Supelco®

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Certificate of Analysis

Product Name:	T-2 Toxin reference material
Product Number:	33947
Batch Number:	BCCG8548
CAS Number:	21259-20-1
Formula:	$C_{24}H_{34}O_9$
Formula Weight:	466.52
Storage Temperature:	-20 C
Expiration Date:	NOV 2026
Quality Release Date:	15 NOV 2021

TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	WHITE
APPEARANCE (FORM)	POWDER OR CRYSTALS	CRYSTALS
PURITY (HPLC) COMP1	≥ 97.0 %	98.6 %
MEASURING TOLERANCE P± COMP1	≤ 3.0 %	± 1.4 %
PROOF OF IDENTITY	IDENTITY CORRESPONDS	CORRESPONDS

Dr. Reinhold Schwenninger
Quality Assurance
Buchs, Switzerland

Sigma-Aldrich warrants that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current specification sheet may be available at Sigma-Aldrich.com. For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.

T-2 Toxin OEKANAL®

1. General information

This document is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31 [1], ISO Guide 35 [2] and Eurachem / CITAG Guides [3,4].

2. Description of the Reference Material (RM)

Name:	T-2 Toxin OEKANAL®
CAS number	21259-20-1
Catalog number:	33947-5MG
Batch / Lot #:	BCCG8548
Date of production / Expiry date:	11.11.2021 / 11.11.2026
Physical description of RM:	White crystals of T-2 Toxin
Packaging of RM:	Amber glass ampoules fitted with teflon faced butyl septa and PP screw caps
Name and address of the supplier:	Sigma-Aldrich Chemie GmbH Kappelweg 1 91625 Schnelldorf Germany www.sigma-aldrich.com

2.1 Intended use of the RM

- calibration of analytical instruments
- validation of analytical methods
- determination of detection limits and linearity studies
- recovery experiments

2.2 Instruction for the correct use of the RM

The ampoules should be stored at approximately -20°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 material safety data sheet (MSDS).

3. Certified values and their uncertainties

T-2 Toxin OEKANAL®		
Compound	**Purity**	
	Certified value [a]	Uncertainty [b]
T-2 Toxin	98.6 %	± 1.4 %
[a] The certified value is based upon the results from LC-UV analysis		
[b] Expanded uncertainty U (k = 2) of the value u_c according to GUM [5]		

3.1 Calculation of the certified value and discussion of uncertainty

The purity check with LC-UV showed two minor impurity peaks with a total estimated mass concentration of 2.4 % of the investigated sample. Based on this result, maximum impurity level in solid T-2 Toxin can be estimated with 2.4 %.

To cover this range, an approach with an estimated purity of 98.6 % with a symmetrical uncertainty of ± 1.4 was used according to a procedure which has recently been accepted by the European Commission within a Standards, Measurements and Testing (SMT) project [6]. The conservative assumption of a rectangular distribution was made and the tolerance of 1.2 % divided by √ 3 [4] resulting in an uncertainty (u_c) of the presented purity level of 0.7. Following the Guide to the Expression of Uncertainty in Measurement (GUM) [5] the expanded uncertainty of the T-2 Toxin 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 % [4]. Using this procedure a theoretical value for the purity of the crystalline T-2 Toxin sample of 98.6 % and its respective expanded uncertainty of ± 1.4 % can be calculated.

4. Discussion of traceability

The certified value (purity of T-2 Toxin) is based on the result of HPLC-UV analysis, an analytical technique previously used for purity assessment of solid mycotoxins [6]. High purity material represents a practical realization of concentration units, through conversion of mass to molar quantity.

5. Purity assessment of T-2 Toxin

5.1. HPLC-UV:

The purity check using isocratic LC-UV of the T-2 Toxin sample showed one main peak and 2 minor impurity peaks after blank subtraction.
The peak areas of the additional minor signals were 1.0 % (5.8 min) 1.4 % (7.7 min) compared to the main peak.

column	Phenomenex Luna C18(2), 250 x 3.0 mm, 5µ
injection volume	25 µL sample
solvent A	Acetonitrile/water = 50/50
oven	22°C
flow rate	0.5 mL / min
VWD settings	203 nm
sample dilution	1:5 with water

	time [min]	area	concentration [a] [µg/mL]
T-2 Toxin	8.0	454.9	100.8 ± 2.6

[a] Mean of 7 replicate measurements against reference batch, confidence intervall with P = 95 %

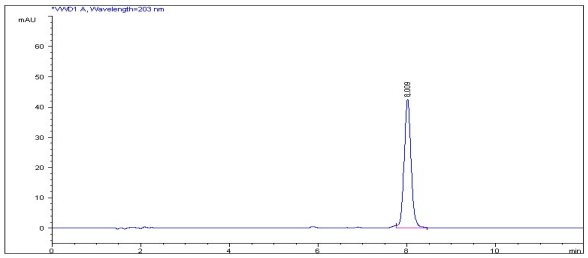

Figure 1: HPLC-UV chromatogram of T-2 Toxin

6. Further information

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

This document has been computer generated and is valid without a signature.

References:

[1] ISO Guide **31**, 1-7, (2000), *"Reference Materials – Contents of Certificates and Labels"*
[2] ISO Guide **35**, 1-7, (2000), *"Certification of Reference Materials – General and Statistical Principles"*
[3] Eurachem / CITAG Guide, 1-37, (2003), *"Traceability in Chemical Measurement"*
[4] Eurachem / CITAG Guide, 1-120, (2000), *"Quantifying Uncertainty in Analytical Measurement"*
[5] International Organization for Standardization (ISO), (1995), *"Guide to the Expression of Uncertainty in Measurement"*, 1st Ed. Geneva, Switzerland
[6] 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"*