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## Relationship between geochemical zoning and mineralization in Qinling Mountains area, China

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Regional geochemical mapping is a fundamental tool for mineral exploration. In this paper, based on the regional geochemical survey data, geochemical zoning analysis have been carried out to reveal the relationship between the geochemical zoning and mineralization in Qinling Mountains region, China. A series of important geochemical indicator indexes have been constructed to distinguish geochemical zone including relative concentration coefficient ( $K_i$ ) which means the ratio of the measured value to the average value for each elements, siderophile elements concentration coefficient ( $K_T$ ) which indicates the ratio of measured value to average value for siderophile elements, affinity Basic element index ( $M$ ) which means the ratio of the sum  $K_i$  value of Fe, Mn, V, Ti to Cr, Co, V, Ni, as well as some other ratio dictators La/Y, Li/Th, Li/Th and La/Y. According to the value of geochemical indicator indexes listed in Table 1, the study area was divided into four geochemical provinces and seven secondary geochemical belts. The mineralization characteristics of the four geochemical provinces in Qinling Mountains region are as below: (1) the southern margin of North China Craton geochemical province, characterized by low  $K_T$  and high Th, La/Y, accompanies Au, Ag, Cu, Pb, Zn polymetallic ore deposit in this region; (2) the northern margin of Yangtze platform geochemical province, characterized by high  $K_T$  and Li, low La/Y and  $M$ , is an important Au, Ag, Cu, Pb, Zn, Hg, Sb polymetallic mineralization area; (3) north Qinling Mountains geochemical province, characterized by high Th,  $K_T$  and widespread acidic rock, is an important Au, Cu, Pb, Zn, Sb polymetallic metallogenic area; and (4) Songfan-Ganzi geochemical province, characterized by high  $M$ , retaining the original geological features, is an important siderophile elements such as Fe, Co, Ni polymetallic metallogenic area.

Table 1 Geochemical indicator indexes in Qinling Mountains region

Parameters	
extreme enrichment	
enrichment	
normal	
depletion	

extreme depletion
$K_i$
>1.50
1.20–1.50
0.80–1.20
0.50–0.80
<0.50
$K_T$
>9.50
7.50–9.50
6.50–7.50
4.50–6.50
<4.50
M
Highest
Higher
normal
lower
lowest
Stratum La/Y
>3.10
2.30–3.10
1.50–2.30
0.70–1.50
<0.70
Stratum Li/Th
<2.50
2.50–3.50

>4.50
3.50—4.50
Granite Li/Th
<1.20
1.20—2.00
>2.80
2.00—2.80
Granite La/Y
>3.80
3.10—3.80
2.40—3.80
1.70—2.40
<1.70
Li/Th
Highest Th
Higher Th
Higher Li
Highest Li

