附表1 高椅山硅灰石（-铜）矿床石榴子石电子探针成分分析结果

Table 1 Electronic probe component analysis (EMPA) results of garnet in the Gaoyishan Wo (-Cu) deposit

|  |  |  |  |
| --- | --- | --- | --- |
| 样号/类型 | 16GYS-05 (Grt1) | 16GYS-07A (Grt1) | 16GYS-10A (Grt1) |
| 01 | 02 | 03 | 04 | 05 | 01 | 02 | 03 | 04 | 05 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 |
| SiO2 | 36.39 | 36.66 | 36.36 | 35.85 | 36.28 | 35.61 | 35.81 | 35.68 | 36.19 | 35.87 | 36.38 | 36.48 | 36.85 | 36.51 | 36.97 | 36.56 | 37.12 | 36.80 |
| TiO2 | 0.02 | 0.01 | 0.02 | 0.02 | 0.03 | 0.00 | 0.02 | 0.01 | 0.06 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 |
| Al2O3 | 3.48 | 3.50 | 3.46 | 3.53 | 3.67 | 2.00 | 1.74 | 2.07 | 5.34 | 2.78 | 4.85 | 5.25 | 5.35 | 5.23 | 5.70 | 4.93 | 6.90 | 6.73 |
| FeOT | 26.81 | 26.58 | 26.90 | 26.10 | 26.69 | 28.62 | 28.81 | 28.50 | 23.93 | 27.36 | 24.60 | 23.61 | 23.80 | 23.65 | 23.31 | 24.15 | 21.58 | 21.88 |
| MnO | 0.20 | 0.19 | 0.21 | 0.19 | 0.21 | 0.18 | 0.18 | 0.20 | 0.37 | 0.20 | 0.21 | 0.24 | 0.26 | 0.23 | 0.24 | 0.28 | 0.28 | 0.27 |
| MgO | 0.03 | 0.04 | 0.02 | 0.02 | 0.02 | 0.05 | 0.07 | 0.06 | 0.06 | 0.08 | 0.08 | 0.07 | 0.08 | 0.08 | 0.08 | 0.07 | 0.08 | 0.09 |
| CaO | 33.33 | 33.13 | 33.55 | 33.37 | 33.66 | 32.99 | 33.06 | 32.97 | 33.26 | 33.12 | 33.69 | 33.00 | 33.87 | 33.27 | 33.67 | 33.66 | 33.73 | 33.72 |
| Total | 100.27 | 100.10 | 100.51 | 99.09 | 100.55 | 99.45 | 99.68 | 99.49 | 99.21 | 99.41 | 99.82 | 98.65 | 100.22 | 98.96 | 99.99 | 99.65 | 99.69 | 99.49 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Si | 3.00 | 3.02 | 2.99 | 2.99 | 2.98 | 2.98 | 2.99 | 2.99 | 2.99 | 2.99 | 2.99 | 3.02 | 3.00 | 3.01 | 3.01 | 3.00 | 3.02 | 3.00 |
| Al iv | 0.00 | 0.00 | 0.01 | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Al vi | 0.36 | 0.36 | 0.35 | 0.36 | 0.36 | 0.19 | 0.18 | 0.20 | 0.53 | 0.28 | 0.48 | 0.54 | 0.54 | 0.54 | 0.58 | 0.50 | 0.69 | 0.68 |
| Ti | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fe3+ | 1.38 | 1.36 | 1.39 | 1.38 | 1.38 | 1.51 | 1.52 | 1.50 | 1.23 | 1.44 | 1.28 | 1.22 | 1.23 | 1.22 | 1.19 | 1.26 | 1.10 | 1.12 |
| Fe2+ | 0.47 | 0.47 | 0.46 | 0.44 | 0.46 | 0.50 | 0.50 | 0.50 | 0.42 | 0.47 | 0.41 | 0.42 | 0.40 | 0.41 | 0.40 | 0.40 | 0.37 | 0.37 |
| Mn | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| Mg | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Ca | 2.94 | 2.92 | 2.96 | 2.98 | 2.96 | 2.96 | 2.96 | 2.96 | 2.94 | 2.96 | 2.96 | 2.93 | 2.96 | 2.94 | 2.94 | 2.96 | 2.94 | 2.95 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 铁铝榴石 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 钙铁榴石 | 80.28 | 80.00 | 80.52 | 79.90 | 79.44 | 88.41 | 89.85 | 88.01 | 70.37 | 84.04 | 73.08 | 70.36 | 70.47 | 70.65 | 68.50 | 72.50 | 62.37 | 63.37 |
| 钙铝榴石 | 19.02 | 19.30 | 18.82 | 19.48 | 19.90 | 10.83 | 9.34 | 11.13 | 28.39 | 15.02 | 25.98 | 28.63 | 28.45 | 28.36 | 30.51 | 26.42 | 36.53 | 35.49 |
| 镁铝榴石 | 0.16 | 0.18 | 0.10 | 0.10 | 0.08 | 0.26 | 0.32 | 0.30 | 0.27 | 0.40 | 0.39 | 0.35 | 0.39 | 0.39 | 0.35 | 0.34 | 0.38 | 0.43 |
| 锰铝榴石 | 0.54 | 0.52 | 0.56 | 0.52 | 0.57 | 0.50 | 0.50 | 0.55 | 0.97 | 0.55 | 0.56 | 0.66 | 0.69 | 0.61 | 0.63 | 0.74 | 0.72 | 0.70 |
| 钙铬榴石 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

续表1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 样号/类型 | 16GYS-10A (Grt1) | 16GYS-10B (Grt2) | 16GYS-09 (Grt2) | 16GYS-12 |
| 09 | 10 | 11 | 12 | 13 | 14 | 15 | 01 | 02 | -01 (Grt2) |
| SiO2 | 36.72 | 37.07 | 37.54 | 37.93 | 37.79 | 37.87 | 37.83 | 37.85 | 37.62 | 37.93 |
| TiO2 | 0.05 | 0.03 | 0.40 | 0.34 | 0.50 | 0.35 | 0.33 | 0.56 | 0.61 | 0.22 |
| Al2O3 | 6.42 | 5.77 | 11.69 | 12.38 | 13.09 | 11.57 | 11.59 | 13.82 | 13.93 | 12.70 |
