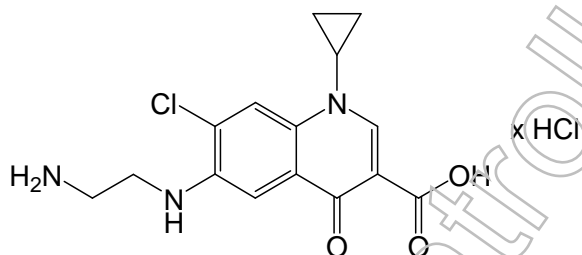




Certificate of Analysis

Reference Standard

6-(2-Aminoethylamino)-7-chloro-1-cyclopropyl-4-oxo-1,4-dihydroquinoline-3-carboxylic Acid Hydrochloride



Molecular Formula: $C_{15}H_{16}ClN_3O_3 \cdot HCl$
Molecular Weight: 358.22
CAS Number: [528851-30-1]

Catalogue Number: MM0018.10
Lot Number: 2298
Long-term Storage: 2 to 8 °C, dark
Appearance: yellow solid
Melting Point (DSC): 305 °C
Assay 'as is': 91.6 %

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

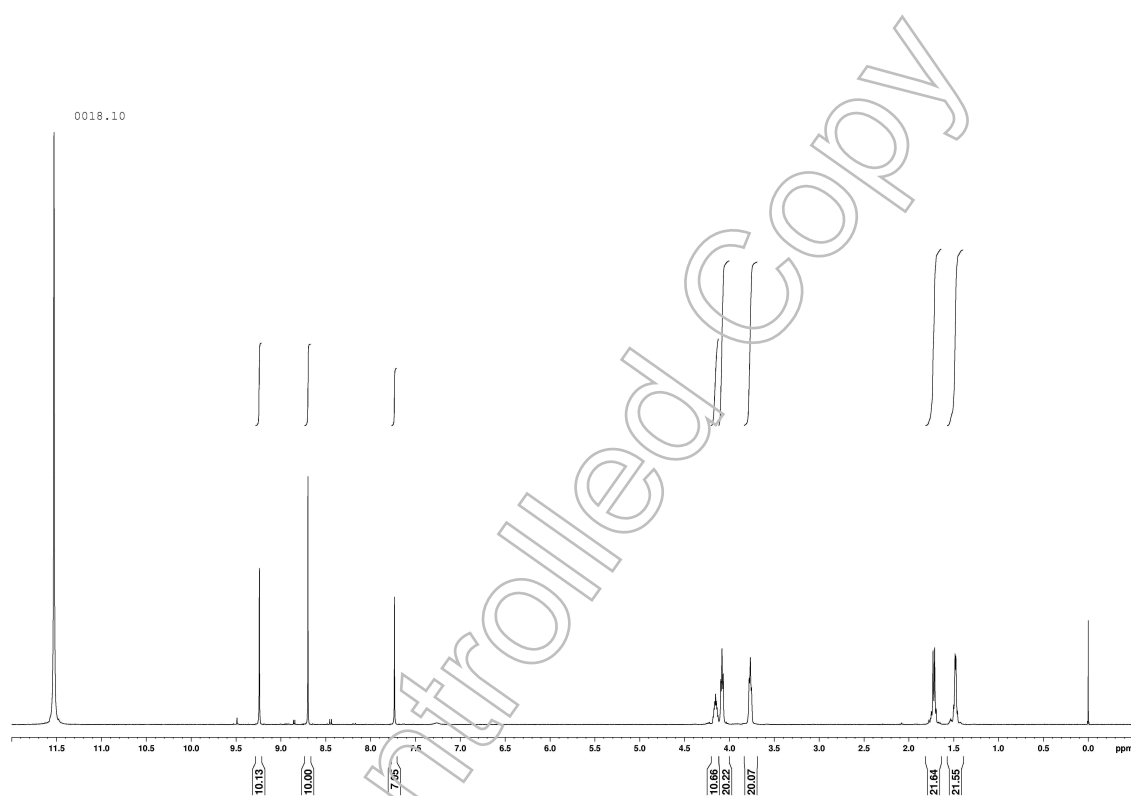
This certificate is valid for two years from the date of shipment provided the substance is stored under the recommended conditions.



I. Identity

The identity of the reference substance was established by $^1\text{H-NMR}$ spectroscopy. The structure is confirmed with the signals of the spectrum and their interpretation.

