表1 乌力吉岩体LA-ICP-MS锆石U-Pb年龄测定结果

Table 1 LA-ICP-MS zircon U-Pb data of the Wuliji intrusions

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 测点号 | Pb | U | Pb/U | 207Pb/235U | | 206Pb/238U | | 232Th/238U | | 207Pb/235U | | 206Pb/238U | |
| 含量10-6 | |  | 同位素比值 | 1σ | 同位素比值 | 1σ | 同位素比值 | 1σ | 年龄（Ma) | 1σ | 年龄（Ma) | 1σ |
| TW4 花岗岩 | | | | | | | | | | | | | |
| 1 | 38 | 871 | 0.04 | 0.3034 | 0.0032 | 0.0398 | 0.0004 | 0.4620 | 1.2429 | 269 | 3 | 252 | 3 |
| 2 | 20 | 454 | 0.04 | 0.2920 | 0.0025 | 0.0402 | 0.0004 | 0.4784 | 1.2442 | 260 | 2 | 254 | 2 |
| 3 | 28 | 650 | 0.04 | 0.2961 | 0.0020 | 0.0396 | 0.0004 | 0.5251 | 1.3829 | 263 | 2 | 250 | 3 |
| 5 | 34 | 740 | 0.05 | 0.3076 | 0.0022 | 0.0402 | 0.0004 | 0.7385 | 2.0112 | 272 | 2 | 254 | 2 |
| 6 | 24 | 546 | 0.04 | 0.2912 | 0.0027 | 0.0404 | 0.0004 | 0.5599 | 1.4529 | 259 | 2 | 256 | 2 |
| 7 | 32 | 741 | 0.04 | 0.2948 | 0.0020 | 0.0403 | 0.0004 | 0.4773 | 1.2521 | 262 | 2 | 255 | 3 |
| 8 | 34 | 817 | 0.04 | 0.3034 | 0.0021 | 0.0401 | 0.0004 | 0.4485 | 1.2065 | 269 | 2 | 253 | 3 |
| 9 | 13 | 302 | 0.04 | 0.2877 | 0.0047 | 0.0405 | 0.0004 | 0.4387 | 1.1264 | 257 | 4 | 256 | 3 |
| 10 | 24 | 524 | 0.05 | 0.2970 | 0.0032 | 0.0401 | 0.0004 | 0.6819 | 1.8005 | 264 | 3 | 254 | 3 |
| 11 | 13 | 294 | 0.04 | 0.2911 | 0.0061 | 0.0409 | 0.0004 | 0.4528 | 1.1746 | 259 | 5 | 258 | 2 |
| 12 | 29 | 678 | 0.04 | 0.2995 | 0.0021 | 0.0405 | 0.0004 | 0.4860 | 1.2927 | 266 | 2 | 256 | 2 |
| 13 | 11 | 257 | 0.04 | 0.2905 | 0.0053 | 0.0404 | 0.0004 | 0.4088 | 1.0588 | 259 | 5 | 255 | 2 |
| 14 | 11 | 252 | 0.04 | 0.2912 | 0.0066 | 0.0410 | 0.0004 | 0.3718 | 0.9648 | 259 | 6 | 259 | 2 |
| 15 | 15 | 318 | 0.05 | 0.2926 | 0.0058 | 0.0406 | 0.0004 | 0.7488 | 1.9513 | 261 | 5 | 257 | 2 |
| 17 | 14 | 319 | 0.05 | 0.3088 | 0.0041 | 0.0402 | 0.0004 | 0.5956 | 1.6276 | 273 | 4 | 254 | 2 |
| 18 | 15 | 365 | 0.04 | 0.3073 | 0.0056 | 0.0400 | 0.0004 | 0.3120 | 0.8489 | 272 | 5 | 253 | 2 |
| 19 | 20 | 479 | 0.04 | 0.3026 | 0.0038 | 0.0402 | 0.0004 | 0.3751 | 1.0069 | 268 | 3 | 254 | 2 |
| 20 | 17 | 379 | 0.04 | 0.2927 | 0.0035 | 0.0405 | 0.0004 | 0.5969 | 1.5559 | 261 | 3 | 256 | 2 |
| 21 | 14 | 347 | 0.04 | 0.2877 | 0.0041 | 0.0401 | 0.0004 | 0.3428 | 0.8802 | 257 | 4 | 254 | 2 |
| 22 | 15 | 341 | 0.04 | 0.2834 | 0.0047 | 0.0400 | 0.0004 | 0.4322 | 1.0950 | 253 | 4 | 253 | 2 |
| 23 | 18 | 439 | 0.04 | 0.2891 | 0.0033 | 0.0405 | 0.0004 | 0.3371 | 0.8691 | 258 | 3 | 256 | 2 |
| 24 | 23 | 545 | 0.04 | 0.3141 | 0.0073 | 0.0398 | 0.0004 | 0.6039 | 1.6750 | 277 | 6 | 252 | 2 |
| TW5 花岗闪长岩 | | | | | | | | | | | | | |
