



BDG SYNTHESIS

Certificate of Analysis

This material is a research-grade material prepared by custom synthesis. The quantity available is limited, 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 research-grade materials. Research 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.

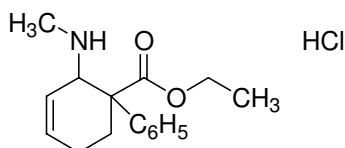
BDG Synthesis certifies that this reference material meets or exceeds the specifications stated in this data sheet.

Barry Dent

Barry R. Dent, PhD, Director
6 June 2001

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

Structure:



Molecular Weight: $C_{16}H_{21}NO_2 \cdot HCl = 295.81$

Lot Number: BDG 2375

Appearance: White, crystalline solid

Purity by HPLC: 99.8 %

Expiry Date: 6 June 2002

Because of the small amount of material available it is not possible to perform formal storage stability studies. This expiry date is assigned from experience gained with the material in the laboratory and/or on storage.

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: store in an amber vial and protect from bright light.

Caution: Only experienced laboratory personnel should handle the material.

Identity and Purity:

Source of Material

The material was made by an unambiguous synthetic route, using literature procedures where possible; starting materials were purchased from reputable sources and all intermediates were checked for identity by NMR.

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.

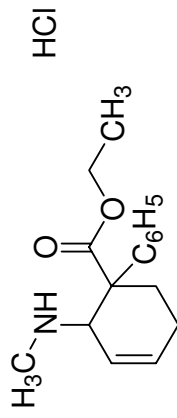
HPLC: A sharp, symmetrical peak is observed (99.8 area %). Note: in the absence of reference materials for preparing calibration curves, it is assumed that all peaks have the same detector response. Where possible, the conditions of analysis follow a pharmacopeial or literature method, or have been adapted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

Elemental Analysis: Found: C 65.19, H 7.66, N 4.68 %
 $C_{16}H_{21}NO_2 \cdot HCl$ requires: C 64.96, H 7.50, N 4.74 %

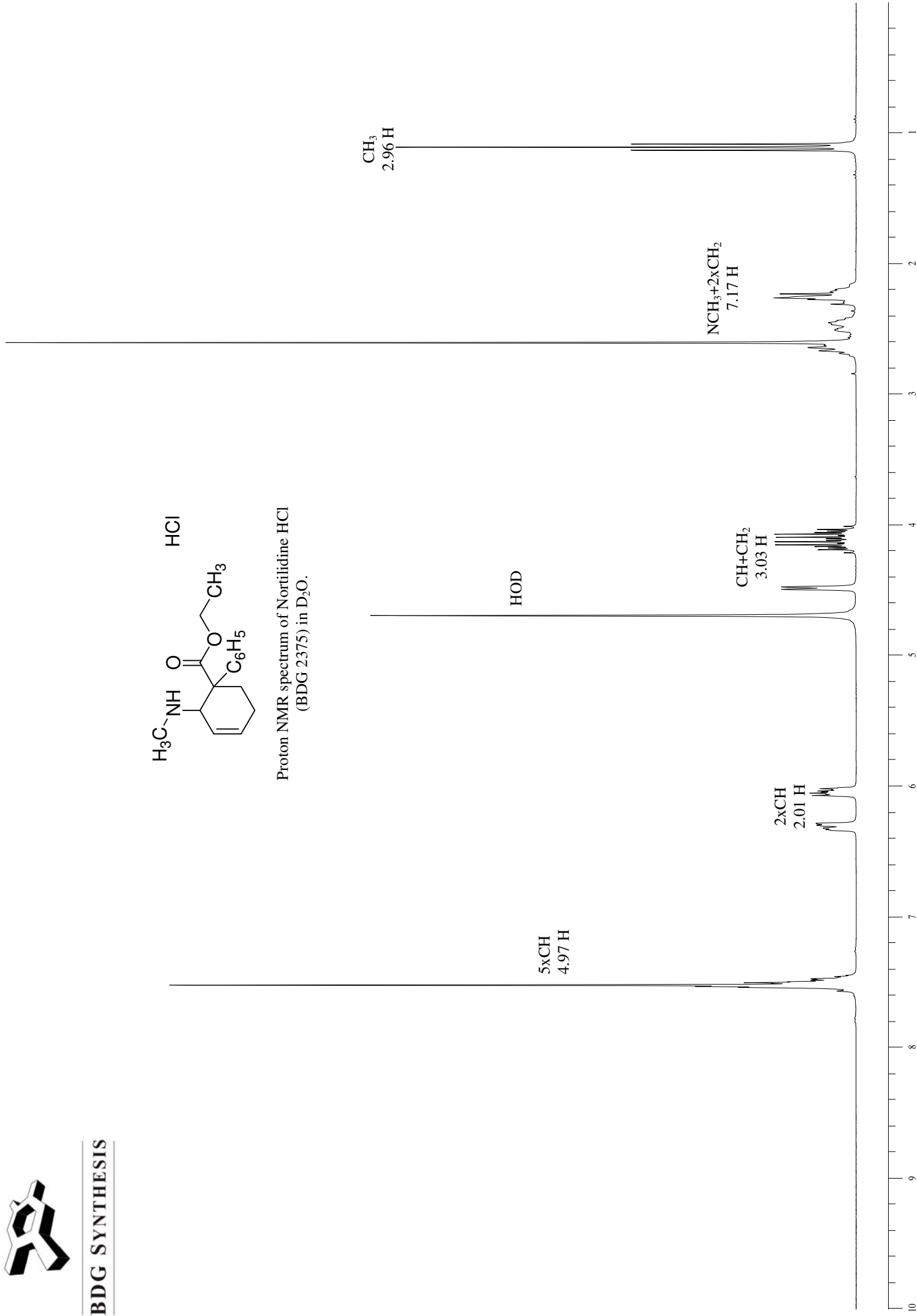
The elemental analyses fall within generally accepted limits for establishing the molecular formula given. The results may also be taken to imply the absence of significant quantities of water or inorganic salts (which have not been elsewhere tested for because of sample size limitations).



