

Improving detection capabilities of biogenic selenium nanoparticles in spICP-MS using an anionic ion-exchange resin

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Table S1. Composition of *H. mediterranei* MMM culture media.

Components	Concentration (g L ⁻¹)
NaCl	156
MgSO ₄ 7 H ₂ O	39.5
MgCl ₂ 6 H ₂ O	27.7
Na ₂ HPO ₄	7.4
Glucose	5.0
KCl	4.0
NH ₄ Cl	0.8
CaCl ₂	0.7
NaH ₂ PO ₄	0.7
NaBr	0.5
NaHCO ₃	0.1
Tris-HCl	0.1
FeCl ₃	0.01

Table S2 ICP-MS operating conditions used for the detection of Se dissolved ions and SeNPs.

	Conventional mode	Single particle mode
Plasma forward power (W)	1550	
Argon flow rate (L min ⁻¹)		
Plasma	15	
Auxiliary	0.90	
Nebulizer (Q _g)	0.90	
Sample introduction system		
Nebulizer	OneNeb®	
Spray chamber	Scott double-pass	
Sample uptake rate (Q _i) (μL min ⁻¹)	210	
Sampling torch injector (mm)	0.8	
Sample depth (mm)	4	
Dwell time (ms)	10	0.1
Measuring time (s)	10	60
Nuclide	⁸⁰ Se (as ⁹⁶ SeO ⁺)	
Cell gas	O ₂	
Cell gas flow (mL min ⁻¹)	4	

Table S3. Influence of the anionic resin treatment on both mean particle size (MPS) and concentration for different incubation times. Confidence intervals represent the standard deviation for n=3 replicates.

	Resin treatment		No resin treatment	
Time (h)	MPS (nm)	Concentration (particles L ⁻¹)	MPS (nm)	Concentration (particles L ⁻¹)
24	65.0 ± 0.1	(3.7 ± 0.1) × 10 ¹²	71.6 ± 0.1	(3.1 ± 0.4) × 10 ¹²
60	117.8 ± 0.7	(7.2 ± 0.2) × 10 ¹²	118.12 ± 0.12	(7.1 ± 0.5) × 10 ¹²

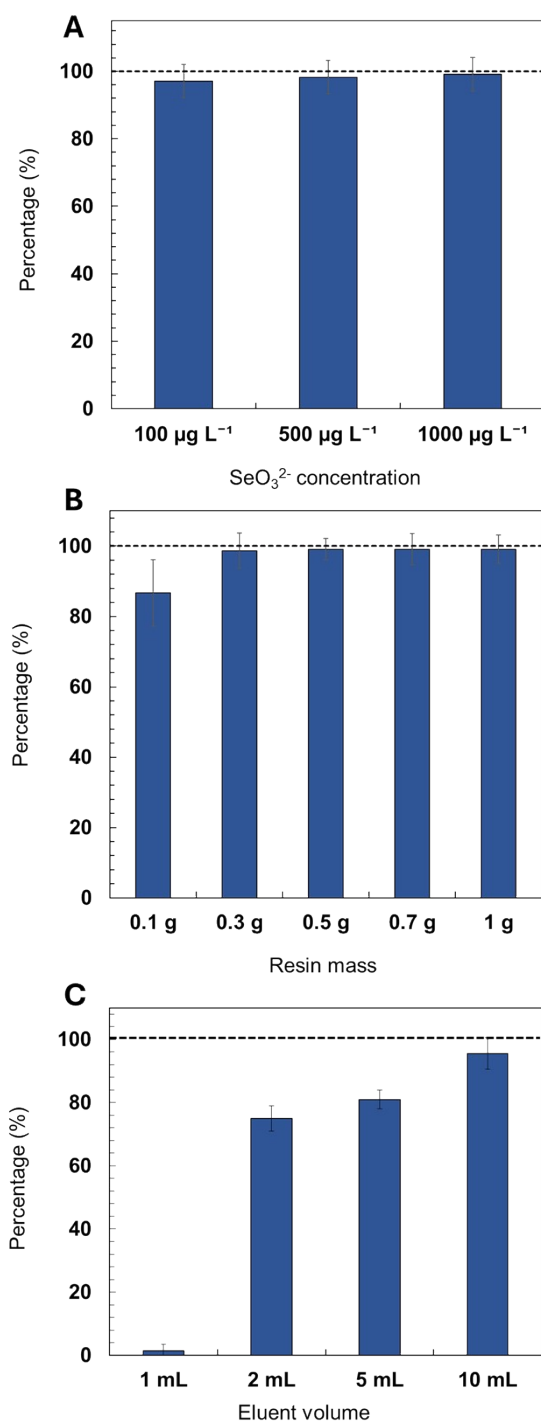


Fig. S1. SeO₃²⁻ retention and recovery experiments. **A.** Influence of SeO₃²⁻ concentration. Resin mass: 0.5 mg; extraction time 5 min.; **B.** Influence of resin mass. extraction time; 5 min; SeO₃²⁻ concentration: 1000 µg L⁻¹; **C.** Influence of eluent volume on SeO₃²⁻ recovery. Resin mass: 0.5 mg; extraction time: 5 min; SeO₃²⁻ concentration: 1000 µg L⁻¹; Eluent: 3% w w⁻¹ HNO₃. Error bars in all graphs represent the standard deviation for n=3 replicates.