| 1 | 43 | 811 | 0.05 | 0.3166 | 0.0044 | 0.0420 | 0.0004 | 0.6267 | 1.7505 | 279 | 4 | 265 | 2 |
| 2 | 19 | 400 | 0.05 | 0.3110 | 0.0060 | 0.0427 | 0.0004 | 0.4665 | 1.2827 | 275 | 5 | 269 | 2 |
| 3 | 20 | 432 | 0.05 | 0.3168 | 0.0028 | 0.0418 | 0.0004 | 0.6080 | 1.6989 | 279 | 2 | 264 | 3 |
| 4 | 7 | 167 | 0.04 | 0.3097 | 0.0060 | 0.0423 | 0.0004 | 0.2578 | 0.7062 | 274 | 5 | 267 | 3 |
| 5 | 17 | 365 | 0.05 | 0.3170 | 0.0032 | 0.0418 | 0.0004 | 0.5360 | 1.4985 | 280 | 3 | 264 | 2 |
| 6 | 15 | 323 | 0.05 | 0.3258 | 0.0045 | 0.0428 | 0.0004 | 0.5532 | 1.5843 | 286 | 4 | 270 | 2 |
| 7 | 16 | 346 | 0.05 | 0.3165 | 0.0046 | 0.0427 | 0.0004 | 0.4735 | 1.3220 | 279 | 4 | 270 | 2 |
| 8 | 16 | 340 | 0.05 | 0.3075 | 0.0037 | 0.0421 | 0.0004 | 0.5536 | 1.5073 | 272 | 3 | 266 | 2 |
| 10 | 16 | 326 | 0.05 | 0.3008 | 0.0039 | 0.0423 | 0.0004 | 0.6835 | 1.8253 | 267 | 3 | 267 | 2 |
| 11 | 17 | 365 | 0.05 | 0.3066 | 0.0033 | 0.0424 | 0.0004 | 0.5693 | 1.5460 | 272 | 3 | 268 | 2 |
| 12 | 14 | 323 | 0.04 | 0.3109 | 0.0036 | 0.0420 | 0.0004 | 0.4311 | 1.1851 | 275 | 3 | 265 | 2 |
| 14 | 15 | 327 | 0.04 | 0.3304 | 0.0054 | 0.0424 | 0.0004 | 0.4029 | 1.1679 | 290 | 5 | 268 | 2 |
| 15 | 20 | 428 | 0.05 | 0.3287 | 0.0040 | 0.0423 | 0.0004 | 0.4929 | 1.4223 | 289 | 4 | 267 | 2 |
| 16 | 20 | 424 | 0.05 | 0.3017 | 0.0026 | 0.0423 | 0.0004 | 0.6014 | 1.6101 | 268 | 2 | 267 | 2 |
| 17 | 12 | 281 | 0.04 | 0.2985 | 0.0038 | 0.0419 | 0.0004 | 0.3966 | 1.0518 | 265 | 3 | 265 | 2 |
| 18 | 17 | 373 | 0.05 | 0.3031 | 0.0034 | 0.0418 | 0.0004 | 0.4722 | 1.2695 | 269 | 3 | 264 | 2 |
| 19 | 16 | 357 | 0.05 | 0.3141 | 0.0037 | 0.0425 | 0.0004 | 0.4448 | 1.2337 | 277 | 3 | 268 | 3 |
| 20 | 17 | 383 | 0.05 | 0.3018 | 0.0039 | 0.0415 | 0.0004 | 0.4669 | 1.2503 | 268 | 3 | 262 | 2 |
| 21 | 9 | 195 | 0.04 | 0.3078 | 0.0067 | 0.0421 | 0.0004 | 0.4736 | 1.2907 | 273 | 6 | 266 | 2 |
| 22 | 5 | 106 | 0.05 | 0.3107 | 0.0121 | 0.0421 | 0.0004 | 0.5853 | 1.6079 | 275 | 11 | 266 | 2 |
| 23 | 17 | 366 | 0.05 | 0.3175 | 0.0036 | 0.0420 | 0.0004 | 0.5620 | 1.5736 | 280 | 3 | 265 | 2 |
| 24 | 22 | 480 | 0.04 | 0.3008 | 0.0031 | 0.0421 | 0.0004 | 0.4468 | 1.1929 | 267 | 3 | 266 | 3 |
| 25 | 16 | 356 | 0.04 | 0.3018 | 0.0035 | 0.0423 | 0.0004 | 0.3452 | 0.9247 | 268 | 3 | 267 | 3 |
| TW10 花岗岩 | | | | | | | | | | | | | |
| 1 | 5 | 107 | 0.05 | 0.2956 | 0.0122 | 0.0402 | 0.0004 | 0.6086 | 1.6004 | 263 | 11 | 254 | 3 |
| 3 | 9 | 205 | 0.04 | 0.2811 | 0.0119 | 0.0391 | 0.0004 | 0.5306 | 1.3347 | 252 | 11 | 247 | 2 |
| 4 | 8 | 186 | 0.04 | 0.2852 | 0.0085 | 0.0400 | 0.0004 | 0.4717 | 1.2016 | 255 | 8 | 253 | 2 |