Conditions: 400 MHz, CF_3COOD



II. Purity

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

HPLC Conditions:

Column:

RP 60 Select B
5 μm , 125 x 4 mm

Conditions:

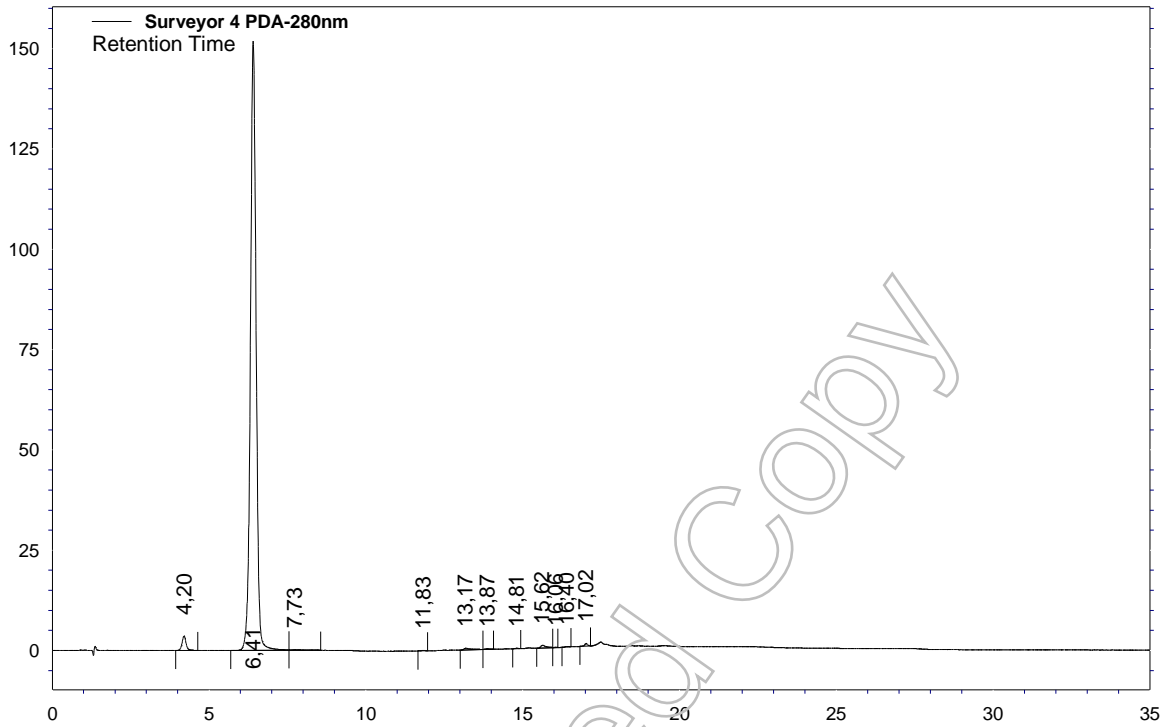
1.0 ml/min, 40 $^{\circ}\text{C}$
0-7 min Water/Acetonitrile 85/15
7-15 min Water/Acetonitrile to 50/50
15-20 min Water/Acetonitrile 50/50
20-25 min Water/Acetonitrile to 85/15
25-35 min Water/Acetonitrile 85/15 (v/v);
0.1 % H_3PO_4

Detector:

DAD
280 nm

Injector:

Auto
3 μl ; 0.042 mg/ml in
Water/Acetonitrile 50/50 (v/v)



Area Percent Report - Sorted by Signal

Pk #	Retention Time	Area	Area %
1	4.20	32336	1.64
2	6.41	1910180	97.06
3	7.73	3872	0.20
4	11.83	698	0.04
5	13.17	6097	0.31
6	13.87	1170	0.06
7	14.81	497	0.03
8	15.62	7608	0.39
9	16.06	316	0.02
10	16.40	1106	0.06
11	17.02	4097	0.21
Totals		1967977	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 97.05 %
Number of results n=6
Standard deviation 0.10 %



III. Water Content

Method: Karl Fischer titration

Results:

Average	5.64 %
Number of results	n=3
Standard deviation	0.03 %

IV. Residual Solvents

Method: ¹H-NMR

No significant amounts of residual solvents were detected (< 0.05 %).

V. Final Result

Total impurities (HPLC)	2.95 %
Water content	5.64 %
Residual solvents	n. d. (not detected)
Assay (100 % method)	91.58 %

The assay is assessed to be 91.6 % 'as is'

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

Release Date: 2010-05-18

LGC GmbH

Dr. Sabine Schröder
Product Release