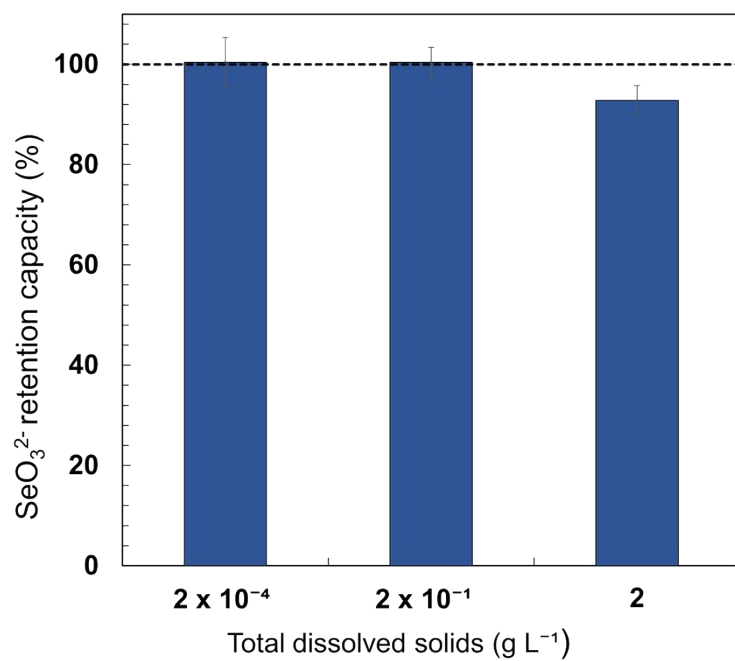


Fig. S2. Influence of TDS content on SeO₃²⁻ retention using the anionic ion-exchange resin. Experimental conditions: resin mass: 0.5 mg; extraction time: 5 min; SeO₃²⁻ concentration of 1000 µg L⁻¹.

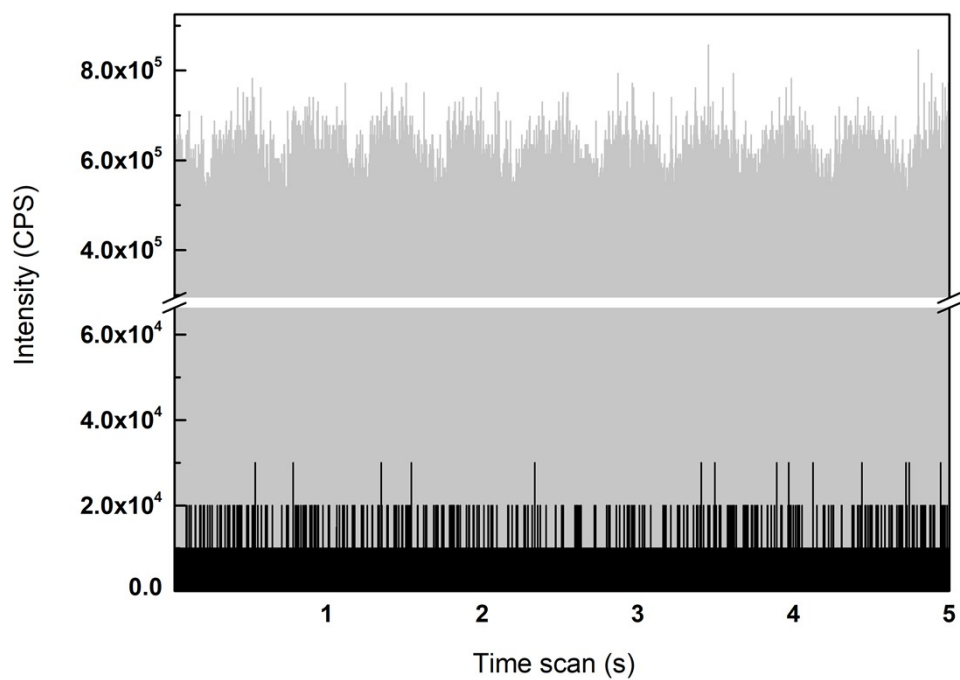


Fig. S3. $^{80}\text{Se}^{16}\text{O}^+$ time scan for $1:10^3$ diluted *H. mediterranei* cell growth media containing $80 \text{ mg L}^{-1} \text{ SeO}_3^{2-}$ with (■) and without (■) the resin treatment.