An x-ray fluorescence spectrometer from Bruker is the elemental analysis instrument of choice for many industry, academic, and regulatory compliance applications in which ascertaining the exact elemental composition of a sample is the key to good decision-making and efficient, profitable operations. An x-ray fluorescence spectrometer from Bruker is the elemental analysis instrument of choice for many industry, academic, and regulatory compliance applications in which ascertaining the exact elemental composition of a sample is the key to good decision-making and efficient, profitable operations. Contact us today to learn how a Bruker x-ray fluorescence spectrometer can enhance your business operations, regulatory compliance protocol, research, or student learning.


X-Ray Fluorescence is defined as “The emission of characteristic "secondary" (or fluorescent) X-rays from a material that has been excited by bombarding with high-energy X-rays or gamma rays. The phenomenon is widely used for elemental analysis.”

How does XRF work? Characteristic X-rays are emitted from elements when their electrons make transitions between the atomic energy levels. If an electron transitions from a level with energy \(E_i\) to one with energy \(E_j\), the emitted X-ray has energy \(E_X = E_i - E_j\). Because each element has a unique set of atomic energy levels, it emits a unique set of X-rays which are characteristic of this element.

The chart below illustrates the nomenclature. It is somewhat confusing, because three distinct naming systems are used for the atomic shells.