

CHAPTER 2 - SUPPLEMENTAL
HYPERSPETRAL REMOTE SENSING OF WHITE MICA: A REVIEW OF IMAGING AND
POINT-BASED SPECTROMETER STUDIES FOR MINERAL RESOURCES, WITH
SPECTROMETER DESIGN CONSIDERATIONS.

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1 White Mica Samples

The United States Geological Survey (USGS) Spectroscopy Laboratory in Lakewood, Colorado maintains a library of minerals and mineral spectra that are used as standards for spectral studies (Kokaly et al., 2017). Nineteen white mica samples from various field sites were used in this analysis. All samples are classified as pure based on significant supporting data. Spectra were obtained by the USGS Spectroscopy Laboratory's Nicolet Fourier Transform Infrared (FTIR) spectrometers (see Table 11 for spectrometer details) in a controlled laboratory setting. The Nicolet FTIR spectrometers have a combination of a narrow sampling interval of 1 nm, a narrow bandpass of 1.94 at 2200 nm, and a highly accurate reported wavelength position that generate high resolution spectra precise enough to be considered as reference spectra for this study. The following spectra were considered as reference spectra for this sensitivity analysis (Table S.1).

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Table S.1. White mica samples from the USGS Spectral Library Version 7 used in this contribution's sensitivity analysis (Kokaly et al., 2017).

USGS Lab Standard Mineral Name	USGS Sample ID	White mica 2200 nm combination feature position (nm)
Muscovite low-Al	CU93-1	2207.0
Muscovite	GDS107	2201.0
Muscovite	GDS108	2198.0
Muscovite	GDS111 Guatemala	2219.4
Muscovite	GDS113 Ruby	2197.3
Muscovite	GDS114 Marshall	2205.2
Muscovite	GDS116 Tanzania	2212.7
Muscovite	GDS117 Isingles	2199.7
Muscovite	GDS118 Capitan	2208.0
Muscovite	GDS119 Mt. Alamo	2201.0
Muscovite	GDS120 Pegma M.	2200.2
Muscovite	HS146.3B	2208.7
Muscovite	HS24.3	2210.6
Muscovite+Chlorite	CU91-253D	2197.3
Muscovite-medlowAl	CU91-250A	2201.6
Ammonio-Illite/Smect	GDS87	2183.8
Illite	GDS4 Marblehead	2223.0
Illite	IMt-1.a	2210.6
Illite	IMt-1.b < 2um	2210.0

The position of the white mica 2200 nm combination feature varied from 2183.8 nm (sample GDS87) to 2223.0 nm (sample GDS4) with an average position of 2205.0 nm.

Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

2 References

Kokaly, R.F., Clark, R.N., Swayze, G.A., Livo, K.E., Hoefen, T.M., Pearson, N.C., Wise, R.A., Benzel, W.M., Lowers, H.A., & Driscoll, R.L., (2017), USGS Spectral Library Version 7, US Geological Survey Data Series 1035, 61. DOI: <https://doi.org/10.3133/ds1035>.