Introduction
Polyatomic interferences are one of the fundamental challenges in ICP-MS. They can be reduced to at least 40% in the Q-ICP-MS, but in many cases even lower percentages are desirable. An alternative reactive gas or more aggressive cell conditions are required to remove any polyatomic interferences. In reactive mode it is also important to remove the reacting gas ions and other low mass ions along the cell.

A new collision cell design employing flatapole rods was developed. The design can widen the mass range due to the elongated entrance area, while maintaining low mass cutoffs. The properties of a flatapole are very similar to that of a quadrupole. As can be seen from Figure 2, the electric field corresponds to a quadrupole with higher confinement. The flatapole rods provide an advantage over traditional flatapoles in that they require less RF power, which reduces interferences at low mass cutoffs.

The QCell™ has curved shaped flatapole rods so that the distance between the rods is lower at the entrance than at the exit. Through the application of innovative technologies in the QCell™, low mass cut-off can be improved further.

Overview
Purpose: To provide an exploration of some of the advanced technologies specifically the QCell™ which has four flatapole rods.

Methods: A series of examples are described that, after explanation of the working principle, demonstrate the use of the advanced features in the QCell™ in both research and routine ICP-MS applications.

Results: Through the application of innovative technologies in the QCell™, the shape, size, and position of the flatapole rods can be adjusted. This allows for a wider mass range compared to a flatapole with a similar entrance between the rods. The properties of a flatapole were shown to be of a quadrupole. As can be seen from Figure 2, the electric field corresponds to a quadrupole with higher confinement.

QCell Technology
In two recent reactions ICP-MS multidetectors are used, as an example, to study matrix effects in collision cell applications. The QCell™ has also been used in a number of kinetic energy discrimination experiments. In summary, the QCell™ is a quadrupole cell with a flatapole field that is used to reduce interferences at low mass cutoffs.

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Conclusions
The QCell™ has been shown to be an effective technique for the analysis of complex samples, providing improved performance for a wide range of applications. The QCell™ is particularly useful for the analysis of low mass interferences in ICP-MS, offering improved sensitivity and selectivity.

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