Table S1 Composition of soluble salt of surface sediments in the salt lakes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sampling sites | EC/ms·cm-1 | Salinity/ ‰ | TDS/g·L-1 | pH | soluble salt ions content /ppm |
| K+ | Na+ | Ca2+ | Mg2+ | Cl- | SO2- 4 | CO2- 3 | HCO2- 3 |
| BP-1 | 2.69 | 1.5 | 1.92 | 8.62 | 12.71 | 32.16 | 638.11 | 33.13 | 5.32 | 1657.44 | 7.20 | 19.04 |
| BP-2 | 2.45 | 1.3 | 1.7 | 8.71 | 17.69 | 190.12 | 350.82 | 23.43 | 89.22 | 1146.42 | 7.20 | 7.32 |
| BP-3 | 10.2 | 5.7 | 7.06 | 8.54 | 30.72 | 1725.60 | 370.64 | 150.52 | 2156.01 | 1886.97 | 7.20 | 14.64 |
| BP-4 | 10.4 | 5.8 | 7.38 | 8.88 | 27.81 | 2018.59 | 55.07 | 147.83 | 2355.23 | 1450.89 | 7.20 | 29.28 |
| BP-5 | 9.1 | 5 | 6.24 | 8.6 | 21.46 | 1411.60 | 672.89 | 85.16 | 1299.49 | 2890.72 | 0 | 36.61 |
| BP-6 | 9.1 | 5.1 | 6.3 | 8.72 | 23.37 | 1493.37 | 627.88 | 88.91 | 1130.74 | 3221.39 | 0 | 29.28 |
| BP-7 | 15.3 | 8.5 | 10.8 | 8.82 | 36.51 | 2949.97 | 640.46 | 172.96 | 2422.85 | 4669.64 | 7.20 | 23.43 |
| BP-8 | 29.4 | 16.2 | 20.5 | 8.49 | 71.38 | 6268.75 | 644.32 | 472.22 | 5485.35 | 8165.87 | 0 | 43.93 |
| BP-9 | 7.3 | 4.1 | 5.09 | 8.55 | 29.87 | 1067.10 | 627.70 | 92.67 | 918.22 | 2610.36 | 0 | 39.53 |
| GP-1 | 1.91 | 1.1 | 1.35 | 8.83 | 4.36 | 320.11 | 19.34 | 38.13 | 261.60 | 387.23 | 7.20 | 51.25 |
| GP-2 | 5.5 | 3 | 3.83 | 8.54 | 7.49 | 954.00 | 46.01 | 125.54 | 1191.70 | 760.98 | 0 | 73.21 |
| GP-3 | 10.6 | 5.9 | 7.36 | 8.29 | 9.75 | 1465.92 | 448.68 | 417.38 | 2219.07 | 2325.14 | 0 | 46.86 |
| GP-4 | 6.2 | 3.4 | 4.37 | 8.53 | 9.20 | 919.93 | 307.40 | 244.99 | 1323.40 | 1557.39 | 0 | 36.61 |
| GP-5 | 9.7 | 5.4 | 6.77 | 8.37 | 10.67 | 1349.50 | 423.63 | 365.25 | 2014.96 | 2164.33 | 0 | 41.00 |
| GP-6 | 5.1 | 2.9 | 3.58 | 8.57 | 11.84 | 860.20 | 133.37 | 189.98 | 984.45 | 1341.68 | 0 | 46.86 |
| GP-7 | 7.2 | 4 | 5.02 | 8.25 | 22.64 | 1038.31 | 658.96 | 260.11 | 1039.55 | 3024.48 | 0 | 74.68 |
| GP-8 | 5.9 | 3.5 | 4.08 | 8.4 | 21.43 | 866.81 | 338.28 | 215.36 | 902.89 | 2015.43 | 0 | 60.03 |
| GP-9 | 9.9 | 5.5 | 6.92 | 8.88 | 33.56 | 1321.38 | 663.80 | 390.85 | 1374.96 | 3558.07 | 0 | 212.32 |
| Ch-1 | 1.04 | 0.6 | 0.74 | 10.4 | 81.30 | 321.05 | 110.71 | 74.48 | 10.81 | 10.71 | 230.44 | 0 |
| Ch-2 | 0.45 | 0.3 | 0.31 | 10.19 | 33.14 | 112.51 | 50.42 | 31.94 | 4.15 | 10.18 | 63.37 | 0 |
| Ch-3 | 5.1 | 2.8 | 3.58 | 10.94 | 82.46 | 1361.62 | 32.78 | 33.96 | 63.23 | 15.65 | 339.90 | 0 |
| Ch-4 | 0.58 | 0.3 | 0.41 | 10.38 | 46.30 | 132.76 | 32.33 | 24.30 | 9.48 | 10.00 | 69.13 | 0 |
| Ch-5 | 3.14 | 1.8 | 2.18 | 10.25 | 92.33 | 700.85 | 10.97 | 14.28 | 375.64 | 68.60 | 155.55 | 0 |
