The Assist provides you with:

- Twice the sample throughput. The time, stabilization time and the time for the sample to move from the autosampler to the nebulizer are all reduced. This reduces the time for a typical analysis by at least half.
- Better precision: the sample is delivered by a precisely controlled syringe, eliminating the signal pulsation problem which occurs with the usual peristaltic pump delivery system.
- Better accuracy: the internal standard is delivered by a second precision pump drive, ensuring that the ratio of internal standard to sample is accurately maintained. The fluctuations in this ratio that occur when the internal standard delivered by peristaltic pumps are eliminated, greatly improving the analytical accuracy.
- Automatic dilution: the second syringe drive can also be used to deliver a diluent, enabling accurate dilution by a factor of up to 8:1 to be carried out automatically.
- Reduced carryover: the sample has never contact any peristaltic pump tubing and the sample path is totally inert.

This system is used when inline delivery of internal standard or diluent is not required. It

The Assist Basic Package – One Syringe Unit

This system is used when inline delivery of internal standard or diluent is not required. It

The Assist Premium Package – Two Syringe Units

This system is used when inline delivery of internal standard or diluent is not required. It

The Assist Oils Package – Three Syringe Units

This system is configured specifically for the analysis of wear metals in raw (undiluted) lubricating oils. It

Currently, instruments are used as ready/update delay, stabilization delay (incorporated in the read delay), ready/update time, and rinse delay. With the Assist and Niagara Plus only a ready/update delay and rinse time cycle of the autosampler probe and uptake tubing is performed during the ready/update cycle, thus eliminating the rinse delay. The constant flow of solution to the plasma and uniform internal diameter throughout the entire system allow the stabilization time to be reduced significantly and it is incorporated into the ready/update delay to simplify the usage process. With the Assist the stabilization time can be reduced further due to the steady solution flow rate from the syringe drive. In the example method above, the Assist cuts out more than 60% of the analysis time.

The data above was taken on an Agilent 7500 and 7700 ICP-MS comparing online delivery of an internal standard and diluent using the Assist, natural aspiration and peristaltic pump. The Assist eliminates the signal pulsation that occurs with the peristaltic pump and provides the most precise online dilution. When choosing to add an internal standard the 7700 achieved with the Assist is well below 0.5%, ensuring that the ratio of internal standard to sample is accurately maintained. The Assist allows you to use online addition of an internal standard (or diluent) with a ratio up to 8:1 (factor of 8 dilution) and all dilution accuracy correction with a stabilization time of 10 seconds or less. In the bottom two graphs (109 mg/L) standards were prepared by manual dilution (diluent) and online using the Assist. The results show that the Assist matches the analytical accuracy of the manual sample preparation.

The measurement of metals in used engine oils provides valuable information about the regime and the state of the lubricant, information which can be used to increase the efficiency of the equipment in which the engine resides and lower the cost of maintenance. The data above was obtained using a Varian Vista Radial ICP-MS. The Assist provides correlation factors of at least five times for the mass-spectra measured, demonstrating excellent correlation. Mass 31 demonstrates between 99% and 100%, showing the Assist is capable of providing accurate online dilution and measurement reproducibility. Any carryover is reduced due to the totally inert sample path.

Conclusion

The Assist sample introduction accessory has greatly enhanced the performance of ICP-MS and ICP-MS instruments. The accessory uses Flow Injection technology to reduce analysis time by more than 50%, rapidly, reducing in reduced environmental impact and lower operating cost. In addition to the cost and environmental benefits, the Assist delivers an improvement in analytical performance with the precise syringe drive. With these different configurations, the Assist can take a variety of applications. Future developments include a PEER diluter probe with the potential to provide a 200:1 online diluter and a direct seawater analysis package.

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