



# CERTIFIED REFERENCE MATERIAL BCR<sup>®</sup> – 320R

## CERTIFICATE OF ANALYSIS

CHANNEL SEDIMENT		
	Mass Fraction	
	Certified value <sup>1)</sup> [mg/kg]	Uncertainty <sup>2)</sup> [mg/kg]
As	21.7	2.0
Cd	2.64	0.18
Co	9.7	0.6
Cr	59	4
Cu	46.3	2.9
Fe	25700	1300
Hg	0.85	0.09
Mn	910	50
Ni	27.1	2.2
Pb	85	5
Sc	5.2	0.4
Th	5.3	0.4
Tl	0.65	0.08
U	1.56	0.20
V	46.5	2.8
Zn	319	20

1) Unweighted mean value of the means of accepted sets of data, each set being obtained in a different laboratory and/or with a different method of determination. The certified values are traceable to the SI.  
2) Expanded uncertainty with a coverage factor  $k = 2$  according to the Guide for the Expression of Uncertainty in Measurement, corresponding to a level of confidence of about 95 %.

This certificate is valid for one year after purchase.

Sales date:

The minimum amount of sample to be used is 100 mg.

Geel, July 2006

Latest Revision: September 2009

Signed: \_\_\_\_\_

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Indicative Values		
	Mass Fraction	
	Indicative value <sup>1)</sup> [mg/kg]	Uncertainty <sup>2)</sup> [mg/kg]
Se	0.96	0.18
Sn	9.4	1.7
<p>1) Unweighted mean value of the means of accepted sets of data, each set being obtained in a different laboratory and/or with a different method of determination. The indicative values are traceable to the SI, while it should be noted that the indicative value for Sn has been obtained using only ICP-MS methods.</p> <p>2) Expanded uncertainty with a coverage factor <math>k = 3.18</math> according to the Guide for the Expression of Uncertainty in Measurement, corresponding to a level of confidence of about 95 %.</p>		

## DESCRIPTION OF THE SAMPLE

The material consists of 40 g of powder, bottled in amber glass bottles, packaged under argon and closed with polyethylene inserts and plastic screw caps.

## ANALYTICAL METHOD USED FOR CERTIFICATION

- Atomic fluorescence spectrometry (AFS)
- Cold vapour atomic absorption spectrometry (CVAAS)
- Differential pulse anodic stripping voltammetry (DPASV)
- Electrothermal atomic absorption spectrometry (ETAAS)
- Flame atomic absorption spectrometry (FAAS)
- Inductively coupled plasma atomic emission spectrometry (ICPAES)
- Inductively coupled plasma optical emission spectrometry (ICPOES)
- Inductively coupled plasma mass spectrometry (ICPMS)
- Inductively coupled plasma mass spectrometry using isotope dilution (ICPMS-ID)
- Instrumental neutron activation analysis (INAA)
- $k_0$ -neutron activation analysis ( $k_0$ -NAA)
- Radiochemical neutron activation analysis (RNAA)
- Thermal ionisation mass spectrometry using isotope dilution (IDTIMS)

## PARTICIPANTS

- ALS Laboratory Group, Praha (CZ)
- Bundesanstalt für Materialforschung und -prüfung (BAM), Isotopenverdünnungsanalytik, Berlin (DE)
- DSM Research, Geleen (NL)
- Centre National de la Recherche Scientifique (CNRS), Service Central d'Analyse, Vernaison (FR)
- European Commission, JRC, Institute for Environment and Sustainability (EC JRC-IES), Ispra (IT)
- European Commission, JRC, Institute for Reference Materials and Measurements (EC JRC-IRMM), Geel (BE)
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- Laboratoire National d'Essais (LNE), Centre Metrologie et Instrumentation, Paris (FR)
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- Milton, Treharne & Davis Ltd., Cardiff (GB)
- Nederlands Meetinstituut (NMI), Afdeling Chemie, Delft (NL)
- NRG Petten, Isotope Specific Analysis, Petten (NL)
- Umweltbundesamt (UBA), Wien (AT)
- University of Pavia, Nuclear Chemistry, Pavia (IT)
- University of Ghent, Laboratory of Analytical Chemistry, Ghent (BE)

- University of Plymouth, Plymouth (GB)
- Vlaamse Instelling voor Technologisch Onderzoek (VITO), Diagnostiek, Mol (BE)
- Wageningen Agricultural University (WEPAL), Wageningen (NL)

## **SAFETY INFORMATION**

Not applicable.

## **INSTRUCTIONS FOR USE**

The certified values refer to dry mass. A dry mass determination should always be carried out on separate subsamples.

The dry mass determination should be carried out by drying a sample of at least 1 g in a ventilated oven at  $105 \pm 2$  °C for at least 3 hours, until constant weight is achieved. Samples should be cooled down in a desiccator.

Bottles should be thoroughly shaken before opening to rehomogenise the material.

The minimum amount of sample to be used is 100 mg.

The main purpose of the material is to assess method performance, i.e. for checking accuracy of analytical results. As any reference material, it can also be used for control charts or validation studies.

## **STORAGE**

Samples can be stored at room temperature. Care should be taken to avoid moisture pick up once the bottles are opened.

However, the European Commission cannot be held responsible for changes that happen during storage of the material at the customer's premises, especially of opened samples.

## **LEGAL NOTICE**

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## **NOTE**

A technical report on the production of BCR-320R is supplied on the internet (<http://www.irmm.jrc.be>).

A paper copy can be obtained from IRMM on request.