

# SPECTRAL EVOLUTION

## Identifying Galena with a Field Spectrometer

Galena is a lead sulfide with the chemical formula PbS. It is the primary ore for lead and also can contain minable quantities of silver. Galena with silver content is referred to as argentiferous galena. Galena is often associated with the minerals sphalerite, calcite and fluorite. Galena deposits are found worldwide in various environments. Large deposits occur in England, Bulgaria, Australia, Canada and the United States.

The NIR spectra for galena has wide absorption features around 560nm and 2250nm. SPECTRAL EVOLUTION offers a wide range of portable spectrometers for field measurements to identify galena in the field. Our mining spectrometers include the oreXpress, oreXplorer and oreXpert. These instruments are designed for field use—ruggedly built with no

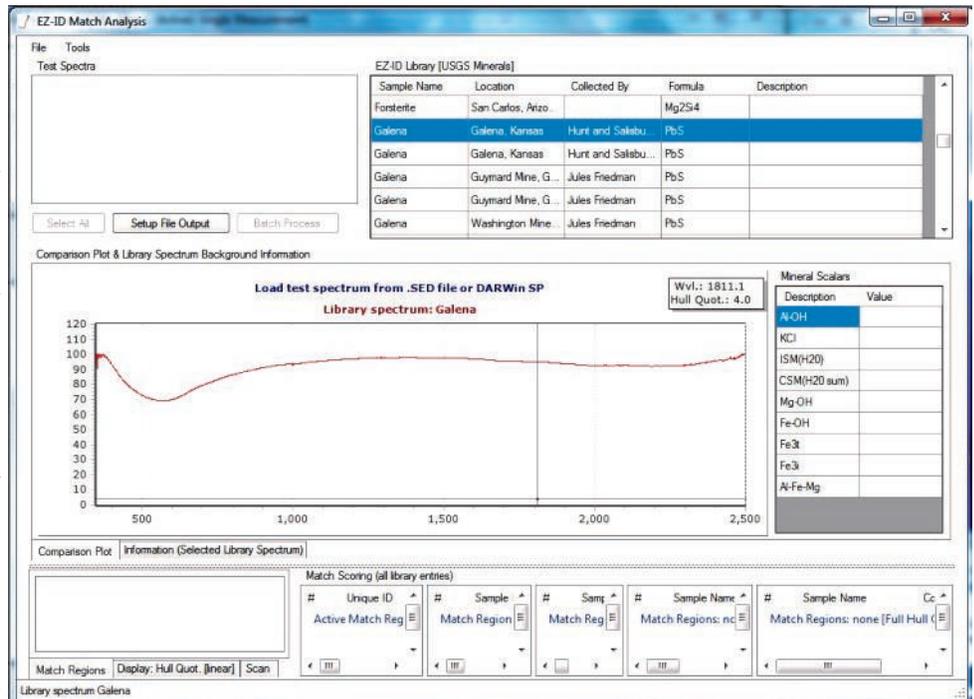
moving optical components to breakdown, running on lithium-ion batteries for a full day of scanning. The oreXpress is our standard unit with high resolution/high sensitivity, the oreXplorer has higher resolution and the oreXpert has the highest resolution available in a portable spectrometer to measure smaller features for more accurate identification especially in mineral mixtures.

These instruments are available with our EZ-ID mineral identification software. EZ-ID matches your target spectra against three libraries of over 1100 minerals: the USGS, SpecMIN and GeoSPEC libraries. EZ-ID allows you to select absorption features for closer examination using spectral match regions. Spectral match regions can be preset when looking for specific minerals during exploration. EZ-ID also provides scalars to enhance the geologist's understanding of crystallinity changes, alteration pattern shifts and geochemical conditions. EZ-ID supports spectral scalars for Al-OH bonds, kaolinite crystallinity (Kx), illite spectral maturity (ISM), chlorite spectral maturity (CSM), Mg-OH bonds, Fe-OH bonds, Fe3t (mineral type), Fe3i (mineral intensity), and Al-Fe-Mg bonds. EZ-ID's three libraries contain 10 spectra of known galena samples to match against.

Our spectrometers are available with an ALGIZ 8X rugged tablet with digital camera, GPS, and voice notes that can be tagged to your spectra. Accessories include two contact probes, one with a 10mm spot size, the other the Miniprobe with a 3mm spot size and a benchtop probe with a compactor. All scans are saved as ASCII files by DARWin SP Data Acquisition software for use (without pre-processing) with third party software, including chemometric analysis software such as Unscrambler from Camo Analytics. Build, optimize and test your model in Unscrambler. The coefficients from your model are used in the prediction engine built into DARWin.

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*Above is a sample of a galena spectra in the USGS library, one of three libraries available with EZ-ID, including the high resolution GeoSPEC library.*

