**Table S3 LA-ICP-MS U-Pb and trace element data for zircons grains from Baqing eclogite sample YA-7-18-40, schist sample GR-17 and gneiss sample YA-7-18-44.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Spot** | **Characteristics** | **207Pb/206Pb** | **1 sigma** | **207Pb/235U** | **1 sigma** | **206Pb/238U** | **1 sigma** | **Age (Ma) 207Pb/206Pb** | **1 sigma** | **Age (Ma) 207Pb/235U** | **1 sigma** | **Age (Ma) 206Pb/238U** | **1 sigma** | **232Th (ppm)** | **238U (ppm)** | **Th/U** | **Disconrdant (%)** |
| **GR-17-1a** | core | 0.078 | 0.002 | 1.891 | 0.042 | 0.174 | 0.003 | 1155.3 | 38.0 | 1078.0 | 14.7 | 1036.9 | 14.0 | 338 | 726 | 0.465 | 96 |
| **2a** | core | 0.074 | 0.002 | 1.652 | 0.045 | 0.161 | 0.002 | 1042.6 | 51.9 | 990.3 | 17.3 | 962.3 | 12.9 | 92 | 176 | 0.520 | 97 |
| **3a** | core | 0.073 | 0.001 | 1.521 | 0.031 | 0.151 | 0.002 | 1005.6 | 45.4 | 938.8 | 12.3 | 906.1 | 10.9 | 303 | 474 | 0.639 | 96 |
| **4.1a** | core | 0.066 | 0.002 | 0.890 | 0.021 | 0.098 | 0.002 | 794.4 | 56.5 | 646.5 | 11.4 | 604.2 | 9.4 | 278 | 486 | 0.571 | 93 |
| **4.2a** | core | 0.062 | 0.001 | 0.674 | 0.015 | 0.079 | 0.001 | 661.1 | 46.3 | 522.8 | 9.4 | 489.7 | 7.2 | 64 | 1679 | 0.038 | 93 |
| **5a** | core | 0.073 | 0.002 | 1.495 | 0.035 | 0.149 | 0.003 | 1033.3 | 61.6 | 928.4 | 14.4 | 893.5 | 15.0 | 103 | 221 | 0.465 | 96 |
| **6a** | core | 0.074 | 0.002 | 1.814 | 0.059 | 0.176 | 0.003 | 1050.0 | 67.6 | 1050.7 | 21.2 | 1043.5 | 14.0 | 39 | 149 | 0.265 | 99 |
| **7a** | core | 0.073 | 0.001 | 1.587 | 0.030 | 0.157 | 0.002 | 1006.5 | 45.4 | 965.1 | 11.8 | 941.9 | 11.6 | 1122 | 955 | 1.175 | 97 |
| **8a** | core | 0.076 | 0.002 | 1.692 | 0.054 | 0.161 | 0.003 | 1100.0 | 64.1 | 1005.4 | 20.5 | 960.5 | 14.4 | 72 | 100 | 0.725 | 95 |
| **9a** | core | 0.072 | 0.002 | 1.579 | 0.038 | 0.157 | 0.002 | 990.7 | 48.2 | 962.0 | 15.0 | 942.1 | 13.1 | 336 | 360 | 0.933 | 97 |
| **10a** | core | 0.105 | 0.002 | 4.356 | 0.099 | 0.298 | 0.005 | 1716.7 | 42.6 | 1704.1 | 18.9 | 1683.3 | 22.9 | 243 | 276 | 0.880 | 98 |
| **11a** | core | 0.109 | 0.002 | 4.498 | 0.103 | 0.297 | 0.004 | 1787.0 | 39.4 | 1730.6 | 19.1 | 1674.1 | 21.8 | 57 | 146 | 0.388 | 96 |
| **12a** | core | 0.098 | 0.002 | 3.817 | 0.083 | 0.280 | 0.004 | 1594.4 | 45.8 | 1596.2 | 17.6 | 1593.3 | 19.8 | 109 | 212 | 0.517 | 99 |
| **13a** | core | 0.071 | 0.002 | 1.651 | 0.033 | 0.168 | 0.002 | 966.7 | 48.3 | 989.9 | 12.5 | 999.8 | 13.2 | 537 | 575 | 0.933 | 98 |
| **14a** | core | 0.166 | 0.004 | 10.567 | 0.219 | 0.460 | 0.006 | 2514.5 | 37.3 | 2485.8 | 19.2 | 2440.3 | 25.6 | 83 | 88 | 0.948 | 98 |
| **15a** | core | 0.069 | 0.002 | 1.521 | 0.038 | 0.158 | 0.002 | 910.8 | 48.9 | 938.7 | 15.3 | 943.3 | 10.8 | 281 | 249 | 1.128 | 99 |
| **16a** | core | 0.064 | 0.002 | 0.750 | 0.020 | 0.085 | 0.001 | 731.5 | 26.9 | 568.3 | 11.6 | 527.2 | 6.8 | 310 | 395 | 0.785 | 92 |
| **17a** | core | 0.076 | 0.002 | 1.699 | 0.047 | 0.163 | 0.002 | 1083.3 | 54.6 | 1008.2 | 17.5 | 973.3 | 13.5 | 78 | 104 | 0.751 | 96 |
| **18a** | core | 0.056 | 0.003 | 0.656 | 0.029 | 0.085 | 0.001 | 461.2 | 97.2 | 512.2 | 17.9 | 523.4 | 7.5 | 94 | 109 | 0.861 | 97 |
| **19a** | core | 0.071 | 0.002 | 1.548 | 0.043 | 0.159 | 0.002 | 946.3 | 64.8 | 949.7 | 17.2 | 953.0 | 12.9 | 70 | 162 | 0.432 | 99 |
| **20.1a** | core | 0.095 | 0.002 | 3.622 | 0.065 | 0.275 | 0.003 | 1527.8 | 33.3 | 1554.3 | 14.4 | 1567.0 | 17.7 | 8 | 1255 | 0.006 | 99 |
| **20.2a** | core | 0.100 | 0.002 | 4.037 | 0.093 | 0.293 | 0.004 | 1621.9 | 50.9 | 1641.6 | 18.8 | 1654.2 | 20.0 | 82 | 160 | 0.516 | 99 |
| **21.1a** | core | 0.060 | 0.001 | 0.735 | 0.018 | 0.088 | 0.001 | 613.0 | 50.8 | 559.5 | 10.6 | 544.1 | 6.8 | 88 | 638 | 0.139 | 97 |
| **21.2a** | core | 0.057 | 0.002 | 0.707 | 0.019 | 0.089 | 0.001 | 505.6 | 61.1 | 543.0 | 11.5 | 551.7 | 7.7 | 64 | 473 | 0.135 | 98 |
| **22a** | core | 0.122 | 0.002 | 6.047 | 0.126 | 0.358 | 0.004 | 1983.6 | 34.1 | 1982.6 | 18.1 | 1974.7 | 20.7 | 108 | 125 | 0.867 | 99 |
| **23.1a** | core | 0.092 | 0.004 | 2.476 | 0.122 | 0.193 | 0.003 | 1461.4 | 82.6 | 1265.1 | 35.7 | 1136.4 | 14.9 | 203 | 188 | 1.082 | 89 |
| ***23.2a*** | *rim* | *0.047* | *0.003* | *0.268* | *0.014* | *0.041* | *0.001* | *72.3* | *125.9* | *241.3* | *11.3* | *259.6* | *4.6* | *4* | *246* | *0.016* | *92* |
| **24a** | core | 0.073 | 0.002 | 1.698 | 0.043 | 0.169 | 0.002 | 1005.6 | 51.9 | 1007.7 | 16.1 | 1005.6 | 9.8 | 106 | 217 | 0.487 | 99 |
| **25a** | core | 0.075 | 0.002 | 1.948 | 0.043 | 0.188 | 0.002 | 1075.9 | 46.3 | 1097.9 | 14.9 | 1109.2 | 12.7 | 128 | 258 | 0.498 | 98 |
| **26a** | core | 0.059 | 0.002 | 0.701 | 0.025 | 0.086 | 0.001 | 568.6 | 72.2 | 539.3 | 15.0 | 530.0 | 7.6 | 84 | 247 | 0.340 | 98 |
| **27a** | core | 0.060 | 0.001 | 0.908 | 0.025 | 0.109 | 0.001 | 611.1 | 53.7 | 656.0 | 13.2 | 669.6 | 8.3 | 1131 | 549 | 2.059 | 97 |
| **28a** | core | 0.071 | 0.001 | 1.758 | 0.039 | 0.180 | 0.002 | 947.8 | 42.6 | 1030.3 | 14.4 | 1067.7 | 12.7 | 48 | 498 | 0.096 | 96 |
| **29a** | core | 0.073 | 0.002 | 0.847 | 0.024 | 0.084 | 0.002 | 1010.2 | 44.5 | 623.0 | 13.3 | 521.4 | 10.8 | 109 | 2115 | 0.051 | 82 |
| **30a** | core | 0.072 | 0.002 | 1.720 | 0.043 | 0.174 | 0.002 | 983.3 | 50.0 | 1016.1 | 15.9 | 1032.4 | 12.9 | 96 | 335 | 0.286 | 98 |
| **31a** | core | 0.081 | 0.002 | 2.147 | 0.049 | 0.193 | 0.003 | 1210.8 | 42.6 | 1164.0 | 15.9 | 1138.2 | 14.0 | 366 | 350 | 1.046 | 97 |
| **32a** | core | 0.106 | 0.002 | 4.548 | 0.090 | 0.312 | 0.004 | 1725.6 | 30.6 | 1739.7 | 16.5 | 1751.6 | 20.6 | 170 | 292 | 0.583 | 99 |
| **33a** | core | 0.077 | 0.001 | 1.978 | 0.039 | 0.186 | 0.003 | 1124.1 | 38.4 | 1107.9 | 13.3 | 1100.5 | 14.3 | 288 | 690 | 0.417 | 99 |
| **34a** | core | 0.171 | 0.003 | 11.299 | 0.238 | 0.477 | 0.007 | 2570.1 | 27.6 | 2548.1 | 19.6 | 2514.7 | 31.8 | 417 | 626 | 0.666 | 98 |
| **35a** | core | 0.078 | 0.002 | 2.031 | 0.044 | 0.187 | 0.003 | 1159.0 | 38.9 | 1126.0 | 14.6 | 1106.1 | 13.7 | 526 | 706 | 0.745 | 98 |
| **36a** | core | 0.062 | 0.003 | 0.735 | 0.040 | 0.086 | 0.002 | 683.3 | 116.7 | 559.4 | 23.2 | 531.7 | 9.4 | 100 | 97 | 1.029 | 94 |
| **37a** | core | 0.074 | 0.003 | 1.549 | 0.055 | 0.152 | 0.002 | 1042.6 | 72.7 | 950.3 | 22.1 | 913.2 | 13.5 | 69 | 110 | 0.632 | 96 |
| **38a** | core | 0.085 | 0.002 | 2.523 | 0.054 | 0.214 | 0.003 | 1320.4 | 41.7 | 1278.7 | 15.5 | 1250.6 | 17.2 | 336 | 563 | 0.597 | 97 |
| **39a** | core | 0.163 | 0.004 | 9.984 | 0.232 | 0.443 | 0.007 | 2487.3 | 37.8 | 2433.3 | 21.4 | 2365.8 | 30.1 | 55 | 74 | 0.753 | 97 |
| **40a** | core | 0.077 | 0.003 | 1.883 | 0.060 | 0.177 | 0.003 | 1121.3 | 64.8 | 1075.0 | 21.0 | 1052.1 | 14.4 | 184 | 165 | 1.117 | 97 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Spot** | **Characteristics** | **207Pb/206Pb** | **1 sigma** | **207Pb/235U** | **1 sigma** | **206Pb/238U** | **1 sigma** | **Age (Ma) 207Pb/206Pb** | **1 sigma** | **Age (Ma) 207Pb/235U** | **1 sigma** | **Age (Ma) 206Pb/238U** | **1 sigma** | **232Th (ppm)** | **238U (ppm)** | **Th/U** | **Disconrdant (%)** |
| **GR-17-41a** | core | 0.080 | 0.002 | 1.964 | 0.046 | 0.177 | 0.003 | 1266.7 | 50.5 | 1103.3 | 15.9 | 1051.8 | 14.6 | 227 | 325 | 0.697 | 95 |
| **42a** | core | 0.175 | 0.004 | 11.308 | 0.229 | 0.466 | 0.006 | 2610.2 | 33.6 | 2548.9 | 18.9 | 2465.7 | 26.7 | 66 | 129 | 0.511 | 96 |
| **43a** | core | 0.059 | 0.001 | 0.666 | 0.015 | 0.082 | 0.001 | 550.0 | 48.1 | 518.1 | 9.4 | 507.9 | 6.1 | 537 | 706 | 0.761 | 98 |
| **44a** | core | 0.059 | 0.003 | 0.680 | 0.029 | 0.083 | 0.001 | 583.4 | 94.4 | 526.8 | 17.2 | 516.0 | 7.9 | 109 | 119 | 0.911 | 97 |
| **45a** | core | 0.083 | 0.002 | 2.263 | 0.045 | 0.197 | 0.003 | 1279.6 | 42.6 | 1200.7 | 14.1 | 1157.3 | 13.5 | 126 | 354 | 0.356 | 96 |
| **46a** | core | 0.089 | 0.002 | 2.714 | 0.055 | 0.221 | 0.003 | 1394.4 | 32.4 | 1332.2 | 15.0 | 1288.6 | 14.2 | 121 | 385 | 0.313 | 96 |
| **47a** | core | 0.077 | 0.002 | 1.931 | 0.048 | 0.181 | 0.002 | 1131.5 | 50.5 | 1092.0 | 16.7 | 1069.8 | 13.4 | 105 | 214 | 0.488 | 97 |
| **48a** | core | 0.070 | 0.002 | 1.551 | 0.044 | 0.161 | 0.002 | 924.1 | 62.0 | 950.9 | 17.3 | 961.3 | 12.2 | 140 | 218 | 0.643 | 98 |
