**Supplement 3**

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**Table 3.** Lu‒Hf isotopic compositions of zircons from the metamorphic rocks of the Bekturgan (U1603 ‒ para-rocks) and

Baladzhezdy (U1675 – orthorocks) series of the Ulutau Precambrian massif.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **no.** | **Point** | **Age (Ma)** | **2s** | **176Yb/177Hf** | **2s** | **176Lu/177Hf** | **2s** | **176Hf/177Hf** | **2s** | **ɛHf(t)** | **2s** | **tHf(DM) ,(Ma)** | **tHf(C), (Ma)** | **tHf(C), (Ma)\*** |
| **U-1603** |
| 1 | U1603-77 | 742 | 9 | 0.05882 | 0.00450 | 0.00124 | 0.00009 | 0.28242 | 0.00002 | 3.5 | 0.9 | 1.18 | 1.30 | 1.43 |
| 2 | U1603-49 | 814 | 14 | 0.02325 | 0.00029 | 0.00053 | 0.00000 | 0.28250 | 0.00001 | 8.1 | 0.8 | 1.05 | 1.12 | 1.19 |
| 3 | U1603-109 | 826 | 8.9 | 0.01609 | 0.00035 | 0.00037 | 0.00001 | 0.28199 | 0.00002 | -9.7 | 0.8 | 1.75 | 2.03 | 2.32 |
| 4 | U1603-52 | 836 | 8.1 | 0.03944 | 0.00031 | 0.00085 | 0.00001 | 0.28194 | 0.00001 | -11.5 | 0.6 | 1.84 | 2.13 | 2.44 |
| 5 | U1603-60 | 917 | 9 | 0.01952 | 0.00018 | 0.00044 | 0.00001 | 0.28178 | 0.00002 | -15.0 | 0.8 | 2.03 | 2.37 | 2.71 |
| 6 | U1603-56 | 953 | 8.5 | 0.00393 | 0.00039 | 0.00008 | 0.00001 | 0.28198 | 0.00001 | -7.1 | 0.6 | 1.75 | 2.00 | 2.25 |
| 7 | U1603-110 | 966 | 7.7 | 0.03335 | 0.00039 | 0.00072 | 0.00001 | 0.28200 | 0.00002 | -6.6 | 0.7 | 1.75 | 1.99 | 2.23 |
| 8 | U1603-94 | 969 | 8.9 | 0.07757 | 0.00043 | 0.00165 | 0.00001 | 0.28202 | 0.00002 | -6.4 | 0.9 | 1.77 | 1.98 | 2.22 |
| 9 | U1603-68 | 973 | 8.3 | 0.04926 | 0.00066 | 0.00106 | 0.00003 | 0.28224 | 0.00002 | 2.1 | 0.8 | 1.43 | 1.55 | 1.70 |
| 10 | U1603-57 | 983 | 8 | 0.04185 | 0.00100 | 0.00103 | 0.00004 | 0.28217 | 0.00002 | -0.2 | 0.7 | 1.52 | 1.68 | 1.85 |
| 11 | U1603-124 | 990 | 9.2 | 0.04609 | 0.00088 | 0.00097 | 0.00003 | 0.28218 | 0.00001 | 0.4 | 0.7 | 1.51 | 1.65 | 1.81 |
| 12 | U1603-45 | 1005 | 8.7 | 0.05274 | 0.00050 | 0.00124 | 0.00001 | 0.28214 | 0.00002 | -0.9 | 0.8 | 1.58 | 1.73 | 1.91 |
| 13 | U1603-67 | 1006 | 8.6 | 0.02665 | 0.00013 | 0.00059 | 0.00001 | 0.28209 | 0.00003 | -2.2 | 1.1 | 1.62 | 1.80 | 1.99 |
