表1 城门山矽卡岩石榴子石电子探针分析结果（氧化物含量单位为wt%）

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| SiO2 | 35.59 | 35.61 | 35.53 | 35.44 | 35.50 | 35.21 | 35.73 | 35.52 | 35.63 | 35.50 | 35.78 | 35.83 | 35.51 | 35.06 | 35.55 | 35.47 |
| TiO2 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.02 | 0.00 |
| Al2O3 | 0.25 | 0.49 | 0.18 | 0.05 | 0.02 | 0.04 | 0.15 | 0.05 | 0.70 | 0.20 | 0.04 | 1.15 | 0.34 | 0.08 | 0.21 | 1.64 |
| Fe2O3 | 30.33 | 30.01 | 30.65 | 30.94 | 30.77 | 31.10 | 30.59 | 30.83 | 30.06 | 30.77 | 31.11 | 29.26 | 30.66 | 31.12 | 30.98 | 28.52 |
| FeO | 0.29 | 0.27 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.27 | 0.28 | 0.28 | 0.27 | 0.28 | 0.28 | 0.28 | 0.26 |
| MnO | 0.21 | 0.20 | 0.23 | 0.19 | 0.26 | 0.16 | 0.15 | 0.19 | 0.20 | 0.23 | 0.15 | 0.24 | 0.20 | 0.17 | 0.20 | 0.23 |
| MgO | 0.05 | 0.01 | 0.02 | 0.04 | 0.07 | 0.05 | 0.04 | 0.04 | 0.03 | 0.07 | 0.09 | 0.01 | 0.02 | 0.04 | 0.02 | 0.04 |
| CaO | 32.76 | 33.03 | 33.23 | 33.29 | 32.86 | 33.29 | 33.16 | 33.33 | 33.23 | 33.30 | 33.37 | 32.91 | 33.22 | 32.37 | 33.55 | 33.16 |
| Na2O | 0.00 | 0.03 | 0.03 | 0.04 | 0.01 | 0.00 | 0.06 | 0.01 | 0.03 | 0.00 | 0.00 | 0.03 | 0.01 | 0.03 | 0.00 | 0.03 |
| K2O | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| Totals | 99.49 | 99.66 | 100.16 | 100.27 | 99.80 | 100.15 | 100.15 | 100.24 | 100.18 | 100.37 | 100.84 | 99.71 | 100.25 | 99.15 | 100.81 | 99.37 |
| Si | 3.019 | 3.013 | 3.001 | 2.994 | 3.009 | 2.982 | 3.014 | 3.000 | 3.000 | 2.993 | 3.002 | 3.018 | 2.995 | 2.994 | 2.986 | 2.996 |
| Ti | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.001 | 0.000 |
| Al | 0.025 | 0.049 | 0.018 | 0.005 | 0.002 | 0.004 | 0.015 | 0.005 | 0.069 | 0.020 | 0.004 | 0.114 | 0.033 | 0.008 | 0.021 | 0.164 |
| Fe3+ | 1.936 | 1.911 | 1.948 | 1.967 | 1.963 | 1.981 | 1.942 | 1.959 | 1.905 | 1.953 | 1.964 | 1.855 | 1.946 | 2.000 | 1.958 | 1.813 |
| Fe2+ | 0.021 | 0.019 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.019 | 0.020 | 0.020 | 0.019 | 0.020 | 0.020 | 0.020 | 0.018 |
| Mn | 0.015 | 0.014 | 0.016 | 0.013 | 0.019 | 0.012 | 0.011 | 0.013 | 0.014 | 0.016 | 0.011 | 0.017 | 0.014 | 0.012 | 0.014 | 0.017 |
| Mg | 0.006 | 0.002 | 0.003 | 0.005 | 0.008 | 0.006 | 0.005 | 0.005 | 0.004 | 0.009 | 0.012 | 0.001 | 0.003 | 0.005 | 0.003 | 0.006 |
| Ca | 2.977 | 2.995 | 3.008 | 3.013 | 2.985 | 3.020 | 2.998 | 3.016 | 2.997 | 3.009 | 3.000 | 2.970 | 3.002 | 2.961 | 3.020 | 3.001 |
| Na | 0.000 | 0.004 | 0.004 | 0.007 | 0.001 | 0.000 | 0.009 | 0.001 | 0.005 | 0.000 | 0.000 | 0.005 | 0.001 | 0.005 | 0.000 | 0.004 |
| K | 0.000 | 0.001 | 0.000 | 0.000 | 0.002 | 0.002 | 0.000 | 0.001 | 0.001 | 0.002 | 0.001 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 |
| Grossularite | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 6 | 2 | 0 | 1 | 8 |
| Andradite | 97 | 96 | 97 | 98 | 98 | 98 | 97 | 98 | 95 | 97 | 98 | 92 | 97 | 98 | 97 | 90 |
| Pyralspite | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

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| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 |
| 35.27 | 35.06 | 35.27 | 35.26 | 35.53 | 35.68 | 35.25 | 35.57 | 35.26 | 35.71 | 35.28 | 35.40 | 34.92 | 34.83 | 34.85 | 35.11 | 34.74 | 34.78 |
| 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 | 0.01 | 0.00 | 0.00 |
| 0.08 | 0.03 | 0.09 | 0.09 | 0.50 | 0.14 | 0.13 | 0.00 | 0.35 | 0.27 | 0.32 | 1.47 | 0.38 | 0.77 | 0.30 | 1.29 | 0.17 | 0.07 |
| 30.68 | 30.72 | 30.90 | 30.65 | 29.91 | 30.71 | 30.68 | 31.10 | 30.25 | 30.68 | 30.46 | 28.70 | 30.52 | 30.40 | 30.71 | 28.98 | 30.82 | 30.94 |
| 0.28 | 0.28 | 0.28 | 0.28 | 0.27 | 0.28 | 0.28 | 0.28 | 0.27 | 0.28 | 0.28 | 0.26 | 0.28 | 0.28 | 0.28 | 0.26 | 0.28 | 0.28 |
| 0.22 | 0.16 | 0.18 | 0.21 | 0.17 | 0.15 | 0.17 | 0.15 | 0.22 | 0.21 | 0.19 | 0.21 | 0.26 | 0.33 | 0.32 | 0.24 | 0.31 | 0.23 |
| 0.04 | 0.05 | 0.04 | 0.03 | 0.04 | 0.02 | 0.02 | 0.05 | 0.02 | 0.02 | 0.05 | 0.00 | 0.00 | 0.02 | 0.01 | 0.03 | 0.00 | 0.01 |
| 33.09 | 32.92 | 33.43 | 32.86 | 33.24 | 33.19 | 33.25 | 33.17 | 33.14 | 33.29 | 32.94 | 33.41 | 32.97 | 33.09 | 32.92 | 33.26 | 32.46 | 32.90 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.00 | 0.01 | 0.03 | 0.00 | 0.01 | 0.03 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| 99.66 | 99.22 | 100.19 | 99.39 | 99.67 | 100.19 | 99.78 | 100.34 | 99.51 | 100.48 | 99.53 | 99.45 | 99.36 | 99.75 | 99.39 | 99.22 | 98.81 | 99.21 |
| 2.997 | 2.993 | 2.984 | 3.002 | 3.008 | 3.010 | 2.992 | 3.001 | 2.996 | 3.004 | 2.997 | 2.992 | 2.976 | 2.957 | 2.973 | 2.980 | 2.980 | 2.974 |
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.008 | 0.003 | 0.009 | 0.009 | 0.050 | 0.013 | 0.013 | 0.000 | 0.035 | 0.027 | 0.032 | 0.146 | 0.039 | 0.077 | 0.030 | 0.129 | 0.017 | 0.007 |
| 1.961 | 1.974 | 1.967 | 1.963 | 1.905 | 1.950 | 1.960 | 1.975 | 1.934 | 1.942 | 1.947 | 1.825 | 1.958 | 1.942 | 1.971 | 1.851 | 1.989 | 1.991 |
| 0.020 | 0.020 | 0.020 | 0.020 | 0.019 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.018 | 0.020 | 0.020 | 0.020 | 0.019 | 0.020 | 0.020 |
| 0.016 | 0.012 | 0.013 | 0.015 | 0.013 | 0.011 | 0.012 | 0.011 | 0.016 | 0.015 | 0.014 | 0.015 | 0.019 | 0.024 | 0.023 | 0.018 | 0.023 | 0.016 |
| 0.005 | 0.006 | 0.005 | 0.004 | 0.005 | 0.002 | 0.002 | 0.006 | 0.002 | 0.003 | 0.006 | 0.000 | 0.000 | 0.002 | 0.001 | 0.004 | 0.000 | 0.001 |
| 3.012 | 3.011 | 3.030 | 2.998 | 3.015 | 3.000 | 3.024 | 2.999 | 3.017 | 3.000 | 2.997 | 3.025 | 3.011 | 3.010 | 3.009 | 3.025 | 2.984 | 3.015 |
| 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.004 | 0.000 | 0.002 | 0.000 | 0.003 | 0.000 | 0.000 | 0.002 | 0.004 | 0.000 | 0.002 | 0.004 | 0.001 |
| 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.001 | 0.001 | 0.001 | 0.000 | 0.000 | 0.001 | 0.001 | 0.001 | 0.001 | 0.000 | 0.001 | 0.000 | 0.000 |
| 0 | 0 | 0 | 0 | 3 | 1 | 1 | 0 | 2 | 1 | 2 | 7 | 2 | 4 | 1 | 6 | 1 | 0 |
| 98 | 98 | 98 | 98 | 96 | 98 | 98 | 98 | 96 | 97 | 96 | 91 | 96 | 94 | 96 | 92 | 97 | 98 |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

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| 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 |
| 34.76 | 34.68 | 35.18 | 34.67 | 35.13 | 35.04 | 35.06 | 35.03 | 34.66 | 34.45 | 34.63 | 35.05 | 34.96 | 34.56 | 34.47 | 35.08 | 34.65 | 34.70 |
| 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| 0.04 | 0.20 | 0.30 | 0.02 | 0.95 | 0.34 | 0.23 | 0.02 | 0.03 | 0.04 | 0.02 | 0.97 | 0.25 | 0.29 | 0.03 | 0.01 | 0.37 | 0.01 |
| 30.86 | 30.96 | 30.22 | 31.16 | 30.06 | 30.40 | 30.67 | 30.91 | 31.14 | 30.39 | 31.29 | 29.74 | 31.01 | 30.46 | 31.14 | 31.40 | 30.06 | 30.93 |
| 0.28 | 0.28 | 0.27 | 0.28 | 0.27 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.27 | 0.28 | 0.28 | 0.28 | 0.29 | 0.27 | 0.28 |
| 0.30 | 0.31 | 0.27 | 0.30 | 0.28 | 0.32 | 0.30 | 0.16 | 0.23 | 0.30 | 0.26 | 0.26 | 0.30 | 0.32 | 0.29 | 0.31 | 0.31 | 0.26 |
| 0.01 | 0.00 | 0.04 | 0.04 | 0.02 | 0.00 | 0.02 | 0.05 | 0.01 | 0.00 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.00 | 0.01 | 0.00 |