| **49a** | core | 0.071 | 0.002 | 1.582 | 0.040 | 0.160 | 0.002 | 968.5 | 51.9 | 963.2 | 15.7 | 958.7 | 12.2 | 197 | 365 | 0.540 | 99 |
| **50a** | core | 0.084 | 0.002 | 2.341 | 0.054 | 0.202 | 0.003 | 1300.0 | 38.0 | 1224.9 | 16.3 | 1183.6 | 15.1 | 130 | 437 | 0.299 | 96 |
| **51a** | core | 0.072 | 0.002 | 1.639 | 0.044 | 0.164 | 0.002 | 987.0 | 53.7 | 985.3 | 16.8 | 981.0 | 11.1 | 60 | 423 | 0.142 | 99 |
| **52a** | core | 0.078 | 0.002 | 1.095 | 0.054 | 0.102 | 0.004 | 1151.6 | 58.8 | 750.7 | 26.4 | 624.4 | 24.5 | 74 | 302 | 0.246 | 81 |
| **53a** | core | 0.097 | 0.003 | 3.475 | 0.092 | 0.260 | 0.004 | 1559.0 | 50.0 | 1521.5 | 20.9 | 1491.4 | 18.6 | 41 | 110 | 0.371 | 98 |
| **54a** | core | 0.062 | 0.003 | 0.999 | 0.043 | 0.117 | 0.002 | 679.6 | 91.7 | 703.1 | 21.9 | 714.1 | 10.7 | 73 | 86 | 0.848 | 98 |
| **55a** | core | 0.058 | 0.002 | 0.656 | 0.019 | 0.082 | 0.001 | 522.3 | 61.1 | 512.2 | 11.7 | 509.6 | 7.1 | 312 | 290 | 1.075 | 99 |
| **56a** | core | 0.073 | 0.002 | 1.592 | 0.034 | 0.159 | 0.002 | 1003.4 | 48.3 | 967.1 | 13.5 | 948.7 | 11.2 | 354 | 564 | 0.627 | 98 |
| **57a** | core | 0.120 | 0.002 | 5.315 | 0.099 | 0.321 | 0.004 | 1953.7 | 33.3 | 1871.2 | 16.0 | 1793.5 | 19.5 | 269 | 252 | 1.067 | 95 |
| **58a** | core | 0.209 | 0.004 | 15.735 | 0.330 | 0.544 | 0.007 | 2899.1 | 33.0 | 2860.9 | 20.0 | 2800.8 | 31.1 | 38 | 65 | 0.593 | 97 |
| **59a** | core | 0.079 | 0.002 | 1.969 | 0.039 | 0.179 | 0.002 | 1180.6 | 38.9 | 1105.1 | 13.2 | 1064.2 | 12.4 | 172 | 755 | 0.228 | 96 |
| **60a** | core | 0.059 | 0.002 | 0.685 | 0.020 | 0.084 | 0.001 | 576.0 | 64.8 | 529.9 | 12.2 | 517.7 | 6.3 | 268 | 430 | 0.623 | 97 |
| **GR-17-61a** | core | 0.072 | 0.002 | 1.355 | 0.027 | 0.136 | 0.002 | 983.3 | 42.6 | 869.6 | 11.5 | 824.7 | 9.5 | 88 | 653 | 0.135 | 94 |
| **62a** | core | 0.057 | 0.001 | 0.659 | 0.015 | 0.083 | 0.001 | 509.3 | 54.6 | 514.0 | 9.2 | 513.9 | 5.7 | 536 | 833 | 0.644 | 99 |
| **63a** | core | 0.133 | 0.002 | 6.601 | 0.109 | 0.358 | 0.004 | 2142.9 | 27.8 | 2059.5 | 14.6 | 1970.6 | 18.8 | 234 | 801 | 0.292 | 95 |
| **64a** | core | 0.076 | 0.002 | 1.787 | 0.037 | 0.171 | 0.002 | 1087.0 | 36.1 | 1040.7 | 13.4 | 1016.4 | 10.8 | 196 | 477 | 0.410 | 97 |
| **65a** | core | 0.165 | 0.003 | 10.266 | 0.177 | 0.449 | 0.005 | 2510.2 | 29.0 | 2459.0 | 15.9 | 2391.5 | 21.3 | 438 | 180 | 2.436 | 97 |
| **66a** | core | 0.074 | 0.002 | 1.690 | 0.059 | 0.166 | 0.002 | 1027.8 | 67.7 | 1004.9 | 22.1 | 991.1 | 10.8 | 45 | 121 | 0.375 | 98 |
| **67a** | core | 0.079 | 0.002 | 2.242 | 0.062 | 0.205 | 0.003 | 1175.9 | 54.2 | 1194.3 | 19.5 | 1204.6 | 15.1 | 69 | 133 | 0.517 | 99 |
| **68a** | core | 0.142 | 0.003 | 7.980 | 0.155 | 0.409 | 0.005 | 2246.0 | 36.6 | 2228.8 | 17.6 | 2208.2 | 22.2 | 192 | 233 | 0.824 | 99 |
| **69a** | core | 0.073 | 0.002 | 1.574 | 0.044 | 0.156 | 0.002 | 1013.0 | 51.9 | 960.0 | 17.4 | 932.4 | 11.6 | 269 | 258 | 1.045 | 97 |
| **70a** | core | 0.073 | 0.002 | 1.684 | 0.040 | 0.167 | 0.002 | 1009.3 | 48.1 | 1002.6 | 15.0 | 998.1 | 11.4 | 169 | 337 | 0.502 | 99 |
| **71a** | core | 0.088 | 0.002 | 2.939 | 0.078 | 0.241 | 0.003 | 1390.7 | 50.3 | 1392.1 | 20.1 | 1389.9 | 16.1 | 150 | 178 | 0.842 | 99 |
| **72a** | core | 0.109 | 0.002 | 4.393 | 0.098 | 0.293 | 0.004 | 1775.9 | 38.7 | 1711.1 | 18.5 | 1654.4 | 19.4 | 78 | 160 | 0.489 | 96 |
| **73a** | core | 0.078 | 0.001 | 2.142 | 0.040 | 0.199 | 0.002 | 1144.1 | 37.8 | 1162.4 | 13.0 | 1169.2 | 12.4 | 531 | 536 | 0.991 | 99 |
| **74a** | core | 0.070 | 0.002 | 1.363 | 0.035 | 0.141 | 0.002 | 1000.0 | 53.4 | 873.2 | 15.2 | 847.8 | 10.4 | 187 | 317 | 0.590 | 97 |
| **75a** | core | 0.071 | 0.002 | 1.577 | 0.037 | 0.161 | 0.002 | 950.9 | 48.6 | 961.2 | 14.4 | 963.9 | 12.9 | 97 | 268 | 0.362 | 99 |
| **76a** | core | 0.115 | 0.002 | 4.920 | 0.086 | 0.311 | 0.003 | 1872.5 | 33.5 | 1805.6 | 14.8 | 1743.7 | 16.9 | 214 | 404 | 0.529 | 96 |
| **77a** | core | 0.068 | 0.004 | 1.203 | 0.065 | 0.129 | 0.002 | 857.4 | 113.4 | 801.8 | 29.9 | 782.1 | 12.9 | 60 | 58 | 1.029 | 97 |
| **78a** | core | 0.108 | 0.002 | 4.338 | 0.075 | 0.291 | 0.003 | 1759.0 | 31.6 | 1700.7 | 14.3 | 1648.3 | 17.3 | 261 | 463 | 0.563 | 96 |
| **79a** | core | 0.071 | 0.002 | 1.422 | 0.032 | 0.146 | 0.002 | 946.3 | 47.8 | 898.3 | 13.6 | 877.9 | 12.0 | 223 | 315 | 0.709 | 97 |
| **80a** | core | 0.159 | 0.003 | 9.267 | 0.159 | 0.419 | 0.005 | 2449.7 | 27.8 | 2364.8 | 15.8 | 2256.9 | 22.7 | 92 | 368 | 0.251 | 95 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Spot** | **Characteristics** | **207Pb/206Pb** | **1 sigma** | **207Pb/235U** | **1 sigma** | **206Pb/238U** | **1 sigma** | **Age (Ma) 207Pb/206Pb** | **1 sigma** | **Age (Ma) 207Pb/235U** | **1 sigma** | **Age (Ma) 206Pb/238U** | **1 sigma** | **232Th (ppm)** | **238U (ppm)** | **Th/U** | **Disconrdant (%)** |
| **GR-17-81.1a** | core | 0.077 | 0.002 | 1.961 | 0.042 | 0.185 | 0.002 | 1110.2 | 43.7 | 1102.3 | 14.3 | 1094.8 | 13.2 | 145 | 519 | 0.280 | 99 |
| **81.2a** | core | 0.080 | 0.003 | 1.973 | 0.063 | 0.178 | 0.003 | 1205.6 | 67.6 | 1106.4 | 21.5 | 1054.9 | 15.8 | 84 | 105 | 0.807 | 95 |
| **82a** | core | 0.071 | 0.002 | 1.491 | 0.032 | 0.151 | 0.002 | 962.7 | 45.2 | 926.5 | 12.9 | 908.2 | 11.5 | 154 | 619 | 0.249 | 97 |
| **83a** | core | 0.129 | 0.003 | 4.562 | 0.119 | 0.254 | 0.004 | 2084.9 | 36.7 | 1742.3 | 21.7 | 1458.5 | 22.5 | 190 | 484 | 0.392 | 82 |
| **M27** | core | 0.090 | 0.005 | 1.954 | 0.114 | 0.159 | 0.003 | 1416.7 | 112.5 | 1099.9 | 39.2 | 952.7 | 16.6 | 45 | 34 | 1.321 | 85 |
| **M28** | core | 0.116 | 0.003 | 4.558 | 0.111 | 0.282 | 0.003 | 1902.8 | 44.1 | 1741.6 | 20.3 | 1603.4 | 14.6 | 126 | 273 | 0.461 | 91 |
| **M29** | core | 0.099 | 0.003 | 3.043 | 0.108 | 0.221 | 0.003 | 1609.6 | 63.0 | 1418.4 | 27.0 | 1286.3 | 14.3 | 443 | 121 | 3.671 | 90 |
| **M30** | core | 0.069 | 0.002 | 1.337 | 0.039 | 0.141 | 0.002 | 892.3 | 61.1 | 861.8 | 17.0 | 847.7 | 10.7 | 133 | 508 | 0.261 | 98 |
| **M31** | core | 0.071 | 0.002 | 1.321 | 0.038 | 0.135 | 0.002 | 953.7 | 61.1 | 855.1 | 16.8 | 814.4 | 9.1 | 19 | 595 | 0.033 | 95 |
| **GR-17-1** | core | 0.078 | 0.003 | 1.939 | 0.083 | 0.181 | 0.003 | 1142.6 | 89.8 | 1094.8 | 28.8 | 1070.4 | 14.7 | 48 | 35 | 1.381 | 97 |
| **2** | core | 0.072 | 0.002 | 1.593 | 0.050 | 0.160 | 0.003 | 975.9 | 52.8 | 967.6 | 19.5 | 957.5 | 18.5 | 88 | 365 | 0.242 | 98 |
| **3** | core | 0.091 | 0.002 | 3.136 | 0.084 | 0.249 | 0.003 | 1443.5 | 51.1 | 1441.6 | 20.6 | 1434.3 | 16.7 | 552 | 141 | 3.907 | 99 |
| **4** | core | 0.114 | 0.003 | 4.863 | 0.105 | 0.307 | 0.004 | 1870.1 | 41.4 | 1795.9 | 18.2 | 1727.1 | 19.8 | 118 | 252 | 0.468 | 96 |
| **5** | core | 0.077 | 0.002 | 1.911 | 0.042 | 0.180 | 0.002 | 1109.3 | 47.1 | 1084.8 | 14.7 | 1068.3 | 11.0 | 423 | 855 | 0.495 | 98 |
| **6** | core | 0.078 | 0.002 | 2.000 | 0.041 | 0.186 | 0.002 | 1136.1 | 44.4 | 1115.4 | 13.7 | 1101.8 | 12.3 | 136 | 463 | 0.295 | 98 |
| **7** | core | 0.069 | 0.002 | 1.530 | 0.038 | 0.160 | 0.002 | 905.6 | 58.3 | 942.4 | 15.1 | 955.6 | 10.2 | 148 | 219 | 0.674 | 98 |
| **8** | core | 0.075 | 0.002 | 1.869 | 0.051 | 0.180 | 0.002 | 1064.8 | 53.7 | 1070.1 | 18.1 | 1068.3 | 12.1 | 161 | 353 | 0.458 | 99 |
| **9** | core | 0.108 | 0.003 | 4.531 | 0.106 | 0.304 | 0.003 | 1761.4 | 42.6 | 1736.8 | 19.4 | 1709.7 | 15.6 | 33 | 194 | 0.168 | 98 |
| **GR-17-10** | core | 0.072 | 0.002 | 1.783 | 0.049 | 0.180 | 0.002 | 973.8 | 58.5 | 1039.2 | 18.0 | 1068.1 | 11.0 | 80 | 210 | 0.382 | 97 |
| **11** | core | 0.073 | 0.002 | 1.604 | 0.048 | 0.159 | 0.002 | 1010.8 | 61.1 | 971.6 | 18.6 | 952.6 | 9.8 | 330 | 328 | 1.006 | 98 |
| **12** | core | 0.077 | 0.002 | 1.932 | 0.042 | 0.181 | 0.002 | 1127.8 | 43.4 | 1092.2 | 14.4 | 1072.6 | 12.0 | 436 | 605 | 0.720 | 98 |
| **13** | core | 0.060 | 0.001 | 0.695 | 0.016 | 0.084 | 0.001 | 590.8 | 48.1 | 536.1 | 9.8 | 521.7 | 5.5 | 530 | 806 | 0.657 | 97 |
| **14** | core | 0.073 | 0.002 | 1.618 | 0.045 | 0.160 | 0.002 | 1016.7 | 55.6 | 977.1 | 17.5 | 957.9 | 11.7 | 307 | 283 | 1.086 | 98 |
| **15** | core | 0.074 | 0.002 | 1.865 | 0.049 | 0.183 | 0.003 | 1042.6 | 55.6 | 1068.9 | 17.5 | 1081.5 | 16.1 | 94 | 285 | 0.329 | 98 |
| **16** | core | 0.098 | 0.002 | 3.429 | 0.088 | 0.253 | 0.003 | 1590.7 | 46.8 | 1511.1 | 20.3 | 1453.0 | 14.8 | 71 | 133 | 0.535 | 96 |
