Sigray's Suite Of Lab-Based Spectroscopy Instruments

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X-ray Absorption Spectroscopy (XAS) is a key technique for studying material properties like oxidation states and bonding. Bringing this powerful method into the lab eliminates the need for limited, time-consuming synchrotron access, addressing the growing demand for high-performance, lab-based alternatives.

The QuantumLeap H2100, a state-of-the-art laboratory-based XAS system developed by Sigray, meets this need by delivering synchrotron-quality results directly in the lab. With an energy range of 4.5–25 keV, it excels in both XANES and EXAFS regions, offering high flux, energy resolution, and throughput. This system is capable of analyzing high-Z elements like Zr, Ru, and Pd, overcoming traditional challenges in lab-based XAS, and is particularly effective for real-world samples.

Sigray has multiple innovations that span from X-ray sources, geometries, architecture and other X-ray components like optics. Utilizing the proprietary multi spectral microfocus X-ray source along with extremely low figure error capillary optics, we have developed two novel XPS sources. The Paradigm X-ray Source takes advantage of the natural energy filtering of a double-paraboid optic to provide a high-brightness, small focus, pseudo-monochromatic soft x-ray beam with multiple energies. The Fulcrum X-ray Source uses two single-paraboloid optics along with a set of channel-cut crystals to provide a highly monochromatic soft-to-tender x-ray beam while maintaining source brightness and small focus.

In this talk, we provide an overview of Sigray's suite of lab-based spectroscopy tools, including the QuantumLeap XAS instrument, Fulcrum, and Paradigm XPS X-ray sources.