Application Note EDXRF1491

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EDXRF1491 - Iron in Milk Powder

Scope

The measurement of iron in milk powder is demonstrated. The analysis is also used for measuring iron in similar food products such as cocoa powder and flour.

Background

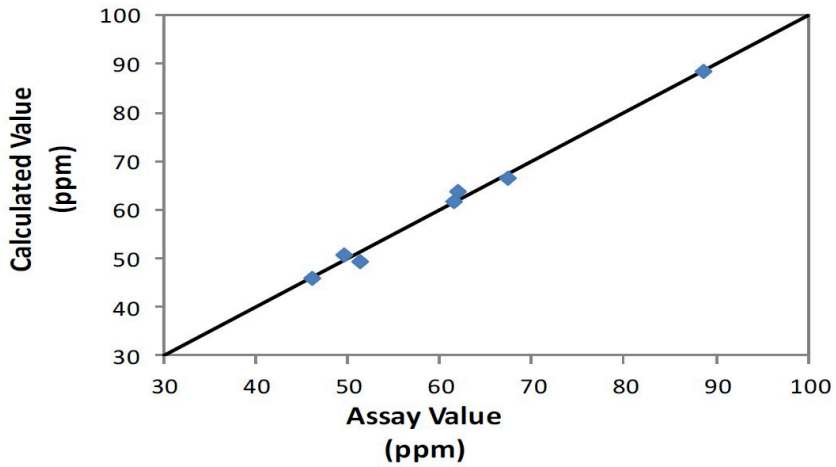
Milk is dried by evaporation to form powdered milk as a way to preserve the milk, giving it a much longer shelf life without the need for refrigeration. Nutrients may be controlled or added at specific levels, the most important being iron. In the production of powdered milk, the iron content is very important and monitored throughout the process to ensure proper iron content of the final product. The measurement is also applicable to other similar food powders such as cocoa powder and flour. Monitoring iron can also be important to ensure no excessive contamination from the milling process. To meet these industry needs, the Rigaku NEX QC+ offers technicians a fast and simple means of monitoring the iron composition of milk powder, cocoa powder, and flour, and is a tool that can be used for quality checks throughout the entire production process.

Calibration

Seven samples assayed for Fe content from a powdered milk production facility were used for the empirical calibration. Other elements such as Zn, K, and Cl were also measured so that corrections can be enabled to compensate for their effects on Fe X-rays.

Iron (Fe) **Units: ppm**

Sample I.D	Assay value	Calculated value
1	51.2	49.4
2	67.4	66.4
3	61.5	61.7
4	49.6	50.8
5	88.6	88.3
6	62.0	63.7
7	46.0	46.0



Correlation plot Fe

Repeatability

An assayed control sample that was not used in the calibration was also provided to confirm calibration accuracy. The control sample was measured in 10 repeat analyses without moving the sample between measurements to determine an average value for precision.

Iron **Units: ppm**				
Sample I.D.	**Assay value**	**Average value**	**Std. dev**	**% Relative**
Control	64	61	1	1.6

Conclusion

The results indicate that given good sample preparation and proper reference standards for calibration, the NEX QC+ can be an excellent tool used for measuring iron in powdered milk and similar products, such as cocoa powder and flour.

Related products

NEX QC II Series

Compact, intuitive benchtop EDXRF for everyday elemental testing