| **17** | core | 0.070 | 0.003 | 1.500 | 0.062 | 0.155 | 0.002 | 938.9 | 92.6 | 930.2 | 25.1 | 930.8 | 10.8 | 43 | 60 | 0.707 | 99 |
| **18** | core | 0.071 | 0.002 | 1.650 | 0.040 | 0.167 | 0.002 | 968.5 | 48.1 | 989.7 | 15.4 | 998.1 | 11.0 | 170 | 364 | 0.466 | 99 |
| **19** | core | 0.071 | 0.001 | 1.414 | 0.030 | 0.144 | 0.002 | 953.7 | 37.0 | 894.7 | 12.6 | 869.4 | 10.6 | 89 | 1121 | 0.080 | 97 |
| **20** | core | 0.081 | 0.002 | 2.272 | 0.049 | 0.205 | 0.002 | 1210.8 | 45.2 | 1203.7 | 15.3 | 1200.4 | 12.4 | 318 | 384 | 0.828 | 99 |
| **21** | core | 0.058 | 0.001 | 0.680 | 0.013 | 0.086 | 0.001 | 522.3 | 38.0 | 526.7 | 8.1 | 529.9 | 5.8 | 198 | 1434 | 0.138 | 99 |
| **22** | core | 0.084 | 0.003 | 2.083 | 0.071 | 0.182 | 0.002 | 1283.3 | 70.1 | 1143.3 | 23.5 | 1076.5 | 13.1 | 61 | 83 | 0.735 | 93 |
| **23** | core | 0.069 | 0.002 | 1.472 | 0.032 | 0.155 | 0.001 | 898.2 | 46.3 | 919.0 | 13.2 | 927.4 | 8.2 | 196 | 386 | 0.508 | 99 |
| **24** | core | 0.079 | 0.002 | 2.071 | 0.046 | 0.191 | 0.002 | 1161.1 | 41.7 | 1139.4 | 15.3 | 1128.9 | 10.2 | 61 | 473 | 0.129 | 99 |
| **25** | core | 0.071 | 0.002 | 1.582 | 0.040 | 0.161 | 0.003 | 972.2 | 50.0 | 963.3 | 15.7 | 961.0 | 13.9 | 84 | 449 | 0.188 | 99 |
| **26** | core | 0.084 | 0.002 | 2.064 | 0.050 | 0.179 | 0.002 | 1281.2 | 46.3 | 1136.8 | 16.6 | 1062.3 | 10.9 | 442 | 632 | 0.699 | 93 |
| **27** | core | 0.074 | 0.003 | 1.771 | 0.062 | 0.175 | 0.002 | 1033.0 | 69.9 | 1034.9 | 22.7 | 1039.4 | 11.1 | 66 | 95 | 0.702 | 99 |
| **28** | core | 0.070 | 0.001 | 1.644 | 0.031 | 0.169 | 0.002 | 942.6 | 40.7 | 987.3 | 12.0 | 1007.4 | 9.2 | 94 | 311 | 0.303 | 97 |
| **29** | core | 0.095 | 0.002 | 3.239 | 0.076 | 0.247 | 0.003 | 1521.9 | 38.9 | 1466.5 | 18.1 | 1425.1 | 14.4 | 268 | 112 | 2.388 | 97 |
| **30** | core | 0.101 | 0.002 | 3.824 | 0.065 | 0.275 | 0.003 | 1639.8 | 31.5 | 1597.7 | 13.7 | 1565.8 | 16.0 | 343 | 648 | 0.529 | 97 |

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| **Spot** | **Characteristics** | **207Pb/206Pb** | **1 sigma** | **207Pb/235U** | **1 sigma** | **206Pb/238U** | **1 sigma** | **Age (Ma) 207Pb/206Pb** | **1 sigma** | **Age (Ma) 207Pb/235U** | **1 sigma** | **Age (Ma) 206Pb/238U** | **1 sigma** | **232Th (ppm)** | **238U (ppm)** | **Th/U** | **Disconrdant (%)** |
| **GR-17-31** | core | 0.083 | 0.002 | 2.411 | 0.048 | 0.211 | 0.002 | 1264.8 | 38.1 | 1245.8 | 14.3 | 1234.5 | 12.5 | 525 | 464 | 1.131 | 99 |
| **32** | core | 0.072 | 0.002 | 1.858 | 0.057 | 0.188 | 0.002 | 984.3 | 67.6 | 1066.3 | 20.2 | 1108.9 | 12.1 | 151 | 95 | 1.588 | 96 |
| **33** | core | 0.068 | 0.002 | 1.453 | 0.035 | 0.155 | 0.002 | 872.2 | 48.9 | 911.3 | 14.5 | 927.3 | 9.9 | 199 | 383 | 0.521 | 98 |
| **34** | core | 0.058 | 0.001 | 0.738 | 0.018 | 0.092 | 0.001 | 538.9 | 55.5 | 561.3 | 10.7 | 566.8 | 6.2 | 301 | 549 | 0.548 | 99 |
| **35** | core | 0.076 | 0.002 | 1.936 | 0.045 | 0.185 | 0.002 | 1087.0 | 44.9 | 1093.6 | 15.5 | 1095.9 | 12.0 | 242 | 488 | 0.496 | 99 |
| **36** | core | 0.084 | 0.002 | 2.565 | 0.045 | 0.220 | 0.002 | 1303.4 | 30.6 | 1290.6 | 12.9 | 1281.1 | 12.0 | 592 | 799 | 0.741 | 99 |
| **37** | core | 0.062 | 0.002 | 0.944 | 0.023 | 0.111 | 0.001 | 670.1 | 53.7 | 674.9 | 11.9 | 675.7 | 6.7 | 113 | 449 | 0.252 | 99 |
| **38** | core | 0.070 | 0.002 | 1.586 | 0.037 | 0.164 | 0.002 | 929.3 | 54.6 | 964.8 | 14.7 | 980.5 | 11.7 | 138 | 244 | 0.567 | 98 |
| **39** | core | 0.071 | 0.001 | 1.506 | 0.027 | 0.155 | 0.002 | 946.3 | 39.7 | 932.6 | 11.0 | 926.1 | 9.0 | 101 | 984 | 0.103 | 99 |
| **40** | core | 0.071 | 0.001 | 1.449 | 0.026 | 0.147 | 0.002 | 968.5 | 39.0 | 909.6 | 10.6 | 883.5 | 8.6 | 170 | 1195 | 0.142 | 97 |
| **41** | core | 0.161 | 0.003 | 8.793 | 0.180 | 0.396 | 0.004 | 2464.5 | 33.2 | 2316.8 | 18.7 | 2148.3 | 19.4 | 108 | 166 | 0.652 | 92 |
| **42** | core | 0.073 | 0.001 | 1.651 | 0.031 | 0.164 | 0.002 | 1016.7 | 38.9 | 989.9 | 11.8 | 976.9 | 9.1 | 801 | 1022 | 0.784 | 98 |
| **43** | core | 0.074 | 0.002 | 1.708 | 0.043 | 0.167 | 0.002 | 1043.5 | 50.0 | 1011.4 | 16.1 | 993.8 | 10.2 | 185 | 245 | 0.755 | 98 |
| **44** | core | 0.059 | 0.002 | 0.695 | 0.020 | 0.085 | 0.001 | 587.1 | 67.6 | 535.9 | 11.8 | 523.0 | 5.1 | 110 | 608 | 0.180 | 97 |
| **45** | core | 0.075 | 0.002 | 1.668 | 0.038 | 0.162 | 0.002 | 1057.4 | 46.3 | 996.6 | 14.3 | 967.6 | 11.2 | 375 | 563 | 0.666 | 97 |
| ***46*** | *rim* | *0.052* | *0.002* | *0.252* | *0.007* | *0.035* | *0.000* | *300.1* | *66.7* | *228.4* | *6.0* | *221.5* | *2.4* | *10* | *1126* | *0.009* | *96* |
| **47** | core | 0.077 | 0.002 | 1.925 | 0.047 | 0.181 | 0.003 | 1122.2 | 16.7 | 1089.9 | 16.4 | 1074.7 | 13.9 | 346 | 331 | 1.046 | 98 |
| **48** | core | 0.070 | 0.002 | 1.528 | 0.037 | 0.158 | 0.002 | 933.0 | 48.9 | 941.9 | 14.7 | 943.6 | 9.4 | 335 | 392 | 0.853 | 99 |
| **49** | core | 0.061 | 0.001 | 0.764 | 0.019 | 0.091 | 0.001 | 627.8 | 41.7 | 576.5 | 10.7 | 561.9 | 8.5 | 510 | 1201 | 0.425 | 97 |
| **50** | core | 0.076 | 0.002 | 2.016 | 0.054 | 0.192 | 0.002 | 1098.2 | 53.2 | 1121.1 | 18.1 | 1130.6 | 11.6 | 83 | 120 | 0.693 | 99 |
| **51** | core | 0.136 | 0.003 | 7.377 | 0.148 | 0.391 | 0.004 | 2183.3 | 33.3 | 2158.2 | 18.0 | 2125.6 | 17.6 | 126 | 209 | 0.603 | 98 |
| **52** | core | 0.126 | 0.002 | 6.123 | 0.113 | 0.352 | 0.003 | 2039.2 | 32.9 | 1993.6 | 16.1 | 1944.8 | 16.0 | 127 | 395 | 0.320 | 97 |
| **53** | core | 0.064 | 0.001 | 0.972 | 0.022 | 0.109 | 0.001 | 766.7 | 50.0 | 689.7 | 11.6 | 668.4 | 7.2 | 380 | 431 | 0.882 | 96 |
| **54** | core | 0.077 | 0.003 | 1.945 | 0.066 | 0.182 | 0.002 | 1129.3 | 66.7 | 1096.6 | 22.9 | 1077.0 | 13.4 | 41 | 104 | 0.396 | 98 |
| **55** | core | 0.074 | 0.001 | 1.893 | 0.039 | 0.184 | 0.002 | 1050.0 | 45.4 | 1078.5 | 13.8 | 1089.0 | 9.4 | 435 | 653 | 0.666 | 99 |
| **56** | core | 0.064 | 0.001 | 1.227 | 0.026 | 0.139 | 0.001 | 738.9 | 43.5 | 813.0 | 11.9 | 839.2 | 8.4 | 356 | 434 | 0.819 | 96 |
| **57** | core | 0.058 | 0.002 | 0.636 | 0.023 | 0.079 | 0.001 | 546.3 | 83.3 | 499.7 | 14.5 | 489.9 | 6.1 | 224 | 176 | 1.270 | 98 |
| **58** | core | 0.075 | 0.001 | 1.806 | 0.040 | 0.175 | 0.002 | 1057.4 | 37.0 | 1047.5 | 14.6 | 1037.9 | 13.1 | 209 | 722 | 0.289 | 99 |
| **59** | core | 0.076 | 0.002 | 1.736 | 0.041 | 0.164 | 0.003 | 1109.3 | 42.6 | 1022.1 | 15.4 | 979.1 | 14.5 | 301 | 657 | 0.458 | 95 |
| **60** | core | 0.071 | 0.001 | 1.653 | 0.034 | 0.168 | 0.002 | 953.7 | 34.3 | 990.6 | 13.1 | 1003.1 | 10.0 | 840 | 651 | 1.290 | 98 |
| ***61*** | *rim* | *0.051* | *0.001* | *0.253* | *0.007* | *0.036* | *0.000* | *261.2* | *64.8* | *229.2* | *5.8* | *225.4* | *2.3* | *6* | *1308* | *0.004* | *98* |
| **62** | core | 0.076 | 0.002 | 1.883 | 0.039 | 0.178 | 0.002 | 1101.9 | 42.6 | 1075.0 | 13.8 | 1058.3 | 9.6 | 322 | 659 | 0.489 | 98 |
| ***63*** | *rim* | *0.051* | *0.002* | *0.251* | *0.009* | *0.036* | *0.000* | *242.7* | *81.5* | *227.4* | *7.0* | *225.0* | *2.4* | *5* | *902* | *0.005* | *98* |
| **64** | core | 0.074 | 0.002 | 1.652 | 0.036 | 0.163 | 0.002 | 1027.8 | 44.4 | 990.3 | 13.8 | 970.7 | 13.1 | 524 | 848 | 0.618 | 98 |
| **65** | core | 0.071 | 0.002 | 1.598 | 0.039 | 0.164 | 0.002 | 942.6 | 50.0 | 969.5 | 15.2 | 977.3 | 11.8 | 252 | 463 | 0.545 | 99 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **YA-7-18-44-01** | core | 0.054 | 0.001 | 0.260 | 0.006 | 0.035 | 0.000 | 380.5 | 55.7 | 235.0 | 4.9 | 220.6 | 1.7 | 83 | 1639 | 0.051 | 107 |
| **02** | rim | 0.052 | 0.002 | 0.227 | 0.007 | 0.032 | 0.000 | 283.7 | 73.3 | 207.8 | 5.8 | 201.2 | 1.8 | 11 | 1176 | 0.009 | 103 |
| **03** | rim | 0.052 | 0.001 | 0.232 | 0.006 | 0.032 | 0.000 | 299.4 | 60.5 | 212.1 | 4.8 | 204.3 | 1.6 | 8 | 1436 | 0.006 | 104 |
| **~~04~~** | ~~mixed~~ | ~~0.052~~ | ~~0.001~~ | ~~0.265~~ | ~~0.006~~ | ~~0.037~~ | ~~0.000~~ | ~~265.0~~ | ~~57.8~~ | ~~238.4~~ | ~~5.1~~ | ~~235.6~~ | ~~1.8~~ | ~~6~~ | ~~1267~~ | ~~0.005~~ | ~~101~~ |
| **05** | rim | 0.053 | 0.001 | 0.242 | 0.006 | 0.033 | 0.000 | 314.2 | 56.7 | 219.9 | 4.7 | 211.2 | 1.6 | 7 | 999 | 0.007 | 104 |
| **06** | rim | 0.053 | 0.001 | 0.250 | 0.005 | 0.034 | 0.000 | 310.5 | 49.6 | 226.6 | 4.1 | 218.6 | 1.6 | 24 | 1307 | 0.018 | 104 |
| **07** | rim | 0.053 | 0.001 | 0.246 | 0.006 | 0.034 | 0.000 | 325.5 | 54.4 | 223.3 | 4.5 | 213.6 | 1.6 | 10 | 1210 | 0.008 | 105 |
