

## Accessory publication

**Assessing the toxicity of arsenic-bearing sulfide minerals with the bio-indicator *Corophium volutator***

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**Table A1. HPLC parameters of anion- and cation-exchange columns**

HPLC	Column-type	Mobile phase	Sample Loop	Note
Anion-exchange	Hamilton PRP-X100 (5 µm, 150 × 4.1 mm)	30 mM H <sub>3</sub> PO <sub>4</sub> with NH <sub>3</sub> ; pH: 5.4; flow rate: 1.0 mL min <sup>-1</sup>	20 µL	Method 1
Cation-exchange	Supelcosil LC-SCX (5 µm, 250 × 4.1 mm)	20 mM pyridine with HCOOH; pH: 2.5; flow rate: 1.0 mL min <sup>-1</sup>	20 µL	Method 2
Anion-exchange	Hamilton PRP-X100 (5 µm, 150 × 4.1 mm)	10 mM H <sub>3</sub> PO <sub>4</sub> with NH <sub>3</sub> ; pH: 5.9; flow rate: 1.0 mL min <sup>-1</sup> ; pressure: 78–90 bar A: deionised water B: 50 mM pyridine with formic acid (pH 2.7)	100 µL	Method 3
Cation-exchange	Ionospher cation exchange (250 × 4.6 mm, 5 µm)	Gradient: 0–4 min per 0.5 mM; 4–16 min per 0.5–5 mM 20–24 min per 5–25 mM; 24–30 min per 37.5–50 mM flow rate: 1.0 mL min <sup>-1</sup>	50 µL	Method 4

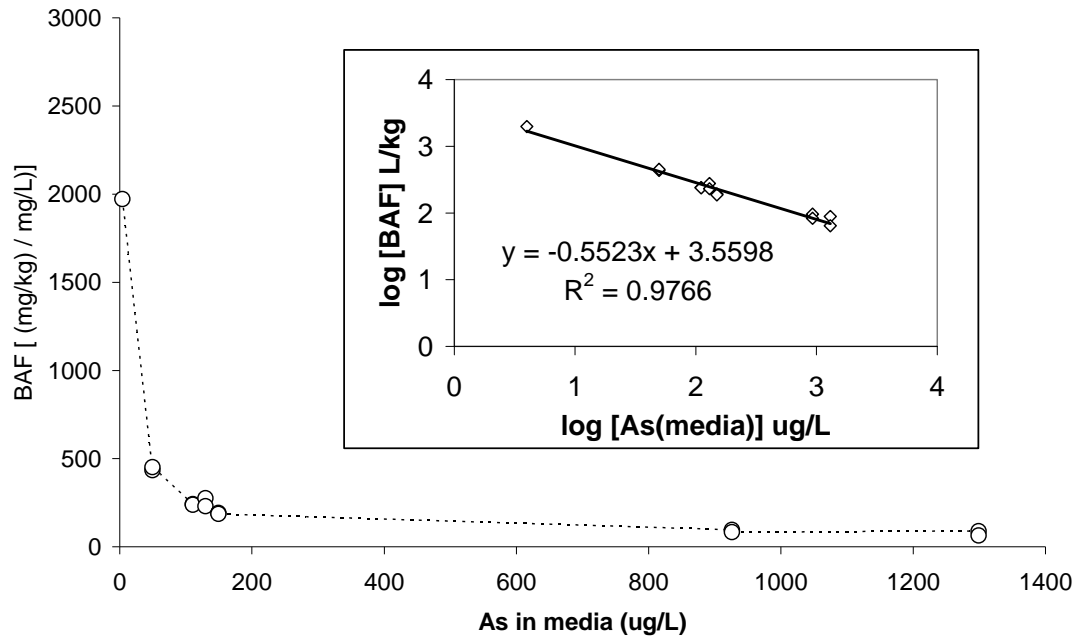
**Table A2. Analytical accuracy for *C. volutator* evaluated by using NIST SRM 2670**

Average values ( $\mu\text{g L}^{-1}$ ) from replicate measurements for methods 1 and 2, certified values of total arsenic in NIST SRM 2670:  $480 \pm 100 \mu\text{g L}^{-1}$ ; published PRP-X100 values from Hansen et al.<sup>[16]</sup>; published LC-SCX values from Pengprecha et al.<sup>[17]</sup>

