IntelliQuant Assistant
Simplifying ICP-QQQ method development

Agilent ICP-QQQ IntelliQuant Assistant:

– Automates ICP-QQQ MS/MS method development and optimization

– Accelerates the development of more complex applications using reaction chemistries

– Selects the best reaction chemistry, mass transitions and integration parameters

– Optimizes sample introduction and plasma conditions

IntelliQuant Assistant is a software function within the Agilent MassHunter instrument software that uses sample information and a database of ICP-QQQ knowledge to select the best method settings.

The Agilent ICP-QQQ instruments can provide significant performance improvements for elements like As, Se, and Cd which can suffer from challenging interferences. However, understanding the best reaction gases, mass shifts and instrument settings can introduce an extra level of complexity and make method development appear to be a challenging process.

IntelliQuant Assistant has been designed to greatly simplify method development, allowing inexperienced users to successfully develop methods and easily achieve the high data quality that's possible on an ICP-QQQ. It's like having an experienced analyst beside you, using years of acquired knowledge to guide the best settings to use for analysis and making method development as simple as selecting an element.

Using IntelliQuant Assistant, the user answers a few simple questions about the sample type, internal standards and elements of interest. IntelliQuant Assistant then uses an extensive knowledge base to determine the best settings for the analysis.

Quadrupole settings, cell gas modes, MS/MS conditions, and mass transitions are all optimized to suit the analysis.

Picking the correct reaction chemistry and quadrupole setting to get the analytes of interest is just the start of developing a great ICP-QQQ method. IQ Assistant will also set your plasma settings, uHMI settings, internal standards, and integration times to ensure you have a method that will give you the best results for your analysis.

IntelliQuant Assistant can also be used as starting point for more complex applications. After creating a method using IntelliQuant Assistant, it can be modified to suit applications requiring specific reaction chemistries.

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IntelliQuant Assistant workflow

After selecting 'IntelliQuant Assistant' the user is presented with a few simple questions:

Sample information	Matrix level – low, medium or high (<0.2% to 25% TDS)
Internal Standards	Preconfigured lists or manual selection
Analytes	Preconfigured lists (e.g. EPA 6020) or manual selection
Method creation	IntelliQuant Assistant uses its extensive database to select the optimum conditions including: – Sample introduction parameters (e.g. plasma power, nebulizer and U-HMI gas flow rates) – Appropriate cell and reaction conditions – Mass selection of both quadrupoles for each element – Appropriate integration settings for each element (e.g. Na 0.1s, Hg 1.0s) – Appropriate internal standard assignments

Example:

As a simple example, a method is required to analyze As, Se, Cd, Hg and Pb in a high matrix sample. IntelliQuant Assistant will set the appropriate U-HMI dilution and all other sample introduction system parameters. Based upon the element choice, IntelliQuant Assistant will select the optimum quadrupole, cell and integration parameters. The table below displays some of the basic decisions made for the analytes in this example.

Element	Q1	Cell Mode	Q2	Comments
As	75	O_2	91	Measured as AsO and SeO. This eliminates polyatomic and doubly charged interferences by moving the elements away from the interferences. Q1 removes any elements at mass 91 and 94 before the reaction cell.
Se	78	O_2	94	
Cd	111	O_2	111	Measured on-mass, the Molybdenum-based interferences reacts with O_2. Q1 rejects Mo before the cell, eliminating possible side-reactions.
Hg	202	O_2	202	Measured on-mass, the Tungsten-based interferences reacts with O_2. Q1 rejects W before the cell, eliminating possible side-reactions.
Pb	208	He	208	No reactions necessary on the Agilent ICP-QQQ. He mode chosen as the best mode for analysis.

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