| **08** | rim | 0.053 | 0.002 | 0.233 | 0.007 | 0.032 | 0.000 | 325.5 | 66.5 | 212.3 | 5.4 | 202.2 | 1.7 | 11 | 1016 | 0.011 | 105 |
| **09** | rim | 0.052 | 0.001 | 0.233 | 0.005 | 0.033 | 0.000 | 270.3 | 52.5 | 213.0 | 4.1 | 207.9 | 1.5 | 17 | 1807 | 0.010 | 102 |
| **~~10~~** | ~~mixed~~ | ~~0.056~~ | ~~0.001~~ | ~~0.259~~ | ~~0.006~~ | ~~0.034~~ | ~~0.000~~ | ~~442.1~~ | ~~52.8~~ | ~~234.1~~ | ~~4.7~~ | ~~213.8~~ | ~~1.6~~ | ~~10~~ | ~~939~~ | ~~0.011~~ | ~~109~~ |
| **11** | coherent | 0.052 | 0.001 | 0.255 | 0.005 | 0.036 | 0.000 | 281.1 | 49.6 | 231.0 | 4.1 | 226.0 | 1.6 | 5 | 852 | 0.006 | 102 |
| **12** | core | 0.051 | 0.002 | 0.252 | 0.007 | 0.036 | 0.000 | 243.9 | 68.6 | 228.1 | 5.9 | 226.5 | 1.9 | 10 | 947 | 0.010 | 101 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Spot** | **Characteristics** | **207Pb/206Pb** | **1 sigma** | **207Pb/235U** | **1 sigma** | **206Pb/238U** | **1 sigma** | **Age (Ma) 207Pb/206Pb** | **1 sigma** | **Age (Ma) 207Pb/235U** | **1 sigma** | **Age (Ma) 206Pb/238U** | **1 sigma** | **232Th (ppm)** | **238U (ppm)** | **Th/U** | **Disconrdant (%)** |
| **YA-7-18-44-13** | coherent | 0.050 | 0.001 | 0.221 | 0.005 | 0.032 | 0.000 | 207.7 | 59.9 | 202.7 | 4.5 | 202.2 | 1.6 | 10 | 1741 | 0.006 | 100 |
| **14** | coherent | 0.051 | 0.001 | 0.247 | 0.004 | 0.035 | 0.000 | 226.0 | 43.7 | 224.5 | 3.4 | 224.4 | 1.5 | 6 | 1465 | 0.004 | 100 |
| **15** | rim | 0.053 | 0.001 | 0.237 | 0.005 | 0.033 | 0.000 | 313.2 | 52.0 | 215.8 | 4.1 | 206.9 | 1.5 | 72 | 1293 | 0.056 | 104 |
| **16** | coherent | 0.051 | 0.001 | 0.243 | 0.006 | 0.034 | 0.000 | 254.3 | 56.4 | 220.9 | 4.6 | 217.7 | 1.6 | 6 | 1024 | 0.006 | 101 |
| **17** | rim | 0.052 | 0.002 | 0.238 | 0.007 | 0.033 | 0.000 | 276.9 | 66.4 | 216.8 | 5.4 | 211.3 | 1.8 | 7 | 924 | 0.007 | 103 |
| **~~18~~** | ~~mixed~~ | ~~0.052~~ | ~~0.001~~ | ~~0.269~~ | ~~0.006~~ | ~~0.037~~ | ~~0.000~~ | ~~296.1~~ | ~~51.3~~ | ~~241.5~~ | ~~4.5~~ | ~~235.9~~ | ~~1.7~~ | ~~7~~ | ~~1195~~ | ~~0.006~~ | ~~102~~ |
| **~~19~~** | ~~mixed~~ | ~~0.053~~ | ~~0.001~~ | ~~0.232~~ | ~~0.005~~ | ~~0.032~~ | ~~0.000~~ | ~~327.4~~ | ~~48.2~~ | ~~212.1~~ | ~~3.7~~ | ~~201.8~~ | ~~1.4~~ | ~~528~~ | ~~1907~~ | ~~0.277~~ | ~~105~~ |
| **~~20~~** | ~~mixed~~ | ~~0.054~~ | ~~0.001~~ | ~~0.298~~ | ~~0.005~~ | ~~0.040~~ | ~~0.000~~ | ~~387.5~~ | ~~41.2~~ | ~~264.6~~ | ~~3.8~~ | ~~250.8~~ | ~~1.7~~ | ~~9~~ | ~~1315~~ | ~~0.007~~ | ~~106~~ |
| **21** | rim | 0.052 | 0.001 | 0.243 | 0.006 | 0.034 | 0.000 | 301.6 | 56.9 | 221.0 | 4.7 | 213.5 | 1.6 | 5 | 963 | 0.005 | 104 |
| **~~22~~** | ~~mixed~~ | ~~0.050~~ | ~~0.001~~ | ~~0.249~~ | ~~0.006~~ | ~~0.036~~ | ~~0.000~~ | ~~203.5~~ | ~~62.0~~ | ~~225.8~~ | ~~5.1~~ | ~~227.9~~ | ~~1.8~~ | ~~7~~ | ~~925~~ | ~~0.007~~ | ~~99~~ |
| **23** | rim | 0.051 | 0.001 | 0.237 | 0.005 | 0.033 | 0.000 | 258.7 | 50.4 | 215.9 | 3.9 | 212.0 | 1.5 | 10 | 1358 | 0.007 | 102 |
| **24** | rim | 0.052 | 0.001 | 0.244 | 0.005 | 0.034 | 0.000 | 281.7 | 48.4 | 221.4 | 3.9 | 215.7 | 1.5 | 69 | 1260 | 0.054 | 103 |
| **25** | rim | 0.050 | 0.001 | 0.220 | 0.006 | 0.032 | 0.000 | 206.9 | 66.5 | 201.8 | 5.0 | 201.3 | 1.7 | 9 | 1321 | 0.007 | 100 |
| **26** | rim | 0.051 | 0.001 | 0.235 | 0.005 | 0.033 | 0.000 | 261.1 | 49.0 | 214.4 | 3.8 | 210.1 | 1.5 | 9 | 1230 | 0.007 | 102 |
| **~~27~~** | ~~mixed~~ | ~~0.053~~ | ~~0.001~~ | ~~0.259~~ | ~~0.005~~ | ~~0.036~~ | ~~0.000~~ | ~~312.2~~ | ~~46.1~~ | ~~234.1~~ | ~~3.9~~ | ~~226.4~~ | ~~1.6~~ | ~~8~~ | ~~1037~~ | ~~0.007~~ | ~~103~~ |
| **28** | core | 0.070 | 0.001 | 1.010 | 0.012 | 0.104 | 0.001 | 937.9 | 29.3 | 708.7 | 5.9 | 638.5 | 3.8 | 390 | 895 | 0.436 | 111 |
| **29** | rim | 0.053 | 0.001 | 0.247 | 0.005 | 0.034 | 0.000 | 320.9 | 53.2 | 224.2 | 4.4 | 215.0 | 1.6 | 12 | 1205 | 0.010 | 104 |
| **30** | rim | 0.053 | 0.001 | 0.245 | 0.005 | 0.034 | 0.000 | 314.9 | 48.0 | 222.5 | 3.9 | 213.9 | 1.5 | 10 | 1278 | 0.008 | 104 |
| **31** | coherent | 0.052 | 0.002 | 0.255 | 0.008 | 0.036 | 0.000 | 273.9 | 78.0 | 230.8 | 6.9 | 226.6 | 2.1 | 12 | 1030 | 0.012 | 102 |
| **32** | core | 0.054 | 0.001 | 0.247 | 0.005 | 0.033 | 0.000 | 354.0 | 49.8 | 223.9 | 4.1 | 211.7 | 1.5 | 36 | 1226 | 0.029 | 106 |
| **~~33~~** | ~~mixed~~ | ~~0.055~~ | ~~0.001~~ | ~~0.246~~ | ~~0.005~~ | ~~0.032~~ | ~~0.000~~ | ~~428.9~~ | ~~46.0~~ | ~~223.4~~ | ~~3.8~~ | ~~204.3~~ | ~~1.4~~ | ~~14~~ | ~~1487~~ | ~~0.010~~ | ~~109~~ |
| **YA-7-18-44-34** | coherent | 0.050 | 0.001 | 0.217 | 0.004 | 0.031 | 0.000 | 192.6 | 50.8 | 199.1 | 3.6 | 199.6 | 1.4 | 6 | 1168 | 0.005 | 100 |
| **35** | coherent | 0.051 | 0.001 | 0.229 | 0.005 | 0.032 | 0.000 | 258.0 | 51.2 | 209.5 | 3.9 | 205.2 | 1.5 | 7 | 1236 | 0.005 | 102 |
| **36** | core | 0.053 | 0.001 | 0.236 | 0.006 | 0.033 | 0.000 | 309.5 | 60.3 | 215.4 | 4.9 | 206.9 | 1.6 | 19 | 1067 | 0.017 | 104 |
| **37** | coherent | 0.052 | 0.001 | 0.229 | 0.004 | 0.032 | 0.000 | 289.8 | 45.9 | 209.6 | 3.5 | 202.5 | 1.4 | 11 | 1328 | 0.008 | 104 |
| **38** | rim | 0.050 | 0.001 | 0.217 | 0.005 | 0.031 | 0.000 | 194.5 | 61.0 | 199.1 | 4.5 | 199.5 | 1.6 | 6 | 1001 | 0.006 | 100 |
| **39** | core | 0.056 | 0.001 | 0.289 | 0.006 | 0.038 | 0.000 | 433.1 | 51.0 | 257.9 | 4.9 | 239.0 | 1.8 | 13 | 1442 | 0.009 | 108 |
| **40** | coherent | 0.053 | 0.001 | 0.232 | 0.004 | 0.032 | 0.000 | 329.8 | 47.7 | 211.6 | 3.7 | 201.2 | 1.4 | 10 | 1481 | 0.007 | 105 |
| **41** | coherent | 0.051 | 0.001 | 0.235 | 0.005 | 0.033 | 0.000 | 243.0 | 50.7 | 214.0 | 3.9 | 211.3 | 1.5 | 7 | 1076 | 0.006 | 101 |
| **42** | coherent | 0.051 | 0.001 | 0.241 | 0.004 | 0.034 | 0.000 | 258.0 | 46.2 | 218.9 | 3.6 | 215.3 | 1.5 | 8 | 1494 | 0.005 | 102 |
| **43** | core | 0.053 | 0.001 | 0.239 | 0.005 | 0.033 | 0.000 | 325.8 | 49.3 | 217.2 | 3.9 | 207.3 | 1.5 | 16 | 1140 | 0.014 | 105 |
| **~~44~~** | ~~mixed~~ | ~~0.051~~ | ~~0.001~~ | ~~0.249~~ | ~~0.004~~ | ~~0.035~~ | ~~0.000~~ | ~~247.4~~ | ~~45.8~~ | ~~225.6~~ | ~~3.6~~ | ~~223.5~~ | ~~1.5~~ | ~~8~~ | ~~1317~~ | ~~0.006~~ | ~~101~~ |
| **45** | rim | 0.051 | 0.001 | 0.232 | 0.006 | 0.033 | 0.000 | 231.7 | 59.0 | 211.7 | 4.6 | 210.0 | 1.6 | 5 | 956 | 0.006 | 101 |
| **46** | core | 0.052 | 0.001 | 0.241 | 0.006 | 0.034 | 0.000 | 270.0 | 57.4 | 219.2 | 4.6 | 214.5 | 1.6 | 13 | 1505 | 0.008 | 102 |
| **~~47~~** | ~~mixed~~ | ~~0.059~~ | ~~0.001~~ | ~~0.288~~ | ~~0.006~~ | ~~0.036~~ | ~~0.000~~ | ~~557.4~~ | ~~47.3~~ | ~~257.2~~ | ~~4.5~~ | ~~225.4~~ | ~~1.6~~ | ~~36~~ | ~~1011~~ | ~~0.035~~ | ~~114~~ |
| **~~48~~** | ~~rim~~ | ~~0.050~~ | ~~0.001~~ | ~~0.244~~ | ~~0.005~~ | ~~0.035~~ | ~~0.000~~ | ~~201.0~~ | ~~50.4~~ | ~~221.4~~ | ~~4.0~~ | ~~223.4~~ | ~~1.6~~ | ~~9~~ | ~~1156~~ | ~~0.008~~ | ~~99~~ |
| **49** | core | 0.056 | 0.001 | 0.286 | 0.004 | 0.037 | 0.000 | 435.5 | 38.1 | 255.5 | 3.4 | 236.4 | 1.5 | 424 | 1517 | 0.280 | 108 |

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|  | YA-7-18-40-1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| **La** | 0.043 | 0.029 | 0.000 | 0.003 | 0.030 | 0.000 | 0.000 | 0.020 | 0.185 | 0.036 | 0.049 | 0.019 | 0.000 | 0.035 | 0.000 | 0.000 | 0.039 | 0.043 | 0.026 | 0.033 |
| **Ce** | 0.143 | 0.076 | 0.050 | 0.270 | 0.037 | 0.226 | 0.090 | 0.081 | 0.288 | 0.135 | 0.200 | 0.000 | 0.219 | 0.192 | 0.250 | 0.711 | 0.282 | 0.202 | 0.055 | 0.135 |
| **Pr** | 0.047 | 0.087 | 0.000 | 0.022 | 0.000 | 0.008 | 0.013 | 0.000 | 0.130 | 0.048 | 0.000 | 0.000 | 0.064 | 0.013 | 0.000 | 0.105 | 0.035 | 0.000 | 0.010 | 0.000 |
| **Nd** | 0.000 | 0.000 | 0.041 | 0.127 | 0.000 | 0.096 | 0.006 | 0.031 | 0.127 | 0.108 | 0.059 | 0.000 | 0.148 | 0.032 | 0.087 | 0.107 | 0.000 | 0.121 | 0.062 | 0.122 |
| **Sm** | 0.573 | 0.647 | 0.050 | 0.612 | 0.334 | 0.358 | 1.341 | 0.344 | 0.746 | 0.675 | 1.549 | 0.000 | 2.083 | 0.488 | 0.421 | 2.949 | 1.310 | 1.449 | 0.544 | 0.764 |
| **Eu** | 2.969 | 3.349 | 1.284 | 6.669 | 0.000 | 2.236 | 4.144 | 1.129 | 2.245 | 1.546 | 3.462 | 0.471 | 4.300 | 2.474 | 3.021 | 6.414 | 6.726 | 4.881 | 2.590 | 4.126 |
| **Gd** | 7.578 | 5.560 | 1.951 | 18.591 | 1.206 | 9.116 | 9.254 | 4.622 | 6.055 | 3.826 | 9.556 | 1.549 | 11.764 | 4.715 | 7.478 | 18.372 | 22.984 | 12.329 | 6.916 | 15.081 |
