

MOBILITY OF ELEMENTS DURING LAMPROPHYRE ALTERATION IN THE ZHENYUAN GOLD DEPOSITS, YUNNAN PROVINCE, CHINA: IMPLICATION FOR THE COMPOSITION AND ORIGIN OF ALTERED FLUIDS

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Lamprophyres are one of the rock types which are easily subject to alteration. Alteration can not only change their texture and mineral assemblage, but also influence their geochemistry properties. The most available data show that alteration will directly influence the content of Au in lamprophyres. Lamprophyres are widely exposed in the Zhenyuan gold deposits, Yunnan Province, China, and they are closely associated with gold mineralization both in space and in time. Lamprophyres in the ore field have undergone varying-degree alteration and partly experienced mineralization. This paper used the mass equilibrium equation and charting method proposed by Grant (1986) to calculate the mobilities of elements during lamprophyre alteration in the ore field. Comparison with the gain or loss values and the relative gain/loss ratios of the calculating results, we found the fluids responsible for the alteration of lamprophyres in the Zhenyuan gold deposits are a kind of alkaline (K₂O) fluids which contained the transition elements (Sc, V, Cr, Co, Ni), the lithophile elements (Rb, Sr, Ba, U, Th, Nb, LREE, HREE), volatile elements (F, Cl, CO₂) and the sulfophile elements (or ore-forming elements) (Cu, Zn, As, Sb, Au, Ag) were enriched in SiO₂ and Al₂O₃. Lots of evidences suggested that this kind of altered fluids seems to be the products of differentiation of lamprophyre magmas when they had evolved till later stages.