

## PICKING UP THE CHALLENGE FOR BEST PRECISION AND ACCURACY IN FERRO ALLOY ANALYSIS

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One of the most important and most expensive raw materials for the steel industry are binary ferro alloys such as FeCr, FeMn, FeMo, FeNb, FeSi, FeW, etc... These are added to the molten steel bath in precise quantities to produce different grades of stainless steel which have specific properties. This industry as many other faces continual increase of the demand and on the other hand users of high end steel look for the best quality level for the products. This situation explained why stricter specifications are always expected.

Steel makers need the most accurate knowledge of the composition of their raw materials including ferro alloys to control final product quality and to control their production cost. XRF spectrometry is known as the most effective, precise and accurate analytical technique for the measurement of major and minor elements in raw materials. But the quality of the XRF results of ferro alloys strongly depends on the sample preparation and this can cause headaches with ferro alloys. Sample preparation as pressed powder gives good precision especially for impurities, but the accuracy is lacking due to particles size effects. Another problem with the analysis of ferro alloys is the fact that only few good quality reference materials (RM) are available worldwide for calibration of spectrometer.

In order to maximize the precision and the accuracy of the analysis borate fusion must be used as sample preparation technique. This technique does not face the problems of particles size effects and the preparation by fusion allows to use synthetic RM for the XRF calibration. One known problem of borate fusion preparation is that this technique applies normally for fully oxidized materials. Ferro alloys are not fully oxidized, which have property to alloy with the platinum dishes use for fusion.

A newly developed sample preparation technique using dry oxidation and/or wet oxidation allow simple and "platinum safe" borate fusion. By using an automated fusion machine, users achieve a very good repeatability of the sample preparation, which finally in a very high level of analytical precision and accuracy. Methodology and results will be presented.