

Migration characteristics of elements during hydrothermal alteration in Nariniya porphyry-type Pb-Zn deposit of the Tuotuohe Region, Qinghai–Tibet Plateau

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The Tuotuohe region is located in the Qiangtang massif, in the hinterland of the Qinghai–Tibet Plateau. The Nariniya porphyry-type Pb-Zn deposit was discovered recently in Tuotuohe region, and is spatially associated with the quartz syenite porphyry, with the host rocks of trachyandesite.

To constrain the migration characteristics of elements during hydrothermal alteration, representative samples of altered and fresh trachyandesites were analyzed by XRF (major elements), and ICP-MS (trace elements).

Element gains and losses on a weight basis have been calculated following Grant's approach (Grant, 1986) and using TiO_2 as the immobile elements. The gains and losses of major and trace elements for the samples are shown graphically in Figure 1.

Figure 1 indicates large gains of SiO_2 , K_2O , Pb and Zn, and Al_2O_3 and Rb with a modest gains. Quite the contrary, the CaO, MgO, Na_2O , Sr and Ba are depleted. Losses in CaO, Na_2O , Sr and Ba and strong gains in K_2O most likely indicate K feldspar-biotite alteration. And the same effect of K feldspar-biotite alteration in combination with silicified alteration were at work sending SiO_2 , Pb and Zn on the upward trend. In other words, K feldspar-biotite alteration and silicified alteration have been a primary cause of enrichment of metals in the Pb and Zn.

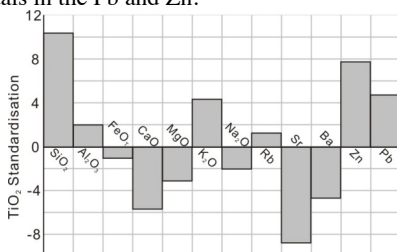


Figure 1: Gains and losses of major and trace elements for the alteration assemblages (Rb, Sr and Ba displayed as 0.4%; Pb and Zn displayed as 4%).

[1] Grant, J. A. (1986). *Economic Geology* **81**, 1976-1982