

SPECTRAL EVOLUTION

Identifying Goethite and Hematite in the Field

Goethite, hematite and magnetite are the primary minerals for iron ore. They are iron oxides. Goethite has the chemical formula of $\text{FeO}(\text{OH})$ while hematite's formula is Fe_2O_3 . Goethite typically has a yellow or brown color while hematite is typically red. Goethite is an iron oxyhydroxide. The formation of goethite is marked by the oxidation state change of Fe^{2+} (ferrous) to Fe^{3+} (ferric) iron, which allows for goethite to exist at the earth's surface. Hematite is one of the most abundant minerals and is found in sedimentary, metamorphic, and igneous rocks.



The oreXpress, oreXplorer and oreXpert are rugged units designed for field use.

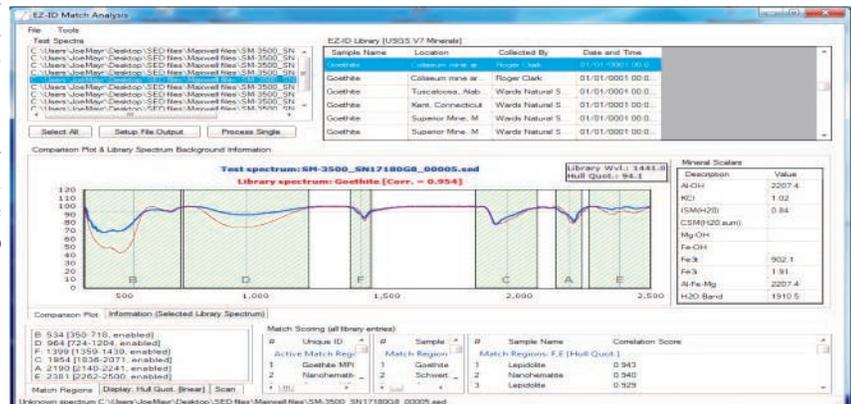
Goethite and hematite can be identified in the field using a SPECTRAL EVOLUTION field spectrometer such as the oreXpress, oreXplorer and oreXpert with EZ-ID mineral identification software running on a personal computer or rugged handheld tablet. Goethite exhibits absorption features at 420, 480, 600 and 920nm. Hematite has features at 520, 650 and 880nm.

The oreXpress has standard resolution, the oreXplorer higher resolution and the oreXpert the highest resolution available in a field portable spectrometer. Higher resolution provides more detail on mineral absorption features making unmixing more accurate.

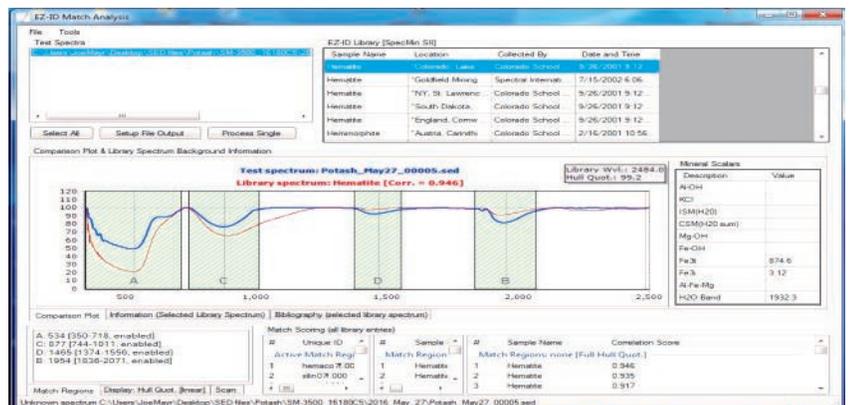
When combined with EZ-ID mineral identification software, these instruments provide a critical tool for exploration. Scans can be taken in the field or the core shack. EZ-ID provides access to three libraries of more than 1100 minerals.

Running on the rugged tablet under DARWin LT Data Acquisition software, EZ-ID gives you instant identification results of the primary minerals in your sample. EZ-ID identifies the top three minerals and instantly displays the results. You can access the target scan and information from the library that your target was matched to.

With EZ-ID's match regions you can focus on different key absorption features in your spectra. You can load up to five pre-set match regions on your tablet and the display will show three different matches based on your match regions for comparison. This provides for further unmixing of the minerals in your sample and more accurate mineral identification. EZ-ID on the tablet includes five sample pre-sets. EZ-ID delivers rapid alteration mapping and vectoring to potential ore bodies.



A scan of goethite matched to the USGS library in EZ-ID.



A scan of hematite matched to the SpecMIN library in EZ-ID.

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