| 5 | 9 | 202 | 0.04 | 0.2831 | 0.0072 | 0.0394 | 0.0004 | 0.6621 | 1.6757 | 253 | 6 | 249 | 2 |
| 6 | 7 | 175 | 0.04 | 0.2942 | 0.0082 | 0.0410 | 0.0004 | 0.4112 | 1.0769 | 262 | 7 | 259 | 2 |
| 8 | 3 | 74 | 0.05 | 0.2832 | 0.0274 | 0.0393 | 0.0005 | 0.7531 | 1.9065 | 253 | 24 | 249 | 3 |
| 9 | 11 | 253 | 0.04 | 0.2827 | 0.0066 | 0.0396 | 0.0004 | 0.6613 | 1.6715 | 253 | 6 | 250 | 2 |
| 10 | 10 | 218 | 0.04 | 0.2899 | 0.0080 | 0.0398 | 0.0004 | 0.5903 | 1.5257 | 258 | 7 | 252 | 2 |
| 12 | 5 | 124 | 0.04 | 0.2855 | 0.0115 | 0.0398 | 0.0004 | 0.3947 | 1.0063 | 255 | 10 | 252 | 2 |
| 13 | 3 | 76 | 0.04 | 0.2825 | 0.0183 | 0.0397 | 0.0004 | 0.4769 | 1.2048 | 253 | 16 | 251 | 3 |
| 14 | 5 | 114 | 0.04 | 0.2855 | 0.0162 | 0.0403 | 0.0004 | 0.3949 | 1.0069 | 255 | 14 | 255 | 3 |
| 15 | 8 | 189 | 0.04 | 0.2927 | 0.0074 | 0.0404 | 0.0004 | 0.5330 | 1.3892 | 261 | 7 | 255 | 2 |
| 16 | 5 | 104 | 0.05 | 0.2835 | 0.0130 | 0.0395 | 0.0004 | 0.6914 | 1.7523 | 253 | 12 | 250 | 2 |
| 17 | 6 | 130 | 0.04 | 0.2867 | 0.0089 | 0.0399 | 0.0004 | 0.5605 | 1.4346 | 256 | 8 | 253 | 2 |
| 18 | 4 | 90 | 0.05 | 0.3156 | 0.0103 | 0.0410 | 0.0004 | 0.6320 | 1.7601 | 278 | 9 | 259 | 3 |
| 19 | 5 | 100 | 0.05 | 0.2944 | 0.0130 | 0.0412 | 0.0004 | 0.6027 | 1.5791 | 262 | 12 | 260 | 2 |
| 20 | 4 | 95 | 0.05 | 0.2923 | 0.0159 | 0.0410 | 0.0004 | 0.5785 | 1.5063 | 260 | 14 | 259 | 3 |
| 21 | 3 | 64 | 0.05 | 0.2945 | 0.0217 | 0.0407 | 0.0004 | 0.6006 | 1.5739 | 262 | 19 | 257 | 3 |
| 22 | 6 | 136 | 0.04 | 0.2936 | 0.0118 | 0.0408 | 0.0004 | 0.4637 | 1.2120 | 261 | 11 | 258 | 2 |
| 23 | 4 | 72 | 0.05 | 0.2874 | 0.0113 | 0.0394 | 0.0004 | 0.7903 | 2.0273 | 257 | 10 | 249 | 3 |
| 24 | 5 | 98 | 0.05 | 0.3007 | 0.0104 | 0.0402 | 0.0004 | 0.7482 | 1.9971 | 267 | 9 | 254 | 2 |
| 25 | 3 | 56 | 0.05 | 0.2984 | 0.0243 | 0.0408 | 0.0004 | 0.6019 | 1.5961 | 265 | 22 | 258 | 3 |
| TW11 花岗岩 | | | | | | | | | | | | | |
| 1 | 22 | 526 | 0.04 | 0.3017 | 0.0031 | 0.0404 | 0.0003 | 0.3259 | 0.8725 | 268 | 3 | 255 | 2 |
| 2 | 5 | 132 | 0.04 | 0.2769 | 0.0103 | 0.0393 | 0.0004 | 0.3960 | 0.9829 | 248 | 9 | 248 | 2 |
| 4 | 9 | 193 | 0.05 | 0.2809 | 0.0055 | 0.0392 | 0.0004 | 1.0498 | 2.6387 | 251 | 5 | 248 | 2 |
| 5 | 3 | 52 | 0.05 | 0.2721 | 0.0095 | 0.0396 | 0.0004 | 0.5742 | 1.4034 | 244 | 9 | 250 | 3 |
| 6 | 7 | 155 | 0.04 | 0.2994 | 0.0085 | 0.0398 | 0.0004 | 0.6385 | 1.6978 | 266 | 8 | 251 | 2 |
| 7 | 13 | 305 | 0.04 | 0.3002 | 0.0039 | 0.0413 | 0.0004 | 0.3509 | 0.9354 | 267 | 3 | 261 | 2 |
| 8 | 4 | 87 | 0.04 | 0.2824 | 0.0156 | 0.0400 | 0.0004 | 0.6210 | 1.5683 | 253 | 14 | 253 | 2 |