| **Tb** | 12.608 | 11.651 | 5.895 | 29.712 | 5.190 | 19.446 | 20.878 | 8.302 | 10.410 | 7.093 | 21.270 | 6.885 | 22.879 | 12.109 | 15.002 | 23.452 | 38.847 | 19.102 | 15.366 | 21.486 |
| **Dy** | 18.086 | 20.638 | 11.034 | 35.986 | 8.466 | 23.550 | 33.603 | 12.318 | 15.753 | 9.835 | 29.252 | 12.750 | 26.435 | 16.196 | 17.854 | 25.765 | 44.896 | 34.113 | 19.919 | 29.718 |
| **Ho** | 22.404 | 26.284 | 12.851 | 36.518 | 11.286 | 22.939 | 40.447 | 14.925 | 17.150 | 17.927 | 37.504 | 16.203 | 30.433 | 17.209 | 17.219 | 28.883 | 47.144 | 34.671 | 26.145 | 29.930 |
| **Er** | 20.044 | 22.854 | 11.650 | 30.811 | 15.565 | 21.624 | 46.174 | 14.537 | 15.689 | 27.138 | 35.856 | 18.037 | 26.071 | 16.226 | 13.438 | 24.060 | 41.660 | 37.468 | 28.201 | 22.353 |
| **Tm** | 17.002 | 24.214 | 9.486 | 20.046 | 17.645 | 18.621 | 47.038 | 17.783 | 10.889 | 49.154 | 30.807 | 18.997 | 20.817 | 12.963 | 12.740 | 23.651 | 33.405 | 37.072 | 16.780 | 11.863 |
| **Yb** | 17.627 | 27.416 | 9.873 | 22.921 | 13.959 | 16.806 | 46.021 | 13.960 | 11.926 | 67.008 | 36.486 | 15.166 | 21.259 | 13.292 | 10.710 | 22.653 | 35.501 | 30.194 | 19.374 | 13.126 |
| **Lu** | 15.671 | 25.939 | 9.597 | 17.798 | 14.444 | 14.897 | 42.113 | 10.561 | 9.086 | 116.249 | 36.590 | 11.558 | 20.728 | 12.104 | 9.214 | 19.585 | 29.439 | 26.718 | 14.988 | 13.187 |
| **Ti (ppm)** | 2.767 | 1.757 | 1.642 | 3.337 | 3.401 | 2.470 | 2.922 | 1.988 | 2.491 | 4.439 | 15.838 | 2.544 | 4.962 | 6.993 | 2.540 | 2.930 | 5.718 | 5.329 | 3.566 | 3.123 |
| **T (℃)** | 639 | 608 | 604 | 653 | 654 | 631 | 643 | 616 | 632 | 674 | 783 | 633 | 683 | 710 | 633 | 643 | 694 | 689 | 658 | 648 |

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|  | YA-7-18-40-21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | YA-7-18-44-01 (core) | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 (core) |
| **La** | 0.000 | 0.000 | 0.023 | 0.000 | 0.000 | 0.017 | 0.027 | 0.000 | 0.181 | 0.033 | 0.024 | 0.016 | 0.018 | 0.083 | 0.014 | 0.027 | 0.068 | 0.142 | 0.015 | 0.049 |
| **Ce** | 0.309 | 0.045 | 0.229 | 0.120 | 0.100 | 0.027 | 0.254 | 0.257 | 7.999 | 1.105 | 0.813 | 1.110 | 1.221 | 2.472 | 1.200 | 1.493 | 1.915 | 1.418 | 0.990 | 1.398 |
| **Pr** | 0.047 | 0.077 | 0.029 | 0.007 | 0.000 | 0.000 | 0.016 | 0.026 | 0.249 | 0.004 | 0.056 | 0.019 | 0.067 | 0.082 | 0.033 | 0.065 | 0.093 | 0.038 | 0.010 | 0.086 |
| **Nd** | 0.000 | 0.084 | 0.109 | 0.000 | 0.000 | 0.000 | 0.153 | 0.131 | 2.685 | 0.334 | 0.372 | 0.329 | 0.422 | 0.828 | 0.362 | 1.032 | 0.566 | 0.394 | 0.093 | 1.159 |
| **Sm** | 1.397 | 0.668 | 1.344 | 0.000 | 0.567 | 0.073 | 1.578 | 0.305 | 5.499 | 1.468 | 1.470 | 1.106 | 1.544 | 3.056 | 1.410 | 2.748 | 2.240 | 1.318 | 1.283 | 2.353 |
| **Eu** | 2.836 | 1.921 | 5.437 | 2.568 | 1.735 | 0.234 | 4.955 | 3.537 | 1.954 | 0.830 | 0.581 | 0.762 | 0.816 | 2.314 | 0.795 | 2.100 | 0.895 | 0.700 | 0.828 | 1.572 |
| **Gd** | 5.577 | 6.511 | 15.772 | 6.871 | 2.988 | 1.682 | 11.392 | 11.825 | 21.282 | 9.547 | 8.945 | 9.833 | 10.347 | 18.688 | 9.177 | 19.715 | 14.520 | 10.115 | 9.634 | 15.791 |
| **Tb** | 11.023 | 12.728 | 26.632 | 14.088 | 9.049 | 4.978 | 23.886 | 13.424 | 5.717 | 2.508 | 3.097 | 3.198 | 3.053 | 5.478 | 2.382 | 4.904 | 4.562 | 2.821 | 2.924 | 4.672 |
| **Dy** | 12.742 | 20.692 | 30.619 | 25.605 | 15.006 | 10.487 | 27.882 | 16.469 | 55.741 | 18.335 | 26.372 | 27.551 | 22.424 | 43.583 | 16.617 | 38.816 | 36.649 | 22.441 | 19.736 | 35.531 |
| **Ho** | 13.164 | 27.487 | 32.841 | 29.660 | 17.772 | 15.502 | 26.005 | 14.041 | 18.084 | 4.503 | 5.931 | 6.065 | 5.106 | 11.273 | 3.883 | 8.775 | 7.926 | 5.653 | 3.896 | 7.791 |
| **Er** | 9.588 | 22.088 | 32.361 | 30.640 | 12.323 | 18.893 | 22.270 | 13.197 | 85.265 | 13.125 | 20.279 | 19.132 | 14.535 | 45.280 | 12.007 | 27.497 | 24.383 | 20.547 | 12.282 | 24.781 |
| **Tm** | 10.654 | 22.028 | 29.649 | 24.993 | 11.304 | 18.036 | 17.558 | 14.539 | 17.981 | 2.165 | 3.759 | 3.366 | 2.395 | 8.708 | 2.263 | 4.427 | 4.251 | 3.922 | 1.959 | 3.813 |
| **Yb** | 6.895 | 21.724 | 24.090 | 25.295 | 14.153 | 20.853 | 19.034 | 12.469 | 199.067 | 18.564 | 33.510 | 30.316 | 22.575 | 87.323 | 21.469 | 36.659 | 38.376 | 37.257 | 19.447 | 29.842 |
| **Lu** | 9.179 | 18.049 | 28.626 | 19.398 | 9.706 | 20.489 | 21.262 | 9.322 | 36.795 | 3.088 | 5.909 | 4.953 | 3.174 | 14.769 | 3.319 | 5.382 | 6.409 | 7.054 | 2.993 | 4.264 |
| **Ti (ppm)** | 2.164 | 2.051 | 2.593 | 3.189 | 3.711 | 2.965 | 2.401 | 2.744 | 2020.780 | 28.253 | 7.823 | 3.126 | 4.220 | 8.886 | 4.067 | 12.077 | 4.471 | 5.273 | 4.071 | 5.106 |
| **T (℃)** | 622 | 619 | 635 | 650 | 661 | 644 | 629 | 639 | 1594 | 835 | 714 | 643 | 665 | 725 | 662 | 752 | 669 | 682 | 662 | 679 |

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|  | YA-7-18-44-13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 (core) | 29 | 30 | 31 | 32 (core) | 33 |
| **La** | 0.066 | 0.007 | 1.115 | 0.007 | 0.014 | 0.000 | 10.444 | 0.035 | 0.025 | 0.007 | 0.002 | 0.728 | 0.042 | 0.008 | 0.098 | 0.209 | 0.010 | 0.113 | 0.027 | 0.033 | 0.024 |
| **Ce** | 1.467 | 0.992 | 9.972 | 1.057 | 1.068 | 1.362 | 47.344 | 1.405 | 1.003 | 0.907 | 1.199 | 8.566 | 1.307 | 1.219 | 1.864 | 6.560 | 1.653 | 1.629 | 0.836 | 4.725 | 1.720 |
| **Pr** | 0.049 | 0.019 | 1.481 | 0.026 | 0.019 | 0.012 | 7.820 | 0.143 | 0.023 | 0.004 | 0.009 | 1.203 | 0.028 | 0.009 | 0.140 | 0.680 | 0.075 | 0.136 | 0.019 | 0.086 | 0.038 |
| **Nd** | 0.712 | 0.201 | 8.979 | 0.303 | 0.379 | 0.462 | 41.569 | 0.970 | 0.232 | 0.351 | 0.284 | 6.619 | 0.781 | 0.315 | 1.103 | 10.240 | 0.656 | 1.396 | 0.311 | 1.338 | 0.468 |
| **Sm** | 2.179 | 1.384 | 7.610 | 1.613 | 1.730 | 1.572 | 27.790 | 2.317 | 1.046 | 1.063 | 1.493 | 5.780 | 1.773 | 1.359 | 2.319 | 16.880 | 2.340 | 2.688 | 1.096 | 2.269 | 2.050 |
| **Eu** | 1.539 | 0.708 | 1.786 | 0.734 | 0.929 | 0.965 | 5.711 | 1.044 | 0.669 | 0.615 | 0.822 | 1.288 | 0.938 | 0.887 | 0.978 | 2.230 | 0.988 | 1.302 | 0.692 | 0.991 | 1.478 |
| **Gd** | 16.275 | 8.345 | 17.235 | 7.948 | 9.763 | 11.322 | 46.226 | 12.563 | 7.753 | 7.079 | 10.385 | 12.696 | 10.972 | 11.341 | 12.866 | 67.340 | 10.405 | 14.655 | 8.653 | 15.305 | 16.804 |
| **Tb** | 4.272 | 2.775 | 5.312 | 2.142 | 2.423 | 3.303 | 11.157 | 3.343 | 2.578 | 1.873 | 3.361 | 4.068 | 3.289 | 2.867 | 3.480 | 20.080 | 2.468 | 3.647 | 2.795 | 5.307 | 4.697 |
| **Dy** | 32.645 | 21.904 | 37.379 | 15.410 | 19.426 | 26.350 | 93.008 | 23.793 | 19.046 | 12.214 | 26.331 | 34.136 | 26.282 | 20.954 | 22.923 | 206.670 | 18.519 | 30.035 | 23.459 | 53.209 | 36.867 |
| **Ho** | 7.067 | 4.614 | 7.805 | 3.153 | 4.549 | 6.109 | 22.534 | 5.421 | 3.941 | 2.602 | 5.662 | 7.114 | 5.792 | 4.510 | 4.592 | 64.770 | 3.938 | 6.782 | 5.819 | 15.583 | 7.631 |
| **Er** | 22.672 | 13.689 | 24.574 | 10.713 | 13.564 | 19.072 | 86.325 | 18.218 | 11.815 | 7.894 | 19.009 | 23.006 | 18.167 | 14.107 | 14.169 | 256.910 | 12.784 | 20.424 | 21.918 | 61.467 | 25.592 |
| **Tm** | 3.713 | 2.306 | 4.177 | 1.738 | 2.195 | 3.022 | 17.262 | 3.395 | 1.892 | 1.286 | 3.603 | 4.045 | 3.038 | 2.364 | 2.289 | 53.100 | 2.421 | 3.390 | 4.219 | 12.061 | 4.342 |
| **Yb** | 28.449 | 19.335 | 37.289 | 16.639 | 18.451 | 27.176 | 173.426 | 33.931 | 17.480 | 11.166 | 36.721 | 38.674 | 27.403 | 19.148 | 22.083 | 483.590 | 20.954 | 30.360 | 42.503 | 118.107 | 40.964 |
| **Lu** | 4.116 | 3.234 | 5.151 | 2.280 | 2.719 | 3.866 | 27.249 | 5.656 | 2.611 | 1.531 | 5.952 | 5.824 | 4.386 | 2.724 | 3.564 | 79.110 | 2.923 | 3.802 | 7.253 | 19.169 | 6.222 |
| **Ti (ppm)** | 3.919 | 3.973 | 2.780 | 2.903 | 3.088 | 4.057 | 16.069 | 4.161 | 3.356 | 4.055 | 3.558 | 4.134 | 7.376 | 4.136 | 4.179 | 16.800 | 5.293 | 3.410 | 3.232 | 7.646 | 7.234 |
| **T (℃)** | 659 | 660 | 634 | 637 | 642 | 662 | 778 | 664 | 648 | 662 | 652 | 663 | 709 | 663 | 664 | 782 | 682 | 649 | 645 | 712 | 707 |

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|  | YA-7-18-44-34 | 35 | 36 (core) | 37 | 38 | 39 (core) | 40 | 41 | 42 | 43 (core) | 44 | 45 | 46 (core) | 47 | 48 | 49 (core) |
| **La** | 0.021 | 0.000 | 0.069 | 0.038 | 0.022 | 0.163 | 0.023 | 0.006 | 0.000 | 0.012 | 0.024 | 0.021 | 0.054 | 0.062 | 0.013 | 3.764 |
| **Ce** | 1.094 | 1.224 | 9.722 | 1.245 | 1.131 | 1.688 | 1.198 | 1.733 | 1.053 | 2.356 | 1.597 | 1.127 | 1.416 | 3.851 | 1.368 | 35.279 |
