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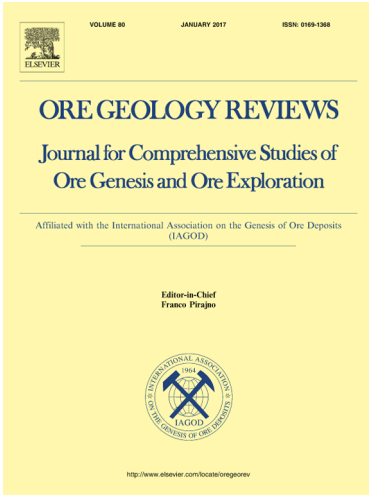

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Geochemical and isotopic evidence for a magmatic-hydrothermal origin of the polymetallic vein-type Zn-Pb deposits in the northwest margin of Jiangnan Orogen, South China

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Abstract

Polymetallic vein-type Zn-Pb deposits are located in the Xiangxi–Qiandong zinc-lead metallogenic belt (XQMB) of the northwestern margin of the Jiangnan Orogen, South China. Ores are mainly found in fault-bounded quartz veins hosted in the upper part of the Banxi Group that consists of low-grade metamorphic sandstone, siltstone with minor tuff interbeds. The Zn-Pb deposits primarily contain sphalerite, galena, chalcopyrite and pyrite, accompanied by quartz and minor calcite. Zinc, lead, copper, indium and gallium are enriched in these ores. Investigation of the ore fluid reveals low temperature (87–262°C) with scattered salinity (range from 2.73 to 26.64 wt% $NaCl_{eqv.}$). Hydrogen and oxygen isotopic compositions of fluid inclusions in quartz indicate mixing of magmatic hydrothermal fluid and meteoric water ($\delta^{18}O_{H2O\ SMOW}$=0.2‰ to 4.2‰; $\delta D_{H2O\ SMOW}$=-126‰ to -80‰). Carbon and oxygen isotopic composition of carbonate samples indicate the magmatic hydrothermal origin of CO_3^{2-} or CO_2 in ore-forming fluid ($\delta^{13}C_{PDB=}$-6.9‰ to -5.7‰, $\delta^{18}O_{SMOW}$=11.3‰ to 12.7‰).

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