| 9 | 1 | 28 | 0.04 | 0.3023 | 0.0245 | 0.0390 | 0.0008 | 0.4131 | 1.1081 | 268 | 22 | 246 | 5 |
| 10 | 4 | 97 | 0.04 | 0.3043 | 0.0137 | 0.0413 | 0.0004 | 0.5122 | 1.3818 | 270 | 12 | 261 | 2 |
| 11 | 3 | 60 | 0.05 | 0.2921 | 0.0123 | 0.0408 | 0.0005 | 0.7100 | 1.8476 | 260 | 11 | 258 | 3 |
| 13 | 2 | 54 | 0.04 | 0.2936 | 0.0188 | 0.0395 | 0.0004 | 0.6016 | 1.5725 | 261 | 17 | 249 | 3 |
| 14 | 7 | 143 | 0.05 | 0.2924 | 0.0087 | 0.0396 | 0.0004 | 0.4969 | 1.2943 | 260 | 8 | 250 | 2 |
| 15 | 39 | 498 | 0.08 | 0.3009 | 0.0073 | 0.0419 | 0.0004 | 3.0982 | 8.2759 | 267 | 6 | 264 | 2 |
| 16 | 12 | 273 | 0.04 | 0.3039 | 0.0048 | 0.0409 | 0.0004 | 0.5183 | 1.3968 | 269 | 4 | 258 | 2 |
| 17 | 7 | 152 | 0.04 | 0.2938 | 0.0113 | 0.0391 | 0.0004 | 0.6028 | 1.5766 | 262 | 10 | 247 | 2 |
| 18 | 4 | 98 | 0.04 | 0.3064 | 0.0132 | 0.0392 | 0.0004 | 0.6999 | 1.8993 | 271 | 12 | 248 | 2 |
| 19 | 7 | 137 | 0.05 | 0.2981 | 0.0079 | 0.0420 | 0.0004 | 0.7829 | 2.0739 | 265 | 7 | 265 | 2 |
| 21 | 33 | 778 | 0.04 | 0.3084 | 0.0080 | 0.0393 | 0.0004 | 0.5023 | 1.3711 | 273 | 7 | 248 | 2 |
| 22 | 8 | 172 | 0.04 | 0.2915 | 0.0095 | 0.0392 | 0.0004 | 0.6016 | 1.5628 | 260 | 9 | 248 | 2 |
| 23 | 1 | 31 | 0.04 | 0.2707 | 0.0196 | 0.0382 | 0.0006 | 0.4442 | 1.0804 | 243 | 18 | 242 | 4 |
| 24 | 12 | 268 | 0.04 | 0.2886 | 0.0074 | 0.0380 | 0.0005 | 0.5167 | 1.3304 | 257 | 7 | 240 | 3 |
| 25 | 5 | 103 | 0.04 | 0.2985 | 0.0143 | 0.0395 | 0.0004 | 0.6551 | 1.7374 | 265 | 13 | 249 | 2 |
| TW14 花岗闪长岩 | | | | | | | | | | | | | |
| 1 | 8 | 169 | 0.05 | 0.3220 | 0.0086 | 0.0426 | 0.0004 | 0.5025 | 1.4245 | 283 | 8 | 269 | 3 |
| 2 | 9 | 198 | 0.05 | 0.3062 | 0.0062 | 0.0422 | 0.0004 | 0.5228 | 1.4180 | 271 | 5 | 266 | 2 |
| 3 | 6 | 143 | 0.04 | 0.3063 | 0.0091 | 0.0423 | 0.0004 | 0.4161 | 1.1291 | 271 | 8 | 267 | 3 |
| 4 | 12 | 254 | 0.05 | 0.3083 | 0.0064 | 0.0423 | 0.0004 | 0.5699 | 1.5550 | 273 | 6 | 267 | 2 |
| 5 | 8 | 177 | 0.05 | 0.3078 | 0.0074 | 0.0425 | 0.0004 | 0.4790 | 1.3053 | 273 | 7 | 268 | 2 |
| 6 | 6 | 139 | 0.04 | 0.3129 | 0.0073 | 0.0422 | 0.0004 | 0.4596 | 1.2704 | 276 | 6 | 266 | 2 |
| 7 | 12 | 256 | 0.05 | 0.3096 | 0.0049 | 0.0422 | 0.0004 | 0.5718 | 1.5659 | 274 | 4 | 267 | 2 |
| 8 | 9 | 192 | 0.05 | 0.3072 | 0.0068 | 0.0424 | 0.0004 | 0.5242 | 1.4259 | 272 | 6 | 268 | 2 |
| 9 | 6 | 143 | 0.05 | 0.3042 | 0.0125 | 0.0423 | 0.0004 | 0.4917 | 1.3263 | 270 | 11 | 267 | 3 |
| 10 | 7 | 152 | 0.05 | 0.3054 | 0.0093 | 0.0427 | 0.0004 | 0.5587 | 1.5120 | 271 | 8 | 270 | 2 |
| 11 | 9 | 185 | 0.05 | 0.3096 | 0.0068 | 0.0425 | 0.0004 | 0.6604 | 1.8087 | 274 | 6 | 268 | 2 |
