A new milestone for ultra-low ^{236}U/^{238}U isotope ratio measurements by ICP-MS/MS

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Associated content

Correction of hydride formation on the ^{236}U/^{238}U isotope ratio (Equation 1)

$$\left(\frac{^{236}U^+}{^{234}U^+}\right)_{corr} = \frac{\left(^{236}U^+\right)_{meas} - \frac{\left(^{238}UH^+\right)_{meas}}{^{238}U^+} \times {^{235}U^+}}{^{234}U^+}$$

$$\left(\frac{^{236}U^+}{^{234}U^+}\right)_{corr} = \left(\frac{^{236}U^+}{^{234}U^+}\right)_{meas} - \left(\frac{^{238}UH^+}{^{234}U^+}\right)_{meas} \times \frac{^{235}U^+}{^{238}U^+}$$

$$\left(\frac{^{236}U^+}{^{234}U^+}\right)_{corr} = \left(\frac{^{236}U^+}{^{234}U^+}\right)_{meas} - \left(\frac{^{238}UH^+}{^{234}U^+}\right)_{meas} \times \frac{1}{137.88}$$

Influence of the ^{235}UH$^+$ interference on the measurement of ^{236}U/^{238}U isotope ratio (Equation 5):

$$\frac{UH^+}{U^+} = \frac{^{235}UH^+}{^{235}U^+} \times \frac{^{238}U^+}{^{238}U^+} \times \frac{^{236}U^+}{^{236}U^+}$$

$$\Rightarrow \frac{UH^+}{U^+} = \frac{^{235}UH^+}{^{236}U^+} \times \frac{^{238}U^+}{^{235}U^+} \times \frac{^{236}U^+}{^{238}U^+}$$

$$\Rightarrow \frac{^{236}U^+}{^{238}U^+} = \frac{UH^+/U^+}{^{235}UH^+/^{236}U^+} \times \frac{^{235}U^+}{^{238}U^+}$$

$$\Rightarrow \frac{^{236}U^+}{^{238}U^+} = \frac{UH^+/U^+}{^{235}UH^+/^{236}U^+} \times \frac{1}{137.88}$$