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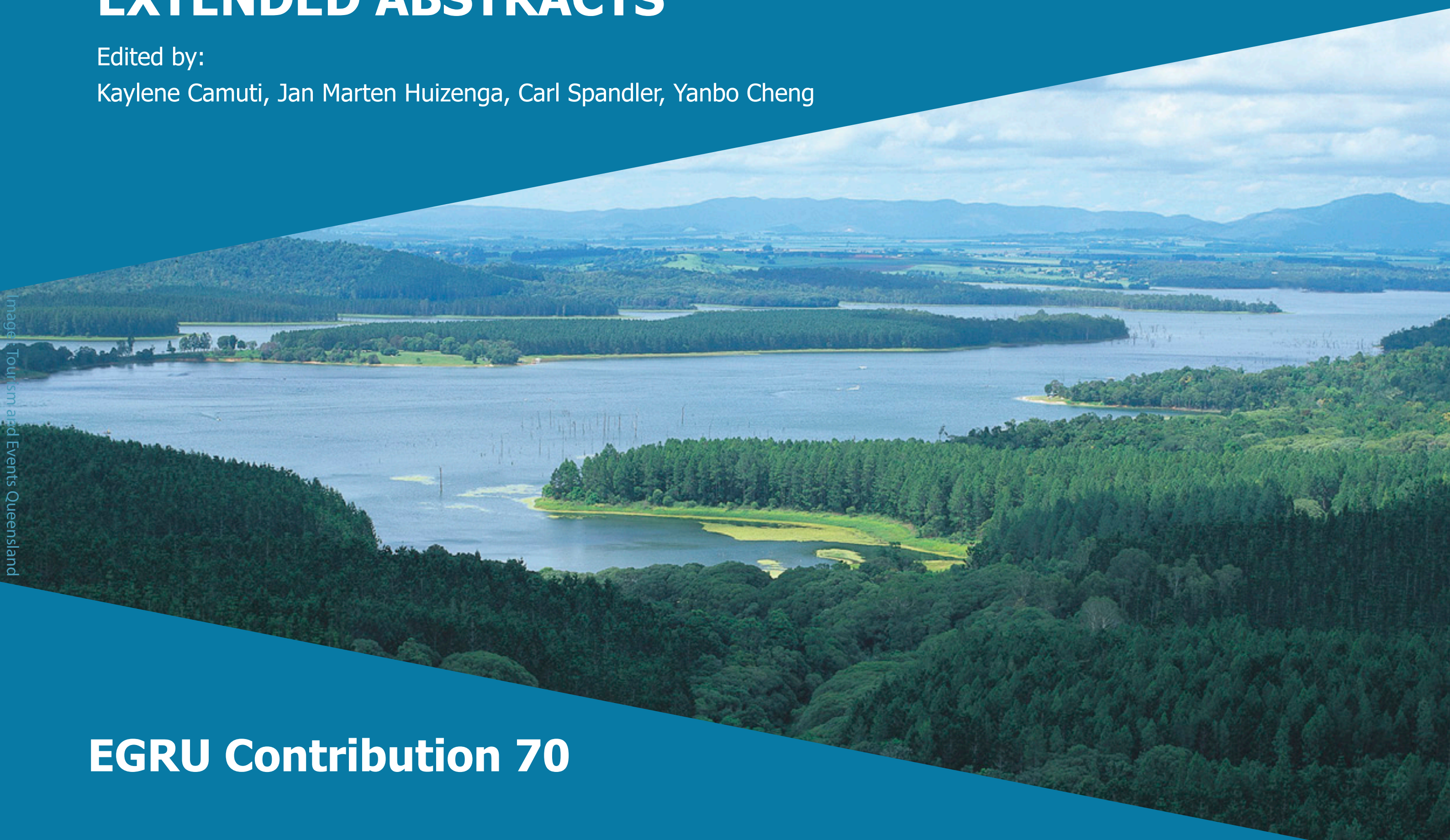
Sn-W-Critical Metals & Associated Magmatic Systems

An International Geological Conference

24th - 28th June 2019
Tinaroo Lake Resort
Atherton Tablelands
Queensland, Australia

EXTENDED ABSTRACTS

Edited by:
Kaylene Camuti, Jan Marten Huizenga, Carl Spandler, Yanbo Cheng



EGRU Contribution 70

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Enquiries
egru@jcu.edu.au

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Geological features of the Jiaoxi tungsten deposit in the western Bangong-Nujiang metallogenic belt, Tibet, China