| **Pr** | 0.017 | 0.009 | 0.072 | 0.026 | 0.237 | 0.052 | 0.018 | 0.020 | 0.015 | 0.020 | 0.043 | 0.010 | 0.030 | 0.105 | 0.009 | 4.849 |
| **Nd** | 0.306 | 0.291 | 0.761 | 0.568 | 0.536 | 0.459 | 0.466 | 0.285 | 0.277 | 0.244 | 0.685 | 0.497 | 0.218 | 1.375 | 0.383 | 30.597 |
| **Sm** | 1.255 | 1.404 | 3.183 | 1.854 | 1.267 | 1.107 | 1.076 | 1.482 | 1.807 | 1.559 | 2.303 | 1.216 | 1.458 | 2.867 | 2.553 | 20.347 |
| **Eu** | 0.953 | 0.891 | 1.621 | 0.937 | 0.786 | 0.710 | 0.814 | 0.830 | 0.901 | 0.789 | 1.145 | 0.720 | 0.636 | 0.925 | 1.203 | 5.070 |
| **Gd** | 11.223 | 11.478 | 19.586 | 10.879 | 9.011 | 9.951 | 11.081 | 11.103 | 13.688 | 11.291 | 12.630 | 9.540 | 10.118 | 17.249 | 14.399 | 38.894 |
| **Tb** | 4.324 | 3.157 | 5.815 | 2.700 | 3.073 | 3.387 | 3.411 | 2.917 | 3.657 | 3.052 | 3.309 | 2.698 | 3.389 | 5.495 | 3.693 | 11.377 |
| **Dy** | 36.067 | 25.205 | 56.447 | 20.833 | 25.707 | 30.757 | 29.564 | 21.077 | 24.749 | 30.421 | 21.771 | 20.524 | 36.511 | 61.966 | 24.241 | 107.934 |
| **Ho** | 10.769 | 5.267 | 17.717 | 4.522 | 5.680 | 8.085 | 7.770 | 4.461 | 4.811 | 10.114 | 4.000 | 4.415 | 10.237 | 21.449 | 5.164 | 32.145 |
| **Er** | 28.070 | 16.144 | 73.594 | 15.589 | 17.443 | 31.192 | 27.102 | 14.185 | 14.162 | 44.326 | 12.085 | 14.954 | 41.311 | 93.434 | 15.449 | 139.118 |
| **Tm** | 4.648 | 2.635 | 14.159 | 2.861 | 3.183 | 6.180 | 5.156 | 2.354 | 2.459 | 9.654 | 2.030 | 2.292 | 8.494 | 18.358 | 2.522 | 28.336 |
| **Yb** | 42.460 | 22.435 | 137.311 | 24.940 | 27.373 | 60.716 | 48.249 | 19.762 | 22.848 | 99.924 | 17.540 | 20.893 | 84.808 | 186.847 | 21.667 | 287.700 |
| **Lu** | 6.478 | 3.395 | 23.033 | 3.972 | 4.069 | 10.447 | 7.842 | 3.024 | 3.753 | 16.784 | 2.876 | 2.974 | 14.244 | 31.514 | 3.237 | 47.056 |
| **Ti (ppm)** | 4.146 | 3.972 | 20.222 | 7.141 | 4.778 | 4140.188 | 8.069 | 2.945 | 3.905 | 10.775 | 3.098 | 3.417 | 269.792 | 4.571 | 4.864 | 15.519 |
| **T (℃)** | 664 | 660 | 801 | 706 | 674 | 1837 | 717 | 638 | 659 | 742 | 642 | 649 | 1138 | 671 | 676 | 775 |

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|  | GR-17-1a | 2a | 3a | 4.1a | 4.2a | 5a | 6a | 7a | 8a | 9a | 10a | 11a | 12a | 13a | 14a | 15a | 16a | 17a | 18a | 19a | 20.1a | 20.2a |
| **La** | 23.327 | 0.089 | 2.487 | 0.125 | 0.509 | 0.000 | 0.003 | 0.246 | 0.020 | 0.078 | 0.105 | 0.000 | 0.000 | 0.000 | 0.000 | 0.041 | 35.227 | 0.000 | 2.667 | 0.000 | 0.000 | 0.115 |
| **Ce** | 65.085 | 9.278 | 23.212 | 18.793 | 11.407 | 28.367 | 3.540 | 25.278 | 9.028 | 10.279 | 14.525 | 5.453 | 12.066 | 24.317 | 28.318 | 8.878 | 123.739 | 8.168 | 25.761 | 13.966 | 1.283 | 10.689 |
| **Pr** | 5.835 | 0.070 | 1.449 | 0.280 | 0.273 | 0.055 | 0.047 | 1.471 | 0.146 | 0.333 | 0.310 | 0.000 | 0.044 | 0.350 | 0.053 | 0.117 | 14.869 | 0.000 | 0.781 | 0.060 | 0.012 | 0.093 |
| **Nd** | 25.506 | 0.781 | 9.818 | 4.323 | 1.227 | 2.983 | 0.681 | 18.861 | 2.315 | 4.616 | 4.372 | 0.812 | 0.803 | 5.941 | 1.109 | 1.994 | 71.118 | 0.634 | 5.653 | 1.180 | 0.220 | 0.442 |
| **Sm** | 9.524 | 2.088 | 6.922 | 8.443 | 3.557 | 6.462 | 1.282 | 28.800 | 3.279 | 11.194 | 9.656 | 2.049 | 2.574 | 13.124 | 1.752 | 4.237 | 17.363 | 0.946 | 4.610 | 3.456 | 1.970 | 0.695 |
| **Eu** | 1.922 | 0.185 | 0.291 | 0.458 | 1.651 | 0.320 | 0.439 | 0.558 | 1.291 | 0.730 | 0.796 | 0.131 | 0.639 | 2.153 | 0.262 | 0.077 | 0.674 | 0.206 | 1.066 | 0.044 | 0.598 | 0.390 |
| **Gd** | 30.706 | 12.944 | 21.357 | 38.209 | 12.250 | 35.668 | 7.050 | 119.370 | 14.741 | 47.327 | 38.999 | 11.058 | 16.368 | 70.121 | 8.794 | 18.581 | 26.203 | 5.473 | 15.211 | 19.450 | 19.289 | 4.235 |
| **Tb** | 8.931 | 4.107 | 7.357 | 12.678 | 3.769 | 12.040 | 2.546 | 37.936 | 4.227 | 14.869 | 11.512 | 3.544 | 5.416 | 22.343 | 2.824 | 6.409 | 5.860 | 2.299 | 3.688 | 6.308 | 9.398 | 1.351 |
| **Dy** | 95.528 | 57.119 | 82.791 | 152.100 | 40.948 | 145.405 | 36.656 | 399.181 | 49.987 | 163.897 | 132.538 | 49.531 | 69.824 | 269.152 | 34.410 | 75.418 | 55.671 | 28.883 | 36.763 | 79.870 | 101.313 | 18.759 |
| **Ho** | 33.533 | 20.507 | 30.294 | 53.304 | 15.064 | 53.647 | 14.909 | 131.982 | 18.387 | 55.654 | 46.283 | 19.163 | 26.591 | 95.450 | 11.950 | 24.468 | 17.083 | 11.799 | 11.223 | 28.519 | 25.101 | 7.247 |
| **Er** | 149.321 | 88.780 | 129.295 | 223.826 | 73.392 | 236.168 | 75.032 | 514.714 | 87.525 | 221.614 | 186.612 | 89.882 | 126.781 | 402.324 | 52.128 | 100.726 | 69.243 | 51.243 | 43.609 | 116.808 | 84.102 | 36.482 |
| **Tm** | 35.600 | 21.077 | 29.814 | 51.059 | 21.186 | 52.761 | 19.461 | 100.423 | 21.429 | 47.111 | 40.356 | 20.971 | 29.814 | 89.917 | 12.214 | 21.625 | 14.826 | 11.905 | 9.366 | 25.551 | 16.431 | 10.142 |
| **Yb** | 374.987 | 208.128 | 282.965 | 490.620 | 248.194 | 549.819 | 229.699 | 905.823 | 248.594 | 435.528 | 391.560 | 221.843 | 309.923 | 861.460 | 131.977 | 196.523 | 147.500 | 116.482 | 89.164 | 235.054 | 147.108 | 119.928 |
| **Lu** | 54.944 | 30.798 | 40.032 | 69.326 | 38.803 | 80.520 | 40.034 | 125.831 | 44.113 | 61.236 | 57.697 | 34.974 | 51.128 | 115.870 | 19.872 | 29.797 | 21.729 | 18.416 | 12.485 | 35.472 | 20.506 | 22.911 |

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|  | 21.1a | 21.2a | 22a | 23.1a | 23.2a | 24a | 25a | 26a | 27a | 28a | 29a | 30a | 31a | 32a | 33a | 34a | 35a | 36a | 37a | 38a | 39a | 40a |
| **La** | 0.000 | 0.000 | 0.000 | 29.065 | 0.000 | 0.042 | 0.000 | 0.000 | 0.070 | 0.000 | 4.526 | 0.089 | 0.007 | 0.079 | 18.163 | 20.054 | 0.000 | 0.079 | 0.019 | 0.047 | 0.000 | 0.078 |
| **Ce** | 25.894 | 2.516 | 33.101 | 80.485 | 0.132 | 5.079 | 19.230 | 12.251 | 120.244 | 0.812 | 26.504 | 1.164 | 13.401 | 9.669 | 40.275 | 77.043 | 34.962 | 23.676 | 7.505 | 18.389 | 13.328 | 21.811 |
| **Pr** | 0.072 | 0.055 | 0.055 | 11.483 | 0.000 | 0.127 | 0.084 | 0.073 | 0.370 | 0.010 | 4.231 | 0.075 | 0.234 | 0.012 | 4.669 | 6.767 | 0.194 | 0.111 | 0.061 | 0.002 | 0.122 | 0.358 |
| **Nd** | 0.628 | 0.613 | 1.559 | 66.062 | 0.089 | 2.603 | 0.959 | 0.823 | 6.376 | 0.272 | 20.280 | 1.886 | 4.952 | 2.367 | 23.365 | 29.257 | 1.313 | 2.199 | 1.177 | 1.204 | 1.119 | 2.965 |
| **Sm** | 1.456 | 1.545 | 4.140 | 32.555 | 0.130 | 5.183 | 5.217 | 2.139 | 10.265 | 2.108 | 20.973 | 4.898 | 7.660 | 5.067 | 7.353 | 12.807 | 5.310 | 3.857 | 1.923 | 3.249 | 3.217 | 4.656 |
| **Eu** | 0.546 | 0.114 | 0.824 | 1.040 | 0.221 | 0.029 | 1.178 | 0.403 | 1.564 | 0.145 | 8.569 | 0.222 | 0.517 | 1.220 | 0.372 | 2.386 | 1.280 | 0.736 | 0.116 | 0.249 | 0.411 | 1.093 |
| **Gd** | 10.025 | 10.671 | 23.485 | 71.627 | 2.640 | 29.886 | 33.924 | 10.335 | 40.154 | 17.525 | 46.037 | 37.017 | 36.754 | 29.243 | 19.646 | 25.669 | 26.761 | 12.324 | 13.797 | 15.971 | 11.305 | 28.347 |
| **Tb** | 3.365 | 3.638 | 7.968 | 18.146 | 1.419 | 9.873 | 12.261 | 3.129 | 13.017 | 6.812 | 16.650 | 13.677 | 9.922 | 9.757 | 7.476 | 7.184 | 9.815 | 3.958 | 4.374 | 6.443 | 3.765 | 9.232 |
| **Dy** | 40.669 | 49.086 | 105.040 | 175.805 | 15.973 | 115.415 | 155.403 | 41.555 | 142.096 | 64.862 | 181.827 | 183.143 | 107.071 | 114.499 | 90.727 | 78.894 | 118.898 | 43.326 | 48.977 | 86.380 | 45.840 | 98.252 |
| **Ho** | 13.543 | 18.528 | 41.058 | 59.664 | 4.280 | 41.919 | 60.146 | 13.788 | 52.618 | 15.723 | 62.746 | 73.869 | 35.177 | 42.856 | 34.989 | 29.831 | 44.955 | 14.039 | 17.965 | 30.942 | 16.738 | 34.303 |
| **Er** | 61.985 | 86.954 | 186.113 | 236.745 | 14.304 | 174.016 | 263.112 | 54.787 | 222.123 | 40.122 | 293.484 | 338.944 | 134.943 | 192.270 | 160.157 | 135.603 | 211.418 | 58.437 | 77.490 | 146.301 | 71.877 | 152.946 |
| **Tm** | 14.726 | 21.500 | 42.107 | 49.370 | 2.777 | 37.194 | 59.334 | 11.222 | 50.340 | 5.780 | 74.848 | 77.402 | 27.866 | 43.911 | 35.234 | 32.640 | 48.347 | 12.948 | 16.938 | 34.290 | 16.572 | 34.310 |
| **Yb** | 155.310 | 208.933 | 417.479 | 455.054 | 25.896 | 349.209 | 586.858 | 103.664 | 487.458 | 35.323 | 777.258 | 745.756 | 245.139 | 438.221 | 336.554 | 330.766 | 498.209 | 129.789 | 162.301 | 323.687 | 156.023 | 314.020 |
| **Lu** | 22.960 | 33.978 | 69.018 | 69.654 | 4.461 | 54.325 | 95.067 | 15.501 | 74.546 | 3.584 | 117.156 | 120.343 | 36.541 | 70.526 | 54.515 | 55.889 | 78.748 | 19.499 | 25.040 | 50.452 | 25.031 | 47.340 |

