High precision N-TIMS Os isotopic measurement on low abundance materials using $10^{13}\Omega$ resistors

BRUCE F SCHAEFER[1], PETER WIELAND[1], RACHEL BEZARD[2] AND SIMON P TURNER[1]

[1] Thermo Fisher Isotope Development Hub, Department of Earth and Environmental Sciences, Macquarie University, Sydney, New South Wales 2109, Australia. (Bruce.Schaefer@mq.edu.au)

[2] Department of Geosciences, Tuebingen University, Wilhelmstrasse 56, 72074 Tuebingen, Germany

The use of N-TIMS analysis for Os isotopes has been the standard analytical protocol for low abundance materials across a wide range of matrices. However, the very low concentrations of Os in many earth science materials has historically limited potential applications, necessitating either dissolution of excessive amounts of sample (>10-20g for granites or obtaining high precision ^{186}Os measurements). Additionally, many samples need to be measured using ion counting procedures in order to accommodate the low beam intensity produced from small sample loads.

Here we present high precision data on low sample loads, and increased precision data on larger sample loads between SEM, $10^{11}\Omega$ and a mixed 10^{11} and $10^{13}\Omega$ amplifier configuration using a ThermoFisher Triton Plus on both standards and geological materials.

JMC2 in house solution standard:

	ng Os	$^{187}Os/^{188}Os$	$2SE_{(mean)}$	n
SEM	5	0.183043	0.000239	117
10^{11}	20	0.183151	0.000150	9
$10^{11}+10^{13}$	5	0.183102	0.000130	7

Not only is precision greatly improved on the $10^{13}\Omega$ resistors, run times are of the order of 20-25 mins compared to 45min - 2 hours in static 10^{11} configuration and dynamic SEM acquisition respectively.

Measuring the residual Os on filaments after SEM runs inidcates that the procedure is able to measure very low loads, albeit there is indication of fractionation effects due to previous runs:

Reruns of filaments run initially by SEM

		SEM		$10^{11}+10^{13}\Omega$	
	ng	$^{187}Os/^{188}Os$	2sd	$^{187}Os/^{188}Os$	2sd
WPR-1	0.3	0.144425	0.000099	0.144441	0.000049
Basaltic andesite	0.18	0.15916	0.00018	0.16021	0.00032

Total procedural replicates of low abundance geological samples will also be presented.