| 32.85 | 32.91 | 32.98 | 33.14 | 33.71 | 33.16 | 33.14 | 33.38 | 32.55 | 33.22 | 32.70 | 33.27 | 32.77 | 33.22 | 32.85 | 32.36 | 32.78 | 32.66 |
| 0.04 | 0.02 | 0.00 | 0.02 | 0.00 | 0.03 | 0.02 | 0.03 | 0.00 | 0.04 | 0.04 | 0.00 | 0.03 | 0.00 | 0.04 | 0.00 | 0.05 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 |
| 99.15 | 99.37 | 99.26 | 99.65 | 100.41 | 99.56 | 99.72 | 99.86 | 98.93 | 98.72 | 99.23 | 99.60 | 99.62 | 99.16 | 99.09 | 99.45 | 98.50 | 98.84 |
| 2.975 | 2.963 | 2.997 | 2.958 | 2.959 | 2.981 | 2.980 | 2.977 | 2.973 | 2.966 | 2.965 | 2.972 | 2.975 | 2.959 | 2.958 | 2.990 | 2.979 | 2.979 |
| 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 |
| 0.004 | 0.020 | 0.031 | 0.002 | 0.094 | 0.034 | 0.023 | 0.002 | 0.003 | 0.004 | 0.002 | 0.097 | 0.025 | 0.029 | 0.003 | 0.001 | 0.037 | 0.001 |
| 1.988 | 1.991 | 1.937 | 2.000 | 1.906 | 1.946 | 1.961 | 1.976 | 2.011 | 1.968 | 2.016 | 1.898 | 1.985 | 1.963 | 2.011 | 2.014 | 1.945 | 1.998 |
| 0.020 | 0.020 | 0.020 | 0.020 | 0.019 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.019 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 |
| 0.021 | 0.022 | 0.019 | 0.022 | 0.020 | 0.023 | 0.022 | 0.011 | 0.017 | 0.022 | 0.019 | 0.019 | 0.021 | 0.023 | 0.021 | 0.022 | 0.023 | 0.019 |
| 0.001 | 0.000 | 0.005 | 0.005 | 0.002 | 0.000 | 0.003 | 0.007 | 0.002 | 0.000 | 0.000 | 0.000 | 0.003 | 0.003 | 0.000 | 0.000 | 0.001 | 0.000 |
| 3.013 | 3.013 | 3.011 | 3.029 | 3.042 | 3.023 | 3.018 | 3.039 | 2.993 | 3.064 | 3.000 | 3.022 | 2.988 | 3.047 | 3.020 | 2.955 | 3.021 | 3.004 |
| 0.007 | 0.003 | 0.000 | 0.003 | 0.000 | 0.004 | 0.003 | 0.004 | 0.000 | 0.007 | 0.007 | 0.000 | 0.004 | 0.000 | 0.006 | 0.000 | 0.008 | 0.000 |
| 0.000 | 0.001 | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 |
| 0 | 1 | 2 | 0 | 5 | 2 | 1 | 0 | 0 | 0 | 0 | 5 | 1 | 1 | 0 | 0 | 2 | 0 |
| 98 | 97 | 96 | 98 | 93 | 96 | 97 | 98 | 98 | 98 | 98 | 93 | 97 | 96 | 98 | 98 | 96 | 98 |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

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| 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 34.82 | 34.55 | 34.76 | 34.62 | 34.63 | 34.72 | 34.67 | 34.75 | 34.71 | 34.93 | 34.66 | 35.22 | 34.72 | 34.54 | 34.89 | 34.53 | 34.87 | 34.60 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.04 | 0.00 | 0.01 | 0.00 | 0.00 | 0.07 | 0.08 | 0.04 | 0.00 | 0.07 |
| 0.45 | 0.01 | 0.00 | 0.36 | 0.17 | 1.24 | 0.01 | 0.43 | 1.43 | 0.22 | 0.47 | 0.05 | 0.06 | 0.57 | 0.74 | 0.62 | 0.56 | 0.59 |
| 30.39 | 31.02 | 31.28 | 30.55 | 30.94 | 29.62 | 31.49 | 30.62 | 29.26 | 30.89 | 30.83 | 31.44 | 31.15 | 30.38 | 29.90 | 30.38 | 30.72 | 30.37 |
| 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.27 | 0.29 | 0.28 | 0.27 | 0.28 | 0.28 | 0.29 | 0.28 | 0.28 | 0.27 | 0.28 | 0.28 | 0.28 |
| 0.27 | 0.29 | 0.27 | 0.27 | 0.28 | 0.30 | 0.25 | 0.28 | 0.25 | 0.29 | 0.28 | 0.28 | 0.30 | 0.28 | 0.28 | 0.29 | 0.24 | 0.31 |
| 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.03 | 0.00 | 0.01 | 0.04 | 0.00 | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 | 0.03 | 0.03 | 0.01 |
| 33.00 | 32.80 | 33.25 | 32.65 | 32.62 | 32.78 | 32.84 | 33.13 | 33.03 | 32.80 | 32.97 | 32.75 | 33.00 | 33.05 | 32.70 | 33.09 | 33.01 | 32.78 |
| 0.04 | 0.05 | 0.04 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.02 | 0.04 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 |
| 99.24 | 99.02 | 99.91 | 98.73 | 98.92 | 99.05 | 99.55 | 99.50 | 99.01 | 99.42 | 99.54 | 100.07 | 99.52 | 99.19 | 98.90 | 99.27 | 99.71 | 99.03 |
| 2.972 | 2.965 | 2.958 | 2.971 | 2.970 | 2.959 | 2.960 | 2.962 | 2.956 | 2.978 | 2.954 | 2.984 | 2.964 | 2.952 | 2.980 | 2.949 | 2.963 | 2.960 |
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.002 | 0.000 | 0.001 | 0.000 | 0.000 | 0.005 | 0.005 | 0.003 | 0.000 | 0.005 |
| 0.045 | 0.001 | 0.000 | 0.037 | 0.018 | 0.125 | 0.001 | 0.043 | 0.144 | 0.022 | 0.047 | 0.005 | 0.006 | 0.057 | 0.074 | 0.062 | 0.056 | 0.059 |
| 1.952 | 2.003 | 2.003 | 1.974 | 1.997 | 1.899 | 2.023 | 1.964 | 1.875 | 1.982 | 1.977 | 2.004 | 2.001 | 1.954 | 1.922 | 1.953 | 1.964 | 1.955 |
| 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.019 | 0.020 | 0.020 | 0.019 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.019 | 0.020 | 0.020 | 0.020 |
| 0.020 | 0.021 | 0.019 | 0.020 | 0.020 | 0.022 | 0.018 | 0.020 | 0.018 | 0.021 | 0.020 | 0.020 | 0.022 | 0.021 | 0.020 | 0.021 | 0.017 | 0.022 |
| 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.003 | 0.000 | 0.001 | 0.005 | 0.000 | 0.000 | 0.003 | 0.000 | 0.001 | 0.000 | 0.003 | 0.004 | 0.002 |
| 3.018 | 3.017 | 3.032 | 3.003 | 2.997 | 2.993 | 3.004 | 3.025 | 3.014 | 2.997 | 3.011 | 2.973 | 3.019 | 3.027 | 2.993 | 3.029 | 3.004 | 3.005 |
| 0.006 | 0.009 | 0.007 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.002 | 0.000 | 0.003 | 0.006 | 0.000 | 0.000 | 0.000 |
| 0.000 | 0.002 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.000 | 0.002 |
| 2 | 0 | 0 | 2 | 1 | 6 | 0 | 2 | 7 | 1 | 2 | 0 | 0 | 3 | 4 | 3 | 3 | 3 |
| 96 | 98 | 98 | 96 | 97 | 92 | 98 | 96 | 91 | 97 | 96 | 98 | 98 | 95 | 94 | 95 | 95 | 95 |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

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| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 |
| 34.66 | 34.68 | 35.45 | 35.09 | 35.38 | 35.62 | 35.05 | 35.37 | 35.28 | 35.05 | 35.55 | 35.27 | 35.92 | 35.12 | 35.37 | 35.36 | 35.32 | 35.32 |
| 0.00 | 0.00 | 0.04 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.03 |
| 0.12 | 0.49 | 0.79 | 0.12 | 0.17 | 2.42 | 0.18 | 0.09 | 0.01 | 0.47 | 0.03 | 0.05 | 3.62 | 0.25 | 0.07 | 0.02 | 0.05 | 0.04 |
| 31.25 | 30.56 | 29.80 | 31.37 | 30.77 | 27.49 | 30.77 | 30.89 | 31.04 | 30.04 | 30.72 | 30.71 | 25.36 | 30.88 | 31.05 | 30.78 | 31.07 | 30.81 |
| 0.28 | 0.28 | 0.27 | 0.29 | 0.28 | 0.25 | 0.28 | 0.28 | 0.28 | 0.27 | 0.28 | 0.28 | 0.23 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| 0.34 | 0.24 | 0.21 | 0.21 | 0.19 | 0.27 | 0.23 | 0.15 | 0.19 | 0.23 | 0.20 | 0.22 | 0.30 | 0.22 | 0.20 | 0.19 | 0.19 | 0.18 |
| 0.02 | 0.00 | 0.01 | 0.04 | 0.04 | 0.07 | 0.04 | 0.04 | 0.05 | 0.07 | 0.03 | 0.05 | 0.02 | 0.06 | 0.05 | 0.03 | 0.06 | 0.04 |
| 32.99 | 33.23 | 33.38 | 33.17 | 33.34 | 33.91 | 32.48 | 33.27 | 33.30 | 32.83 | 33.05 | 33.19 | 33.70 | 33.39 | 33.20 | 33.26 | 33.02 | 33.15 |
| 0.00 | 0.00 | 0.05 | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.04 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 |
| 99.66 | 99.49 | 100.00 | 100.30 | 100.21 | 100.05 | 99.04 | 100.09 | 100.15 | 99.02 | 99.88 | 99.79 | 99.16 | 100.19 | 100.25 | 99.93 | 100.02 | 99.89 |
| 2.956 | 2.956 | 2.991 | 2.969 | 2.989 | 2.980 | 2.995 | 2.993 | 2.986 | 2.991 | 3.010 | 2.994 | 3.005 | 2.972 | 2.989 | 2.997 | 2.992 | 2.995 |
| 0.000 | 0.000 | 0.002 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.002 |
