Geology and fluid origin of Mohailaheng Pb-Zn deposit in Tibet

YINGCHAO LIU[1], ZENGQIAN HOU[1], ZHUSEN YANG[2] AND SHIHONG TIAN[2]

[1]Institute of Geology, CAGS, Beijing 100037, China (lychappy@126.com)
[2]Institute of Mineral Resources,CAGS,Beijing 100037, China

The Mohailaheng Pb-Zn deposit in south Qinghai, China, is a stratabound epigenetic deposit hosted by Early Carboniferous limestone in the hanging wall of a Cenozoic thrust fault system. Four mineralization stages are recognized in the deposit. During Stage I, xenomorphic grass-green sphalerite, galena, and pyrite precipitated as dissemination with dolomite and calcite. In Stage II, xenomorphic and less colloform brown sphalerite, galena and pyrite precipitated with barite, quartz, fluorite and calcite as cements of limestone breccias. It is followed by calcite-pyrite vein in Stage III and pure calcite vein in Stage IV. Most sulfides in the deposit were produced during Stage II.

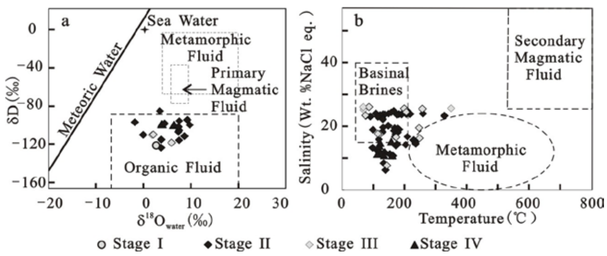

Figure 1: a-Diagram of $\delta D_{v\text{-}snow}$-$\delta^{18}O_{fluid}$ (base diagram after [1]) and b-Diagram of salinity-temperature of fluid inclusions (base diagram after [2])

Raman microprobe analyses indicate that CO_2, CH_4, H_2S and H_2O are common in vapor phases of fluid inclusions in Stage II. The H-O isotopic data of fluid show the character of organic matter or gas (Fig.1a). Most salinity-temperature data of primary fluid inclusions fall into the basinal brine field and some fall near or into the metamorphic fluid field (Fig.1b). The results above give two possible fluid origins which are basinal brine possibly providing CH_4 and metamorphic fluid possibly providing CO_2.

The geology and fluid orogin of this deposit indicate the characters including MVT and fracture controlled Pb-Zn deposit, so it is just considerded as a carbonate hosted Pb-Zn deposit controlled by thrust systerms in the orogenic belt.

This work was supported by grants (Contract No. 2006BAB01A08, 2011CB403106 and U0933605).

[1] Lu H Z *et al*. (2004) Beijing, Science Press, 19–20. [2] Beane (1983) *Geothermal resources council Special Report*, 245–253.

Autotrophic denitrification potential: An experimental study on nitrate-N removal from groundwater by pyrite in mining wastes as electron donor

Y. LIU[1]* AND Y.X. LI[2]

[1]School of Biotechnology and Food Engineering, Hefei University of Technology, Hefei 230009, China (liuy99999@163.com)
[2]Hefei University of Technology, Hefei 230009, China

New Method

Groundwater nitrate pollution is a common problem in the world, especially in North China [1-2]. It becomes a serious threat to source of drinking water in fractured media where how to control and remedy it is an open question [3-8]. In addition, there are lots of mining waste including pyrite often causing acid mine drainage. The new method is to use the pyrite as electron donor combining with the *thiobacillus* to remedy nitrate pollution by the experimental study [2].

Discussion of Results

The mixed *denitrogenation thiobacillus* (T.D) is concentrated and separated from the charcoal factory's soil. Then a strain with strong denitrification ability is isolated, which is self-supportive and facultative anaerobic. Based on the analysis of physiological and biochemical measurements, this stain is preliminary judged to Thiobacillus. The mixed T.D is employed to reduce Nitrate nitrogen from the groundwater using pyrite as electron donor. The effect of the ratio by Sulfur and Nitrogen (S/N), iron disulfide quantity and vaccination quantity is investigated experimentally. Results show that: the most suitable S/N is 5/2, the quantity of Sulfur in iron disulfide reach to 250 mg/L is the most suitable iron disulfide quantity, and the best vaccination quantity is 9%. At the condition mentioned above, the nitrate removal rate is 62.17%. The effect of nitrogen removal on chemical synthesis culture medium of pure T.D is better than that using mixed T.D. Conclusions show that the strain isolated can be used to remove the nitrate-N (high concentration) from groundwater using pyrite as electron donor with potential value. (Grant no: 2009HGCX0233)

[1] Liu *et al.*(2009) *Geochim.Cosmochim. Acta* **73**, 783–783. [2] Qian *et al*. (2011, in press) *Environ. Technol.* [3] Qian *et al*. (2005) *J. Hydrol.* **311**, 134–142. [4] Zhou *et al*. (2004) *Int. J. Rock Mech. Min. Sci.* **41**, 402. [5] Qian *et al*. (2006) *Hydrogeol. J.* **14**, 1192–1205. [6] Chen *et al*. (2009) *Journal of Hydrodynamics* **21**(6) 820–825. [7] Qian *et al*. (2009) *Hydrogeol. J.* **17**, 1749–1760. [8] Qian *et al*. (2011) *Hydrol. Process.* **25**, 614–622.