| Ch-6 | 17.2 | 9.6 | 12.2 | 10.75 | 436.44 | 4548.57 | 1.01 | 21.31 | 2154.35 | 474.76 | 2448.42 | 0 |
| Ch-7 | 12.5 | 6.8 | 8.58 | 10.47 | 351.46 | 2945.20 | 2.72 | 11.80 | 2062.81 | 428.20 | 1209.81 | 0 |
| Ch-8 | 12.7 | 7.2 | 8.89 | 10.55 | 409.05 | 3001.07 | 3.20 | 13.87 | 2168.54 | 481.35 | 1209.81 | 0 |
| Ch-9 | 8.3 | 4.7 | 5.93 | 10.45 | 265.29 | 1879.56 | 1.40 | 10.10 | 1462.17 | 393.47 | 518.49 | 0 |
| HJ-1 | 0.11 | 0.1 | 0.07 | 9.51 | 7.09 | 10.02 | 5.68 | 3.59 | 1.89 | 9.78 | 8.64 | 35.14 |
| HJ-2 | 0.32 | 0.2 | 0.22 | 9.29 | 10.45 | 47.96 | 7.49 | 8.93 | 3.26 | 56.89 | 6.05 | 95.18 |
| HJ-3 | 0.24 | 0.1 | 0.17 | 9.64 | 6.51 | 39.89 | 6.17 | 4.82 | 7.84 | 23.03 | 8.64 | 84.93 |
| HJ-4 | 0.15 | 0.1 | 0.11 | 9.73 | 4.58 | 23.49 | 5.93 | 2.97 | 2.76 | 14.01 | 15.84 | 42.46 |
| HJ-5 | 0.51 | 0.3 | 0.36 | 9.77 | 10.24 | 95.57 | 10.92 | 3.93 | 19.19 | 96.02 | 21.60 | 70.28 |
| HJ-6 | 0.36 | 0.2 | 0.25 | 9.05 | 9.97 | 63.85 | 6.05 | 5.18 | 25.95 | 22.40 | 5.04 | 118.60 |
| HJ-7 | 0.86 | 0.5 | 0.60 | 9.35 | 11.51 | 156.87 | 10.27 | 5.63 | 94.77 | 73.29 | 6.05 | 166.92 |

Table S2 The fraction from risk assessment code (%) of surface sediments in the salt lakes

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sample Fraction | Cr | Ni | Cu | Zn | As | Cd | Pb |
| BP-6-F1 | 0.25 | 3.38 | 4.30 | 0.31 | 0.86 | 2.12 | 0.07 |
| BP-6-F2 | 10.36 | 26.29 | 45.35 | 31.76 | 24.19 | 8.90 | 0.27 |
| BP-6-F3 | 2.30 | 4.85 | 0.50 | 3.79 | 16.85 | 24.37 | 1.76 |
| BP-6-F4 | 24.82 | 16.53 | 7.53 | 5.72 | 13.08 | 50.15 | 0.35 |
| BP-6-F5 | 62.27 | 48.95 | 42.33 | 58.42 | 45.01 | 14.46 | 97.56 |
| BP-7-F1 | 0.32 | 0.47 | 4.66 | 0.13 | 0.57 | 1.40 | 0.03 |
| BP-7-F2 | 8.98 | 24.27 | 37.57 | 28.60 | 12.81 | 11.20 | 0.31 |
| BP-7-F3 | 3.02 | 5.98 | 0.55 | 3.92 | 14.55 | 37.11 | 1.05 |
| BP-7-F4 | 24.64 | 14.76 | 8.15 | 6.33 | 10.69 | 40.76 | 0.26 |
| BP-7-F5 | 63.04 | 54.52 | 49.07 | 61.01 | 61.38 | 9.52 | 98.35 |
| Ch-7-F1 | 4.16 | 9.31 | 25.32 | 11.63 | 7.75 | 13.56 | 3.55 |
| Ch-7-F2 | 6.60 | 23.41 | 23.00 | 19.59 | 6.99 | 5.75 | 0.29 |
| Ch-7-F3 | 1.73 | 6.02 | 1.46 | 1.83 | 19.68 | 12.19 | 0.96 |
| Ch-7-F4 | 22.14 | 11.83 | 3.46 | 4.10 | 10.69 | 23.97 | 0.06 |
| Ch-7-F5 | 65.36 | 49.43 | 46.76 | 62.84 | 54.89 | 44.52 | 95.14 |
| Ch-8-F1 | 6.56 | 12.13 | 33.09 | 13.06 | 13.25 | 13.62 | 7.35 |
| Ch-8-F2 | 8.83 | 24.77 | 30.46 | 25.92 | 9.69 | 5.05 | 0.31 |
| Ch-8-F3 | 2.08 | 6.23 | 1.44 | 2.97 | 21.44 | 10.49 | 1.16 |
| Ch-8-F4 | 24.73 | 13.52 | 2.99 | 3.40 | 11.04 | 41.68 | 0.08 |
| Ch-8-F5 | 57.80 | 43.35 | 32.02 | 54.65 | 44.58 | 29.16 | 91.10 |