| FeOT | 22.33 | 23.56 | 14.72 | 13.80 | 12.64 | 14.62 | 14.76 | 11.94 | 11.82 | 13.33 |
| MnO | 0.36 | 0.35 | 0.44 | 0.49 | 0.47 | 0.40 | 0.40 | 0.36 | 0.40 | 0.28 |
| MgO | 0.07 | 0.05 | 0.06 | 0.04 | 0.07 | 0.07 | 0.07 | 0.03 | 0.03 | 0.02 |
| CaO | 33.51 | 33.47 | 34.08 | 34.50 | 34.46 | 34.19 | 34.29 | 36.08 | 36.19 | 35.23 |
| Total | 99.46 | 100.30 | 98.94 | 99.48 | 99.02 | 99.06 | 99.26 | 100.64 | 100.61 | 99.70 |
|  |  |  |  |  |  |  |  |  |  |  |
| Si | 3.00 | 3.01 | 3.00 | 3.00 | 3.00 | 3.02 | 3.01 | 2.95 | 2.94 | 2.99 |
| Al iv | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.06 | 0.01 |
| Al vi | 0.65 | 0.58 | 1.13 | 1.19 | 1.25 | 1.12 | 1.12 | 1.25 | 1.25 | 1.21 |
| Ti | 0.00 | 0.00 | 0.02 | 0.02 | 0.03 | 0.02 | 0.02 | 0.03 | 0.04 | 0.01 |
| Fe3+ | 1.14 | 1.19 | 0.72 | 0.68 | 0.62 | 0.72 | 0.73 | 0.62 | 0.62 | 0.67 |
| Fe2+ | 0.39 | 0.42 | 0.26 | 0.24 | 0.22 | 0.25 | 0.25 | 0.16 | 0.15 | 0.21 |
| Mn | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.02 | 0.03 | 0.02 |
| Mg | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| Ca | 2.93 | 2.92 | 2.92 | 2.93 | 2.93 | 2.92 | 2.92 | 3.01 | 3.03 | 2.98 |
|  |  |  |  |  |  |  |  |  |  |  |
| 铁铝榴石 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 钙铁榴石 | 64.85 | 68.21 | 39.68 | 37.00 | 33.72 | 39.95 | 40.15 | 32.74 | 32.59 | 36.27 |
| 钙铝榴石 | 33.86 | 30.63 | 58.94 | 61.65 | 64.86 | 58.76 | 58.56 | 66.28 | 66.35 | 62.98 |
| 镁铝榴石 | 0.34 | 0.25 | 0.28 | 0.17 | 0.28 | 0.29 | 0.30 | 0.14 | 0.14 | 0.08 |
| 锰铝榴石 | 0.95 | 0.92 | 1.10 | 1.19 | 1.15 | 1.00 | 0.99 | 0.84 | 0.92 | 0.66 |
| 钙铬榴石 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

附表2 高椅山硅灰石（-铜）矿床锆石和石榴子石LA-ICP-MS U-Pb同位素分析结果

Table 2 LA-ICP-MS U-Pb data of zircon and garnet for the Gaoyishan Wo (-Cu) deposit

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 序号 | Pb | Th | U | Th/U | 同位素比值 | 年龄（Ma） | 谐和度 |
| (10-6) | (10-6) | (10-6) | 207Pb/206Pb | ±1*σ* | 207Pb/235U | ±1*σ* | 206Pb/238U | ±1*σ* | 207Pb/206Pb | ±1*σ* | 207Pb/235U | ±1*σ* | 206Pb/238U | ±1*σ* |
| 16GYS-01 (Zr) |
| 1 | 6.1 | 163.8 | 202.7 | 0.81  | 0.053 580 | 0.004 430 | 0.158 448 | 0.011 373 | 0.022 102 | 0.000 478 | 353.8 | 188.9 | 149.3 | 10.0 | 140.9 | 3.0 | 94% |
| 2 | 8.4 | 236.7 | 279.1 | 0.85  | 0.042 151 | 0.003 735 | 0.134 429 | 0.011 250 | 0.022 031 | 0.000 494 |  |  | 128.1 | 10.1 | 140.5 | 3.1 | 90% |
| 3 | 5.1 | 195.4 | 153.6 | 1.27  | 0.052 522 | 0.007 843 | 0.149 439 | 0.018 220 | 0.021 957 | 0.000 721 | 309.3 | 307.4 | 141.4 | 16.1 | 140.0 | 4.5 | 99% |
| 4 | 5.8 | 177.5 | 185.2 | 0.96  | 0.044 132 | 0.005 275 | 0.132 514 | 0.014 322 | 0.021 795 | 0.000 530 |  |  | 126.4 | 12.8 | 139.0 | 3.3 | 90% |
| 5 | 4.5 | 125.0 | 154.6 | 0.81  | 0.047 981 | 0.006 176 | 0.133 884 | 0.013 995 | 0.021 943 | 0.000 614 | 98.2 | 277.7 | 127.6 | 12.5 | 139.9 | 3.9 | 90% |
| 6 | 3.9 | 106.3 | 133.4 | 0.80  | 0.053 729 | 0.007 179 | 0.147 660 | 0.015 742 | 0.021 773 | 0.000 634 | 366.7 | 300.9 | 139.8 | 13.9 | 138.9 | 4.0 | 99% |
| 7 | 7.2 | 194.3 | 246.6 | 0.79  | 0.045 537 | 0.003 577 | 0.138 172 | 0.010 615 | 0.021 970 | 0.000 413 |  |  | 131.4 | 9.5 | 140.1 | 2.6 | 93% |
| 8 | 4.9 | 164.1 | 162.2 | 1.01  | 0.045 199 | 0.005 035 | 0.133 574 | 0.013 817 | 0.021 738 | 0.000 518 |  |  | 127.3 | 12.4 | 138.6 | 3.3 | 91% |
| 9 | 6.2 | 193.7 | 209.7 | 0.92  | 0.049 467 | 0.004 731 | 0.144 435 | 0.012 258 | 0.021 736 | 0.000 513 | 168.6 | 220.3 | 137.0 | 10.9 | 138.6 | 3.2 | 98% |
| 10 | 6.0 | 225.7 | 200.7 | 1.12  | 0.052 087 | 0.005 888 | 0.145 639 | 0.015 505 | 0.021 930 | 0.000 716 | 300.1 | 259.2 | 138.1 | 13.7 | 139.8 | 4.5 | 98% |
| 11 | 4.8 | 128.9 | 164.3 | 0.78  | 0.052 358 | 0.004 969 | 0.150 990 | 0.012 633 | 0.021 962 | 0.000 598 | 301.9 | 213.9 | 142.8 | 11.1 | 140.0 | 3.8 | 98% |
