|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 附表1 样品的主微量元素分析结果 | | |  |  |  |  |  |  |  |  | |  | |  |  |  |  |
| Table 1 The contents of major and trace element from the samples | | | | | |  |  |  |  |  | |  | |  |  |  |  |
| 岩性 | 辉绿岩 | | 煌斑岩 |  | 蚀变石英闪长玢岩 | |  |  |  | 花岗闪长斑岩 | | |  | |  |  | 白云岩 |
| 样品号 | JR-9 | JR-10 | JR-12 |  | JR-2 | JR-3 |  | JR-1 | JR-5 | JR-6 | JR-7 | | JR-8 | | TH-2 |  | JR-11 |
| 主量元素 | |  |  |  |  |  |  |  |  |  |  | |  | |  |  |  |
| SiO2 | 42.02 | 47.98 | 49.36 |  | 59.93 | 57.26 |  | 64.22 | 64.79 | 66.49 | 66.20 | | 65.10 | | 67.68 |  | 0.79 |
| TiO2 | 0.59 | 0.80 | 0.84 |  | 0.63 | 0.65 |  | 0.48 | 0.49 | 0.46 | 0.45 | | 0.46 | | 0.65 |  | 0.01 |
| Al2O3 | 19.12 | 24.00 | 14.48 |  | 15.41 | 14.62 |  | 14.57 | 15.66 | 15.13 | 14.41 | | 14.47 | | 15.08 |  | 0.18 |
| Fe2O3T | 2.32 | 2.18 | 7.95 |  | 2.39 | 3.96 |  | 3.09 | 1.67 | 2.74 | 2.54 | | 3.26 | | 3.18 |  | 1.13 |
| MnO | 0.08 | 0.05 | 0.11 |  | 0.05 | 0.06 |  | 0.02 | 0.01 | 0.03 | 0.03 | | 0.03 | | 0.06 |  | 0.17 |
| MgO | 4.96 | 2.38 | 5.04 |  | 2.18 | 6.67 |  | 2.10 | 2.16 | 1.65 | 1.65 | | 1.58 | | 0.94 |  | 21.79 |
| CaO | 10.06 | 5.63 | 7.77 |  | 4.30 | 3.92 |  | 2.51 | 2.17 | 2.82 | 3.09 | | 3.29 | | 2.07 |  | 29.87 |
| Na2O | 0.05 | 0.03 | 2.43 |  | 1.36 | 2.05 |  | 2.07 | 2.49 | 3.75 | 3.17 | | 2.68 | | 4.14 |  | 0.01 |
| K2O | 0.04 | 0.05 | 2.06 |  | 0.80 | 0.32 |  | 3.37 | 5.14 | 3.76 | 3.95 | | 3.68 | | 5.15 |  | 0.03 |
| P2O5 | 0.30 | 0.39 | 0.30 |  | 0.32 | 0.33 |  | 0.25 | 0.23 | 0.23 | 0.22 | | 0.22 | | 0.20 |  | 0.01 |
| 烧失量 | 20.41 | 16.5 | 9.14 |  | 12.59 | 10.1 |  | 7.32 | 4.61 | 2.94 | 3.78 | | 4.71 | | 0.29 |  | 46.00 |
| 总量 | 99.95 | 99.99 | 99.48 |  | 99.96 | 99.94 |  | 99.99 | 99.41 | 100.00 | 99.48 | | 99.48 | | 99.44 |  | 99.98 |
| K2O/Na2O | 0.80 | 1.89 | 0.85 |  | 0.59 | 0.16 |  | 1.63 | 2.06 | 1.00 | 1.25 | | 1.37 | | 1.24 |  | 2.90 |
| K2O+Na2O | 0.10 | 0.08 | 4.49 |  | 2.16 | 2.37 |  | 5.44 | 7.63 | 7.51 | 7.12 | | 6.36 | | 9.29 |  | 0.04 |
| Mg# | 80.90 | 68.38 | 55.67 |  | 64.37 | 76.94 |  | 57.38 | 71.93 | 54.40 | 56.27 | | 48.98 | | 36.88 |  | 97.45 |
| A/CNK | 2.06 | 4.59 | 1.09 |  | 2.19 | 2.01 |  | 1.56 | 1.35 | 1.18 | 1.17 | | 1.27 | | 1.06 |  | 0.01 |