| HJ-5-F1 | 1.64 | 1.08 | 2.08 | 1.53 | 1.51 | 2.00 | 0.92 |
| HJ-5-F2 | 5.59 | 24.73 | 27.08 | 19.62 | 9.37 | 11.11 | 0.32 |
| HJ-5-F3 | 2.92 | 8.15 | 1.19 | 8.99 | 17.79 | 45.33 | 0.63 |
| HJ-5-F4 | 34.29 | 14.71 | 5.97 | 5.24 | 11.03 | 22.22 | 0.07 |
| HJ-5-F5 | 55.56 | 51.33 | 63.68 | 64.62 | 60.30 | 19.33 | 98.06 |
| HJ-4-F1 | 0.86 | 1.34 | 2.84 | 2.82 | 1.49 | 1.07 | 0.52 |
| HJ-4-F2 | 5.50 | 24.31 | 22.72 | 19.35 | 9.55 | 7.83 | 0.43 |
| HJ-4-F3 | 2.94 | 9.23 | 1.58 | 4.29 | 20.90 | 25.80 | 0.49 |
| HJ-4-F4 | 39.56 | 20.58 | 6.75 | 10.11 | 13.12 | 19.75 | 0.06 |
| HJ-4-F5 | 51.14 | 44.53 | 66.11 | 63.43 | 54.94 | 45.55 | 98.49 |
| GP-7-F1 | 0.23 | 2.16 | 2.62 | 0.23 | 0.94 | 2.75 | 0.02 |
| GP-7-F2 | 6.18 | 27.65 | 43.15 | 30.62 | 27.74 | 11.72 | 0.21 |
| GP-7-F3 | 4.20 | 5.31 | 1.99 | 4.47 | 17.51 | 20.57 | 1.50 |
| GP-7-F4 | 20.94 | 14.36 | 7.22 | 5.65 | 9.49 | 39.83 | 0.43 |
| GP-7-F5 | 68.45 | 50.51 | 45.02 | 59.04 | 44.32 | 25.12 | 97.84 |
| GP-8-F1 | 0.32 | 0.49 | 2.44 | 0.18 | 0.74 | 1.96 | 0.07 |
| GP-8-F2 | 5.86 | 28.07 | 41.23 | 26.75 | 21.25 | 13.85 | 0.62 |
| GP-8-F3 | 3.60 | 5.32 | 1.72 | 3.76 | 15.19 | 27.69 | 1.47 |
| GP-8-F4 | 22.41 | 12.87 | 4.84 | 3.53 | 7.94 | 28.11 | 0.30 |
| GP-8-F5 | 67.80 | 53.24 | 49.76 | 65.78 | 54.88 | 28.39 | 97.54 |

Table S3 The *Eir* and RI value of surface sediments in the salt lakes

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sampling sites | Cr | Ni | Cu | Zn | As | Cd | Pb | RI |
| BP-1 | 4.41 | 7.86 | 4.63 | 1.05 | 2.51 | 17.01 | 3.82 | 41.31 |
| BP-2 | 6.24 | 6.48 | 4.71 | 1.27 | 2.01 | 16.90 | 4.97 | 42.57 |
| BP-3 | 10.56 | 6.41 | 6.43 | 1.38 | 0.82 | 17.34 | 5.54 | 48.47 |
| BP-4 | 6.16 | 6.86 | 7.95 | 1.36 | 0.87 | 15.72 | 5.18 | 44.10 |
| BP-5 | 4.10 | 8.81 | 5.63 | 1.10 | 0.15 | 11.65 | 3.74 | 35.18 |
| BP-6 | 6.09 | 8.73 | 4.39 | 1.02 | 0.53 | 14.42 | 3.18 | 38.34 |
| BP-7 | 6.45 | 7.61 | 5.39 | 1.26 | 0.37 | 13.92 | 4.54 | 39.54 |
| BP-8 | 4.30 | 11.40 | 11.08 | 2.13 | 1.18 | 23.51 | 6.19 | 59.80 |
| BP-9 | 5.16 | 11.62 | 9.16 | 1.84 | 1.43 | 23.78 | 5.87 | 58.86 |
| GP-1 | 6.09 | 10.39 | 7.93 | 1.72 | 1.57 | 15.90 | 5.49 | 49.09 |
| GP-2 | 5.95 | 16.06 | 13.83 | 2.82 | 2.14 | 30.54 | 8.11 | 79.45 |
| GP-3 | 6.34 | 12.98 | 10.36 | 2.11 | 1.27 | 23.93 | 5.95 | 62.94 |
| GP-4 | 6.09 | 11.18 | 8.72 | 1.87 | 0.85 | 19.87 | 5.85 | 54.42 |
| GP-5 | 7.20 | 11.77 | 9.43 | 1.91 | 1.09 | 17.74 | 5.72 | 54.85 |
| GP-6 | 5.34 | 9.39 | 7.02 | 1.52 | 1.44 | 14.71 | 5.35 | 44.77 |
| GP-7 | 5.62 | 8.99 | 6.62 | 1.53 | 1.82 | 22.84 | 5.20 | 52.62 |
| GP-8 | 5.56 | 7.76 | 6.08 | 1.29 | 1.11 | 13.78 | 5.26 | 40.85 |
