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PRODUCT SPOTLIGHT

Thermo Scientific iCAP TQ ICP-MS

Multiple operation modes to maximize your ICP-MS capability

With its unique Reaction Finder for simpler method development, easy access sample introduction system and low maintenance operation, the Thermo Scientific™ iCAP™ TQ ICP-MS provides the simplest route to high accuracy trace element analysis.

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When using triple quadrupole (TQ) ICP-MS, there are many ways to isolate your analyte, using different reaction gases and scan options. Although TQ modes are highly effective for some interferences, single quadrupole (SQ) modes such as kinetic energy discrimination (KED) are sometimes the best option.

The iCAP TQ ICP-MS can be operated in 3 modes to cover everything from routine, multi-element measurement to ultralow detection of strongly interfered analytes in challenging sample matrices:

SQ mode – Routine SQ operation. Multi-element analysis in standard mode (no cell gas), collision cell with helium and KED (SQ-KED) or a mixture of both, to provide quick results for routine samples in high-throughput laboratories.

TQ on mass mode – TQ on mass mode, using reactive gases such as hydrogen. In this mode, ultralow, on mass detection of elements that remain strongly interfered in conventional SQ-KED mode (e.g. ^{78}Se in a nickel matrix with NiO and NiOH interferences) can be simply achieved. With its unique gas protection interlocks, the iCAP TQ ICP-MS ensures safe and effective reactive cell gas operation in your laboratory.

TQ mass shift mode – TQ mass shift mode, using reactive gases such as oxygen and ammonia. This mode solves specific analytical challenges such as accurately detecting titanium in clinical research samples. It allows the isotope of interest to be combined with the reaction gas to form a higher mass product ion (e.g. $TiNH(NH_3)_3^+$ for the example of titanium) which can be measured free from interference.

The effectiveness of TQ on mass mode is demonstrated in Figure 1 where selenium can be accurately measured down to ng·L^{-1} level in 100 mg·L^{-1} nickel, whereas Figure 2 demonstrates that this analysis in a SQ mode does not allow reliable measurement below µg·L^{-1} level.

For maximum flexibility, all three modes can be combined in a single run, providing fully optimized analysis for your complete range of applications.