| A/NK | 141.24 | 232.05 | 2.33 |  | 4.96 | 3.93 |  | 2.07 | 1.62 | 1.48 | 1.52 | | 1.72 | | 1.22 |  | 3.76 |
| CaO/Na2O | 186.30 | 201.07 | 3.20 |  | 3.16 | 1.91 |  | 1.21 | 0.87 | 0.75 | 0.97 | | 1.23 | | 0.50 |  | 2987.00 |
| 微量元素 | |  |  |  |  |  |  |  |  |  |  | |  | |  |  |  |
| Li | 40.52 | 0.31 | 15.85 |  | 14.90 | 33.64 |  | 10.96 | 11.38 | 10.48 | 10.06 | | 9.17 | |  |  | 12.84 |
| Be | 1.69 | 0.09 | 2.73 |  | 2.65 | 2.66 |  | 2.26 | 2.04 | 2.14 | 2.11 | | 2.07 | |  |  | 1.45 |
| P | 1309.14 | 1714.98 | 877.13 |  | 1378.97 | 1431.33 |  | 1077.86 | 994.95 | 981.86 | 942.58 | | 968.77 | |  |  | 39.27 |
| Sc | 9.17 | 0.13 | 4.90 |  | 6.38 | 7.97 |  | 6.04 | 5.50 | 5.85 | 5.38 | | 5.77 | |  |  | 20.56 |
| Ti | 3524.17 | 4800.79 | 3913.75 |  | 3763.91 | 3901.76 |  | 2846.91 | 2930.82 | 2774.99 | 2697.07 | | 2739.02 | |  |  | 35.96 |
| V | 189.42 | 13.02 | 40.61 |  | 75.81 | 70.77 |  | 63.38 | 60.07 | 62.17 | 56.88 | | 64.02 | |  |  | 174.42 |
| Cr | 47.89 | 6.68 | 2.90 |  | 81.22 | 80.44 |  | 48.60 | 41.37 | 38.12 | 35.82 | | 37.23 | |  |  | 202.18 |
| Mn | 619.57 | 387.23 | 472.42 |  | 379.48 | 464.67 |  | 154.89 | 54.21 | 224.59 | 193.61 | | 224.59 | |  |  | 1324.32 |
| Co | 1.70 | 1.84 | 5.26 |  | 4.28 | 5.59 |  | 13.95 | 3.77 | 8.30 | 8.86 | | 9.13 | |  |  | 23.28 |
| Ni | 14.97 | 11.78 | 3.12 |  | 29.11 | 25.13 |  | 36.09 | 28.87 | 23.10 | 25.93 | | 20.88 | |  |  | 74.90 |
| Cu | 467.28 | 70.02 | 6.00 |  | 216.74 | 22.17 |  | 346.60 | 608.18 | 93.15 | 277.72 | | 148.76 | |  |  | 20.19 |
| Zn | 62.67 | 25.80 | 56.25 |  | 274.91 | 42.77 |  | 25.50 | 11.78 | 27.46 | 20.12 | | 25.15 | |  |  | 68.13 |
| Ga | 36.31 | 0.49 | 20.70 |  | 20.54 | 14.67 |  | 19.56 | 19.38 | 20.29 | 18.34 | | 18.51 | |  |  | 17.38 |
| Rb | 2.62 | 0.19 | 125.62 |  | 55.00 | 14.12 |  | 114.10 | 144.69 | 94.98 | 96.91 | | 134.67 | |  |  | 84.89 |
| Sr | 48.10 | 68.39 | 413.55 |  | 274.79 | 319.52 |  | 328.08 | 708.92 | 681.46 | 636.03 | | 499.06 | |  |  | 489.05 |
| Y | 16.41 | 1.84 | 32.66 |  | 13.97 | 13.12 |  | 10.88 | 10.84 | 11.69 | 11.21 | | 11.80 | |  |  | 17.92 |