Yong Wang[1], Juxing Tang[2], Liqiang Wang[2], Jan Marten Huizenga[3]
[1]School of Earth Sciences and Resources, China University of Geosciences, Beijing, China
[2]Institute of Mineral Resources, Chinese Academy of Geological Sciences, China, Beijing
[3]Economic Geology Research Centre, College of Science and Engineering, James Cook University, Townsville, Qld, Australia

Introduction

The Tibetan Plateau includes two important metallogenic belts, the Gangdese metallogenic zone in southern Tibet and the newly delimited Bangong-Nujiang metallogenic belt in central Tibet (Geng et al., 2016). The Bangong-Nujiang metallogenic belt is considered to be a Fe-Cu-Au metallogenic belt since the discovery of the Tiegelongnan giant porphyry-epithermal Cu-Au deposit (Tang et al., 2014), the Duobuza large porphyry deposit (Li et al., 2012) and the Ga'erqiong-Galale large skarn Cu-Au deposit (Zhang et al., 2015). The Jiaoxi quartz vein-type tungsten deposit (WO_3: 39,000 t, Wang et al., 2018) is the first quartz-vein type tungsten deposit found in this belt.

Geological features

The Jiaoxi deposit is located in the Shiquanhe-Nam Tso Mélange Zone. The strata exposed in the district includes the Early Cretaceous Shiquanhe ophiolite mélange of sandstone, shale and sheet of ophiolite. Sandstones and shales in the deposit area have been locally metamorphosed, due to the emplacement of the granites in this area. Intrusions in the deposit includes biotite monzogranite porphyry, granite porphyry and muscovite monzogranite. Muscovite monzogranite has only been found in drill core at a depth of 402 to 415 m.

Tungsten-bearing quartz vein is the main mineralization type in this deposit. The extensional veins are subvertical and strike approximately north-south. Wolframite and scheelite coexist with chalcopyrite, pyrite, molybdenite, galena, sphalerite, quartz, beryl, lepidomelane, fluorite, ankerite and topaz (Fig. 1a). So far, around 70 tungsten orebodies have been discovered at surface. The orebodies are mainly hosted in the sandstone and shales (Fig. 1b, c, d). However, drill core inspection revealed that the biotite monzogranite porphyry and the muscovite monzogranite also host some orebodies (Fig.1g, h).

Three stages of mineralization have been identified. The first, prominent, oxide stage is characterized by the development of the following vein types:

- rare quartz + molybdenite ± feldspar (in the biotite monzogranite only) veins (Fig. 2f),
- quartz + wolframite + lepidomelane veins (Fig. 2h);
- quartz + wolframite veins (Fig. 2c);
- quartz + wolframite + fluorite veins (Fig. 1b);
- quartz + pyrite +wolframite + lepidomelane veins (Fig. 1d), and
- quartz + lepidomelane + beryl + topaz veins.

The second sulfide stage is characterized by different types of sulfide-bearing veins, including ;

- quartz + pyrite + chalcopyrite + galena + sphalerite veins (Fig. 2i), and
- quartz + pyrrhotite + chalcopyrite veins and the quartz + lepidomelane + pyrite + chalcopyrite veins.

The final fluorite-carbonate stage is characterized by pure fluorite veins, pure ankerite veins, fluorite + lepidomelane veins, quartz + pyrite veins, lepidomelane + scheelite veins and minor quartz + calcite veins.

W-Nb-Ta mineralization potential

The discovery of Ta-Nb oxides-containing pegmatite in the northeast of Jiaoxi deposit (Fig. 3a, b), indicates the potential for W-Nb-Ta mineralization in this district. Field data indicate that this pegmatite is exposed at a large scale in this district.