| 12 | 4.6 | 140.6 | 154.9 | 0.91  | 0.046 756 | 0.005 771 | 0.133 082 | 0.013 931 | 0.021 839 | 0.000 568 | 35.3 | 274.0 | 126.9 | 12.5 | 139.3 | 3.6 | 90% |
| 13 | 6.3 | 193.7 | 209.7 | 0.92  | 0.052 734 | 0.005 254 | 0.152 854 | 0.013 213 | 0.021 973 | 0.000 533 | 316.7 | 227.8 | 144.4 | 11.6 | 140.1 | 3.4 | 96% |
| 14 | 9.5 | 299.6 | 307.1 | 0.98  | 0.047 273 | 0.005 469 | 0.147 018 | 0.017 902 | 0.021 795 | 0.000 557 | 61.2 | 255.5 | 139.3 | 15.8 | 139.0 | 3.5 | 99% |
| 15 | 5.2 | 139.6 | 181.8 | 0.77  | 0.056 525 | 0.006 031 | 0.163 894 | 0.014 783 | 0.022 067 | 0.000 670 | 472.3 | 238.9 | 154.1 | 12.9 | 140.7 | 4.2 | 90% |
| 16 | 4.7 | 126.5 | 160.4 | 0.79  | 0.050 188 | 0.006 413 | 0.135 360 | 0.012 509 | 0.022 202 | 0.000 592 | 211.2 | 264.8 | 128.9 | 11.2 | 141.6 | 3.7 | 90% |
| 17 | 6.7 | 210.9 | 211.9 | 1.00  | 0.057 408 | 0.006 205 | 0.163 117 | 0.015 053 | 0.021 851 | 0.000 609 | 505.6 | 238.9 | 153.4 | 13.1 | 139.3 | 3.8 | 90% |
| 18 | 4.1 | 108.5 | 136.6 | 0.79  | 0.053 829 | 0.010 384 | 0.151 227 | 0.027 450 | 0.021 823 | 0.000 895 | 364.9 | 385.1 | 143.0 | 24.2 | 139.2 | 5.6 | 97% |
| 19 | 4.9 | 149.5 | 162.0 | 0.92  | 0.049 094 | 0.005 486 | 0.148 726 | 0.013 680 | 0.022 088 | 0.000 610 | 153.8 | 240.7 | 140.8 | 12.1 | 140.8 | 3.8 | 99% |
| 20 | 4.9 | 168.4 | 163.2 | 1.03  | 0.051 023 | 0.004 714 | 0.151 028 | 0.011 792 | 0.022 068 | 0.000 580 | 242.7 | 214.8 | 142.8 | 10.4 | 140.7 | 3.7 | 98% |
| 21 | 7.2 | 227.7 | 246.9 | 0.92  | 0.047 051 | 0.004 573 | 0.138 827 | 0.011 392 | 0.021 719 | 0.000 502 | 50.1 | 283.3 | 132.0 | 10.2 | 138.5 | 3.2 | 95% |
| 22 | 5.8 | 177.7 | 192.3 | 0.92  | 0.052 279 | 0.007 040 | 0.161 767 | 0.021 301 | 0.021 944 | 0.000 673 | 298.2 | 290.7 | 152.2 | 18.6 | 139.9 | 4.2 | 91% |
| 16GYS-10A (Grt1) |
| 1 | 0.6 | 1.3 | 20.6 | 0.06  | 0.150 066 | 0.040 142 | 0.268 080 | 0.021 771 | 0.021 618 | 0.000 940 | 2 346.6 | 473.2 | 241.2 | 17.4 | 137.9 | 5.9 | 45% |
| 2 | 0.5 | 1.3 | 21.4 | 0.06  | 0.077 723 | 0.011 865 | 0.206 084 | 0.021 308 | 0.021 513 | 0.000 778 | 1 139.8 | 108.3 | 190.3 | 17.9 | 137.2 | 4.9 | 67% |
| 3 | 0.5 | 1.5 | 22.0 | 0.07  | 0.053 488 | 0.008 247 | 0.145 635 | 0.017 050 | 0.023 604 | 0.000 837 | 350.1 | 314.8 | 138.1 | 15.1 | 150.4 | 5.3 | 91% |
| 4 | 0.5 | 1.4 | 21.3 | 0.07  | 0.070 612 | 0.013 100 | 0.181 513 | 0.032 650 | 0.022 538 | 0.000 786 | 946.3 | 382.4 | 169.4 | 28.1 | 143.7 | 5.0 | 83% |
| 5 | 0.5 | 1.4 | 22.3 | 0.06  | 0.060 676 | 0.011 387 | 0.154 985 | 0.022 518 | 0.022 530 | 0.000 883 | 627.8 | 412.9 | 146.3 | 19.8 | 143.6 | 5.6 | 98% |
| 6 | 0.5 | 1.5 | 22.4 | 0.07  | 0.074 433 | 0.012 516 | 0.179 909 | 0.018 690 | 0.022 700 | 0.000 927 | 1 053.7 | 344.4 | 168.0 | 16.1 | 144.7 | 5.8 | 85% |
| 7 | 0.6 | 1.6 | 23.4 | 0.07  | 0.058 309 | 0.008 148 | 0.168 337 | 0.020 141 | 0.023 590 | 0.000 828 | 542.6 | 304.6 | 158.0 | 17.5 | 150.3 | 5.2 | 95% |
| 8 | 0.7 | 1.5 | 23.7 | 0.06  | 0.065 880 | 0.008 258 | 0.196 709 | 0.018 614 | 0.023 718 | 0.000 725 | 1 200.0 | 269.4 | 182.3 | 15.8 | 151.1 | 4.6 | 81% |
| 9 | 0.5 | 1.4 | 22.7 | 0.06  | 0.051 478 | 0.007 452 | 0.133 064 | 0.012 934 | 0.021 625 | 0.000 690 | 261.2 | 303.7 | 126.8 | 11.6 | 137.9 | 4.4 | 91% |
| 10 | 0.6 | 1.2 | 19.7 | 0.06  | 0.070 614 | 0.009 701 | 0.216 963 | 0.024 090 | 0.023 880 | 0.000 860 | 946.3 | 285.2 | 199.4 | 20.1 | 152.1 | 5.4 | 73% |
| 11 | 0.5 | 1.6 | 15.0 | 0.11  | 0.147 502 | 0.035 493 | 0.250 205 | 0.025 463 | 0.020 907 | 0.001 059 | 2 317.0 | 423.8 | 226.7 | 20.7 | 133.4 | 6.7 | 48% |
| 12 | 0.4 | 1.6 | 15.7 | 0.10  | 0.083 636 | 0.014 232 | 0.232 973 | 0.030 650 | 0.022 389 | 0.001 045 | 1 284.3 | 336.4 | 212.7 | 25.2 | 142.7 | 6.6 | 60% |