| 0.012 | 0.050 | 0.078 | 0.012 | 0.017 | 0.239 | 0.018 | 0.008 | 0.001 | 0.047 | 0.003 | 0.005 | 0.357 | 0.025 | 0.007 | 0.002 | 0.005 | 0.004 |
| 2.006 | 1.961 | 1.892 | 1.997 | 1.956 | 1.731 | 1.979 | 1.966 | 1.977 | 1.929 | 1.958 | 1.962 | 1.596 | 1.966 | 1.975 | 1.963 | 1.980 | 1.966 |
| 0.020 | 0.020 | 0.019 | 0.020 | 0.020 | 0.017 | 0.020 | 0.020 | 0.020 | 0.019 | 0.020 | 0.020 | 0.016 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 |
| 0.025 | 0.018 | 0.015 | 0.015 | 0.014 | 0.019 | 0.017 | 0.011 | 0.014 | 0.016 | 0.014 | 0.016 | 0.022 | 0.016 | 0.014 | 0.013 | 0.014 | 0.013 |
| 0.002 | 0.000 | 0.001 | 0.005 | 0.006 | 0.008 | 0.004 | 0.005 | 0.006 | 0.009 | 0.004 | 0.006 | 0.003 | 0.008 | 0.006 | 0.004 | 0.007 | 0.005 |
| 3.015 | 3.035 | 3.018 | 3.007 | 3.019 | 3.040 | 2.974 | 3.016 | 3.021 | 3.002 | 2.999 | 3.019 | 3.020 | 3.027 | 3.007 | 3.020 | 2.997 | 3.011 |
| 0.000 | 0.000 | 0.008 | 0.003 | 0.002 | 0.001 | 0.000 | 0.000 | 0.000 | 0.003 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 | 0.001 | 0.003 | 0.006 |
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.001 | 0.001 | 0.002 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.000 |
| 1 | 2 | 4 | 1 | 1 | 12 | 1 | 0 | 0 | 2 | 0 | 0 | 18 | 1 | 0 | 0 | 0 | 0 |
| 97 | 96 | 94 | 97 | 97 | 86 | 97 | 98 | 98 | 95 | 98 | 98 | 80 | 97 | 98 | 98 | 98 | 98 |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

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| 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 |
| 35.41 | 35.12 | 35.33 | 35.72 | 35.58 | 35.28 | 34.96 | 35.87 | 35.36 | 35.01 | 34.82 | 34.81 | 35.08 | 35.19 | 35.34 | 35.48 | 35.87 | 35.62 |
| 0.00 | 0.00 | 0.00 | 0.02 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.21 | 0.18 | 1.07 | 1.98 | 1.43 | 0.05 | 0.31 | 3.18 | 0.29 | 0.10 | 0.29 | 0.54 | 0.23 | 0.08 | 0.04 | 0.08 | 1.66 | 0.78 |
| 30.74 | 30.58 | 29.22 | 28.23 | 28.31 | 30.90 | 30.64 | 26.13 | 30.54 | 30.83 | 30.60 | 30.00 | 30.36 | 30.72 | 30.55 | 30.74 | 28.88 | 29.53 |
| 0.28 | 0.28 | 0.27 | 0.26 | 0.26 | 0.28 | 0.28 | 0.24 | 0.28 | 0.28 | 0.28 | 0.27 | 0.28 | 0.28 | 0.28 | 0.28 | 0.26 | 0.27 |
| 0.19 | 0.20 | 0.19 | 0.23 | 0.16 | 0.18 | 0.21 | 0.21 | 0.23 | 0.24 | 0.23 | 0.23 | 0.23 | 0.24 | 0.23 | 0.17 | 0.20 | 0.27 |
| 0.04 | 0.06 | 0.04 | 0.05 | 0.02 | 0.01 | 0.03 | 0.00 | 0.05 | 0.10 | 0.00 | 0.03 | 0.10 | 0.03 | 0.05 | 0.06 | 0.04 | 0.03 |
| 33.07 | 33.48 | 33.64 | 33.63 | 33.60 | 32.70 | 33.04 | 33.90 | 33.12 | 32.91 | 33.31 | 33.27 | 33.01 | 33.23 | 33.35 | 33.16 | 33.34 | 33.45 |
| 0.00 | 0.01 | 0.06 | 0.01 | 0.01 | 0.00 | 0.03 | 0.00 | 0.01 | 0.05 | 0.00 | 0.06 | 0.00 | 0.00 | 0.03 | 0.04 | 0.00 | 0.01 |
| 0.02 | 0.00 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 99.95 | 99.91 | 99.81 | 100.16 | 99.40 | 99.40 | 99.51 | 99.54 | 99.88 | 99.55 | 99.53 | 99.21 | 99.31 | 99.78 | 99.86 | 100.01 | 100.26 | 99.96 |
| 2.997 | 2.979 | 2.984 | 2.989 | 3.005 | 3.003 | 2.977 | 2.998 | 2.995 | 2.981 | 2.967 | 2.971 | 2.989 | 2.989 | 2.997 | 3.002 | 3.001 | 3.004 |
| 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.021 | 0.019 | 0.106 | 0.196 | 0.143 | 0.005 | 0.031 | 0.314 | 0.029 | 0.010 | 0.029 | 0.054 | 0.024 | 0.008 | 0.004 | 0.008 | 0.164 | 0.078 |
| 1.958 | 1.952 | 1.857 | 1.778 | 1.799 | 1.979 | 1.963 | 1.644 | 1.946 | 1.976 | 1.962 | 1.927 | 1.947 | 1.963 | 1.950 | 1.957 | 1.818 | 1.874 |
| 0.020 | 0.020 | 0.019 | 0.018 | 0.018 | 0.020 | 0.020 | 0.017 | 0.020 | 0.020 | 0.020 | 0.019 | 0.020 | 0.020 | 0.020 | 0.020 | 0.018 | 0.019 |
| 0.013 | 0.014 | 0.013 | 0.017 | 0.011 | 0.013 | 0.015 | 0.015 | 0.016 | 0.018 | 0.017 | 0.016 | 0.017 | 0.018 | 0.017 | 0.013 | 0.014 | 0.019 |
| 0.005 | 0.008 | 0.005 | 0.006 | 0.003 | 0.002 | 0.004 | 0.000 | 0.006 | 0.013 | 0.000 | 0.004 | 0.012 | 0.004 | 0.006 | 0.007 | 0.006 | 0.004 |
| 2.999 | 3.043 | 3.045 | 3.016 | 3.040 | 2.983 | 3.014 | 3.036 | 3.005 | 3.003 | 3.041 | 3.042 | 3.014 | 3.024 | 3.030 | 3.006 | 2.988 | 3.023 |
| 0.000 | 0.001 | 0.009 | 0.002 | 0.002 | 0.000 | 0.005 | 0.000 | 0.002 | 0.008 | 0.000 | 0.009 | 0.000 | 0.000 | 0.004 | 0.007 | 0.000 | 0.001 |
| 0.002 | 0.000 | 0.001 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 1 | 1 | 5 | 10 | 7 | 0 | 2 | 16 | 1 | 0 | 1 | 3 | 1 | 0 | 0 | 0 | 8 | 4 |
| 97 | 97 | 93 | 88 | 91 | 98 | 97 | 83 | 96 | 97 | 97 | 95 | 96 | 98 | 98 | 98 | 90 | 94 |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

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| 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 |
| 34.93 | 35.24 | 35.43 | 35.36 | 35.44 | 35.55 | 35.55 | 35.05 | 35.48 | 35.61 | 35.44 | 35.68 | 35.70 | 35.60 | 35.52 | 35.37 | 35.34 | 35.40 |
| 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| 0.03 | 0.56 | 0.10 | 0.33 | 0.13 | 0.06 | 0.13 | 0.30 | 0.36 | 0.66 | 0.52 | 1.19 | 0.07 | 0.78 | 0.40 | 1.05 | 0.00 | 0.54 |
| 30.99 | 29.78 | 30.39 | 30.25 | 30.52 | 30.74 | 30.25 | 30.36 | 30.45 | 30.27 | 29.43 | 29.11 | 30.81 | 29.81 | 30.17 | 29.23 | 31.07 | 30.04 |
| 0.28 | 0.27 | 0.28 | 0.27 | 0.28 | 0.28 | 0.27 | 0.28 | 0.28 | 0.28 | 0.27 | 0.26 | 0.28 | 0.27 | 0.27 | 0.27 | 0.28 | 0.27 |
| 0.34 | 0.27 | 0.25 | 0.23 | 0.18 | 0.22 | 0.25 | 0.28 | 0.26 | 0.25 | 0.23 | 0.24 | 0.16 | 0.17 | 0.20 | 0.21 | 0.23 | 0.19 |
| 0.04 | 0.05 | 0.04 | 0.05 | 0.04 | 0.06 | 0.05 | 0.07 | 0.04 | 0.05 | 0.08 | 0.08 | 0.05 | 0.03 | 0.05 | 0.04 | 0.07 | 0.08 |
| 32.69 | 33.29 | 33.18 | 33.06 | 33.46 | 33.13 | 33.13 | 33.56 | 32.97 | 33.23 | 33.23 | 33.08 | 33.29 | 33.38 | 33.13 | 32.95 | 32.80 | 33.11 |
| 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.02 | 0.00 | 0.01 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.01 | 0.01 | 0.00 | 0.02 | 0.00 | 0.00 |
| 99.30 | 99.47 | 99.69 | 99.55 | 100.06 | 100.05 | 99.64 | 99.90 | 99.85 | 100.35 | 99.21 | 99.64 | 100.39 | 100.04 | 99.76 | 99.16 | 99.80 | 99.64 |
| 2.983 | 2.993 | 3.006 | 3.002 | 2.998 | 3.006 | 3.015 | 2.974 | 3.002 | 2.995 | 3.013 | 3.008 | 3.008 | 3.000 | 3.006 | 3.002 | 2.998 | 2.999 |
| 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |
| 0.003 | 0.056 | 0.010 | 0.033 | 0.013 | 0.006 | 0.013 | 0.030 | 0.036 | 0.065 | 0.052 | 0.118 | 0.007 | 0.077 | 0.040 | 0.105 | 0.000 | 0.054 |
| 1.992 | 1.903 | 1.941 | 1.932 | 1.943 | 1.956 | 1.930 | 1.939 | 1.939 | 1.916 | 1.883 | 1.847 | 1.953 | 1.890 | 1.921 | 1.867 | 1.984 | 1.915 |
| 0.020 | 0.019 | 0.020 | 0.020 | 0.020 | 0.020 | 0.019 | 0.020 | 0.020 | 0.019 | 0.019 | 0.019 | 0.020 | 0.019 | 0.019 | 0.019 | 0.020 | 0.019 |
| 0.024 | 0.019 | 0.018 | 0.016 | 0.013 | 0.016 | 0.018 | 0.020 | 0.019 | 0.018 | 0.017 | 0.017 | 0.011 | 0.012 | 0.014 | 0.015 | 0.016 | 0.013 |
| 0.005 | 0.006 | 0.005 | 0.006 | 0.004 | 0.008 | 0.006 | 0.008 | 0.005 | 0.007 | 0.010 | 0.010 | 0.006 | 0.004 | 0.006 | 0.005 | 0.009 | 0.010 |
| 2.991 | 3.030 | 3.016 | 3.007 | 3.033 | 3.002 | 3.011 | 3.051 | 2.989 | 2.995 | 3.027 | 2.989 | 3.005 | 3.014 | 3.004 | 2.997 | 2.982 | 3.006 |
