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CERTIFICATE OF ANALYSIS

Aflatoxin (B1, B2, G1, G2) Mixture in Acetonitrile LCMS grade

This document is designed, and the certified values and uncertainty are determined in accordance with ISO Guide 31, ISO Guide 35, ISO Guide 34 and Eurachem/ CITAC Guides.

Description of the Reference Material (RM)

	Product name:	Aflatoxin (B1, B2, G1, G2) Mixture				
	Product number:	FIA000377				
	CAS number:	Aflatoxin B1	1162-65-8			
		Aflatoxin B2	7220-81-7			
		Aflatoxin G1	1165-39-5			
		Aflatoxin G2	7241-98-7			
	Lot number:	AFBG17100302				
	Expiry date:	02-Oct-25				
	Certified value (s):	Aflatoxin B1	**1,00**	**±**	**0,10**	**µg/mL**
		Aflatoxin B2	**1,00**	**±**	**0,10**	**µg/mL**
		Aflatoxin G1	**1,00**	**±**	**0,10**	**µg/mL**
		Aflatoxin G2	**1,00**	**±**	**0,10**	**µg/mL**
	Physical description:	Clear solution of toxins mixture in Acetonitrile LCMS grade				
	Packing	Amber glass vial filled with 5 mL of solution				
	Storage conditions	≤ -10°C				
	Matrix and starting material:	This material was prepared with/from:				
		Acetonitrile UPLC/MS			Batch:	0001204102BS
		Aflatoxin B1			Internal ID:	AFBG17082901
		Aflatoxin B2			Internal ID:	AFBG17082901
		Aflatoxin G1			Internal ID:	AFBG17082901
		Aflatoxin G2			Internal ID:	AFBG17082901

Intended use of the RM:

For laboratory use for R&D purposes only. The main purpose of this material is for analytical instrument calibration (e. g. external calibration, standard addition). Not for drug, household or other uses.

Instruction for the correct use of the RM:

The vial should be stored in a dark place at Acetonitrile UPLC/MS. Before usage of the RM, allow the vial to warm to room temperature. The expiry date of this RM is based on the current knowledge and holds only for proper storage conditions in the originally closed vials / packages. Solutions prepared for calibration purpose should be protected from exposure to light. Discard solutions after use in accordance with appropriate safety regulations for chemical substances.

Hazardous situation:

H225 : Flammable liquid - Category 2 - Highly flammable liquid and vapour
H302 : Acute toxicity - Oral - Category 4 - Harmful if swallowed
H312 : Acute toxicity - Dermal - Category 4 - Harmful in contact with skin
H319 : Eye irritation - Category 2 - Causes serious eye irritation
H332 : Acute toxicity - Inhalation - Category 4 - Harmful if inhaled

In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Avoid exposure. Wear suitable protective clothing.

Safety measures:

Special care must be taken when manipulating this standard. Avoid contact with eyes, skin and clothing. Avoid prolonged or repeated exposure. Use only in a chemical fume hood. Safety shower and eye bath must be near. In case of spills, cover and absorb with an inert dry material such as dry-lime, sand or soda ash and place in an appropriate waste disposal container.
Keep container tightly closed. Do not store in direct sunlight. Keep away from heat, sparks, flame and incompatible material. Storage area should be cool, dry and away from incompatible materials.

Further information:

Further information is available in the MSDS provided along with this certificate. Final users should make their own investigations to determine the suitability of the information for their particular research purposes. In no event the supplier of this RM shall be held liable for any damage resulting from handling or from contact with the product.

Traceability

The certified values are based on the results of analytical techniques previously used for purity assessment of solid mycotoxins. High purity material represents a practical realization of concentration units, through conversion of mass to molar quantity.

Calculation of certified values and associated uncertainties

This calibrant is certified on solution preparation. Toxin is pipetted and diluted in acetonitrile. Mass concentration calculation is based on certified concentration, purity and dilution step.
The pipet was calibrated with traceability to national and international standards (Dakks & ilac-MRA). All weights used for metrological control are connected to national and international standards. The weights are calibrated by an accredited laboratory.

$$C\ (\mu g/mL) = \frac{m \times P}{V}$$

Toxin	Source				Standard uncertainty
Aflatoxin B1	Purity				100,000
	Liquid solution	concentration	24,71	(µg/mL)	1,175
	Volumetry procedure	volume	4,05	mL	0,012
	Dilution1	Volume	115	mL	0,101
$Combined_u = \sqrt{\left(\frac{u_P}{P}\right)^2 + \left(\frac{u_{Cm}}{V_{Cm}}\right)^2 + \left(\frac{u_{Vp}}{V_p}\right)^2 + \left(\frac{u_{V1}}{V_1}\right)^2}$					0,048
$Concentration_{Toxin} = \frac{Concentration\ mother}{V_{D1}}$				µg/mL	**1,00**
Total expanded uncertainty (using a coverage factor k=2)					**0,10**

Toxin	Source				Standard uncertainty
Aflatoxin B2	Purity				100,000
	Liquid solution	concentration	24,71	(µg/mL)	1,175
	Volumetry procedure	volume	4,05	mL	0,012
	Dilution1	Volume	115	mL	0,101
$Combined_u = \sqrt{\left(\frac{u_P}{P}\right)^2 + \left(\frac{u_{Cm}}{V_{Cm}}\right)^2 + \left(\frac{u_{Vp}}{V_p}\right)^2 + \left(\frac{u_{V1}}{V_1}\right)^2}$					0,048
$Concentration_{Toxin} = \frac{Concentration\ mother}{V_{D1}}$				µg/mL	**1,00**
Total expanded uncertainty (using a coverage factor k=2)					**0,10**

Toxin	Source				Standard uncertainty
Aflatoxin G1	Purity				100,000
	Liquid solution	concentration	24,71	(µg/mL)	1,175
	Volumetry procedure	volume	4,05	mL	0,012
	Dilution1	Volume	115	mL	0,100
$Combined_u = \sqrt{\left(\frac{u_P}{P}\right)^2 + \left(\frac{u_{Cm}}{V_{Cm}}\right)^2 + \left(\frac{u_{Vp}}{V_p}\right)^2 + \left(\frac{u_{V1}}{V_1}\right)^2}$					0,048
$Concentration_{Toxin} = \frac{Concentration\ mother}{V_{D1}}$				µg/mL	**1,00**
Total expanded uncertainty (using a coverage factor k=2)					**0,10**

Toxin	Source				Standard uncertainty
Aflatoxin G2	Purity				100,000
	Liquid solution	concentration	24,71	(µg/mL)	1,175
	Volumetry procedure	volume	4,05	mL	0,012
	Dilution1	Volume	115	mL	0,100
$Combined_u = \sqrt{\left(\frac{u_P}{P}\right)^2 + \left(\frac{u_{Cm}}{V_{Cm}}\right)^2 + \left(\frac{u_{Vp}}{V_p}\right)^2 + \left(\frac{u_{V1}}{V_1}\right)^2}$					0,048
$Concentration_{Toxin} = \frac{Concentration\ mother}{V_{D1}}$				µg/mL	**1,00**
Total expanded uncertainty (using a coverage factor k=2)					**0,10**

Notes: The purity of the mycotoxin used for this RM was determined by liquid chromatography.
Following the Guide to the Expression of Uncertainty in measurement (GUM) the expanded uncertainty of toxin level is obtained by multiplication with a coverage factor K for which 2 is usually chosen to obtain a confidence level of 95 %.

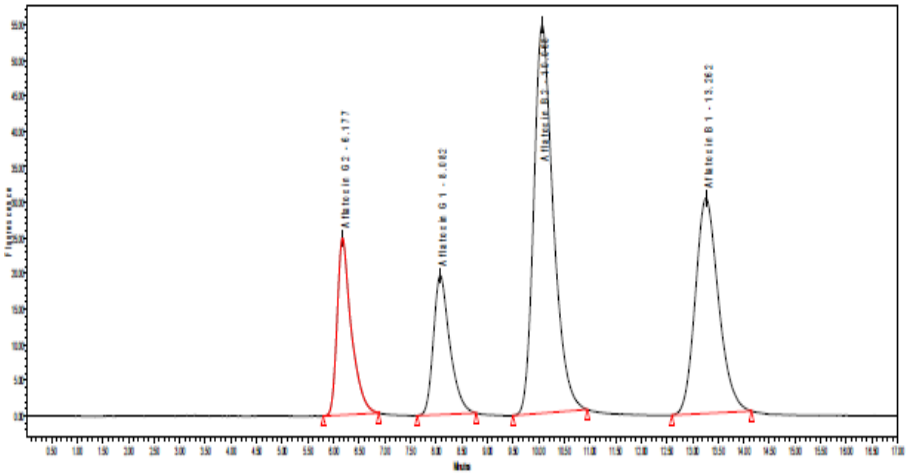
Quality control

Confirmation of the certified concentration by HPLC-FLD & cell

The certified concentrations of the prepared solution was confirmed by HPLC-FLD & cell against a reference batch.

Chromatogram
Chromatographic conditions:

Column:	InertSustain C18 250 x 4,6 mm5 µm			
Mobile phase:	MeOH / H2O + HNO3 +KBr / Isocratique : 35%A / 65%B			
Flow mL/min:	1,80			
Temperature °C:	50,00			
Detector	FLD with post-column electrochemical with bromide using FARLIB® ECD Cell			
Aflatoxin B1	1,08	±	0,01	µg/mL
Aflatoxin B2	1,05	±	0,01	µg/mL
Aflatoxin G1	1,07	±	0,01	µg/mL
Aflatoxin G2	1,00	±	0,02	µg/mL
Mean of 6 replicates measurement against reference batch, confidence interval with P = 95%				



Chromatogram of Toxins

References:

a- ISO Guide 31, 1–7, (2000), “Reference Materials–Contents of certificates and labels”.
b- ISO Guide 35, 1–7 (2000) “Certification of Reference Materials – General and Statistical Principles”.
c- Eurachem/CITAC guide, 1–37 (2003) “Traceability in Chemical Measurement”.
d- Eurachem/CITAC guide, 1–120 (2000) “Quantifying Uncertainty in Analytical Measurement”.
e- AOAC Official Method 970.44 - Preparation of Standards for Mycotoxins.

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Quality Control

Date: 22-Jul-24