| 13 | 0.5 | 1.3 | 20.2 | 0.07  | 0.102 008 | 0.015 138 | 0.230 598 | 0.022 631 | 0.020 669 | 0.000 735 | 1 661.1 | 273.3 | 210.7 | 18.7 | 131.9 | 4.6 | 53% |
| 14 | 0.5 | 1.6 | 21.2 | 0.08  | 0.066 563 | 0.011 579 | 0.162 951 | 0.023 285 | 0.022 741 | 0.000 910 | 833.3 | 368.5 | 153.3 | 20.3 | 145.0 | 5.7 | 94% |
| 15 | 0.6 | 1.1 | 20.0 | 0.06  | 0.075 913 | 0.021 767 | 0.153 415 | 0.031 001 | 0.021 688 | 0.000 829 | 1 094.4 | 602.3 | 144.9 | 27.3 | 138.3 | 5.2 | 95% |
| 16 | 0.5 | 1.2 | 18.6 | 0.06  | 0.086 932 | 0.013 650 | 0.234 318 | 0.029 446 | 0.023 418 | 0.000 918 | 1 359.0 | 306.6 | 213.8 | 24.2 | 149.2 | 5.8 | 64% |
| 17 | 0.6 | 1.3 | 20.6 | 0.06  | 0.097 468 | 0.015 448 | 0.258 174 | 0.027 284 | 0.021 745 | 0.000 787 | 1 576.2 | 295.5 | 233.2 | 22.0 | 138.7 | 5.0 | 49% |
| 18 | 0.6 | 1.5 | 21.7 | 0.07  | 0.084 060 | 0.012 910 | 0.244 069 | 0.035 329 | 0.022 429 | 0.000 860 | 1 294.4 | 302.6 | 221.7 | 28.8 | 143.0 | 5.4 | 56% |
| 19 | 1.4 | 1.6 | 21.4 | 0.08  | 0.189 976 | 0.026 405 | 0.778 455 | 0.124 460 | 0.026 733 | 0.001 306 | 2 741.7 | 229.8 | 584.6 | 71.1 | 170.1 | 8.2 | -10% |
| 20 | 0.5 | 1.8 | 20.3 | 0.09  | 0.078 384 | 0.012 941 | 0.219 202 | 0.028 173 | 0.022 291 | 0.000 854 | 1 166.7 | 332.6 | 201.2 | 23.5 | 142.1 | 5.4 | 65% |
| 21 | 0.6 | 1.7 | 20.2 | 0.08  | 0.074 194 | 0.013 439 | 0.176 288 | 0.030 346 | 0.021 476 | 0.000 937 | 1 055.6 | 372.2 | 164.9 | 26.2 | 137.0 | 5.9 | 81% |
| 22 | 0.6 | 1.8 | 20.8 | 0.09  | 0.067 373 | 0.013 018 | 0.157 106 | 0.023 956 | 0.022 429 | 0.000 961 | 850.0 | 409.7 | 148.2 | 21.0 | 143.0 | 6.1 | 96% |
| 23 | 0.6 | 1.7 | 20.0 | 0.09  | 0.063 712 | 0.012 438 | 0.167 264 | 0.019 164 | 0.022 598 | 0.000 905 | 731.5 | 422.7 | 157.0 | 16.7 | 144.1 | 5.7 | 91% |
| 24 | 0.5 | 1.6 | 20.4 | 0.08  | 0.068 299 | 0.013 044 | 0.176 449 | 0.035 558 | 0.022 945 | 0.000 913 | 877.5 | 399.1 | 165.0 | 30.7 | 146.2 | 5.8 | 87% |
| 25 | 0.6 | 1.9 | 21.9 | 0.09  | 0.055 757 | 0.009 683 | 0.160 149 | 0.030 682 | 0.022 581 | 0.000 861 | 442.6 | 194.3 | 150.8 | 26.9 | 143.9 | 5.4 | 95% |
| 26 | 0.7 | 1.8 | 22.0 | 0.08  | 0.071 895 | 0.012 109 | 0.206 255 | 0.023 675 | 0.022 887 | 0.000 855 | 983.3 | 350.0 | 190.4 | 19.9 | 145.9 | 5.4 | 73% |
| 27 | 0.7 | 2.0 | 22.4 | 0.09  | 0.054 943 | 0.010 364 | 0.137 420 | 0.020 237 | 0.021 695 | 0.000 945 | 409.3 | 374.0 | 130.7 | 18.1 | 138.4 | 6.0 | 94% |
| 28 | 0.5 | 2.0 | 22.4 | 0.09  | 0.052 463 | 0.012 205 | 0.122 345 | 0.022 682 | 0.022 857 | 0.000 858 | 305.6 | 459.2 | 117.2 | 20.5 | 145.7 | 5.4 | 78% |
| 29 | 0.7 | 2.1 | 22.7 | 0.09  | 0.068 808 | 0.012 178 | 0.170 872 | 0.020 792 | 0.022 604 | 0.000 909 | 894.4 | 372.7 | 160.2 | 18.0 | 144.1 | 5.7 | 89% |
| 30 | 0.5 | 1.5 | 20.7 | 0.07  | 0.060 802 | 0.011 143 | 0.163 010 | 0.019 447 | 0.022 823 | 0.000 915 | 631.5 | 397.6 | 153.3 | 17.0 | 145.5 | 5.8 | 94% |
| 31 | 0.5 | 1.6 | 20.0 | 0.08  | 0.052 045 | 0.010 251 | 0.141 475 | 0.019 035 | 0.022 500 | 0.000 889 | 287.1 | 396.2 | 134.4 | 16.9 | 143.4 | 5.6 | 93% |
| 32 | 0.7 | 1.8 | 20.5 | 0.09  | 0.063 459 | 0.010 326 | 0.187 985 | 0.022 645 | 0.022 342 | 0.000 923 | 724.1 | 345.3 | 174.9 | 19.4 | 142.4 | 5.8 | 79% |
| 33 | 0.6 | 1.7 | 20.5 | 0.08  | 0.068 941 | 0.019 373 | 0.142 334 | 0.014 628 | 0.020 859 | 0.000 802 | 898.2 | 607.4 | 135.1 | 13.0 | 133.1 | 5.1 | 98% |
| 34 | 0.6 | 1.7 | 21.1 | 0.08  | 0.058 211 | 0.008 807 | 0.136 285 | 0.014 418 | 0.021 516 | 0.000 929 | 538.9 | 335.1 | 129.7 | 12.9 | 137.2 | 5.9 | 94% |
| 35 | 0.5 | 1.7 | 22.2 | 0.08  | 0.069 988 | 0.011 739 | 0.186 105 | 0.030 268 | 0.021 701 | 0.000 992 | 927.8 | 350.0 | 173.3 | 25.9 | 138.4 | 6.3 | 77% |