| Zr | 227.31 | 0.77 | 362.30 |  | 213.56 | 193.94 |  | 172.73 | 169.63 | 170.08 | 171.60 | | 160.33 | |  |  | 121.23 |
| Nb | 10.99 | 0.03 | 30.48 |  | 11.57 | 10.04 |  | 10.29 | 10.58 | 10.85 | 10.16 | | 10.62 | |  |  | 8.02 |
| Sn | 16.68 | 0.19 | 2.22 |  | 1.48 | 1.80 |  | 0.52 | 1.03 | 0.91 | 0.87 | | 1.23 | |  |  | 1.05 |
| Cs | 0.85 | 0.03 | 1.12 |  | 37.33 | 5.60 |  | 5.56 | 7.08 | 2.74 | 3.26 | | 3.45 | |  |  | 47.24 |
| Ba | 7.54 | 2.68 | 1268.01 |  | 99.53 | 106.90 |  | 743.30 | 2776.98 | 1235.21 | 1110.12 | | 846.14 | |  |  | 503.75 |
| La | 133.99 | 0.58 | 110.35 |  | 41.40 | 42.00 |  | 46.68 | 42.34 | 44.34 | 44.35 | | 46.85 | |  |  | 27.58 |
| Ce | 246.09 | 1.16 | 200.02 |  | 96.66 | 90.86 |  | 84.41 | 80.26 | 85.74 | 83.38 | | 84.97 | |  |  | 57.62 |
| Pr | 26.23 | 0.15 | 20.06 |  | 11.13 | 10.09 |  | 9.03 | 8.69 | 8.92 | 8.86 | | 8.93 | |  |  | 6.68 |
| Nd | 93.80 | 0.58 | 68.69 |  | 41.15 | 38.27 |  | 32.38 | 31.60 | 32.63 | 31.82 | | 31.96 | |  |  | 26.46 |
| Sm | 13.59 | 0.16 | 10.62 |  | 6.72 | 6.31 |  | 5.23 | 5.19 | 5.19 | 5.18 | | 5.10 | |  |  | 5.08 |
| Eu | 1.79 | 0.04 | 1.93 |  | 1.28 | 1.14 |  | 1.21 | 1.40 | 1.34 | 1.30 | | 1.19 | |  |  | 1.47 |
| Gd | 8.88 | 0.15 | 7.68 |  | 4.54 | 4.43 |  | 3.39 | 3.59 | 3.52 | 3.55 | | 3.63 | |  |  | 4.37 |
| Tb | 0.86 | 0.03 | 1.11 |  | 0.53 | 0.55 |  | 0.41 | 0.43 | 0.42 | 0.46 | | 0.44 | |  |  | 0.64 |
| Dy | 3.56 | 0.16 | 6.13 |  | 2.73 | 2.63 |  | 2.16 | 2.14 | 2.21 | 2.22 | | 2.30 | |  |  | 3.49 |
| Ho | 0.54 | 0.04 | 1.13 |  | 0.48 | 0.47 |  | 0.41 | 0.39 | 0.40 | 0.38 | | 0.41 | |  |  | 0.65 |
| Er | 1.41 | 0.13 | 3.07 |  | 1.31 | 1.23 |  | 1.04 | 1.03 | 1.08 | 1.06 | | 1.10 | |  |  | 1.85 |
| Tm | 0.16 | 0.01 | 0.46 |  | 0.18 | 0.16 |  | 0.14 | 0.14 | 0.16 | 0.14 | | 0.14 | |  |  | 0.26 |
| Yb | 1.02 | 0.11 | 2.84 |  | 1.01 | 1.01 |  | 0.89 | 0.87 | 1.02 | 0.98 | | 0.94 | |  |  | 1.54 |
| Lu | 0.16 | 0.01 | 0.39 |  | 0.15 | 0.14 |  | 0.13 | 0.12 | 0.15 | 0.15 | | 0.15 | |  |  | 0.22 |
| Hf | 5.81 | 0.02 | 8.80 |  | 5.21 | 4.92 |  | 4.64 | 4.41 | 4.40 | 4.48 | | 4.20 | |  |  | 3.07 |
| Ta | 0.92 | 0.01 | 2.05 |  | 0.65 | 0.59 |  | 0.67 | 0.68 | 0.65 | 0.62 | | 0.65 | |  |  | 0.49 |
