

# Certificate of Analysis



## ISO Guide 34 Reference Material

### Product Identification

Article Code: DRE-C10148500  
Article Name: Amaranth  
Formula: C<sub>20</sub>H<sub>11</sub>N<sub>2</sub>O<sub>10</sub>S<sub>3</sub> 3Na  
Mol. Weight: 604.47  
CAS No.: 915-67-3

Lot Number: G977779  
Expiry Date: 09.08.2022  
Storage Temperature: 20°C ± 4°C

Storage and handling: The RM should be stored in the original sealed bottle at the temperature given above. After use the bottle should be tightly closed and protected from moisture.

Purity: 86.86% (g/g)

Expanded Uncertainty U= 1.00% (g/g)

The uncertainty of this standard is calculated in accordance with the ISO Guide 34 and EURACHEM/CITAC Guide - Quantifying Uncertainty in Analytical Measurement, Second Edition. The expanded uncertainty is  $U(\text{exp}) = u(\text{RM}) \times k$ , where  $k$  is the coverage factor at the 95% confidence level ( $k=2$ ). Uncertainty  $u(\text{RM})$  is based on the combination of the uncertainties associated with each individual operation involved in the analysis of the product:  $u(\text{RM}) = \sqrt{u(\text{char})^2 + u(\text{bb})^2 + u(\text{its})^2 + u(\text{sts})^2}$ ;  $u(\text{char})$  is the uncertainty of characterisation;  $u(\text{bb})$  uncertainty of homogeneity test;  $u(\text{its})$  uncertainty of stability test long-term;  $u(\text{sts})$  uncertainty of stability test short-term.  $u(\text{its})$  and  $u(\text{sts})$  are not included in the calculation as the stability statement is based on real evidence opposed to simulation.

Minimum sample: 1 mg is recommended as the minimal sample amount. If less material is used, it is recommended to increase the certified uncertainty by a factor of two for half sample and a factor of four for a quarter of sample.

Intended use: Use this RM as calibrant for chromatography or any other analytical technique.

### Analytical Data

Traceability of chromatography: To the International System of Units (SI).

Instrument: HPLC/DAD  
Detection: DAD  
Column: Poroshell 120 EC-C18 2,7 µm 4,6 x 50 mm  
Inj.-Vol.: 10.0 µl  
Flow: 1.0 ml/min  
Ret.Time: 6.95 min

#### Method Details

Eluent A: Acetonitrile  
Eluent B: 1.7 g Tetrabutylammoniumhydrogen sulfate + 0.7 g Na<sub>2</sub>HPO<sub>4</sub> / 1L Water, pH = 3.35

Time[min]	Eluent A [%]	Eluent B [%]
0	20	80
1	20	80
9	50	50
15	50	50
20	20	80

### Comment

Traceability: The balances used are calibrated with weights traceable to the national standards (DKD).

Calibrated class A glassware is used for volumetric measurements.

Water Content: 8.74% (g/g) by Karl-Fischer-Titration ( $U(\text{exp}) = 0.23\%$  (g/g)).