| 36 | 0.9 | 1.8 | 22.0 | 0.08  | 0.129 640 | 0.013 851 | 0.404 122 | 0.032 663 | 0.024 408 | 0.000 831 | 2 094.4 | 188.9 | 344.6 | 23.6 | 155.5 | 5.2 | 24% |
| 37 | 0.6 | 1.8 | 22.8 | 0.08  | 0.073 267 | 0.014 689 | 0.163 417 | 0.018 000 | 0.021 805 | 0.000 888 | 1 021.3 | 416.7 | 153.7 | 15.7 | 139.1 | 5.6 | 90% |
| 38 | 0.6 | 1.7 | 22.1 | 0.07  | 0.081 485 | 0.014 056 | 0.187 331 | 0.020 933 | 0.023 273 | 0.001 003 | 1 233.0 | 344.5 | 174.3 | 17.9 | 148.3 | 6.3 | 83% |
| 16GYS-10B (Grt2) |
| 1 | 0.6  | 0.1  | 8.7  | 0.01  | 0.404 476  | 0.090 351  | 0.734 668  | 0.130 001  | 0.024 266  | 0.002 017  | 3 925.8  | 342.3  | 559.3  | 76.1  | 154.6  | 12.7  | -14% |
| 2 | 0.4  | 0.1  | 5.9  | 0.01  | 0.346 993  | 0.073 719  | 0.891 542  | 0.118 950  | 0.024 942  | 0.002 455  | 3 694.1  | 329.9  | 647.2  | 63.9  | 158.8  | 15.4  | -22% |
| 3 | 0.4  | 0.0  | 8.0  | 0.00  | 0.154 279  | 0.037 796  | 0.496 743  | 0.086 930  | 0.021 871  | 0.001 496  | 2 394.1  | 429.2  | 409.5  | 59.0  | 139.5  | 9.4  | 1% |
| 4 | 0.5  | 0.1  | 6.4  | 0.01  | 0.210 311  | 0.050 274  | 0.925 423  | 0.248 359  | 0.025 463  | 0.001 884  | 2 909.3  | 396.5  | 665.2  | 131.0  | 162.1  | 11.8  | -22% |
| 5 | 0.3  | 0.1  | 8.9  | 0.01  | 0.198 843  | 0.075 621  | 0.335 756  | 0.064 052  | 0.020 384  | 0.001 844  | 2 817.0  | 664.2  | 294.0  | 48.7  | 130.1  | 11.7  | 22% |
| 6 | 0.2  | 0.0  | 7.0  | 0.01  | 0.122 601  | 0.034 887  | 0.379 252  | 0.099 775  | 0.023 691  | 0.002 015  | 1 994.1  | 526.4  | 326.5  | 73.5  | 150.9  | 12.7  | 26% |
| 7 | 0.3  | 0.0  | 5.0  | 0.00  | 0.095 009  | 0.028 917  | 0.454 020  | 0.169 376  | 0.024 133  | 0.002 200  | 1 528.1  | 602.0  | 380.1  | 118.3  | 153.7  | 13.8  | 15% |
| 8 | 0.2  | 0.0  | 8.2  | 0.00  | 0.150 503  | 0.047 008  | 0.575 534  | 0.128 436  | 0.024 364  | 0.001 754  | 2 351.6  | 559.0  | 461.6  | 82.8  | 155.2  | 11.0  | 0% |
| 9 | 0.6  | 3.2  | 10.2  | 0.31  | 0.292 414  | 0.055 489  | 0.831 808  | 0.124 101  | 0.025 012  | 0.001 616  | 3 430.6  | 299.1  | 614.6  | 68.8  | 159.3  | 10.2  | -18% |
| 10 | 0.4  | 2.5  | 8.6  | 0.29  | 0.230 899  | 0.057 405  | 0.497 088  | 0.073 356  | 0.023 555  | 0.001 650  | 3 058.3  | 408.3  | 409.7  | 49.8  | 150.1  | 10.4  | 7% |
| 11 | 0.3  | 2.5  | 8.6  | 0.29  | 0.311 119  | 0.069 906  | 0.737 231  | 0.168 582  | 0.023 343  | 0.001 682  | 3 526.5  | 354.0  | 560.8  | 98.5  | 148.7  | 10.6  | -17% |
| 12 | 0.5  | 2.7  | 8.4  | 0.32  | 0.293 588  | 0.090 679  | 0.563 378  | 0.168 519  | 0.022 099  | 0.001 755  | 3 436.7  | 499.5  | 453.7  | 109.5  | 140.9  | 11.1  | -6% |
| 13 | 0.7  | 0.5  | 8.8  | 0.05  | 0.206 798  | 0.042 976  | 0.678 914  | 0.105 588  | 0.024 632  | 0.002 134  | 2 880.6  | 343.8  | 526.1  | 63.9  | 156.9  | 13.4  | -9% |
| 14 | 0.3  | 0.1  | 6.1  | 0.01  | 0.166 464  | 0.054 717  | 0.642 148  | 0.227 359  | 0.024 436  | 0.002 108  | 2 524.1  | 581.3  | 503.6  | 140.6  | 155.6  | 13.3  | -6% |
| 15 | 0.1  | 0.0  | 5.8  | 0.01  | 0.220 465  | 0.067 540  | 0.802 810  | 0.191 068  | 0.026 399  | 0.002 753  | 2 984.3  | 514.2  | 598.4  | 107.6  | 168.0  | 17.3  | -13% |
| 16 | 0.3  | 0.1  | 8.0  | 0.01  | 0.232 179  | 0.071 394  | 0.593 137  | 0.108 843  | 0.022 093  | 0.001 938  | 3 133.3  | 511.9  | 472.9  | 69.4  | 140.9  | 12.2  | -9% |
| 17 | 0.5  | 0.1  | 6.5  | 0.01  | 0.296 665  | 0.065 465  | 1.081 573  | 0.305 052  | 0.026 078  | 0.002 189  | 3 452.8  | 349.04  | 744.4  | 148.8  | 166.0  | 13.8  | -28% |

附表3 高椅山硅灰石（-铜）矿床锆石和石榴子石LA-ICP-MS稀土元素组成（10-6）

Table 3 The LA-ICP-MS rare earth elements (10-6) of zircon and garnet in the Gaoyishan Wo (-Cu) deposit

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 序号 | La | Ce | Pr | Nd | Sm | Eu | Gd | Tb | Dy | Ho | Er | Tm | Yb | Lu | ∑REE | LREE | HREE | LREE/HREE | δEu |