| Pb | 4.24 | 2.05 | 25.67 |  | 792.27 | 3.14 |  | 8.37 | 12.55 | 10.62 | 9.36 | | 13.49 | |  |  | 6.78 |
| Th | 27.12 | 0.05 | 22.54 |  | 18.45 | 15.26 |  | 18.30 | 14.30 | 15.01 | 14.98 | | 15.61 | |  |  | 6.60 |
| U | 14.98 | 3.19 | 2.42 |  | 2.89 | 2.62 |  | 2.54 | 2.73 | 3.04 | 3.15 | | 3.20 | |  |  | 1.35 |
| TREE | 532.08 | 3.32 | 434.48 |  | 209.26 | 199.28 |  | 187.51 | 178.16 | 187.13 | 183.83 | | 188.12 | |  |  | 137.92 |
| Nb/Ta | 11.93 | 5.11 | 14.90 |  | 17.75 | 17.03 |  | 15.28 | 15.66 | 16.74 | 16.44 | | 16.36 | |  |  | 16.34 |
| Sr/Y | 2.93 | 37.08 | 12.66 |  | 19.68 | 24.35 |  | 30.16 | 65.43 | 58.31 | 56.72 | | 42.29 | |  |  | 27.28 |
| (La/Yb)N | 88.72 | 3.44 | 26.17 |  | 27.60 | 28.09 |  | 35.25 | 32.86 | 29.29 | 30.49 | | 33.66 | |  |  | 12.07 |
| Eu/Eu\* | 0.47 | 0.82 | 0.63 |  | 0.67 | 0.63 |  | 0.83 | 0.94 | 0.91 | 0.88 | | 0.80 | |  |  | 0.93 |
| (La/Sm)N | 6.20 | 2.35 | 6.53 |  | 3.88 | 4.19 |  | 5.62 | 5.13 | 5.37 | 5.39 | | 5.77 | |  |  | 3.42 |
| (Gd/Yb)N | 7.03 | 1.04 | 2.18 |  | 3.62 | 3.55 |  | 3.06 | 3.33 | 2.78 | 2.92 | | 3.12 | |  |  | 2.29 |
| 注: 主量元素含量为质量百分数（%），微量元素含量为质量分数（10－6）。 | | | | | | | | |  |  |  | |  | |  |  |  |
| Mg# = 100×molar Mg/(Mg + Fe)；(FeOT = 0.8998×Fe2O3T)；A/CNK = molar Al2O3/(CaO+Na2O+K2O)；A/NK = molar Al2O3/(Na2O+K2O)； | | | | | | | | | | | | |  | |  |  |  |
| Eu/Eu\* = EuN/[√(SmN \* GdN)]；(La/Yb)N, (La/Sm)N and (Gd/Yb)N, N = chondrite normalized to values of Sun and McDonough (1989)；TREE = La + Ce + Pr + Nd + Sm + Eu + Gd + Tb + Dy + Ho + Er + Tm + Yb + Lu. | | | | | | | | | | | | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 附表2 样品的Li-Nd-Sr 同位素数据 | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Table 2 Li-Nd-Sr isotopic data of the samples | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 样品号 | Rb | Sr | 87Rb/ | 87Sr/ | 2 | ISr | Sm | Nd | 147Sm/ | 143Nd/ | 2 | Nd(0) | fSm/Nd | Nd(T) | TDM | Li | δ7Li | 2 |
|  | （ppm） | （ppm） | 86Sr | 86Sr |  |  | （ppm） | （ppm） | 144Nd | 144Nd |  |  |  |  | （Ga） | （ppm） | （‰） |  |
| 基性岩脉 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| JR-9 | 2.6 | 48.10 | 3.0871 | 0.708513 | 6 | 0.70281 | 13.59 | 93.80 | 0.1190 | 0.512260 | 7 | -7.4 | -0.40 | -6.1 | 1.43 | 42.82 | -4.88 | 0.04 |
