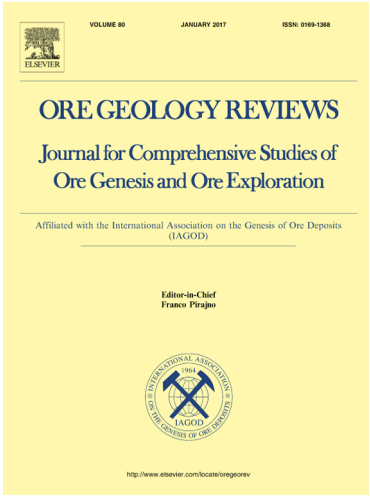
Accepted Manuscript



Application of SWIR Spectrometry to the Determination of Biotite Compositions in Hydrothermally Altered units of the Yangyang Iron-Oxide-Apatite (IOA) Deposit, South Korea

YongHwi Kim, Seon-Gyu Choi, Jieun Seo, Kwang-Beom Ko, Young Jae Lee

PII: S0169-1368(17)30765-5
DOI: https://doi.org/10.1016/j.oregeorev.2018.06.022
Reference: OREGEO 2616

To appear in: *Ore Geology Reviews*

Received Date: 11 October 2017
Revised Date: 18 June 2018
Accepted Date: 30 June 2018

Please cite this article as: Y. Kim, S-G. Choi, J. Seo, K-B. Ko, Y.J. Lee, Application of SWIR Spectrometry to the Determination of Biotite Compositions in Hydrothermally Altered units of the Yangyang Iron-Oxide-Apatite (IOA) Deposit, South Korea, *Ore Geology Reviews* (2018), doi: https://doi.org/10.1016/j.oregeorev.2018.06.022

Application of SWIR Spectrometry to the Determination of Biotite Compositions in Hydrothermally Altered units of the Yangyang Iron-Oxide-Apatite (IOA) Deposit, South Korea

YongHwi Kim[a], Seon-Gyu Choi[a]*, Jieun Seo[b], Kwang-Beom Ko[c], Young Jae Lee[a]

[a]*Department of Earth and Environmental Sciences, Korea University, Seoul 02841, South Korea*

[b]*Department of Geology, School of Earth System Sciences, Kyungpook National University, Daegu 41566, South Korea*

[c]*Korea Resources Corporation, Wonju 26464, South Korea*

*Corresponding author: seongyu@korea.ac.kr, Tel.: +82–2–3290–3174

Abstract

The Yangyang iron oxide-apatite deposit in South Korea has gone through multiple events for igneous activity, structural evolution, hydrothermal alteration, and mineralization. Trioctahedral mica is indicative of potassic alteration in the Yangyang IOA deposit and its mineral chemistry is quite variable. The variability can be described in terms of biotite colors and short wavelength infrared (SWIR) reflectance spectra. Brown to greenish brown biotite displays lower values of Mg# (0.48–0.58) than green biotite (0.62–0.78), whereas colorless phlogopite related to Fe–P mineralization has the highest values of Mg# (0.85–0.95). To compare Mg# values with the positions and intensities of absorption in the trioctahedral micas, we used three types of spectrum: reflectance, hull quotient, and Gaussian. Brown biotite produces a short Mg–OH peak near 2340 nm, green biotite has a peak near