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Mineral Chemical Characteristics and Indication of Mineralization of Lengshuikeng Ag-Pb-Zn Feeposit, Jiangxi, South China

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1 Regional Geological Setting

The Lengshuikeng Ag-Pb-Zn deposit is located in northeastern Jiangxi Province, close to Gan-Hang tectonic belt (GHTB) between the Cathaysia and Yangtze blocks. This fault represents the eastern part of the Shiwandashan-Hangzhou (Shi-Hang) fault zone and is considered to mark the collisional suture zone in SE China (Yao et al., 2011). The Lengshuikeng Ag-Pb-Zn deposit developed big vein and veinlet-dissemination ore deposit (Yinluling and Yinzhushan) and bedded ore deposit (Xiabao, Wang et al., 2014). The spatial distribution of the both ore bodies, mineral constituents, and the zoning of alteration assemblages are markedly different from those of typical porphyry deposits, and has attracted many scholars' attention. Some research questions remain ambiguous, such as widely attention of the relationship between two type ore deposits, mineralization mechanism of layering ore body and formation of the iron and manganese carbonate rock, etc.

2 Geology of the Lengshuikeng Ore District

The host rock units range from Sinian (Neoproterozoic) high-grade metamorphics, migmatite and granitic gneiss in the crystalline basement, through Carboniferous folded carbonates and clastics, to Late Jurassic predominantly felsic volcano-plutonic and volcanoclastic suite. The stratigraphic sequence comprises the Jurassic Daguding and E'huling Formations. The latter one composed of tuffs, rhyolite, tuffaceous siltstone, sandstone, and manganese- and iron-rich carbonates, which are the main host of the stratabound ores.

3 Section Study of Xiabao Ag-Pb-Zn Ore Deposit

The Xiabao Ag-Pb-Zn ore deposit is the largest one in Lengshuikeng ore district, and sequential sampling were carried on a section that crosses granite and bedded ore body and find their contact relationship was clear, and don't appear a gradient features. Elements content and ratios show obvious difference. Granite porphyry has higher Al, Ba, Sr, K and Na content, but layer ore bodies, occurring in iron and manganese carbonate, are with higher Ag, Fe, Mn, Zn, Pb and Mg content. Element chemistry of the bedded ore body show the characteristics of sedimentary origin, and maybe not experienced larger-scale hydrothermal metasomatism, its formation background looks like related to volcanic-sedimentary continental deep-lake-basin and further research is still needed.

4 Comparative Study with Electron Microprobe Analysis

Based on electron microprobe analysis, sphalerites in both types were compared. Sulphur content of sphalerite range from 32.05 to 33.81 wt%, with mean 33.02 wt %, and corresponding zinc content range from 53.51 to 63.79 wt%, with mean 59.38 wt %. Iron element range larger (2.02–12.42 wt %), and show significant difference between two types of ore deposits. Iron content of sphalerite in stratiform ore body range from 2.02 to 7.69 wt%, with mean 4.17 wt%. By contrast, sphalerite in big vein ore deposit had much higher iron content, ranging from 8.02 to 12.42 wt%, with mean 9.49 wt%. Bedded deposits occurred in the iron and manganese carbonate strata, and its sphalerites had much less Fe and Mn content than the porphyry deposit. Iron, Mn, Pb and Zn element

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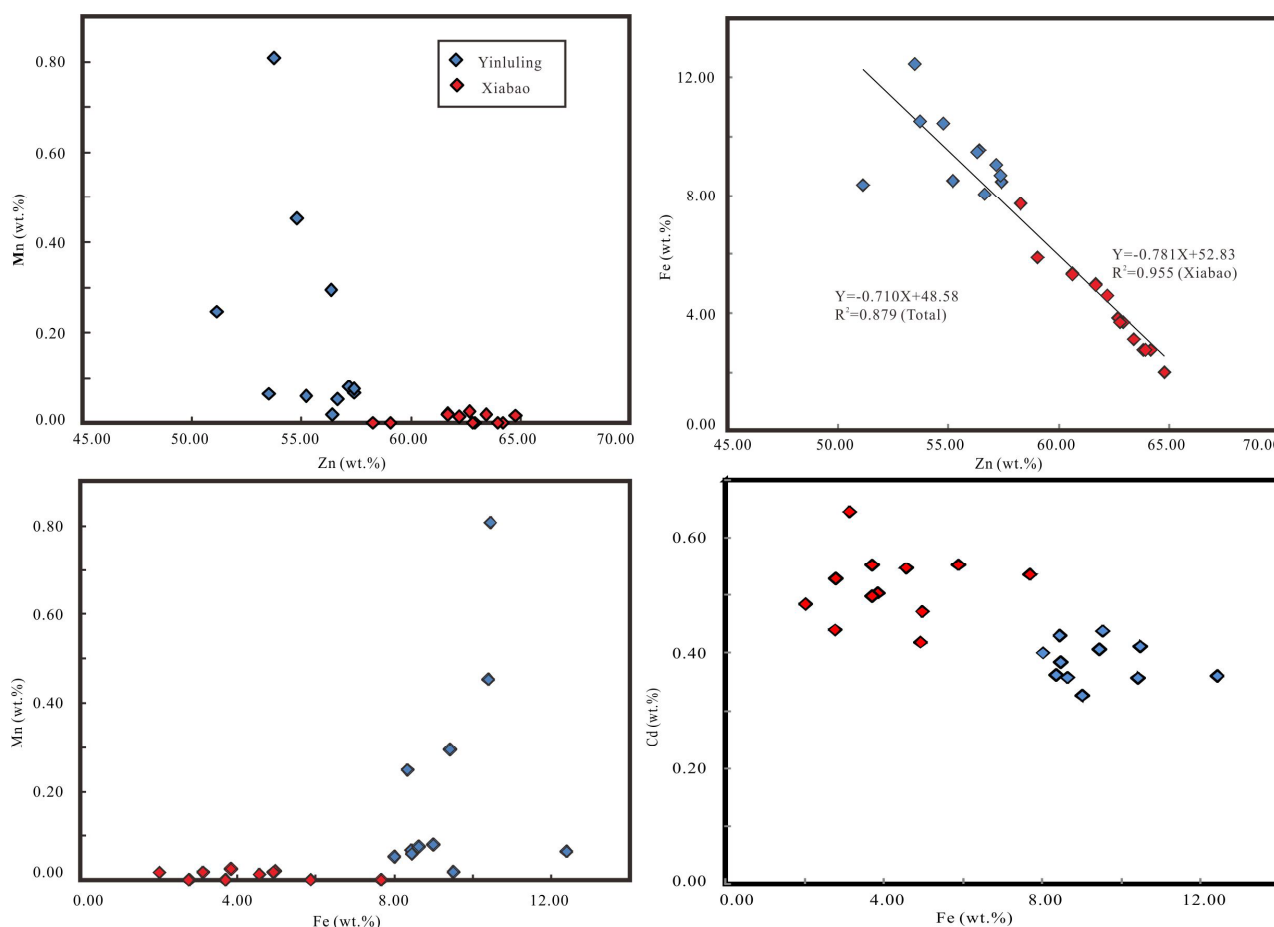


Fig. 1. Elements diagrams of sphalerites from the Lengshuikeng ore field.

within the magmatic system that were related to the mineralization, may reflect different physical and chemical conditions (e.g. temperature, pressure, pH, etc.), and indicate the difference of magmatic system (Gammons, 1989).

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