Supplementary material

The supplementary material includes three tables and one figure.

Table S1 Combustion program for ^{129}I separation from aerosol on glass fiber filter

Step	Segment type	Temperature, °C	Duration	Ramp rate, °C min^{-1}	Gas and flow rate, L min^{-1}
1	Time	20-250	20 min	11.5	
2	dwell	250	10 min		N_2, 0.1
3	Time	250-400	30 min	5	O_2, 0.1
4	dwell	400	20 min		
5	time	400-(700-900)	40 min	7.5-12.5	O_2, 0.2
6	dwell	(700-900)	1-3 hours		

Table S2 Operating parameters of the AMS (3 MV, HVEE, the Netherlands)

AMS parameters	3 MV (HVEE)
Energy of Cs-sputter negative ion source	35 keV
Bouncer frequency	100 Hz
Injection time of ion	Mass 129: 9 ms; Mass 127: 100 μs
stripper gas	Ar
Acceleration voltage	2.5 MeV
Charge state of iodine	+5
Mass resolution M/ΔM for ^{129}I	820
Stripping yield of I^{5+}	3.6-3.8%
Iodine ion current in the Faraday cup	0-100 nA for AgI-AgCl coprecipitation targets
	0-1 μA for AgI precipitate targets
Energy resolution E/ΔE of the cylindrical electrostatic analyzer	750
Mass resolution M/ΔM of the 30° deflection magnet	175
Measurement time per cycle	5 min per sample

Cycle number	6 cycles

Table S3 Operating parameters of the ICP-MS/MS (8800 series, Agilent)

ICP-MS parameters	8800 series (Agilent)
RF power	1480 W
Sampling depth	4.0 mm
Plasma gas	15 L min^{-1}
Auxiliary gas	0.8 L min^{-1}
Carrier gas	0.9 L min^{-1}
Nebulizer	MicroMist
Data acquisition mode	Full quantitative data collection
Analysed isotopes	^{127}I, ^{133}Cs
Analysis mode	Single quadrupole, no collision/reaction gas
Dwell time	0.1 s
Repeat of measurements	3
CeO/Ce	< 2.0 %
Ce^{2+}/Ce	< 3.0 %
Spray chamber temperature	2.0°C

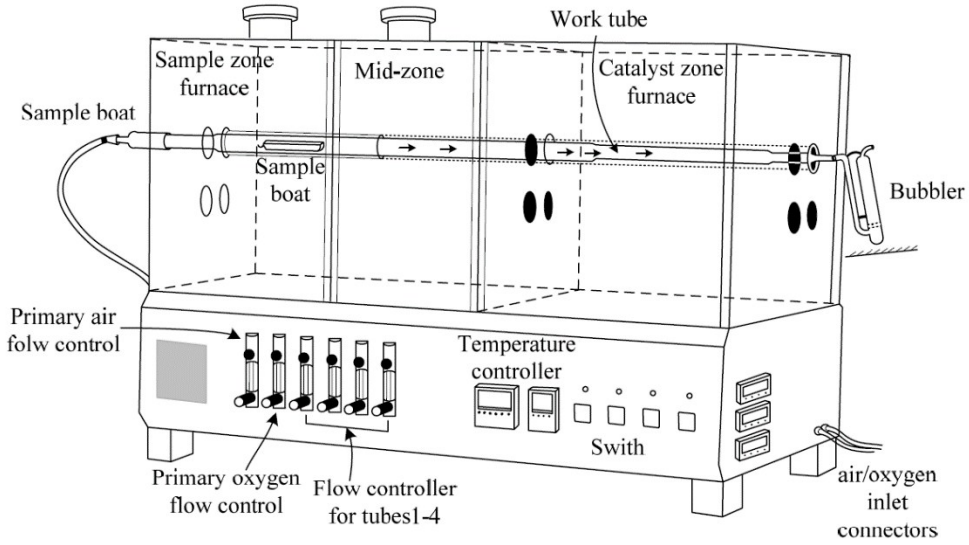

Figure S1 Schematic diagram of the pyrolyser-4 TrioTM furnace