| 0.002 | 0.000 | 0.000 | 0.000 | 0.002 | 0.001 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.003 | 0.003 | 0.000 | 0.001 |
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.002 | 0.000 | 0.001 | 0.001 | 0.000 | 0.003 | 0.000 | 0.000 |
| 0 | 3 | 1 | 2 | 1 | 0 | 1 | 1 | 2 | 3 | 3 | 6 | 0 | 4 | 2 | 5 | 0 | 3 |
| 97 | 95 | 97 | 96 | 97 | 98 | 97 | 96 | 96 | 95 | 95 | 92 | 98 | 94 | 96 | 93 | 98 | 95 |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

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| 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 |
| 35.15 | 35.41 | 35.42 | 35.16 | 35.37 | 35.01 | 35.24 | 35.83 | 35.72 | 35.22 | 35.32 | 35.26 | 35.42 | 35.34 | 35.42 | 35.45 | 35.15 | 34.98 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.40 | 0.02 | 0.02 | 0.01 | 0.00 | 0.00 | 0.11 | 1.44 | 0.04 | 0.00 | 0.52 | 0.29 | 1.39 | 0.14 | 1.76 | 0.00 | 0.00 | 0.05 |
| 29.78 | 30.66 | 30.78 | 30.66 | 31.03 | 30.69 | 30.47 | 28.60 | 31.13 | 30.93 | 29.63 | 30.81 | 28.85 | 30.57 | 27.66 | 30.48 | 30.94 | 30.44 |
| 0.27 | 0.47 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.26 | 0.28 | 0.28 | 0.27 | 0.28 | 0.26 | 0.28 | 0.25 | 0.28 | 0.28 | 0.28 |
| 0.22 | 0.19 | 0.21 | 0.21 | 0.19 | 0.21 | 0.23 | 0.23 | 0.17 | 0.19 | 0.22 | 0.23 | 0.30 | 0.24 | 0.19 | 0.19 | 0.24 | 0.27 |
| 0.07 | 0.07 | 0.05 | 0.04 | 0.04 | 0.04 | 0.07 | 0.00 | 0.02 | 0.03 | 0.09 | 0.10 | 0.12 | 0.15 | 0.10 | 0.07 | 0.07 | 0.08 |
| 33.18 | 32.41 | 32.90 | 32.94 | 33.08 | 32.96 | 33.01 | 33.52 | 33.39 | 33.19 | 33.47 | 33.43 | 33.34 | 33.07 | 33.52 | 33.47 | 33.05 | 33.20 |
| 0.00 | 0.00 | 0.04 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.03 | 0.01 | 0.02 | 0.00 | 0.00 |
| 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.03 |
| 99.07 | 99.22 | 99.70 | 99.31 | 100.01 | 99.18 | 99.41 | 99.90 | 100.77 | 99.85 | 99.52 | 100.41 | 99.72 | 99.84 | 98.91 | 99.95 | 99.73 | 99.33 |
| 2.998 | 3.017 | 3.006 | 2.998 | 2.996 | 2.991 | 3.000 | 3.010 | 3.000 | 2.990 | 2.997 | 2.975 | 2.988 | 2.995 | 3.001 | 3.003 | 2.988 | 2.986 |
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.040 | 0.002 | 0.002 | 0.001 | 0.000 | 0.000 | 0.011 | 0.143 | 0.004 | 0.000 | 0.052 | 0.029 | 0.139 | 0.014 | 0.176 | 0.000 | 0.000 | 0.005 |
| 1.912 | 1.963 | 1.966 | 1.968 | 1.977 | 1.974 | 1.952 | 1.808 | 1.968 | 1.976 | 1.892 | 1.956 | 1.831 | 1.950 | 1.764 | 1.943 | 1.979 | 1.955 |
| 0.019 | 0.036 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.018 | 0.020 | 0.020 | 0.019 | 0.020 | 0.018 | 0.020 | 0.018 | 0.020 | 0.020 | 0.020 |
| 0.016 | 0.014 | 0.015 | 0.015 | 0.013 | 0.015 | 0.017 | 0.016 | 0.012 | 0.013 | 0.016 | 0.016 | 0.021 | 0.017 | 0.013 | 0.013 | 0.017 | 0.020 |
| 0.009 | 0.009 | 0.006 | 0.004 | 0.005 | 0.005 | 0.009 | 0.001 | 0.003 | 0.004 | 0.011 | 0.012 | 0.015 | 0.020 | 0.013 | 0.008 | 0.008 | 0.010 |
| 3.032 | 2.959 | 2.992 | 3.010 | 3.002 | 3.017 | 3.011 | 3.017 | 3.006 | 3.019 | 3.043 | 3.022 | 3.013 | 3.004 | 3.044 | 3.038 | 3.010 | 3.037 |
| 0.000 | 0.000 | 0.007 | 0.001 | 0.003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.006 | 0.005 | 0.001 | 0.003 | 0.000 | 0.000 |
| 0.001 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.003 |
| 2 | 0 | 0 | 0 | 0 | 0 | 1 | 7 | 0 | 0 | 3 | 1 | 7 | 1 | 9 | 0 | 0 | 0 |
| 96 | 97 | 98 | 98 | 98 | 98 | 97 | 91 | 98 | 98 | 95 | 96 | 90 | 96 | 89 | 98 | 98 | 97 |
| 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 |

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| 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 |
| 35.50 | 35.51 | 35.67 | 35.20 | 35.74 | 35.97 | 35.91 | 35.20 | 35.75 | 35.57 | 36.07 | 35.22 | 35.01 | 34.84 | 35.10 | 35.25 | 34.91 | 35.12 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 0.18 | 0.28 | 0.03 | 0.00 | 0.00 | 0.11 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.02 | 0.26 | 0.00 | 3.20 | 3.84 | 3.37 | 1.19 | 0.75 | 1.62 | 3.41 | 0.00 | 0.01 | 0.04 | 0.01 | 0.03 | 0.01 | 0.00 |
| 30.54 | 30.79 | 31.07 | 30.90 | 26.45 | 25.56 | 26.33 | 29.36 | 30.15 | 28.60 | 26.37 | 30.65 | 30.98 | 30.63 | 30.67 | 30.68 | 30.65 | 30.77 |
| 0.28 | 0.28 | 0.28 | 0.28 | 0.24 | 0.23 | 0.24 | 0.27 | 0.27 | 0.26 | 0.24 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| 0.25 | 0.22 | 0.23 | 0.25 | 0.28 | 0.26 | 0.24 | 0.33 | 0.15 | 0.20 | 0.27 | 0.28 | 0.27 | 0.32 | 0.27 | 0.27 | 0.31 | 0.32 |
| 0.04 | 0.03 | 0.03 | 0.04 | 0.11 | 0.14 | 0.02 | 0.03 | 0.01 | 0.02 | 0.09 | 0.08 | 0.08 | 0.09 | 0.07 | 0.07 | 0.11 | 0.06 |
| 33.16 | 33.13 | 33.34 | 33.17 | 33.02 | 33.93 | 33.85 | 33.25 | 33.11 | 33.45 | 33.38 | 33.25 | 33.20 | 32.84 | 33.19 | 33.12 | 33.08 | 32.81 |
| 0.00 | 0.02 | 0.02 | 0.01 | 0.03 | 0.00 | 0.02 | 0.00 | 0.01 | 0.01 | 0.00 | 0.02 | 0.00 | 0.02 | 0.00 | 0.01 | 0.01 | 0.03 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 99.78 | 100.00 | 100.89 | 99.85 | 99.23 | 100.11 | 100.26 | 99.67 | 100.21 | 99.75 | 99.92 | 99.77 | 99.84 | 99.07 | 99.60 | 99.70 | 99.35 | 99.39 |
| 3.010 | 3.005 | 2.992 | 2.989 | 2.994 | 2.980 | 2.979 | 2.978 | 3.006 | 2.994 | 2.997 | 2.992 | 2.976 | 2.982 | 2.988 | 2.995 | 2.981 | 2.994 |
| 0.000 | 0.000 | 0.000 | 0.000 | 0.010 | 0.011 | 0.017 | 0.002 | 0.000 | 0.000 | 0.007 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.001 | 0.002 | 0.025 | 0.000 | 0.316 | 0.375 | 0.329 | 0.119 | 0.074 | 0.160 | 0.334 | 0.000 | 0.001 | 0.004 | 0.001 | 0.003 | 0.001 | 0.000 |
| 1.949 | 1.961 | 1.961 | 1.974 | 1.668 | 1.593 | 1.644 | 1.869 | 1.907 | 1.811 | 1.649 | 1.959 | 1.981 | 1.973 | 1.965 | 1.962 | 1.969 | 1.974 |
| 0.020 | 0.020 | 0.020 | 0.020 | 0.017 | 0.016 | 0.017 | 0.019 | 0.019 | 0.018 | 0.017 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 |
| 0.018 | 0.016 | 0.016 | 0.018 | 0.020 | 0.018 | 0.017 | 0.023 | 0.010 | 0.014 | 0.019 | 0.020 | 0.019 | 0.023 | 0.020 | 0.020 | 0.022 | 0.023 |
| 0.005 | 0.004 | 0.003 | 0.005 | 0.014 | 0.017 | 0.002 | 0.003 | 0.002 | 0.003 | 0.011 | 0.010 | 0.010 | 0.011 | 0.009 | 0.008 | 0.014 | 0.007 |
| 3.013 | 3.004 | 2.996 | 3.017 | 2.964 | 3.013 | 3.009 | 3.013 | 2.983 | 3.017 | 2.972 | 3.027 | 3.023 | 3.012 | 3.027 | 3.015 | 3.027 | 2.998 |
| 0.000 | 0.003 | 0.003 | 0.002 | 0.005 | 0.000 | 0.004 | 0.000 | 0.002 | 0.002 | 0.000 | 0.003 | 0.000 | 0.003 | 0.000 | 0.002 | 0.002 | 0.004 |
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0 | 0 | 1 | 0 | 16 | 19 | 16 | 6 | 4 | 8 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 98 | 98 | 97 | 98 | 82 | 79 | 82 | 92 | 95 | 90 | 81 | 98 | 98 | 97 | 98 | 97 | 97 | 98 |
| 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 2 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 |
| 34.79 | 35.23 | 34.83 | 35.33 | 34.91 | 34.91 | 34.98 | 35.10 | 35.01 | 35.19 | 35.66 | 35.17 | 35.19 | 34.92 | 35.15 | 35.16 | 34.99 | 35.37 |
| 0.00 | 0.01 | 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 | 0.01 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.03 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 2.46 | 0.00 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 |
