

## **New development in Lithium Borate fusion for Ferroalloys**

Ferroalloys are used to adjust the final composition of steels. They play a key role in the physical and chemical properties such as hardness, strength, resistance to oxidation, etc. Ferroalloys are expensive and a careful management of the quantities added in the steel making process can lead to important savings.

XRF spectrometry has become the main instrumentation technique for ferroalloys because it allows accurate and precise multi-elemental determination. However, ferroalloys are not suitable for direct XRF analysis and sample preparation must be performed. In the past, borate fusion was not recommended for ferroalloys because they are composed of metallic species that are insoluble in borate salts and that metallic species can cause severe damage to Pt-Au ware. A few manual fusion techniques are described in the literature but they are time consuming and the results are dependant of the operator's skills. Moreover, they involve frequent manipulations of hot materials.

Recent improvements in borate fusion techniques have overcome the danger of fusing ferroalloys and made it easier. Automated fusion techniques with dry oxidation on a fluxer allow minimizing the preparation time and the number of manipulations and weighing steps. Perfectly flat, homogenous glass disks, without mineralogy nor particle size effects are now produced which also reduce inter-element effects. Optimization of the fluxer parameters and timing sequences now allow for easy and accurate borate fusion for ferroalloys such as FeV, FeMo, FeSiMn and FeV with high precision.