A Study on Alunite SWIR Mapping for Tracing Fluid Pathways of the Zijinshan Cu-Au Deposit, Fujian, China

LI Jing\(^1,2\), QI Jinping\(^1\), XIU Liancun\(^3\), JIANG Jiaojiao\(^1\) and HUANG Haiyan\(^1\)

1 Zijin Mining Group CO., LTD., Shanghang, Fujian, P.R. China
2 Xiamen Zijin Mining & Metallurgy Technology CO. LTD., Xiamen, Fujian, P.R. China
3 Nanjing Institute of Geology and Mineral Resources, Nanjing, P.R. China

1 Introduction

Alunite is one of the most important minerals in advanced argillic alteration zone in high-sulfidation deposit. Studies on mineralogy, stable isotope and fluid inclusions of alunite are not suitable for field exploration and tracing fluid pathways because of restricted data and long analytical time. In this work, SWIR core scanning for alunite in Zijinshan Cu-Au deposit has been conducted, in order to investigate the distribution of alunite with various compositions and trace the fluid pathways.

2 Geological Setting

The Zijinshan Cu-Au mine is the largest open pit Au mine in China. It is a typical high sulfidation deposit with the Au orebodies hosted in an upper oxide zone and the Cu orebodies hosted in a lower advanced argillic zone of hydrothermal breccias. The orebodies locate to the northwest of the Zijinshan volcanic edifice (Fig. 1.).

3 The SWIR Characteristics of Alunite

In SWIR spectra, K-Na alunite has a strong absorption feature at about 1480nm wavelength (F1480), which shifts with the compositional variations of alunite. That is longer wavelength corresponding to higher Na content (Chang et al., 2011; Thompson et al., 1999). The higher Na content has been demonstrated to correlate positively with formation temperature, supported by alunite experiments (Stoffregen and Cygan, 1990), equilibrium mineral-fluid calculations (Deyell and Dipple, 2005) and studies in

Fig. 1. The PWF1478 results of Zijinshan drill cores.

* Corresponding author. E-mail: 55377165@qq.com