| 30.23 | 30.76 | 31.17 | 30.95 | 30.70 | 31.10 | 30.66 | 31.02 | 30.73 | 30.73 | 27.50 | 30.94 | 30.67 | 30.92 | 31.05 | 30.85 | 30.18 | 31.12 |
| 0.27 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.25 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.27 | 0.28 |
| 0.30 | 0.31 | 0.31 | 0.20 | 0.28 | 0.28 | 0.34 | 0.29 | 0.32 | 0.33 | 0.17 | 0.27 | 0.31 | 0.30 | 0.31 | 0.32 | 0.36 | 0.31 |
| 0.11 | 0.05 | 0.10 | 0.04 | 0.07 | 0.10 | 0.08 | 0.09 | 0.07 | 0.08 | 0.02 | 0.08 | 0.05 | 0.06 | 0.10 | 0.08 | 0.04 | 0.10 |
| 33.00 | 33.35 | 33.08 | 33.03 | 33.26 | 33.11 | 33.24 | 33.14 | 32.97 | 33.22 | 33.73 | 32.72 | 33.13 | 32.96 | 32.83 | 33.09 | 32.80 | 33.14 |
| 0.04 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.03 | 0.01 | 0.01 | 0.04 | 0.04 | 0.00 | 0.03 | 0.01 | 0.00 | 0.00 |
| 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 98.75 | 99.99 | 99.78 | 99.85 | 99.52 | 99.78 | 99.60 | 99.93 | 99.42 | 99.84 | 99.82 | 99.50 | 99.70 | 99.45 | 99.77 | 99.80 | 98.67 | 100.34 |
| 2.987 | 2.988 | 2.965 | 2.996 | 2.977 | 2.970 | 2.980 | 2.980 | 2.986 | 2.988 | 2.987 | 2.995 | 2.992 | 2.980 | 2.986 | 2.987 | 3.003 | 2.988 |
| 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.000 | 0.000 | 0.000 | 0.003 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.243 | 0.000 | 0.002 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 |
| 1.954 | 1.963 | 1.997 | 1.975 | 1.970 | 1.992 | 1.966 | 1.982 | 1.973 | 1.964 | 1.734 | 1.982 | 1.962 | 1.985 | 1.986 | 1.972 | 1.949 | 1.978 |
| 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.018 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 |
| 0.022 | 0.022 | 0.022 | 0.014 | 0.020 | 0.020 | 0.024 | 0.021 | 0.023 | 0.024 | 0.012 | 0.019 | 0.022 | 0.022 | 0.022 | 0.023 | 0.026 | 0.022 |
| 0.014 | 0.006 | 0.012 | 0.005 | 0.009 | 0.013 | 0.010 | 0.011 | 0.009 | 0.010 | 0.003 | 0.010 | 0.007 | 0.007 | 0.013 | 0.010 | 0.005 | 0.012 |
| 3.036 | 3.031 | 3.018 | 3.001 | 3.039 | 3.019 | 3.034 | 3.014 | 3.014 | 3.022 | 3.028 | 2.985 | 3.018 | 3.014 | 2.989 | 3.012 | 3.017 | 2.999 |
| 0.006 | 0.000 | 0.003 | 0.000 | 0.000 | 0.000 | 0.005 | 0.000 | 0.005 | 0.001 | 0.002 | 0.007 | 0.006 | 0.000 | 0.005 | 0.002 | 0.000 | 0.000 |
| 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97 | 98 | 97 | 98 | 97 | 97 | 97 | 97 | 97 | 97 | 86 | 98 | 97 | 98 | 97 | 97 | 97 | 97 |
| 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 |
| 35.14 | 35.44 | 36.20 | 35.93 | 35.32 | 35.17 | 34.81 | 35.59 | 35.43 | 34.99 | 35.70 | 35.02 | 35.12 | 35.24 | 35.16 | 34.64 | 35.59 | 35.37 |
| 0.01 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.01 | 0.11 | 0.00 | 0.00 | 0.03 | 0.00 | 0.03 | 0.01 | 0.00 |
| 0.01 | 0.00 | 4.10 | 3.17 | 0.01 | 0.00 | 0.02 | 0.01 | 3.83 | 0.11 | 2.33 | 0.12 | 0.53 | 0.00 | 0.94 | 0.63 | 1.67 | 0.56 |
| 31.10 | 31.12 | 25.09 | 26.24 | 31.05 | 30.68 | 31.18 | 30.85 | 25.44 | 30.78 | 27.21 | 30.47 | 30.54 | 30.48 | 29.49 | 29.73 | 28.41 | 30.21 |
| 0.28 | 0.28 | 0.23 | 0.24 | 0.28 | 0.28 | 0.28 | 0.28 | 0.23 | 0.28 | 0.25 | 0.28 | 0.28 | 0.28 | 0.27 | 0.27 | 0.26 | 0.27 |
| 0.28 | 0.21 | 0.26 | 0.26 | 0.25 | 0.26 | 0.28 | 0.20 | 0.25 | 0.21 | 0.18 | 0.20 | 0.18 | 0.16 | 0.21 | 0.27 | 0.30 | 0.27 |
| 0.07 | 0.09 | 0.05 | 0.06 | 0.06 | 0.14 | 0.05 | 0.19 | 0.15 | 0.06 | 0.08 | 0.04 | 0.04 | 0.06 | 0.12 | 0.12 | 0.03 | 0.02 |
| 32.49 | 33.05 | 34.05 | 33.83 | 33.35 | 33.25 | 33.37 | 33.24 | 33.43 | 32.97 | 33.90 | 33.07 | 32.83 | 33.39 | 33.08 | 33.15 | 33.27 | 33.19 |
| 0.03 | 0.02 | 0.02 | 0.02 | 0.08 | 0.04 | 0.01 | 0.00 | 0.03 | 0.02 | 0.00 | 0.00 | 0.02 | 0.01 | 0.01 | 0.00 | 0.02 | 0.03 |
| 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 |
| 99.41 | 100.21 | 99.99 | 99.84 | 100.42 | 99.82 | 100.00 | 100.35 | 98.84 | 99.43 | 99.76 | 99.19 | 99.53 | 99.67 | 99.30 | 98.85 | 99.57 | 99.95 |
| 2.994 | 2.995 | 2.997 | 2.994 | 2.984 | 2.987 | 2.959 | 3.001 | 2.975 | 2.983 | 2.991 | 2.990 | 2.983 | 2.995 | 2.985 | 2.966 | 2.999 | 2.991 |
| 0.001 | 0.000 | 0.000 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.001 | 0.007 | 0.000 | 0.000 | 0.002 | 0.000 | 0.002 | 0.001 | 0.000 |
| 0.001 | 0.000 | 0.400 | 0.311 | 0.001 | 0.000 | 0.002 | 0.000 | 0.379 | 0.011 | 0.230 | 0.013 | 0.053 | 0.000 | 0.094 | 0.063 | 0.166 | 0.056 |
| 1.994 | 1.979 | 1.563 | 1.645 | 1.973 | 1.961 | 1.995 | 1.958 | 1.607 | 1.974 | 1.716 | 1.958 | 1.952 | 1.949 | 1.884 | 1.915 | 1.802 | 1.922 |
| 0.020 | 0.020 | 0.016 | 0.017 | 0.020 | 0.020 | 0.020 | 0.020 | 0.016 | 0.020 | 0.017 | 0.020 | 0.020 | 0.020 | 0.019 | 0.019 | 0.018 | 0.019 |
| 0.021 | 0.015 | 0.018 | 0.018 | 0.018 | 0.019 | 0.020 | 0.014 | 0.018 | 0.015 | 0.013 | 0.014 | 0.013 | 0.012 | 0.015 | 0.019 | 0.021 | 0.019 |
| 0.009 | 0.011 | 0.006 | 0.008 | 0.008 | 0.017 | 0.006 | 0.023 | 0.019 | 0.007 | 0.010 | 0.005 | 0.005 | 0.008 | 0.015 | 0.016 | 0.004 | 0.003 |
| 2.967 | 2.993 | 3.020 | 3.021 | 3.019 | 3.026 | 3.040 | 3.004 | 3.008 | 3.012 | 3.044 | 3.026 | 2.988 | 3.041 | 3.010 | 3.041 | 3.005 | 3.007 |
| 0.005 | 0.003 | 0.004 | 0.004 | 0.014 | 0.007 | 0.001 | 0.000 | 0.005 | 0.003 | 0.000 | 0.000 | 0.003 | 0.002 | 0.002 | 0.000 | 0.004 | 0.005 |
| 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.002 | 0.001 | 0.001 | 0.001 |
| 0 | 0 | 20 | 16 | 0 | 0 | 0 | 0 | 19 | 1 | 12 | 1 | 3 | 0 | 5 | 3 | 8 | 3 |
| 98 | 98 | 78 | 82 | 98 | 97 | 98 | 97 | 79 | 97 | 86 | 97 | 96 | 98 | 93 | 94 | 90 | 95 |
| 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 |
| 35.98 | 35.81 | 35.20 | 35.39 | 35.41 | 35.32 | 34.94 | 35.34 | 35.08 | 35.36 | 35.42 | 35.22 | 35.31 | 35.22 | 36.11 | 35.32 | 35.85 | 35.14 |
| 0.18 | 0.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4.03 | 3.71 | 0.19 | 0.39 | 0.98 | 0.72 | 0.11 | 0.42 | 0.23 | 2.04 | 0.37 | 0.76 | 0.41 | 0.27 | 0.32 | 0.29 | 1.27 | 1.62 |
| 25.00 | 24.74 | 30.64 | 30.24 | 29.98 | 29.76 | 30.02 | 30.31 | 30.17 | 27.91 | 30.14 | 29.57 | 30.16 | 30.33 | 29.33 | 30.73 | 29.26 | 27.94 |
| 0.23 | 0.22 | 0.28 | 0.27 | 0.27 | 0.27 | 0.27 | 0.28 | 0.27 | 0.25 | 0.27 | 0.27 | 0.27 | 0.28 | 0.56 | 0.28 | 0.27 | 0.25 |
| 0.29 | 0.29 | 0.29 | 0.20 | 0.21 | 0.29 | 0.20 | 0.22 | 0.21 | 0.30 | 0.18 | 0.16 | 0.20 | 0.22 | 0.19 | 0.28 | 0.21 | 0.25 |
| 0.14 | 0.21 | 0.04 | 0.01 | 0.07 | 0.10 | 0.10 | 0.10 | 0.03 | 0.04 | 0.03 | 0.08 | 0.07 | 0.03 | 0.10 | 0.06 | 0.06 | 0.04 |
| 33.67 | 33.80 | 33.22 | 33.52 | 33.52 | 33.22 | 33.19 | 33.28 | 33.23 | 33.37 | 33.49 | 33.35 | 33.33 | 33.27 | 32.83 | 32.94 | 33.48 | 32.98 |
| 0.04 | 0.01 | 0.00 | 0.05 | 0.00 | 0.01 | 0.01 | 0.02 | 0.04 | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.04 | 0.07 | 0.00 | 0.03 |
| 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 |
| 99.54 | 99.74 | 99.87 | 100.08 | 100.43 | 99.70 | 98.85 | 99.97 | 99.26 | 99.40 | 99.94 | 99.41 | 99.75 | 99.63 | 99.49 | 99.98 | 100.39 | 98.26 |
