

## Fluid inclusion evidence of the origin of mineralization in the Dongxiang deposit

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### Summary

The Dongxiang copper (also known as Fenglin Tungsten-Copper ) deposit is located at the Southern Yangtze block of China, and is one of the largest copper deposits in the northeastern Jiangxi province, South China. This deposit has been studied previously by many researchers in different aspects since it was found (Xu, 1997; Xue et al., 2000; Zhang, 2001; Zhang and Huang, 1979; Zhu, 2005). The origin of the deposit remains controversial. Some researchers proposed that it is Carboniferous sedimentary exhalative deposit (Gu and Xu, 1986; Xu et al., 1996; Zhu, 2005). However, the fluid inclusions and Rb-Sr age suggest that the Dongxiang deposit is a Middle Jurassic magmatic-hydrothermal deposit rather than a carboniferous Sedex deposit (Cai et al., 2011,2016,2017).

The mineralized veins consist mainly of pyrite, chalcopyrite and quartz. The dominant inclusion types are vapor inclusions (two phase), liquid inclusions (two phase) and multiphase inclusions. Multiphase and liquid inclusions have homogenization temperatures 280 to 340 °C and bimodal salinities 0.4~6.8 wt% NaCl and 30 to 42 wt% NaCl respectively(Cai et al., 2011). Raman analysis of the fluid inclusions indicates that, in the gaseous phase, water vapor is dominant with small amount of CO<sub>2</sub> and CH<sub>4</sub>. Hydrogen and Oxygen isotopic compositions are also within the range of magmatic water (Cai et al., 2016).

Pseudosecondary fluid inclusion assemblages in this system, if it is a magmatic-hydrothermal system, are likely to have homogeneous composition and have been trapped simultaneously for the resolution of Rb-Sr isochron systematics (Shepher and

Darbyshire, 1981). The age of Rb-Sr isochrons of the pseudosecondary inclusions was  $161.8 \pm 9.6$  Ma (MSDW=1.3) (Cai et al., 2017). Since the quartz is associated with chalcopyrite in the veins, the Rb-Sr age has been interpreted to represent the age of Cu mineralization in the Dongxiang Cu deposit. The local granodiorite-porphyrries have Mid-late Jurassic crystallization age (U-Pb) of  $164.3 \pm 1.6$  Ma (MSDW=1.7) and  $160.3 \pm 1$  Ma (MSDW=0.89)), which is referred to in China as the Yanshanian tectonic events. The Rb-Sr age of fluid inclusion assemblages is consistent with the crystallization age of the granodiorite-porphyr. Therefore, we propose that the ore-bearing fluid comes from intrusive rocks related with Yanshanian tectonics.

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