

NEWLY DEVELOPED COMPACT X-RAY SOURCES

S. Cornaby, T. Parker, R. Steck, B. Harris, K. Kozaczek, C. Smith, E. Miller and S. Kamtekar

Moxtek, Inc.

The XRF and XRD benchtop instrumentation face increasing demand for lowering the detection limits and increasing the accuracy and precision of the measurements. The x-ray tube is a vital component of XRF instruments, which affects the aforementioned characteristics. There are several ways of addressing these needs: increasing the x-ray flux, conditioning the x-ray beam in terms of the size and energy spectrum, and increasing the activation energy. We will present the three different prototype x-ray tubes being developed at Moxtek which address the performance needs of modern XRF/XRD spectrometers:

1. A compact 75 kV 350 watt x-ray tube, which provides an unprecedented x-ray flux from a compact, air cooled, and vacuum compatible device.
2. A compact 60 kV 30 watt microfocal x-ray tube, with a 50 microns or less focal spot size, for close coupling with the polycapillaries, multilayer mirrors, and focusing crystals for μ -XRF and XRD.
3. A portable and compact 120 kV & 5 Watt x-ray tube and high voltage power supply, an air cooled device in a hand size package, which allows one to analyze the K-lines of heavy elements, including lead.

In this presentation we will be covering some of the basic functionality of each one of these sources, as well as some of the intended applications.