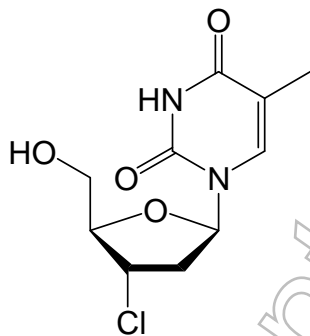




Certificate of Analysis

Reference Standard

1-(3-Chloro-2,3-dideoxy- β -D-erythro-pentofuranosyl)-5-methylpyrimidine-2,4(1H,3H)-dione



Molecular Formula: $C_{10}H_{13}ClN_2O_4$
Molecular Weight: 260.67
CAS Number: [25526-94-7]

Catalogue Number: MM0173.02
Lot Number: 1866
Long-term Storage: 2 to 8 °C, dark
Appearance: beige solid
Melting Point: 178 °C (dec.)
Assay 'as is': 98.0 %

Date of shipment: **2015-July-04**

This certificate is valid for two years from the date of shipment provided the substance is stored under the recommended conditions.



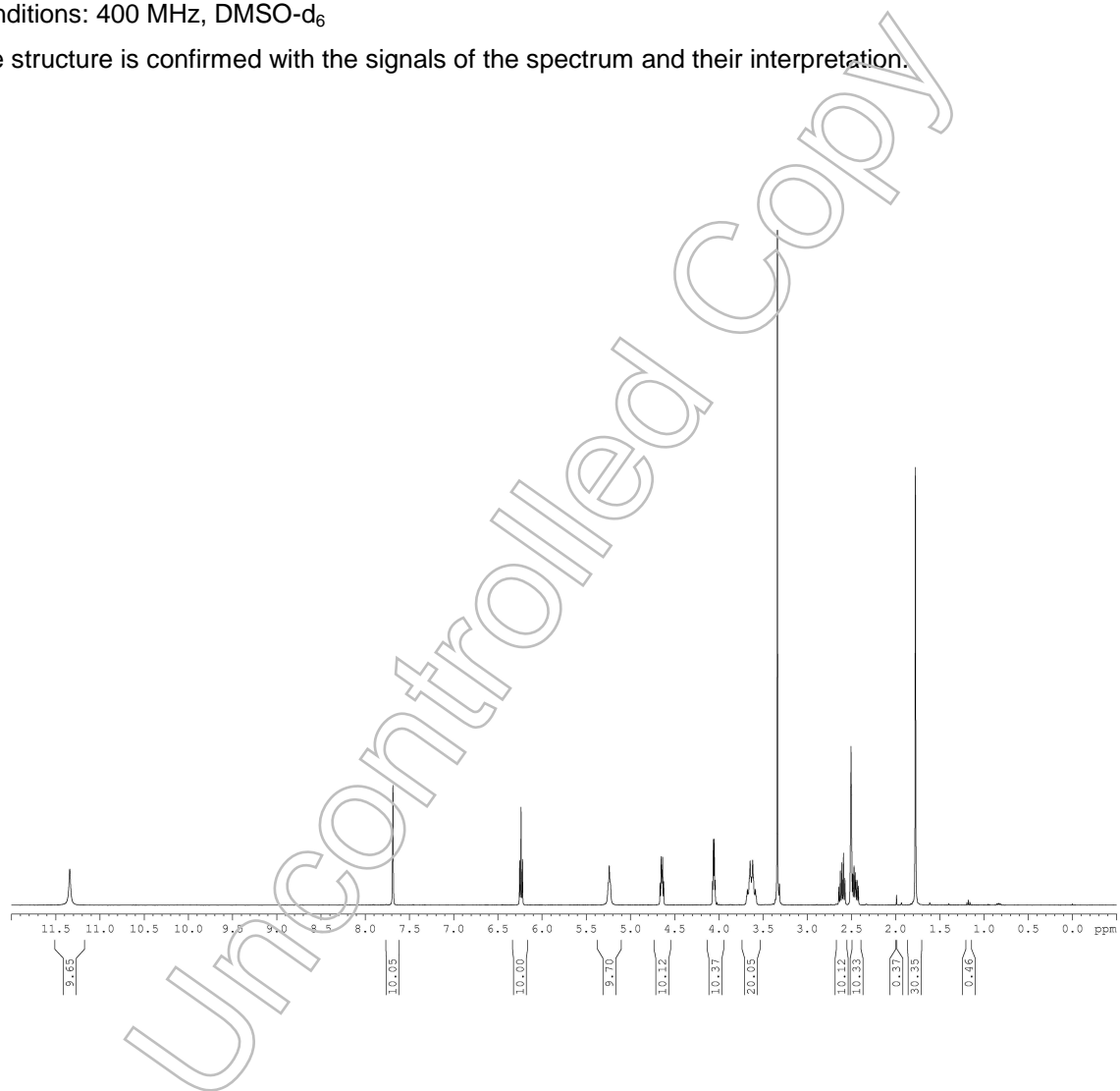
I. Identity

The identity of the reference substance was established by following analyses.

