

Does size matter? Can portable XRF be used for process control?

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In this paper a case study will be presented where an identical set of reference materials was used to calibrate a Wavelength Dispersive X-ray Fluorescence Spectrometer, an Energy Dispersive benchtop system, and a handheld spectrometer.

The data will show that the capabilities between the three variations of the technique are comparable, especially since the introduction of the SDD detector for handheld XRF. The biggest restrictive factor remains sample preparation which is often neglected when portable systems are used.

Specific limitations will be discussed regarding light elements and the consequences of low power systems that necessitate much longer analysis times.

In conclusion it was found that a portable system theoretically has the same capabilities, and can obtain the same quality data as a laboratory system for perfectly prepared material and long enough measuring times. In practice there are limitations and they have to be balanced against the advantage of bringing the spectrometer closer to the process and thus eliminating long turnaround times.

Laboratory Wavelength Dispersive XRF instruments, are not going to be extinct soon, because, as far as uncertainties due to counting statistics, detection limits and speed of analysis go, they are still the perfect process control tool, but portable systems can be a valuable tool in giving quick turnaround, on site data. Ideally the different techniques should be used in conjunction.