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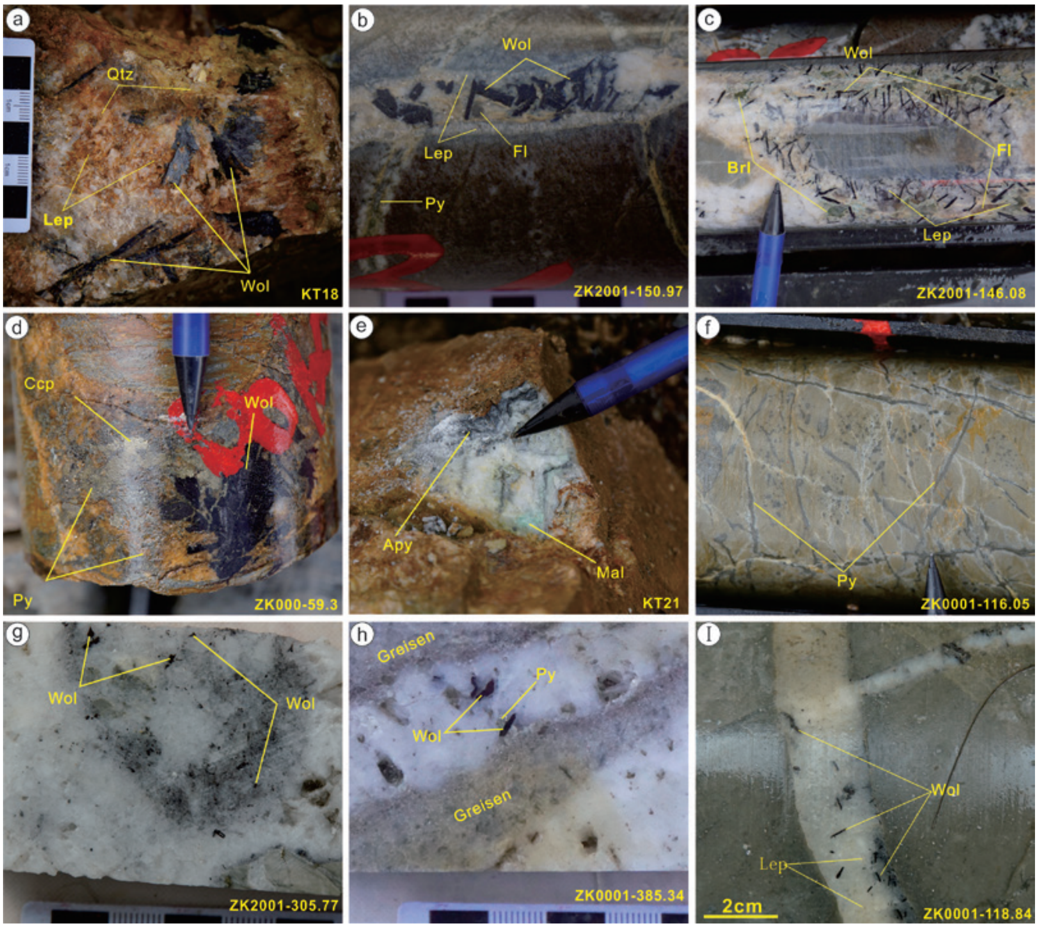

Figure 1. Photographs of mineralization features in Jiaoxi deposit. Apy = arsenopyrite; Brl = beryl; Ccp = Chalcopyrite; Fl = fluorite; Lep = lepidomelane; Py = pyrite; Mal = malachite; Qtz = quartz; Wol = wolframite.