| 12 | 11 | 240 | 0.05 | 0.3028 | 0.0057 | 0.0422 | 0.0004 | 0.4738 | 1.2725 | 269 | 5 | 267 | 2 |
| 13 | 13 | 287 | 0.05 | 0.3079 | 0.0055 | 0.0425 | 0.0004 | 0.5675 | 1.5470 | 273 | 5 | 268 | 2 |
| 14 | 17 | 350 | 0.05 | 0.3158 | 0.0038 | 0.0426 | 0.0004 | 0.7228 | 2.0140 | 279 | 3 | 269 | 2 |
| 15 | 4 | 90 | 0.05 | 0.3128 | 0.0165 | 0.0425 | 0.0004 | 0.4474 | 1.2362 | 276 | 15 | 268 | 3 |
| 16 | 11 | 229 | 0.05 | 0.3033 | 0.0054 | 0.0424 | 0.0004 | 0.6354 | 1.7093 | 269 | 5 | 267 | 2 |
| 17 | 12 | 252 | 0.05 | 0.3046 | 0.0079 | 0.0422 | 0.0004 | 0.5090 | 1.3742 | 270 | 7 | 266 | 2 |
| 18 | 4 | 87 | 0.05 | 0.3123 | 0.0187 | 0.0417 | 0.0005 | 0.5883 | 1.6232 | 276 | 17 | 263 | 3 |
| 19 | 10 | 214 | 0.05 | 0.3076 | 0.0082 | 0.0425 | 0.0004 | 0.6212 | 1.6916 | 272 | 7 | 268 | 2 |
| 20 | 19 | 384 | 0.05 | 0.3054 | 0.0037 | 0.0427 | 0.0004 | 0.8115 | 2.1959 | 271 | 3 | 269 | 2 |
| 21 | 12 | 227 | 0.05 | 0.3063 | 0.0071 | 0.0426 | 0.0004 | 0.8582 | 2.3286 | 271 | 6 | 269 | 2 |
| 22 | 8 | 172 | 0.05 | 0.3113 | 0.0079 | 0.0423 | 0.0004 | 0.6576 | 1.8099 | 275 | 7 | 267 | 2 |
| 23 | 5 | 111 | 0.05 | 0.3041 | 0.0134 | 0.0425 | 0.0004 | 0.4730 | 1.2750 | 270 | 12 | 268 | 3 |
| 24 | 7 | 148 | 0.05 | 0.3067 | 0.0095 | 0.0426 | 0.0004 | 0.5125 | 1.3921 | 272 | 8 | 269 | 2 |
| 25 | 8 | 173 | 0.05 | 0.3039 | 0.0089 | 0.0426 | 0.0004 | 0.5318 | 1.4330 | 269 | 8 | 269 | 2 |

表2 乌力吉岩体主量元素（wt%）、微量元素和稀土元素(×10-6)分析结果表

Table2 Major（wt%）, trace and rare earth elements(×10-6) of the Wuliji intrusions

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 样品号 | TW10-1 | TW10-2 | TW10-3 | TW10-5 | TW10-6 | TW10-7 | TW14-1 | TW14-2 | TW14-3 | TW14-4 | TW14-5 | TW14-6 | TW14-7 |
| 岩性 | 花岗岩 | | | | | | 花岗闪长岩 | | | | | | |
| SiO2 | 73.26 | 73.03 | 73.42 | 75.29 | 73.51 | 73.62 | 65.91 | 66.40 | 64.13 | 64.22 | 66.25 | 67.17 | 64.93 |
| Al2O3 | 13.74 | 14.22 | 13.85 | 13.31 | 13.68 | 14.11 | 15.56 | 15.47 | 15.93 | 15.64 | 15.22 | 15.40 | 15.72 |
| TiO2 | 0.25 | 0.30 | 0.24 | 0.20 | 0.27 | 0.24 | 0.69 | 0.67 | 0.78 | 0.74 | 0.66 | 0.66 | 0.73 |
| Fe2O3 | 1.01 | 1.12 | 0.84 | 0.77 | 1.04 | 0.96 | 1.81 | 1.63 | 1.87 | 1.73 | 1.73 | 1.79 | 1.71 |
| FeO | 0.52 | 0.68 | 0.58 | 0.37 | 0.57 | 0.52 | 2.18 | 2.18 | 2.62 | 2.55 | 2.12 | 1.98 | 2.51 |
| CaO | 1.61 | 1.54 | 1.58 | 1.55 | 1.74 | 1.51 | 3.98 | 3.50 | 4.36 | 4.62 | 3.77 | 3.28 | 4.10 |
| MgO | 0.49 | 0.63 | 0.49 | 0.38 | 0.52 | 0.48 | 1.75 | 1.51 | 1.81 | 1.84 | 1.55 | 1.55 | 1.76 |
| K2O | 4.19 | 3.70 | 4.18 | 3.49 | 3.80 | 3.62 | 2.52 | 2.75 | 2.56 | 2.40 | 3.07 | 3.03 | 2.56 |
