Lypaczewski P, Rivard B, 2018, Shortwave infrared reflectance spectroscopy of white mica, biotite and chlorite with variable mineral chemistries, International Journal for Earth Observation and Geoinformation, 68, 116-126

Shortwave infrared (SWIR, 1000–2500 nm) reflectance spectra of biotite and chlorite were investigated to establish quantitative relationships between spectral metrics and mineral chemistry, determined by electron microprobe analysis (EMPA). Samples spanning a broad range of mineral compositions were used to establish regression equations to Mg#, which can be estimated to ± 3 and ± 5 Mg#, and to Al^{VI} content, which can be estimated to ± 0.044 Al^{VI} (11 O) and ± 0.09 Al^{VI} (14 O), respectively for biotite and chlorite. Both minerals have absorptions at common positions (1400, 2250, 2330 nm), and spectral interference may occur in mineral mixtures. For an equivalent Mg#, absorptions of chlorite are offset to 1–15 nm higher wavelengths relative to those of biotite. If the incorrect mineral is identified, errors in the estimation of composition may occur. Additionally, the 2250 nm absorption, which is related to Al(Mg,Fe)-OH in both minerals, is strongly affected by both the Al^{VI} content and Mg#. This can lead to erroneous Mg# estimations in low Al^{VI} samples. Recommendations to mitigate these issues are presented.

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