

Table S1. Instrumental parameters for MC-ICP-MS, Neptune Plus

MC-ICP-MS (Neptune Plus)	
RF power	1200 W
Guard electrode	Off
Cool gas	16 L/min (Ar)
Auxiliary gas	0.8 L/min (Ar)
Sample gas	0.8–1.0 L/min (Ar)
High vacuum	$<2 \times 10^{-7}$ mbar
Ion getter pressure	$<1 \times 10^{-8}$ mbar
Cup configuration	^{140}Ce (L4), ^{142}Nd (L3), ^{143}Nd (L2), ^{144}Nd (L1), ^{145}Nd (C), ^{146}Nd (H1), ^{147}Sm (H2), ^{148}Nd (H3), ^{150}Nd (H4)
Mass resolution (M/ Δ M)	400
Cycles/blocks	200 cycles/1 block
Integration/idle time	1.049 s/1.000 s
Sample/skimmer cones	Jet-sample/X-shape skimmer or Normal-sample/X-shape skimmer
Nebulizer	PFA ESI-100
Baseline correction	ESA defocused (315 s)
Aridus II	
Ar sweep gas	3–5 L/min
N ₂ gas	0–3 mL/min
Spray chamber/desolvator	160 °C/110 °C



Fig. S1. Sampling photo of KAIKO#684-R05 at 4441 m depths using a manipulator of ROV *Kaiko* deployed from *RV Kairei*.