Ia. ¹H-NMR Spectrum

Conditions: 400 MHz, DMSO-d₆

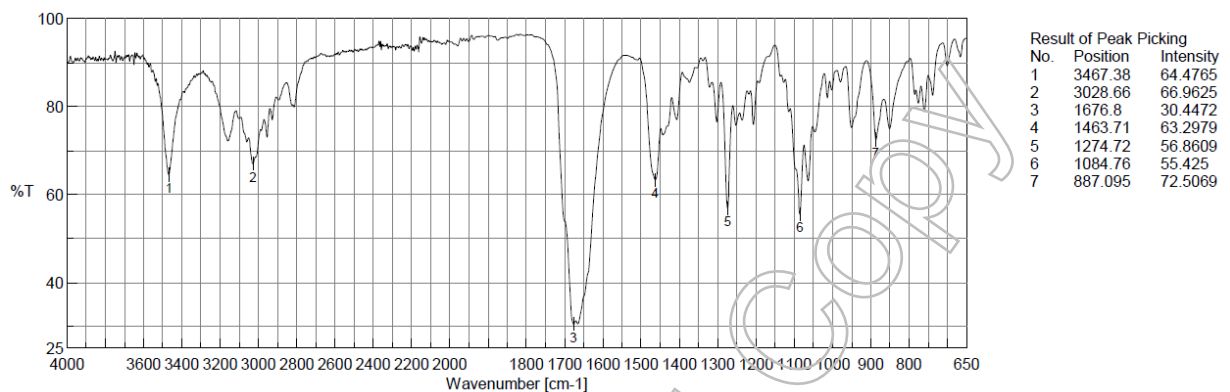
The structure is confirmed with the signals of the spectrum and their interpretation.





1b. IR Spectrum

Method: Attenuated Total Reflection Fourier Transform Infrared (ATR-FTIR) Spectroscopy



The signals of the IR spectrum and their interpretation are consistent with the structural formula.

II. Purity

The purity of the reference substance was analysed by high performance liquid chromatography (HPLC).

HPLC Conditions:

Column:

LiChrosorb RP-18
5 µm, 250 x 4 mm

Conditions:

1.0 ml/min, 40 °C
mob. phase A: Water/Methanol 70/30 (v/v)
mob. phase B: Methanol

