

BDG SYNTHESIS

Certificate of Analysis

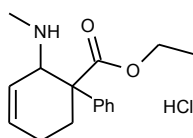
BDG Synthesis certifies that this reference material meets or exceeds the specifications stated herein.

Neil Beare

Neil Beare, PhD, Director
1 September 2014

Name: Nortilidine HCl
CAS Number: 38677-94-0 (free base)

Structure:



Molecular Weight: $C_{16}H_{21}NO_2 \cdot HCl = 295.80$

Lot Number: BDG 2375

Appearance: White, crystalline solid

Purity By HPLC: 99.8 %

Re-test Date: 1 September 2019

Storage and Handling:

Temperature:	refrigerate for prolonged storage; may be handled and shipped at ambient temperature.
Humidity:	not believed to be hygroscopic; may be handled in normal laboratory atmosphere.
Light:	protect from strong sunlight.
Caution:	only experienced laboratory personnel should handle the material.

Identity and Purity

Proton NMR Spectrum

Identity: the signals are consistent with the proposed structure and in accord with literature where available.

Residual Solvents: no residual solvents are observed.

Impurities: no significant impurities are evident in the spectrum.

Carbon-13 NMR Spectrum

Identity: the signals are consistent with the proposed structure and in accord with literature where available.

High-resolution Mass Spectrum (EI+)

Found m/z 259.1570. $C_{16}H_{21}NO_2$ $[M]^+$ requires m/z 259.1572. The deviation of 1.0 ppm is within normally accepted limits for the establishment of identity by HRMS.

HPLC

A somewhat broadened, slightly tailing peak is observed (99.8 %). Note: in the absence of reference materials for preparing calibration curves, it is assumed that all peaks have the same detector response. Where possible, the conditions of analysis follow a pharmacopeial or literature method, or have been adapted from same.

Elemental Analysis

$C_{16}H_{21}NO_2 \cdot HCl$	Found:	C 65.19, H 7.66, N 4.68 %
	Requires:	C 64.97, H 7.50, N 4.74 %

The elemental analyses fall within generally accepted limits for establishing the molecular formula given. The results may also be taken to imply the absence of significant quantities of water or inorganic salts (which have not been elsewhere tested for because of sample size limitations).

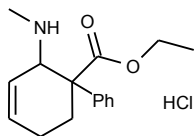
The available quantity of custom-synthesised material is always small, and this limits the extent and type of analytical data which can be obtained. This Certificate is presented in descriptive format for use by analytical chemists who are trained in the use of custom-synthesised materials. Custom materials often contain higher levels of residual solvents and/or water, and we urge you to use the corrected purity where needed rather than the raw HPLC purity. This compound is intended for use as an analytical reference material and it is not for human administration. Structures are shown with relative stereochemistry unless otherwise specified.

The re-test date is assigned from experience gained with the material in the laboratory and/or on storage. It is not possible to perform formal storage studies because of the small amount of material available.

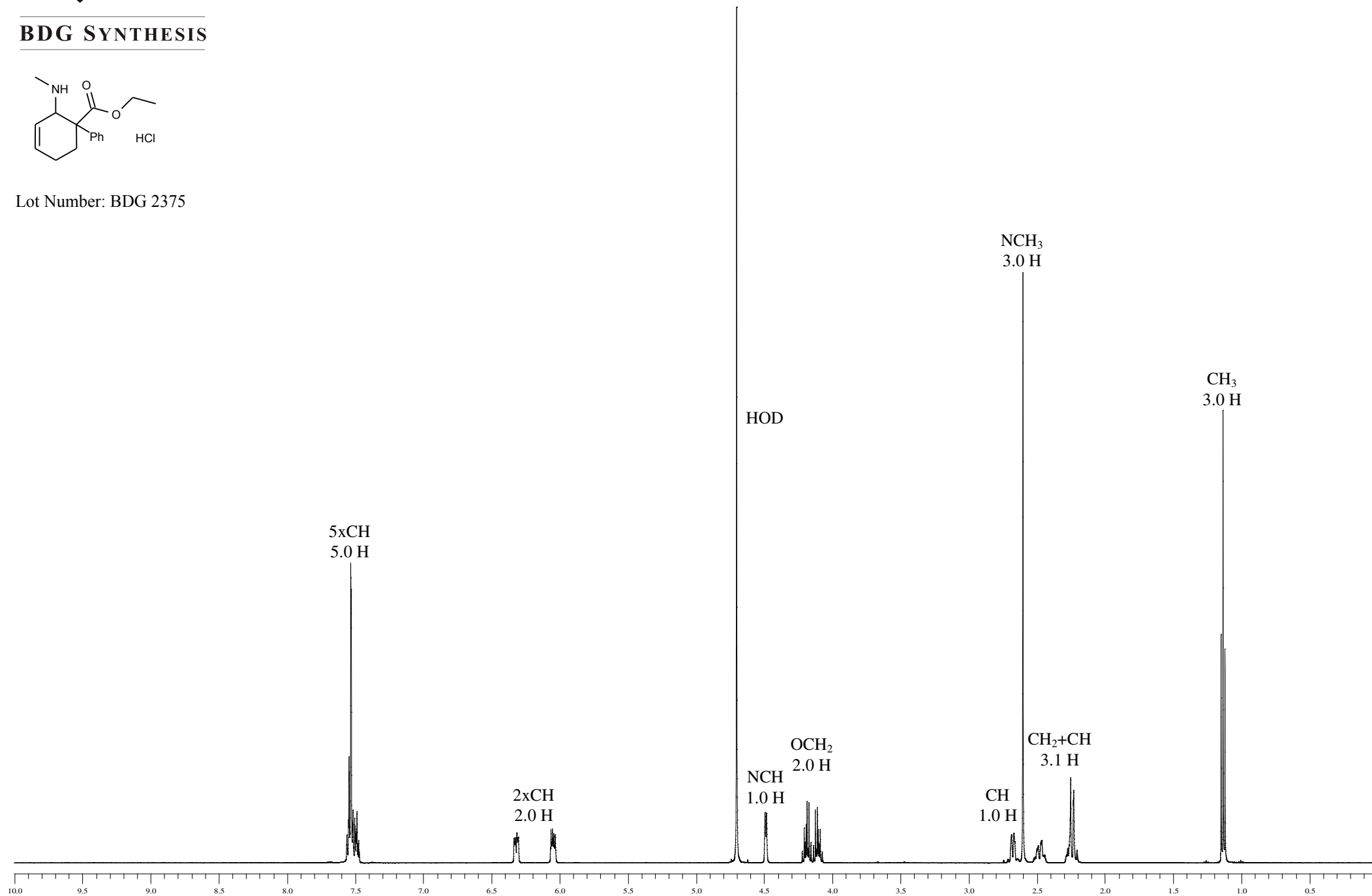


Proton NMR Spectrum of Nortilidine HCl in D₂O

BDG SYNTHESIS

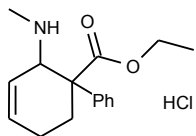


Lot Number: BDG 2375



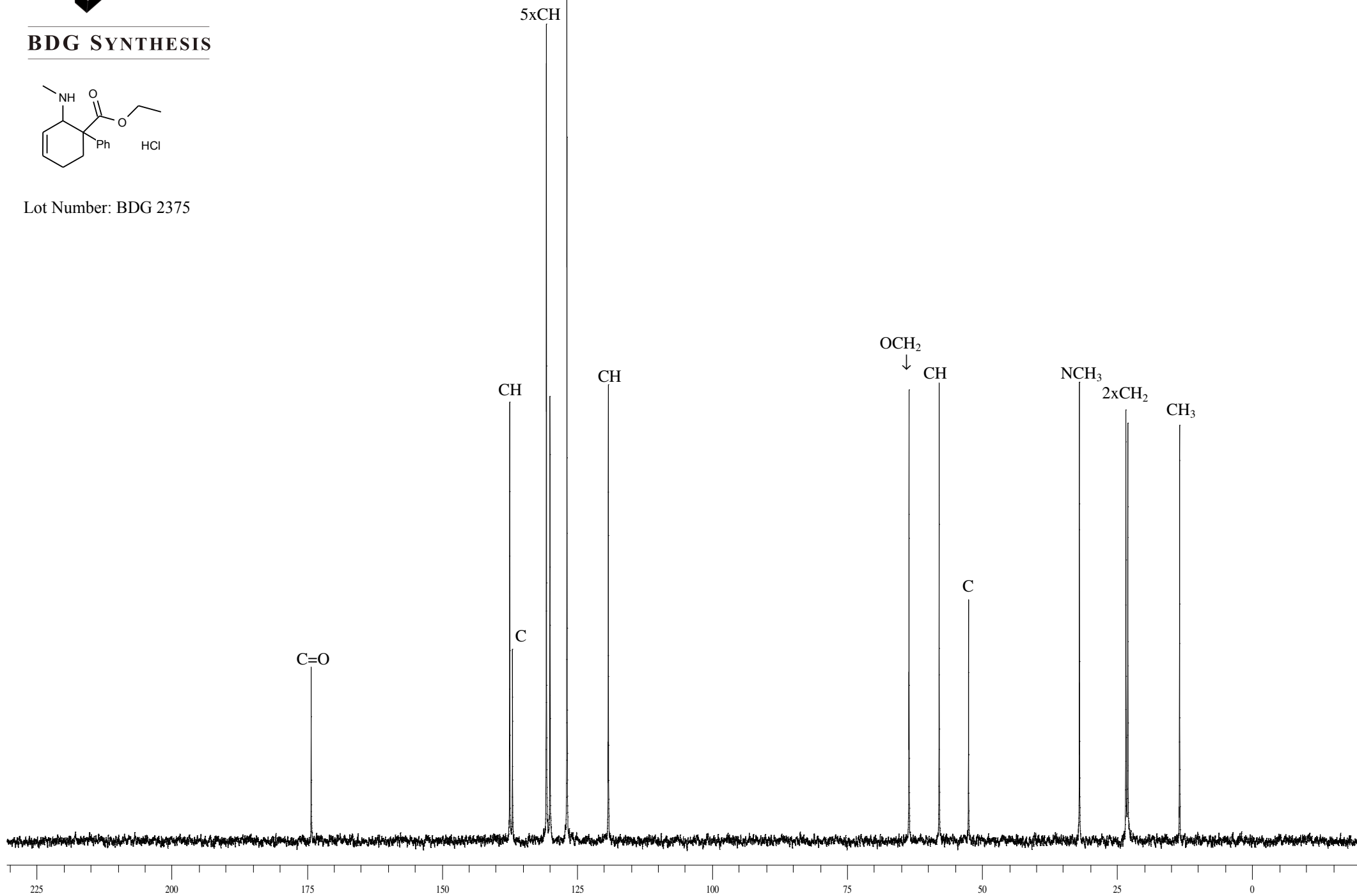


BDG SYNTHESIS



Lot Number: BDG 2375

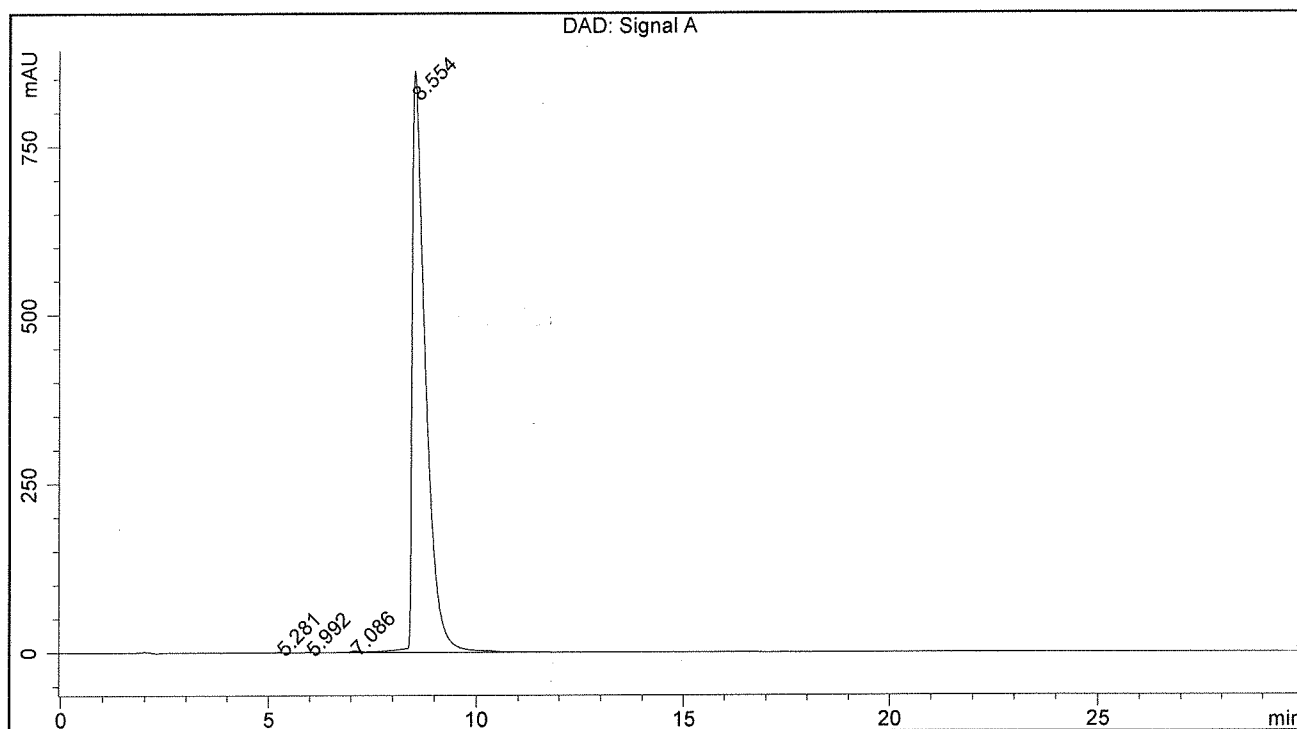
Carbon-13 NMR Spectrum of Nortilidine HCl in D₂O



BDG - Analysis of Nortilidine hydrochloride

Column : Phenomenex Luna C18(2) 5um 250 x 4.6 mm
 Guard : Phenomenex Security Guard C18 RP 4 x 3 mm
 Mobile Phase : 40:60 0.98 g/L Ammonium Carbonate : Acetonitrile
 Flow Rate : 1.0 mL/min
 Sample Solvent : Water
 Column Temperature : 20C
 Injection Volume : 10 uL
 Detection : UV at 220 nm

Sample Name	BDG 2375	Instrument	AnalyticalLC01
Acquisition	01/09/2014, 11:17:46	Method (rev.)	LC10255a (6)
Sequence	BDG_01Sep2014b - Reprocessed	Vial Position	31
Operator	solvation010\cerityadmin	Injection	2 of 2



Area Percent Report

Peak#	RT	Peak Height	Peak Area	Width	Area %
1	5.28 min	0.7938	10.2511	0.1947 min	0.054 %
2	5.99 min	0.2851	4.3774	0.1931 min	0.023 %
3	7.09 min	1.8959	25.5413	0.2072 min	0.134 %
4	8.55 min	861.1272	19024.1959	0.3177 min	99.789 %