| GP-9 | 5.31 | 8.21 | 6.11 | 1.36 | 1.57 | 19.09 | 5.09 | 46.72 |
| Ch-1 | 11.50 | 7.21 | 5.60 | 1.36 | 2.88 | 14.19 | 5.73 | 48.48 |
| Ch-2 | 10.71 | 4.01 | 3.49 | 0.95 | 2.74 | 10.56 | 5.78 | 38.23 |
| Ch-3 | 13.09 | 4.16 | 3.32 | 0.83 | 1.53 | 7.70 | 5.66 | 36.29 |
| Ch-4 | 12.83 | 3.57 | 3.05 | 0.73 | 2.51 | 8.23 | 5.37 | 36.29 |
| Ch-5 | 13.32 | 4.27 | 3.59 | 0.93 | 1.45 | 8.82 | 5.84 | 38.22 |
| Ch-6 | 6.91 | 3.88 | 2.96 | 0.72 | 0.64 | 9.13 | 4.77 | 29.01 |
| Ch-7 | 9.60 | 3.33 | 2.93 | 0.79 | 0.74 | 9.34 | 5.31 | 32.03 |
| Ch-8 | 8.33 | 4.45 | 3.56 | 0.86 | 0.86 | 10.62 | 5.30 | 33.98 |
| Ch-9 | 12.66 | 3.28 | 2.22 | 0.61 | 0.72 | 8.07 | 5.46 | 33.02 |
| HJ-1 | 21.11 | 5.74 | 4.60 | 1.24 | 2.04 | 11.01 | 6.11 | 51.85 |
| HJ-2 | 18.53 | 4.00 | 3.10 | 0.81 | 1.93 | 10.88 | 5.76 | 45.01 |
| HJ-3 | 10.62 | 3.11 | 2.14 | 0.62 | 0.10 | 9.79 | 6.11 | 32.49 |
| HJ-4 | 6.27 | 2.96 | 2.29 | 0.62 | 1.91 | 9.22 | 6.02 | 29.28 |
| HJ-5 | 8.08 | 4.31 | 3.03 | 0.87 | 2.20 | 12.70 | 5.81 | 36.99 |
| HJ-6 | 10.49 | 5.91 | 4.16 | 1.03 | 2.44 | 12.93 | 6.13 | 43.09 |
| HJ-7 | 8.62 | 2.63 | 2.04 | 0.53 | 1.39 | 7.24 | 6.04 | 28.50 |

Table S4 The correlations between the concertation of heavy metals and influencing factors in the first group (pH<9) according to Pearson's correlation analysis.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | pH | K+ | Na+ | Cl- | SO2- 4 | HCO2-3 | Al2O3 | Ni | Cu | Zn | As | Cd | Pb  | Cr | SiO2 |
| pH | Pearson's correlation | 1 | -.351 | -.224 | -.213 | -.341 | -.309 | .119 | -.564 | -.409 | -.503 | -.208 | -.576 | -.352 | .065 | -.073 |
| Significance (bilateral) | 　 | .354 | .563 | .582 | .369 | .419 | .760 | .113 | .274 | .167 | .591 | .105 | .353 | .867 | .852 |
| K+ | Pearson's correlation | -.351 | 1 | .974\*\* | .957\*\* | .911\*\* | .574 | .388 | .554 | .802\*\* | .827\*\* | -.236 | .563 | .638 | -.091 | .116 |
| Significance (bilateral) | .354 | 　 | .000 | .000 | .001 | .106 | .302 | .121 | .009 | .006 | .541 | .114 | .064 | .815 | .767 |
| Na+ | Pearson's correlation | -.224 | .974\*\* | 1 | .983\*\* | .927\*\* | .585 | .314 | .471 | .712\* | .694\* | -.361 | .379 | .490 | -.124 | -.043 |
| Significance (bilateral) | .563 | .000 | 　 | .000 | .000 | .098 | .411 | .200 | .031 | .038 | .340 | .314 | .181 | .751 | .912 |
| Cl- | Pearson's correlation | -.213 | .957\*\* | .983\*\* | 1 | .848\*\* | .548 | .427 | .386 | .743\* | .694\* | -.380 | .370 | .551 | -.010 | .022 |
| Significance (bilateral) | .582 | .000 | .000 | 　 | .004 | .127 | .252 | .305 | .022 | .038 | .312 | .328 | .124 | .980 | .955 |