| 14 | U1603-111 | 1162 | 8.4 | 0.02642 | 0.00050 | 0.00068 | 0.00001 | 0.28203 | 0.00002 | -0.9 | 0.7 | 1.70 | 1.86 | 2.03 |
| 15 | U1603-51 | 1216 | 8.5 | 0.02733 | 0.00024 | 0.00062 | 0.00001 | 0.28189 | 0.00002 | -4.7 | 0.7 | 1.89 | 2.09 | 2.30 |
| 16 | U1603-86 | 2456 | 10 | 0.02742 | 0.00021 | 0.00065 | 0.00001 | 0.28106 | 0.00002 | -6.7 | 0.8 | 3.03 | 3.19 | 3.37 |
| 17 | U1603-114 | 2457 | 9.4 | 0.06319 | 0.00047 | 0.00143 | 0.00001 | 0.28107 | 0.00002 | -7.4 | 0.7 | 3.06 | 3.23 | 3.41 |
| 18 | U1603-46 | 2485 | 8.6 | 0.02530 | 0.00007 | 0.00056 | 0.00000 | 0.28111 | 0.00002 | -4.0 | 0.8 | 2.95 | 3.08 | 3.23 |
| 19 | U1603-105 | 2491 | 12 | 0.05405 | 0.00027 | 0.00114 | 0.00000 | 0.28112 | 0.00001 | -4.6 | 0.7 | 2.98 | 3.12 | 3.27 |
| 20 | U1603-65 | 2499 | 8.8 | 0.00754 | 0.00008 | 0.00017 | 0.00000 | 0.28127 | 0.00002 | 2.8 | 0.7 | 2.70 | 2.76 | 2.83 |
| 21 | U1603-97 | 2510 | 9.2 | 0.02596 | 0.00036 | 0.00059 | 0.00001 | 0.28132 | 0.00001 | 3.9 | 0.7 | 2.67 | 2.72 | 2.77 |
| 22 | U1603-71 | 2541 | 9 | 0.04178 | 0.00040 | 0.00095 | 0.00001 | 0.28112 | 0.00001 | -3.0 | 0.5 | 2.96 | 3.08 | 3.21 |
| 23 | U1603-116 | 2681 | 9.8 | 0.03473 | 0.00110 | 0.00080 | 0.00002 | 0.28103 | 0.00002 | -2.8 | 0.7 | 3.07 | 3.19 | 3.31 |
| **U-1675** |
| 1 | U-1675-95 | 751 | 8 | 0.03835 | 0.00041 | 0.00088 | 0.00002 | 0.28229 | 0.00002 | -1.1 | 0.8 | 1.36 | 1.54 | 1.72 |
| 2 | U-1675-96 | 756 | 8 | 0.07420 | 0.00140 | 0.00171 | 0.00002 | 0.28229 | 0.00002 | -1.2 | 0.8 | 1.38 | 1.55 | 1.74 |
| 3 | U-1675-94 | 757 | 8 | 0.08508 | 0.00053 | 0.00191 | 0.00001 | 0.28228 | 0.00002 | -1.7 | 0.7 | 1.41 | 1.57 | 1.76 |
| 4 | U-1675-111 | 759 | 8 | 0.07016 | 0.00140 | 0.00161 | 0.00002 | 0.28233 | 0.00002 | 0.2 | 0.7 | 1.33 | 1.48 | 1.65 |
| 5 | U-1675-108 | 759 | 8 | 0.09116 | 0.00290 | 0.00206 | 0.00005 | 0.28232 | 0.00001 | -0.3 | 0.7 | 1.36 | 1.50 | 1.68 |
| 6 | U-1675-93 | 760 | 8 | 0.07529 | 0.00070 | 0.00179 | 0.00005 | 0.28225 | 0.00001 | -2.5 | 0.7 | 1.44 | 1.61 | 1.82 |
| **7** | U-1675-130 | 771 | 8 | 0.09204 | 0.00100 | 0.00206 | 0.00001 | 0.28234 | 0.00003 | 0.8 | 1.2 | 1.32 | 1.46 | 1.62 |