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Determination of the Isotopic Composition of Iridium Using Multicollector-ICPMS

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Like many other elements, iridium is lacking a calibrated, SI traceable isotope ratio measurement. In this study, we
have undertaken absolute isotope amount ratio measurements of iridium by multicollector inductively coupled plasma mass
spectrometry (MC-ICPMS) using a state-of-the-art regression model to correct for the instrumental fractionation (mass bias) of
isotope ratios using both NIST SRM 997 isotopic thallium and NIST SRM 989 isotopic rhenium as primary calibrators. The
optimized regression mass bias correction model is based on incrementally increasing plasma power and short (10−30 min)
measurement sessions. This experimental design allows fast implementation of the regression method which would normally
require hours-long measurement sessions when executed under constant plasma power. Measurements of four commercial
iridium materials provide a calibrated iridium isotope ratio R193/191 = 1.6866(6)k=1 which corresponds to isotopic abundance x191
= 0.372 21(8)k=1 and an atomic weight of Ar(Ir) = 192.217 63(17)k=1. In addition, we present data on a new Certified Reference
Material from NRC Canada IRIS-1 which fulfills the requirements of a delta zero reference for iridium isotope ratio
measurements.