

JOINT RESEARCH CENTRE
Institute for Reference Materials and Measurements

CERTIFICATE OF ANALYSIS

ERM[®] - BB186

PIG KIDNEY		
	Mass Fraction	
	Certified value ^{1, 2)} [mg/kg]	Uncertainty ^{2,3)} [mg/kg]
Cd	1.09	0.05
Cu	36.5	1.8
Fe	255	13
Mn	7.26	0.25
Pb	0.040	0.005
Se	10.3	0.9
Zn	134	5

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 value and its uncertainty are traceable to the International System of Units (SI).

2) Certified mass fractions are corrected for the water content of the material (and expressed as dry mass), determined as described in the section "Instructions for use".

3) The certified uncertainty is the expanded uncertainty with a coverage factor $k = 2$ corresponding to a level of confidence of about 95 % estimated in accordance with ISO/IEC Guide 98-3, Guide to the Expression of Uncertainty in Measurement (GUM:1995), ISO, 2008.

This certificate is valid for one year after purchase.

Sales date:

The minimum amount of sample to be used is 200 mg.

NOTE

European Reference Material ERM[®]-BB186 was produced and certified under the responsibility of the Institute for Reference Materials and Measurements of the European Commission's Joint Research Centre according to the principles laid down in the technical guidelines of the European Reference Materials[®] co-operation agreement between BAM-IRMM-LGC. Information on these guidelines is available on the internet (<http://www.erm-crm.org>).

Accepted as an ERM[®], Geel, 22 August 2012

Latest revision: October 2013

INFORMATION ONLY

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Indicative Values		
	Mass Fraction	
	Indicative value ^{1,2,3)} [mg/kg]	Uncertainty ^{2,4)} [mg/kg]
As	0.008	0.006
Hg	0.023	0.011
<p>1) Unweighted mean value of the means of accepted sets of data, each set being obtained in a different laboratory. The indicative value and its uncertainty are traceable to the International System of Units (SI).</p> <p>2) Indicative mass fractions are corrected for the water content of the material (and expressed as dry mass), determined as described in the section "Instructions for use".</p> <p>3) The value is not certified as the uncertainty is unsuitably high for the intended use of the material</p> <p>4) The indicative uncertainty is the expanded uncertainty with coverage factors $k = 3.18$ for As and $k = 2.78$ for Hg corresponding to a level of confidence of about 95 % estimated in accordance with ISO/IEC Guide 98-3, Guide to the Expression of Uncertainty in Measurement (GUM:1995), ISO, 2008.</p>		

Additional Material Information	
	Mass Fraction
	Value ^{1,2} [g/kg]
Ca	0.29
Cl	7.1
K	12.0
Mg	0.79
Na	6.0
	Value ^{2,3} [mg/kg]
Co	0.106
<p>1) Unweighted mean value of 6 replicate measurements made by the k_0-NAA technique, with k_0 values that are traceable to the International System of units (SI).</p> <p>2) Mass fractions are corrected for the water content of the material (and expressed as dry-mass), determined as described in the section "Instructions for use".</p> <p>3) Unweighted mean value of 72 replicate measurements made by a validated method using Inductively Coupled Plasma Mass Spectrometry with calibrants having values traceable to the International System of Units (SI).</p>	

DESCRIPTION OF THE MATERIAL

The sample consists of about 10 g of lyophilised, powdered pig kidney in a brown-glass vial with rubber insert and aluminium cap.

ANALYTICAL METHODS USED FOR CERTIFICATION

Atomic Absorption Spectrometry
Hydride-Generation Atomic Absorption Spectrometry
Inductively Coupled Plasma Optical Emission Spectrometry
Inductively Coupled Plasma Mass Spectrometry
Isotope-Dilution Inductively Coupled Plasma Mass Spectrometry
Neutron Activation Analysis
Solid-Sampling Atomic Absorption Spectrometry

PARTICIPANTS

ALS Czech Republic s.r.o., Praha (CZ)

(Measurements performed under ISO/IEC 17025 accreditation; Czech Accreditation Institute 259/2006)

ALS Scandinavia AB, Luleå (SE)

(Measurements performed under ISO/IEC 17025 accreditation; SWEDAC 1087)

Ceinal, S.A. (Silliker), Área Análisis Físico-Químicos, Barcelona (ES)

(Measurements performed under ISO/IEC 17025 accreditation; ENAC 257/LE413)

European Commission (EC), Joint Research Centre (JRC), Institute for Reference Materials and Measurements (IRMM), Reference Materials Unit, Geel (BE)

(Work performed under ISO Guide 34 accreditation; BELAC No. 268-RM)

The Food and Environment Research Agency, York (UK)

(Measurements performed under ISO/IEC 17025 accreditation; UKAS 1642)

Helmholtz Zentrum München - Deutsches Forschungszentrum für Gesundheit und Umwelt GmbH, München (DE)

(Measurements performed under ISO/IEC 17025 accreditation; DACH DAC-PL-0141-01-10)

Laboratoire National de Métrologie et d'Essais, Paris (FR)

(Measurements performed under ISO/IEC 17025 accreditation; COFRAC No 2-54)

Minton, Treharne & Davies Ltd., Llanelli (UK)

(Measurements performed under ISO/IEC 17025 accreditation; UKAS 1946)

LGC Ltd., Teddington (UK)

(Measurements performed under ISO/IEC 17025 accreditation; UKAS 0003)

SCK-CEN, Mol (BE)

(Measurements performed under ISO/IEC 17025 accreditation; BELAC 015-TEST)

Solvias AG- Elemental and Microanalytical Services, Basel (CH)

(Measurements performed under ISO 9001 Certification; SQS 11237-04)

SAFETY INFORMATION

The usual laboratory safety precautions apply.

INSTRUCTIONS FOR USE AND INTENDED USE

This material is intended to be used for analytical method validation and performance control.

Shake the vial before taking aliquots.

Certified mass fractions are corrected for the water content of the material (dry mass): To determine dry mass, accurately weigh an aliquot of approximately 1 g on an analytical balance and dry the sample in an oven at atmospheric pressure, at $103\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, until constant mass is attained. The weighing should be made at the same time as preparation of samples for element measurement.

Dispose in accordance with good laboratory practice.

STORAGE

The material should be stored at a temperature of $18\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$. 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 detailed technical report is available on www.irmm.jrc.be. A paper copy can be obtained from the Joint Research Centre, Institute for Reference Materials and Measurements on request.

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