| Na2O | 3.75 | 4.03 | 3.73 | 3.92 | 3.92 | 4.20 | 4.07 | 3.97 | 4.15 | 4.00 | 3.92 | 3.97 | 4.08 |
| MnO | 0.030 | 0.052 | 0.036 | 0.032 | 0.045 | 0.045 | 0.069 | 0.065 | 0.077 | 0.073 | 0.067 | 0.066 | 0.077 |
| P2O5 | 0.062 | 0.082 | 0.063 | 0.046 | 0.072 | 0.062 | 0.14 | 0.13 | 0.16 | 0.17 | 0.13 | 0.14 | 0.15 |
| H2O+ | 0.38 | 0.21 | 0.27 | 0.17 | 0.30 | 0.23 | 0.67 | 0.91 | 0.76 | 0.90 | 0.71 | 0.49 | 0.91 |
| H2O- | 0.10 | 0.11 | 0.10 | 0.08 | 0.09 | 0.11 | 0.13 | 0.18 | 0.13 | 0.11 | 0.13 | 0.05 | 0.14 |
| LOI | 0.98 | 0.51 | 0.88 | 0.54 | 0.73 | 0.54 | 1.20 | 1.58 | 1.41 | 1.90 | 1.39 | 0.83 | 1.54 |
| Total | 99.89 | 99.90 | 99.89 | 99.91 | 99.90 | 99.91 | 99.88 | 99.87 | 99.86 | 99.87 | 99.87 | 99.87 | 99.87 |
| Ba | 618 | 494 | 594 | 457 | 560 | 441 | 503 | 591 | 592 | 504 | 642 | 609 | 524 |
| Be | 1.22 | 1.85 | 1.42 | 1.85 | 1.54 | 2.05 | 1.92 | 2.02 | 1.86 | 1.90 | 1.83 | 1.99 | 1.89 |
| Co | 2.51 | 2.95 | 2.38 | 2.11 | 2.61 | 2.22 | 10.7 | 10.7 | 11.5 | 11.2 | 10.2 | 10.4 | 10.7 |
| Cr | 4.55 | 4.81 | 5.32 | 4.39 | 4.45 | 5.01 | 15.8 | 10.6 | 9.62 | 12.1 | 11.0 | 12.6 | 12.9 |
| Cs | 1.01 | 1.29 | 0.90 | 2.11 | 1.03 | 1.35 | 5.09 | 2.20 | 3.49 | 2.73 | 3.39 | 4.20 | 3.55 |
| Cu | 2.40 | 2.38 | 2.49 | 2.16 | 2.60 | 1.62 | 10.9 | 10.7 | 11.1 | 13.1 | 10.8 | 9.40 | 15.4 |
| Ga | 14.8 | 16.6 | 14.9 | 15.1 | 16.0 | 15.2 | 17.9 | 18.9 | 18.7 | 18.4 | 18.4 | 19.3 | 17.9 |
| Hf | 2.76 | 3.92 | 3.34 | 3.33 | 3.72 | 3.33 | 5.22 | 6.86 | 5.92 | 6.28 | 5.62 | 6.09 | 5.70 |
| Nb | 5.14 | 8.21 | 5.80 | 4.57 | 7.41 | 7.44 | 8.71 | 9.08 | 9.58 | 8.99 | 8.83 | 9.02 | 9.18 |
| Ni | 2.15 | 2.42 | 1.90 | 1.56 | 1.99 | 1.72 | 9.55 | 7.66 | 8.33 | 7.97 | 7.55 | 7.44 | 9.25 |
| Pb | 17.3 | 17.8 | 19.5 | 17.1 | 17.8 | 18.4 | 13.9 | 16.2 | 13.9 | 14.2 | 15.9 | 16.1 | 15.2 |
| Rb | 68.0 | 92.8 | 83.0 | 68.6 | 88.9 | 85.0 | 83.3 | 79.3 | 81.1 | 69.9 | 95.7 | 103 | 72.3 |
| Sc | 2.79 | 4.19 | 3.80 | 2.78 | 3.25 | 3.43 | 9.75 | 8.48 | 11.9 | 10.2 | 9.49 | 9.10 | 10.4 |
| Sr | 247 | 248 | 238 | 253 | 242 | 236 | 264 | 297 | 276 | 274 | 268 | 259 | 274 |
| Ta | 0.80 | 0.68 | 0.53 | 0.47 | 0.83 | 0.91 | 1.00 | 0.81 | 0.87 | 0.89 | 0.78 | 0.84 | 0.97 |
| Th | 5.16 | 13.2 | 6.04 | 10.5 | 7.09 | 11.2 | 7.53 | 10.4 | 6.71 | 8.05 | 7.22 | 10.2 | 8.18 |
| U | 1.06 | 1.65 | 0.82 | 1.24 | 0.91 | 1.14 | 1.32 | 1.86 | 1.00 | 1.57 | 1.24 | 1.67 | 1.86 |
| V | 22.5 | 21.6 | 18.1 | 14.2 | 20.2 | 16.7 | 68.4 | 72.5 | 77.5 | 72.2 | 67.4 | 66.9 | 70.9 |
| Zn | 26.3 | 34.7 | 27.1 | 22.5 | 31.0 | 25.9 | 56.5 | 58.6 | 62.1 | 61.2 | 57.0 | 59.3 | 59.1 |
| Zr | 26.3 | 34.7 | 27.1 | 22.5 | 31.0 | 25.9 | 56.5 | 58.6 | 62.1 | 61.2 | 57.0 | 59.3 | 59.1 |