| 2.992 | 2.974 | 2.986 | 2.991 | 2.975 | 2.991 | 2.993 | 2.989 | 2.991 | 2.982 | 2.996 | 2.989 | 2.992 | 2.992 | 3.054 | 2.989 | 3.001 | 3.001 |
| 0.011 | 0.059 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.395 | 0.364 | 0.019 | 0.039 | 0.097 | 0.072 | 0.011 | 0.042 | 0.024 | 0.203 | 0.037 | 0.076 | 0.041 | 0.027 | 0.032 | 0.029 | 0.125 | 0.163 |
| 1.564 | 1.546 | 1.956 | 1.923 | 1.895 | 1.896 | 1.935 | 1.929 | 1.936 | 1.771 | 1.919 | 1.889 | 1.924 | 1.939 | 1.867 | 1.958 | 1.843 | 1.795 |
| 0.016 | 0.016 | 0.020 | 0.019 | 0.019 | 0.019 | 0.020 | 0.019 | 0.020 | 0.018 | 0.019 | 0.019 | 0.019 | 0.020 | 0.040 | 0.020 | 0.019 | 0.018 |
| 0.020 | 0.021 | 0.021 | 0.014 | 0.015 | 0.021 | 0.015 | 0.016 | 0.015 | 0.021 | 0.013 | 0.012 | 0.015 | 0.016 | 0.014 | 0.020 | 0.015 | 0.018 |
| 0.017 | 0.026 | 0.005 | 0.001 | 0.009 | 0.012 | 0.013 | 0.012 | 0.004 | 0.006 | 0.004 | 0.010 | 0.008 | 0.004 | 0.013 | 0.007 | 0.008 | 0.005 |
| 3.000 | 3.007 | 3.019 | 3.035 | 3.018 | 3.014 | 3.046 | 3.016 | 3.036 | 3.015 | 3.036 | 3.033 | 3.027 | 3.029 | 2.975 | 2.988 | 3.004 | 3.017 |
| 0.006 | 0.002 | 0.000 | 0.008 | 0.000 | 0.002 | 0.001 | 0.004 | 0.007 | 0.000 | 0.003 | 0.001 | 0.000 | 0.000 | 0.006 | 0.012 | 0.000 | 0.005 |
| 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.001 | 0.001 | 0.001 | 0.000 | 0.000 |
| 20 | 18 | 1 | 2 | 5 | 4 | 1 | 2 | 1 | 10 | 2 | 4 | 2 | 1 | 2 | 1 | 6 | 8 |
| 78 | 78 | 97 | 96 | 93 | 94 | 97 | 96 | 97 | 88 | 96 | 94 | 96 | 97 | 95 | 96 | 92 | 90 |
| 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 |
| 35.39 | 35.58 | 35.10 | 35.42 | 35.05 | 35.31 | 35.24 | 35.27 | 35.74 | 35.36 | 35.21 | 34.84 | 35.05 | 35.48 | 34.81 | 35.13 |
| 0.02 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.70 | 0.53 | 0.37 | 0.28 | 0.40 | 0.29 | 0.14 | 0.11 | 0.16 | 1.53 | 0.78 | 0.79 | 0.61 | 1.26 | 0.13 | 0.70 |
| 28.32 | 30.67 | 30.55 | 30.59 | 30.53 | 30.23 | 30.67 | 30.33 | 30.70 | 29.01 | 29.61 | 29.70 | 29.70 | 29.38 | 30.73 | 30.17 |
| 0.26 | 0.28 | 0.28 | 0.28 | 0.28 | 0.27 | 0.28 | 0.28 | 0.28 | 0.26 | 0.27 | 0.27 | 0.27 | 0.27 | 0.28 | 0.27 |
| 0.25 | 0.22 | 0.23 | 0.20 | 0.20 | 0.21 | 0.24 | 0.22 | 0.16 | 0.24 | 0.21 | 0.27 | 0.25 | 0.22 | 0.19 | 0.25 |
| 0.06 | 0.01 | 0.06 | 0.10 | 0.04 | 0.03 | 0.04 | 0.06 | 0.04 | 0.05 | 0.06 | 0.08 | 0.05 | 0.03 | 0.08 | 0.05 |
| 33.23 | 33.31 | 33.29 | 33.39 | 32.75 | 33.00 | 32.69 | 33.35 | 33.21 | 33.13 | 33.03 | 32.95 | 33.23 | 33.44 | 33.21 | 33.13 |
| 0.04 | 0.01 | 0.00 | 0.01 | 0.01 | 0.03 | 0.03 | 0.02 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.01 | 0.01 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| 99.27 | 100.63 | 99.91 | 100.31 | 99.28 | 99.37 | 99.34 | 99.65 | 100.28 | 99.68 | 99.18 | 98.92 | 99.16 | 100.08 | 99.45 | 99.71 |
| 2.992 | 2.989 | 2.975 | 2.988 | 2.986 | 3.003 | 3.001 | 2.996 | 3.011 | 2.981 | 2.994 | 2.976 | 2.987 | 2.985 | 2.970 | 2.978 |
| 0.001 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.169 | 0.053 | 0.037 | 0.028 | 0.041 | 0.029 | 0.014 | 0.011 | 0.015 | 0.152 | 0.078 | 0.079 | 0.061 | 0.125 | 0.013 | 0.070 |
| 1.802 | 1.939 | 1.949 | 1.942 | 1.958 | 1.935 | 1.966 | 1.939 | 1.946 | 1.841 | 1.895 | 1.909 | 1.905 | 1.860 | 1.973 | 1.925 |
| 0.018 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.020 | 0.019 |
| 0.018 | 0.016 | 0.017 | 0.015 | 0.015 | 0.015 | 0.017 | 0.016 | 0.011 | 0.017 | 0.015 | 0.020 | 0.018 | 0.016 | 0.014 | 0.018 |
| 0.007 | 0.002 | 0.008 | 0.013 | 0.004 | 0.004 | 0.005 | 0.008 | 0.006 | 0.006 | 0.008 | 0.010 | 0.006 | 0.004 | 0.011 | 0.006 |
| 3.010 | 2.998 | 3.024 | 3.018 | 2.990 | 3.008 | 2.983 | 3.036 | 2.998 | 2.993 | 3.010 | 3.015 | 3.034 | 3.014 | 3.036 | 3.009 |
| 0.007 | 0.002 | 0.000 | 0.002 | 0.002 | 0.005 | 0.005 | 0.003 | 0.000 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.001 | 0.001 | 0.001 | 0.003 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.000 | 0.001 | 0.000 | 0.000 |
| 8 | 3 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 7 | 4 | 4 | 3 | 6 | 1 | 3 |
| 89 | 96 | 96 | 96 | 96 | 97 | 97 | 97 | 97 | 90 | 94 | 94 | 95 | 92 | 97 | 94 |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

表2 城门山矽卡岩石榴子石LA-ICPMS分析结果（主量元素单位为wt%和微量元素单位为10-6）

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | SiO2 | FeO | CaO | MgO | Al2O3 | V | Ga | Y | In | Sn | W | Pb | As | Th | U | La | Ce | Pr |
| 1 | 37.06 | 27.15 | 34.26 | 0.05 | 0.48 | 10.08 | 7.33 | 0.76 | 7.87 | 13.68 | 22.77 | 0.00 | 37.01 | 0.12 | 2.78 | 1.18 | 11.41 | 2.14 |
| 2 | 37.21 | 25.14 | 34.57 | 0.05 | 1.97 | 11.05 | 22.24 | 1.72 | 10.54 | 66.58 | 99.75 | 0.07 | 112.97 | 0.82 | 6.96 | 7.47 | 81.63 | 18.60 |
| 3 | 37.80 | 25.95 | 33.83 | 0.04 | 1.23 | 5.50 | 22.71 | 0.33 | 15.16 | 156.05 | 513.67 | 0.04 | 258.92 | 0.52 | 13.85 | 17.69 | 149.67 | 31.46 |
| 4 | 36.92 | 26.22 | 34.88 | 0.04 | 0.96 | 11.99 | 13.17 | 0.78 | 7.03 | 18.97 | 1.07 | 0.06 | 7.09 | 0.11 | 0.94 | 0.60 | 7.19 | 1.58 |
| 5 | 37.43 | 26.52 | 34.09 | 0.10 | 0.81 | 8.65 | 17.89 | 0.48 | 6.34 | 44.88 | 136.21 | 0.03 | 146.83 | 0.75 | 11.50 | 4.84 | 44.32 | 8.42 |
| 6 | 37.73 | 23.74 | 34.35 | 0.03 | 3.05 | 16.93 | 25.03 | 1.95 | 13.70 | 172.33 | 325.99 | 0.15 | 186.44 | 1.96 | 11.76 | 11.76 | 106.73 | 25.19 |
| 7 | 37.46 | 26.46 | 33.98 | 0.04 | 0.90 | 4.47 | 20.21 | 0.27 | 14.97 | 139.63 | 475.02 | 0.00 | 254.49 | 0.41 | 13.94 | 17.28 | 156.37 | 33.15 |
| 8 | 37.40 | 26.36 | 34.37 | 0.04 | 0.75 | 12.44 | 5.35 | 1.21 | 4.36 | 13.74 | 162.77 | 0.00 | 241.73 | 0.40 | 5.51 | 8.01 | 67.34 | 11.31 |
| 9 | 37.32 | 27.11 | 34.48 | 0.06 | 0.06 | 0.29 | 12.46 | 0.01 | 10.48 | 35.04 | 48.30 | 0.00 | 26.70 | 0.04 | 3.81 | 2.17 | 21.56 | 4.00 |
| 10 | 36.95 | 26.88 | 34.53 | 0.07 | 0.41 | 2.52 | 26.94 | 0.25 | 15.36 | 79.35 | 450.97 | 0.55 | 243.82 | 0.52 | 15.71 | 19.67 | 177.84 | 37.52 |
| 11 | 37.93 | 26.52 | 34.03 | 0.05 | 0.33 | 9.32 | 12.72 | 0.41 | 10.12 | 31.75 | 461.04 | 0.00 | 222.69 | 0.24 | 13.79 | 18.67 | 178.19 | 34.14 |
| 12 | 37.45 | 25.42 | 34.94 | 0.06 | 1.08 | 28.08 | 3.07 | 0.56 | 3.60 | 3.77 | 523.05 | 0.02 | 153.38 | 0.53 | 4.87 | 6.70 | 21.62 | 1.59 |
| 13 | 36.07 | 25.72 | 35.65 | 0.04 | 1.47 | 13.98 | 16.11 | 1.32 | 5.34 | 20.77 | 18.09 | 0.34 | 11.56 | 0.78 | 3.40 | 2.84 | 31.71 | 7.91 |
| 14 | 36.46 | 23.33 | 35.51 | 0.04 | 3.72 | 44.26 | 10.26 | 3.13 | 4.66 | 11.50 | 16.92 | 0.04 | 7.72 | 1.65 | 5.34 | 3.56 | 43.38 | 10.06 |
| 15 | 34.57 | 26.01 | 37.93 | 0.04 | 0.50 | 5.53 | 12.73 | 0.33 | 7.09 | 13.71 | 2.42 | 0.55 | 2.51 | 0.09 | 1.61 | 2.81 | 35.73 | 5.99 |
| 16 | 36.46 | 26.62 | 34.98 | 0.05 | 0.82 | 5.92 | 10.01 | 0.22 | 7.65 | 9.21 | 534.63 | 0.02 | 60.07 | 0.53 | 17.11 | 21.84 | 108.30 | 11.02 |
| 17 | 37.32 | 25.04 | 34.45 | 0.04 | 2.03 | 51.47 | 11.56 | 4.47 | 6.56 | 13.41 | 370.11 | 0.21 | 29.35 | 0.94 | 14.44 | 18.00 | 88.79 | 9.20 |
| 18 | 35.92 | 22.71 | 36.07 | 0.08 | 3.87 | 130.76 | 22.94 | 15.89 | 6.57 | 29.01 | 4.93 | 0.40 | 10.52 | 0.69 | 3.11 | 2.86 | 17.33 | 3.70 |
