Longhua quartz vein Ni-Co-Bi-Au deposit in Guangxi Zhuang Autonomous region, China: a new type of hydrothermal Ni deposits?

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Hydrothermal Ni systems are poorly understood due to the rarity of Ni occurrences or deposits reported [1]. Most of the hydrothermal Ni deposits[1] are adjacent to the mafic-ultramafic suites. The Longhua hydrothermal Ni-Co-Bi-Au deposit in the Jinxiu county, Guangxi Zhuang Autonomous Region, China, differs greatly from the hydrothermal Ni deposits reported in mineral assemblages and geological settings. The Longhua hydrothermal Ni-Co-Bi-Au deposit occurred as quartz-mineralization veins in the fracture zone in the Cambrian carbonaceous mudstone and siltstone and no mafic-ultramafic rocks have been found in the region. The main mineralization vein is more than 120 m in length and about 1 m in thickness. The ore minerals are niccolite, cobaltite, native bismuth and native gold, with small amount of gersdoriffite, chalcopyrite and pyrite. Gangue mineral is composed of quartz, calcite, chlorite, sericite and chalcedony. Mineral assemblage of nicclite with calcedony is popular. The Longhua hydrothermal Ni-Co-Bi-Au deposit is characterized by very high content of Ni and the Ni concentration is up to 25%-27% locally, with Co: 0.5%-6.7%, Bi: 0.3%-3.8% and Au:0.4-2.5ppm. Homogeneous temperature of mineralized quartz fluid inclusions is less than 200°C, which is supported by much lower temperature mineral assemblage such as calcedony with niccilite. Although nickel sulfides (NiS) solubility in hydrothermal systems is very lower[2], the discovery of Longhua low temperature hydrothermal Ni deposit with rare sulfide suggests that Ni could be disolved in low temperature arsenic rich fluid and more attention shoud be paid on the geochemical features of Ni in low temperature fluids. The Longhua hydrothermal Ni deposit which has special element association such as Ni-Co-Bi-Au, characterized by very high concentraion of Ni, could be attributed to a new type of hydrothermal Ni deposit.

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[1] González-Álvarez I *et al* (2013) *Ore Geol Rev*, **52**, 1-3 [2] Liu *et al* (2012) *Geochim. Cosmochim. Acta*, **94**, 276-290.