| 16GYS-01 (Zr) |
| 1 | 0.06 | 20.39 | 0.06 | 1.65 | 2.19 | 1.12 | 10.70 | 3.28 | 37.74 | 15.48 | 74.65 | 18.23 | 195.61 | 45.42 | 426.59 | 25.47 | 401.12 | 0.06 | 0.58 |
| 2 | 0.02 | 25.83 | 0.06 | 1.29 | 2.34 | 1.13 | 12.85 | 4.76 | 54.90 | 23.54 | 117.96 | 27.07 | 287.62 | 64.00 | 623.39 | 30.68 | 592.71 | 0.05 | 0.50 |
| 3 | 0.01 | 28.79 | 0.08 | 0.91 | 1.98 | 0.67 | 9.60 | 2.84 | 35.97 | 14.88 | 64.42 | 14.79 | 156.08 | 34.16 | 365.19 | 32.44 | 332.75 | 0.10 | 0.38 |
| 4 | 0.00 | 23.39 | 0.13 | 2.41 | 4.44 | 1.68 | 17.71 | 5.08 | 62.64 | 24.00 | 111.98 | 26.23 | 262.29 | 58.21 | 600.19 | 32.06 | 568.14 | 0.06 | 0.50 |
| 5 | 0.06 | 19.27 | 0.04 | 1.06 | 1.42 | 0.77 | 8.06 | 2.64 | 31.12 | 12.90 | 60.61 | 14.62 | 150.35 | 34.06 | 336.98 | 22.63 | 314.35 | 0.07 | 0.55 |
| 6 | 0.28 | 19.31 | 0.08 | 1.33 | 1.21 | 0.70 | 10.69 | 2.94 | 35.48 | 13.83 | 68.79 | 16.03 | 163.98 | 35.69 | 370.33 | 22.90 | 347.43 | 0.07 | 0.40 |
| 7 | 0.00 | 24.73 | 0.04 | 0.59 | 1.10 | 0.68 | 7.15 | 2.46 | 29.74 | 12.78 | 62.74 | 15.34 | 158.88 | 37.65 | 353.89 | 27.15 | 326.74 | 0.08 | 0.56 |
| 8 | 0.05 | 23.30 | 0.04 | 1.06 | 1.92 | 0.79 | 12.30 | 3.71 | 41.12 | 15.58 | 75.17 | 16.64 | 175.43 | 36.28 | 403.39 | 27.16 | 376.23 | 0.07 | 0.38 |
| 9 | 0.00 | 26.96 | 0.06 | 1.08 | 2.49 | 0.63 | 11.41 | 3.70 | 46.46 | 18.08 | 88.09 | 19.67 | 205.81 | 45.08 | 469.52 | 31.22 | 438.30 | 0.07 | 0.30 |
| 10 | 0.40 | 28.00 | 0.04 | 1.45 | 1.84 | 0.82 | 13.22 | 3.85 | 45.78 | 17.53 | 82.43 | 18.60 | 194.62 | 40.34 | 448.91 | 32.55 | 416.36 | 0.08 | 0.37 |
| 11 | 0.02 | 19.75 | 0.02 | 0.88 | 1.34 | 0.53 | 7.13 | 2.55 | 31.16 | 11.53 | 57.30 | 13.89 | 151.20 | 33.33 | 330.61 | 22.53 | 308.08 | 0.07 | 0.42 |
| 12 | 5.61 | 31.94 | 1.47 | 6.75 | 2.59 | 0.66 | 10.35 | 2.72 | 33.88 | 13.73 | 64.30 | 14.77 | 149.66 | 33.01 | 371.45 | 49.02 | 322.42 | 0.15 | 0.34 |
| 13 | 0.04 | 28.02 | 0.08 | 1.00 | 1.41 | 0.78 | 11.42 | 3.80 | 48.03 | 17.74 | 91.07 | 19.79 | 208.94 | 45.61 | 477.73 | 31.33 | 446.40 | 0.07 | 0.41 |
| 14 | 1.65 | 38.71 | 0.36 | 2.81 | 1.59 | 1.10 | 10.62 | 3.56 | 40.96 | 16.12 | 79.34 | 17.41 | 199.11 | 43.62 | 456.97 | 46.23 | 410.74 | 0.11 | 0.61 |
| 15 | 0.26 | 22.14 | 0.06 | 0.73 | 1.15 | 0.65 | 7.71 | 2.52 | 28.81 | 11.87 | 58.62 | 13.71 | 145.10 | 32.56 | 325.89 | 25.00 | 300.89 | 0.08 | 0.50 |
| 16 | 0.00 | 19.53 | 0.03 | 1.07 | 1.50 | 0.54 | 7.16 | 2.56 | 30.28 | 12.12 | 58.98 | 14.29 | 144.99 | 31.42 | 324.48 | 22.68 | 301.80 | 0.08 | 0.41 |
| 17 | 0.13 | 26.13 | 0.10 | 1.32 | 2.12 | 0.76 | 12.83 | 3.71 | 47.75 | 17.84 | 91.11 | 20.48 | 203.40 | 44.02 | 471.69 | 30.56 | 441.13 | 0.07 | 0.34 |
| 18 | 0.00 | 18.58 | 0.00 | 0.92 | 1.89 | 0.50 | 7.51 | 2.44 | 30.15 | 10.88 | 54.58 | 13.20 | 133.29 | 31.26 | 305.22 | 21.90 | 283.32 | 0.08 | 0.35 |
| 19 | 0.02 | 21.61 | 0.03 | 1.37 | 3.49 | 0.87 | 12.22 | 3.55 | 42.56 | 16.23 | 72.66 | 16.87 | 174.74 | 37.69 | 403.92 | 27.40 | 376.52 | 0.07 | 0.36 |
| 20 | 0.00 | 24.15 | 0.05 | 0.80 | 2.73 | 0.92 | 10.60 | 3.57 | 42.12 | 16.58 | 79.22 | 17.85 | 174.42 | 38.40 | 411.41 | 28.65 | 382.76 | 0.07 | 0.45 |
| 21 | 0.01 | 28.25 | 0.05 | 0.70 | 1.83 | 0.88 | 8.17 | 2.73 | 34.05 | 14.33 | 71.84 | 16.69 | 171.71 | 40.34 | 391.59 | 31.73 | 359.86 | 0.09 | 0.58 |
| 22 | 0.04 | 24.86 | 0.08 | 1.29 | 2.24 | 0.75 | 10.06 | 3.72 | 40.20 | 16.63 | 79.83 | 17.95 | 185.48 | 41.41 | 424.55 | 29.26 | 395.29 | 0.07 | 0.41 |
| 16GYS-10A (Grt1) |
| 1 | 17.10 | 56.39 | 3.68 | 4.13 | 0.44 | 0.14 | 0.69 | 0.13 | 0.85 | 0.17 | 0.48 | 0.05 | 0.41 | 0.07 | 84.73 | 81.88 | 2.85 | 28.76 | 0.79 |
