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Geochemical characteristics of magnetites from the Lala IOCG deposit of Huili Sichuan, China, and their genetic research

LIU Xiaowen , ZHENG Kai and LI Zeqin*

Chengdu University of Technology, Chengdu, Sichuan 610059

1 Geological Features of this ore deposit

Huili Lala IOCG deposit is located in the southwest margin of the Yangtze block and the centre area of west-Sichuan and Yunnan province. It is an important Fe-Cu-Mo-Au-REE polymetallic deposit in southwest China. This deposit has also been considered as a typical iron oxide-copper-gold (IOCG) deposit (Li et al., 2012), and which is exposed in the mining area consists of metamorphosed volcano sedimentary rocks of the Proterozoic estuarine community Dang group, the strata mainly consists of biotite schist, marble, crystal (magnetite + quartz) albite gneiss and albite breccia. Magnetite is one of the major ore minerals in this deposit, and it is also the main carrier of Fe.

2 Research contents and conclusions

According to the structure and depositing position,magnetite is divided into four generations: detrital magnetite (Mt1), elongated oriented magnetite (Mt2), dense disseminated magnetite (Mt3) and coarse grained magnetite veins (Mt4). Based on the electronic probe analysis, Al, Ti, Mn, V contents in Lala IOCG deposit are relative high. The average content of TiO_2 in Mt1 is 46.77%, which indicates the ore-forming fluid of Lala deposit comes from deep earth with high temperature and high pressure property (Xu et al., 1979). The average content of V_2O_5 is 0.31%, it may caused by high formation temperature of magnetite in magma and high developed isomorphous replacement effect; The average content of MnO is 1.19% and Ti/V ratio is 167.9, those two factors indicate this deposit has obvious marine volcano sedimentary magnetite formation characteristics (Chen W T et al., 2012); Based on the discussion above, high temperature ore-forming fluid with high content of Fe and Ti is the main source to form detrital magnetite. Particle size of Mt2 is significantly larger than which of Mt1, the particle shape differences is significant indicates that in the process of mineralization was influenced by the directional extrusion pressure.

The average contents of V, Ti, SiO_2 in Mt3 are 582.816×10^{-6}, 1017.75×10^{-6}, 0.05%, respectively. All of the three values reveal the characteristics of deposit from hydrothermal solution . The average content of Al_2O_3 is 0.17%(Dupuis C et al., 2011), which indicates the formation temperature of magnetite is low. The content of MnO is low, with an average content of 0.01%, the average ratio of Ti/V is of 1.84, Those two values show the characteristics of the terrigenous sediment sources of iron. Mt3 existed with a large amount of carbonate minerals, which indicates Mt3 may be formed via metamorphic hydrothermal replacement. The chemical composition, characteristic parameter values and crystal structures of Mt4 are very similar to that of Mt3, which proved Mt3 and Mt4 has the same formation mechanism and iron sources.

* Corresponding author. E-mail: liu_xiaowen@126.com

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References

Li Zeqin, Hu Ruizhong, Wang Jiangzhen, Liu Jiajun, Li Chaoyang, Liu Yuping, Ye Lin. 2012, *Lala Fe-Oxide-Cu–Au-U-REE ore deposit, Sichuan China-an example of superimposed mineralization.* Guiyang: Bulletin of Mineralogy, Petrology and Geochemistry, 21(4): 258~260.

Xu Guofeng and Shao Jielian, 1979. *The typomorphic characteristics of magnetite and its significance*. Beijin: Geology and Prospecting, 3: 30~37.

Chen W T, Zhou M F, 2012. *Paragenesis, Stable Isotopes, and*

Molybdenite Re-Os Isotope Age of the Lala Iron- Copper Deposit, Southwest China. America: Economic Geology. 107:459 ~480.

Dupuis C and Beaudoin G, 2011. *Discriminant diagrams for iron oxide trace element fingerprinting of mineral deposit types*. America: Mineralium Deposita, 46(4):319~335.