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|  | GR-17-41a | 42a | 43a | 44a | 45a | 46a | 47a | 48a | 49a | 50a | 51a | 52a | 53a | 54a | 55a | 56a | 57a | 58a | 59a | 60a |
| **La** | 5.647 | 4.170 | 0.093 | 0.004 | 0.000 | 0.054 | 0.028 | 0.000 | 0.000 | 0.014 | 0.086 | 1.094 | 0.004 | 0.014 | 0.000 | 0.000 | 0.029 | 0.000 | 0.000 | 0.097 |
| **Ce** | 50.958 | 16.565 | 33.568 | 19.755 | 13.180 | 18.321 | 14.023 | 5.997 | 11.123 | 5.575 | 1.191 | 9.980 | 2.801 | 5.748 | 26.319 | 6.691 | 19.658 | 11.284 | 3.610 | 20.688 |
| **Pr** | 2.295 | 0.960 | 0.323 | 0.111 | 0.090 | 0.000 | 0.068 | 0.076 | 0.038 | 0.201 | 0.082 | 1.352 | 0.036 | 0.384 | 0.034 | 0.216 | 0.204 | 0.066 | 0.072 | 0.089 |
| **Nd** | 13.219 | 4.473 | 5.953 | 1.486 | 1.620 | 0.381 | 0.560 | 1.114 | 0.612 | 2.773 | 0.876 | 6.934 | 0.872 | 6.108 | 1.511 | 2.737 | 2.763 | 1.433 | 1.007 | 1.884 |
| **Sm** | 5.928 | 3.185 | 12.326 | 2.377 | 3.475 | 0.791 | 2.996 | 2.807 | 1.735 | 4.831 | 3.059 | 6.590 | 1.601 | 9.064 | 3.343 | 5.785 | 3.895 | 2.683 | 4.269 | 3.064 |
| **Eu** | 1.613 | 0.398 | 0.135 | 0.466 | 0.041 | 0.443 | 0.521 | 0.228 | 0.044 | 0.419 | 0.099 | 1.451 | 0.263 | 0.885 | 0.311 | 0.308 | 1.238 | 0.425 | 0.170 | 0.207 |
| **Gd** | 19.258 | 12.478 | 52.664 | 11.139 | 23.262 | 5.141 | 12.824 | 16.624 | 9.039 | 24.680 | 31.092 | 19.049 | 8.563 | 39.210 | 16.745 | 31.296 | 16.103 | 14.335 | 32.903 | 17.128 |
| **Tb** | 5.879 | 4.798 | 15.116 | 3.516 | 8.092 | 1.614 | 4.564 | 5.913 | 3.513 | 7.557 | 14.738 | 6.334 | 3.225 | 10.896 | 5.892 | 11.431 | 4.781 | 5.162 | 13.643 | 4.830 |
| **Dy** | 69.263 | 59.784 | 160.999 | 35.675 | 97.039 | 19.382 | 55.972 | 67.693 | 42.264 | 84.170 | 191.212 | 65.804 | 42.125 | 109.523 | 69.383 | 123.347 | 56.896 | 62.501 | 180.467 | 56.342 |
| **Ho** | 25.999 | 21.995 | 50.436 | 11.149 | 34.971 | 6.979 | 21.807 | 24.593 | 16.361 | 28.547 | 70.564 | 20.525 | 16.336 | 35.885 | 26.526 | 42.691 | 23.157 | 24.889 | 74.228 | 19.485 |
| **Er** | 126.072 | 102.126 | 191.886 | 46.236 | 146.752 | 31.469 | 97.404 | 104.187 | 73.860 | 112.097 | 298.404 | 78.592 | 73.737 | 144.689 | 115.611 | 180.205 | 112.321 | 112.160 | 352.252 | 81.659 |
| **Tm** | 31.140 | 23.200 | 39.356 | 9.726 | 30.111 | 8.218 | 22.940 | 22.111 | 17.046 | 23.357 | 63.725 | 17.428 | 16.160 | 30.325 | 27.563 | 36.805 | 28.651 | 25.761 | 82.995 | 18.715 |
| **Yb** | 321.462 | 232.907 | 357.044 | 90.173 | 272.091 | 93.873 | 231.474 | 208.536 | 161.856 | 214.239 | 596.338 | 167.247 | 167.040 | 267.042 | 262.592 | 341.273 | 336.166 | 261.363 | 817.339 | 175.022 |
| **Lu** | 55.157 | 37.660 | 51.841 | 13.563 | 41.058 | 19.422 | 40.068 | 31.244 | 26.398 | 31.572 | 87.724 | 23.621 | 26.705 | 42.051 | 42.241 | 52.511 | 62.715 | 42.608 | 130.427 | 27.843 |

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|  | GR-17-61a | 62a | 63a | 64a | 65a | 66a | 67a | 68a | 69a | 70a | 71a | 72a | 73a | 74a | 75a | 76a | 77a | 78a | 79a | 80a |
| **La** | 0.018 | 0.029 | 0.042 | 0.000 | 0.065 | 0.032 | 0.000 | 0.072 | 0.007 | 0.000 | 0.000 | 0.000 | 0.119 | 0.000 | 0.000 | 0.000 | 0.000 | 10.767 | 0.000 | 0.051 |
| **Ce** | 1.079 | 10.936 | 3.411 | 3.276 | 61.829 | 7.102 | 7.634 | 13.454 | 9.856 | 11.769 | 12.379 | 12.121 | 32.352 | 3.173 | 2.834 | 8.065 | 7.255 | 46.271 | 17.686 | 12.392 |
| **Pr** | 0.125 | 0.084 | 0.058 | 0.182 | 0.318 | 0.091 | 0.089 | 0.345 | 0.433 | 0.069 | 0.075 | 0.158 | 0.504 | 0.282 | 0.029 | 0.141 | 0.035 | 3.472 | 0.214 | 0.028 |
| **Nd** | 0.999 | 1.716 | 2.028 | 4.014 | 6.633 | 0.306 | 0.634 | 7.225 | 5.902 | 1.023 | 1.483 | 1.665 | 8.731 | 4.585 | 1.128 | 1.945 | 1.453 | 16.878 | 2.613 | 0.271 |
| **Sm** | 3.716 | 3.756 | 4.717 | 8.759 | 10.046 | 0.931 | 1.945 | 11.846 | 9.946 | 3.086 | 3.073 | 2.325 | 12.269 | 11.122 | 5.110 | 5.397 | 3.343 | 5.498 | 2.436 | 0.997 |
| **Eu** | 0.223 | 0.097 | 0.061 | 0.310 | 2.048 | 0.447 | 0.045 | 1.966 | 0.736 | 0.874 | 0.680 | 0.266 | 1.740 | 0.225 | 0.106 | 0.464 | 0.301 | 0.640 | 0.241 | 0.149 |
| **Gd** | 31.324 | 15.410 | 26.114 | 52.822 | 44.423 | 6.445 | 10.990 | 43.427 | 42.539 | 20.747 | 10.853 | 10.456 | 38.874 | 48.443 | 28.458 | 29.534 | 18.306 | 22.692 | 10.454 | 4.490 |
| **Tb** | 13.792 | 5.451 | 10.057 | 19.303 | 13.545 | 2.344 | 3.880 | 12.105 | 13.955 | 7.261 | 3.917 | 3.563 | 11.401 | 17.044 | 12.198 | 10.948 | 6.031 | 7.137 | 4.074 | 1.647 |
| **Dy** | 185.458 | 60.265 | 113.860 | 235.189 | 150.810 | 28.862 | 46.722 | 130.783 | 162.053 | 82.993 | 41.653 | 37.670 | 124.770 | 204.245 | 165.877 | 134.963 | 73.450 | 92.602 | 51.395 | 17.668 |
| **Ho** | 71.524 | 20.933 | 42.302 | 85.713 | 52.865 | 12.704 | 16.837 | 43.603 | 55.544 | 32.864 | 14.038 | 14.047 | 41.457 | 72.142 | 65.742 | 50.939 | 26.984 | 34.932 | 18.579 | 6.391 |
| **Er** | 307.509 | 90.539 | 181.701 | 355.931 | 213.835 | 64.005 | 76.691 | 170.414 | 232.663 | 150.860 | 60.728 | 58.437 | 164.792 | 305.148 | 295.605 | 216.267 | 114.975 | 156.692 | 83.525 | 28.700 |
| **Tm** | 68.802 | 21.469 | 39.418 | 72.658 | 45.283 | 16.527 | 17.958 | 35.321 | 47.334 | 36.550 | 13.665 | 13.526 | 36.558 | 67.199 | 67.731 | 48.205 | 25.407 | 34.819 | 19.548 | 7.016 |
| **Yb** | 626.096 | 212.972 | 365.994 | 639.039 | 410.983 | 177.673 | 173.206 | 312.730 | 421.628 | 367.429 | 140.061 | 123.749 | 341.830 | 604.130 | 664.863 | 460.707 | 234.039 | 338.474 | 192.735 | 69.095 |
| **Lu** | 95.854 | 32.014 | 56.472 | 98.079 | 66.146 | 32.720 | 27.430 | 49.094 | 65.648 | 63.250 | 22.486 | 19.719 | 50.301 | 88.755 | 101.459 | 71.632 | 38.764 | 54.369 | 30.092 | 11.571 |

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|  | GR-17-81.1a | 81.2a | 82a | 83a | M27 | M28 | M29 | M30 | M31 | GR-17-1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| **La** | 0.032 | 0.019 | 0.000 | 0.000 | 0.000 | 0.000 | 0.579 | 0.112 | 0.000 | 0.003 | 0.041 | 0.156 | 0.032 | 16.452 | 0.051 | 0.011 | 0.000 | 0.046 |
| **Ce** | 8.865 | 9.673 | 12.704 | 15.955 | 5.828 | 3.534 | 41.181 | 1.777 | 0.025 | 6.690 | 19.378 | 42.829 | 4.122 | 55.752 | 2.105 | 25.233 | 17.029 | 1.616 |
| **Pr** | 0.064 | 0.042 | 0.000 | 0.000 | 0.044 | 0.177 | 0.912 | 0.033 | 0.000 | 0.080 | 0.162 | 1.057 | 0.231 | 5.237 | 0.150 | 0.303 | 0.067 | 0.038 |
| **Nd** | 0.661 | 1.020 | 0.513 | 0.576 | 1.162 | 4.193 | 11.620 | 1.770 | 0.054 | 1.262 | 2.702 | 13.367 | 4.173 | 23.293 | 2.821 | 6.118 | 1.440 | 1.281 |
| **Sm** | 1.347 | 1.240 | 1.280 | 2.113 | 2.744 | 9.152 | 15.943 | 3.637 | 1.680 | 2.669 | 3.889 | 16.900 | 7.695 | 7.019 | 6.430 | 15.064 | 3.509 | 3.197 |
| **Eu** | 0.143 | 0.120 | 0.233 | 0.249 | 0.327 | 0.336 | 3.097 | 0.000 | 0.110 | 0.441 | 0.716 | 3.243 | 0.394 | 0.621 | 0.224 | 0.799 | 0.235 | 0.207 |
| **Gd** | 6.060 | 8.228 | 5.714 | 14.324 | 16.257 | 38.816 | 78.495 | 14.805 | 11.546 | 16.429 | 15.892 | 87.159 | 34.415 | 17.706 | 38.730 | 81.954 | 21.293 | 28.667 |
| **Tb** | 2.329 | 3.081 | 2.205 | 5.194 | 5.423 | 11.297 | 21.380 | 3.438 | 3.537 | 5.746 | 5.084 | 28.469 | 11.256 | 6.033 | 14.239 | 28.173 | 7.643 | 14.335 |
| **Dy** | 31.284 | 35.400 | 28.229 | 60.663 | 66.478 | 118.191 | 263.543 | 30.697 | 29.195 | 71.707 | 43.733 | 318.816 | 114.452 | 75.345 | 171.965 | 342.364 | 91.769 | 201.926 |
| **Ho** | 12.509 | 12.483 | 11.716 | 21.944 | 22.925 | 40.142 | 92.109 | 7.709 | 5.608 | 26.019 | 10.895 | 114.110 | 38.955 | 30.330 | 63.627 | 118.679 | 33.842 | 82.530 |
| **Er** | 61.014 | 54.590 | 54.540 | 95.866 | 102.374 | 156.396 | 381.234 | 23.949 | 13.729 | 113.915 | 38.668 | 481.905 | 160.334 | 147.261 | 272.713 | 497.057 | 149.702 | 392.366 |
| **Tm** | 16.113 | 12.651 | 14.090 | 22.173 | 23.106 | 33.747 | 78.793 | 4.241 | 2.074 | 25.178 | 7.526 | 97.529 | 32.692 | 36.098 | 58.158 | 101.058 | 31.989 | 91.079 |
| **Yb** | 174.277 | 121.485 | 152.865 | 215.399 | 227.880 | 311.406 | 703.856 | 29.587 | 15.636 | 244.126 | 69.234 | 856.895 | 303.209 | 365.255 | 563.628 | 873.779 | 306.035 | 875.852 |
| **Lu** | 30.044 | 18.968 | 27.025 | 32.721 | 34.378 | 46.728 | 107.320 | 4.134 | 2.111 | 40.066 | 12.268 | 139.451 | 47.780 | 67.854 | 92.443 | 133.408 | 49.052 | 156.932 |

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|  | GR-17-10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| **La** | 0.002 | 1.115 | 2.508 | 0.036 | 0.043 | 0.004 | 0.014 | 0.120 | 0.003 | 0.010 | 0.023 | 0.003 | 0.008 | 0.034 | 0.000 | 0.075 | 21.504 | 0.001 | 0.000 | 0.324 | 0.052 |