| La | 23.3 | 25.7 | 25.6 | 26.8 | 22.3 | 23.7 | 21.7 | 30.9 | 23.3 | 23.2 | 24.3 | 27.7 | 21.4 |
| Ce | 44.7 | 49.1 | 47.4 | 42.1 | 45.2 | 43.4 | 44.5 | 57.4 | 48.2 | 47.1 | 47.7 | 53.1 | 45.0 |
| Pr | 5.29 | 5.67 | 5.75 | 3.99 | 5.34 | 5.22 | 5.55 | 6.75 | 6.18 | 5.77 | 5.94 | 6.33 | 5.52 |
| Nd | 17.5 | 19.2 | 18.7 | 11.2 | 18.2 | 17.4 | 20.2 | 23.6 | 22.8 | 21.8 | 21.1 | 22.6 | 20.3 |
| Sm | 3.19 | 3.43 | 3.22 | 1.59 | 3.27 | 3.05 | 4.44 | 4.80 | 4.84 | 4.50 | 4.39 | 4.69 | 4.41 |
| Eu | 0.76 | 0.78 | 0.77 | 0.60 | 0.75 | 0.70 | 1.16 | 1.23 | 1.36 | 1.18 | 1.19 | 1.19 | 1.17 |
| Gd | 2.78 | 3.07 | 2.70 | 1.65 | 2.82 | 2.57 | 3.90 | 4.20 | 4.26 | 3.93 | 3.94 | 4.26 | 3.98 |
| Tb | 0.44 | 0.45 | 0.42 | 0.20 | 0.42 | 0.40 | 0.68 | 0.73 | 0.76 | 0.72 | 0.69 | 0.73 | 0.69 |
| Dy | 2.52 | 2.52 | 2.36 | 1.06 | 2.33 | 2.24 | 4.09 | 4.23 | 4.44 | 4.03 | 3.95 | 4.30 | 4.12 |
| Ho | 0.50 | 0.50 | 0.48 | 0.22 | 0.48 | 0.45 | 0.80 | 0.85 | 0.87 | 0.83 | 0.82 | 0.83 | 0.81 |
| Er | 1.44 | 1.48 | 1.44 | 0.68 | 1.45 | 1.32 | 2.29 | 2.37 | 2.51 | 2.39 | 2.35 | 2.36 | 2.24 |
| Tm | 0.25 | 0.27 | 0.25 | 0.12 | 0.26 | 0.24 | 0.38 | 0.41 | 0.43 | 0.41 | 0.40 | 0.40 | 0.39 |
| Yb | 1.50 | 1.69 | 1.58 | 0.87 | 1.74 | 1.58 | 2.39 | 2.52 | 2.70 | 2.56 | 2.49 | 2.50 | 2.47 |
| Lu | 0.21 | 0.26 | 0.23 | 0.14 | 0.26 | 0.23 | 0.35 | 0.37 | 0.40 | 0.38 | 0.37 | 0.38 | 0.36 |
| Y | 14.1 | 14.2 | 13.3 | 7.06 | 14.5 | 12.3 | 22.0 | 23.8 | 23.0 | 22.1 | 23.1 | 24.1 | 21.7 |
| ∑REE | 104.16 | 113.87 | 110.62 | 91.04 | 104.59 | 102.22 | 112.01 | 140.07 | 122.75 | 118.42 | 119.27 | 131.09 | 112.50 |
| LREE | 94.75 | 103.88 | 101.38 | 86.24 | 95.08 | 93.42 | 97.47 | 124.75 | 106.79 | 103.55 | 104.64 | 115.71 | 97.81 |
| HREE | 9.42 | 9.99 | 9.24 | 4.80 | 9.51 | 8.80 | 14.54 | 15.32 | 15.96 | 14.87 | 14.63 | 15.38 | 14.70 |
| LREE/HREE | 10.06 | 10.40 | 10.97 | 17.97 | 10.00 | 10.62 | 6.71 | 8.14 | 6.69 | 6.96 | 7.15 | 7.52 | 6.65 |
| (La/Yb)N | 15.56 | 15.15 | 16.14 | 30.75 | 12.84 | 14.96 | 9.06 | 12.27 | 8.65 | 9.05 | 9.76 | 11.08 | 8.68 |
| ∂ Eu | 7.86 | 8.31 | 7.71 | 5.44 | 8.18 | 8.05 | 7.20 | 7.30 | 6.69 | 7.11 | 7.02 | 7.53 | 7.19 |
| Nb/u | 4.86 | 4.97 | 7.07 | 3.70 | 8.19 | 6.54 | 6.62 | 4.89 | 9.59 | 5.71 | 7.14 | 5.41 | 4.95 |
| Nb/Ta | 6.39 | 12.03 | 10.96 | 9.74 | 8.89 | 8.22 | 8.72 | 11.19 | 10.97 | 10.12 | 11.35 | 10.76 | 9.48 |
| Nb/La | 0.22 | 0.32 | 0.23 | 0.17 | 0.33 | 0.31 | 0.40 | 0.29 | 0.41 | 0.39 | 0.36 | 0.33 | 0.43 |

表3 乌力吉两期侵入体主量元素（wt%）含量对比表

