# Geological features and lead-zinc mineralization of the Kelan Devonian volcano-sedimentary basin in southern Altay, Xinjiang, China

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Located in rift of the Devonian continental margin of Siberia plate, the Kelan basin is the biggest one of southern Altay mountains, north Xinjiang. As large-scale and multiple-stage volcanic activities were occurred in the early Devonian epoch, copper, lead, and zinc poly-metallic ore deposits, i.e., Qiaxia, Tiemierte, Abagong, Dadonggou, were formed in the volcanic sedimentary stratum of Kangbutiebao group. The volcanic activities got weakened in the middle Devonian epoch, and then occurred SEDEX-type lead and zinc mineralization, i.e., Hongdun deposit.

Geological features and distribution of typical deposits show that the known deposits were characterized by: (1) The formation of Pb-Zn deposits is controlled by NW-trending faults, volcanic-sedimentary basins, hydrothermal fluid and eruption centers. (2) Their orebody occurrence is uniform with the stratum and characterized by stratabound formation and stable thickness. (3) Ore structures are predominantly banded, disseminated, and veinlet-disseminated textures with relatively simple ore mineral composition, i.e., galena, sphalerite, pyrite. (4) Most of the deposits were altered by hydrothermal fluid. Wall-rock alteration is well developed, and skarnization was closely related to Pb-Zn mineralization.

All of these features show that the discovered deposits in Kelan basin are of volcanic sedimentary-exhalative type, and multiple-stage wall-rock alterations indicate that Pb-Zn deposits were formed in different phase or environment.

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# Tectonic settings of mafic volcanic rocks in Shanbaishan Basin

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Sanbaishan Basin locates in the Southern China. Mafic volcanic rocks in Sanbaishan Basin have been dominantly classified as tholeiite series. The mafic rocks have features of $SiO_2$=46.13~48.54(%), TiO2>2%, $K_2O$<1%, $Na_2O$<$K_2O$, SI=21~38. It has crystallization differentiation, no assimilation. It is highly-differentiated, large ion lithosphere elements and high field strength elements are rich, δEu=1.3~1.6, La/Yb=8.63~15.57, La/Eu=3.27~5.28, Gd/Lu= 18.2~19.4, rich in LREE.

Different tectonic settings are quite different in their Th, Ta, Hf characters [1]. The Th/Ta ratios of basalts within the continent are greater than 1.6 which is the value of primary mantle. The Th/Ta ratios of the mafic volcanic rocks are between 2.45 and 8.2, meanly 4, the concentration of Ta is between 1.04 and $2.00\times10^{-6}$, the Hf/Th ratios are between 0.48 and 1.25 which is obviously lower than 8, all these characters imply their intraplate origin. Th/Ta = 2.45~8.20, Ta/Hf = 0.25~0.34, which is consistent with the values (>1.6 and >0.1 respectively) of continental intraplate basalt.

The tectonic setting of the volcanic rocks in Southern China was influenced by the plate tectonic activities. The mafic volcanic rocks in Sanbaishan Basin were formed within the continent in an extensional tectonic setting and may have experienced crystallization differentiation.

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[1] Wang & Zhang (2001) *Acta Petrologica Sinica* **17**(3) 413-421.