BDG SYNTHESIS

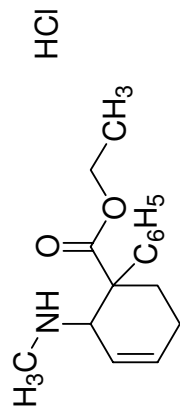


Proton NMR spectrum of Nortilidine HCl
(BDG 2375) in D₂O.

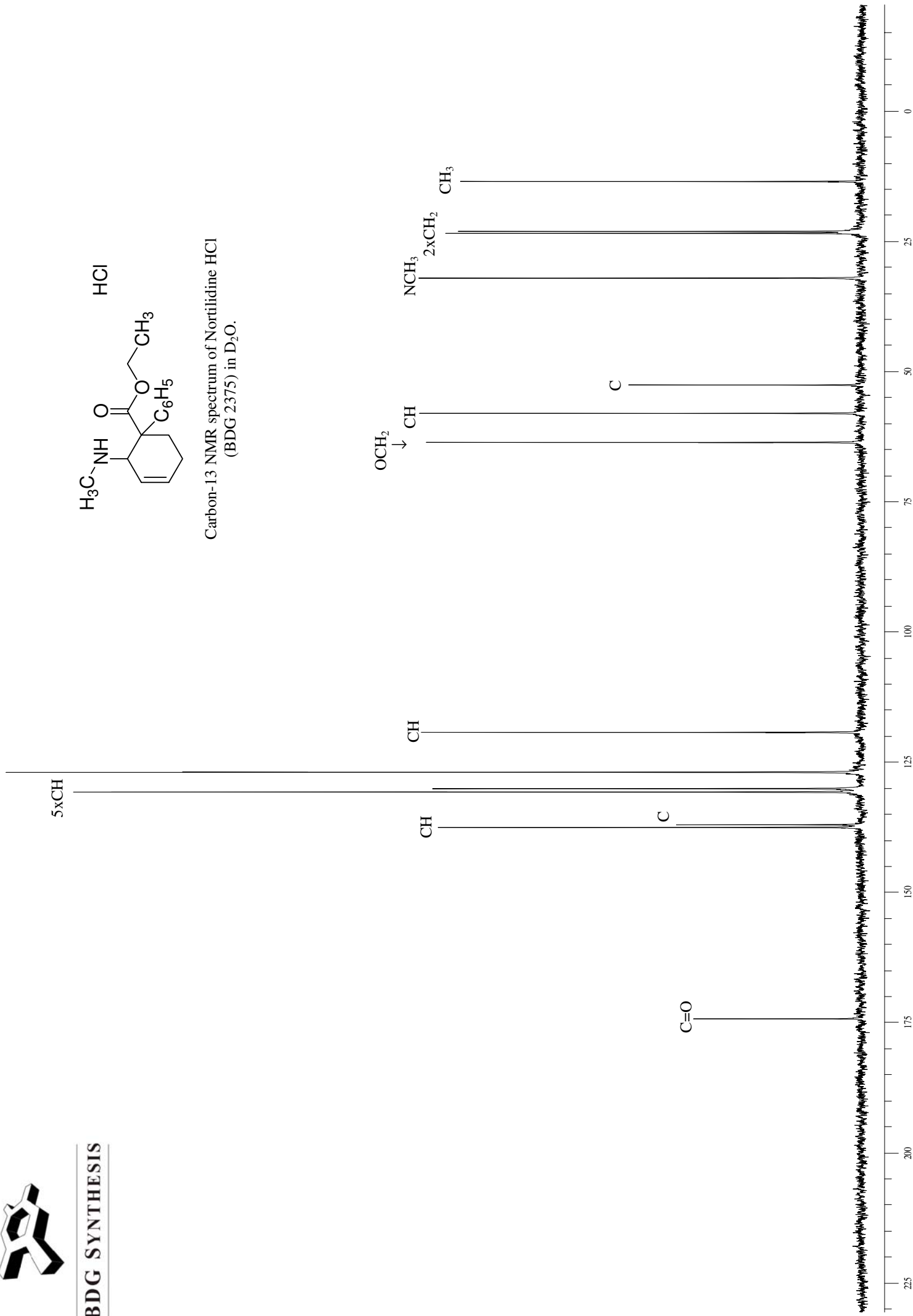




BDG SYNTHESIS



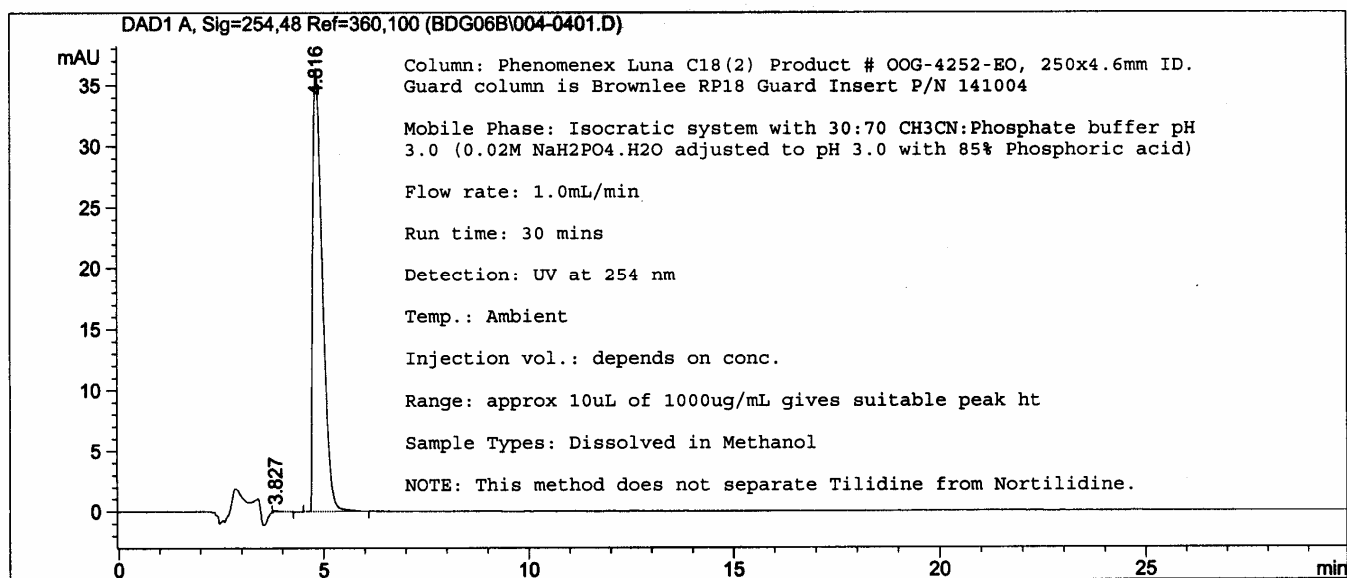
Carbon-13 NMR spectrum of Nortilidine HCl (BDG 2375) in D₂O.



```

=====
Injection Date : 5/31/2001 7:01:10 PM      Seq. Line : 4
Sample Name    : BDG2375                    Location  : Vial 4
Acq. Operator  : LKBadmIn                  Inj      : 1
                                           Inj Volume : 10 µl
Acq. Method    : C:\HPCHEM\1\METHODS\LC10059B.M
Last changed   : 5/31/2001 3:55:06 PM by LKBadmIn
Analysis Method : C:\HPCHEM\1\METHODS\LC10059B.M
Last changed   : 6/6/2001 11:52:00 AM by LKBadmIn
                (modified after loading)
    
```

Isocratic analysis of Tilidine/Nortilidine on ODS2 with ACN/Phosphate buffer pH 3.0 30:70, #LC10059



=====
Area Percent Report
=====

```

Sorted By      :      Signal
Multiplier     :      1.0000
Dilution       :      1.0000
    
```

Signal 1: DAD1 A, Sig=254,48 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	3.827	MM	0.1785	1.10298	1.03002e-1	0.1868
2	4.816	MM	0.2698	589.35529	36.40421	99.8132

Totals : 590.45826 36.50721

Results obtained with enhanced integrator!

=====
*** End of Report ***