| 19 | 36.23 | 25.20 | 35.44 | 0.04 | 2.07 | 23.02 | 7.24 | 1.63 | 6.51 | 7.40 | 258.79 | 0.07 | 32.05 | 1.09 | 10.91 | 13.75 | 70.94 | 8.15 |
| 20 | 36.53 | 26.45 | 34.94 | 0.08 | 0.75 | 1.55 | 5.34 | 0.20 | 0.73 | 4.57 | 1381.77 | 0.09 | 155.40 | 0.69 | 18.82 | 19.21 | 41.47 | 2.98 |
| 21 | 36.63 | 26.78 | 34.96 | 0.07 | 0.34 | 12.25 | 9.49 | 0.78 | 3.51 | 27.60 | 1173.57 | 0.05 | 164.70 | 0.11 | 14.90 | 16.01 | 41.41 | 3.26 |
| 22 | 36.37 | 26.06 | 34.85 | 0.04 | 1.40 | 14.96 | 10.62 | 0.68 | 5.62 | 17.55 | 131.05 | 0.56 | 64.17 | 0.72 | 8.89 | 3.65 | 15.07 | 1.53 |
| 23 | 36.42 | 26.74 | 35.17 | 0.09 | 0.31 | 0.65 | 3.50 | 0.54 | 0.70 | 1.79 | 1301.25 | 0.08 | 159.00 | 0.20 | 15.87 | 18.00 | 37.51 | 2.37 |
| 24 | 36.23 | 27.83 | 34.58 | 0.03 | 0.26 | 2.78 | 7.12 | 0.28 | 7.10 | 18.47 | 203.36 | 0.95 | 71.88 | 0.17 | 6.43 | 5.81 | 30.19 | 3.87 |
| 25 | 36.42 | 27.41 | 34.89 | 0.04 | 0.08 | 1.44 | 3.94 | 1.63 | 5.24 | 6.68 | 268.17 | 0.85 | 160.53 | 0.19 | 5.14 | 42.83 | 198.28 | 22.50 |
| 26 | 35.97 | 26.41 | 34.99 | 0.07 | 1.32 | 5.17 | 10.69 | 0.88 | 30.71 | 4.27 | 989.89 | 0.15 | 257.43 | 0.37 | 12.71 | 32.99 | 104.26 | 8.35 |
| 27 | 36.47 | 25.08 | 34.97 | 0.14 | 2.13 | 56.28 | 16.63 | 7.34 | 9.59 | 87.35 | 66.51 | 1.83 | 169.06 | 1.84 | 10.86 | 3.32 | 32.58 | 7.05 |
| 28 | 37.05 | 26.80 | 34.51 | 0.05 | 0.50 | 1.17 | 5.62 | 0.90 | 0.86 | 1.46 | 21.75 | 0.06 | 13.90 | 0.12 | 1.16 | 10.20 | 43.90 | 5.39 |
| 29 | 36.83 | 27.40 | 34.18 | 0.08 | 0.38 | 13.99 | 15.03 | 1.09 | 7.68 | 39.51 | 49.12 | 0.67 | 35.34 | 0.12 | 3.42 | 4.11 | 28.72 | 4.93 |
| 30 | 36.16 | 27.42 | 34.14 | 0.12 | 0.63 | 6.01 | 8.17 | 2.50 | 9.03 | 15.31 | 200.84 | 0.63 | 92.58 | 0.38 | 6.89 | 24.06 | 107.22 | 12.82 |
| 31 | 36.19 | 27.17 | 34.34 | 0.18 | 0.84 | 26.43 | 15.05 | 3.06 | 9.95 | 87.10 | 240.76 | 0.49 | 491.86 | 0.50 | 20.60 | 21.08 | 169.51 | 33.80 |
| 32 | 36.01 | 27.07 | 34.49 | 0.15 | 0.75 | 13.95 | 7.76 | 4.18 | 8.23 | 9.15 | 1562.24 | 0.00 | 968.74 | 0.22 | 34.57 | 57.20 | 325.51 | 43.52 |
| 33 | 36.70 | 26.99 | 34.70 | 0.04 | 0.57 | 5.76 | 6.78 | 0.41 | 4.53 | 11.39 | 59.72 | 0.06 | 39.13 | 0.19 | 4.27 | 3.16 | 22.41 | 3.27 |
| 34 | 36.13 | 27.41 | 34.56 | 0.02 | 0.72 | 1.87 | 5.01 | 1.30 | 9.46 | 18.65 | 432.36 | 0.05 | 234.69 | 0.28 | 16.39 | 7.51 | 38.19 | 5.25 |
| 35 | 36.54 | 24.98 | 34.76 | 0.13 | 2.43 | 54.64 | 14.39 | 9.44 | 7.67 | 73.02 | 35.27 | 0.04 | 155.44 | 2.01 | 9.92 | 3.02 | 29.90 | 6.88 |
| 36 | 36.25 | 26.95 | 34.72 | 0.04 | 1.04 | 8.65 | 9.77 | 0.12 | 6.58 | 13.95 | 99.04 | 0.11 | 22.35 | 0.59 | 6.69 | 2.48 | 19.77 | 2.88 |
| 37 | 35.00 | 28.02 | 34.66 | 0.09 | 0.67 | 2.18 | 7.93 | 1.39 | 12.16 | 28.26 | 621.01 | 0.07 | 260.04 | 0.34 | 29.11 | 19.08 | 92.10 | 13.62 |
| 38 | 36.46 | 24.28 | 34.81 | 0.16 | 3.07 | 48.64 | 20.94 | 11.49 | 7.98 | 94.15 | 33.37 | 0.11 | 95.10 | 1.46 | 7.32 | 2.68 | 28.12 | 7.33 |
| 39 | 36.18 | 27.19 | 33.92 | 0.14 | 1.35 | 11.97 | 16.26 | 0.19 | 6.99 | 13.36 | 69.06 | 0.15 | 39.92 | 0.34 | 5.47 | 2.47 | 18.74 | 2.83 |
| 40 | 35.28 | 28.21 | 33.55 | 0.15 | 1.07 | 4.40 | 11.18 | 2.51 | 14.63 | 17.76 | 555.42 | 0.44 | 245.70 | 0.64 | 25.87 | 24.10 | 118.63 | 16.53 |
| 41 | 36.15 | 26.78 | 34.81 | 0.06 | 1.17 | 10.22 | 10.71 | 0.09 | 4.75 | 8.84 | 56.90 | 0.13 | 36.78 | 0.25 | 4.62 | 2.77 | 20.81 | 2.96 |
| 42 | 35.71 | 27.37 | 34.37 | 0.10 | 0.94 | 6.18 | 2.08 | 3.29 | 10.15 | 1.15 | 637.56 | 0.18 | 213.03 | 1.09 | 7.14 | 8.48 | 31.75 | 3.53 |
| 43 | 36.13 | 26.94 | 34.96 | 0.04 | 0.94 | 8.09 | 9.35 | 0.07 | 3.90 | 7.64 | 47.35 | 0.13 | 25.52 | 0.28 | 4.44 | 2.92 | 22.47 | 3.27 |
| 44 | 36.29 | 27.00 | 34.71 | 0.03 | 0.79 | 4.55 | 7.03 | 1.99 | 7.53 | 17.43 | 601.66 | 0.00 | 202.57 | 0.52 | 15.56 | 7.75 | 36.20 | 5.70 |
| 45 | 35.68 | 27.79 | 35.44 | 0.04 | 0.01 | 2.94 | 4.50 | 0.36 | 8.47 | 11.94 | 231.97 | 0.19 | 90.96 | 0.01 | 6.04 | 4.42 | 26.81 | 2.64 |
| 46 | 36.26 | 27.71 | 34.86 | 0.06 | 0.07 | 0.66 | 7.83 | 0.04 | 12.90 | 22.64 | 9.33 | 0.31 | 30.20 | 0.09 | 2.84 | 0.98 | 9.38 | 1.53 |
| 47 | 36.63 | 27.22 | 34.44 | 0.08 | 0.50 | 4.77 | 17.02 | 0.13 | 17.80 | 46.33 | 285.31 | 0.96 | 53.32 | 0.52 | 10.05 | 3.24 | 23.79 | 3.63 |
| 48 | 36.19 | 27.82 | 34.88 | 0.04 | 0.01 | 0.22 | 2.60 | 0.02 | 10.24 | 2.24 | 163.87 | 0.00 | 80.63 | 0.02 | 6.59 | 4.16 | 28.66 | 2.83 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Nd | Sm | Eu | Gd | Tb | Dy | Ho | Er | Tm | Yb | Lu | Hf | Y/Ho | ∑REE | (La/Yb)N | Eu/Eu\* |
| 7.44 | 0.50 | 2.63 | 0.24 | 0.03 | 0.15 | 0.02 | 0.09 | 0.01 | 0.10 | 0.02 | 0.03 | 33.97 | 25.95 | 8.50 | 23.34 |
| 94.58 | 7.09 | 8.73 | 1.12 | 0.07 | 0.40 | 0.07 | 0.18 | 0.02 | 0.12 | 0.02 | 0.02 | 23.33 | 220.09 | 44.65 | 9.47 |
| 159.17 | 13.93 | 10.33 | 1.85 | 0.05 | 0.14 | 0.02 | 0.02 | 0.00 | 0.05 | 0.00 | 0.00 | 20.50 | 384.39 | 261.62 | 6.22 |
| 7.44 | 0.47 | 1.41 | 0.23 | 0.02 | 0.17 | 0.02 | 0.06 | 0.01 | 0.00 | 0.01 | 0.00 | 31.79 | 19.21 | - | 13.14 |
| 32.81 | 1.39 | 6.17 | 0.39 | 0.02 | 0.15 | 0.02 | 0.03 | 0.00 | 0.03 | 0.01 | 0.02 | 23.68 | 98.60 | 132.42 | 25.69 |
| 145.50 | 16.81 | 10.05 | 2.71 | 0.11 | 0.38 | 0.08 | 0.16 | 0.02 | 0.13 | 0.02 | 0.00 | 25.40 | 319.66 | 65.42 | 4.55 |
| 163.42 | 12.02 | 10.78 | 1.74 | 0.06 | 0.10 | 0.01 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 21.47 | 394.96 | 652.94 | 7.20 |
| 37.95 | 1.42 | 3.18 | 0.46 | 0.03 | 0.26 | 0.04 | 0.09 | 0.01 | 0.11 | 0.02 | 0.01 | 34.47 | 130.22 | 51.69 | 12.06 |
| 12.14 | 0.24 | 3.27 | 0.04 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 53.87 | 43.43 | 268.09 | 106.64 |
| 156.63 | 6.55 | 10.79 | 0.57 | 0.03 | 0.08 | 0.01 | 0.03 | 0.00 | 0.02 | 0.00 | 0.00 | 25.44 | 409.73 | 811.28 | 17.14 |
| 119.56 | 3.17 | 8.36 | 0.34 | 0.02 | 0.11 | 0.01 | 0.06 | 0.01 | 0.05 | 0.00 | 0.00 | 30.06 | 362.70 | 251.60 | 24.76 |
| 3.60 | 0.23 | 0.74 | 0.25 | 0.02 | 0.08 | 0.02 | 0.08 | 0.00 | 0.00 | 0.01 | 0.02 | 33.01 | 34.93 | - | 9.33 |
| 35.60 | 1.81 | 2.17 | 0.47 | 0.05 | 0.17 | 0.05 | 0.10 | 0.02 | 0.13 | 0.01 | 0.13 | 27.62 | 83.03 | 15.48 | 7.22 |
| 54.20 | 4.90 | 2.25 | 1.76 | 0.13 | 0.63 | 0.08 | 0.16 | 0.02 | 0.14 | 0.02 | 0.03 | 40.03 | 121.29 | 18.34 | 2.34 |
| 15.26 | 0.45 | 0.68 | 0.13 | 0.00 | 0.03 | 0.01 | 0.03 | 0.00 | 0.01 | 0.01 | 0.00 | 27.62 | 61.13 | 195.33 | 8.51 |
| 26.73 | 0.82 | 0.90 | 0.20 | 0.01 | 0.04 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 36.78 | 169.89 | - | 6.67 |
| 23.80 | 1.55 | 0.89 | 0.94 | 0.10 | 0.64 | 0.14 | 0.45 | 0.07 | 0.54 | 0.09 | 0.26 | 31.33 | 145.22 | 23.85 | 2.24 |
| 18.58 | 3.02 | 2.34 | 2.41 | 0.32 | 2.08 | 0.51 | 1.32 | 0.23 | 1.37 | 0.25 | 1.62 | 31.39 | 56.32 | 1.49 | 2.65 |
| 26.52 | 1.81 | 1.01 | 0.63 | 0.06 | 0.29 | 0.06 | 0.13 | 0.02 | 0.14 | 0.02 | 0.00 | 27.62 | 123.52 | 70.09 | 2.89 |
| 5.38 | 0.24 | 0.47 | 0.14 | 0.01 | 0.06 | 0.01 | 0.05 | 0.01 | 0.03 | 0.00 | 0.00 | 32.94 | 70.04 | 524.75 | 7.57 |
| 6.62 | 0.52 | 0.86 | 0.27 | 0.02 | 0.15 | 0.02 | 0.04 | 0.01 | 0.04 | 0.01 | 0.00 | 45.87 | 69.25 | 276.48 | 7.07 |