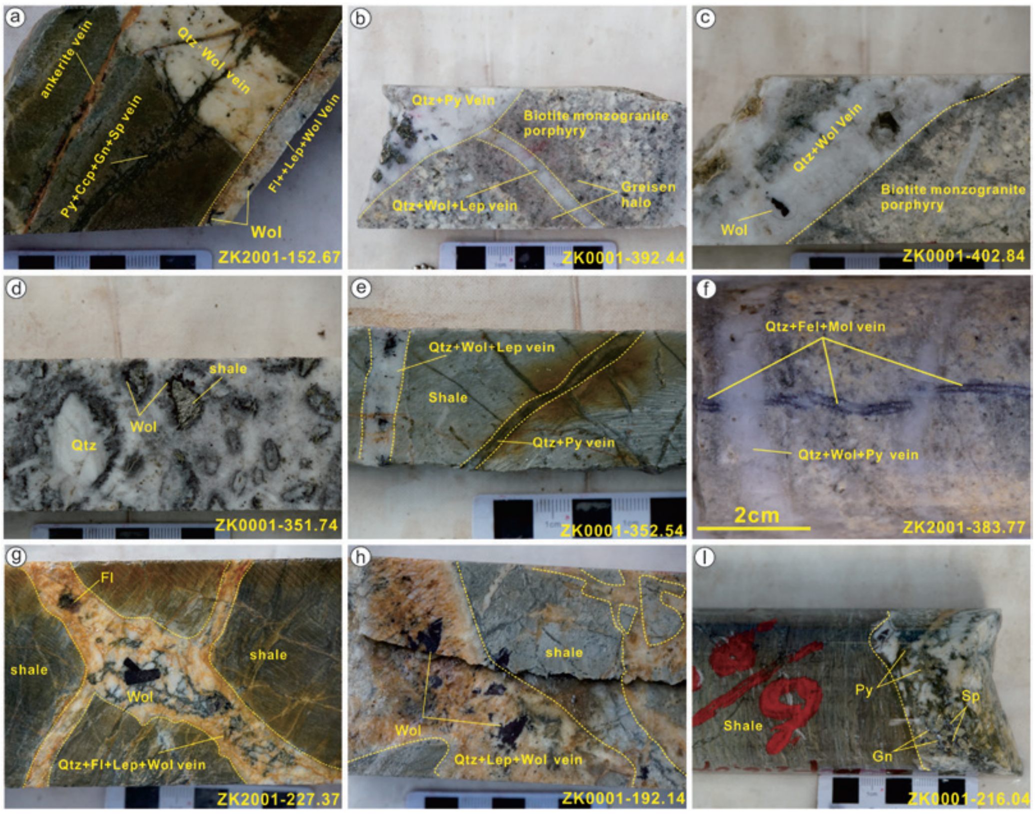

Figure 2. Illustration of different types of veins in Jiaoxi deposit. Ccp = Chalcopyrite; Fl = fluorite; Fel = feldspar; Gn = Galena; Lep = lepidomelane; Py = pyrite; Qtz = quartz; Wol = wolframite.

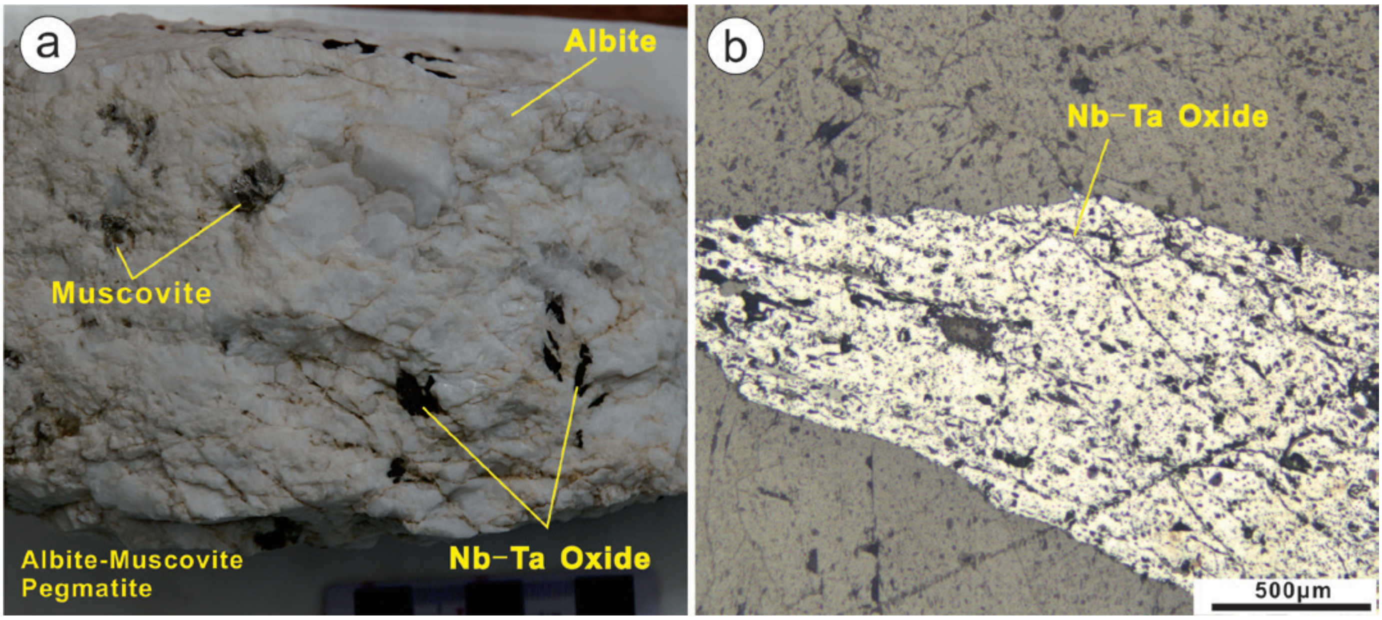

Figure 3. Hand specimen photograph (a) and microphotograph (b) of Nb-Ta oxide-containing pegmatite in the Jiaoxi district.