Precision determination of precious metals with ICP-OES–

History - Application, Limits and Future of Precision Analysis with ICP

Stefan Zorn

Agosi, Germany

+49 7231 960 214, Stefan.zorn@agosi.com

For over 30 years, precision determinations with ICP OES using bracketing has been an integral part of modern precious metal analysis. High precious metal prices, hallmarking regulations and low splitting limits for the assay exchange are the challenges for instrumental precious metal analysis with ICP OES.

In the field of precious metals determination, the following standards describe the bracketing method:

1) ISO 11494:2019 Jewellery and precious metals - Determination of platinum in platinum alloys - ICP-OES method using an internal standard element.
2) ISO 11495:2019 Jewellery and precious metals - Determination of palladium in palladium alloys - ICP-OES method using an internal standard element.

The samples are dissolved in aqua regia. These sample solutions are mixed with the internal standard and made up to the standard measuring volume.
Using ICP-OES, the precious metal content of the sample solution is measured by comparison of the ratio intensities of the spectral emission of precious metal and appropriate yttrium line(s) with the ratios for solutions containing known masses of precious metal and yttrium using the bracketing method.

In daily work with precision determination, these described standards can also be adapted for other metals and thus ensure an exact analysis.

This presentation will outline the how the bracketing method is implemented for the determination of different elements. With comparison round robins and synthetic samples.