



CERTIFIED REFERENCE MATERIAL BCR[®] – 667

CERTIFICATE OF ANALYSIS

ESTUARINE SEDIMENT			
Element	Mass fraction based on dry mass		Number of accepted sets of data p
	Certified value [mg/kg] ¹⁾	Uncertainty [mg/kg] ²⁾	
Ce	56.7	2.5	8
Dy	4.01	0.14	8
Er	2.35	0.15	6
Eu	1.00	0.05	9
Gd	4.41	0.12	8
Ho	0.80	0.06	6
La	27.8	1.0	9
Lu	0.325	0.020	8
Nd	25.0	1.4	10
Pr	6.1	0.5	4
Sc	13.7	0.7	6
Sm	4.66	0.20	10
Tb	0.682	0.017	7
Tm	0.326	0.025	6
Yb	2.20	0.09	9
Th	10.0	0.5	7
U	2.26	0.15	7

¹⁾ This value is the unweighted mean of the means of p accepted sets of results. The certified values are traceable to the SI.
²⁾ Half-width of the 95 % confidence interval of the mean defined in ¹⁾.

This certificate is valid for one year after purchase.

Sales date:

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

NOTE

This material has been certified by BCR (Community Bureau of Reference, the former reference materials programme of the European Commission). The certificate has been revised under the responsibility of IRMM.

Brussels, November 1999

Latest revision: May 2007

Signed: _____

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Indicative Values			
Element	Mass fraction based on dry mass		
	Indicative value ¹⁾		Uncertainty ²⁾
Br	99.7	mg/kg	2.5 mg/kg
Cd	0.67	mg/kg	0.11 mg/kg
Co	23.0	mg/kg	1.3 mg/kg
Cr	0.178	g/kg	0.016 g/kg
Cs	7.8	mg/kg	0.7 mg/kg
Cu	60	mg/kg	9 mg/kg
Fe	44.8	g/kg	1.0 g/kg
Mn	0.92	g/kg	0.04 g/kg
Ni	0.128	g/kg	0.009 g/kg
Pb	31.9	mg/kg	1.1 mg/kg
Sb	0.96	mg/kg	0.05 mg/kg
Se	1.59	mg/kg	0.08 mg/kg
Ta	0.876	mg/kg	0.017 mg/kg
Zn	0.175	g/kg	0.013 g/kg

¹⁾ This value is the unweighted mean of the means accepted sets of results.
²⁾ Standard deviation.

Additional Material Information	
Element	Mass fraction based on dry mass ¹⁾ [mg/kg]
As	14.3-19.9
Au	0.0153-0.0178
Sr	206-243
Y	16.7-25.3

¹⁾ Range of laboratory means.

DESCRIPTION OF THE SAMPLE

The material consists of estuarine sediment in a glass bottle containing approximately 40 g of powder. Information on the preparation and the certification of the rare earth elements Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Nd, Pr, Sc, Sm, Tb, Tm and Yb, and of the elements Th and U is given in the certification report.

ANALYTICAL METHOD USED FOR CERTIFICATION

- Inductively coupled plasma atomic emission spectrometry
- Inductively coupled plasma mass spectrometry (low, medium and high resolution)
- Isotope dilution inductively coupled plasma mass spectrometry
- Isotope dilution mass spectrometry
- Instrumental neutron activation analysis
- k_0 Instrumental neutron activation analysis

PARTICIPANTS

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- University of Agriculture Institute of Chemistry, Vienna (AT)
- University of Cambridge, Department of Earth Sciences, Cambridge (GB)
- University of Pavia, Pavia (IT)
- University of Plymouth, Plymouth (GB)

SAFETY INFORMATION

The usual laboratory safety precautions apply.

INSTRUCTIONS FOR USE

Before a bottle is opened, it should be shaken manually for 1 minute so that the material within is re-homogenised. The analytical sample for analysis should be taken as it is. The correction to dry mass should be made by taking a separate portion of 1 g and drying in an oven at 105°C for 2-3 h until constant mass is attained (successive weighings should not differ by more than 1 mg). The mean moisture mass fraction found in the certification campaign was (1.3 ± 0.4) %.

STORAGE

It is recommended that the bottles be kept closed at 18 °C in the dark. The material picks up moisture when in prolonged contact with humid air. Therefore, after having been opened, the bottle with remaining material should be stored in a dry desiccator.

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.

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NOTE

A technical report on the production of BCR-667 is available on the internet (<http://www.irmm.jrc.be>). A paper copy can be obtained from IRMM on request.