| SO2-4 | Pearson's correlation | -.341 | .911\*\* | .927\*\* | .848\*\* | 1 | .631 | .018 | .636 | .588 | .631 | -.284 | .383 | .314 | -.323 | -.204 |
| Significance (bilateral) | .369 | .001 | .000 | .004 | 　 | .069 | .964 | .065 | .096 | .068 | .459 | .309 | .410 | .397 | .598 |
| HCO2-3 | Pearson's correlation | -.309 | .574 | .585 | .548 | .631 | 1 | -.127 | .858\*\* | .696\* | .558 | -.381 | .363 | .204 | -.567 | -.334 |
| Significance (bilateral) | .419 | .106 | .098 | .127 | .069 | 　 | .745 | .003 | .037 | .119 | .311 | .337 | .599 | .112 | .379 |
| Al2O3 | Pearson's correlation | .119 | .388 | .314 | .427 | .018 | -.127 | 1 | -.196 | .531 | .528 | .016 | .378 | .832\*\* | .491 | .813\*\* |
| Significance (bilateral) | .760 | .302 | .411 | .252 | .964 | .745 | 　 | .614 | .141 | .144 | .968 | .316 | .005 | .180 | .008 |
| Ni | Pearson's correlation | -.564 | .554 | .471 | .386 | .636 | .858\*\* | -.196 | 1 | .673\* | .687\* | -.024 | .659 | .311 | -.581 | -.143 |
| Significance (bilateral) | .113 | .121 | .200 | .305 | .065 | .003 | .614 | 　 | .047 | .041 | .951 | .054 | .415 | .101 | .713 |
| Cu | Pearson's correlation | -.409 | .802\*\* | .712\* | .743\* | .588 | .696\* | .531 | .673\* | 1 | .946\*\* | -.035 | .780\* | .826\*\* | -.180 | .353 |
| Significance (bilateral) | .274 | .009 | .031 | .022 | .096 | .037 | .141 | .047 | 　 | .000 | .928 | .013 | .006 | .642 | .352 |
| Zn | Pearson's correlation | -.503 | .827\*\* | .694\* | .694\* | .631 | .558 | .528 | .687\* | .946\*\* | 1 | .091 | .884\*\* | .886\*\* | -.123 | .479 |
| Significance (bilateral) | .167 | .006 | .038 | .038 | .068 | .119 | .144 | .041 | .000 | 　 | .816 | .002 | .001 | .752 | .192 |
| As | Pearson's correlation | -.208 | -.236 | -.361 | -.380 | -.284 | -.381 | .016 | -.024 | -.035 | .091 | 1 | .457 | .164 | -.191 | .400 |
| Significance (bilateral) | .591 | .541 | .340 | .312 | .459 | .311 | .968 | .951 | .928 | .816 | 　 | .216 | .674 | .623 | .287 |
| Cd | Pearson's correlation | -.576 | .563 | .379 | .370 | .383 | .363 | .378 | .659 | .780\* | .884\*\* | .457 | 1 | .787\* | -.106 | .504 |
| Significance (bilateral) | .105 | .114 | .314 | .328 | .309 | .337 | .316 | .054 | .013 | .002 | .216 | 　 | .012 | .785 | .166 |
| Pb  | Pearson's correlation | -.352 | .638 | .490 | .551 | .314 | .204 | .832\*\* | .311 | .826\*\* | .886\*\* | .164 | .787\* | 1 | .214 | .792\* |
| Significance (bilateral) | .353 | .064 | .181 | .124 | .410 | .599 | .005 | .415 | .006 | .001 | .674 | .012 | 　 | .581 | .011 |
| Cr | Pearson's correlation | .065 | -.091 | -.124 | -.010 | -.323 | -.567 | .491 | -.581 | -.180 | -.123 | -.191 | -.106 | .214 | 1 | .361 |
