1701 | 0.0026 |
| 24JX-181-Grt2-12 | Grt2 | 12.9793 | 0.6941 | 0.4032 | 0.0238 |
| 24JX-181-Grt2-13 | Grt2 | 22.2153 | 0.2810 | 0.1946 | 0.0029 |
| 24JX-181-Grt2-14 | Grt2 | 9.1864 | 0.3788 | 0.5684 | 0.0127 |
| 24JX-181-Grt2-15 | Grt2 | 14.5419 | 0.1900 | 0.4268 | 0.0053 |
| 24JX-181-Grt2-16 | Grt2 | 11.7258 | 0.1700 | 0.5035 | 0.0090 |
| 24JX-181-Grt2-17 | Grt2 | 6.8286 | 0.1114 | 0.6495 | 0.0108 |
| 24JX-181-Grt2-18 | Grt2 | 22.2885 | 0.2730 | 0.1649 | 0.0023 |
| 24JX-181-Grt2-19 | Grt2 | 23.9701 | 0.6224 | 0.1092 | 0.0129 |
| 24JX-181-Grt2-20 | Grt2 | 24.0016 | 0.4600 | 0.1307 | 0.0088 |
| 24JX-181-Grt2-21 | Grt2 | 15.5158 | 0.3057 | 0.3863 | 0.0055 |
| 24JX-181-Grt2-22 | Grt2 | 26.0614 | 0.3258 | 0.0823 | 0.0022 |
| 24JX-181-Grt2-23 | Grt2 | 25.6700 | 0.2275 | 0.0724 | 0.0007 |
| 24JX-181-Grt2-24 | Grt2 | 27.0940 | 0.2476 | 0.0717 | 0.0006 |
| 24JX-181-Grt2-25 | Grt2 | 11.8399 | 0.1533 | 0.5074 | 0.0063 |
| 24JX-181-Grt2-26 | Grt2 | 11.3317 | 0.1894 | 0.5114 | 0.0080 |
| 24JX-181-Grt2-27 | Grt2 | 22.3815 | 0.2836 | 0.1825 | 0.0022 |
| 24JX-171-Grt3-01 | Grt3 | 2.2192 | 0.2991 | 0.7920 | 0.0285 |
| 24JX-171-Grt3-02 | Grt3 | 6.4244 | 0.3929 | 0.7157 | 0.0206 |
| 24JX-171-Grt3-03 | Grt3 | 1.6338 | 0.2236 | 0.8043 | 0.0137 |
| 24JX-171-Grt3-04 | Grt3 | 15.7242 | 1.0636 | 0.3267 | 0.0188 |
| 24JX-171-Grt3-05 | Grt3 | 1.6688 | 0.1833 | 0.8040 | 0.0094 |
| 24JX-171-Grt3-06 | Grt3 | 1.4733 | 0.1847 | 0.8033 | 0.0097 |
| 24JX-171-Grt3-07 | Grt3 | 2.4644 | 0.2243 | 0.8125 | 0.0119 |
| 24JX-171-Grt3-08 | Grt3 | 0.3424 | 0.0379 | 0.8529 | 0.0090 |
| 24JX-171-Grt3-09 | Grt3 | 6.2220 | 0.7550 | 0.6446 | 0.0264 |
| 24JX-171-Grt3-10 | Grt3 | 0.1168 | 0.0305 | 0.8501 | 0.0096 |
| 24JX-171-Grt3-11 | Grt3 | 0.2697 | 0.0286 | 0.8595 | 0.0091 |
| 24JX-171-Grt3-12 | Grt3 | 1.7495 | 0.1932 | 0.7769 | 0.0100 |
| 24JX-171-Grt3-13 | Grt3 | 9.8096 | 0.4614 | 0.5923 | 0.0164 |
| 24JX-171-Grt3-14 | Grt3 | 8.7907 | 0.5652 | 0.5599 | 0.0166 |
| 24JX-171-Grt3-15 | Grt3 | 0.9296 | 0.1067 | 0.7983 | 0.0113 |
| 24JX-171-Grt3-16 | Grt3 | 0.7767 | 0.0926 | 0.8257 | 0.0145 |
| 24JX-171-Grt3-17 | Grt3 | 1.5121 | 0.1969 | 0.8319 | 0.0126 |
| 24JX-177-Grt3-01 | Grt3 | 4.0359 | 0.4605 | 0.7157 | 0.0149 |
| 24JX-177-Grt3-02 | Grt3 | 2.6954 | 0.1532 | 0.7601 | 0.0112 |
| 24JX-177-Grt3-03 | Grt3 | 0.6311 | 0.0888 | 0.8103 | 0.0113 |
| 24JX-177-Grt3-04 | Grt3 | 0.3817 | 0.0818 | 0.8491 | 0.0161 |
| 24JX-177-Grt3-05 | Grt3 | 15.7760 | 0.8037 | 0.3938 | 0.0166 |
| 24JX-177-Grt3-06 | Grt3 | 9.9573 | 0.6923 | 0.4874 | 0.0200 |
| 24JX-177-Grt3-07 | Grt3 | 12.3134 | 1.0906 | 0.3985 | 0.0208 |
| 24JX-177-Grt3-08 | Grt3 | 27.5682 | 0.4792 | 0.0860 | 0.0291 |
| 24JX-177-Grt3-09 | Grt3 | 0.1327 | 0.0273 | 0.8406 | 0.0104 |
| 24JX-177-Grt3-10 | Grt3 | 0.1575 | 0.0170 | 0.8668 | 0.0258 |
| 24JX-177-Grt3-11 | Grt3 | 9.1690 | 0.5021 | 0.5906 | 0.0281 |
| 24JX-177-Grt3-12 | Grt3 | 9.0313 | 1.2792 | 0.5369 | 0.0382 |
| 24JX-177-Grt3-13 | Grt3 | 26.8428 | 0.5388 | 0.1196 | 0.0441 |
| 24JX-177-Grt3-14 | Grt3 | 13.3191 | 0.9971 | 0.3640 | 0.0228 |
| 24JX-177-Grt3-15 | Grt3 | 9.2926 | 0.5432 | 0.5232 | 0.0257 |