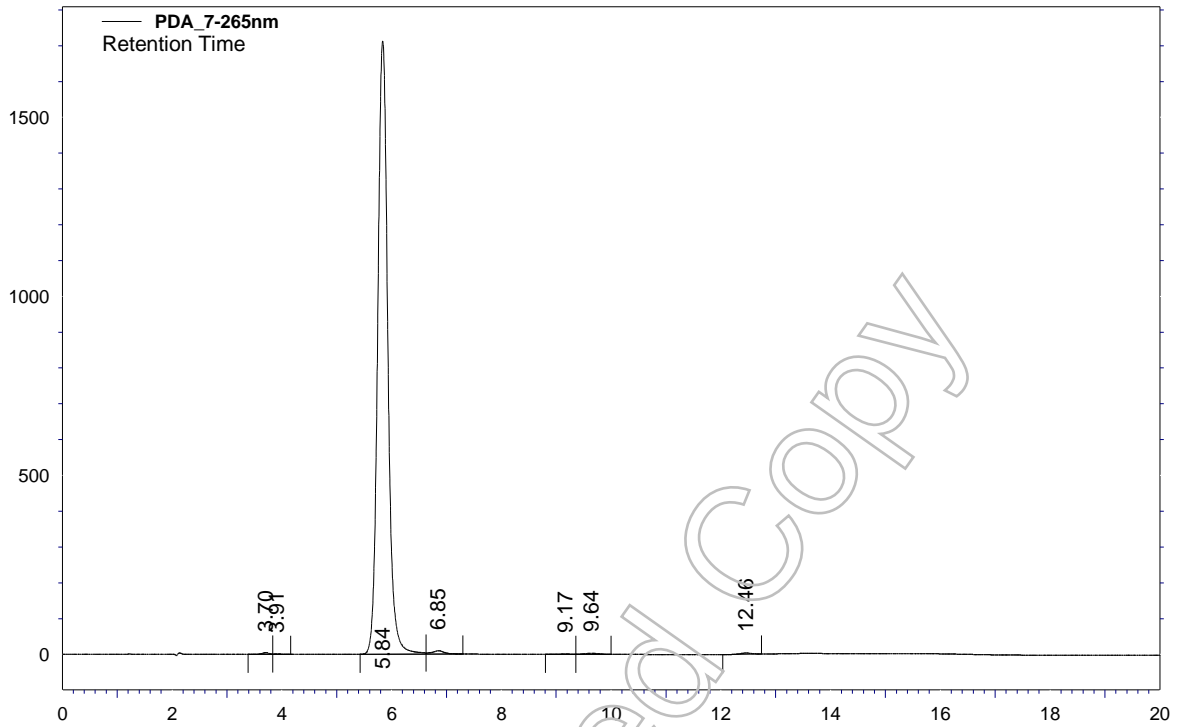
0 – 8 min	A/B	100/0
8 – 10 min	A/B	to 80/20
10 – 12 min	A/B	80/20
12 – 14 min	A/B	to 100/0
14 – 20 min	A/B	100/0 (v/v)

Detector:

DAD
265 nm

Injector:

Auto
5 µl; 0.5066 mg/ml in
Methanol



Area Percent Report - Sorted by Signal

Pk #	Retention Time	Area	Area %
1	3.70	44255	0.20
2	3.91	11228	0.05
3	5.84	21937552	98.57
4	6.85	146207	0.66
5	9.17	11549	0.05
6	9.64	51645	0.23
7	12.46	52479	0.24
Totals		22254915	100.00

For the calculation the system peaks were ignored. The content of the analyte was determined as ratio of the peak area of the analyte and the cumulative areas of the purities, added up to 100 %.

Results:

Average 98.58 %

Number of results n=6

Standard deviation 0.05 %



III. Water Content

Method: Karl Fischer titration

Results:

Average	0.14 %
Number of results	n=3
Standard deviation	0.01 %

IV. Residual Solvents

Method: ¹H-NMR

Result: 0.47 % Ethyl acetate

V. Final Result

Total impurities (HPLC)	1.42 %
Water content	0.14 %
Residual solvents	0.47 %
Assay (100 % method)	97.98 %

The assay is assessed to be 98.0 % 'as is'

The assay 'as is' is equivalent to the assay based on the not anhydrous and not dried substance respectively.

Release Date: 2010-04-14

LGC GmbH

Dr. Sabine Schröder
Product Release