

MINING

APPLICATIONS

Portable X-ray fluorescence (XRF) technology can be used in a wide range of mineralogical and geological exploration markets, one of which is the mining of Rare Earth Elements (REEs). REEs are defined as the 15 lanthanides plus scandium (Sc) and yttrium (Y), and they are critical components in consumer electronics, automobile catalytic converters, and rechargeable batteries due to their unique optical and magnetic properties.



REEs rarely exist in pure form; they are usually concentrated in more than one mineral, and each mineral requires a different costly extraction technology and mineral processing. Geochemical exploration is the main method of REE exploration. Depending on the REE project type, XRF analyzers are useful instruments that can provide real-time, on-site assays of REEs and other elements in any type of geological samples.

Portable XRF analyzers are indispensable tools for the analysis of the light series of REEs (LREEs), including lanthanum (La), cerium (Ce), praseodymium (Pr), and neodymium (Nd). Other elements associated with REE-bearing minerals such as thorium (Th) and Yttrium (Y) can also be analyzed. By using the concentrations from these elements, especially Y, it is possible to infer concentrations of heavy REEs (HREEs) that are commonly associated with Y-containing host minerals.

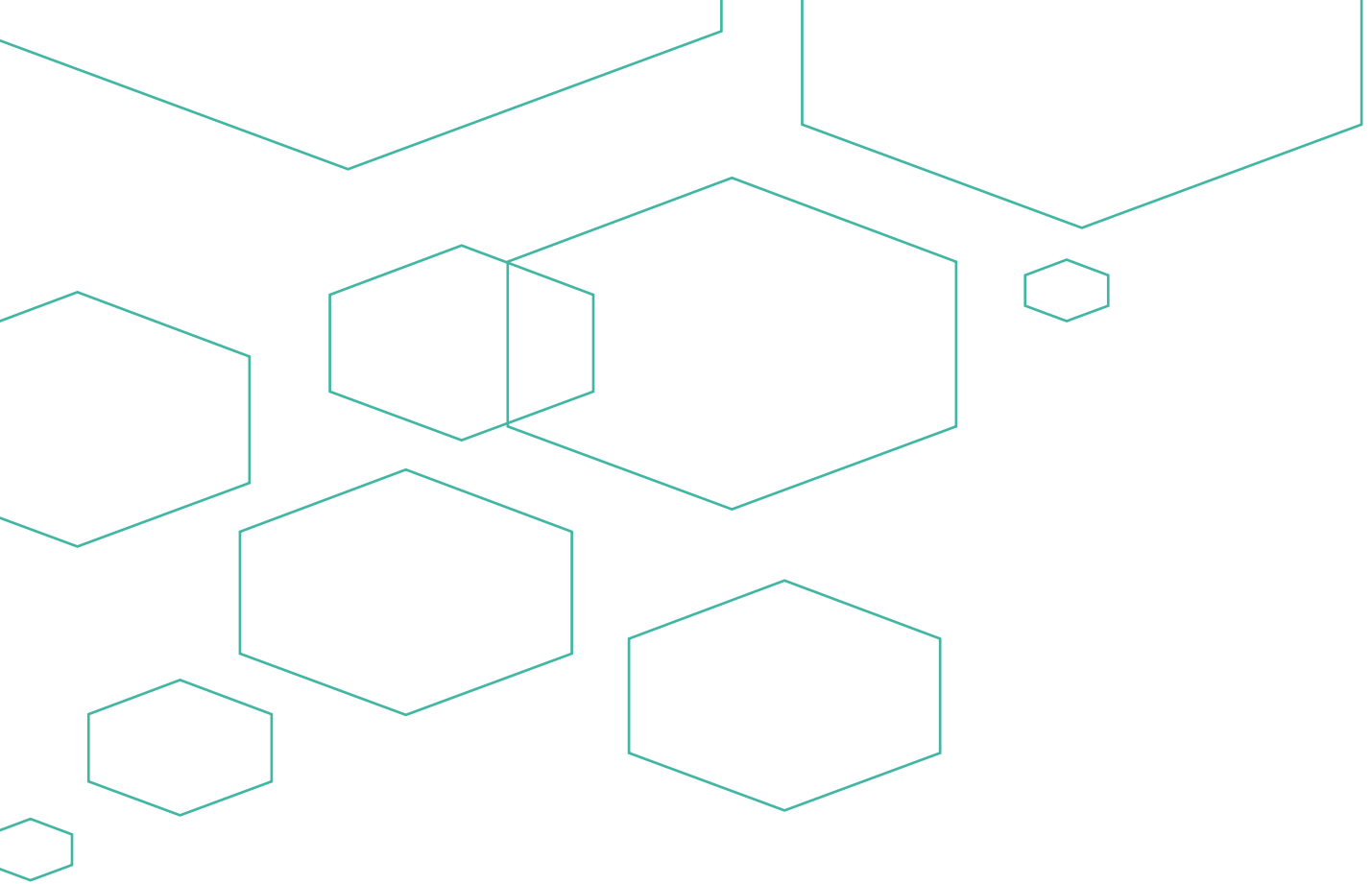
Other applications where XRF analyzers are used in the measurement, mapping, and characterization of various types of ores include:

Iron Ore: Penalty elements in iron ores dilute the overall ore grade and reduce the ore-processing efficiency. X-ray analyzers can determine the composition of the iron ore and other base metal deposits (Fe, Cu, Pb, Zn, Ni, Co).

Bauxite: The ability to grade bauxite, the primary source of aluminum ore, by measuring penalty elements such as silicon (Si) and iron (Fe) is critical for the productivity of bauxite mining operations.

Platinum Group Metals (PGMs): Precious metals, including the PGMs, can be detected directly using Handheld analyzers. It is also possible to successfully locate zones of high concentrations of platinum, palladium and gold by using portable XRF on pathfinder elements.

Tantalum (Ta) and tin (Sn): These elements are widely used in high-end technology products. XRF analyzers provide the fast analyses needed to keep pace with the high-trading values of these metals.



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