Purity was determined by elemental analysis

Identity: EA, NMR, RT, IR, UV, MS

Certificate Revision 1 - 09.08.2018 - N. Müller

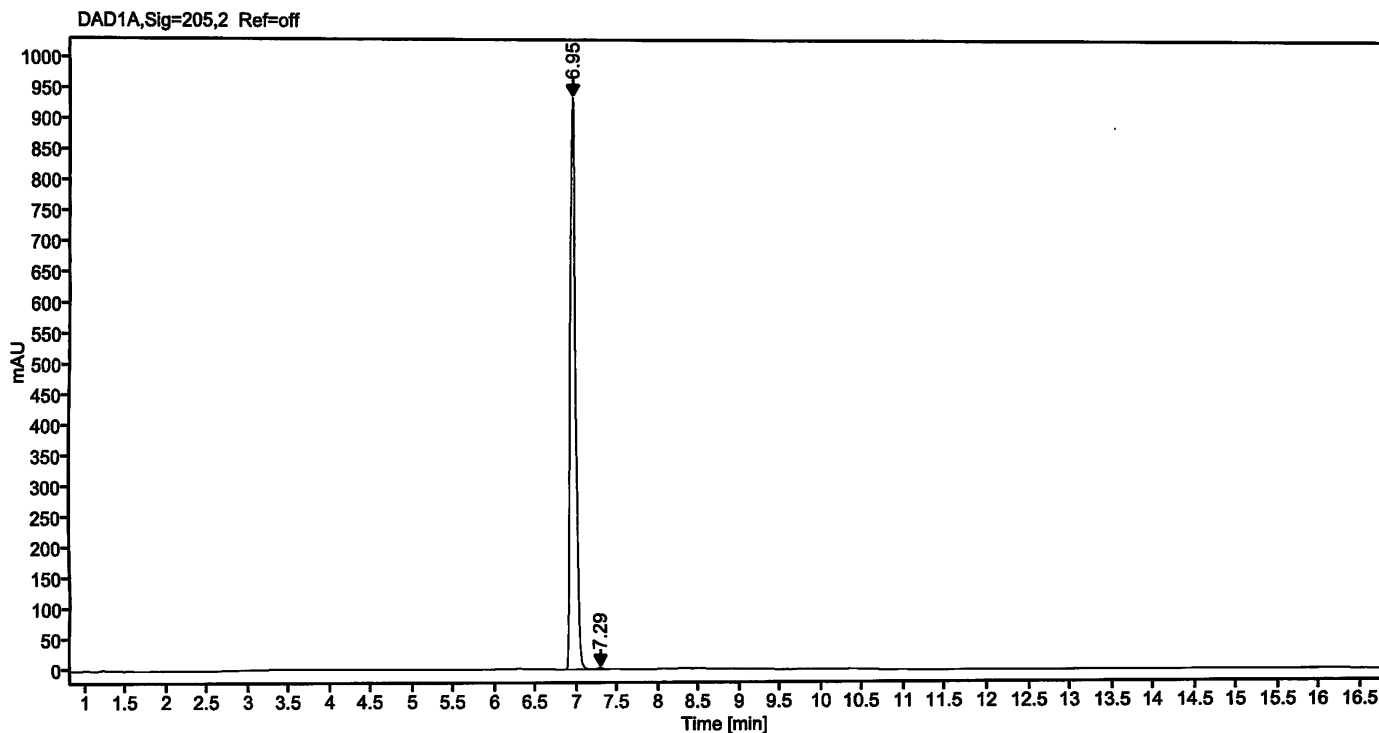
Certified on: 09.08.2018  
Certified by: N. Müller  
RM Release

The LGC Labor GmbH, accredited by DAkkS as indicated by the accreditation number D-RM-19883-01 & D-PL-19883-01, has shown competence based on ISO Guide 34:2009 with relevant parts of DIN EN ISO/IEC 17025:2005 for production of certified reference materials in form of organic pure substances and in form of single and multi-component solutions of organic pure substances.

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The warranty for this product is limited to the purchasing price of this product.

<b>Data file:</b>	10148500-03.dx	<b>Instrument:</b>	DAD5
<b>Sample name:</b>	80802WA G977779	<b>Sequence Name:</b>	07082018-SE
<b>Inj. volume [µl]:</b>	10.0	<b>Injection date:</b>	8/7/2018 10:02:01 AM
<b>Acq. method:</b>	S2_Gradient_BrilliantBlack.amx	<b>Location:</b>	P1-C2

**Sample Description**      Amaranth  
Column: Poroshell 120 EC-C18 2,7 µm 4,6 x 50 mm  
Eluent: Tetrabutylammoniumhydrogen sulfate (1.7 g) and Na2HPO4 (0.7 g) in 1 L Water (pH 3.35 with H3PO4)



**Signal:** DAD1A,Sig=205,2 Ref=off

Nr.	RT [min]	Area	Height	Area%
1	6.95	4168.07219	936.81	99.73
2	7.29	11.37645	2.90	0.27
Sum		4179.45		

*Handwritten signature*