JOINT RESEARCH CENTRE
Institute for Reference Materials and Measurements

CERTIFICATE OF ANALYSIS

ERM®- BB422

FISH MUSCLE		
	Mass Fraction	
	Certified value [1, 2)] [mg/kg]	Uncertainty [2,3)] [mg/kg]
As	12.7	0.7
Cd	0.0075	0.0018
Cu	1.67	0.16
Fe	9.4	1.4
Hg	0.601	0.030
I	1.4	0.4
Mn	0.368	0.028
Se	1.33	0.13
Zn	16.0	1.1

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 for As, Cd, Cu, Hg, Fe, Mn, Se and Zn, and k = 2.78 for I (Iodine) 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®-BB422 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).

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Latest revision: October 2013

Signed:

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Joint Research Centre
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Additional Material Information

	Mass Fraction
	Value [1,2) [g/kg]
Ca	0.342
Cl	3.5
K	21.4
Mg	1.37
Na	2.80

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).

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".

DESCRIPTION OF THE MATERIAL

The sample consists of about 10 g of lyophilised, powdered fish muscle in a brown-glass vial with rubber insert and aluminium cap. Fish of the species *pollachius virens* (Saithe) was used for preparation of the material.

ANALYTICAL METHODS USED FOR CERTIFICATION

Cold-Vapour Atomic Absorption Spectrometry
Graphite Furnace Atomic Absorption Spectrometry
Hydride-Generation Atomic Absorption Spectrometry
Hydride-Generation Inductively Coupled Plasma Optical Emission 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)

Fødevareinstituttet, Danmarks Tekniske Universitet, Søborg (DK)
(Measurements performed under ISO/IEC 17025 accreditation; DANAK No 350)

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

Laboratoire National de Métrologie et d'Essais, Paris (FR)
(Measurements performed under ISO/IEC 17025 accreditation; COFRAC No 2-54)

SCK-CEN, Mol (BE)
(Measurements performed under ISO/IEC 17025 accreditation; BELAC 015-TEST)

Service Centrale d'Analyse (C.N.R.S.), Solaize (FR)

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

Umweltbundesamt GmbH, Wien (AT)
(Measurements performed under ISO/IEC 17025 accreditation; Wirtschaftsministerium 92714/499-IV/9/01)

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 °C ± 2 °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 °C ± 5 °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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