| JR-10 | 3.1 | 27.46 | 3.4298 | 0.708615 | 5 | 0.70228 | 3.35 | 15.52 | 0.1217 | 0.512321 | 4 | -6.2 | -0.38 | -4.9 | 1.37 | 56.85 | -4.78 | 0.05 |
| JR-12 | 84.9 | 489.05 | 4.1152 | 0.706592 | 9 | 0.69899 | 5.08 | 26.46 | 0.1271 | 0.512360 | 2 | -5.4 | -0.35 | -4.3 | 1.39 | 13.85 | 0.55 | 0.09 |
| 白云岩 | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| JR-11 | 0.2 | 68.39 | 3.7725 | 0.709805 | 5 | 0.70283 |  |  |  |  |  |  |  |  |  | 40.54 | -5.60 | 0.08 |
| 蚀变石英闪长玢岩 | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| JR-2 | 55.0 | 274.79 | 0.5805 | 0.707828 | 5 | 0.70676 | 6.72 | 41.15 | 0.0987 | 0.512305 | 2 | -6.5 | -0.50 | -4.9 | 1.12 | 15.85 | -4.41 | 0.02 |
| JR-3 | 14.1 | 319.52 | 0.1281 | 0.707001 | 5 | 0.70676 | 6.31 | 38.27 | 0.0997 | 0.512317 | 2 | -6.3 | -0.49 | -4.7 | 1.11 | 40.58 | -5.57 | 0.07 |
| 花岗闪长斑岩 | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| JR-1 | 114.1 | 328.08 | 1.0086 | 0.709265 | 5 | 0.70740 | 5.23 | 32.38 | 0.0976 | 0.512310 | 3 | -6.4 | -0.50 | -4.8 | 1.10 | 11.56 | 3.16 | 0.06 |
| JR-5 | 144.7 | 708.92 | 0.5919 | 0.708059 | 6 | 0.70697 | 5.19 | 31.60 | 0.0993 | 0.512318 | 3 | -6.2 | -0.50 | -4.6 | 1.11 | 12.17 | 1.54 | 0.10 |
| JR-6 | 95.0 | 681.46 | 0.4042 | 0.707511 | 7 | 0.70676 | 5.19 | 32.63 | 0.0962 | 0.512313 | 3 | -6.3 | -0.51 | -4.7 | 1.09 | 11.50 | 0.92 | 0.12 |
| JR-7 | 96.9 | 636.03 | 2.4017 | 0.707426 | 7 | 0.70299 | 5.18 | 31.82 | 0.1135 | 0.512306 | 3 | -6.5 | -0.42 | -5.1 | 1.28 | 10.76 | 1.59 | 0.09 |
| JR-8 | 134.7 | 499.06 | 2.7444 | 0.708430 | 8 | 0.70336 | 5.10 | 31.96 | 0.1163 | 0.512322 | 4 | -6.2 | -0.41 | -4.8 | 1.29 | 10.05 | 2.93 | 0.01 |
| TH-2 | 125.6 | 413.55 | 4.4578 | 0.709218 | 4 | 0.70098 | 10.62 | 68.69 | 0.1299 | 0.511712 | 6 | -18.1 | -0.34 | -17.0 | 2.60 | 15.95 | 3.05 | 0.04 |
| 注：: Nd = ((143Nd/144Nd)s/(143Nd/144Nd)CHUR -1) x 10000, fSm/Nd = (147Sm/144Nd)s/(147Sm/144Nd)CHUR - 1, (143Nd/144Nd)CHUR = | | | | | | | | | | | | | |  |  |  |  |  |
| 0.512638， (147Sm/144Sm)CHUR = 0.1967. | | | | | | | | | | | | | |  |  |  |  |  |
| TDM = 1/x ln(1 + ((143Nd/144Nd)s - 0.51315)/((147Sm/144Nd)s - 0.2137)). | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |