Institute for Reference Materials and Measurements

ERM European Reference Materials

CERTIFICATE OF ANALYSIS

ERM®- CD281

RYE GRASS		
	Mass Fraction	
	Certified value [1] [mg/kg]	Uncertainty [2] [mg/kg]
As	0.042	0.010
B	5.5	0.5
Cd	0.120	0.007
Cr	24.8	1.3
Cu	10.2	0.5
Hg	0.0164	0.0022
Mn	82	4
Mo	2.22	0.12
Ni	15.2	0.6
Pb	1.67	0.11
Sb	0.042	0.007
Se	0.023	0.004
Sn	0.062	0.011
Zn	30.5	1.1

1) The value is the unweighted mean of accepted sets of data, each set being obtained in a different laboratory and/or with a different method. The certified values are reported on dry mass basis and are traceable to the SI.

2) Expanded uncertainty with a coverage factor k = 2 according to the Guide to the Expression of Uncertainty in Measurement (GUM), 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 200 mg.

Accepted as an ERM®, Geel, May 2010

Signed:

Prof. Dr. Hendrik Emons
European Commission
Joint Research Centre
Institute for Reference Materials and Measurements
Retieseweg 111
B-2440 Geel, Belgium

JRC EUROPEAN COMMISSION

NOTE

European Reference Material ERM®-CD281 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).

Additional Material Information

	Mass fraction
	Value[1)] [g/kg]
Ca	6.3
Fe	0.18
K	34
Mg	1.6
Na	4.0
P	2.8
S	3.4
Si	1.3

1) As obtained by quantitative screening analysis using ICP-MS in one laboratory and reported based on dry mass.

DESCRIPTION OF THE SAMPLE

The material consists of about 10 g of dried and ground rye grass packed into an amber glass vial under argon atmosphere.

ANALYTICAL METHODS USED FOR CERTIFICATION

- atomic absorption spectrometry
- atomic fluorescence spectrometry
- direct mercury analyzer
- inductively coupled plasma mass spectrometry
- inductively coupled plasma optical emission spectrometry
- isotope dilution inductively coupled plasma optical emission spectrometry
- neutron activation analysis

PARTICIPANTS

ALS Scandinavia AB, Luleå (SE)
(accredited to ISO/IEC 17025 for element determination in environmental matrices and food, SWEDAC No 1087)

Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin (DE)
(accredited to ISO/IEC 17025 for measurement of trace elements in foodstuffs, DAP-PL-2614.14)

DSM Resolve, Geleen (NL)

Energieonderzoek Centrum Nederland (ECN), Petten (NL)
(accredited to ISO/IEC 17025 for element determination in plants, sediment and ash, RVA No L135)

European Commission, Joint Research Centre, Institute for Reference Materials and Measurements (IRMM), Geel (BE)
(accredited to ISO Guide 34 for production of certified reference materials, BELAC No 268-TEST)

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

Institut "Jozef Stefan" (JIS), Ljubljana (SI)

Laboratoire National de métrologie d'Essais (LNE), Paris (FR)
(accredited to ISO/IEC 17025 for element determination in food and sediments, COFRAC No 2-54)

LGC Limited, Teddington – Middlesex (GB)
(accredited to ISO 17025/IEC for measurement of trace elements in food, inorganic and organic matrices, UKAS No 0003)

Minton, Treharne & Davis Limited, Carmarthenshire (GB)
(accredited to ISO/IEC 17025 for element determination in environmental matrices and food, UKAS No 1946)

MTT Agrifood Research Finland, Jokioinen (FI)
(accredited to ISO/IEC 17025 for measurement of elements in food and feed, FINAS T024)

Studiecentrum voor Kernenergie - Centre d'Etude de l'énergie Nucléaire (SCK-CEN), Mol (BE)
(accredited to ISO/IEC 17025 for element determination in animal feed, sediment and soils using k_0-NAA, BELAC No 015-TEST)

The Food and Environment Research Agency (FERA), York (GB)
(accredited to ISO/IEC 17025 for element determination in animal feed and soils, UKAS No 1642)

Umweltbundesamt Wien (UBA Wien) , Wien (AT)
(accredited to ISO/IEC 17025 for element determination in plants and sewage sludge, BMWA No -92.714/0518-I/12/2007)

Universidad de Santiago, Facultad de Quimica, Departamento de Quimica Analitica, Nutricion y Bromatologia, Santiago de Compostela (ES)

VA SYD, Malmö (SE)
(accredited to ISO/IEC 17025 for element determination in sewage sludge and sediments, SWEDAC No 2011)

Vlaamse Instelling voor Technologisch Onderzoek (VITO), Mol (BE)
(accredited to ISO/IEC 17025 for measurement of elements in soils, BELAC No 045-TEST)

SAFETY INFORMATION

The usual laboratory safety precautions apply.

INSTRUCTIONS FOR USE

This material is intended to be used for method performance assessment i.e. for checking accuracy of analytical results. As any reference material, it can also be used for control charts or validation studies.

The vials shall be shaken by turning upside down for at least 2 min before opening to ensure material re-homogenisation.

Dry mass determination shall be carried out on a separate portion of at least 1 g, by drying in an oven at 105 °C ± 2 °C until constant mass (separate weighings should not differ by more than 5 mg) is attained. Weighing of the samples for dry mass determination and weighing for the analysis shall be done at the same time to avoid differences due to possible take up of moisture by the material.

STORAGE

The materials shall be stored at 18 °C ± 5 °C and in the dark. Care shall be taken to avoid moisture pickup once the vials are open. However, the European Commission cannot be held responsible for changes that happen during storage of the material at the customer's premises, especially of open samples.

LEGAL NOTICE

NOTE

A detailed technical report is available on www.erm-crm.org. A paper copy can be obtained from the Joint Research Centre, Institute for Reference Materials and Measurements on request.

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