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Thermo Scientific ARL iSpark Fire Assay Analyzer

Fire assay analysis without cupellation using spark OES

Fire assay analysis is one of the most accurate methods for the **determination of the contents of Gold, Silver and the Platinum Group Metals** in various materials (e.g. ores and slurries). It is suitable for the most demanding analytical purposes, in activities ranging from exploration to metal accounting, and from mining to recycling.

The traditional fire assay analysis is a complex process that includes the following steps (explained on back page):

- Fluxing and fusion
- Separation of the slag from the lead button
- Cupellation – formation of the precious metals bead
- Complex analysis process

Although providing accurate results at very low precious metal contents, traditional fire assay analysis suffers from **major drawbacks**, e.g. duration, cost, and risks for operator and environment.

Drawbacks are considerably reduced if **cupellation and subsequent analysis process are replaced by direct determination of the precious metals contents in the lead button with the ARL iSpark Fire Assay Analyzer**.

ARL iSpark Fire Assay Analyzer

The Thermo Scientific™ ARL™ iSpark Fire Assay Analyzer is a high-performance spark optical emission spectrometer, **specially tuned for the analysis of fire assay lead buttons**.

Thanks to its unique one-meter focal length optics with photomultiplier tubes and advanced technologies, it has the limits of detection that allow optimal quantification of trace level contents of gold, silver and platinum group elements in lead buttons.

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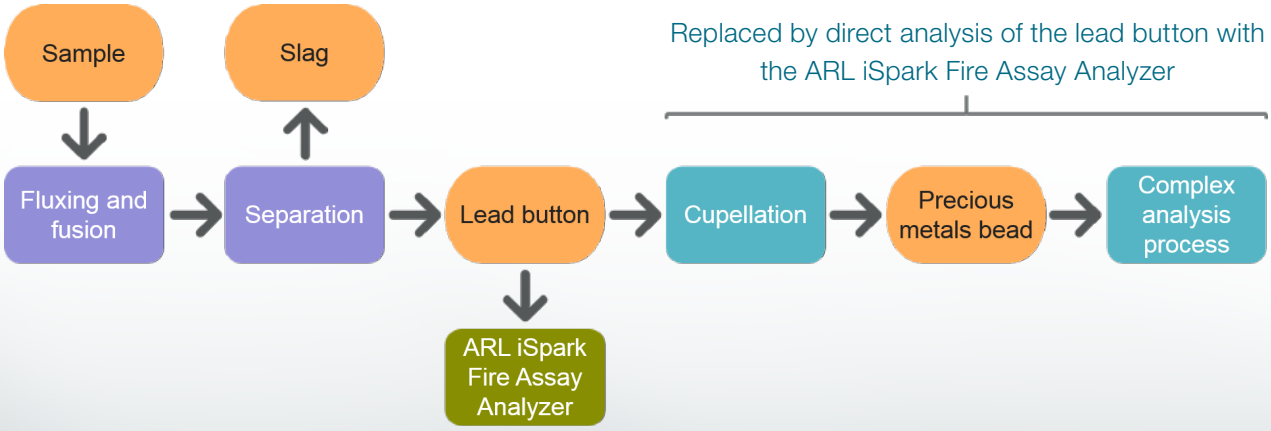
Traditional fire assay analysis and alternative with ARL iSpark Fire Assay Analyzer



Traditional fire assay process

In the traditional form, fire assay analysis includes the steps:

- **Fluxing and fusion:** the sample is ground, mixed with flux and lead oxide, and heated in a crucible to around 1100°C. The lead oxide is reduced to liquid lead and quantitatively absorbs the precious metals.
- **Separation:** the molten mixture is poured into a mold. The lead sinks to the bottom of the mold, solidifying into a lead button, while the slag solidifies on the surface. The slag is carefully removed.
- **Cupellation:** the lead button is placed in a special crucible, the cupel, and heated to about 1000°C. The lead oxidizes on contact with air and is absorbed by the cupel, leaving a precious metal bead.
- **Analysis process:** the precious metal bead is dissolved in aqua regia, and the precious metal contents are determined by gravimetric or instrumental methods, in general AAS, ICP-AES and ICP-MS.

The alternative with ARL iSpark Fire Assay Analyzer

Cupellation and complex analysis process are replaced by a simple, direct analysis of the lead button with the ARL iSpark Fire Assay Analyzer.

Benefits

- All the precious metal concentrations available in a minute
- Reduction of the cost of cupels, chemicals and energy
- No environment risk associated with the disposal of lead-contaminated cupels
- Reduction of risks for operators exposed to heat and toxic substances, dusts and fumes
- A single analytical instrument, i.e. low investment and operation costs
- Ease of automatization of the analysis with ARL SMS (Sample Manipulation Systems).

Ask for an evaluation of the ARL iSpark Fire Assay Analyzer!

Learn more about ARL iSpark Fire Assay Analyzer at
thermofisher.com/fireassay

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