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Fluid Inclusion Characteristics of Caixiashan Pb-Zn Deposit in Eastern Tianshan , China and Its Meaning for Ore Genesis and Prospecting

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Caixiashan Pb-Zn deposit is a large hydrothermal deposit in Eastern Tianshan area, China. It locates on the southern margin of Junggar plate. Qingbaikouan Kawabulake group hosts the orebodies, which consists of a suite of clastic rock and carbonate rock. Intrusive rocks include hornblende and feldspar granite, granodiorite and diorite. The major fault- Aqikekuduk fault and its subsidiary faults are the main faults in the area. Alterations associated with mineralization are silification, dolomitization, pyritization, sericitization, chloritization and so forth. The deposit consist of four mineralization zones

(Fig.1).

Fluid inclusion data can provide information on ore-forming temperature, salinity and composition of mineralization fluid ,which is important for ore genesis study. Samples were collected from gangue minerals such as quartz and calcite in different drill holes of No 2 ore body. Most of the fluid inclusions are volatile and liquid type. Homogeneous temperature was acquired using Linkam THMSG-600 heating and freezing stage. Most of the homogeneous temperatures are between 190° C and 240° C ,which represent the best ore-forming

temperature. The temperature data can be classified into 3 groups (170° ~ 240° ,260° ~290° and 300—320°), which may indicate that 3 periods were underwent during ore-forming. Salinity data were calculated using frozen temperature method. Most of the salinity data is between 2NaCl% and 6 NaCl % , which means a low salinity fluid . From homogeneous temperature data and salinity data, mineralization process could be divided into 3 periods (Fig.2.)

Laman spectrometer was used to analysis

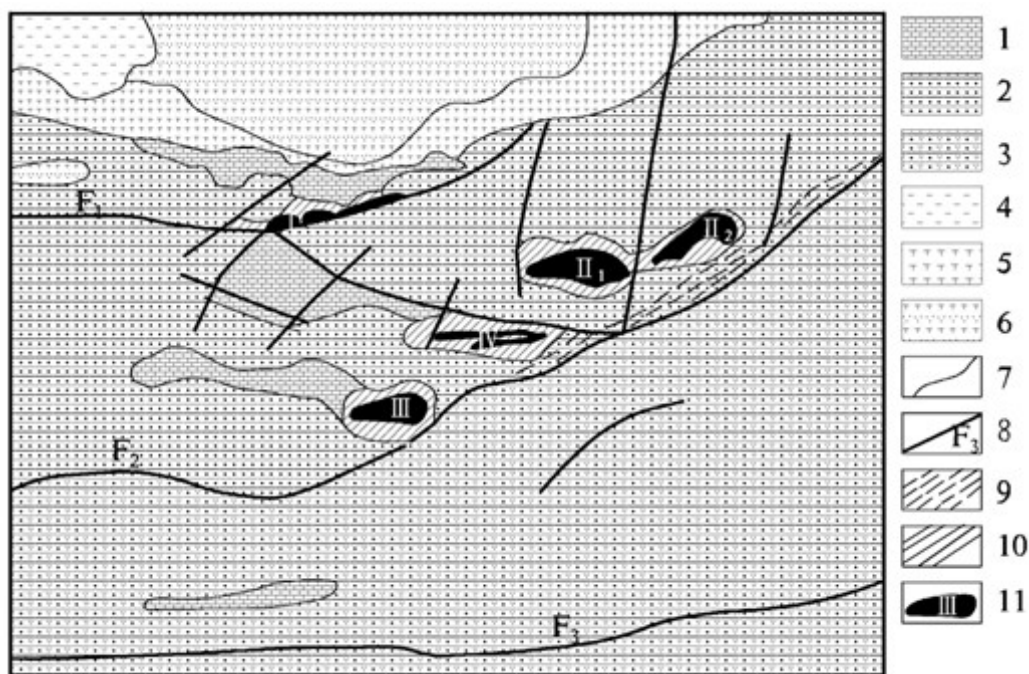


Fig.1.Geological map of Caixiashan deposit(modified after Gao Jinggang etal.,2007)

1-dolomitic marble;2-siltstone intercalated with mudstone and siliceous rock; 3-mylonitized quartz sandstone with marble interbed; 4-Changchengiangranulite; 5-Carboniferous diorite; 6-Carboniferous quartz diorite; 7-geologic boundary; 8- fault; 9- mylonitization zone;10- ore body;11- alteration zone.

