

# SPECTRAL EVOLUTION

## Hectorite and Lithium

Most lithium occurs in pegmatites. Spodumene, lepidolite, and petalite are some of the minerals associated with lithium in pegmatites. However, lithium can also be found in commercially viable amounts in sedimentary rock in the mineral hectorite.

Hectorite is a clay, an end member of the montmorillonite group and contains magnesium and lithium and lacks aluminum. Originally found in Hector, California (hence the name), hectorite can be identified using an oreXpress field spectrometer, running EZ-ID with two spectral libraries of over 500 minerals. By matching your target sample to known samples in the libraries, EZ-ID is able to identify hectorite in a field sample. EZ-ID's match region capabilities allow a geologist to focus on important absorption features and unmix the dominant minerals in the sample. While similar to other clays such as montmorillonite, hectorite has distinctive absorption features near 1400, 1900, 2300, and 2380nm.

With EZ-ID mineral identification software, the oreXpress can provide geologists with a tool for identifying and mapping hectorite in sedimentary rock.

The oreXpress is a high resolution/high sensitivity, field portable NIR spectrometer. Covering the full UV/VIS/NIR range from 350-2500nm, an oreXpress is lightweight and rugged with photodiode array design for no moving optical parts. oreXpress allows a geologist to take spectra in the field within seconds so that a detailed mineral map can be constructed. Scans of a sample taken with an oreXpress and a contact probe can be analyzed on a laptop using Spectral Evolution's EZ-ID mineral identification software and matching to known samples from two libraries.

Spectroscopy has long been shown to provide an effective technique for identifying minerals, especially different types of clay. The oreXpress allows for field identification and differentiation of clays without disturbing the sample.



*Hectorite sample—a clay related to montmorillonite and containing potentially commercially viable lithium deposits*



*Hectorite spectra with unique absorption features.*



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