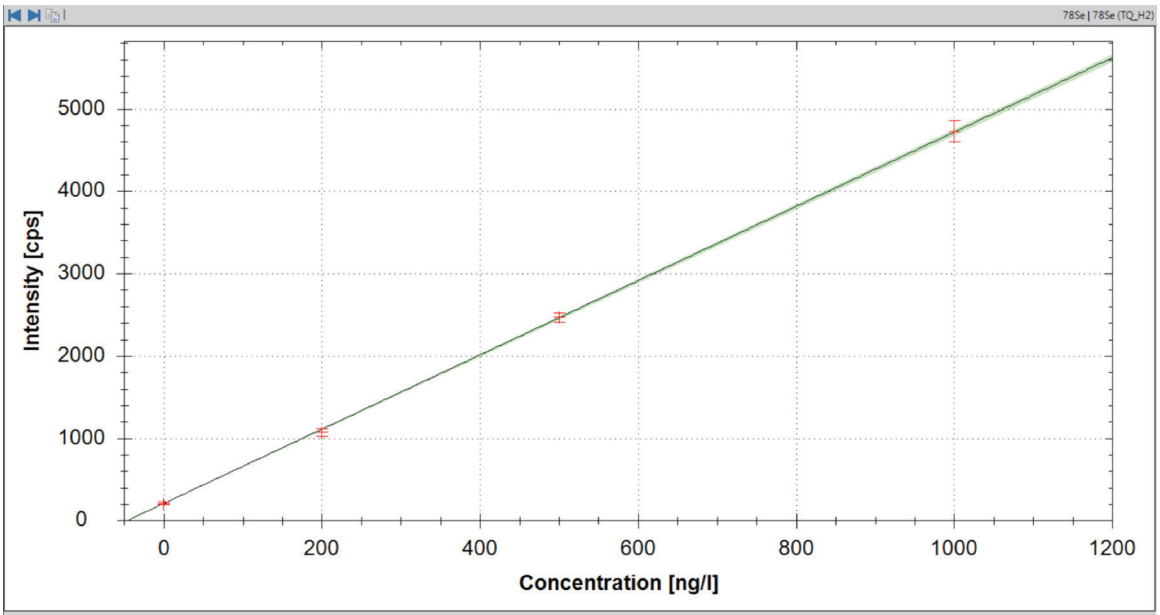

Figure 1. ^{78}Se measured on mass in a 100 mg·L^{-1} nickel solution using TQ mode, with hydrogen cell gas (NiO and NiOH interferences efficiently removed).

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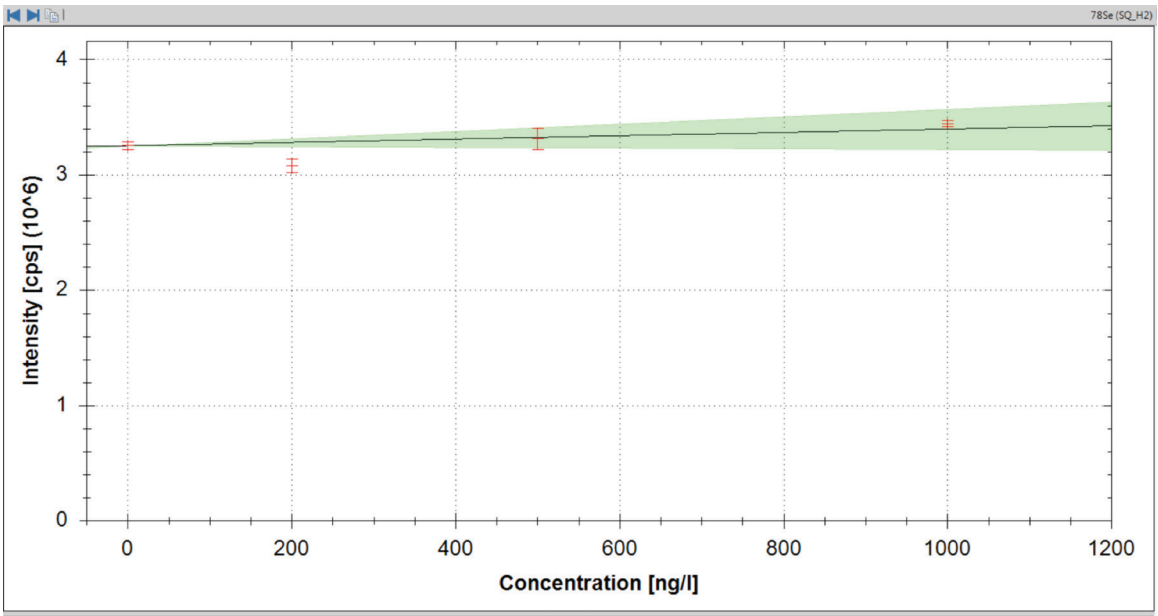

f(x) = b*x + a

Parameter	Value	Confidence Delta at 90%	StdErr	Rel. StdErr [%]
b	144.339	+/-174.393	106.486	73.775
a	3,250,861.921	+/-0.000	0.000	0.000
R^2	0.367			
BEC	22,522.419 ng/l			
IDL(LOD)	666.626 ng/l			

Figure 2. ^{78}Se measured on mass in a 100 mg·L^{-1} nickel solution using SQ mode, with hydrogen cell gas (NiO interferences not efficiently removed).

Maximize your ICP-MS capability

- Enhanced interference removal capability with triple quadrupole technology.
- High accuracy analysis delivering right first time results.
- Improved limits of detection, compared to SQ-ICP-MS analysis, even in challenging matrices.
- Simple instrument operation and error free analysis with Reaction Finder.

Find out more at **thermofisher.com/TQ-ICP-MS**

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