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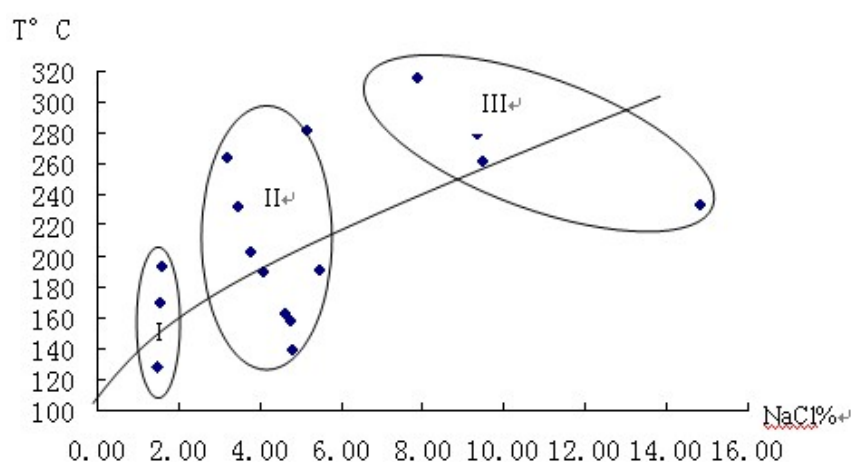


Fig.2. Correlation diagram of homogeneous temperature and salinity

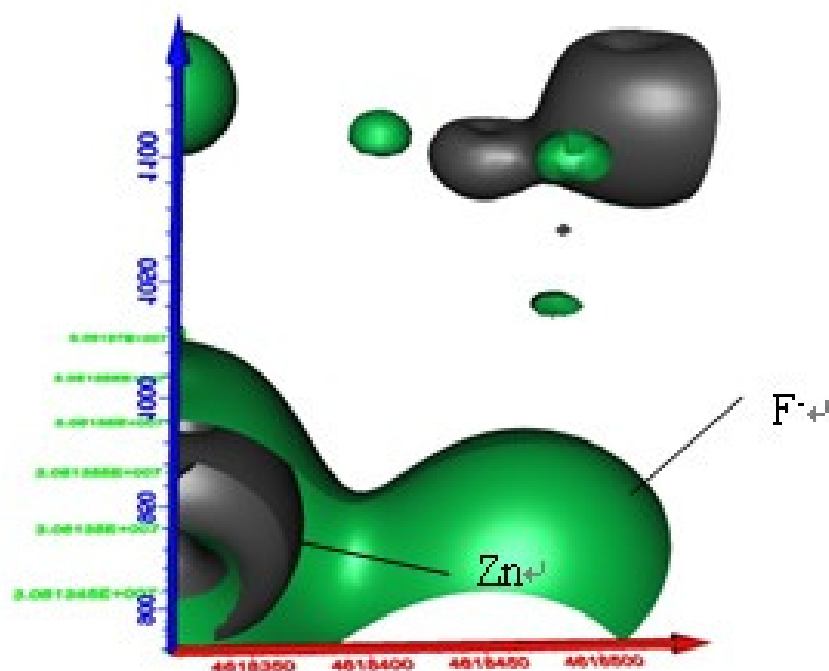


Fig.3. Spatial relationship between Zn and F⁻

the composition of fluid inclusions. The main anions in the fluid inclusions are SO_4^{2-} , Cl^- , F^- and NO_3^- . The Ca/Mg value is relative small (5.89) as a result of dolomitization. To study the relationship between fluid composition and

ore-forming elements, multivariable statistical methods such as correlation analysis, cluster analysis and factor analysis were used. The result shows that Pb and Zn are closely associated with F^- while Ag is closely associated with Cl^- and Na^+ . The Zn geochemical anomaly is adjacent to F^- anomaly in space (Fig.3.), therefore, F^- halo is useful in prospecting for zinc.

In conclusion, Caixiashan deposit is mesothermal deposit with three mineralization stages. The spatial relationship between chemical compositions and ore-forming elements can be used to predict mineralization in deep zone.

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