| **Ce** | 8.386 | 37.697 | 26.984 | 27.457 | 16.391 | 5.473 | 6.483 | 6.057 | 8.072 | 1.158 | 3.764 | 2.780 | 11.516 | 2.450 | 0.714 | 1.103 | 88.651 | 2.663 | 2.293 | 95.998 | 13.216 |
| **Pr** | 0.125 | 0.600 | 1.670 | 0.153 | 0.360 | 0.125 | 0.093 | 0.509 | 0.048 | 0.051 | 0.193 | 0.078 | 0.153 | 0.151 | 0.046 | 0.086 | 7.684 | 0.105 | 0.030 | 1.324 | 0.159 |
| **Nd** | 1.698 | 6.289 | 15.048 | 1.997 | 5.770 | 1.725 | 1.646 | 6.483 | 0.794 | 0.876 | 3.568 | 2.199 | 2.803 | 2.405 | 0.949 | 1.679 | 39.234 | 2.003 | 0.956 | 14.545 | 2.366 |
| **Sm** | 4.251 | 6.423 | 18.195 | 4.168 | 8.172 | 3.994 | 3.436 | 12.564 | 2.032 | 3.965 | 8.567 | 7.990 | 5.718 | 6.780 | 3.853 | 4.284 | 19.570 | 5.199 | 2.587 | 17.292 | 4.347 |
| **Eu** | 1.350 | 1.286 | 2.978 | 0.430 | 0.448 | 0.170 | 0.642 | 3.628 | 0.119 | 0.305 | 0.153 | 0.111 | 1.010 | 0.253 | 0.202 | 0.094 | 2.401 | 0.154 | 0.040 | 4.752 | 0.040 |
| **Gd** | 22.020 | 23.005 | 83.048 | 17.887 | 36.087 | 17.952 | 17.274 | 65.016 | 15.739 | 23.680 | 28.243 | 48.405 | 30.054 | 45.167 | 29.489 | 22.301 | 37.619 | 33.080 | 19.473 | 57.035 | 25.214 |
| **Tb** | 7.428 | 5.790 | 26.364 | 5.796 | 11.114 | 5.811 | 5.717 | 20.884 | 7.037 | 6.503 | 6.387 | 19.670 | 9.654 | 15.214 | 10.631 | 6.601 | 9.935 | 13.066 | 8.158 | 15.729 | 8.572 |
| **Dy** | 92.123 | 54.573 | 304.199 | 65.713 | 113.985 | 67.660 | 65.619 | 228.952 | 102.141 | 45.871 | 42.348 | 247.340 | 116.031 | 149.329 | 110.179 | 57.165 | 109.406 | 178.445 | 113.882 | 171.329 | 99.854 |
| **Ho** | 36.978 | 17.256 | 105.692 | 22.297 | 39.386 | 25.369 | 24.229 | 81.965 | 43.353 | 9.547 | 8.426 | 87.418 | 43.008 | 42.992 | 33.695 | 15.052 | 42.948 | 71.730 | 48.411 | 62.316 | 38.780 |
| **Er** | 179.508 | 68.828 | 431.493 | 98.098 | 158.805 | 103.326 | 102.163 | 334.001 | 198.770 | 27.415 | 21.732 | 383.151 | 181.493 | 148.769 | 128.338 | 47.620 | 199.365 | 314.514 | 221.824 | 256.572 | 160.407 |
| **Tm** | 43.461 | 14.303 | 94.616 | 22.526 | 33.003 | 22.361 | 22.462 | 67.703 | 45.369 | 4.675 | 2.889 | 83.345 | 39.271 | 25.997 | 25.992 | 8.637 | 47.363 | 71.458 | 50.826 | 52.594 | 33.839 |
| **Yb** | 473.825 | 129.827 | 881.669 | 212.503 | 290.313 | 225.815 | 212.091 | 636.295 | 426.713 | 39.414 | 19.941 | 786.260 | 370.809 | 208.282 | 224.846 | 67.654 | 473.293 | 666.306 | 496.719 | 500.776 | 317.550 |
| **Lu** | 101.780 | 23.904 | 141.626 | 34.955 | 44.631 | 35.415 | 34.846 | 111.330 | 71.454 | 5.999 | 2.457 | 126.451 | 63.561 | 34.559 | 36.452 | 10.649 | 89.726 | 113.464 | 87.462 | 86.903 | 50.477 |

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|  | GR-17-31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| **La** | 0.129 | 0.022 | 0.014 | 0.028 | 0.018 | 0.005 | 0.007 | 0.009 | 0.019 | 0.018 | 0.008 | 0.019 | 0.017 | 0.000 | 0.016 | 0.129 | 0.025 | 0.154 | 2.332 | 0.001 |
| **Ce** | 19.278 | 57.876 | 13.166 | 13.397 | 8.938 | 17.482 | 3.130 | 2.107 | 2.366 | 3.599 | 35.193 | 35.709 | 13.985 | 7.956 | 31.348 | 0.722 | 58.161 | 3.473 | 32.076 | 7.623 |
| **Pr** | 0.409 | 0.232 | 0.062 | 0.194 | 0.092 | 0.312 | 0.090 | 0.151 | 0.039 | 0.066 | 0.071 | 0.203 | 0.341 | 0.024 | 0.054 | 0.089 | 0.317 | 0.582 | 0.814 | 0.063 |
| **Nd** | 6.079 | 4.177 | 0.949 | 3.267 | 1.656 | 6.116 | 1.401 | 2.763 | 0.321 | 0.955 | 1.496 | 4.508 | 6.204 | 0.326 | 1.277 | 0.533 | 5.966 | 9.167 | 5.705 | 0.972 |
| **Sm** | 8.648 | 7.010 | 2.136 | 6.900 | 4.698 | 12.709 | 3.097 | 7.581 | 1.997 | 2.626 | 3.154 | 8.393 | 11.330 | 0.656 | 3.742 | 0.734 | 10.930 | 19.516 | 4.447 | 2.162 |
| **Eu** | 1.441 | 1.647 | 0.112 | 0.915 | 0.595 | 0.400 | 0.140 | 0.165 | 0.113 | 0.228 | 0.695 | 0.638 | 2.677 | 0.065 | 0.997 | 0.588 | 3.740 | 0.176 | 0.986 | 0.263 |
| **Gd** | 45.617 | 28.925 | 12.218 | 29.748 | 26.149 | 63.769 | 19.918 | 41.715 | 12.930 | 21.101 | 14.063 | 40.581 | 56.762 | 3.815 | 19.429 | 8.396 | 48.751 | 70.610 | 18.571 | 13.050 |
| **Tb** | 14.274 | 8.652 | 4.526 | 9.169 | 9.038 | 21.060 | 6.984 | 14.318 | 5.733 | 8.507 | 4.684 | 13.242 | 17.791 | 1.379 | 6.697 | 2.828 | 14.938 | 19.158 | 6.001 | 4.593 |
| **Dy** | 164.613 | 103.506 | 53.727 | 101.396 | 108.661 | 253.099 | 85.681 | 157.704 | 77.595 | 106.295 | 50.307 | 159.659 | 203.586 | 19.225 | 79.818 | 21.734 | 174.576 | 162.610 | 65.207 | 53.778 |
| **Ho** | 63.574 | 38.301 | 21.441 | 35.514 | 42.724 | 96.194 | 34.241 | 54.020 | 32.366 | 40.028 | 19.707 | 59.628 | 75.513 | 7.814 | 30.104 | 4.760 | 60.850 | 41.013 | 22.476 | 20.645 |
| **Er** | 264.413 | 166.503 | 94.767 | 140.559 | 183.581 | 405.034 | 150.676 | 213.635 | 155.235 | 184.363 | 83.467 | 263.360 | 328.690 | 39.054 | 144.124 | 17.047 | 277.520 | 123.551 | 101.789 | 92.947 |
| **Tm** | 54.480 | 37.786 | 20.680 | 28.521 | 38.869 | 80.509 | 32.573 | 41.546 | 36.677 | 42.300 | 18.575 | 55.182 | 67.355 | 10.300 | 34.408 | 3.215 | 59.097 | 19.971 | 23.632 | 19.227 |
| **Yb** | 503.641 | 373.348 | 199.674 | 269.465 | 380.270 | 714.101 | 310.059 | 366.750 | 360.183 | 427.012 | 188.530 | 513.568 | 619.835 | 114.333 | 361.732 | 29.135 | 563.068 | 148.427 | 237.323 | 178.749 |
| **Lu** | 87.969 | 64.974 | 34.989 | 45.082 | 65.582 | 121.550 | 54.343 | 59.337 | 62.361 | 77.726 | 32.772 | 86.978 | 110.459 | 21.256 | 65.237 | 5.484 | 97.213 | 20.551 | 41.759 | 31.095 |

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|  | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 |
| **La** | 0.001 | 0.012 | 2.584 | 0.062 | 0.500 | 0.821 | 0.009 | 0.020 | 0.104 | 0.161 | 0.081 | 37.219 | 0.039 | 0.516 | 2.893 |
| **Ce** | 15.100 | 4.557 | 51.165 | 3.983 | 26.527 | 27.626 | 12.608 | 4.859 | 7.155 | 35.035 | 0.989 | 110.091 | 0.371 | 30.012 | 26.834 |
| **Pr** | 0.084 | 0.052 | 0.990 | 0.035 | 0.517 | 0.807 | 0.072 | 0.061 | 0.135 | 0.911 | 0.101 | 11.990 | 0.027 | 0.422 | 1.247 |
| **Nd** | 1.428 | 1.120 | 8.172 | 0.605 | 3.933 | 8.603 | 1.481 | 1.290 | 2.236 | 11.848 | 0.586 | 61.727 | 0.334 | 4.493 | 9.666 |
| **Sm** | 2.541 | 2.940 | 9.183 | 1.118 | 4.124 | 11.619 | 3.086 | 3.426 | 6.056 | 15.206 | 0.890 | 19.263 | 0.425 | 5.905 | 9.079 |
| **Eu** | 0.519 | 0.297 | 1.592 | 0.372 | 0.252 | 1.169 | 0.149 | 0.332 | 0.394 | 2.871 | 0.457 | 0.377 | 0.307 | 1.493 | 0.647 |
| **Gd** | 14.861 | 12.829 | 37.718 | 7.781 | 20.717 | 59.543 | 16.242 | 22.953 | 39.136 | 49.404 | 3.837 | 42.621 | 6.427 | 19.487 | 51.914 |
| **Tb** | 4.508 | 3.777 | 10.742 | 2.651 | 7.400 | 19.886 | 5.396 | 8.522 | 14.187 | 12.676 | 1.089 | 12.968 | 2.665 | 6.013 | 19.267 |
| **Dy** | 51.063 | 35.823 | 115.319 | 31.588 | 93.582 | 224.212 | 59.827 | 117.061 | 165.688 | 125.459 | 9.653 | 146.213 | 17.110 | 66.997 | 230.394 |
| **Ho** | 18.174 | 9.918 | 37.773 | 13.103 | 35.030 | 80.395 | 21.305 | 47.977 | 63.871 | 38.389 | 2.769 | 57.996 | 3.957 | 26.305 | 90.038 |
| **Er** | 83.013 | 38.983 | 162.675 | 68.142 | 161.279 | 333.423 | 92.914 | 220.734 | 285.626 | 153.059 | 10.839 | 252.533 | 14.747 | 115.944 | 390.332 |
| **Tm** | 17.804 | 7.456 | 32.825 | 16.654 | 35.453 | 66.827 | 19.204 | 49.359 | 59.215 | 30.550 | 2.136 | 53.328 | 2.899 | 27.687 | 81.447 |
| **Yb** | 161.814 | 59.081 | 302.139 | 185.111 | 327.156 | 579.333 | 172.074 | 458.447 | 538.342 | 274.525 | 19.486 | 495.434 | 25.367 | 283.567 | 722.968 |
| **Lu** | 28.962 | 9.854 | 55.247 | 40.325 | 59.620 | 97.786 | 30.267 | 87.062 | 96.425 | 49.871 | 3.610 | 84.956 | 5.252 | 56.189 | 126.310 |

Notes: Detrital zircon U–Pb age spectrum for meta-sedimentary or sedimentary rocks source: SLB: 14DD01-1 (Jin et al., 2017) North Qiangtang: 05AQ07, 05AQ10, 05GT42, 05GT56, 524022, 619051, AP0703052, 06GT69, 06GT43 (Gehrels et al., 2011); South Qiangtang: 061705,06AQ187, 06AQ197, 06GT81, 06GT81 (Gehrels et al., 2011); T13T (Fan et al., 2015); Anduo: JG062505-3, AP061304-A (Guynn et al., 2012); Lhasa: 08YR10, NX1-5, XM01, MB07-2, GBJD (Zhu et al., 2011); Himalaya: SL5-1 (Zhu et al., 2011). The spots in italic from sample YA-7-18-44 are involved in the age calculation; spots with strikethrough were excluded for the age calculation because of their possible mixing and unstable signal.