| Significance (bilateral) | .867 | .815 | .751 | .980 | .397 | .112 | .180 | .101 | .642 | .752 | .623 | .785 | .581 | 　 | .340 |
| SiO2 | Pearson's correlation | -.073 | .116 | -.043 | .022 | -.204 | -.334 | .813\*\* | -.143 | .353 | .479 | .400 | .504 | .792\* | .361 | 1 |
| Significance (bilateral) | .852 | .767 | .912 | .955 | .598 | .379 | .008 | .713 | .352 | .192 | .287 | .166 | .011 | .340 | 　 |

\*\*. Correlation is significant at 0.01 level (bilateral).

\*. Correlation is significant at 0.05 level (bilateral).

Table S5 The correlations between the concertation of heavy metals and influencing factors in the first group (pH>9) according to Pearson's correlation analysis.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | pH | K+ | Na+ | Cl- | SO2- 4 | HCO2-3 | Al2O3 | Ni | Cu | Zn | As | Cd | Pb  | Cr | SiO2 |
| pH | Pearson's correlation | 1 | .123 | -.422 | -.495 | -.211 | .556 | -.178 | -.177 | -.174 | -.158 | .171 | -.240 | -.076 | -.342 | -.041 |
| Significance (bilateral) |  | .754 | .258 | .176 | .585 | .120 | .646 | .649 | .654 | .686 | .660 | .534 | .847 | .367 | .916 |
| K+ | Pearson's correlation | .123 | 1 | .386 | .034 | .854\*\* | .810\*\* | -.729\* | -.663 | -.632 | -.624 | .076 | -.164 | -.502 | -.561 | -.774\* |
| Significance (bilateral) | .754 |  | .305 | .932 | .003 | .008 | .026 | .051 | .068 | .073 | .846 | .673 | .169 | .116 | .014 |
| Na+ | Pearson's correlation | -.422 | .386 | 1 | .927\*\* | .725\* | .297 | -.039 | .148 | .146 | .106 | -.160 | .326 | .010 | .264 | -.637 |
| Significance (bilateral) | .258 | .305 |  | .000 | .027 | .437 | .921 | .704 | .708 | .785 | .681 | .392 | .980 | .493 | .065 |
| Cl- | Pearson's correlation | -.495 | .034 | .927\*\* | 1 | .466 | -.009 | .200 | .364 | .349 | .297 | -.318 | .337 | .138 | .537 | -.340 |
| Significance (bilateral) | .176 | .932 | .000 |  | .206 | .981 | .606 | .336 | .357 | .437 | .404 | .375 | .723 | .136 | .370 |
| SO2-4 | Pearson's correlation | -.211 | .854\*\* | .725\* | .466 | 1 | .612 | -.670\* | -.479 | -.478 | -.482 | -.111 | -.018 | -.506 | -.189 | -.802\*\* |
| Significance (bilateral) | .585 | .003 | .027 | .206 |  | .080 | .049 | .193 | .193 | .189 | .776 | .964 | .164 | .627 | .009 |
| HCO2-3 | Pearson's correlation | .556 | .810\*\* | .297 | -.009 | .612 | 1 | -.481 | -.333 | -.311 | -.294 | .325 | .069 | -.193 | -.494 | -.810\*\* |
| Significance (bilateral) | .120 | .008 | .437 | .981 | .080 |  | .190 | .380 | .416 | .442 | .394 | .860 | .618 | .176 | .008 |