Table3 The Comparison of Major elements（wt%）of the Wuliji intrusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 主量元素 | 花岗岩（wt%） | | 花岗闪长岩（wt%） | |
| 范围 | 平均值 | 范围 | 平均值 |
| SiO2 | 73.03~75.29 | 73.69 | 64.13~67.17 | 65.57 |
| Al2O3 | 13.31~14.22 | 13.81 | 15.22~15.93 | 15.56 |
| Na2O+K2O | 7.41~7.94 | 7.76 | 6.40~7.00 | 6.72 |
| K2O/ Na2O | 0.86~1.12 | 0.98 | 0.60~0.78 | 0.67 |
| CaO | 1.51~1.74 | 1.59 | 3.28~4.62 | 3.94 |
| MgO | 0.38~0.63 | 0.50 | 1.51~1.84 | 1.68 |
| P2O5 | 0.046~0.082 | 0.065 | 0.13~0.17 | 0.15 |
| TiO2 | 0.20~0.30 | 0.25 | 0.66~0.78 | 0.70 |
| TFe2O3 | 1.19~1.87 | 1.56 | 3.78~4.49 | 4.31 |
| A/KNC | 1.00~1.06 | 1.02 | 0.88~0.97 | 0.93 |
| NK/A | 0.75~0.78 | 0.77 | 0.59~0.64 | 0.61 |
| 里特曼指数（б） | 1.70~2.07 | 1.96 | 1.88~2.10 | 1.98 |
| 固结指数（SI） | 4.30~6.22 | 5.11 | 12.54~14.73 | 13.50 |
| 分异指数（DI） | 87.64~89.55 | 88.55 | 68.86~75.00 | 71.94 |

注：б=（Na2O+K2O）2/(SiO2-43)；SI=MgO×100/(MgO+FeO+Fe2O3+Na2O+K2O)；DI=Qz+Or+Ab+Ne+Lc+Kp

表4 乌力吉两期侵入体稀土元素（×10-6）含量对比表

Table4 The Comparison of rare earth elements(×10-6) of the Wuliji intrusions

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 侵入体类型 | ΣREE | LREE | HREE | LREE/ HREE | （La/Yb）N | δEu | δCe |
| 花岗岩 | 91.19~114.13 | 86.24~103.88 | 4.94~10.25 | 9.73~17.45 | 9.21~22.06 | 0.72~1.12 | 0.89~0.98 |
| 花岗闪长岩 | 112.36~140.44 | 97.47~124.75 | 14.89~16.36 | 6.49~7.95 | 6.21~8.80 | 0.80~0.90 | 0.93~0.99 |

表5 乌力吉两期侵入体元素含量特征比值对比表

Table5 The Comparison of elements content ratio of the Wuliji intrusions

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 含量  比值 | 花岗岩 | | 花岗闪长岩 | | 壳源  花岗岩 | 陆壳 | 上地壳 | 上地幔 |
| 变化范围 | 平均值 | 变化范围 | 平均值 |
| Zr/Hf | 32.18~34.71 | 33.31 | 34.79~37.29 | 35.97 | 33 |  |  |  |
| Nb/Ta | 6.39~12.03 | 9.37 | 8.72~11.35 | 10.37 |  | 10~14 |  | 17.5 |
| Rb/Sr | 0.27~0.37 | 0.33 | 0.26~0.40 | 0.31 |  |  |  |  |
| Rb/Ba | 0.11~0.19 | 0.16 | 0.13~0.17 | 0.15 |  |  |  |  |
| Ba/Rb | 5.19~9.08 | 6.62 | 5.90~7.45 | 6.84 |  |  |  |  |
| CaO/Na2O | 0.36~0.45 | 0.41 | 0.83~1.16 | 0.98 |  |  |  |  |
| Nb/U | 3.70~8.19 | 5.89 | 4.89~9.59 | 6.33 |  | 6.2 |  |  |
| Ce/Pb | 2.35~2.76 | 2.52 | 2.96~3.55 | 3.26 |  | 3.9 |  |  |
| Rb/Nb | 11.30~15.01 | 12.88 | 7.78~11.44 | 9.24 |  |  | 4.5 |  |
| Th/U | 4.89~9.87 | 7.74 | 4.41~6.72 | 5.65 | 3.8 |  |  |  |
| La/Nb | 3.01~5.86 | 4.02 | 2.34~3.40 | 2.72 |  |  |  |  |
| Nb/La | 0.17~0.33 | 0.26 | 0.29~0.43 | 0.37 |  |  |  |  |
| Ba/Nb | 59.27~120.27 | 86.3 | 56.04~72.71 | 62.55 |  |  |  |  |
| Ba/La | 17.06~26.54 | 21.64 | 19.12~26.44 | 23.18 |  |  |  |  |
| Th/La | 0.22~0.51 | 0.36 | 0.29~0.38 | 0.34 |  |  |  |  |
| Sr/Ba | 0.40~0.55 | 0.47 | 0.42~0.54 | 0.49 |  |  |  |  |