

# Joint Research Centre

## Certified reference materials for elements in environmental materials



### Fly ash

Substance	BCR-038 Fly ash from pulverised coal (5 g) (mg/kg)	BCR-176R Fly ash (40 g) (mg/kg)
As	48.0 ± 2.3	54 ± 5
Ca		
Cd	4.6 ± 0.3	226 ± 19
Co	53.8 ± 1.9	26.7 ± 1.6
Cr	192 ± 10	810 ± 70
Cu	176 ± 9	1050 ± 70
Fe	33.8 × 10 <sup>3</sup> ± 0.7 × 10 <sup>3</sup>	13100 ± 500
Hg	2.10 ± 0.15	(1.60 ± 0.23)
Mn	479 ± 16	(730 ± 50)
Na	3.74 × 10 <sup>3</sup> ± 0.15 × 10 <sup>3</sup>	
Ni	1.263 ± 0.024	117 ± 6
Pb	262 ± 11	5000 ± 500
Sb		850 ± 50
Se		18.3 ± 1.9
Tl		1.32 ± 0.21
V		(35 ± 6)
Zn	581 ± 29	16800 ± 400

### Human Hair

Substance	ERM-DB001 Elements in human hair (mg/kg)
As	0.044 ± 0.006
Cd	0.125 ± 0.007
Cu	33 ± 4
Hg	0.365 ± 0.028
Pb	2.14 ± 0.20
Se	3.24 ± 0.24
Zn	209 ± 12

### Dust

Substance	BCR-723 Trace elements in road dust (µg/kg)	ERM-CZ120 Elements in fine dust (PM <sub>10</sub> -like) (mg/kg)
Pd	6.1 ± 1.9	
Pt	81.3 ± 2.5	
Rh	12.8 ± 1.3	
As		7.1 ± 0.7
Cd		0.90 ± 0.22
Pb		113 ± 17
Ni		58 ± 7

Confidence in measurements

All certificates and detailed production information can be found at <https://crm.jrc.ec.europa.eu>

## Mussel tissue


(Values in brackets are not certified.)

Substance	ERM-CE278k Mussel tissue (mg/kg)	BCR-668 Mussel tissue ( $\mu\text{g}/\text{kg}$ )
As	$6.7 \pm 0.4$	$(7100 \pm 500)$
Ag	$(0.044 \pm 0.016)$	
Cd	$0.336 \pm 0.025$	$(275 \pm 11)$
Ce		$89 \pm 7$
Cr	$0.73 \pm 0.22$	$(370 \pm 60)$
Cu	$5.98 \pm 0.27$	
Dy		$8.9 \pm 0.6$
Er		$4.5 \pm 0.5$
Eu		$2.79 \pm 0.16$
Fe	$161 \pm 8$	
Gd		$13.0 \pm 0.6$
Hg	$0.071 \pm 0.007$	
La		$80 \pm 6$
Lu		$0.389 \pm 0.024$
Mn	$4.88 \pm 0.24$	
Nd		$54 \pm 4$
Ni	$0.69 \pm 0.15$	
Pb	$2.18 \pm 0.18$	
Pr		$12.3 \pm 1.1$
Rb	$2.46 \pm 0.16$	
Se	$1.62 \pm 0.12$	
Sm		$11.2 \pm 0.8$
Sr	$19.0 \pm 1.2$	$1.62 \pm 0.12$
Tb		$10.7 \pm 1.2$
Th		$0.48 \pm 0.08$
Tm		$56 \pm 5$
U		$59 \pm 5$
Y		$(70700 \pm 400)$
Zn	$71 \pm 4$	

Distributed by



ARMi (USA)  
<http://www.armi.com>

 Accredited CRM Producer: we are accredited to ISO Guide 34:2009 for the production of reference materials under the code BELAC 268-RM