| Al2O3 | Pearson's correlation | -.178 | -.729\* | -.039 | .200 | -.670\* | -.481 | 1 | .905\*\* | .925\*\* | .902\*\* | .208 | .566 | .905\*\* | .408 | .376 |
| Significance (bilateral) | .646 | .026 | .921 | .606 | .049 | .190 |  | .001 | .000 | .001 | .591 | .112 | .001 | .275 | .319 |
| Ni | Pearson's correlation | -.177 | -.663 | .148 | .364 | -.479 | -.333 | .905\*\* | 1 | .995\*\* | .993\*\* | .319 | .785\* | .917\*\* | .515 | .112 |
| Significance (bilateral) | .649 | .051 | .704 | .336 | .193 | .380 | .001 |  | .000 | .000 | .403 | .012 | .001 | .156 | .775 |
| Cu | Pearson's correlation | -.174 | -.632 | .146 | .349 | -.478 | -.311 | .925\*\* | .995\*\* | 1 | .995\*\* | .331 | .785\* | .943\*\* | .494 | .103 |
| Significance (bilateral) | .654 | .068 | .708 | .357 | .193 | .416 | .000 | .000 |  | .000 | .384 | .012 | .000 | .177 | .792 |
| Zn | Pearson's correlation | -.158 | -.624 | .106 | .297 | -.482 | -.294 | .902\*\* | .993\*\* | .995\*\* | 1 | .390 | .822\*\* | .951\*\* | .450 | .076 |
| Significance (bilateral) | .686 | .073 | .785 | .437 | .189 | .442 | .001 | .000 | .000 |  | .300 | .007 | .000 | .224 | .846 |
| As | Pearson's correlation | .171 | .076 | -.160 | -.318 | -.111 | .325 | .208 | .319 | .331 | .390 | 1 | .593 | .479 | -.344 | -.404 |
| Significance (bilateral) | .660 | .846 | .681 | .404 | .776 | .394 | .591 | .403 | .384 | .300 |  | .092 | .192 | .365 | .280 |
| Cd | Pearson's correlation | -.240 | -.164 | .326 | .337 | -.018 | .069 | .566 | .785\* | .785\* | .822\*\* | .593 | 1 | .794\* | .138 | -.411 |
| Significance (bilateral) | .534 | .673 | .392 | .375 | .964 | .860 | .112 | .012 | .012 | .007 | .092 |  | .011 | .723 | .272 |
| Pb  | Pearson's correlation | -.076 | -.502 | .010 | .138 | -.506 | -.193 | .905\*\* | .917\*\* | .943\*\* | .951\*\* | .479 | .794\* | 1 | .245 | .041 |
| Significance (bilateral) | .847 | .169 | .980 | .723 | .164 | .618 | .001 | .001 | .000 | .000 | .192 | .011 |  | .526 | .917 |
| Cr | Pearson's correlation | -.342 | -.561 | .264 | .537 | -.189 | -.494 | .408 | .515 | .494 | .450 | -.344 | .138 | .245 | 1 | .313 |
| Significance (bilateral) | .367 | .116 | .493 | .136 | .627 | .176 | .275 | .156 | .177 | .224 | .365 | .723 | .526 |  | .413 |
| SiO2 | Pearson's correlation | -.041 | -.774\* | -.637 | -.340 | -.802\*\* | -.810\*\* | .376 | .112 | .103 | .076 | -.404 | -.411 | .041 | .313 | 1 |
| Significance (bilateral) | .916 | .014 | .065 | .370 | .009 | .008 | .319 | .775 | .792 | .846 | .280 | .272 | .917 | .413 |  |
| \*\*. Correlation is significant at 0.01 level (bilateral).\*. Correlation is significant at 0.05 level (bilateral). |