FORARRAYS OF LOW POWER WD XRF INTO FOOD AND NUTRITIONAL SUPPLEMENT ANALYSIS

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The drive for globalization of sourcing basic food commodities and nutritional supplements has heightened awareness for the need to monitor consumer products in the interest of food safety. Although not currently as widely used as ICAP or AAS, XRF is gaining recognition as valuable method for both screening food products for toxic elements and assuring proper levels of nutrient content. The GcMP qualities of XRF allow analytical methods to be validated and implemented as an efficient test method with minimal sample preparation compared to methods requiring sample digestion.

Traditional high powered wavelength dispersive XRF (WDXRF) is capable of many application requirements but acceptance is often hampered by comparatively high instrument price and infrastructure modifications needed to accommodate power and cooling requirements. High performance energy dispersive XRF (EDXRF) is challenged with light element sensitivity while total reflection XRF (TXRF) suffers from a number of sample preparation and contamination issues that make it impractical for routine laboratory use.

Low power WDXRF instruments, operating in the range of 200-1500W, are a class of instruments that meet a range of analytical requirements from a favorable program implementation perspective. As an example, a method for characterization of milk powders based on the work of Perring and Audrey (2003) is revisited to compare the results of earlier generation low power WDXRF to currently available higher performance instruments. The approach to calibration and validation of this test method for several major elements such as, Sodium, Magnesium, Phosphorus, Sulfur and Chlorine, Potassium, Calcium and Iron in different milk powders (infant formulas and others) will be presented. It is expected that similar approaches can be applied to multivitamin tablets, bread fortifiers and many “mineral” based food additives.

Perring, L.; Abdrey, D; Wavelength-dispersive x-ray fluorescence measurements on organic matrices. Application to milk based products; X-Ray Spectrometry 2004; **33**; 128- 135