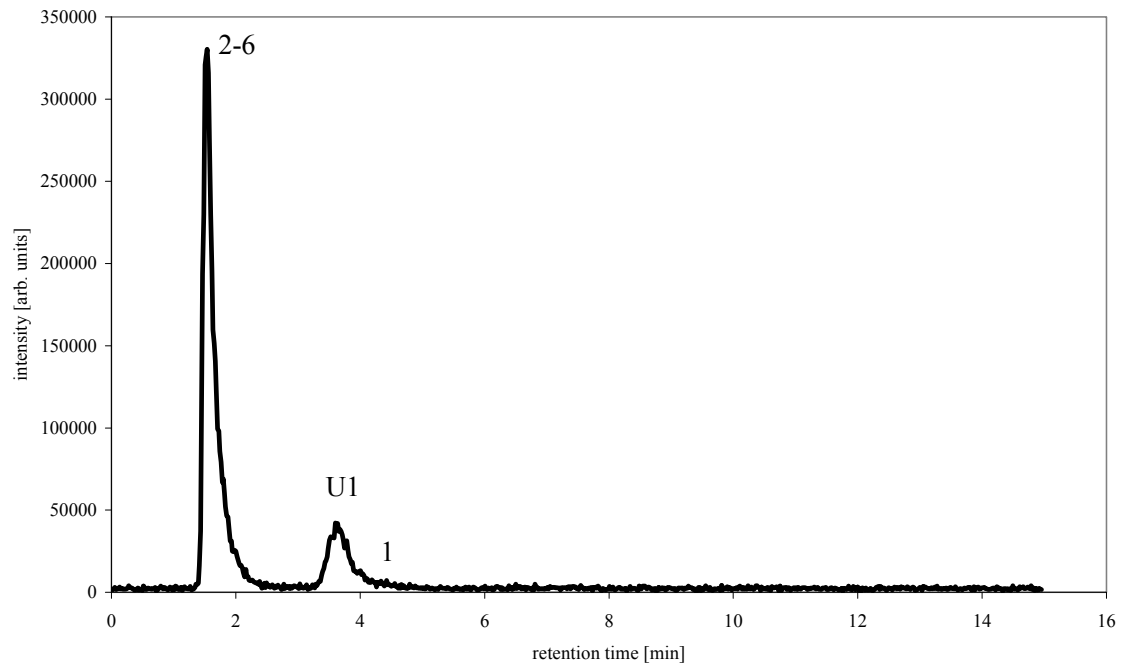
SRM 2670	Experimental values			Published values	
	Method 1 (PRP-X100)	Method 2 (LC-SCX)	Method 3 (PRP-X100)	PRP-X100	LC-SCX
AB	14.8	16.4	$16.1 \pm 5.1$	$34 \pm 7$	$14 \pm 4$
MA <sup>V</sup>	11.9	10.0	$10.7 \pm 1.2$	$15 \pm 1$	$21 \pm 3$
DMA <sup>V</sup>	49.0	47.6	$52.8 \pm 6.8$	$68 \pm 4$	$47 \pm 6$
As <sup>V</sup>	331	418	$344 \pm 28$	$359 \pm 22$	$390 \pm 43$
Sum[As]	407	492	425	477	472
Total As	$432 \pm 43$		$508 \pm 69$		

**Table A3. Other metals (mg kg<sup>-1</sup> DW) in *C. volutator* after 10-day exposure experiment to sediments loaded with As-bearing minerals (*n* = 3)**

Spiked ratio	Controls		AsS		As <sub>2</sub> S <sub>3</sub>		Fe[AsS]		CRM DOLT-2	
	0.00%	0.01%	0.10%	0.01%	0.10%	0.01%	0.10%	Measured	Recovery	
Cd	0.13 ± 0.01	0.17 ± 0.03	0.18 ± 0.04	0.24 ± 0.12	0.15 ± 0.05	0.34 ± 0.26	0.18 ± 0.03	21.8 ± 1.57	106	
Pb	0.87 ± 0.44	1.60 ± 0.25	2.03 ± 0.58	0.98 ± 0.26	1.06 ± 0.53	0.91 ± 0.25	1.52 ± 0.15	0.25 ± 0.05	114	
Ba	63.0 ± 2.35	54.8 ± 12.3	70.4 ± 7.14	69.5 ± 8.50	75.0 ± 18.1	70.8 ± 2.15	73.0 ± 18.5	0.75 ± 0.29	–	
Fe	733 ± 113	737 ± 27.8	846 ± 128	781 ± 125	943 ± 309	747 ± 277	867 ± 452	948 ± 43.6	86	
Mn	54.9 ± 5.55	63.3 ± 16.1	60.7 ± 3.90	50.9 ± 10.4	69.4 ± 11.7	60.7 ± 19.7	67.4 ± 12.1	7.78 ± 0.26	113	
Cu	90.6 ± 13.9	108 ± 35.5	107 ± 9.8	107 ± 16.6	89.3 ± 7.35	93.7 ± 10.5	116 ± 23.9	24.7 ± 0.94	96	
Zn	98.1 ± 5.3	105 ± 6.6	110 ± 8.4	106 ± 2.7	111 ± 7.6	102 ± 2.0	117 ± 19	84.8 ± 15	99	
Se	6.74 ± 0.88	7.81 ± 2.31	8.01 ± 2.56	8.03 ± 2.41	8.37 ± 0.36	6.79 ± 0.93	9.40 ± 2.44	6.66 ± 0.84	103	
Cr	1.83 ± 0.18	1.98 ± 0.18	2.17 ± 0.21	1.59 ± 1.37	2.26 ± 0.50	1.94 ± 0.73	2.29 ± 0.52	0.47 ± 0.03	127	
Co	0.49 ± 0.35	0.81 ± 0.11	0.33 ± 0.30	0.20 ± 0.16	0.44 ± 0.34	0.47 ± 0.37	0.67 ± 0.06	0.38 ± 0.19	158	
Mo	0.77 ± 0.10	0.83 ± 0.25	0.94 ± 0.24	0.89 ± 0.16	0.89 ± 0.04	0.79 ± 0.09	1.11 ± 0.53	0.74 ± 0.15	–	
V	2.46 ± 0.10	2.81 ± 0.15	2.75 ± 0.27	1.76 ± 1.13	3.02 ± 0.42	2.70 ± 0.72	2.46 ± 0.46	0.06 ± 0.02	–	



**Fig. A1.** Correlation between BAF by *C. volutator* and arsenic concentrations in the media (i.e. field-porewater and lab-exposure supernatants).



**Fig. A2.** Extract of unexposed *Corophium volutator* separated with anion exchange chromatography (PRP X 100: 30-mM phosphate pH 5.4), identified species are: 1,  $\text{As}^{\text{V}}$ ; 2,  $\text{As}^{\text{III}}$ ; 3,  $\text{DMA}^{\text{V}}$ ; 4, AsB; 5, TMAO; 6, Arsenosugar (glycerol); and U1 unknown.