| 4.06 | 0.36 | 0.50 | 0.23 | 0.02 | 0.10 | 0.02 | 0.05 | 0.01 | 0.05 | 0.01 | 0.02 | 42.56 | 25.64 | 53.89 | 5.27 |
| 4.61 | 0.18 | 0.38 | 0.14 | 0.01 | 0.10 | 0.02 | 0.04 | 0.01 | 0.02 | 0.01 | 0.00 | 32.76 | 63.41 | 599.16 | 7.13 |
| 11.06 | 0.54 | 1.49 | 0.18 | 0.01 | 0.04 | 0.02 | 0.03 | 0.00 | 0.03 | 0.00 | 0.01 | 15.37 | 53.27 | 130.21 | 14.58 |
| 59.26 | 2.50 | 5.88 | 0.98 | 0.08 | 0.41 | 0.05 | 0.10 | 0.01 | 0.04 | 0.00 | 0.01 | 35.02 | 332.92 | 826.60 | 11.46 |
| 15.58 | 0.34 | 1.62 | 0.25 | 0.03 | 0.12 | 0.03 | 0.08 | 0.01 | 0.08 | 0.01 | 0.06 | 28.12 | 163.74 | 301.67 | 16.97 |
| 32.88 | 2.12 | 8.61 | 1.15 | 0.17 | 1.00 | 0.21 | 0.68 | 0.09 | 0.60 | 0.09 | 0.68 | 34.73 | 90.56 | 3.97 | 16.83 |
| 15.01 | 0.87 | 1.41 | 0.33 | 0.03 | 0.11 | 0.03 | 0.06 | 0.01 | 0.10 | 0.01 | 0.01 | 35.02 | 77.45 | 75.27 | 8.10 |
| 22.25 | 1.93 | 2.60 | 0.42 | 0.03 | 0.19 | 0.04 | 0.13 | 0.01 | 0.12 | 0.01 | 0.03 | 26.05 | 65.48 | 24.98 | 8.82 |
| 36.52 | 1.67 | 4.21 | 0.64 | 0.07 | 0.40 | 0.09 | 0.22 | 0.05 | 0.21 | 0.04 | 0.04 | 28.49 | 188.23 | 83.64 | 12.43 |
| 143.74 | 7.31 | 11.85 | 1.17 | 0.11 | 0.54 | 0.11 | 0.26 | 0.02 | 0.24 | 0.04 | 0.03 | 28.77 | 389.78 | 63.16 | 12.41 |
| 105.43 | 1.69 | 7.80 | 1.07 | 0.10 | 0.69 | 0.16 | 0.35 | 0.06 | 0.29 | 0.05 | 0.09 | 26.72 | 543.90 | 142.89 | 17.75 |
| 9.03 | 0.49 | 1.26 | 0.15 | 0.02 | 0.06 | 0.01 | 0.05 | 0.01 | 0.06 | 0.01 | 0.01 | 33.26 | 39.98 | 36.42 | 14.28 |
| 18.56 | 1.14 | 3.07 | 0.44 | 0.05 | 0.23 | 0.05 | 0.08 | 0.02 | 0.05 | 0.01 | 0.01 | 26.64 | 74.63 | 101.99 | 13.24 |
| 33.73 | 3.33 | 7.95 | 1.40 | 0.21 | 1.29 | 0.28 | 0.77 | 0.11 | 0.82 | 0.11 | 0.79 | 34.13 | 89.78 | 2.63 | 11.26 |
| 8.33 | 0.24 | 1.79 | 0.14 | 0.01 | 0.03 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | - | 35.69 | 148.66 | 29.82 |
| 47.18 | 2.15 | 7.01 | 0.48 | 0.05 | 0.30 | 0.06 | 0.10 | 0.02 | 0.05 | 0.02 | 0.00 | 24.29 | 182.23 | 274.56 | 21.12 |
| 42.68 | 6.56 | 6.97 | 3.36 | 0.35 | 1.77 | 0.34 | 0.89 | 0.14 | 0.83 | 0.14 | 0.85 | 34.17 | 102.16 | 2.32 | 4.54 |
| 8.24 | 0.27 | 1.42 | 0.11 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | - | 34.12 | - | 24.89 |
| 47.00 | 1.51 | 6.52 | 0.62 | 0.08 | 0.47 | 0.10 | 0.25 | 0.02 | 0.16 | 0.03 | 0.03 | 25.25 | 216.04 | 106.35 | 20.58 |
| 7.94 | 0.36 | 1.12 | 0.08 | 0.01 | 0.03 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 22.49 | 36.11 | 107.08 | 19.47 |
| 8.73 | 0.60 | 0.94 | 0.44 | 0.08 | 0.52 | 0.11 | 0.29 | 0.04 | 0.25 | 0.04 | 0.00 | 29.14 | 55.79 | 24.29 | 5.56 |
| 8.39 | 0.34 | 0.82 | 0.12 | 0.00 | 0.05 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.15 | 38.39 | - | 12.59 |
| 20.47 | 0.99 | 1.55 | 0.37 | 0.05 | 0.28 | 0.06 | 0.18 | 0.03 | 0.24 | 0.03 | 0.00 | 30.88 | 73.91 | 23.40 | 7.80 |
| 4.36 | 0.12 | 1.55 | 0.00 | 0.01 | 0.06 | 0.00 | 0.04 | 0.01 | 0.02 | 0.00 | 0.01 | - | 40.04 | 141.30 | - |
| 4.49 | 0.15 | 2.04 | 0.03 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 15.34 | 18.63 | 40.61 | 93.56 |
| 10.71 | 0.33 | 2.90 | 0.00 | 0.00 | 0.02 | 0.00 | 0.03 | 0.01 | 0.02 | 0.00 | 0.00 | - | 44.69 | 96.82 | - |
| 3.59 | 0.04 | 1.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | - | 40.60 | 174.79 | - |

表3 城门山矽卡岩石榴子石U-Pb同位素定年结果

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Th | U | Th/U | 同位素比值 | | | | | | 年龄（Ma） | | 校正年龄（Ma） | |
|  | （10-6） | （10-6） |  | 207Pb/206Pb | 2δ | 207Pb/235U | 2δ | 206Pb/238U | 2δ | 206Pb/238U | 2δ | 206Pb/238U | 2δ |
| 1 | 0.060 | 3.577 | 0.017 | 0.0967 | 0.0117 | 0.3151 | 0.0374 | 0.0243 | 0.0007 | 154.8 | 4.6 | 146.0 | 4.4 |
| 2 | 0.749 | 12.875 | 0.058 | 0.4878 | 0.0170 | 3.3552 | 0.2513 | 0.0494 | 0.0022 | 310.7 | 13.7 | 147.3 | 6.7 |
| 3 | 0.288 | 14.337 | 0.020 | 0.1049 | 0.0136 | 0.3939 | 0.0800 | 0.0244 | 0.0009 | 153.4 | 4.6 | 144.8 | 5.3 |
| 4 | 3.061 | 6.265 | 0.488 | 0.1863 | 0.0291 | 0.8322 | 0.1724 | 0.0281 | 0.0016 | 178.2 | 10.2 | 149.0 | 8.6 |
| 5 | 1.110 | 5.187 | 0.214 | 0.1111 | 0.0093 | 0.3820 | 0.0335 | 0.0245 | 0.0006 | 156.2 | 4.0 | 144.6 | 3.7 |
| 6 | 1.258 | 4.945 | 0.254 | 0.0837 | 0.0095 | 0.2930 | 0.0334 | 0.0247 | 0.0006 | 157.5 | 3.8 | 150.9 | 3.7 |
| 7 | 0.349 | 5.993 | 0.058 | 0.3302 | 0.0314 | 1.7441 | 0.2713 | 0.0353 | 0.0022 | 223.4 | 13.9 | 148.3 | 9.4 |
| 8 | 0.323 | 12.279 | 0.026 | 0.0920 | 0.0057 | 0.3025 | 0.0189 | 0.0241 | 0.0005 | 153.4 | 2.8 | 145.5 | 2.7 |
| 9 | 0.472 | 21.323 | 0.022 | 0.1094 | 0.0065 | 0.3743 | 0.0237 | 0.0250 | 0.0004 | 159.3 | 2.6 | 147.8 | 2.4 |
| 10 | 0.607 | 23.499 | 0.026 | 0.0674 | 0.0033 | 0.2160 | 0.0104 | 0.0231 | 0.0003 | 147.4 | 2.2 | 144.2 | 2.1 |
| 11 | 0.457 | 21.877 | 0.021 | 0.0813 | 0.0046 | 0.2660 | 0.0153 | 0.0237 | 0.0004 | 150.8 | 2.3 | 145.0 | 2.2 |
| 12 | 0.705 | 21.342 | 0.033 | 0.0807 | 0.0051 | 0.2616 | 0.0153 | 0.0240 | 0.0003 | 153.1 | 1.9 | 147.3 | 1.8 |
| 13 | 0.026 | 5.381 | 0.005 | 0.0529 | 0.0051 | 0.1708 | 0.0176 | 0.0228 | 0.0005 | 145.4 | 3.4 | 144.7 | 3.4 |
| 14 | 0.112 | 29.275 | 0.004 | 0.0643 | 0.0027 | 0.2152 | 0.0098 | 0.0244 | 0.0006 | 155.7 | 3.5 | 152.8 | 3.5 |
| 15 | 0.260 | 22.293 | 0.012 | 0.0768 | 0.0051 | 0.2518 | 0.0172 | 0.0237 | 0.0003 | 150.9 | 2.0 | 145.9 | 1.9 |
| 16 | 0.051 | 23.664 | 0.002 | 0.0557 | 0.0023 | 0.1771 | 0.0073 | 0.0233 | 0.0003 | 148.3 | 2.1 | 147.1 | 2.1 |
| 17 | 0.075 | 24.922 | 0.003 | 0.0533 | 0.0024 | 0.1687 | 0.0078 | 0.0231 | 0.0003 | 147.0 | 1.8 | 146.2 | 1.8 |
| 18 | 0.172 | 20.421 | 0.008 | 0.0701 | 0.0033 | 0.2194 | 0.0104 | 0.0233 | 0.0003 | 148.4 | 2.2 | 144.7 | 2.2 |
| 19 | 0.636 | 9.555 | 0.067 | 0.1133 | 0.0091 | 0.3894 | 0.0356 | 0.0247 | 0.0005 | 157.1 | 3.1 | 145.0 | 2.9 |
| 20 | 0.957 | 4.743 | 0.202 | 0.2550 | 0.0234 | 1.1283 | 0.1370 | 0.0308 | 0.0012 | 195.7 | 7.7 | 147.4 | 5.9 |
| 21 | 0.364 | 20.775 | 0.018 | 0.0814 | 0.0066 | 0.2722 | 0.0256 | 0.0240 | 0.0004 | 152.6 | 2.8 | 146.7 | 2.8 |
| 22 | 1.757 | 5.553 | 0.316 | 0.2921 | 0.0241 | 1.3567 | 0.1587 | 0.0326 | 0.0014 | 206.6 | 8.6 | 146.4 | 6.2 |
| 23 | 0.019 | 16.759 | 0.001 | 0.0566 | 0.0037 | 0.1806 | 0.0114 | 0.0233 | 0.0004 | 148.6 | 2.4 | 147.3 | 2.4 |
| 24 | 0.006 | 8.430 | 0.001 | 0.1436 | 0.0111 | 0.5164 | 0.0415 | 0.0264 | 0.0006 | 167.7 | 3.6 | 148.7 | 3.2 |
| 25 | 1.034 | 17.529 | 0.059 | 0.1214 | 0.0099 | 0.4188 | 0.0358 | 0.0252 | 0.0004 | 160.2 | 2.8 | 146.3 | 2.6 |
| 26 | 0.652 | 12.743 | 0.051 | 0.1685 | 0.0132 | 0.6325 | 0.0570 | 0.0273 | 0.0007 | 173.8 | 4.5 | 148.9 | 3.9 |
| 27 | 0.194 | 21.273 | 0.009 | 0.0800 | 0.0053 | 0.2632 | 0.0187 | 0.0238 | 0.0004 | 151.7 | 2.2 | 146.1 | 2.2 |
| 28 | 0.445 | 11.371 | 0.039 | 0.2308 | 0.0158 | 0.9687 | 0.0760 | 0.0299 | 0.0006 | 190.1 | 3.5 | 148.6 | 2.8 |
| 29 | 1.273 | 17.765 | 0.072 | 0.2130 | 0.0142 | 0.8390 | 0.0679 | 0.0286 | 0.0007 | 181.6 | 4.2 | 145.9 | 3.5 |
| 30 | 0.820 | 15.372 | 0.053 | 0.2321 | 0.0110 | 0.9438 | 0.0565 | 0.0292 | 0.0007 | 185.7 | 4.3 | 144.9 | 3.4 |
| 31 | 0.022 | 8.623 | 0.003 | 0.4847 | 0.0231 | 3.3315 | 0.3301 | 0.0490 | 0.0028 | 308.2 | 17.3 | 147.3 | 8.5 |