

Supplementary

Supplementary table 1 – Typical operating condition of Agilent 8900 ICP-MS/MS for the analysis of Pu isotopes using O₂ gas

Parameter	Typical operating conditions
Forward power	1550 W
Reflected power	<20 W
Plasma gas	15 l min ⁻¹
Auxiliary gas flow	0.9 l min ⁻¹
Nebuliser carrier gas flow	1.0 l min ⁻¹
Nebuliser make up gas flow	0.25 l min ⁻¹
Cooling water temperature	15-40 °C
Cooling water minimum flow rate	5.0 l min ⁻¹
Cooling water inlet pressure	230-400 kPa
Exhaust duct extraction flow rate	4-6 m ³ min ⁻¹
O ₂ gas	0.3 ml min ⁻¹ (30%)
Environment Temperature	15-30°C <2°C change in 1 hr
Acquisition time	149 s
Integration time	0.05 secs for ¹⁹³ Ir (on mass), ²⁰⁹ IrO ⁺ (mass sift), ²²⁵ IrO ⁺ (mass sift) and 0.2 secs for ²⁷⁰ UO ⁺ , ²⁷¹ PuO ⁺ , ²⁷² PuO ⁺ , ²⁷³ PuO ⁺ and ²⁷⁴ PuO ⁺
Nebuliser	Glass Expansion concentric
Spray chamber	Double pass
Spray chamber temperature	2°C
Spray chamber drain pump tubing	PharMed tubing yellow/blue 1.52 mm
Mass range	6 – 275 amu
Mode of acquisition	Time Resolved Analysis
Type of detector	Simultaneous
Detector mode	Pulse counting
Total acquisition time	149 s
Sampling period	1.18 s
Quaternary Pump stop time	120 s
Quaternary Pump post time	120 s

Isotope	²³⁸ U	²³⁹ Pu	²⁴² Pu
Sensitivity (cps / pg)	1089	974	1197

kg⁻¹)

Supplement
ary table 2 -

Sensitivity of measurement for isotopes ²³⁸U, ²³⁹Pu and ²⁴²Pu using ICP-MS/MS