| 2 | 17.51 | 58.66 | 3.85 | 5.22 | 0.53 | 0.12 | 0.57 | 0.11 | 0.77 | 0.20 | 0.52 | 0.06 | 0.48 | 0.06 | 88.68 | 85.89 | 2.78 | 30.88 | 0.67 |
| 3 | 17.42 | 60.08 | 3.95 | 5.00 | 0.30 | 0.13 | 0.60 | 0.12 | 0.73 | 0.13 | 0.47 | 0.07 | 0.55 | 0.05 | 89.60 | 86.88 | 2.71 | 32.00 | 0.95 |
| 4 | 17.29 | 57.75 | 3.85 | 4.70 | 0.38 | 0.17 | 0.65 | 0.12 | 0.91 | 0.23 | 0.68 | 0.09 | 0.55 | 0.08 | 87.44 | 84.14 | 3.30 | 25.46 | 1.02 |
| 5 | 16.54 | 59.25 | 3.75 | 4.77 | 0.43 | 0.16 | 0.62 | 0.15 | 0.90 | 0.23 | 0.67 | 0.10 | 0.61 | 0.11 | 88.29 | 84.90 | 3.39 | 25.02 | 0.98 |
| 6 | 18.01 | 60.24 | 4.10 | 4.78 | 0.33 | 0.16 | 0.73 | 0.13 | 0.68 | 0.17 | 0.47 | 0.07 | 0.34 | 0.04 | 90.26 | 87.62 | 2.63 | 33.28 | 0.95 |
| 7 | 19.03 | 65.01 | 4.26 | 5.41 | 0.59 | 0.19 | 0.98 | 0.13 | 0.92 | 0.22 | 0.69 | 0.09 | 0.66 | 0.08 | 98.25 | 94.48 | 3.76 | 25.10 | 0.75 |
| 8 | 19.43 | 64.41 | 4.23 | 5.65 | 0.54 | 0.17 | 0.71 | 0.13 | 1.01 | 0.21 | 0.57 | 0.08 | 0.56 | 0.07 | 97.77 | 94.44 | 3.33 | 28.34 | 0.86 |
| 9 | 17.25 | 59.28 | 4.05 | 5.46 | 0.50 | 0.19 | 0.50 | 0.13 | 0.62 | 0.16 | 0.30 | 0.05 | 0.38 | 0.05 | 88.92 | 86.73 | 2.19 | 39.66 | 1.13 |
| 10 | 16.62 | 56.07 | 3.90 | 4.50 | 0.49 | 0.16 | 0.84 | 0.16 | 0.84 | 0.17 | 0.60 | 0.09 | 0.57 | 0.07 | 85.08 | 81.75 | 3.33 | 24.53 | 0.77 |
| 11 | 14.71 | 64.69 | 6.06 | 9.01 | 0.26 | 0.23 | 0.16 | 0.01 | 0.11 | 0.02 | 0.06 | 0.01 | 0.04 | 0.01 | 95.38 | 94.96 | 0.42 | 226.35 | 3.23 |
| 12 | 14.02 | 57.71 | 5.23 | 8.12 | 0.33 | 0.18 | 0.10 | 0.03 | 0.09 | 0.03 | 0.10 | 0.01 | 0.11 | 0.00 | 86.08 | 85.60 | 0.48 | 178.11 | 2.35 |
| 13 | 16.67 | 57.13 | 3.88 | 5.01 | 0.27 | 0.21 | 0.56 | 0.12 | 0.58 | 0.14 | 0.28 | 0.04 | 0.24 | 0.04 | 85.17 | 83.17 | 2.01 | 41.42 | 1.59 |
| 14 | 17.20 | 57.62 | 3.81 | 6.34 | 0.52 | 0.21 | 1.17 | 0.19 | 1.12 | 0.25 | 0.61 | 0.09 | 0.43 | 0.06 | 89.63 | 85.71 | 3.93 | 21.82 | 0.80 |
| 15 | 16.14 | 54.16 | 3.50 | 4.14 | 0.48 | 0.11 | 0.37 | 0.06 | 0.23 | 0.06 | 0.15 | 0.02 | 0.22 | 0.01 | 79.65 | 78.53 | 1.12 | 70.29 | 0.79 |
| 16 | 15.83 | 53.30 | 3.76 | 4.78 | 0.60 | 0.12 | 0.46 | 0.09 | 0.55 | 0.12 | 0.30 | 0.03 | 0.23 | 0.04 | 80.21 | 78.39 | 1.82 | 42.97 | 0.65 |
| 17 | 17.39 | 58.79 | 3.89 | 5.16 | 0.29 | 0.14 | 0.46 | 0.06 | 0.48 | 0.11 | 0.26 | 0.04 | 0.15 | 0.03 | 87.25 | 85.65 | 1.59 | 53.79 | 1.13 |
| 18 | 17.82 | 58.29 | 4.02 | 5.93 | 0.41 | 0.15 | 0.70 | 0.11 | 0.62 | 0.14 | 0.27 | 0.05 | 0.24 | 0.04 | 88.78 | 86.62 | 2.16 | 40.08 | 0.86 |
| 19 | 14.33 | 52.22 | 4.50 | 6.35 | 0.27 | 0.30 | 0.20 | 0.03 | 0.13 | 0.04 | 0.07 | 0.01 | 0.06 | 0.01 | 78.53 | 77.96 | 0.56 | 138.88 | 3.77 |
| 20 | 14.13 | 51.58 | 4.27 | 5.95 | 0.31 | 0.30 | 0.33 | 0.02 | 0.12 | 0.03 | 0.13 | 0.01 | 0.09 | 0.00 | 77.29 | 76.55 | 0.74 | 103.14 | 2.89 |
| 21 | 13.99 | 53.09 | 4.43 | 6.50 | 0.47 | 0.19 | 0.33 | 0.04 | 0.12 | 0.03 | 0.09 | 0.02 | 0.09 | 0.02 | 79.41 | 78.67 | 0.74 | 106.64 | 1.44 |
| 22 | 14.22 | 51.93 | 4.38 | 6.31 | 0.39 | 0.18 | 0.23 | 0.02 | 0.14 | 0.03 | 0.07 | 0.01 | 0.11 | 0.02 | 78.04 | 77.41 | 0.63 | 123.03 | 1.73 |
| 23 | 14.58 | 52.63 | 4.04 | 5.93 | 0.33 | 0.28 | 0.22 | 0.02 | 0.19 | 0.03 | 0.13 | 0.02 | 0.05 | 0.01 | 78.48 | 77.79 | 0.68 | 113.71 | 2.94 |
| 24 | 16.36 | 57.11 | 4.77 | 6.95 | 0.21 | 0.26 | 0.21 | 0.06 | 0.18 | 0.03 | 0.09 | 0.01 | 0.09 | 0.01 | 86.34 | 85.67 | 0.68 | 126.79 | 3.83 |
| 25 | 15.14 | 56.41 | 4.39 | 6.31 | 0.47 | 0.30 | 0.32 | 0.02 | 0.22 | 0.05 | 0.14 | 0.02 | 0.09 | 0.02 | 83.91 | 83.03 | 0.88 | 94.62 | 2.25 |
| 26 | 14.94 | 56.34 | 4.55 | 6.63 | 0.30 | 0.17 | 0.25 | 0.03 | 0.28 | 0.04 | 0.11 | 0.00 | 0.08 | 0.02 | 83.70 | 82.91 | 0.79 | 104.47 | 1.83 |
| 27 | 16.26 | 56.94 | 4.56 | 7.08 | 0.49 | 0.30 | 0.25 | 0.03 | 0.20 | 0.04 | 0.10 | 0.02 | 0.10 | 0.01 | 86.38 | 85.64 | 0.74 | 115.22 | 2.38 |
