

Aflatoxin G2

1. General information

This document is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31 [1] and Eurachem / CITAC Guides [2,3].

2. Description of the Reference Material (RM)

Name:	Aflatoxin G2
CAS number	7241-98-7
Catalog number:	B-MYC0265-C
Lot #:	S12033A
Certificate version:	2
Expiry date:	18.01.2019
Physical description of RM:	White crystals of Aflatoxin G2
Packaging and amount of RM:	Amber glass ampoules fitted with teflon faced butyl septa and PP screw caps, quantities of 5 mg or 10 mg of RM
Name and address of the manufacturer:	Romer Labs Diagnostic GmbH Technopark 1 3430 Tulln, Austria www.romerlabs.com
Name and address of the supplier:	LGC Standards GmbH Mercatorstraße 51, 46485 Wesel, Germany Tel +49(0)2 81 98 87 0, Fax +49(0)2 81/98 87 199 www.lgcstandards.com

2.1 Intended use of the RM

- for laboratory use only
- calibration of analytical instruments

2.2 Instruction for the correct use of the RM

The ampoules should be stored at 2-8°C in a dark place. Before usage of the RM, the ampoules should be allowed to warm to room temperature. The recommended minimum sub-sample amount for all kinds of application is 1 mg. The expiry date of this RM is based on the current knowledge and holds only for proper storage conditions in the originally closed flasks/packages. Solutions prepared for calibration purposes should be protected from exposure to light. Discard solutions after use in accordance with appropriate safety regulations for chemical substances.

2.3 Hazardous situation

The normal laboratory safety precautions should be observed when working with this RM. Further details for the handling of this RM are available as safety data sheet (SDS).

Hazardous Ingredients

Aflatoxin G2

Pictograms



Signal word

Danger

Hazard statements

H300, H310, H330, H350

3. Certified values and their uncertainties

Aflatoxin G2		
Compound	Purity	
	Certified value ^a	Uncertainty ^b
Aflatoxin G2	97.1 %	± 2.9 %
^a The certified value is based upon the results by LC-MS/MS analysis ^b Expanded uncertainty U (k = 2) of the value u _c according to GUM [4]		

3.1 Calculation of the certified value and discussion of uncertainty

The purity check with LC-MS/MS showed 2 minor impurities identified as Aflatoxin B1 and Aflatoxin B2 with an estimated mass concentration of total 4.92 % and 0.13 % of the investigated sample. Based on these findings, maximum impurity level in solid Aflatoxin G2 can be estimated with 5.1 %.

To cover this range, an approach with an estimated purity of 97.1 % with a symmetrical uncertainty of ± 2.9 was used according to a procedure which has recently been accepted by the European Commission within a Standards, Measurements and Testing (SMT) project [5]. The conservative assumption of a rectangular distribution was made and the tolerance of 2.55 % divided by $\sqrt{3}$ resulting in an uncertainty (u_c) of the presented purity level of 1.47. Following the Guide to the Expression of Uncertainty in Measurement (GUM) [1] the expanded uncertainty of the Aflatoxin G2 purity level is obtained by multiplication with a coverage factor k for which 2 is usually chosen to obtain a confidence level of ca. 95 %. Using this procedure a theoretical value for the purity of the crystalline Aflatoxin G2 sample of 97.1 % and its respective expanded uncertainty of ± 2.9 % can be calculated.

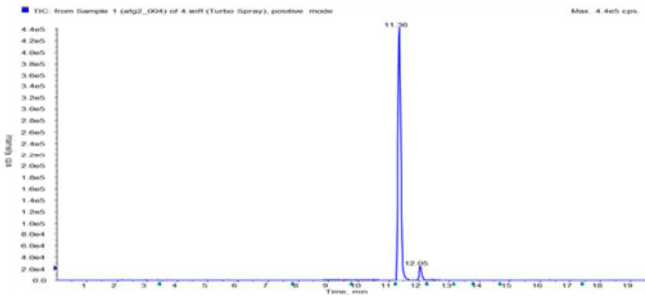
4. Discussion of traceability

The certified value (purity of Aflatoxin G2) is based on the result of LC-MS/MS analysis which was previously used as method for purity assessment of solid mycotoxins [5]. High purity material represents a practical realization of concentration units, through conversion of mass to molar quantity.

5. HPLC-MS/MS analysis of Aflatoxin G2 [6]

5.1 Purity assessment

The purity check using gradient LC-MS/MS of the Aflatoxin G2 sample showed one main peak and 2 minor impurities after blank subtraction. The impurities were identified as Aflatoxin B1 and Aflatoxin B2. The purity was calculated according literature [7] (100 % method).

column	Keystone RP Aquasil-C18, 100 x 4.6 mm, 3µm		 <p>Figure 1: TIC of Aflatoxin G2 sample Lot# S12033A</p>
Sample dilution	1:200 with solvent A		
injection volume	25 µL sample		
solvent A	methanol/water 20/80 with 5mM ammonium acetate		
solvent B	methanol/water 90/10 with 5mM ammonium acetate		
flow rate	1.0 mL / min		
gradient	time in minutes (min)	% solvent B	
	0 – 0.5	0	
	0.5 – 9.5	0-100	
	9.5 – 13.0	100	
	13.0 – 20	100-0	
Source type	Heated Nebulizer (APCI), positive mode		
	time [min]	height [cps]	% of total peak area
Aflatoxin G2	11.36	2.7E+05	94.95
Aflatoxin B2	12.06	1.4E+04	4.92
Aflatoxin B1	12.48	375	0.13

6. Further information

The purchaser must determine the suitability of this product for its particular use. LGC Standards GmbH makes no warranty of any kind, express or implied, other than its products meet all quality control standards set by LGC Standards GmbH. We do not guarantee that the product can be used for a special application.

approved for release by: Dipl. Chem. Ulrich Berger

date: 12.05.2016

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References:

- [1] ISO Guide **31**, 1-7, (2000), "Reference Materials – Contents of Certificates and Labels"
- [2] Eurachem / CITAC Guide, 1-37, (2003), "Traceability in Chemical Measurement"
- [3] Eurachem / CITAC Guide, 1-120, (2000), "Quantifying Uncertainty in Analytical Measurement"
- [4] International Organization for Standardization (ISO), (1995), "Guide to the Expression of Uncertainty in Measurement", 1st Ed. Geneva, Switzerland
- [5] R.D. Josephs, R. Krska, S. MacDonald, P. Wilson, H. Pettersson, J. AOAC Int. **86**, 50-60, (2003), "Preparation of a Calibrant as Certified Reference Material for Determination of the Fusarium Mycotoxin Zearalenone"
- [6] M. Sulyok, R. Krska R. Schuhmacher, Anal. Bioanal. Chem. **389**, 1505-1523, (2007), "A liquid chromatography/tandem mass spectrometric multi-mycotoxin method for the quantification of 87 analytes and its application to semi-quantitative screening of moldy food samples"
- [7] V.R. Meyer, Fallstricke und Fehlerquellen in der HPLC in Bildern, 2. Auflage, 126-127, (1999), Verlag Wiley-VCH, "Quantifizierung im 99 % Bereich"