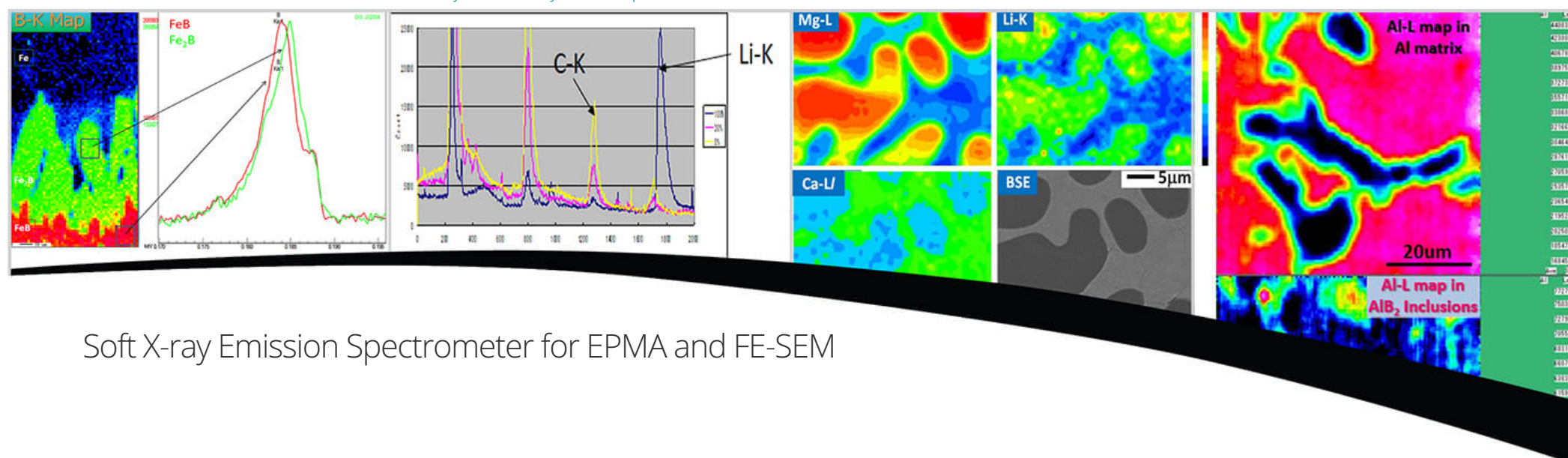


PRODUCTS > Elemental Analysis > Soft X-ray Emission Spectrometer



Soft X-ray Emission Spectrometer for EPMA and FE-SEM

JEOL has developed an unprecedented new type of wavelength dispersive spectrometer (WDS) that utilizes a variable space grating, allowing the efficient and parallel collection of very low energy-rays (so called "soft" X-rays). These new **Soft X-ray Emission Spectrometers (SXES)** boast not only high spectral resolution (0.3eV) which allows for the Nitrogen K α and Titanium L β line to be resolved with a separation of only 1.78eV, but also ultra-low energy, low-concentration sensitivity with the capability to detect Li even at low single digit weight percent concentration. An additional, and maybe its strongest asset, is its ability to do chemical state analysis. The spectrometer detects differences between conduction band and valence band electrons when they emit X-rays allowing the distinction between bonding and crystal structure in samples containing the same elements. An example would be differentiating highly ordered pyrolytic graphite vs. diamond vs. amorphous C, all of which are made only of carbon.

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REQUEST SOFT X-RAY EMISSION SPECTROMETER
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SOFT X-RAY EMISSION SPECTROMETER

ELEMENTEYE JSX-1000S XRF



JEOL has also added another version of the Soft X-ray Emission Spectrometer with an extended energy range (SXES-ER). The SXES-ER has a spectral range of 100eV to ~2300eV. This extended range allows collection of not only light elements, but transition metals and heavy element using L, M, and N lines.

The SXES is available for both JEOL FE-SEMs and JEOL W/LaB6/FEG EPMA systems.

Li Detection: Peak shape in compounds

In metallic Li, a single K-line is detected. In Li-compounds, and additional satellite peak can occur depending on the occupancy of the valence band.

High Energy Resolution Spectral Mapping

The SXES allows for direct observation of the Li-K emission for the first time. It is even capable of mapping the different chemical states within a Li-battery that result from different levels of battery charge. Two different Li-K emission lines can be mapped. The intensity of the lower energy Li-K line corresponds to the degree of charge in the battery and the higher energy Li-K line corresponds to the amount of metallicly bonded Li.

Fast Parallel Detection

A newly developed aberration corrected grating system and a high sensitivity X-ray CCD allow the SXES to simultaneously collect a spectrum over a wide energy range.

Chemical State Analysis

With the SXES, chemical state analysis is comparable to that of XPS or EELS. The SXES has an energy resolution of 0.3 eV, as demonstrated using the Fermi-edge of the Al-L emission of Al metal.

SXES Details

Key Features [SXES]
Key Features [SXES-ER]
Resources

- Excellent light element detection (suitable for Li)
- Ideal for chemical state analysis of light elements – critical for battery research
- Superb sensitivity - a few 10s of ppm B in steel
- Energy range 50eV – 210eV (even 2nd and 3rd order lines have a high P/B ratio and high resolution)
- Extreme spectral resolution 0.3eV Al-L fermi edge
- No moving parts, resulting in high stability and reproducibility
- Part of an integrated analytical system or as a stand-alone detector
- Easy to use spectral mapping

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