| 28 | 16.58 | 57.62 | 4.77 | 7.09 | 0.51 | 0.34 | 0.28 | 0.05 | 0.19 | 0.03 | 0.13 | 0.01 | 0.10 | 0.01 | 87.71 | 86.91 | 0.80 | 108.46 | 2.48 |
| 29 | 14.39 | 50.96 | 4.13 | 5.92 | 0.32 | 0.17 | 0.20 | 0.03 | 0.14 | 0.03 | 0.11 | 0.02 | 0.10 | 0.02 | 76.54 | 75.89 | 0.64 | 117.72 | 1.95 |
| 30 | 13.78 | 51.09 | 4.26 | 5.53 | 0.33 | 0.26 | 0.26 | 0.02 | 0.16 | 0.05 | 0.07 | 0.02 | 0.12 | 0.01 | 75.95 | 75.24 | 0.71 | 106.46 | 2.67 |
| 31 | 14.32 | 52.04 | 4.28 | 6.10 | 0.41 | 0.21 | 0.12 | 0.03 | 0.10 | 0.06 | 0.11 | 0.02 | 0.03 | 0.01 | 77.86 | 77.37 | 0.49 | 158.09 | 2.23 |
| 32 | 14.97 | 52.10 | 4.59 | 6.06 | 0.35 | 0.26 | 0.26 | 0.02 | 0.17 | 0.04 | 0.12 | 0.01 | 0.11 | 0.01 | 79.06 | 78.32 | 0.74 | 105.81 | 2.49 |
| 33 | 15.45 | 53.75 | 4.60 | 6.13 | 0.23 | 0.22 | 0.13 | 0.02 | 0.12 | 0.02 | 0.10 | 0.02 | 0.10 | 0.01 | 80.90 | 80.38 | 0.52 | 154.14 | 3.52 |
| 34 | 14.59 | 54.44 | 4.25 | 6.06 | 0.20 | 0.28 | 0.37 | 0.03 | 0.14 | 0.03 | 0.07 | 0.01 | 0.08 | 0.00 | 80.56 | 79.82 | 0.74 | 108.16 | 3.05 |
| 35 | 15.16 | 54.17 | 4.51 | 6.00 | 0.48 | 0.23 | 0.27 | 0.02 | 0.20 | 0.04 | 0.10 | 0.00 | 0.11 | 0.01 | 81.29 | 80.55 | 0.75 | 108.08 | 1.79 |
| 36 | 15.98 | 56.01 | 4.59 | 6.18 | 0.24 | 0.24 | 0.17 | 0.02 | 0.13 | 0.05 | 0.14 | 0.01 | 0.08 | 0.02 | 83.85 | 83.24 | 0.62 | 134.95 | 3.44 |
| 37 | 15.92 | 56.81 | 4.45 | 6.17 | 0.23 | 0.23 | 0.29 | 0.04 | 0.15 | 0.03 | 0.09 | 0.01 | 0.12 | 0.01 | 84.56 | 83.81 | 0.75 | 111.99 | 2.67 |
| 16GYS-10B (Grt2) |
| 1 | 0.46  | 9.15  | 3.66  | 36.64  | 16.63  | 4.68  | 18.06  | 2.63  | 15.38  | 2.72  | 7.38  | 0.93  | 6.64  | 0.77  | 125.74  | 71.22  | 54.52  | 1.31  | 0.82  |
| 2 | 0.47  | 11.52  | 4.73  | 49.40  | 19.86  | 5.91  | 21.72  | 3.07  | 19.43  | 3.37  | 8.97  | 1.15  | 8.81  | 0.99  | 159.40  | 91.90  | 67.50  | 1.36  | 0.86  |
| 3 | 0.41  | 9.20  | 4.15  | 39.79  | 19.35  | 5.22  | 20.23  | 3.12  | 18.52  | 3.51  | 10.49  | 1.19  | 10.09  | 1.23  | 146.50  | 78.10  | 68.40  | 1.14  | 0.80  |
| 4 | 0.51  | 11.83  | 4.95  | 49.57  | 19.63  | 5.66  | 20.57  | 2.88  | 18.62  | 3.29  | 7.89  | 1.03  | 7.88  | 1.04  | 155.33  | 92.15  | 63.19  | 1.46  | 0.85  |
| 5 | 0.30  | 6.99  | 3.16  | 32.52  | 15.58  | 4.58  | 16.57  | 2.43  | 15.79  | 3.23  | 9.00  | 1.26  | 9.31  | 1.26  | 121.98  | 63.13  | 58.85  | 1.07  | 0.86  |
| 6 | 0.48  | 10.06  | 4.57  | 44.09  | 20.16  | 5.38  | 21.34  | 2.93  | 18.37  | 3.55  | 10.26  | 1.41  | 10.90  | 1.36  | 154.86  | 84.74  | 70.12  | 1.21  | 0.78  |
| 7 | 0.11  | 3.46  | 1.96  | 22.71  | 12.82  | 3.92  | 11.69  | 1.55  | 8.97  | 1.58  | 4.31  | 0.58  | 4.58  | 0.48  | 78.72  | 44.98  | 33.73  | 1.33  | 0.95  |
| 8 | 0.36  | 7.01  | 3.18  | 31.50  | 14.81  | 4.04  | 14.36  | 2.10  | 12.27  | 2.13  | 5.62  | 0.78  | 5.72  | 0.74  | 104.60  | 60.89  | 43.71  | 1.39  | 0.83  |
| 9 | 2.38  | 25.03  | 7.22  | 50.17  | 15.57  | 5.10  | 13.07  | 1.95  | 11.92  | 2.05  | 5.34  | 0.71  | 4.85  | 0.56  | 145.92  | 105.47  | 40.45  | 2.61  | 1.06  |
| 10 | 0.50  | 9.63  | 4.40  | 42.03  | 19.59  | 5.44  | 21.03  | 3.12  | 19.15  | 3.59  | 10.46  | 1.36  | 10.37  | 1.45  | 152.11  | 81.59  | 70.52  | 1.16  | 0.81  |
| 11 | 0.47  | 9.52  | 4.36  | 44.41  | 19.07  | 5.82  | 21.19  | 3.30  | 19.34  | 3.91  | 10.83  | 1.49  | 12.03  | 1.56  | 157.30  | 83.65  | 73.65  | 1.14  | 0.88  |
| 12 | 0.48  | 9.10  | 3.91  | 39.01  | 16.28  | 4.69  | 16.19  | 2.65  | 14.03  | 2.44  | 6.26  | 0.75  | 5.71  | 0.62  | 122.13  | 73.47  | 48.65  | 1.51  | 0.87  |
| 13 | 0.42  | 10.63  | 4.52  | 45.06  | 20.24  | 5.43  | 22.16  | 2.94  | 19.20  | 3.61  | 9.01  | 1.32  | 9.71  | 1.26  | 155.52  | 86.30  | 69.21  | 1.25  | 0.77  |